New Gold
Rainy River Mine

Environmental Assessment
Compliance Report
Reporting Period
January to December 2018

Per Provincial Environmental Assessment
Notice of Approval Condition 5
EA 05-09-02/EAIMS 13102

And

Per Federal Environmental Assessment
Decision Statement Condition 2.3

BINDER 1 0F 2
MARCH 31, 2019
Version 1

newgold™ Rainy River

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Figure 1 November Sunrise over the Mill 2018

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Executive Summary

The 2018 Annual Compliance Report covers the reporting period from January 1st to December 31st, 2018 for the New Gold Inc. (New Gold) Rainy River Mine.

The site is located in Chapple Township, approximately 65 kilometers northwest of Fort Frances in northwestern Ontario. In October 2017 the Project transitioned from its construction phase to an operational phase.

To date Rainy River Mine is an operational open pit mine designed toproduce 325,000 ounces of gold annually. New Gold intends to pursue the opportunity to process higher grade ounces in the early years of production, while stockpiling lower grades for processing towards the end of the mine life, with the intent of increasing cash flow and enhancing project economics.

The 2018 Rainy River Mine Environmental Assessment Compliance Report demonstrates New Gold's commitment to environmental performance and compliance with the Federal Environmental Assessment Decision Statement and in addition to satisfying reporting requirements for the Canadian Environmental Assessment Agency and the Ministry of Environment, Conservation and Parks.

This document has been created to meet the requirements of;

Provincial Environmental Assessment, Notice of Approval Condition 5 EA 05-09-02/EAIMS 13102; and the Federal Environmental Assessment Decision Statement Condition 2.3.

Key areas discussed in this report are; indigenous and community consultation, project development, reclamation activities, protection of fish and wildlife, migratory birds, health of indigenous peoples, site archaeology, heritage and cultural resources. This document also contains a summary of monitoring and research activities associated with water and air quality as well as wildlife and aquatic monitoring.

Figure 2 Elk in Field on HWY 617 January 4th, 2018

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Acronyms

ABA	Acid Based Accounting
BMA	Bear Management Area
CEAA	Canadian Environmental Assessment Agency
CMP	Compliance Monitoring Plan
DFO	Department of Fisheries and Oceans
DMBPP	Dust Management Best Practice Plan
EA	Environmental Assessment
ECCC	Environment and Climate Change Canada
ECA	Environmental Compliance Approval
EEM	Environmental Effects Monitoring
EMRS	East Mine Rock Stockpile
ERT	Emergency Response Team
ENDM	Ministry of Energy of Northern Development and Mines
FMP	Follow-up Monitoring Plan
LRIA	Lakes and Rivers Improvement Act
MDMER	Metal and Diamond Mining Effluent Regulation
MNRF	Ministry of Natural Resources and Forestry
MECP	Ministry of Environment, Conservation and Parks
MRP	Mine Rock Pond
MTCS	Ministry of Tourism, Culture and Sport
NG	New Gold
PTTW	Permit to Take Water
PWQO	Provincial Water Quality Objectives
RRM	Rainy River Mine
RRP	Rainy River Project
SAR	Species at Risk
SDS	Safety Data Sheets
TK/TLU	Traditional Knowledge/Traditional Land Use
TMA	Tailings Management Area
WMP	Water Management Pond
WMRS	West Mine Rock Stockpile
XRD	X-Ray Diffraction

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SECTION 1.0
NEW GOLD RAINY RIVER MINE
MINE UPDATE

Figure 3 Open Pit Mine Summer 2018

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1.0 Mine Update

The Rainy River Mine (RRM) site is located in the Township of Chapple, approximately 65 kilometers, Northwest of Fort Frances in Northwestern Ontario. Owned and operated by New Gold Inc (New Gold). Physical works related to the RRM consists primarily of:

- Open pit (current),
- Overburden, mine rock and low-grade ore stockpiles,
- Primary crusher and process plant (completed 2018),
- Tailings management area,
- 230 kilovolt transmission line (completed 2016),
- Relocation of a portion of gravel-surfaced Highway 600 (completed 2016), and
- Associated infrastructure, buildings and facilities, supported by related pipeline and power infrastructure as required.

Construction of the RRM began in February 2015 after the Environmental Assessment (EA) process was completed, the Closure Plan was filed and the environmental approvals necessary for the work proposed were obtained.

During 2018, construction continued with the completion and commissioning of Cell 3 of the Tailings Management Area.

The subsections that follow provide an overview of the activities conducted onsite during 2018.

1.1 Health and Safety

Health and Safety is a primary focus of the RRM. Table 1 outlines the project statistics from 2015 to 2018.

Table 1: Rainy River Mine Safety Statistics

Description	***2015***	***2016***	***2017***	***2018***
Lost Time Incidents	**0**	**1**	**2**	**3**
Hours Worked on Project	**1,265,699**	**2,899,056**	**3,726,628**	**2 586 258**
Site Health, Safety and Environmental Orientations completed	**2500**	**3200**	**4328**	**2719**

2018 Highlights and activities within the Health and Safety Department include;

- Total Recordable Injury Frequency Rate (TRIFR) of 0.95 for 2018 represent a major improvement over 2.80 in 2017.
- There was 2,127,883 Lost Time Injury (LTI) Free Hours for the site.
- New fully dedicated Emergency Response Coordinator
- New fully dedicated Security Coordinator
- Underground rescue training started in 2018

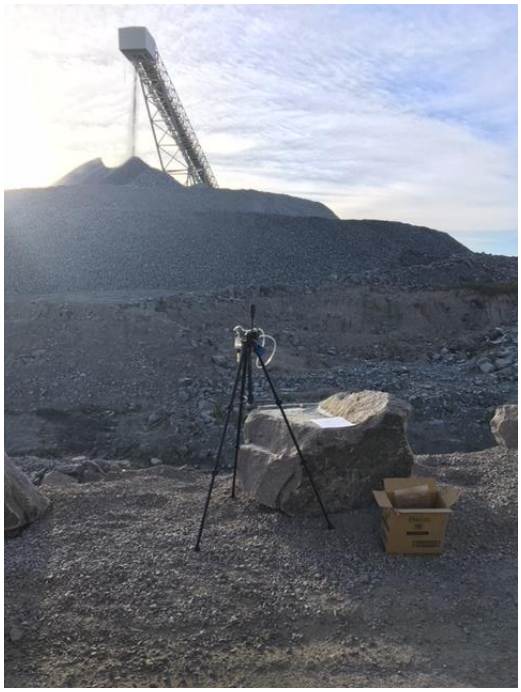

Figure 4 Occupational health sampling by maintenance wash trailers

1.2 Construction

2018 marked the fourth year of construction on the RRM. During 2018 the follow projects were completed:

- TMA North Dam and Cell 2 Dam
- North Dam seepage collection pond and ditch
- TMA Cell 2 Dam Spillway
- TMA South Dam to Cell 3 Elevation
- Sediment Ponds 1 & 2
- Water Discharge Pond
- West Creek Diversion Culvert Removal Project and Marr Creek Tie-in
- Crushing of Zone 5 Aggregate for TMA
- Started the Water Treatment Train including BCR #1
- Cell 2 tailings and TMA reclaim pipelines
- Substantial completion of the TMA wildlife exclusion barrier

Construction activities in the TMA for 2019 will include the completion of Cell 3 seepage collection system and tailing pipeline, raises and/or extensions of North, West and South Dams, completion of reptile exclusion barrier on the wildlife exclusion fence, as well as completion of the Phase 1 Water Treatment Train.

Figure 5 Exclusion fence and reptile barrier

1.3 Mine Operations

Open pit operations continued in Phase 1, which progressed down to the 230 elevation. In addition, development of Phase 2 of the open pit progressed to the 300 elevation. The mine also delivered construction material(rock) to the TMA to support construction of the dams.

Figure 6 Southern facing aerial view of the open pit mine winter 2018

1.4 Human Resources

As of December 31, 2018, there were 682 employees of New Gold at RRM. In December 2017 there were 584 employees. During the year we hired 240 employees and off-boarded 142 employees for an overall increase of 98 employees. Of the 682 employees;

- 73% were hired from the Rainy River District
- 2% were hired from the Kenora District
- 15% were hired from other locations in Ontario
- 8% were hired from Provinces or Territories within Canada, other than Ontario
- 2% were hired from outside of Canada
- 26% of New Gold employees at RRM self-identified as Indigenous, with the majority from local communities or affiliations.
- 14.4% of New Gold employees at RRM are female

The majority of employees work within the mine department, followed by maintenance, mill, and general operations departments (including finance, supply chain, environment, human resources, community and health and safety).

In 2018 we continued our recruitment efforts in the local communities conducting career fairs and school visits.

We introduced the Line of Progression (LOP) for production employees in the Mine, Mill, Maintenance, and Construction. The LOP outlines the training requirements and compensation structure of all of our production positions. We also introduced an updated employee manual updating our employee related policies and procedures.

New training software was implemented that maintains a centralized data base for all of employee training records.

In 2019, New Gold will continue to focus on hiring from local communities and developing our team members.

Figure 8 New Gold employee by a drill

Figure 7 Mill operators

1.5 Community

Engagement of neighbour, Indigenous communities, local municipalities and employees remained a priority for New Gold RRM in 2018. In New Gold's first full year of commercial production, tours of the site and facilities continued to be very popular. Tours were provided to the general public, business partners, school groups, neighbour, Indigenous community members and to families of employees.

New Gold RRM also distributed two newsletters throughout the local communities, mailed locally and emailed to communities outside of the local mail distribution. New Gold also participated in the Christmas Parade in Fort Frances, Literacy Day at Donald Young School, and presentations to other local schools. New Gold hosted annual Spring and Fall Ceremonies at the site; officiants were Elder Laura Horton at the Spring Ceremony and Elder Alfred Oshie at the Fall Ceremony. Both ceremonies were attended by both New Gold employees and members of local Indigenous communities.

New Gold RRM has various existing partnerships with Indigenous groups and continued to engage through Participation and implementation committee meetings, site visits, business development assistance, and participation in community events. The community team for Rainy River includes Community Coordinators, a Business Development Officer and a Commitments Supervisor.

New Gold is proud of the numerous sponsorships and donations it makes to local communities. New Gold RRM supports initiatives that focus on education, arts & culture, environment and health and wellness. In 2018, some of the sponsorships and donations by New Gold RRM included;

- Sponsorship of the Rainy Lake Concert Series;
- Support for the Emo fair grounds upgrades;
- Donations to local food banks;
- Support of new local bee yard;
- Donations to local community Pow Wows;
- Donation of speed awareness signs to the Township of Sioux Narrows-Nestor Falls;
- Sponsorship of local hockey associations;
- Sponsorship of a youth summer program in the Township of Emo;
- Support to Indigenous Art Workshops;

New Gold RRM will continue to be responsive to communities, ensuring community members are engaged with New Gold.

Figure 10 Alex Pollard, Rick Neilson, Ty Stafford (new bee yard)

Figure 9 Karen Rustige, Gerry Race, Kris Tittlemier, Jerry O'Leary (Mayor SN-NF), Claude McKenzie (New Gold H&S Manager), Paul Van Belleghem (Speed awareness signs)

1.6 Environmental Update

During 2018, Rainy River Mine successfully completed first year of production. In keeping pace with site wide changes, the Environmental team continued to provide support and guidance to various operations and construction teams. In addition to providing site wide support, the team effectively met all monitoring reporting timelines and requirements.

In January, New Gold acquired a mobile bear trap, designed and approved by the MNRF, to trap and transport bears. In February, the team rescued an orphaned bear cub, See Figure 11, discovered on site. The cub was treated for hypothermia by a local veterinarian then transported to a rehabilitation center in southern Ontario.

Figure 11 Orphaned bear cub

Critical submissions included an amendment and update of the environmental compliance construction and sewage works approvals including discharge criteria changes, spring freshet water management contingency plan, comprehensive site wide water balance and updated groundwater model, feasibility and design reports for flume and diversion dykes in the Pinewood River and PTTW amendments for dewatering aggregate operations.

In addition, an external compliance audit of the Environmental Management System was completed and a design for Phase 1 EMS/TSM implemented.

The Environmental team hosted several meetings with MNRF, MECP, EMND, EC, CEAA and the Environmental Monitoring Board. Team members participated in consultation meetings with First Nations groups on ECA and Closure Plan Amendments and traditional knowledge. Selected team members participated in GIS and reclamation conferences.

In April, tasks completed included bird deterrent staking in high risk areas and submission of various applications for tree clearing in construction and infrastructure expansion areas.

Commissioning of the West Creek Diversion channel in 2017 provided a safe passage for fish to migrate through the site and into spawning grounds. During May of 2018, Environmental Team members spotted White Sucker fish spawning in several locations along the upper reaches of the West Creek Diversion channel (Figure 12).

Figure 12 White Sucker spawning May 2018

During July and August, New Gold Environmental group hosted Stewardship Youth Ranger groups from Atikokan and Fort Frances. Group members were involved with tree planting, identification of fish bearing waterbodies and removal of dilapidated erosion and sediment control fences.

From July to September, Environmental team members and First Nations Community members conducted several fish salvage operations from isolated ponds and pools before culverts were removed from the West Creek Diversion channel.

Reclamation of the former Tait Quarry was completed during the summer of 2018. Vegetation and trees were planted according to the reclamation plan design. This area will provide future habitat for Whip-por-will and become a part of the Whip-por-will management studies.

Team members participated in pilot plant testing on the use of biological reactors to treat tailings effluent, selected contractors and facilitated construction on the water treatment train.

The Environmental group provided continued support on the construction of the TMA wildlife exclusion fence, which was 80% completed during 2018. The remaining reptile barrier sections will be constructed during the spring of 2019.

From May to October, the Environment Department facilitated completion of the fieldwork portion for a Stage 4 archaeological study. This study was conducted over an area of cultural significance, previously identified during Stage 2 and 3 Archaeological studies. Under the Ontario Heritage Act, areas of cultural significance must be studied by a licensed archaeologist. Proposed development can proceed once the archaeologist has submitted a report to the Ministry of Tourism, Culture and Sport (MTCS) stating no further concerns with the area. A preliminary report was prepared and submitted to the MTCS by the consultant archaeologist performing the study, releasing the area for development. Over the summer months, First Nations community members participated in the fieldwork and toured the site. Artifacts recovered include a quartz arrowhead (Figure 13) During 2019, all artifacts recovered will be catalogued and stored until their final location is determined.

Figure 13 Arrowhead discovered during summer excavation

During 2018, the GIS Team continued to manage and advance the internal New Gold Rainy River Web GIS System (NGRR GIS); a distributed client/server GIS environment that provides instant access to up to date geospatial information to all New Gold employees and registered consultants (users) via web GIS and mobile applications. In 2018 the team has been working on developing an updated backend database structure and migrating critical environmental and other data to an enterprise GIS SQL Server Geodatabase on site. End users of the GIS System can now consume as well as create and update data on the server directly using future services within web GIS applications.

As a part of an ongoing annual survey program, the GIS team facilitated the collection of high-resolution multispectral imagery in the spring and the fall of 2018 as well as a LiDAR topographic survey and an ultra-high-resolution aerial imagery survey of the entire site in early September 2018. This survey data was used to provide NGRR GIS users with most recent overview of the site as well as for analysis, monitoring, digitizing, modelling changes in the mine topography and updating the site hydrology network and the site road network. UAVs (drones) were also used to collect high resolution data of select target areas and used to create 3D models, flyovers and made available as ortho-imagery mosaic in NGRR GIS. The GIS team has also been working on a multitude of individual projects with the Environmental, Engineering, Mine Operations, Construction, Land Administration, Geology & Exploration and the Community teams and have continually been updating and maintaining the Land Tenure database, Infrastructure & Underground Utilities database, Site Clearing Plan, Site Layout progression model and other datasets.

Figure 14 Enviro/GIS crew UAV selfie.

As the Rainy River Mine advances, the Environmental Department continues to be successful in their search to find efficient and effective means for conducting required monitoring. This also includes incorporating new projects into the department's routine, to aid in future mine reclamation.

On top of the above projects being completed, the environmental team continues to monitor air quality, wildlife, water quality, waste and the environment. They inspect areas around site to ensure second containment is in place, light plants are in the appropriate directions, hazardous storage areas are being kept tidy, waste is properly segregated, dust is kept to a minimum, wildlife is unharmed, and many others. The environmental department is a support role to the entire mine site.

Figure 15 Sampling May 2018

1.7 Regulatory Update

In January 2015 both a Federal Environmental Assessment Decision Statement and a Provincial Environmental Assessment Notice of Approval were provided to New Gold for the RRM

Throughout 2015 to 2018 construction of dams, water diversion systems, roads, and commissioning of mining operations were advanced based on various permits and approvals granted by both the Federal and Provincial Governments.

Table 2 provides a summary of the environmental approvals related to the RRM.

Figure 16 Bobcat kitten

Table 2: Rainy River Mine - Environmental Permits and Approvals

Agency	Type	Number	Description	Comments
Ontario Ministry of Environment, Conservation and Parks	Permit to Take Water	7430-AYEN78	Renewed Tailings Management Area Construction	
		8101-AY8HT5	Renewed Construction Minor Takings	
		2558-AJ7HXF	Renewed Tait Quarry	
		1386-9VTP2H	Aggregate Sources (OC3, OC4, Roen)	
		7631-9VULMS	Mine Dewatering	
		8776-9W2QN3	Pinewood River	Expired November 30, 2018
		0040-9VUL6B	Tailings Management Area Construction	Expired May 8, 2018
		2133-9VUPVZ	Construction Minor Takings	Expired May 8, 2018
		3638-9VTNRM	Tait Quarry	Expired May 8, 2017
	Environmental Compliance Approval	5178-9TUPD9	Industrial Sewage	
		0412-A2LR4V	Air / Noise	Amended
		8567-9ZXG8U	Air / Noise	Superseded
		5781-9VJQ2J	Construction Phase / Tait Quarry	Expired May 8, 2018
Ontario Ministry of Natural Resources and Forestry	Location, Plans and Specifications Approval *Lakes and Rivers Improvement Act*	FF-2017-03	TMA Cell #2	
		FF-2017-02	Sediment Ponds	
		FF-2017-01	West Creek Natural Channel Temporary Bypass	
		FF-2016-02 FF-2016-02A	Culvert Crossing CPL15	
		FF-2015-08	Culvert C15	
		FF-2015-07	Pinewood River Intake / Outfall	
		FF-2015-05 FF-2015-05A	Mine Rock Pond	
		FF-2015-04 FF-2015-04A FF-2015-04B FF-2015-04C	TMA	
		FF-2015-03 FF-2015-03A FF-2015-03B	Clark Creek Diversion	
		FF-2015-02 FF-2015-02A FF-2015-02B	West Creek Diversion	
		FF-2015-01	West Creek Diversion	
		FF-2015-01	Temporary Culverts C2, C6, C8	
	Work Permit/ Letter of Authority *Public Lands Act*	FF11-2015/2016	Pinewood River Bridge Crossing	Expired December 30, 2016
		FF6-2015/2016	East Access Road Construction Amendment	Expired May 30, 2016
		FF2-2015/2016	East Access Road Construction	Expired May 30, 2016
	Endangered Species Act Permit	FF-C-001-14	Permit Under 17(2)(c)	
	Aggregate Resources Licence	626197	Laydown 4 Quarry	
		625851	Tait Quarry	Rehabilitated in 2018
	Overlapping Forest Resource Licence Agreement	Agreement with Resolute Forest Products 2018-2019.		Expires March 31, 2019
	Forest Resource Licence	553907, B12125, B12144		2018-2019
		553675, 553676, 553722, 553723, 553724, 553725		2017-2018

Table 2: Rainy River Mine - Environmental Permits and Approvals

Ontario Ministry of Natural Resources and Forestry		553726, 553727, 553728, 553729, 553730, B12095, B12104		
		553386, 553481, 553482, 553500, 553501, 553533, 553534, 553535, 553514, 553517, 553531, 553532, 553541, 553592, 553593, 553594, 553595, 553596, 553597, 553598, 553676, 553675, B12057, B12071, B12072, B12077, B12078, B12083, B12086, B12090, B12095		2016-2017
Ontario Ministry of Natural Resources and Forestry		553212, 553213, 553214, 553223, 553224, 553225, 553226, 553227, 553271, 553272, 553145, B12011, B12013, B12014, B12032, B12033, B12039, B12040, B12052, B12053		2015-2016
		553037, 553038, 553039, B12008, B12009		2014-2015
		552762		2013-2014
	Harvest Approval/ Authority to Haul	219198, 218658, 219196		2018-2019
		218246, 218247, 218452, 218453, 218454, 218456, 218457, 218458, 218459, 218460, 218475, 218248, 218450		2017-2018
		217396, 217645, 217646, 217682, 217683, 217766, 217767, 217772, 217387, 217712, 217718, 217762, 217763, 217662, 217663, 217717, 217719, 217760, 217771, 217781, 217888, 217889, 217890, 217891, 217892, 217893, 217894, 217895, 218246, 218247, 218248		2016-2017
		216310, 216366, 216367, 216557, 216880, 216881, 216822, 216823, 216833, 216836, 216838, 216882, 216883, 216884, 216885, 216886, 217018, 217019, 217020, 217021		2015-2016

Table 2: Rainy River Mine - Environmental Permits and Approvals

		216269, 216277, 216278, 216279, 216280		2014-2015
		215455		2013-2014
	Land Use Permit	1134-1003167	Transmission Line	
		1134-1003203	Four Safety Platforms	
		1134-1003160	Wood Storage Site	Expired January 31, 2016
		1134-1003161	Wood Storage Site	Expired January 31, 2016
		1134-1003162	Wood Storage Site	Expired January 31, 2016
		1134-1003163	Wood Storage Site	Expired February 29, 2016
		1134-1003164	Wood Storage Site	Expired February 29, 2016
	Fish & Wildlife Collection Approvals	1089611	Licence to Collect Fish for Scientific Purposes	Expired December 31, 2018
		1083746	Authorization to Trap and Transfer Black Bears 2017	Expired December 31, 2016
		1080070	Wildlife Scientific Collectors Authorization - Turtle and Snake Relocation 2018	October 31st 2016
		1079341		Expired April 14, 2015
		1089610	Wildlife Scientific Collectors Permit	Expired December 31, 2018
		1085813		Expired December 31, 2017
		1081168		Expired December 30, 2016
		1088198	Authorization to Trap and Transfer Black Bears	Expired December 30, 2018
		1081093	Authorization for Wildlife Interference	Expired September 30, 2015
		1079145		Expired April 30, 2018
Canadian Environmental Assessment Agency	Federal Decision Statement issued under Section 54 of Canadian Environmental Assessment Act, 2012	Federal EA	90+ Federal EA Commitments	
Ontario Ministry of Environment, Conservation and Parks	Environmental Assessment Act Section 9 Notice of Approval to proceed with the Undertaking	Provincial EA	68 Provincial Commitments	
Environment Canada	Final EA Report Commitments Registry	EA Commitments	205 Commitments	
	Metal and Diamond Mining Effluent Regulations	Reporting Procedures for MMER		
Ontario Ministry of Northern Development, Energy and Mines	Closure Plan		Contains Closure Plan Commitments Registry Filed by Ministry of Northern Development and Mines (February 23, 2015)	
Ontario Ministry of Transportation	Entrance Permit	13+ approvals		
	Encroachment Permit	14+ approvals		
	Land Use	11+ approvals		
Fisheries and Oceans Canada	Authorization	15-HCAA-00039	Section 35(2)	
	Letter of Advice	KE-12-0963	Road Crossings	
	Letter	15-0045	Linear Structure	

Table 2: Rainy River Mine - Environmental Permits and Approvals				
Transport Canada	Letter	15-0046	Blasting Zone	
	Clearance	ATS-15-16-00026521	Transmission Line - Aeronautic Obstruction Clearance	No lighting or marking required
	Letter	16-2664	Linear Structure	Renewal
Canadian Nuclear Safety Commission	Nuclear Radiation Licence	15954-1-19.0	Nuclear Radiation Device License	
Ontario Energy Board	Electricity Wholesaler Licence	EW-2014-0371		
Municipality	Occupancy Permit	N16-08	Admin Building – Process Plant Site	

SECTION 2
NEW GOLD RAINY RIVER MINE ANNUAL ENVIRONMENTAL APPROVAL COMPLIANCE REPORT REQUIREMENTS

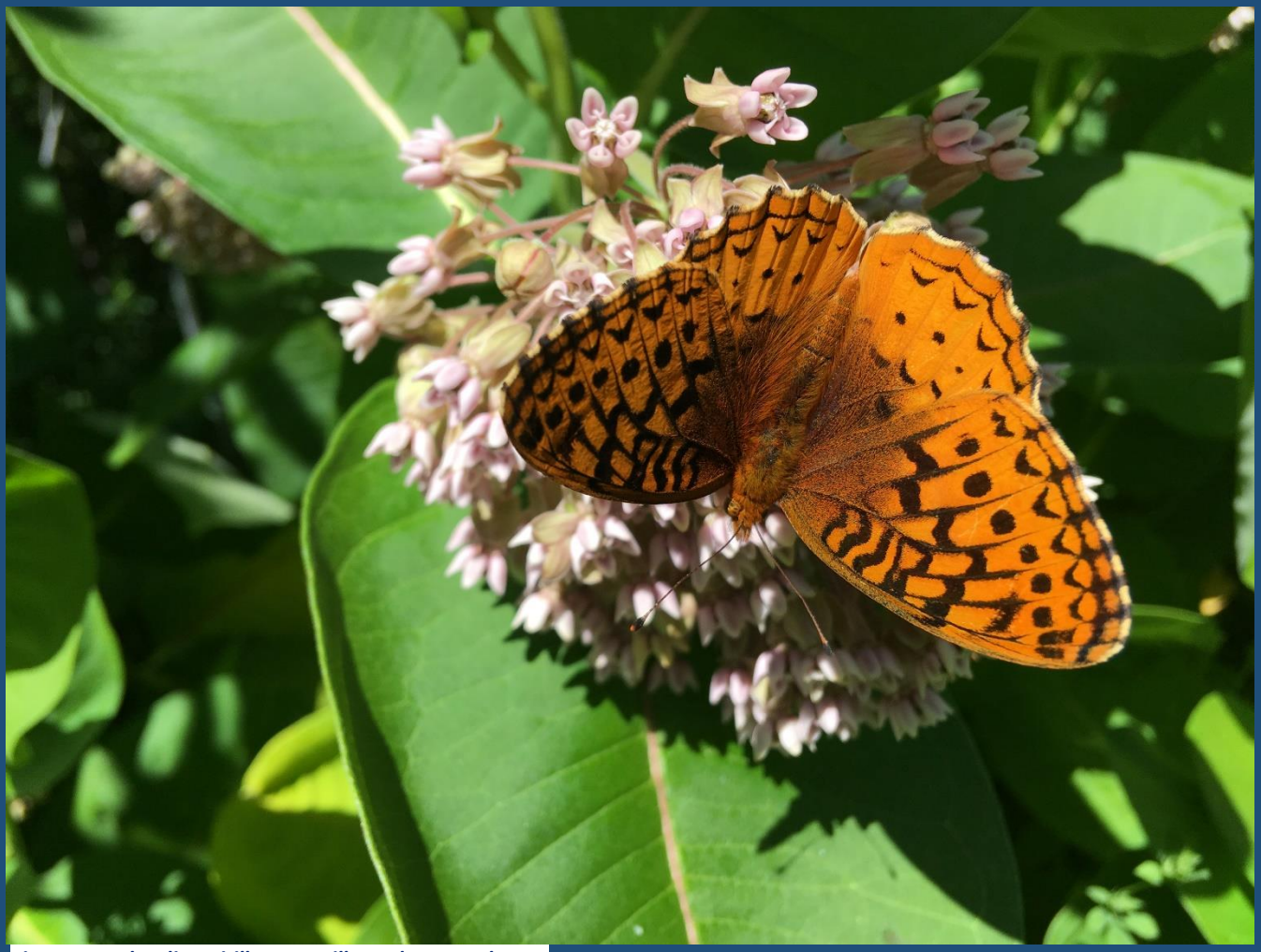

Figure 17 Aphrodite Fritillary on milkweed at pumphouse

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2.0 Annual Environmental Approval Compliance Report Requirements

This section provides a summary of the Compliance Requirements. Information on each of the specific compliance requirements can be found in detail in Sections 3-7 of this report. When referenced, Supporting Documentation can be found in the Appendices.

This report is intended to meet both Federal and Provincial annual Environmental Assessment Compliance Reporting requirements.

2.1 Regulatory Background

Condition 2.3 of the Federal EA Decision Statement required that:

The Proponent shall submit to the Agency an annual report on the implementation of the conditions set out in this Decision Statement with a supporting analysis for each of the conditions for the preceding calendar year on or before March 31st, starting from the commencement of any activities in connection with the carrying out of the Designated Project. Each annual report shall describe how the Proponent has considered and incorporated the factors outlined in condition 2.1 in the implementation of the conditions set out in this Decisions Statement.

Condition 2.5 requires that the report be available on the Proponent website within 30 days of submission to the CEAA. This posting will be completed by March 31st 2019.

- Condition 6 of the Provincial Notice of Approval also indicated a requirement for an annual EA compliance report:

- Condition 6.1: The Proponent shall prepare an annual Compliance Report which describes its compliance with the conditions of approval set out in this Notice of Approval, and which describes the results of the Proponent's Environmental Assessment Compliance Monitoring Program required by Condition 5 of this Notice of Approval.

- Condition 6.2: The first annual Compliance Report shall be submitted to the Director, for the public record, within one year from the Start of Construction and shall cover all activities of the previous 12-month period.

Per an e-mail communication between Mr. Kyle Stanfield, New Gold RRM and Ms Sasha McLeod of the Ministry of Environment and Climate Change on March 2, 2015, the timing of the Provincial EA Compliance Report was aligned with the Federal requirement and will be due on March 31st each year.

This report is intended to meet both the Federal and Provincial, annual Environmental Assessment compliance report requirements.

2.2 Report Content Requirements

In accordance with the Federal EA Decision Statement and the Provincial EA Notice of Approval, along with the Compliance Monitoring Program submitted by New Gold RRM in fulfillment of Condition 5 of the Provincial EA Notice of Approval, this Annual EA Compliance Report contains the following:

- Federal Decision Statement Registry (Section 3)
  This registry includes several conditions that are to be tracked. Most conditions are monitored on an ongoing basis. The comprehensive table provides a summary and feedback on how the first year of the Operations

Phase met the conditions of the Decision Statement, recognizing that 2018 was a very productive year.

- Provincial Notice of Approval Registry (Section 4)

  With this registry, New Gold RRM committed to maintaining a Notice of Approval Registry that tabulates the conditions of the Notice of Approval and the on-going status. The Notice of Approval Registry is to be updated on a regular basis, and no less frequently than annually as part of the project follow up reporting.

- Commitments Registry (Section 5)

  New Gold RRM made many commitments which were disseminated through the associated EA documentation. New Gold RRM intends to fulfil these commitments as summarized in the Commitments Registry. The registry is intended as a living document and will be amended as needed, to include other mitigation measures / commitments as identified going forward. The registry will be updated on a regular basis, and no less frequently than annually as part of the project follow up reporting.

- Follow Up Monitoring Program (FMP) Registry (Section 6)

  Section 13 of the RRM EA Report / Environmental Impact Statement, describes the RRM monitoring plan and environmental management in accordance with the Code of Practice for Preparing and Reviewing EAs in Ontario, 2014, monitoring is:

  > *Used to verify the expected environmental effects of the undertaking and to determine if any additional impact management measures, or adjustments to any measures, are required. The monitoring framework should consider all phases of the proposed undertaking (for example, planning, detailed design, tendering, construction, operation, closure, decommissioning). This framework must include compliance monitoring and, where appropriate, effects monitoring*.

In accordance with *Canadian Environmental Assessment Act, 2012* the purpose of the FMP is to:

> *Verify the accuracy of the environmental assessment of a designated project; and determine the effectiveness of any mitigation measures.*

The FMP applies to the construction, operation, active closure and decommissioning (active closure), and post-closure phases of the RRM, as appropriate. Additional reporting has been completed as required by the environmental approvals received to date; these reports have been issued to the appropriate regulatory authorities.

- Public Consultation Registry (Section 7)

  New Gold has committed to providing a public consultation table as part of the Provincial Compliance Monitoring Program (Version 2 February 11, 2015).

SECTION 3
NEW GOLD RAINY RIVER MINE COMMITMENT REGISTRY FEDERAL

Figure 18 Pinewood River south of open pit

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2.0 General Conditions

Condition 2.1

The Proponent shall, throughout all phases of the Designated Project, inform its actions in meeting the conditions set in this Decision Statement by the best available information and knowledge, based on validated methods and models, undertaken by qualified individuals and apply the best available economically and technologically feasible mitigation measures.

Status: Ongoing

Supporting Analysis:

In 2018 RRM continued to to engage the services of reputable consulting companies to provide qualified individuals for various activities, based on requirements of RRM obligations.

These activities included data collection, data analysis and report preparation for air, noise, fish tissue monitoring, biological monitoring and Species at Risk programs as well as monitoring of migratory birds, bird breeding activites and fish habitat compensation.

Data analysis and report writing for surface water, groundwater, RRM deer tissue program, as well as hydrometric data all utilized qualified experts.

A qualified professional Archaeologist was onsite to conduct Stage 4 archaeological study.

Qualified professionals were also involved in building the site water balance, sediment and erosion control work, closure plan design and reclamation activities.

All minor and major infrastructure onsite is designed and signed off by professionals as well.

On November 7, 2018, the Canadian Environmental Assessment Agency conducted an inspection at the mine. This allowed an opportunity for New Gold RRM to update CEAA on the mine progress.

Condition 2.2

Where consultation is a requirement of the conditions set out in this Decision Statement, the Proponent shall first consult Aboriginal groups on the most appropriate manner in which to engage in consultation with them.

Status: Ongoing

Supporting Analysis:

Consultation and engagement methods were significant discussion items throughout the EA process and in the negotiation of Impact Benefit and Participation Agreements. Active consultation and engagement with local communities continued through 2018. See section 7 for Consultation Registry.

Condition 2.3

The Proponent shall submit to the Agency an annual report on the implementation of the conditions set out in this Decision Statement with a supporting analysis for each of the conditions for the preceding calendar year on or before March 31, starting from the commencement of any activities in connection with the carrying out of the Designated Project. Each annual report shall describe how the Proponent has considered and incorporated the factors outlined in condition 2.1 in the implementation of the conditions set out in this Decision Statement.

Status: Completed

Supporting Analysis:

The annual report was submitted to the Agency on March 31, 2018. A digital copy can be found on the New Gold Website at http://www.newgold.com/projects/rainyriver/rainyriver-project. The public is also welcome to visit the New Gold office in Emo Ontario to review copies of the document.

Condition 2.4

The Proponent shall, in consideration of the annual report for condition 2.3, provide documentation to the Agency indicating the results of any monitoring for conditions 3.8, 4.6, 5.2, 5.3, 5.4, 6.4, and 8.4. The documentation shall demonstrate whether the mitigation measures have proven effective and whether the predictions made during the environmental assessment were accurate. The documentation shall also detail any corrective actions taken by the Proponent should the mitigation measures prove not to be effective.

Status: Ongoing

Supporting Analysis:

Documented results can be found in the appendices. See each condition in reference to appropriate appendix for all monitoring work that was completed in 2018.

Condition 3: Fish and Fish Habitat

Condition 3.1.1

The Proponent shall minimize changes caused by the Designated Project to water levels and water flows in the Pinewood River, the Minor Creek System, and the Modified Minor Creek System in such a way as to protect fish and fish habitat, by implementing mitigation measures including, but not limited to: recycling of water, for ore processing, from the TMA and ponds constructed for water management.

Status: Ongoing

Supporting Analysis:

In 2018, water from the open pit was directed to the Mine Rock Pond, under the authorization and subject to Conditions 3.2 through 3.5 of Permit to Take Water (PTTW) 7631-9VULMS, the WMP and TMA to assist in the milling of ore. The mine infrastructure was designed to encourage recycling of water. Water was also recycled from the Tailing Management Area Cells.

Water was withdrawn from the Pinewood River to continue to build the initial water inventory needed to start operations, under the authorization and subject to Conditions 3.2 and 3.3 of PTTW 8776-9W2QN3. It is not anticipated that there will be any discharges from the WMP to the Pinewood River until 2021, at which time water will only be discharged when Condition 5 of Environment Compliance Approval 5178-9TUPD9 is met. Prior to discharge New Gold will need to obtain a Lakes and Rivers Improvement Act Approval (LRIA) from the Ministry of Natural Resources and Forestry (MNRF) to construct a rock groyne, or alternative, in the Pinewood River for direct discharges from the WMP. The purpose of this groin is to; i) protect against erosion, ii) create a water mixing zone, iii) disperse water energy.

Condition 3.1.2

The Proponent shall minimize changes caused by the Designated Project to water levels and water flows in the Pinewood River, the Minor Creek System, and the Modified Minor Creek System in such a way as to protect fish and fish habitat, by implementing mitigation measures including, but not limited to: optimizing the timing, position and quantity of final effluent discharge between the final effluent discharge points.

Status: Ongoing

Supporting Analysis:

In 2018, the Tailings Management Area (TMA) Cell 2, Water Discharge Pond (WDP), Temporary Sediment Pond and Sediment Ponds 1 & 2 were commissioned, which increased the site capture of watershed drainage areas associated with the RRM. As per Condition 3.3 of Permit to Take Water (PTTW) 8776-9W2QN3, the volume of water captured by site catchments was included in the total direct taking from the Pinewood River. During the development of the Open Pit, there were construction related discharges to the environment subject to the Effluent Limits in Condition 7 of Environmental Compliance Approval (ECA) 5781-9VJQ2J. The construction related discharge points were obtained

through the Environment Canada Metal Mining Effluent Notification Process, and subject to the Metal Mining Effluent Regulations.

Condition 5 of ECA 5178-9TUPD9 dictates the discharge quality criteria, timing and volume restrictions for release of effluent from the four (4) final discharge points, Constructed Wetland Final Discharge, Water Management Pond Pipeline Discharge, Sediment Pond #1 and Sediment Pond #2. To date, there have been zero discharges from the specified final discharge locations.

Condition 3.1.3

The Proponent shall minimize changes caused by the Designated Project to water levels and water flows in the Pinewood River, the Minor Creek System, and the Modified Minor Creek System in such a way as to protect fish and fish habitat, by implementing mitigation measures including, but not limited to: filling the open pit during the decommissioning and abandonment phases in a manner which meets the flow requirements in the Pinewood River while allowing the pit to be filled as expeditiously as possible to reduce any adverse environmental effects.

Status: Not applicable in 2018.

Supporting Analysis:

The Closure Plan for the RRM outlines the close out and rehabilitation methods that will be used at the time of mine closure. With regards to the open pit, the pit walls will be reviewed by a professional engineer to insure compliance with the Ontario Mine Rehabilitation Code. Safety measures that include a berm, rock boulders and signage will be installed and then the pit will be allowed to fill naturally (rain, groundwater seeps) and from water inputs using a staged approach. This approach will involve water being taken from the Mine Rock Pond, seepage from the East Mine Rock Stockpile, and potentially runoff from the outside of the Tailings Management Area dams.

Additional water taking from the Pinewood River to enhance the rate of flooding is not currently under consideration. This option may be further evaluated during the life of the mine as additional flow data is obtained, and in consultation with regulatory agencies.

Flooding the final open pit is expected to take 60 to 75 years.

Condition 3.1.4

The Proponent shall minimize changes caused by the Designated Project to water levels and water flows in the Pinewood River, the Minor Creek System, and the Modified Minor Creek System in such a way as to protect fish and fish habitat, by implementing mitigation measures including, but not limited to: not taking water from the Pinewood River when flows are below the minimum threshold set by Ontario

Status: Ongoing

Supporting Analysis:

During 2018, water was taken from the Pinewood River to supplement the site water inventory, as permitted by the MECP under PTTW 8776-9W2QN3. Water taking commenced May 8, 2018 and continued until October 30, 2018, when flows were above the minimum threshold set by the MECP

and consistent with all other permit conditions. A total of 376,588 m^3 of water was taken from the Pinewood River over 68 days at a rate determined by the Pinewood River flow on the specific days of taking.

Condition 3.2.1

The Proponent shall, for all effluent, comply with the MDMER, the Fisheries Act and any site-specific water quality requirements set by Ontario. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: treat effluent prior to discharge to the environment.

Status: Ongoing

Supporting Analysis:

In 2018, effluent discharges to the environment were from; overburden and mine rock stockpile ditching and pit dewatering systems that were constructed between 2015 and 2017. Effluent was generated from water associated with overburden dumps and mine rock stockpiles, and water associated with blasting bedrock for the advancement of the Open Pit. The discharge water had not been through the mill nor had it been in contact with Potentially Acid Generating material.

In 2018, any effluent that did not meet discharge criteria was pumped to the WMP to assist in building the water inventory and will receive further treatment prior to discharge to the environment.

To maintain compliance with Environment Canada Environmental Effects Monitoring requirements and the Environmental Compliance Approval (No. 5781-9VJQ2J) issued for the project, RRM conducts semi-annual sublethal toxicity testing of its primary final effluent, water quality monitoring, sediment quality monitoring, benthic invertebrate community monitoring and fish population monitoring. For 2018, this testing was not conducted as there were only 5 effluent discharges in April 2018, and there were no further discharges on which to conduct the testing.

Condition 3.2.2

The Proponent shall, for all effluent, comply with the MDMER, the Fisheries Act and any site-specific water quality requirements set by Ontario. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: treat tailings slurry to break down cyanide and precipitate heavy metals.

Status: Ongoing

Supporting Analysis:

Authorization to deposit tailings in the Tailings Management Area (TMA) Cell 2 was received on April 12, 2018. Before tailings slurry can be deposited in Cell 2, or any subsequent cell in the TMA, the slurry must be treated by an in-plant tailings slurry cyanide destruction (SO2/Air) treatment facility located in the process plant as permitted in Environmental Compliance Approval (ECA) 5178-9TUPD9. The Water Management Pond (WMP) received effluent flow from the TMA during 2018.

Water from the TMA will be pumped to the Lime WTP for treatment of primarily the following metals and metalloids: antimony, arsenic, cadmium, cobalt, mercury, molybdenum, nickel and zinc. After the removal of metals and metalloids, the treated water is then pumped into a nitrification treatment cell, where a microbial process termed “nitrification” is performed for treatment of ammonia. The

Nitrification treatment cell uses microbial nitrification to convert the nitrogen compounds (ammonia, cyanide, cyanate, and thiocyanate) to nitrate. Some amount of manganese is also expected to be removed in the nitrification cell. Water from the nitrification treatment cell is then pumped to Biochemical Reactor #1 for nitrate and nitrite treatment through the microbial process termed "denitrification". The outflow from the BCR #1 then reports to the WMP.

Along with the flow from the WMP during May and September, the WDP also collects seepage from the TMA and runoff from the surrounding environment. Water collected in the WDP is then directed to BCR #2 where the metals and metalloids treatment, as well as some sulphate treatment, will occur. Sulphate will partially be treated by reduction to sulphate by sulphide producing bacteria, after which metals and metalloids polishing through binding of metals sulphides will occur. Phosphorus will also be treated in BCR #2. At that water meeting criteria can be discussed. If it does not meet criteria, it will be pumped back from the outflow basin to the WMP for another pass through the treatment train. In the future discharge, the CWTS would be located downstream of BCR #2 and will provide polishing and redundancy in the treatment process. Eventually CWTS will replace the treatment train.

Phase 1 of the treatment train construction (nitrification cell, BCR1 and WTP) is under way and construction of BCR #2 and discharge basin 3 are scheduled for later in 2019.

Condition 3.2.3

The Proponent shall, for all effluent, comply with the MDMER, the Fisheries Act and any site-specific water quality requirements set by Ontario. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: collect site contact water and seepage in ditches and divert to either the TMA or water management facilities for release via final discharge points.

Status: Ongoing

Supporting Analysis:

Site water generated from blasting, overburden and mine rock stockpiles, and construction related activities is collected in a site impoundment structures. The water is diverted to either the Tailings Management Area (TMA), ~~Water Management Pond (WMP)~~ or Mine Rock Pond (MRP) for recycling and further treatment before eventual release via final discharge points. The Water Discharge Pond, Sediment Ponds 1 and 2 were commissioned in 2018. The WMP and TMA have seepage collection systems, or drainage ditches, and water from these collection systems is either put back into the structure or the water will first be recycled in mill processing prior to discharge into the TMA.

Condition 3.2.4

The Proponent shall, for all effluent, comply with the MDMER, the Fisheries Act and any site-specific water quality requirements set by Ontario. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: install and operate a water quality control structure in the constructed wetland to prevent the release of final effluent discharge not compliant with the Regulations or requirements

Status: Not applicable for 2018.

Supporting Analysis:

Construction of the treatment train started in 2019 will be completed in 2019 and will include a pump back system should water not meet discharge criteria at the final discharge points.

Condition 3.2.5

The Proponent shall, for all effluent, comply with the MDMER, the Fisheries Act and any site-specific water quality requirements set by Ontario. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: install secondary containment on pipelines that cross the West Creek Diversion Channel to prevent accidental discharge of effluent.

Status: This commitment is now complete and can be closed

Supporting Analysis:

Pipelines associated with mill processing and tailings transportation from the plant to the Tailings Management Area were installed in 2017. A design modification was completed which included secondary containment of the pipeline that cross the West Creek Diversion channel and where the pipeline crosses West Creek. The secondary containment consists of sleeves (pipe within a pipe) made from 36" high density polyethylene (HDPE). The rest of the pipeline has a double wall thickness for protection. The entire tailings pipeline also rest into a corridor which is also lined with a fused geomembrane and is sloped to drain into the multiple sumps in case of emergency

Condition 3.3.1

The Proponent shall control acid rock drainage and metal leaching so that all effluent and passive outflow from the Project Site comply with the MDMER, any site-specific water quality requirements set by Ontario, and the Fisheries Act, as applicable at any time. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: line the former Clark Creek channel (under the east mine rock stockpile) with non-potentially acid generating material.

Status: Ongoing

Supporting Analysis:

To comply with MDMER and provincial permitting requirements, effluent and passive outflow from the Potentially Acid Generating (PAG) rock drainage and metal leaching from active areas of East Mine Rock Stockpile area was collected in the Mine Rock Pond and associated seepage collection system. In Q1 of 2018, Clark Creek channel remnant was lined with non-acid generating rock under the East Mine Rock Stockpile area.

Condition 3.3.2

The Proponent shall control acid rock drainage and metal leaching so that all effluent and passive outflow from the Project Site comply with the MDMER, any site-specific water quality requirements set by Ontario, and the Fisheries Act, as applicable at any time. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: sort waste rock into potentially acid generating and non-potentially acid generating rock stockpiles through the development and implementation of a detailed mine rock segregation program using criteria for determining potentially acid generating material set by Ontario.

Status: Ongoing

Supporting Analysis:

A Geochemical Monitoring Plan for the Construction and Operation Phases was issued in accordance with MECP ECA 5178-9TUPD9 requirements and has been implemented at the RRM site. Monitoring was ongoing during 2018. See appendix A for Geochemical Monitoring Results.

Condition 3.3.3

The Proponent shall control acid rock drainage and metal leaching so that all effluent and passive outflow from the Project Site comply with the MMER, any site-specific water quality requirements set by Ontario, and the Fisheries Act, as applicable at any time. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: design and construct the perimeter ditching around the east mine rock stockpile and low-grade ore stockpile to accommodate a 100-year flood event.

Status: Ongoing

Supporting Analysis:

Designs, to construct perimeter ditching that will accommodate a 100-year flood event for the East Mine Rock Stockpile (EMRS) and 25-year flood for the West Mine Rock Stockpile, were completed in 2017 and 2018 ~~and are planned for construction in 2018 and 2019~~. Permanent ditching for the southern half of the EMRS was complete during 2018 and aligns the portion of the dump that has been constructed.

Condition 3.3.4

The Proponent shall control acid rock drainage and metal leaching so that all effluent and passive outflow from the Project Site comply with the MDMER, any site-specific water quality requirements set by Ontario, and the Fisheries Act, as applicable at any time. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: use potentially acid generating material only for the purpose of constructing the tailing management dam, where saturated conditions can be maintained. Potentially acid generating material must not be used for any other construction purpose.

Status: Ongoing

Supporting Analysis:

Potentially acid generating material is either used for construction of the interior of the Tailings Management Area, for padding of the overburden areas or for use to construct roads within the open pit.

Condition 3.3.5

The Proponent shall control acid rock drainage and metal leaching so that all effluent and passive outflow from the Project Site comply with the MDMER, any site-specific water quality requirements set by Ontario, and the Fisheries Act, as applicable at any time. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: place an engineered cover over the east mine rock stockpile and any remaining ore stockpiles at or before the decommissioning phase. The cover should be designed to prevent infiltration of water and to limit infiltration of air during the decommissioning and abandonment phases.

Status: Ongoing

Supporting Analysis:

An engineered cover will be placed over the east mine rock stockpile and any remaining ore stockpiles at or before the decommissioning phase as per sections 6.1 and 9.14 of the RRM Closure Plan (January 2015). During 2017 a stockpile containing potentially acid generating rock was covered with an engineered cover as per design in section 6.1 of the RRM Closure Plan. Further testing and monitoring was conducted in 2018 to assess first year of cover trial. See appendix T for the Pag cover Trial Factual Data Report.

Condition 3.3.6

The Proponent shall control acid rock drainage and metal leaching so that all effluent and passive outflow from the Project Site comply with the MDMER, any site-specific water quality requirements set by Ontario, and the Fisheries Act, as applicable at any time. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: cover the tailings with water and maintain the tailings in a perpetually saturated state during the decommissioning and abandonment phases.

Status: Not applicable in 2018.

Supporting Analysis:

At the time of mine closure New Gold intends on maintaining the tailings in a perpetually saturated state during the decommissioning and abandonment phases. Further information regarding mine reclamation and decommissioning can be found in the Updated RRM Closure Plan (March 2018). This condition currently doesn't apply to the operational state of the mine.

Condition 3.3.7

The Proponent shall control acid rock drainage and metal leaching so that all effluent and passive outflow from the Project Site comply with the MDMER, any site-specific water quality requirements set by Ontario, and the Fisheries Act, as applicable at any time. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: fill the open pit, in accordance with condition 3.1.3 and 3.1.4, as rapidly as practicable during the decommissioning and abandonment phases, using all available means, including directing drainage from the east mine rock stockpile into the pit.

Status: Not applicable in 2018.

Supporting Analysis:

During the decommissioning and abandonment phases, the open pit will fill and be managed according to the requirements specified in section 9.3 of the Rainy River Mine Closure Plan (March 2018). During the first 10 years of flooding, waters from the Mine Rock Pond will be piped into the open pit. Following this initial flooding period, seepage from the east mine rock stockpile area will be piped into the open pit. With the additional input of natural water sources (rain, ground water seeps, TMA dam runoff) it is estimated that it will take 60-75 years to flood the open pit.

Condition 3.3.8

The Proponent shall control acid rock drainage and metal leaching so that all effluent and passive outflow from the Project Site comply with the MDMER, any site-specific water quality requirements set

by Ontario, and the Fisheries Act, as applicable at any time. To ensure compliance, the Proponent shall implement, at a minimum, the following mitigation measures: control water quality in the open pit lake during the abandonment phase.

Status: Not applicable in 2018.

Supporting Analysis:

This condition is not relevant to the construction and operations phases. It will be implemented during the "closing out" stage of the RRM as stipulated in the Rainy RRM Plan (March 2018), Sections 9.3 and 10.2.

Condition 3.4

The Proponent shall design and construct new road watercourse crossings for the realignment of Highway 600 to allow for fish passage in accordance with the Environmental Guide for Fish and Fish Habitat.

Status: Complete

Supporting Analysis:

During the realignment of Highway 600 there was one water crossing required over a fish bearing watercourse located at the Pinewood River. In the fall of 2015, a clear span bridge was installed over the Pinewood River. There was no in water work required for the installation therefore no alterations to the original river channel that would impact or alter fish habitat or passage.

Condition 3.5

The Proponent shall design and construct new road watercourse crossings for the realignment of Highway 600 to meet the Highway Drainage Design Standards of the MTO.

Status: Complete

Supporting Analysis:

During the design phase of the Highway 600 realignment routine meetings were held between New Gold Inc. (formally Rainy River Resources) and the Ministry of Transportation of Ontario (MTO). The road and its associated crossings have been designed and constructed to meet MTO standards and was completed under the MTO Construction Administration and Inspection Task Manual (CAITM) protocol. Highway 600 was turned over to the MTO in 2017.

Condition 3.6

The Proponent shall design and construct water intakes meeting standards set out in the Freshwater Intake End-of-Pipe Fish Screen Guideline of the DFO.

Status: Ongoing

Supporting Analysis:

In 2016 the Pinewood River Pumphouse and Intake was completed and operated in 2017. This facility provides water to the Water Management Pond to utilize in mill processing in the event that there is not enough fresh water in the sites recycling process.

The pump intake enters the Pinewood River and is isolated by chain link fence that is installed below the high-water mark of the Pinewood River. In order to meet DFO guidelines and continue to allow successful suction of water, a fish screen was installed over the chain link fence running from the base of the Pinewood River to the above high-water mark.

During low flow periods, the screen is periodically monitored to ensure that it remains secure and free of debris.

Condition 3.7

The Proponent shall both offset any residual serious harm to fish in accordance with subsection 35(2) of the Fisheries Act and associated regulations, and compensate for the loss of fish habitat resulting from the deposition of a deleterious substance into a tailings impoundment area in accordance with the MDMER, by recreating fish habitat in the West Creek Diversion Channel, West Creek Pond, Stockpile Pond Diversion Channel, Stockpile Pond, Clark Creek Diversion Channel, Clark Creek Pond, and Teeple Road Pond.

Status: Ongoing

Supporting Analysis:

Fish habitat compensation was designed by qualified experts and was reviewed by the MNRF and the Department of DFO during the permit approval phase.

In 2016, Teeple Pond and Clark Creek Diversion channel construction concluded, and the system was commissioned that fall. In 2017 the design team conducted a review of the system and produced an Annual Monitoring Report for the DFO to meet the requirements of Fisheries Act Authorization No. 15-HCAA-00039. The review concluded substantial conformance between the as built specifications and the design criteria and that the area or replacement habitat was greater than the required 8.41ha.

Construction of the remaining offsetting habitat (West Creek Pond and Diversion Channel, Stockpile Pond and Diversion Channel, and Clark Creek Pond and Diversion Channel) was completed in July 2017. As part of fulfilling the as-constructed survey condition of the approval, an interim As-Constructed compensation measures review was conducted during 2017 and a report submitted to DFO. In 2018, monitoring was completed and indicated 7 of the targeted 9 minnow species had returned to the Clark Creek system while West Creek system had 12 minnow species return (success criteria target 9 species). This monitoring is planned to happen annually for the next 4 years.

In 2018 field research indicated 8 of the targeted 9 minnow species had returned to the system and were utilizing the constructed fish pools during periods of low water flow. This monitoring will continue for the next 3 years to ensure compliance with Fisheries Act Authorization No. 15-HCAA-00039. A copy of the Teeple Pond and Diversion Annual Monitoring Report can be found in the Supporting Documentation for this section.

Condition 3.8.1

The Proponent shall monitor water quality and quantity, and fish and fish habitat, to determine the effectiveness of the mitigation measures under conditions 3.1, 3.2, 3.3 and 3.7. In doing so, the Proponent shall monitor, at a minimum: water levels and flows, with respect to minimum flow thresholds for the Pinewood River set by Ontario, during periods of water taking as authorized pursuant to the Ontario Water Resources Act.

Status: Ongoing

Supporting Analysis

During 2015, a flow monitoring station was installed in the Pinewood River to track water level elevations and flow rates for the Pinewood River System. A flow monitoring station belonging to the Water Survey of Canada (WSC) is also located downstream of the project on the Pinewood River.

In April 2017, the Water Management Pond (WMP) was commissioned and direct water takings from the Pinewood River began to build the initial water inventory for operations start up. The water takings were in accordance with Permit to Take Water (PTTW) 8776-9W2QN3.The WMP will require monitoring for the life of the mine.

Under PTTW 8776-9W2QN3, New Gold was required to develop and submit a Biological Monitoring Plan that addresses methods for monitoring and identifying fish kills and fish stranding, and a contingency plan to address adverse effects. This monitoring plan was submitted in early 2016 and commenced upon MECP approval. The monitoring continued in 2017 and 2018.

The project has 5 additional PTTWs for the Mine Workings, Tailings Management Area (TMA), Construction Workings and Aggregate Dewatering. All water takings are monitored using calibrated flow meters and data obtained from these takings is submitted annually via the MECP online reporting protocol.

Condition 3.8.2

The Proponent shall monitor water quality and quantity, and fish and fish habitat, to determine the effectiveness of the mitigation measures under conditions 3.1, 3.2, 3.3 and 3.7. In doing so, the Proponent shall monitor, at a minimum: effluent quality as per the requirements set out in the MDMER.

Status: Ongoing

Supporting Analysis:

During 2018, effluent discharges to the environment as defined by the MDMER were related to temporary seepage collection, overburden and rock stockpile runoff, and pit dewatering systems. Effluent was generated from storm water runoff and contact water associated when blasting bedrock for the development of infrastructure foundations and open pit development. All water was treated in sumps and tested in accordance with applicable permits and legislation from EC, MECP, and DFO. In 2018 there were 5 effluent discharges from overburden and rock stockpile, and pit dewatering sediment ponds designed to capture contact water and provide adequate treatment for total suspended solids (TSS) and un-ionized ammonia prior to discharge to the environment. These discharges occurred in April 2018. All discharge water met the water quality objectives outlined in the EC, MDMER, and the MECP Environmental Compliance Approval (ECA).

Beginning April 2018, tailings from ore reclaiming was deposited in the TMA Cell 2 for treatment. Water quality objectives and sampling requirements for the Rainy River Mine are outlined in the MDMER and MECP ECA Operations. See Appendix B for MDMER Results.

Condition 3.8.3

The Proponent shall monitor water quality and quantity, and fish and fish habitat, to determine the effectiveness of the mitigation measures under conditions 3.1, 3.2, 3.3 and 3.7. In doing so, the

Proponent shall monitor, at a minimum: the effectiveness of recreated fish habitat. The monitoring shall be designed in accordance with any authorizations pursuant to subsection 35(2) of the Fisheries Act and associated regulations and/or the MDMER.

Status: Ongoing

Supporting Analysis:

Fish habitat compensation was designed by qualified experts and was reviewed by the MNRF and the DFO during the permit approval phase.

By the end of 2017, all fish habitat had been recreated. The As-Constructed Report for Teeple Pond and Diversion Channel was completed and submitted to the DFO at the end of 2016. The second year of monitoring had been completed in 2018. A monitoring report was submitted to the DFO at the end of 2018. This monitoring will occur for the next 3 years with a report submitted annually. See Appendix N for The Offset Plan for the Fisheries Act- 2018 Annual Report.

The As-Constructed Report for West Creek Pond, Stockpile Pond, Clark Creek Pond and associated diversions was submitted to the DFO at the end of 2017. In 2018, the first year of monitoring had been completed and the monitoring report was submitted to the DFO December 2018. This 2018 monitoring will occur for the next 4 years with a report submitted annually. See Appendix O Schedule 2 MDMER Fish Habitat Compensation Plan Annual Report.

Condition 3.8.4

The Proponent shall monitor water quality and quantity, and fish and fish habitat, to determine the effectiveness of the mitigation measures under conditions 3.1, 3.2, 3.3 and 3.7. In doing so, the Proponent shall monitor, at a minimum: the effectiveness of the potentially acid generating and non-potentially acid generating rock segregation program through ongoing geochemical verification of the waste rock during any period that waste rock is generated.

Status: Ongoing

Supporting Analysis

Potential acid generating and non-potentially acid generating rock is sampled and segregated per the Geochemical Monitoring Plan. See Appendix A for Geochemical Monitoring Results.

Condition 3.8.5

The Proponent shall monitor water quality and quantity, and fish and fish habitat, to determine the effectiveness of the mitigation measures under conditions 3.1, 3.2, 3.3 and 3.7. In doing so, the Proponent shall monitor, at a minimum: water quality in the open pit, pursuant to any requirements set by Ontario in the Mine Closure Plan for the Designated Project.

Status: Not applicable in 2018.

Supporting Analysis:

This condition is currently not relevant as the mine is in its operational phase.

Condition 3.8.6

The Proponent shall monitor water quality and quantity, and fish and fish habitat, to determine the effectiveness of the mitigation measures under conditions 3.1, 3.2, 3.3 and 3.7. In doing so, the Proponent shall monitor, at a minimum: the maintenance of a perpetually saturated state of the tailings, for 25 years from the start of the decommissioning phase of the Designated Project.

Status: Not applicable in 2018.

Supporting Analysis:

This condition currently does not apply to the project as the mine was in a construction and operational phase in 2018. However, the Closure Plan for the project outlines the process in which tailings will be rehabilitated in a saturated state.

Condition 4: Migratory Birds

Condition 4.1.1

The Proponent shall carry out all phases of the Designated Project in a manner that avoids harming or killing migratory birds, or disturbing, destroying or the taking of nests or eggs, with consideration of guidance provided in: Environment Canada's policy on Incidental Take of Migratory Birds in Canada.

Status: Ongoing

Supporting Analysis

In order to educate New Gold Employees and site contractors, the RRM Environmental Team has implemented site wide notices regarding the breeding bird window and the requirements for bird sweeps in new construction areas or areas that have been inactive for periods of time. A bird sweep is a method of walking an area in a grid system to ensure that no birds are nesting on the ground or nesting in tall grass areas. The Environment department is also the primary contact for any incidents or mortalities to birds, nests or eggs on site.

In 2018, there was one incident of mortality of a Barn Swallow which was found in the Truck Shop. See Appendix C for the Fledgling Incident Report. The doors to the Truck Shop almost always remain open due to the manner of work that is preformed there. The nest was well out of the way and was not discovered until a fledgling failed to return to the nest. Efforts were made to protect the bird so the parents could feed it, but this was unsuccessful. The incident was reported the MNRF and EC.

In 2019 the monitoring programs will continue and the Environmental team will continue to provide education to staff and site contractors.

Condition 4.1.2

The Proponent shall carry out all phases of the Designated Project in a manner that avoids harming or killing migratory birds, or disturbing, destroying or the taking of nests or eggs, with consideration of guidance provided in: Environment Canada's avoidance guidelines on General Nesting Periods of Migratory Birds in Canada.

Status: Ongoing

Supporting Analysis:

Starting in 2015 members of the RRM Environmental Team have been trained by qualified professionals on conducting bird sweeps and identifying bird species classified as Species at Risk (SAR). During 2018, 45 bird sweeps were conducted between April and August in construction areas to ensure the absence of nesting birds or species at risk prior to disturbance.

In areas where nests were found, appropriate buffers were flagged off around the perimeter of the buffer zone and the nests were monitored on a weekly basis until the nests were abandoned. Buffer zones were established based on input from consulting expertise in conjunction with discussions with the Ministry of Natural Resources and Forestry. Furthermore, the clearing of vegetation was prohibited during the breeding bird window. This program will continue in 2019. See Appendix D for the 2018 Species at Risk Report.

Condition 4.2

The Proponent shall, at all times, implement noise reduction measures to control sound levels from machinery to avoid harassing migratory birds.

Status: Ongoing

Supporting Analysis:

In 2018 New Gold continued to conduct Species at Risk Monitoring which included sound level monitoring in Eastern Whip-poor-will Receptor Habitats during May and June, 2018. Monitoring results exceeded the hourly sound criteria threshold three times. Reviews of all audio recordings found exceedances were related to natural phenomena and not construction or operation activities. Copies of the letter reports issued to the MNRF are included under appendices.

Condition 4.3

The Proponent shall install and use site lighting fixtures in a manner that reduces light pollution in the surrounding environment to avoid disturbance to nocturnal species, such as the Common Nighthawk (Chordeiles minor).

Status: Ongoing

Supporting Analysis:

New Gold is working towards installing more permanent lightning fixtures on the project to reduce the need to temporary light plants. Some temporary light plants are solar powered.

Temporary light plants are used only in areas where employees are working a night shift or if required for safety purposes. Light plants are designed so that lights can be angled toward the ground. During routine field inspections members of the Rainy River Environmental Department check lighting plants to ensure they are angled appropriately and used only when necessary. Monitoring and consideration to this condition will continue to be implemented as the project advances.

Condition 4.4

The Proponent shall deter migratory birds from using the tailings management area.

Status: Ongoing

Supporting Analysis:

During the open water season of 2018, the TMA was inspected daily by mill operators for birds as well as other potential issues. The current protocol is that Mill Operators are to contact the New Gold Environmental Department if birds are identified anywhere on the active TMA. Additional inspections are conducted by the Environmental Department frequently. To date when birds have been found on the TMA best efforts to haze them away have been made using certified bird hazing techniques (flares, noise making devises). The Environmental Department is reviewing the current process to see if adjustments are necessary for 2019. .

Condition 4.5

The Proponent shall provide comparable replacement artificial nesting structures for Barn Swallows (Hirundo rustica) prior to the removal of existing nesting structures.

Status: Ongoing

Supporting Analysis:

At the commencement of construction in 2015, four artificial nesting structures were put in place during April, prior to the 2015 breeding season. New Gold has been monitoring the success of these nesting structures each year since 2015. Further information related to the monitoring program can be found in condition 4.8.

Following the breeding bird window in 2018, New Gold was required to remove a trailer home from the property that served as habitat for barn swallows. As the project advances additional homes and outbuildings will have to be torn down. At that time the need to develop additional artificial nesting structures will be investigated. If it is found that there is an increase in use of artificial nesting structures and competition for nesting habitat is observed, more nesting structures will be built.

Condition 4.6

The Proponent shall monitor migratory birds, breeding activity and mortality, to evaluate the effectiveness of mitigation measures under conditions 4.1 to 4.3. If monitoring demonstrates an inconsistency with those conditions, then document how this has been rectified. Monitoring starts at construction and ceases at the end of the decommissioning phase.

Status: Ongoing

Supporting Analysis:

During 2018 the RRM obtained the professional assistance of Wood PLC. to conduct appropriate monitoring of migratory birds and breeding activity in addition to site activities. Studies and activities included;

- Ongoing visual inspections of four artificial barn swallow nesting structures. The structures were installed on April 2015. Nesting was attempted in one structure in 2016 but did not reoccur in 2018.
- Development of a detailed Wildlife Monitoring Plan, approved MNRF in May 2016, which was implemented in 2016. The plan includes Species at Risk Monitoring during the operations phase as well as post mine closure, and acoustic monitoring in areas of non Whip-poor-will presence to ensure sound decibels are within an appropriate range. See Appendix E for the RRP Early Operations Acoustic Assessment Report.
- Targeted point count surveys for diurnal SAR including Golden-winged Warbler, Barn Swallow and Bobolink, and for woodland area-sensitive breeding birds in suitable habitat. Point counts will be based on standardized survey protocols described for the Ontario Breeding Bird Atlas Guide for Participants (OBBA 2001) so as to be consistent with baselines study methodology.
- Incidental data collection for SAR and provincially rare species which are currently present at lower abundance including: Canada Warbler, Olive-sided Flycatcher, Short-eared Owl, American Pelican, Bald Eagle and Black-billed Magpie.
- Targeted twilight surveys for Eastern Whip-poor-will in suitable habitat. Whip-poor-will monitoring efforts will follow standardized survey protocols as outlined in the whip-poor-will Roadside Survey Participant's Guide (BSC 2012).
- Concurrent data collection for Common Nighthawk to be undertaken during targeted Eastern Whip-poor-will surveys as described above as no standardized survey protocols have been developed specifically for this species.
- Annual monitoring of active Bald Eagle nests which occur in proximity to the RRM site. Monitoring will attempt to establish fledging success.
- Implementation of a wildlife log of general breeding bird observations at the RRM site by employees (focused on raptors and raptor nests, and SAR species); and In regard to mitigation strategies that are being implemented on the project to assist in monitoring and reduce adverse effects these include.

- Acquiring of 1468 hectares of lands to provide Eastern Whip-poor-will breeding territories and 348 hectares of field habitat suitable for Bobolink breeding habitat. These offset benefit lands are to compensate for habitat lost during the construction of the mine. Monitoring the success of these areas and potential impacts to the bird species is conducted through three phases; visual monitoring, monitoring of habitat use in the offset benefit lands and monitoring or rehabilitation plans during mine closure.
- Reduction of speed limits on the project to reduce vehicle collisions with birds
- Restricting habitat displacement for mine infrastructure to periods outside the breeding bird season (May 1 to August 15).
- In order to track mortality New Gold RRM has an onsite reporting system for employees to report any road collisions with birds and wildlife.

During 2018 there was one bird mortality reported, a juvenile barn swallow found in the truck shop. (additional information related to this incident can be found in Condition 4.1.1) See Appendix S for the 2018 Wildlife Monitoring Report

Condition 4.7

The Proponent shall monitor use of the tailings management area by migratory birds under condition 4.4 from the start of the operations phase to the end of the decommissioning phase.

Status: Ongoing

Supporting Analysis:

During the open water season of 2018, the TMA was inspected daily by mill operators for birds as well as other potential issues. The current protocol is that Mill Operators are to contact the New Gold Environmental Department if birds are identified anywhere on the active TMA. Additional inspections are conducted by the Environmental Department frequently. To date when birds have been found on the TMA best efforts to haze them away have been made using certified bird hazing techniques (flares, bangers, other noise making devises). The Environmental Department is reviewing the current process to see if adjustments are necessary for 2019.

Condition 4.8

The Proponent shall monitor the effectiveness of the artificial nesting structures created for Barn Swallows (Hirundo rustica).

Status: Ongoing

Supporting Analysis:

New Gold RRM Environmental team implemented the Bird Studies Canada Nest Watch protocol for monitoring the four artificial nesting structures located on site. Routine bi-weekly monitoring was completed between May and August 2018. There were no nesting attempts in 2018.

5.0 Health of Aboriginal Peoples

Condition 5.1.1

The Proponent shall, during the construction, operations, and decommissioning phases of the Designated Project, control exceedances of the Canadian Ambient Air Quality Standards and meet air quality requirements established by Ontario at the nearest human receptor by: implementing fugitive dust best management practices.

Status: Ongoing

Supporting Analysis:

During the construction and early operations phases, fugitive dust management practices followed the Fugitive Dust Best Management Practices Plan. Ambient air quality exceedances occurred in 2018 at the Gallinger Road ambient air quality station, were controlled by restricting light vehicle access along Gallinger Road and application of Calcium Chloride as a dust suppressant.

Condition 5.1.2

The Proponent shall, during the construction, operations, and decommissioning phases of the Designated Project, control exceedances of the Canadian Ambient Air Quality Standards and meet air quality requirements established by Ontario at the nearest human receptor by: maintaining site roadways to control silt loading.

Status: Ongoing

Supporting Analysis:

During 2018 site roadways were maintained to control silt loading by implementing the same measures that were utilized in 2017. This includes the application of Calcium chloride as a dust suppressant on light vehicle roads, restricting all haul traffic to designated heavy haul roads, using water as dust suppression when applicable on heavy haul roads, restricting speeds to 60 km on all site access roads and 40 km to 20 km on internal site roads, restricting commercial traffic to enter the site along East Access or Teeple Road, regular grading and placing of crush material on all site roads, restricting off-road activities, and constructing rock access roads into new areas during construction.

The Fugitive Dust Control Plan will be reviewed in and updated in 2019.

Condition 5.1.3

The Proponent shall, during the construction, operations, and decommissioning phases of the Designated Project, control exceedances of the Canadian Ambient Air Quality Standards and meet air quality requirements established by Ontario at the nearest human receptor by: using water sprays at the crusher and at active stockpiles.

Status: Ongoing

Supporting Analysis:

The primary crusher is equipped with a baghouse system to manage dust generated during the crushing process. At the end of 2017, a secondary water and chemical dust suppression system incorporating spray bars was also installed at the primary crusher. In 2018, water spray bars were installed during April to October at the active construction quarries.

Condition 5.1.4

The Proponent shall, during the construction, operations, and decommissioning phases of the Designated Project, control exceedances of the Canadian Ambient Air Quality Standards and meet air quality requirements established by Ontario at the nearest human receptor by: using dust control equipment.

Status: Ongoing

Supporting analysis:

During the early operations phase, the same dust control equipment utilized in 2017 continued usage into 2018. This included water trucks equipped with spray bars for road dust suppression, spray bars on mobile aggregate crushers, dust control curtains on production drills and dust cyclones on development drills. The primary crusher and conveyor system utilizes baghouses and a chemical spray system to control dust. In the mill processing area dust is controlled by a system of baghouses, wet scrubbers and specialized dust control equipment.

Condition 5.1.5

The Proponent shall, during the construction, operations, and decommissioning phases of the Designated Project, control exceedances of the Canadian Ambient Air Quality Standards and meet air quality requirements established by Ontario at the nearest human receptor by: using low-Sulphur diesel equipment and using pollution control equipment on mobile heavy equipment and meeting the Canadian Environmental Protection Act for the emissions from this equipment and vehicles.

Status: Ongoing

Supporting Analysis:

All preventative maintenance programs include a surveillance program to test emissions from mobile equipment. Pollution control equipment is installed on mobile heavy equipment that meets the Canadian Environmental Protection Act for the emissions from equipment and vehicles. Two air quality monitoring stations are also installed on site and routinely monitored to ensure there are no air quality exceedances.

Condition 5.1.6

The Proponent shall, during the construction, operations, and decommissioning phases of the Designated Project, control exceedances of the Canadian Ambient Air Quality Standards and meet air quality requirements established by Ontario at the nearest human receptor by: revegetating disturbed areas in a manner that minimizes all exposed dust sources.

Status: Ongoing

Supporting Analysis:

In 2018, revegetating disturbed areas to minimize exposed dust sources was performed in the Tait Quarry area. Stabilization and revegetation of the quarry was completed as per regulatory requirements.

Condition 5.2

The Proponent shall monitor air quality to evaluate the effectiveness of mitigation measures under condition 5.1. Monitoring starts with construction and ceases at the commencement of the decommissioning phase.

Status: Ongoing

Supporting Analysis:

An ambient air quality monitoring program was continued during 2018. Two air quality sampling stations, established in May 2015, located east of the site on Gallinger Road and one to the south of the site near the beginning of the Highway 600 reroute on Tait Road.

These stations are equipped with hi-vol samplers (brush motor and mass flow controlled), PQ200 samplers, dustfall samplers, and passive sampling for SO2 and NO2.

The hi-vol samplers measure Total Suspended Particulate (TSP) and metal concentrations averaged over 24-hour period. The metals and metalloids analyzed include arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), vanadium (V), and zinc (Zn).

The PQ200 samplers measure Particulate Matter 2.5 (PM2.5) concentrations averaged over a 24-hour period. The dustfall samplers measure total dustfall deposition over a 30-day period. Passive sampling measures SO2 and NO2 concentrations over a 30-day period.

There were two TSP and metal exceedances measured in Q2 of 2018 at the Gallinger Station. Both were attributed to increased light vehicle traffic utilizing the road that passes directly beside the station. Mitigation measures included restricting traffic along the road and utilizing calcium chloride as a dust suppressant. See Appendix F for 2018 Air Quality Results. See Appendix I for the 2018 Exceedance Table.

Condition 5.2.1

The Proponent shall alert the Aboriginal groups in cases of exceedances of the Canadian Ambient Air Quality Standards and air quality requirements established by Ontario at the nearest human receptor.

Status: Ongoing

Supporting Analysis:

All exceedances are reported indigenous groups through a weekly reporting procedure.

Condition 5.3

The Proponent shall monitor wells located within the open pit dewatering zone of influence, used by Aboriginal groups for drinking water, for water quality and quantity. Monitoring starts with construction and ceases after the first 10 years of the decommissioning phase.

Status: Ongoing

Supporting Analysis:

Through the consultation phase and up to the end of 2018, New Gold has not been informed of the locations of any wells utilized by indigenous groups within the proximity of the open pit dewatering zone of influence.

In 2017, New Gold implemented a drinking well sampling program for residents surrounding the project boundary. To date there have been no issues reported to New Gold regarding wells from any of the neighboring land owners. See appendix U 2018 Offsite Groundwater Monitoring Report.

Condition 5.3.1

The Proponent shall alert Aboriginal groups who use wells located within the open pit dewatering zone of influence for drinking water in cases of exceedance of water quality standards established by Ontario. The Proponent shall alert these Aboriginal groups as soon as possible once any exceedance is detected.

Status: Ongoing

Supporting Analysis:

To date New Gold has not been informed of any wells used by indigenous groups within the Open Pit zone of influence.

Condition 5.4

The Proponent shall monitor key contaminants, including mercury, arsenic, cadmium and lead, for their concentrations in Northern Pike (Esox lucius) and Walleye (Sander vitreus) in the Pinewood River. Monitoring starts with construction and ceases 10 years after the start of the decommissioning phase.

Status: Ongoing

Supporting Analysis:

During September of 2018 Minnow Environmental Inc. conducted a fish tissue monitoring program at selected points along the Pinewood River, downstream of the RRM extending approximately 500 m upstream of the confluence with the Rainy River. The focus of this study was to collect tissue samples from northern pike and walleye. Fifteen individuals of each species were sacrificed for the study. ~~les~~ were collected from each fish. Muscle, liver and ovary tissue samples were collected from each fish and sent to a certified laboratory ~~for~~ to be analyzed for chemicals of potential concern. These include metalloids such as arsenic, boron, cadmium, cobalt, copper, chromium, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc. This is the fourth consecutive year that New Gold has completed this study. Results obtained from the 2018 study are consistent with results from previous studies (2015, 2016 and 2017) and 2012 baseline study. Data from the 2018 study indicate that the RRM has not influenced the concentrations of metals in muscle, liver and ovary tissues of northern pike and walleye fish species.

Further studies will be conducted in 2019. A copy of the 2018 report on Fish Tissue Quality Monitoring can be found in the Supporting Documentation in Appendix G.

Condition 5.4.1

The Proponent shall alert the Aboriginal groups in cases of exceedance of provincial, federal or international health-based criteria. The Proponent shall alert these Aboriginal groups as soon as possible once any exceedance is detected.

Status: Ongoing

Supporting Analysis:

All Exceedances are reported to the indigenous communities via the appropriate reporting procedures. Ex. Spill Reporting is completed and distributed weekly.

5.5 The proponent shall consult with the Aboriginal groups on the implementation of conditions 5.2, 5.3 and 5.4.

Status: Ongoing

Supporting Analysis:

During the Environmental Assessment permitting phase of the New Gold RRM, indigenous Communities were consulted regarding the project and potential impacts related to conditions 5.2 to 5.4 (air, fish, water quality). Since the approval of the EA New Gold has continued Aboriginal Community involvement by;

- Establishing Environmental Monitoring Boards in 2016. The purpose of these meetings is to ensure community members are engaged in environmental aspects of the project. Some topics that are discussed include; environmental monitoring results (ie; air quality, wildlife monitoring, dear tissue sampling programs, fish tissue sampling programs), exceedances or environmental spills, project design (tailings management, reclamation).
- Conducting on-site tours and discussing fish salvage programs, water quality sampling protocols and sampling results and other environmental monitoring requirements
- Providing email notifications to indigenous Communities regarding environmental exceedances (air, water and environmental spills)
- Inviting First Nation members to participate in fish tissue sampling programs and fish salvage programs.

6.0 Current use of Lands and Resources for Traditional Purposes:

Condition 6.1

The Proponent shall provide access to private lands to Aboriginal groups for their current use of land, including hunting and plant harvesting.

Status: Ongoing

Supporting Analysis:

New Gold provides access to private lands where it is safe to do so. On a regular basis, New Gold also provides site tours to community members, so they are familiar with the lands.

Condition 6.2

Current use of Lands and Resources for Traditional Purposes: The Proponent shall avoid use of herbicides along the transmission line corridor unless required to prevent fire hazards. The Proponent shall minimize the removal of non-woody vegetation within the transmission line corridor.

Status: Ongoing

Supporting Analysis:

Over the life of the Mine the line will be inspected and if necessary, vegetation that would impact the line may need to be managed. The use of herbicide for vegetation management is not intended.

During 2018 there was no need to manage vegetation along the transmission line.

Condition 6.3.1

The Proponent shall, throughout all phases of the Designated Project, undertake progressive habitat restoration as per any requirements set by Ontario in the Mine Closure Plan for the Designated Project. Habitat restoration shall include: a consideration of habitat types that support a diversity of wildlife species and traditional uses by Aboriginal peoples, including ungulates and furbearers, as well as native plant species previously collected at the Project Site for food and medicinal purposes.

Status: Ongoing

Supporting Analysis:

During 2018, native seeds and plant species were used in areas where re-vegetation occurred. Preliminary earthworks also took place to establish the area of the vegetation test plots. These plots will be used to test different plant and tree species with an array of surface treatments. Consultation began in 2018 with First Nation communities to determine the different plant species that could be used at closure for medicinal and traditional purposes. The vegetation test plots are scheduled to be completed in 2019 with monitoring commencing shortly after.

Condition 6.3.2

The Proponent shall, throughout all phases of the Designated Project, undertake progressive habitat restoration as per any requirements set by Ontario in the Mine Closure Plan for the Designated Project. Habitat restoration shall include: separating and stockpiling removed organic rich material during construction (of open pit and during tailings dam stripping) for use to support revegetation and other reclamation activities.

Status: Ongoing

Supporting Analysis:

During construction activities, organic rich material was separated and stockpiled in designated areas for use in revegetation and other reclamation activities. In 2017 and 2018 organic rich material was salvaged during development of areas within the East Mine Rock Stockpile, West Mine Rock Stockpile, Mine Rock Pond dam footprint, open pit water collection sumps, Tailing Management Area dam footprints and clay borrow pit areas.

Condition 6.4

The Proponent shall monitor habitat restoration to verify the success of revegetation efforts. Monitoring starts with construction and ends once habitat has been restored and proven effective.

Status: Ongoing

Supporting Analysis:

In the early stages of the RRM the largest construction undertaking that has seen the most reclamation is the creation of three manmade diversions to re-route former water systems known as the West Creek, Clark Creek and Teeple Drain. Construction of these diversion structures referred to as the West Creek, Clark Creek and Teeple Diversions commenced in 2015 with commissioning commencing in late 2016 and mid 2017. As part of the Fisheries and Oceans Canada approval process for these structures, New Gold is required to complete an annual monitoring report of the fisheries, fish habitat and compensation of these structures. In regard to habitat restoration, the 2018 reports indicate the following; Teeple, West Creek, Clark Creek ponds and diversions constructed habitat remains stable and in place. Shorelines and graded offset features are stable, and riparian vegetation cover and plantings have achieved moderate to good coverage and have reached the targeted 80% success criteria. This monitoring of these systems will continue annually until 2022. See Appendix N The Offset Plan for the Fisheries Act-2018 Report and Appendix O Schedule 2 MDMER Fish Habitat Compensation Plan.

Condition 6.5

The Proponent shall restore access to the Project Site for the Aboriginal groups during the decommissioning phase, to the extent that such access is safe, for their traditional purposes.

Status: This condition is not applicable in 2018.

Supporting Analysis:

This condition is not relevant to the current early operations phase of the project.

Condition 6.6

The proponent shall consult with the Aboriginal groups on the implementation of conditions 6.1, 6.4 and 6.5.

Status Update: Ongoing

Supporting Analysis:

6.1 Through negotiated agreements and in the Rainy River Project Indigenous Consultation Plan, New Gold has engaged Indigenous groups on accessing New Gold property.

6.4 Updates on habitat restoration and the success of revegetation efforts are provided during site tours and at Environmental Monitoring Board meetings.

6.5 Not applicable during the operations phase.

7.0 Aboriginal Archaeological, Heritage and Cultural Resources

Condition 7.1.1

The Proponent shall, for all phases of the Designated Project: avoid known culturally significant sites.

Status Update: Ongoing

Supporting Analysis:

Culturally significant sites were avoided in 2018.

Condition 7.1.2

The Proponent shall, for all phases of the Designated Project: assess additional culturally significant sites, if discovered.

Status Update: Ongoing

Supporting Analysis:

No culturally significant sites were identified in 2018.

Condition 7.1.3

The Proponent shall, for all phases of the Designated Project: establish a procedure for Aboriginal groups to safely access the Project Site for cultural and ceremonial purposes.

Status Update: Ongoing

Supporting Analysis:

A formal procedure was identified in Section 4.0 of the Aboriginal Consultation Plan (Provincial Environmental Assessment, Notice of Approval Condition 9) and issued to MECP on February 9, 2015. In 2018, revisions were made to the document name, contact information and updates made in response to MECP comments. The current version of the Indigenous Consultation Plan was issued to MECP on July 30, 2018.

Condition 7.1.4

The Proponent shall, for all phases of the Designated Project: preserve any discovered burial sites.

Status Update: Ongoing

Supporting Analysis:

No burial sites were discovered in 2018.

Condition 7.1.5

The Proponent shall, for all phases of the Designated Project: salvage and preserve any artifacts that cannot be maintained in-situ.

Status Update: Ongoing

Supporting Analysis:

New Gold had archaeologists on site to excavate archaeological sites as per Provincial Standards and Guidelines. The archaeologists currently hold the artifacts and will make arrangements to transfer the artifacts to appropriate facilities upon consultation with indigenous people.

Condition 7.1.6

The Proponent shall, for all phases of the Designated Project: transfer artifacts in condition 7.1.5 to a facility identified by Aboriginal groups, in consultation with the Ontario Ministry of Tourism, Culture and Sport.

Status: Ongoing

Supporting Analysis:

Artifacts will be transferred from the archaeologist once the reports for MTCS are complete and consultation with Indigenous groups regarding the artifacts is complete. No artifacts were transferred in 2018.

Condition 7.2

The proponent shall consult with the Aboriginal groups on the implementation of condition 7.1.

Status: Ongoing

Supporting Analysis:

No additional cultural sites were identified in 2018. Throughout the Environmental Assessment process, New Gold had engaged indigenous groups on previously identified cultural sites.

8.0 Subsection 5(2) effects related to components of the Designated Project that may be associated with federal authorizations

Condition 8.1.1

The proponent shall, in implementing condition 3.7, take measures to avoid or lessen adverse effects: on migratory birds and their habitats.

Status: Ongoing

Supporting Analysis

In order to lessen adverse effects on migratory birds and their habitats New Gold has implemented the following activities during the first year of construction (2015) and continued to carry these tasks through 2018;

- Establishment of compensation-related habitat and a monitoring and maintenance plan has been initiated (barn swallow nesting boxes and compensation lands).
- New Gold RRM is aware and has taken extra care with regards to the potential for effects on migratory birds during nesting periods. All employees receive Species at Risk training and information regarding nesting birds and the migratory bird act during site orientation. Frequent site wide information bulletins are also shared.
- ~~45~~ bird sweeps occurred in 2018 as a precautionary measure to ensure birds were not nesting in proposed areas for construction. A bird sweep is a method of walking a grid system in a proposed construction work zone to ensure that no birds are nesting in the area prior to the commencement of work. A sweep is valid for 72 hours.
- Mitigation measures used to deter birds from nesting in construction zones or landing on the Tailings Management Area include; deterrent cannons, netting over uninstalled pipes, culverts and openings, and 10,000+ stakes with reflective tape were installed to deter birds from future work areas.
- No tree clearing occurred during the breeding bird window (April to August).

Condition 8.1.2

The proponent shall, in implementing condition 3.7, take measures to avoid or lessen adverse effects: on terrestrial species, including amphibians and reptiles, and their habitats.

Status: Ongoing

Supporting Analysis:

The commissioning of the Teeple Diversion system commenced in 2016 followed by the commissioning of West Creek Diversion and Clark Creek Diversion in mid-2017. During the construction of the Teeple and Clark Pond turtle basking areas were developed using rocks and trees. Since the start of construction New Gold has obtained an annual Wildlife Scientific Collectors Authorization (License No. 1089610) from the Ministry of Natural Resources and Forestry which allows for the live trapping and relocation of turtles and snakes that are found in areas where they will be impacted by construction activities. During 2018 the license was not utilized. New Gold will apply for the license in 2019.

Monitoring of the success of the diversion structures and fish habitat compensation will be monitored over the next four years as part of the Department of Fisheries and Oceans Authorization. In an event

that maintenance activities are required, this condition will be reviewed for appropriate mitigation strategies.

Condition 8.1.3

The proponent shall, in implementing condition 3.7, take measures to avoid or lessen adverse effects: On species at risk (SAR) and their habitats.

Status: Ongoing

Supporting Analysis:

SAR are considered in all aspects of Mine activities and an assessment of SAR and their habitats in relation to the RRM can be found in the 2018 SAR report (See IPT-0054 Rev C).

Since the early construction stages of the diversions, New Gold has retained qualified biologists to conduct fish salvage programs in the creeks and wetlands that would be altered as part of the diversion design. A component of the salvage program was to identify species found. To date no SAR species have been identified during salvages.

Monitoring of the success of the diversion structures and fish habitat compensation will be conducted over the next four years as part of the Department of Fisheries and Oceans Authorization. In an event that maintenance activities are required, this condition will be reviewed for appropriate mitigation strategies.

Condition 8.1.4

The proponent shall, in implementing condition 3.7, take measures to avoid or lessen adverse effects: on current use of lands and resources for traditional purposes by Aboriginal peoples.

Status: Ongoing

Supporting Analysis:

The construction of fish habitat compensation to offset the impact of the TMA started in 2015 and was completed in 2017. The man-made ponds (4) and creek diversion systems contained fish habitat features suitable to existing fish species presence (minnows) and native plant species consistent to what was naturally growing on site. The construction of these features and loss of habitat associated with the construction of the TMA was shared with communities through the Environmental Assessment Permitting Phase as part of Public and Indigenous Consultation. All project design components related to compensation and reclamation were developed to reflect available Traditional Knowledge, naturally occurring features and previous land use considerations.

Monitoring of the success of the diversion structures and fish habitat compensation will be monitored over the next five years as part of the Department of Fisheries and Oceans Authorization. In an event that maintenance activities are required this condition will be reviewed for appropriate mitigation strategies. See Appendix N The Offset Plan for the Fisheries Act-2018 Report and Appendix O Schedule 2 MDMER Fish Habitat Compensation Plan.

Condition 8.1.5

The proponent shall, in implementing condition 3.7, take measures to avoid or lessen adverse effects: on sites of cultural significance to Aboriginal peoples.

Status: Ongoing

Supporting Analysis:

Creation of fisheries compensation related habitat was initiated during 2015, 2016, 2017 and completed in 2018 did not impact any identified sites of cultural significances to Indigenous peoples. Previous archeological assessments of the New Gold Rainy River Project property included Stage 1 through 4 assessments and excavation.

Monitoring of the success of the diversion structures and fish habitat compensation will be monitored over the next five years as part of the Department of Fisheries and Oceans Authorization. In an event that maintenance activities are required this condition will be reviewed for appropriate mitigation strategies.

Condition 8.1.6

The proponent shall, in implementing condition 3.7, take measures to avoid or lessen adverse effects: from potential sources of contamination (e.g. mercury, arsenic, cadmium and lead).

Status: Ongoing

Supporting Analysis:

The design and construction of the fisheries compensation features were created in a manner to reflect natural systems that will not be impacted by mine waste water that could be a potential source of contamination. No acid generating rock was used in the creation of rock features.

Monitoring of the success of the diversion structures and fish habitat compensation will be monitored over the next five years as part of the Department of Fisheries and Oceans Authorization. In the event that maintenance activities are required this condition will be reviewed for appropriate mitigation strategies.

Condition 8.2

The Proponent shall, in implementing condition 6.3, take into consideration the habitat needs of species at risk consistent with final recovery strategies or action plans, or alternatively, rely on best available information where recovery plans or action plans for the species are not yet completed for the species at risk.

Status: Ongoing

Supporting Analysis:

In 2018 New Gold completed the reclamation of the former Tait Quarry which operated between 2015 and 2017 to provide material for the construction of Highway 600. Through discussions with the MNRF in 2013 and 2014 it was decided that the Tait Quarry would be reclaimed to whip-poor-will habitat similar to that found in the gravel pit. Prior to its development, Tait Quarry was not considered to be suitable habitat for whip-poor-wills, which are a Species at Risk in the Rainy River District.

A consulting firm was retained by New Gold to design the reclamation plan which involves; ensuring the site is safe by sloping rock faces and banks to a minimum 2: 1 slope, leaving the pit floor as a pond, applying a topsoil, clay, organics mixture to areas where vegetation will be planted, planting trees and seeding with native species. Suitable plant species and habitat creation has been designed to mirror other areas known to be Eastern Whip Poor-Will habitat within the project boundary. In late fall of 2017 the earthworks component began and in summer of 2018 the vegetation component of the Tait Quarry reclamation plan was completed.

New Gold RRM considered Species at Risk and the potential for habitat creation in site restoration activities to date, in accordance with their Provincial Endangered Species Act permit.

Species at Risk monitoring was conducted in 2017 and the annual report was submitted to MNRF in January 2018 to fulfill condition numbers 7.2 and 7.3 of ESA FF-C-001-14.

Condition 8.3

The Proponent shall provide about 1400 hectares of private land as habitat for Eastern Whip poor-will (Antrostomus vociferous) and Bobolink (Dolichonyx oryzivorus).

Status: Closed

Supporting Analysis:

Prior to project development the MNRF determined that 18 identified Eastern Whip Poor-Will breeding territories could potentially be affected by the project's development and that 348 ha of Bobolink habitat had the potential to be impacted by the project. Based on this information to offset the loss of habitat, New Gold obtained 1468.3 ha of lands to provide Eastern Whip poor-will breeding territories and 348 ha of field habitat suitable for Bobolink breeding habitat.

Condition 8.4

The Proponent shall monitor the effectiveness of the habitat in condition 8.3.

Status: Ongoing

The RRM owns and monitors over 1800 ha of overall benefit land and are following the monitoring plan described in the 2018 SAR report. See Appendix D for the 2018 Species at Risk Report

Condition 8.5.1

The Proponent shall: maintain a fence around the tailings management area to prevent access by wildlife.

Status: Ongoing

Supporting Analysis:

In late fall of 2018, a 14 km wildlife exclusion fence was erected that encompasses the footprint of the TMA and WMP. This fence includes 8 km of reptile barrier, the remaining 6 km of reptile barrier will be completed in spring of 2019.

Condition 8.5.2

The Proponent shall: implement measures to prevent Snapping Turtles (Chelydra serpentine) from entering the following components of the Designated Project: tailings management area (TMA), water management pond (WMP), water discharge pond, constructed wetland, overburden pile, west mine rock pile and sediment ponds 1 and 2.

Status: Ongoing

Supporting Analysis:

8.5.2.1 – Tailings Management Area

In late fall of 2018 a 14 km wildlife exclusion fence was erected that encompasses the footprint of the TMA and WMP. This fence includes 8 km of reptile barrier, the remaining 6 km of reptile barrier will be installed in spring of 2019. No Snapping turtles were observed in the TMA in 2018.

8.5.2.2- Water Management Pond

In late fall of 2018 a 14 km wildlife exclusion fence was erected that encompasses the footprint of the TMA and WMP. This fence includes 8 km of reptile barrier, the remaining 6 km of reptile barrier will be installed in spring of 2019. No Snapping turtles were observed in the WMP in 2018.

8.5.2.3 - Water Discharge Pond

The WDP was completed in late fall 2018, no snapping turtles were observed during its construction. The WDP did not receive any mine effluent during 2018 and is not expected to during 2019, only surface run off has reported to the WDP. The WDP will be monitored for snapping turtles and if any are observed, efforts will be made to remove and exclude them before discharge of effluent to the pond.

8.5.2.4 – Constructed Wetland: Not constructed in 2018, differed to 2020-2021.

Water Treatment Train construction initiated in 2018 and to be completed in 2019. The treatment train consist of a Water Treatment Plant, a nitrification cell, two BCR and a discharge basin.

8.5.2.5 - Overburden Pile

Ditching is built with steep banks around the overburden stockpile to ensure turtles do not enter the overburden dump and silt fence was installed that will direct them away from the area. No snapping turtles were observed in or around the overburden stockpile in 2018.

8.5.2.6 - West Mine Rock Pile

Ditching around the area was complete in 2018. This ditching is built with steep banks to ensure turtles do not enter the stockpile area. No turtles were observed in the area in the 2018.

8.5.2.7 - Sediment Ponds 1 & 2

Sediment ponds 1 and 2 were completed in 2018, During construction of these ponds no snapping turtles were observed. The banks of the ponds are rock armored and geotechnical fabric lined so turtles will be discouraged from burrowing into them or climbing over them.

9.0 Accidents or Malfunctions

Condition 9.1.1

In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall; Notify the Agency and other relevant regulatory agencies of the occurrence as soon as possible.

Status: Ongoing

Supporting Analysis:

In the event of an accident or malfunction with the potential to cause adverse environmental effects, New Gold RRM has implemented a standard operating procedure for spill reporting and an emergency preparedness and response plan that obligates notification to the Agency and other relevant regulatory agencies of an occurrence as soon as possible.

Condition 9.1.2

In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall: implement measures to minimize any adverse environmental effects associated with the occurrence as soon as possible.

Status: Ongoing

Supporting Analysis:

In the event of an accident or malfunction with potential to cause adverse environmental effects, New Gold has implemented a site wide spill reporting procedure. The objective of this procedure is to implement measures to control and minimize adverse environmental effects associated with the event. This reporting procedure incorporates the site-wide emergency preparedness and response plan, if necessary.

Condition 9.1.3

In the event of an accident or malfunction with the potential to cause adverse environmental effects, the Proponent shall: submit a written report to the Agency as soon as possible in the circumstances, but at the latest 30 days after the day on which the accident or malfunction took place; the written report must include:

9.1.3.1 The measures that were taken to mitigate the effects of the occurrence;
9.1.3.2 If an emergency response plan was implemented, details concerning its implementation;
9.1.3.3 Changes made to avoid a subsequent occurrence of the accident or malfunction.
Status: Ongoing

Supporting Analysis:

In the event of an accident or malfunction with the potential to cause adverse environmental effects, New Gold shall follow the site wide spill reporting procedure and ECA#5178-9TUPD9 condition 11(4) which includes providing a written report detailing mitigation measures and changes made to avoid a reoccurrence. A copy of the report will be submitted to the Agency within 10 working days of the event as per ECA# 5178-9TUPD9 condition 11(4).

A copy of the Site Wide Spill Reporting Procedure (ENV-SOP-0001) and the Environmental Department Reporting Procedure (ENV-SOP-0002) can be found in Appendix H.

10.0 Implementation Schedule

Condition 10.1

The Proponent shall submit an implementation schedule for conditions contained within this Decision Statement to the Agency, or anyone designated pursuant to s. 89 of CEAA 2012, 15 days prior to construction.

Status: Complete

Supporting Analysis: This condition was completed on February 3, 2015.

Condition 10.2

The Proponent shall submit an update to this implementation schedule in writing to the Agency, or anyone designated pursuant to s. 89 of CEAA 2012, every two years on March 31, starting the year following the date of the initial submission of the implementation schedule until completion of the activities.

Status: Ongoing

Supporting Analysis:

An updated Implementation Schedule was included in the 2017 Annual Compliance Report that was submitted March 29, 2018.

Next due date for Implementation Schedule submission is March 31, 2020

Condition 10.3

The Proponent shall provide the Agency, or anyone designated pursuant to s. 89 of CEAA 2012, with notice of any implementation schedule changes from the initial schedule or any subsequent updates 30 days prior to the implementation of the change.

Status: Ongoing

Supporting Analysis:

An updated Implementation Schedule was provided to CEAA on September 8, 2017. There has been no changes for 2018.

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SECTION 4
NEW GOLD RAINY RIVER MINE COMMITMENT REGISTRY PROVINCIAL COMMITMENTS

Figure 19 Cows at SW28A

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Condition/ Tracking #	Description	Status 2018	Date Completed
3.1	Where a document, plan or report is required to be submitted to the Ministry, the Proponent shall provide two copies of the final document, plan or report to the Director: a copy for filing in the specific public record file maintained for the Undertaking, and a copy for use by Ministry staff.	To date, New Gold has provided two copies of reports and documentations to the Ministry or has submitted required information in the requested format by the Ministry.	Ongoing
3.2	The Proponent shall provide additional copies of the documents required for the public record file to the following for access by the public: a) Regional Director, b) District Manager and c) New Gold Inc. office in Emo, Ontario.	The conditions of this commitment have been met. All copies have been submitted by March 31st, 2019.	March 31, 2019
3.3	The EAB file number EA 05-09-02 and EAIMS file number 13102 shall be quoted on all documents submitted by the Proponent pursuant to condition 3.1 of this Notice of Approval.	These numbers have been added to the 2018 annual report.	Ongoing Annually
3.4	Without detracting from the foregoing Public Record conditions, the proponent may also provide these documents through other means, as considered appropriate by the Proponent.	The 2018 Annual Compliance Report is made available on the company's website. A hard copy can be viewed at the New Gold office in Emo. Additional reports, supporting documentation and environmental information can be made available by request from the New Gold Environmental Department.	Ongoing
4.1	The Proponent shall post the Errata document dated December 15, 2014 on the Proponent's project website. The Proponent shall update the Summary of the Environmental Assessment Report to reflect the addition of the Errata and to itemize what sections of the Environmental Assessment Report have been impacted by it and shall post the updated Summary on the website. The Proponent shall update the Table of Contents of the Environmental Assessment Report to reflect that the Errata is included as part of Volume 2 of the Environmental Assessment Report and shall post the updated Table of Contents on the website.	The EA with the addition of the Errata document was posted on November 12, 2015. Following the commissioning of the RRM the company's website was updated. There was a delay in the re-posting of this document which was rectified on March 23, 2018.	November 12, 2015
5.1	The Proponent shall prepare and submit to the Director, for the public record, an Environmental Assessment Compliance Monitoring Program (CMP).	Completed	February 9, 2015

Condition/ Tracking #	Description	Status 2018	Date Completed
5.2	The CMP shall be submitted 30 days before the start of construction or such other date as agreed to in writing by the Director.	Completed	February 9, 2015
5.3	The CMP shall describe how the Proponent will monitor its fulfilment of: 1) the provisions of the Environmental Assessment pertaining to mitigation measures, public consultation, and additional studies and work to be carried out; 2) all other commitments made by the Proponent during the Environmental Assessment process including the Commitments Registry as contained in the Errata dated December 15, 2014; and 3) the conditions included in this Notice of Approval.	Completed	February 9, 2015
5.4	The CMP must contain an implementation schedule for construction, operations and closure, as well as monitoring during construction, operations and closure.	A Compliance Monitoring Plan for the Rainy River Project was submitted to MOECC on February 9, 2015. No revisions have been submitted to date. Through the submission of the Annual Compliance Report to the MECP and CEAA, New Gold provides the results of on-site monitoring as outlines in the Plan.	February 9, 2015
5.5	When the Proponent submits the CMP to the Director, the Proponent shall append a statement indicating that the CMP is intended to fulfil condition 5 of this Notice of Approval.	Completed	February 9, 2015
5.6	The Director may require the Proponent to amend the CMP at any time. Should an amendment be required, the Director will notify the Proponent, in writing, of the required amendment and the date by which the Proponent must complete the amendment and submit it to the Director.	During 2018 there were no requests for New Gold to amend the Compliance Monitoring Plan	Ongoing
5.7	The Proponent shall carry out the CMP, as it may be amended by the Director.	During 2018 there were no requests made for New Gold to amend the Compliance Monitoring Plan.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
5.8	The Proponent shall make the documentation pertaining to the CMP available to the Ministry or designate upon request, in a timely manner, when so requested by the Ministry during an on-site inspection, audit, response to a pollution incident report or when information concerning compliance is requested by the Ministry.	There were no requests made in 2018.	Ongoing
6.1	The Proponent shall prepare an annual Compliance Report which describes its compliance with the conditions of approval set out in this Notice of Approval, and which describes the results of the Proponent's Environmental Assessment CMP required by Condition 5 of this Notice of Approval.	This table forms part of the 2018 Annual Compliance Report and describes compliance with the conditions of the approval. Information related to the Follow Up Monitoring Plan can be found in Appendix S.	Ongoing
6.2	The first annual Compliance Report shall be submitted to the Director, for the public record, within one year from the Start of Construction and shall cover all activities of the previous 12 month period.	The First Annual Compliance Report covered the period from the start of construction to December 31, 2015 and was submitted on March 31, 2016. The 2016 Compliance Report was submitted on March 31, 2017 and the 2017 Compliance Report was submitted on March 31, 2018. The 2018 Compliance Report was submitted March 31st, 2019.	Complete March 31, 2019
6.3	Subsequent Compliance Reports shall be submitted to the Director, for the public record, on or before the anniversary of the Start of Construction each year thereafter. Each Compliance Report shall cover all activities of the previous 12 month period.	In 2015 a decision was made between the Agency and New Gold Representative Kyle Stanfield that the Annual Compliance Reports would cover the period from January to December and that the report would be submitted March of the following year. In 2015 the report covered the period from the start of construction (February) to December 2015 and was submitted March 31, 2016; In 2016 the report covered January to December 2016 and the report was submitted March 31, 2017. The 2017 report covers the period from January to December 2017 and was submitted on March 31, 2018. The 2018 report covers the period from January to December 2018 and was submitted on March 31, 2019.	Completed annually on March 31.
6.4	Once all conditions in this Notice of Approval have been satisfied, or have been incorporated into any other provincial approval, the Proponent shall indicate in its annual Compliance Report that the Compliance Report is its final Compliance Report, and that all	The terms of this condition are understood and not applicable to the 2018 report.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	conditions in this Notice of Approval have been satisfied. The Director may also vary the time at which the Proponent is to provide its final Compliance Report, and state this in writing to the Proponent.		
6.5	The Proponent shall retain either on site or in another location approved by the Director, a copy of each of the annual Compliance Reports and any associated documentation of compliance monitoring activities.	Copies of the Annual Compliance Monitoring Report are available at the New Gold Rainy River Office located in Emo, Ontario as well as available at the mine site from the Environmental Department. Any associated compliance monitoring documentation that is not available in the report can be requested from the New Gold Environmental Department.	Ongoing
6.6	The Proponent shall make the Compliance Reports, and associated documentation, available to the Ministry or designate in a timely manner when requested to do so by the Ministry.	To date New Gold has been in compliance with this condition and is willing to share associated documentation as requested by the Ministry.	Ongoing
7.1	The Proponent shall prepare and implement a Complaint Protocol that sets out how it will deal with and respond to inquiries and complaints received during the design, construction and operation of the Undertaking.	A Complaint Protocol was implemented in February 2015 at the start of construction and remains in effect.	February 2, 2015
7.2	The Proponent shall submit the Complaint Protocol to the Director, for the public record, 30 days before the Start of Construction or such other date as agreed to in writing by the Director.	A Complaint Protocol was submitted on February 2, 2015.	February 2, 2015
7.3	The Director may require the Proponent to amend the Complaint Protocol at any time. If an amendment is required, the Director will notify the Proponent in writing of the required amendment and the date by which the Proponent must complete the amendment and submit it to the Director.	During 2018 there were no requests made to New Gold to amend the Complaint Protocol.	Ongoing
7.4	The Proponent shall carry out the Complaint Protocol, as it may be amended by the Director.	There were 10 complaints reported in 2018. The majority of these complaints (6) were due traffic and dust. Other complaints were due to vibration, land use and employee behavior.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
8.1	The Proponent shall prepare and implement a Community Communications Plan that sets forth: a) How the Proponent plans to disseminate information to interested persons; b) How interested persons will be notified and kept informed about Site operations; and c) The procedures for keeping interested persons apprised of information about documents related to the Undertaking, and when and how the updated information and/or documents will be made available.	The Community Communications Plan was completed February 9, 2015.	February 9, 2015
8.2	The Proponent shall submit a Community Communications Plan to the Director 30 days before the Start of Construction or such other date as agreed to in writing by the Director.	A Community Communications Plan was submitted on February 9, 2015.	Completed February 9, 2015
8.3	The Proponent shall implement the Community Communications Plan during construction, operations and closure of the Undertaking.	Implemented in 2018.	Ongoing
9.1	The Proponent shall prepare and implement an Aboriginal Consultation Plan that sets forth: a) How, during the detailed design and implementation of the Undertaking, the Proponent will consult with the Aboriginal communities that were notified of the Undertaking during the Environmental Assessment process; b) How the Proponent will fulfill all commitments made to Aboriginal communities during the Environmental Assessment process, including ongoing consultation during the design and implementation of the Undertaking; c) A Notification Protocol for how the Proponent will inform Aboriginal communities if archaeological resources or Aboriginal remains are	Completed. A draft plan was submitted on January 21, 2015. Following up on the communication on February 13 2015, New Gold RRM noted that the MOECC had no additional comments on the Aboriginal Consultation Plan stipulated in Condition 9 of the Provincial EA decision for the RRM. A copy of the plan was provided.	January 21, 2015

Condition/ Tracking #	Description	Status 2018	Date Completed
	encountered during construction; d) How the Proponent will issue notices and updates on key steps in the design and implementation of the Undertaking.		
9.2	The Proponent shall submit the Aboriginal Consultation Plan to the Director and the Aboriginal communities that were notified of the Undertaking during the Environmental Assessment process 30 days before the Start of Construction or by such other date as agreed to in writing by the Director.	The Aboriginal Consultation Plan was submitted February 9, 2015.	February 9, 2015
9.3	The Proponent shall implement the Aboriginal Consultation Plan during construction, operations and closure of the Undertaking.	Implemented in 2018.	Ongoing
9.4	The Proponent shall continue to consult with the following Aboriginal communities: Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Naotkamegwanning (Whitefish Bay) First Nation, Anishinaabeg of Naongashiing (Big Island) First Nation, Ojibways of Onigaming First Nation, and the Sunset Country Métis community (represented by Métis Nation of Ontario Region 1 Consultation Committee), to inform them of when impacting activities will occur. Before impacting activities occur, the Proponent shall provide interested Aboriginal communities with reasonable opportunity to carry out specific cultural practices, as those communities consider appropriate.	Implemented in 2018.	Ongoing
10.1	The Proponent shall complete stage 2 archaeological assessment studies for the project, as necessary. The stage 2 archaeological assessments must be submitted to the Ministry of Tourism, Culture and Sport (MTCS) for review and accepted into MTCS's report register prior to the start of in-ground work.	During 2018, no new areas were identified, within or surrounding the RRM ESA boundary, that require a Stage 1 and 2 archaeological assessment.	February 3, 2015

Condition/ Tracking #	Description	Status 2018	Date Completed
10.2	If during construction any archaeological resources are discovered, all construction activities within 100 metres of the archaeological resources will cease immediately and a licensed archaeologist will be retained to carry out the necessary fieldwork in compliance with Section 48(1) of the Ontario Heritage Act.	There were no findings during the additional archaeological work completed during 2015 (see 10.1). No new archaeological resources were uncovered in 2018.	Ongoing
10.3	Archaeological resources that require removal will be transferred to a public institution selected through consultation with local First Nations and Métis represented by the Métis Nation of Ontario Region 1 Consultation Committee, in consultation with MTCS. An MTCS collection transfer form will be completed by the surrendering licensee and the institution accepting the materials. Collection shall be curated to current standards.	A Stage 4 archaeological Field Study was completed during the spring and into early fall. Cataloguing and analyses of any significant findings is scheduled for completion in 2019. Consultation with local First Nations and Metis Nation of Ontario Region 1 will occur once the final report has been prepared and filed with the MTCS.	Ongoing
11.1	Prior to the construction of the proposed demolition landfill (or any other landfill) within the Site's property boundary, the Proponent shall obtain any necessary Environmental Assessment Act approvals and Environmental Protection Act approvals. In addition, prior to construction of the proposed demolition landfill (or any other landfill), the Proponent shall provide appropriate financial assurance to the Ministry's satisfaction, unless by then the appropriate cost has already been accounted for and provided to the MNDM as part of Closure Plan requirements under the Mining Act	There is no landfill within the boundary of the RRM.	Ongoing
12.1	As a minimum, the Proponent shall meet all requirements and commitments related to mine water discharges to the Pinewood River as agreed to by the Ministry during the EA process, or as revised through approvals by the Ministry. These requirements and commitments are found throughout the EA and include, but are not limited to, those set out in the July 17, 2014 memo by the Ministry's surface water specialist regarding	New Gold RRM has implemented a water sampling programs that meets the requirements of the MECP Environmental Compliance Approvals and the Federal Metal and Diamond Mining Effluent Regulation. During 2018, effluent was discharged indirectly to the Pinewood River from temporary sediment ponds constructed in the periphery of the open pit and overburden stockpile collection sumps. Water in these systems was treated for ammonia and suspended solids. Heavy metal concentrations have not been a concern at	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	the "Rainy River Gold Project: Effluent Criteria Discussion and Water Taking Thresholds" which appears in Section 4 of the Ministry Review of the EA. Further, as part of its application for the Environmental Compliance Approval(s) (ECA) required for the Undertaking, the proponent shall identify, through memo or other means acceptable to the ECA Director, how the proponent's proposed water management process will satisfy the technical requirements and other surface water quality commitments stated in the EA.	this time. During the Environmental Compliance Approval(s) application process (2015) a Water Management Plan was submitted to MECP, and an updated Water Management Plan draft was submitted to the MECP in March 2018.	
12.2	The Proponent shall meet all requirements and commitments related to the establishment of a minimum water taking threshold from the Pinewood River as agreed to by the Ministry during the EA process, or as revised through approvals by the Ministry. These requirements and commitments are found throughout the EA and include, but are not limited to, those set out in the July 17, 2014 memo by the Ministry's surface water specialist regarding the "Rainy River Gold Project: Effluent Criteria Discussion and Water Taking Thresholds" which appears in Section 4 of the Ministry Review of the EA. Further, as part of its application for the Permit(s) to Take Water (PTTW) required for the Undertaking, the proponent shall identify, through memo or other means acceptable to the PTTW Director, how the proponent's proposed water management process will satisfy the water taking commitments stated in the EA.	New Gold is committed to meeting all requirements and commitments related to the establishment of a minimum water taking threshold from the Pinewood River. Condition 3.3, sub-sections A and B, of the six (6) Permits to Take Water (PTTW) issued to New Gold restricts the total site water taking to a percentage of the Pinewood River daily flow rate. The total site water taking is restricted to not more than 20% of the daily flow rate in the Pinewood River during the period of March 1 to July 31, and to an amount of not more than 15% during the period of August 1 to November 30. Condition 3.3 sub-sections C and D of PTTW 8776-9W2QN3 for taking of water from the Pinewood River further restricts the direct taking of water from the Pinewood with a minimum water taking threshold. During the period of March 1 to July 31, the calculated flow of the Pinewood River must remain above 10,000m³ after pumping, and above 5,000m³ during the period of August 1 to November 30. No direct water taking from the Pinewood River is permitted under Condition 3.3 subsection E of PTTW 8776-9W2QN3. There were no exceedances of the minimum direct water taking threshold, or maximum water taking limits by source for any of the six PTTWs for 2018. PTTW 8776-9W2QN3 expired on November 30, 2018.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
13.1	The Proponent shall fulfill all requirements and commitments related to tailings management, including maintaining a sufficient water cover over deposited tailings and fulfilling monitoring requirements detailed in provincial regulatory documents, including the Closure Plan and any other permits and approvals associated with the Undertaking. In addition, the Proponent shall consider deterrent systems to ward off bird and animal life from accessing the TMA.	The draft closure plan amendment submitted to the Ministry of Northern Development and Mines (October 2017) outlines commitments related to tailings management during operations and mine closure and reclamation. These commitments include maintaining a sufficient water cover. In Q4 of 2017 the plant began pumping tailings into Cell 1 (Starter Cell) of the Tailings Management Area (TMA). The water from the tailings are sampled routinely. In the fall of 2017 Cell 1 was monitored for bird activity. New Gold has onsite deterrents for birds in the form of bangers and hand-held noise making devices. The Environmental Department is currently reviewing larger, self-sufficient deterrent systems to ward off birds and animals. Permanent fencing was installed in 2018 with completion of the reptile barrier planned for spring 2019 once the frost is out.	Ongoing
13.2	The Proponent shall assess and utilize provincial, national and international industry best practices for tailings management and water management containment facilities as they relate to climate change and the increasing frequency of severe weather abnormalities. The management of tailings, based on this assessment, shall be done in a manner adequate to ensure the appropriate management of any contaminants that may be present during and beyond the operating life of the Undertaking. The Proponent shall, as part of the Compliance Reports required under Condition 6, or otherwise specified in writing by the Director, provide details to the Ministry on how actions required by this condition have been considered in the project design, operations and the Closure Plan.	Section 5.6.1 of the RRM Comprehensive Closure Plan Amendment (October 2017) outlines the Geotechnical Design Criteria for the TMA dams. It indicates that; - the dams have been designed to meet the most severe flood and earthquake criteria, being the probable maximum flood and maximum credible earthquake in accordance with the Ontario Lakes and Rivers Improvement Act requirements. - The designs are supported by geotechnical investigations of sub surface conditions conducted in 2010 by Klohn Crippen Berger and in 2011 and 2014 by AMEC. - Emergency spillways will be provided for each state of the TMA dam construction and Water Management Pond (WMP) to safely pass the probably maximum flood. Adequate freeboard will be maintained in the TMA and WMP to contain the environmental design flood corresponding to a 100-year 24-hour storm event. All spillways will be rock armored to withstand erosion impacts from these flow rates.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
14.1	The Proponent shall assess and utilize best practices to protect the biodiversity of existing species within the area of the Undertaking. Building on the baseline studies completed during the Environmental Assessment process, including aquatic resources, terrestrial and species at risk baselines, and further studies as deemed necessary, the Proponent shall establish a pre-construction biodiversity baseline and report on biodiversity levels within the area of the Undertaking. The Proponent shall as part of the Compliance Reports required under Condition 6, or otherwise specified in writing by the Director, provide details to the Ministry on how the requirements set out in this condition are being met.	Version 5 of the Terrestrial Systems Monitoring Plan was submitted to the MNRF on February 3, 2016 and accepted by the MNRF in May 2016. New Gold is continually monitoring as part of the Terrestrial Systems and Habitat Monitoring Plan. During 2017 the following monitoring programs were implemented; Species at Risk monitoring for Bobolink and Eastern Whip-poor-will, wildlife observation monitoring, bat monitoring, deer and fish tissue sampling to assess metal accumulation in organ and muscle tissue and barn swallow monitoring. The Biodiversity Monitoring Plan for the Pinewood River was implemented as per ECA No. 5781-9VJQ2J Condition 10(5) and ECA No. 5178-9TUPD9 Condition 8(7). These annual monitoring programs are built off of baseline data collected during the EA process.	February 3, 2016
14.2	In addition to fulfilling all commitments with regard to rehabilitating wildlife habitat and terrestrial systems, the Proponent shall consult with MNRF on the development of a monitoring plan for terrestrial systems and habitat. The Proponent shall prepare the monitoring plan before the start of construction and shall provide a draft plan to MNRF for review before the plan is finalized. The Proponent shall carry out the plan during construction, operation and closure of the Undertaking. The purpose of the monitoring plan is to verify the accuracy of the predictions the Proponent made during the EA about the Undertaking's impacts on wildlife and habitat and to monitor the effectiveness of rehabilitation efforts for wildlife habitat and terrestrial environments. The Proponent shall report on biodiversity baseline and results required in Condition 14.1 through the Terrestrial Systems and Habitat Monitoring Plan.	Version 5 of the Terrestrial Systems Monitoring Plan was accepted by the MNRF in May of 2016.	May 6, 2016

Condition/ Tracking #	Description	Status 2018	Date Completed
15.1 A	Conditions Specific to Vegetation Clearing Activities Occurring Before May 1, 2015: a) The Proponent shall prepare and implement a Vegetation Clearing Plan that sets forth how the Proponent will conduct vegetation clearing activities that are intended to occur on the Site before May 1, 2015 ("Vegetation Clearing Activities"). As itemized below, this Vegetation Clearing Plan shall address issues related to those Vegetation Clearing Activities, including: compliance monitoring; compliance reporting; a complaint protocol; a community communication plan; consultation with Aboriginal communities; and terrestrial systems and habitat monitoring plans.	A vegetation clearing plan was prepared and implemented prior to the commencement of construction. The plan consists of clearing areas that coincide with the progression of construction and approvals from the Ministry of Natural Resources and Forestry.	February 21, 2015
15.1 B	Conditions Specific to Vegetation Clearing Activities Occurring Before May 1, 2015: b) Unless otherwise stated in Condition 15 or stipulated per another timeline as may be identified in writing by the Director, the Proponent shall submit all elements of the Vegetation Clearing Plan to the Director, for the public record, 15 days before the Proponent's intended start of Vegetation Clearing Activities.	Prior to the start of construction a Vegetation Clearing Plan was provide to appropriate government agencies, and clearing permits were obtained from the MNRF. Consultation on the Vegetation Clearing Plan commenced in late 2014 and early 2015.	February 21, 2015
15.1 C	Conditions Specific to Vegetation Clearing Activities Occurring Before May 1, 2015: c) The Proponent shall post the Vegetation Clearing Plan on its project website by no later than 15 days prior to the intended start of Vegetation Clearing Activities.	The Vegetation Clearing Plan was originally posted on the New Gold Rainy River Project website on February 21, 2015. In the fall of 2017 the company website underwent some layout changes when the project transitioned to a mine. At that time the Clearing Plan was unintentionally removed from the website. The plan was reposted on March 23, 2018.	March 23, 2018

Condition/ Tracking #	Description	Status 2018	Date Completed
15.2 A	Compliance Monitoring for Vegetation Clearing Activities: In relation to any vegetation clearing that occurs on the site before May 1, 2015, the Proponent shall monitor its fulfilment of: 1) the provisions of the Environmental Assessment pertaining to mitigation measures and public consultation regarding such Vegetation Clearing Activities; 2) all other commitments made by the Proponent during the Environmental Assessment process including the Commitments Registry as contained in the Errata dated December 15, 2014, in relation to such Vegetation Clearing Activities; and 3) the conditions included in section 15 of this Notice of Approval.	All clearing that has occurred on site has been completed in accordance with licenses obtained from the MNRF (when applicable). Clearing was ongoing during 2018 excluding the period of the breeding bird window.	Ongoing
15.2 B	The Proponent shall prepare an implementation schedule for all the vegetation clearing activities that are intended to occur on the Site before May 1, 2015.	Completed	February 21, 2015
15.3 A	Compliance Reporting for Vegetation Clearing Activities: In relation to vegetation clearing activities that occur on the Site before May 1, 2015, the Proponent shall prepare a Vegetation Clearing Compliance Report which describes and provides evidence of the Proponent's compliance with Condition 15 of this Notice of Approval.	Completed New Gold RRM submitted the updated RRM Vegetation Clearing Plan for Initial Clearing Prior to May 1, 2015, as required by the conditions of the Provincial EA Approval Notice.	February 9, 2015
15.3 B	Compliance Reporting for Vegetation Clearing Activities: The Proponent shall submit the Vegetation Clearing Compliance report to the Director within 30 days of completing the Vegetation Clearing Activities	Completed	May 31, 2015
15.4 A	Complaint Protocol for Vegetation Clearing Activities: The Proponent shall prepare and implement a Vegetation Clearing Complaint Protocol that sets out how the Proponent will address inquiries and complaints received during any Vegetation Clearing Activities.	An External Feedback Protocol was completed February 2, 2015. In addition, New Gold implemented a complaints protocol in February 2015 for any site activity or concern. No complaints were received related to Vegetation Clearing Activities in 2018.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
15.5 A	By no later than 15 days prior to the start of Vegetation Clearing Activities, the Proponent shall provide notification to those interested persons to whom Condition 8 of this Notice of Approval applies. The notification shall include a link to the location where copies of the Vegetation Clearing Plan can be seen by members of the public, as required by Condition 15.1 (c).	Completed. The Vegetation Plan was posted to the New Gold website (accessible to the public) on February 12, 2015. Revision 2 was posted on February 24, 2015. Aboriginal communities were notified on January 19, 2015.	February 12, 2015 (V2); February 24, 2015 (V3)
15.6 A	Consultation with Aboriginal Communities for Vegetation Clearing Activities: By no later than 15 days prior to the intended start of Vegetation Clearing Activities, the Proponent shall notify and then follow up with the Aboriginal communities identified in Condition 9.1 of this Notice of Approval. This notification shall append the implementation schedule required under Condition 15.2(b), above. The notification shall also include a link to the location where copies of the Vegetation Clearing Plan can be seen by members of the public, as required by Condition 15.1 (c).	Completed An additional notification was provided on March 20, 2015 for new areas not included in the initial notification.	February 13th 2015
15.6 B	Consultation with Aboriginal Communities for Vegetation Clearing Activities: By no later than 15 days prior to the intended start of Vegetation Clearing Activities, the Proponent shall consult the Aboriginal communities identified in condition 9.4 of this Notice of Approval, to ascertain whether they wish to carry out specific cultural practices prior to Vegetation Clearing Activities occurring. The Proponent shall provide reasonable time for interested Aboriginal communities to carry out such cultural practices prior to the start of Vegetation Clearing Activities, in coordination with the interested communities.	An Aboriginal Blessing Ceremony was carried out on February 6, 2015 attended by several of the 16 Aboriginal communities. The event was a follow-up to the RRM updated vegetation clearing schedule sent to Aboriginal communities in January 2015.	January 2015 & February 6, 2015

Condition/ Tracking #	Description	Status 2018	Date Completed
15.6 C	Consultation with Aboriginal Communities for Vegetation Clearing Activities: By no later than 7 days prior to the intended start of Vegetation Clearing Activities, the Proponent shall submit to the Director copies of: the notification letters that it sent in fulfilment of conditions 15.6 (a) and (b); any records confirming the Aboriginal communities' receipt of those notification letters; records of any concerns heard from the Aboriginal communities in response to those letters; and records of efforts the Proponent has made, or has committed to make, to address those concerns.	Completed.	February 16, 2015
15.7 A	Terrestrial Systems and Habitat Monitoring for Vegetation Clearing Activities: The Proponent shall fulfill all its EA commitments with regard to land clearing and to rehabilitating wildlife habitat and terrestrial systems, in relation to any associated impacts from Vegetation Clearing Activities.	Land clearing is contained within the footprint of the project only in areas where development is required. When licenses are required, they are obtained from MNRF. Grubbing is not conducted unless necessary and buffers are implemented around sensitive areas. Reclamation earthworks of the former Tait Quarry commenced in 2017 with seeding and planting occurring in 2018. The quarry which operated from 2015 to 2017 to supply material for the Highway 600 realignment underwent extensive tree clearing, blasting and rock extraction. Based on decisions made with MNRF during the Environmental Assessment process, the quarry will be reclaimed to suitable whip-poor-will habitat. A memorandum outlining the reclamation strategy can be found in Appendix D 2018 SAR Report. Work will commence in 2019 on setting up vegetation plots to mimic stockpile closure on a small scale. This will include multiple tree and shrub species planted with assorted grasses and fertilizers. As the mine advances into operations, the opportunity to reclaim more land will be possible.	Ongoing
15.8	When the Proponent submits its Vegetation Clearing Plan materials to the Director, the Proponent shall append a statement indicating that its submission is intended to fulfill Condition 15 of this Notice of Approval.	Completed	February 21, 2015

Condition/ Tracking #	Description	Status 2018	Date Completed
15.9	The Director may require the Proponent to amend aspects of the Vegetation Clearing Plan at any time. Should an amendment be required, the Director will notify the Proponent, in writing, of the required amendment and of the date by which the Proponent must complete the amendment and submit it to the Director.	Not requested in 2018.	Ongoing
15.10	The Proponent shall carry out the Vegetation Clearing Plan, as it may be amended by the Director.	Implemented in 2018	Ongoing
15.11	The Proponent shall make documentation pertaining to the Vegetation Clearing Plan available to the Ministry or designate upon request, in a timely manner, when so requested by the Ministry.	No requests were made during 2018.	Ongoing
15.12	In addition to fulfilling the Vegetation Clearing Plan conditions above, the Proponent shall also mention its Vegetation Clearing Activities, as relevant, in other materials it produces to fulfill the other conditions required by this Notice of Approval.	Complete. The Vegetation Clearing Plan was posted on New Gold's website February 12, 2015 and with a subsequent revision (Revision 3) posted on February 24, 2015. The clearing plan was unintentionally removed from the company website during maintenance that was conducted in the winter of 2017. The plan was uploaded back to the New Gold RRM page on March 25, 2018.	February 12, 2015 and February 24, 2015.
16.1 A	The Proponent shall ensure that the need for the Undertaking is capable of adapting to climate change during the construction, operation and closure phases of the Undertaking, and to that end the Proponent shall: a) Plan its construction practices, operational procedures and the design of the Undertaking to respond to storms, flooding, (including the consideration of the 500-year flood level), drought or other severe weather events resulting from climate change.	In 2018 Sediment Ponds 1 and 2 were completed. Perimeter ditches on both waste dumps were completed. In addition, a contingency water management plan was developed to address spring freshet.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
16.1 B	The Proponent shall ensure that the need for the Undertaking is capable of adapting to climate change during the construction, operation and closure phases of the Undertaking, and to that end the Proponent shall: b) Design the post-closure aspects of the site to ensure resilience to climate change impacts, such as maintaining an appropriate site water balance and sufficient water cover over the TMA. The Proponent shall also undertake an updated review of climate change scenarios at a point approximately two years prior to implementing final closure of the TMA to confirm, or modify, anticipated future hydrological conditions related to climate change scenarios.	The filed Closure Plan (2015) and draft Closure Plan Amendment (October 2017) outline the post-closure strategy of the TMA which includes a 2m water cover over the tailings. As the project advances through the operations further amendments to the closure plan will be necessary and will allow for opportunities to review climate change scenarios at closure.	Ongoing
16.1 C	The Proponent shall ensure that the need for the Undertaking is capable of adapting to climate change during the construction, operation and closure phases of the Undertaking, and to that end the Proponent shall: c) The Proponent shall, as part of the Compliance Reports required under condition 6, or otherwise specified in writing by the Director, provide details to the Ministry on how climate change has been incorporated into the project design.	New Gold has submitted an ECA amendment on April 30, 2018, which includes a review on climate change and the site water balance.	Ongoing
16.1 D	The Proponent shall ensure that the need for the Undertaking is capable of adapting to climate change during the construction, operation and closure phases of the Undertaking, and to that end the Proponent shall: d) The Proponent shall also include these considerations, as appropriate, in the Closure Plan or future Closure Plan amendments submitted to MNDM.	The Closure Plan for the RRM discusses operational flexibility in regard to water demands. The design, the project water diversion structures and ditching around the East Mine Rock Stockpile were designed to handle extreme flooding events (1 in 100 year event). The TMA dams have been designed to meet the most severe flood and earthquake criteria, being the probable maximum flood and maximum credible earthquake in accordance with the Ontario Lakes and Rivers Improvement Act requirements.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
17.1	The Proponent shall obtain other necessary permits and approvals including, but not limited to, those that are committed to in the Environmental Assessment.	To date New Gold has met the requirements of this condition. A copy of the Environmental Permits and Approvals obtained to date and specifically in 2018 by New Gold have been included in the Annual Compliance Report in Table 2 Section 2 Regulatory Update.	Ongoing
18.1 A	In carrying out the Undertaking, the Proponent shall require that its contractors, subcontractors and employees: a) Fulfil the commitments made by the Proponent in the Environmental Assessment process, including those made in the Environmental Assessment and in the Proponent's responses to comments received during the formal Environmental Assessment comment periods.	All employees and contractors go through a standard site orientation, which includes Environmental, community, health and safety and other pertinent site aspects. • Contractors are required to attend an environmental kick off meeting prior to start of work. Purpose of the meeting is to review commitments and permit requirements applicable to the Scope of Work. There are also statements in contracts that require the contractor to adhere to all applicable permits and site environmental procedures. • Financial / other materials may include specific clauses with contracts on standards, requirements etc., depending on the nature of the contract. • Environmental Conditions set out in Permits also include reference to specific contract drawings that are to be adhered to by the construction contractors • NG RRM Environmental Department monitors Contractors to ensure construction works and mining operations are carried out in accordance with Environmental Commitments • Site wide bulletins are issued via email, radio communication and posting in work places. When required the bulletins discuss environmental commitments and approvals.	Ongoing
18.1 B	In carrying out the Undertaking, the Proponent shall require that its contractors, subcontractors and employees: b) Meet applicable regulatory standards regarding the construction, operation and maintenance of the Undertaking, including these conditions of approval.	As outlined in the response to condition 18.1(a) New Gold has taken several steps to ensure that all onsite personnel are familiar with the Environmental Conditions and Approvals for the project. To ensure that these conditions are implemented and met as well as other permit approvals New Gold Environmental Department has implemented a number of strategies including; Site Inspections and Audits or work tasks; incorporating regulatory requirements in contract tenders, orientation training, operating procedures, site wide communication bulletins; installing signage around the mine site; participating in meetings amongst different departments and contractors to communicate environmental requirements; include environmental	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
		conditions and approvals in construction execution plans.	
18.1 C	In carrying out the Undertaking, the Proponent shall require that its contractors, subcontractors and employees: c) Obtain any necessary approvals, permits or licenses	New Gold Environmental Department is responsible for obtaining all environmental related permits, approvals and licenses for the project. In order to ensure that permits are obtained for all work fronts, the department reviews contract scopes of work and participates in meetings held with mine staff and contractors. During 2018 New Gold also retained environmental consulting expertise in areas related to fisheries, wildlife and species at risk, air quality monitoring, mine reclamation and water quality who assist in ensuring appropriate approvals are obtained. Since the start of construction in 2015, it is site practice that all new construction and operation activities or deviations from original designs are communicated to the Environmental Department who screen for required permits or amendments to existing permits.	Ongoing
19.1	Prior to implementing any proposed changes to the Undertaking, the Proponent shall determine what Environmental Assessment Act requirements are applicable to the proposed changes and shall fulfill those Environmental Assessment Act requirements.	The RRM believes that during 2018, design modifications and changes to support the project were communicated effectively with MECP to obtain input and ensure work was being conducted in accordance with current permits and approvals. In 2018, the following amendments, applications and memos were submitted to MECP; Permit to take Water 0040-9VUL6B for Construction of Tailings Management Area Renewal (January 2018), Permit to take Water 2133-9VUPVZ for Construction Minor Takings Renewal (January 2018), ESDM Report Executive Summary (January 2018), Acoustic Summary Report for Early Operations (January 2018), Permit to take Water #7631-9VULMS for Pit Dewatering Condition Removal Request (February 2018), Permit to take Water 7631-9VULMS for Pit Dewatering Amendment (February 2018), Tailings Pipeline Corridor As-Built Drawings (February 2018), 2017 Annual Compliance Report (February 2018), Comprehensive Site Water Balance Interim Update (March 2018), Update of Groundwater Model (March 2018), Water Management Plan Draft (March 2018), Potential Effects of Effluent Discharge to Pinewood (March 2018), Request for Permit Update (April 2018), Feasibility and Design Reports for a Flume and Divider Dyke (April 2018), Permit to take Water 1386-9VTP2H for Dewatering of Aggregate Operations Amendment (May 2018), Cell 2 Freshwater	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
		Abatement Plan Supplemental (May 2018), Clarifications and Responses to ECA Amendment Application (July 2018), Rationale for Proposed Revisions to ECA Effluent Limits (July 2018), Notice of Modification - Mine Rock Pond (July 2018), Phased Implementation of Water Treatment Train (July 2019), Notification of Commencement of Work - Water Discharge Pond (August 2018) Permit to take Water 8776-9W2QN3 for Industrial Water Supply Renewal Application (August 2018), 2017 Annual Compliance Report Revision (August 2018), 2017 Annual Compliance Report - Revised (September 2018), Onsite Sewage Holding Tanks (September 2018), Sewage Holding Tank Request (October 2018), Sewage Holding Tanks Request - Underground Operations (December 2018). See Appendix E for RRP Early Operations Acoustic Assessment Report.	
20.1	30 days prior to construction, or as per another timeline as may be identified in writing by the Director, the Proponent shall provide notification of the Proponent's intention to proceed with construction. If significant changes to the existing environment or regulatory changes have occurred that could affect the implementation of the Undertaking or result in any new potential adverse environmental effects from the undertaking, the Proponent shall include a description of those changes in its notice. The Proponent shall provide the notice to the Director and Regional Director of the Ministry, the MNRF, the MNDM, and any other relevant agencies that the Proponent or the Director determine may have an interest in any changes provided in the notice.	Completed Notification was submitted on January 29, 2015. During the fall of 2017 the mine entered its operations phase.	January 29, 2015.

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SECTION 5
NEW GOLD RAINY RIVER MINE COMMITMENT REGISTRY

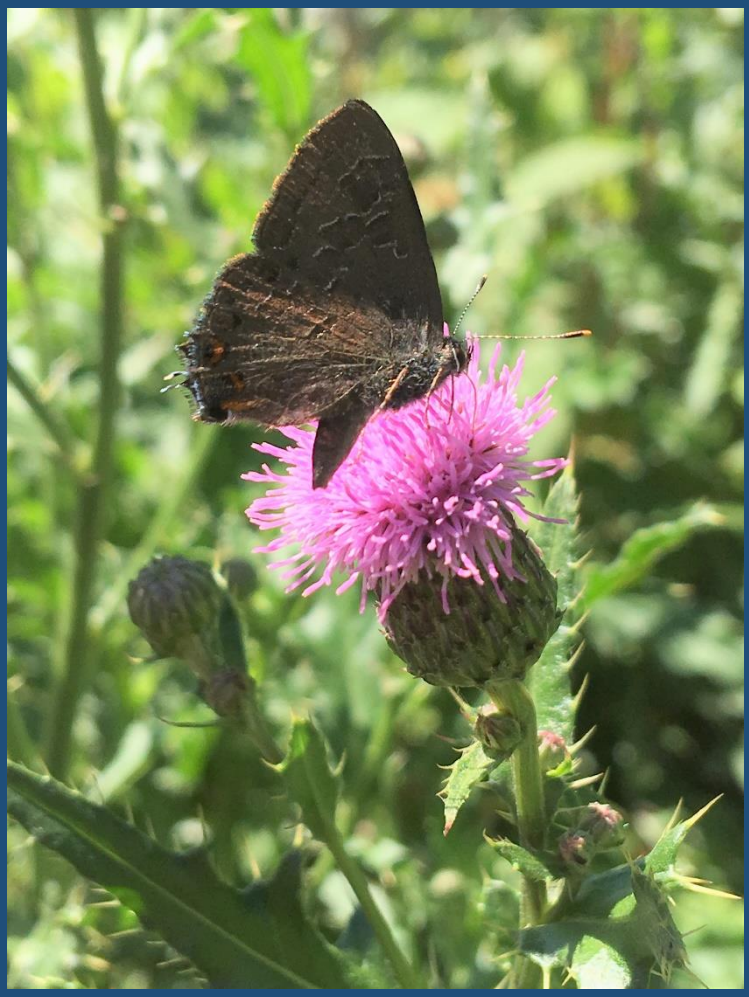

Figure 20 Striped hairstreak on thistle at Pinewood

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Condition/ Tracking #	Description	Status 2018	Date Completed
1	The RRM will monitor and mitigate air emissions, particularly dust, through implementation of current industry best management practices.	Air quality monitoring program continued with monitoring of relevant air emissions parameters dictated in Rainy River Project Ambient Air Quality Monitoring Plan per ECA 04172-A2LR4V condition 10.1 (a) Ambient Air Quality Monitoring Plan. Data was collected at the two air quality monitoring stations located east and south-east of the project site by New Gold Environment staff. Data analysis, interpretation and quarterly reporting was performed by external laboratories and consultants. During 2018, there were two exceedances of total suspended particulates (TSP) and metallic iron concentrations measured in March and May at the Gallinger Road station. (See Appendix I for 2018 Exceedance Table.) Gallinger Road passes by the air quality station. Wind direction and road dust from light vehicle were defined as the probable causes of both exceedances. Mitigation measures included restricting road access for light vehicles, watering and application of Calcium Chloride on road surface. Fugitive Dust Best Management Practices Plan (BMP) for operations was updated and submitted to MECP for review in February and June of 2018. Best management practices include the use of water as dust suppressant on major haul roads and application of calcium chloride on major light vehicle routes during non-freezing conditions. In addition, speed limits on and around site were controlled. Baghouses and other dust suppression equipment were used at the processing plant and crusher. Drills used in the open pit were equipped with dust curtains and water dispersion during operations. Primary and auxiliary aggregate crushers used chemical and water dispersed by spray bars during non-freezing conditions. Commercial traffic was limited to site access along the east access or Teeple Road.	Air Quality Stations installed May 2015 Monitoring is ongoing for life of mine.

Condition/ Tracking #	Description	Status 2018	Date Completed
2	Dust Management Plan 2. A fugitive dust best management practices plan will be prepared to identify all potential sources of fugitive dusts, outline mitigative measures that will be employed to control dust generation, and detail the inspection and recordkeeping required to demonstrate that fugitive dusts are being effectively managed.	An updated Fugitive dust best management practices plan for RRM operations phase was prepared as per ECA #0412-A2LR4V in February 2018. The updated plan identifies fugitive emission sources, composition and characterization of particulate emissions, fugitive dust control for each source, implementation and operation plus inspection and maintenance procedures. The updated plan was submitted on February 26, 2018 to MECP for review and approval. RRM construction activities also adopted the updated version of the plan. Both paper and electronic records were maintained during the 6 months of 2018. See appendix J for Dust Management Results. The Fugitive Dust Control Plan will be reviewed and updated in 2019 to better reflect current conditions.	ECA Application Submission – November 14, 2014; Fugitive Dust Best Management Plants submitted to MOECC February 4, 2016; Updated Water Use Plan for dust submitted to MOEC December 14, 2016.
3	Sound will be monitored during construction, operations and active closure phases consistent with Ministry of the Environment (MOE) requirements	During the first week of May and June of 2018, noise monitoring was conducted at two different Species at Risk habitat areas, located due north and south of the RRM open pit and TMA area. Monitoring determined if the sound levels from the RRM operations activities exceeded the sound level threshold of 50 dBA. This means 50 decibell A-Weighted sound level averaged over one hour (50 dBALeq determined through standard MECP NPC 103 monitoring procedures.) Three sound level exceedances were documented. All were attributed to natural occurrences such as bird/insect noise and thunderstorm activity. Additional sound monitoring was not conducted during 2018. An audit is planned for 2019. See Appendix I for 2018 Exceedance Table	Ongoing
4	NG (NG; previously Rainy River Resources) expect that the monitoring required will include: total suspended particulate (TSP) and metals on the TSP size fraction, PM10, dustfall and passive monitoring for NO2 and	Ambient air quality monitoring occurs at two air quality stations located along the eastern and southern boundaries of the mine site. The ambient air quality monitoring program strictly follows the Ambient Air Monitoring Program Plan that was reviewed and approved by MECP in 2016. Since the installation of the	Ambient Air Quality Plan submitted February 2016 and approved by MOECC in

Condition/ Tracking #	Description	Status 2018	Date Completed
	SO2. NG commits to conducting this monitoring which is also expected to be an approval requirement.	stations, MECP inspections occurred in 2015 and 2016. These inspections revealed no significant deficiencies. During 2018 the MECP did not conduct inspections of either ambient air quality monitoring station.	November 2016.
5	The best management plan related to fugitive dust management, source control and operational constraints required by the Provincial Environmental Compliance Approval will be provided to Environment Canada (EC) for review and will be fully implemented prior to the construction phase.	During 2018 the Fugitive Dust Best Management Practices Plan (FDBMPP) for operations was updated and submitted to the MECP for review in February of 2018. At the request of the MECP, the plan was resubmitted for review in June of 2018. An Air Inspection conducted by the MECP during November and December of 2018 stated that more effort to mitigate fugitive dust was required and asked for an updated FDBMPP in April of 2019.	ECA Application Submission – November 14, 2014; Fugitive Dust Best Management Plants submitted to MOECC February 4, 2016; Updated Water Use Plan for dust submitted to MOEC Dec 14, 2016.
6	A transboundary notification under the Canada - U.S. Air Quality Agreement will be filed prior to operation.	This notification was filed on September 17, 2014.	Completed September 17, 2014
7	Planning measures aimed at reducing fuel and power consumption for the RRM site include the following: • Using larger, more fuel efficient trucks for material transport; • Using optimum insulation in buildings to reduce heat loss and heat recovery from equipment where practical • Maintaining site equipment and vehicles in good working order	Implemented in 2018	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	through regular preventative maintenance.		
8	Monitoring of air quality will occur during construction, operations and active closure phases per Section 13.1.1 of the Final EA Report.	Monitoring of air quality at the RRM site continued during 2018. New Gold Environmental staff collected raw data from the two air quality sampling stations as per the Ambient Air Quality Monitoring Plan. Stations are located to the south of the Site near the beginning of the Highway 600, and one to the east of the site along Gallinger Road. During 2018, there were two exceedances of total suspended particulates (TSP) and metallic iron concentrations measured in March and May at the Gallinger Road station. (See Appendix I for 2018 Exceedance Table) Gallinger Road passes by the air quality station. Wind direction and road dust from light vehicle were defined as the probable causes of both exceedances. Mitigation measures included restricting road access for light vehicles, watering and application of Calcium Chloride on road surface. Air Quality Monitoring Reports for each quarter of 2018 can be found in Appendix F.	Ongoing
9	Sound mitigation measures will be used, such as selection of quieter equipment. Implementation of sound abatement strategies to dampen sound infiltrating habitats and migratory bird nesting areas surrounding high traffic areas of the mine.	Measures that were implemented during 2015 and continued into 2018 to reduce sound included; - Specific trucks that allow exhaust to pass through the truck box rather than directly through the exhaust pipe (muffles sound); - Reducing size of blasts where appropriate and scheduling those blast only at 1100 and 1500; - Tree buffers maintained where practical;	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
10	Should the final equipment selections determine through detailed engineering and sound level assumptions vary materially from those presented in the Environmental Assessment (EA), an updated assessment with the new information will be prepared as part of the detailed design and approvals application(s) for the RRM.	During the fall of 2018 the MECP conducted a review of the updated Acoustic Assessment Report (AAR) for early operations (January 2018). Inspection notes discussed that the site is operating at or near the noise limits set out in Ministry Publication NPC-300. To assess compliance with the report RRM has agreed to conduct an acoustic audit in Q2 of 2019 to verify the results of the updated AAR. See Appendix E for the RRP Early Operation Acoustic Assessment Report.	Ongoing
11	The maximum charge size per delay for blasting is limited to 1,000 kg as the vibration and overpressure mitigation option. If the charge size is larger than 1,000 kg per delay, the vibration and overpressure levels emanating from RRM blasting operations will be reassessed in a detailed study to confirm that the predicted levels are within guideline limits.	There are three holes (199kg each) planned for the 5.5 to 6 ¾ inch drill pattern that will detonate in close proximity(8m) of each other. For the 9 inch, the design is to have 2 holes on average detonating (330kg each) in close proximity. Therefore, our average MIC can be estimated at 597-660kg per shot.	Ongoing
12	NG will continue to work actively with local residents throughout the period of mine construction, operation and active closure to further manage and reduce any disturbances due to air and sound emissions to the extent possible, as well as for other effects.	Through regular communication, New Gold has established positive relationships with neighbour who are closest to the project mine site. When neighbour have any concerns or comments, they contact the Community Coordinator or Community Supervisor directly, who then ensure follow-up and closeout. In 2018, neighbour joined the New Gold team for a site visit and lunch at the accommodation facility. New Gold continues to communicate with Emcon and the Township of Chapple regarding dust management issues when advised by local neighbour of dust concerns. In September, one neighbor commented on noise and vibration from one blast. No exceedances were recorded, which was communicated back to the neighbor.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
13	Collectively and individually, the processes and water management strategies proposed for the RRM are Best Management Practices and/or Best Available Technology Economically Achievable (BATEA), and NG has committed to the use of such processes and water management strategies in the Final EA Report. Examples of such BATEA committed to by NG: • Use of the in-plant SO2/Air process for cyanide destruction and metal precipitation, as well as to extended post SO2/Air treatment effluent aging in the TMA (TMA) and water management ponds, followed by constructed wetland treatment; • Detailed plans and designs to manage potentially acid generating rock (PAG) on site, including ongoing progressive reclamation at the stockpile to limit acid generation, with drainage from this stockpile reporting to the mine rock pond, for re-use as part of the mill process water supply thereby reducing fresh water requirements. Dissolved metals associated with east mine rock stockpile drainage would ultimately report to the process plant SO2/Air and hydroxide precipitation circuit, and then to tailings; • Use of emulsion and/or emulsion blend explosives as a means of limiting ammonia residuals from the use of blasting agents at source; and • Collection of site runoff and seepage as per MDMER (MDMER), and to maximize the use of near 100% contact water	During 2018 the mill continued in plant treatment of tailings using SO2/air in the cyanide destruction tank, where cyanide and metallocyanide complexes are oxidized to cyanate ion. The cyanate ion reacted with water to form ammonia and carbon dioxide. Free metal ions were precipitated with the addition of lime to form insoluble metalhydroxides and absorbed onto tailings particle solids, settling out of the slurry in the tailing's management area. Excess SO2 was used in the process to ensure complete stoichiometric oxidation of cyanide. In 2018, construction of the Tailings Management Area (TMA) Cells 2 and 3 was completed. Treated tailings are continuously pumped from the mill through the tailings pipeline into TMA. The water discharge pond was also completed during fall of 2018. Construction of the water treatment plant begun in 2018 and is scheduled for completion in 2019. Construction of the wetlands is scheduled for 2019 with completion in 2020. Identification of potentially acid generating rock (PAG) continued to be managed through chemical testing and segregation into ore stockpiles within the low grade and East Mine Rock stockpile areas, as per requirements of the geochemical monitoring plan. Progression reclamation begin with the Tait Quarry area and will continue as discussed in the Rainy River Closure Plan Amendment (January 2019), which is undergoing final review. Drainage from low grade and east mine rock PAG stockpiles reported into the Mine Rock Pond in 2018. Construction of a drainage ditch surrounding the East Mine Rock Stockpile area commenced in the fall of 2018. Ditch construction is scheduled for completion in spring of 2019. The former Clark Creek was filled with nonacid generating rock (NAG) to provide a conduit for water movement from East Mine Rock Stockpile into the Mine Rock Pond. Recycling of water from the Mine Rock	

Condition/ Tracking #	Description	Status 2018	Date Completed
	recycle for the processing plant water supply.	Pond for re-use in the mill process water supply continued during 2018. The current drilling and blasting contractor on site, Dyno Nobel, continued to use a straight emulsion for all blasting in 2018. As per MDMER regulations, collection of site runoff and seepage was directed into the Water Management Pond and other on-site holding ponds. Discharges to the environment from on-site holding ponds was minimized during 2018 due to lack of available water for processing.	
14	Surface water runoff will be diverted from entering the pit or flowing through stockpiles by ditching or other means.	During 2018, surface water was diverted from the stockpiles and the open pit with a combination of permanent and temporary ditching and sumps. With the completion of Temporary Sediment Pond, Sediment Ponds 1 and 2, and Sumps 1A and 1B, West Mine Rock Stockpile has had a portion of permanent ditching completed and temporary ditches rerouted to drain to these structures. East Mine Rock Stockpile has had the southern portion of the permanent ditching completed with temporary internal water management systems sending all water to the Mine Rock Pond. The northern portion of the permanent ditching is scheduled to be completed Q1 2019. The open pit has expanded in the general north direction with a temporary north ditch developed to collect surface water from the West Creek remnant channel. The water is pumped to the Plant Site water management structures and used in ore processing. Temporary sumps are still in use for staging pumps to remove localized surface water runoff within the open pit footprint. This water is pumped to In Pit Sumps 4, 5, and 6. If discharge is planned, water is sampled per ECA and MDMER requirements and treated for suspended solids and ammonia if necessary. If no discharge is planned, these sumps reroute the water to Mine Rock Pond for ore processing.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
15	Open pit dewatering water will be contained and if necessary, treated before it is discharged to the environment.	The open pit has expanded in the general north direction with a temporary north ditch developed to collect surface water from the West Creek remnant channel. The water is pumped to the Plant Site water management structures and used in ore processing. Temporary sumps are still in use inside the open pit for staging pumps to remove localized surface water runoff and groundwater seepage within the open pit footprint. This water is pumped to In Pit Sumps 4, 5, and 6. If discharge is planned, water is sampled per ECA and MDMER requirements and treated for suspended solids and ammonia if necessary. If no discharge is planned, these sumps reroute the water to Mine Rock Pond for ore processing	Ongoing
16	In regards to final reclamation, the open pit will be flooded at closure to create a pit lake either passively through natural groundwater entry and precipitation inputs; or by active enhanced flooding. Discussions will be held with the various government agencies to determine the optimal balance between maintaining Pinewood River flows and filling the open pit on an expedited basis.	In October 2018 a draft closure plan amendment was submitted to the Ministry of Northern Development and Mines for the RRM. The reason for the amendment was to address the transition of the mine from its construction phase to its operational phase. Section 9.3.1 discusses the staged approach to flooding the open pit at closure which is expected to take between 60 to 75 years. Water inputs will include water from the Mine Rock Pond, seeps from beneath the East Mine Rock stockpile and potential water runoff from the TMA dams. Additional inputs will be from natural sources (ie; rain, snow, groundwater).	Ongoing
17	Enhanced pit flooding using the West Creek source is not under consideration by NG and has been clarified in the Draft Closure Plan submitted for review, pending discussions and further direction from various government agencies.	The process for flooding the open pit at mine closure is discussed in commitment number 16. The use of West Creek as a source to provide water for flooding the open pit is not being considered by New Gold.	Ongoing
18	Pit lake water quality will be monitored regularly as part of the post-closure monitoring program.	The mine is currently in an operational phase and ore is being extracted from the open pit. This commitment will be addressed at mine closure.	Ongoing
19	Should it be determined that future treatment is needed for stockpile	Pump back systems have been installed for Sediment pond 1 and 2. Interim ditch collects	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	runoff / seepage and overflow from the pit at closure, passive treatment options would be fully considered during the detailed design stage.	water and a water treatment system is being constructed.	
20	Ditches (and ponds as appropriate), will be established around the stockpiles to collect and manage runoff. Diversions will be sized to convey the environmental design flood. All sedimentation ponds will be designed with a retention period to meet the MDMER discharge requirement for total suspended solids. The design criteria for perimeter ditching in this area (east mine rock stockpile and low grade ore stockpile) has been increased to the 100-year return period condition, as these stockpiles will contain PAG materials.	Permanent ditch design in EMRS has been designed by qualified engineers based on 100 years storm event criteria. It has been constructed up to 2.2km in southern and half of eastern side of EMRS. The construction of the ditch at EMRS will continue into 2019 Q1. Permanent ditch design for WMRS is still being designed by qualified engineers based on a 25 year storm event. It has been budgeted and planned to be constructed in 2019 Q2-Q4.	Ongoing
21	The retention time for sediment ponds 1 and 2 has been increased to 12 days, subject to review and acceptance by the MOECC.	Design of structures in accordance with this commitment was initiated during 2015 or as refined through the Provincial environmental approval process. During 2016, temporary ponds were constructed to capture runoff from small overburden piles which continues to be used in 2017. The construction of the permanent Sediment Ponds 1 and 2 was completed and commissioned in 2018.	Ongoing
22	PAG mine rock (and ore) will be managed, with drainage from the PAG mine rock and ore stockpile reporting to the mine rock pond, for re-use as part of the process plant water supply.	The Mine Rock Pond (MRP) was commissioned in December of 2017 and is being operated as per commitments.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
23	The deepest local till layer resting directly on bedrock contains PAG material and will be visually segregated and treated as PAG material unless otherwise determined and will be stockpiled within the east mine rock stockpile or disposed of in a manner where acid rock drainage (ARD) potentials will be controlled. A detailed mine rock segregation program / management strategy will be developed around the distribution of non-potentially acid generating (NPAG) and PAG materials, and a program of ongoing testing to be carried out during mining operations of the mine rock being removed. NG proposes to utilize visual and geochemical data to identify that portion of the till overlying the bedrock which requires handling as PAG material, based on the characteristics of the clasts (loose stones) contained therein. Segregation is commonly utilized and MEND 5.4.2d (MEND Manual, Volume 4, Prevention and Control) indicates that segregation is applicable where a clean separation can be made and where a disposal location is available for the PAG material - both of which apply to the RRP. This PAG till would be treated as PAG material and would be directed to the east mine rock stockpile for disposal along with PAG mine rock. NG is conducting a detailed sampling and analysis program of the overburden within the pit area. The study will be used to delineate the thickness of till over the bedrock that may contain locally	A Geochemical Monitoring Plan for the Construction and Operation Phases was issued in accordance with MECP ECA 5178-9TUPD9 requirements and has been implemented at the RRM site. Monitoring was ongoing during 2018. Periodic sampling of till is ongoing during open pit stripping of till. Results have been in line with the initial interpretations. Additional testing on 13 samples to better understand the material including ABA, NAG testing with leachate analysis, whole rock analysis, and semi-quantitative XRD is being conducted.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	derived PAG rock materials so that these materials can be segregated during operations and placed into the East Mine Rock stockpile, or otherwise maintained in a saturated condition. Periodic confirmation analysis will be conducted during the (open pit) stripping program to ensure that the initial interpretation of the thickness of till requiring handling as PAG remains accurate. A draft mine rock and overburden management plan was submitted with the Draft Closure Plan that will be finalized and submitted with the Final Closure Plan for filing with the MNDM later in 2014. It will also be provided to EC per their request. The plan will be revised during operations if necessary to ensure it remains current and as part of future Closure Plan amendments.		
24	Geochemistry monitoring: • Runoff and seepage related to tailings and stockpiles will be monitored as per surface and groundwater monitoring; • Blast hole sampling from open pit operations for mine rock segregation will be carried out throughout the open pit operations phase; • Tailings samples will be collected at regular intervals during the mine operations phase; and • Field trials will be carried out during all or a portion of the mine construction and operations phases as required to generate data need to confirm modeling results.	A Geochemical Monitoring Plan for the Construction and Operation Phases was issued in accordance with MOECC ECA 5178-9TUPD9 requirements and has been implemented at the RRM site. Monitoring was ongoing during 2017. A field capping trial was commissioned in 2017.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
25	PAG material would only be used for fill material in areas where it can be maintained in a saturated state to exclude oxygen and inhibit sulphide oxidation. These uses may include underground backfill and construction of the upstream portion of the TMA dams.	All the PAG that has been encountered during 2018 has either been stockpiled in the East Mine Rock Stockpile, used in the pit (for road building and padding in the overburden), stockpiled in the Tailings Management Area or used for upstream dam wall construction.	Ongoing
26	Progressive rehabilitation of mine rock and overburden stockpiles will be undertaken where practical once the maximum height of each stockpile has been reached and/or as each lift is completed.	During 2018, mine rock and overburden piles did not require rehabilitation. Some rehabilitation in the form of shaping and compaction occurred at the topsoil salvage piles in the Water Management Pond area and the Mine Rock Pond area. Moving further into operations, wherever reasonable, areas will continue to be rehabilitated, re-seeded and used for future reclamation. A mine rock cover treatment system was set up and monitored in 2018 with a vegetation cover test plot planned to be set up in 2019.	Ongoing
27	Encapsulation of the east mine rock stockpile under a multi-layered cover is proposed with a long term goal of controlling ARD.	In October 2017 New Gold submitted an amended Mine Closure Plan for the RRM to the Ministry of Northern Development and Mines. The Encapsulation of the East Mine Rock Stockpile under a multi cover is detailed in section 6.2.5. The process is scheduled to begin once the first lift/level of the stockpile is in place. Also in 2017, a muti-cover system test plot was set up on the northeast side of the plant to test the proposed design through multiple years. In 2018, this multi cover system was monitored to ensure complete encapsulation was successful.	Ongoing
28	As part of the geochemical characterization studies for the project, NG committed to an extended monitoring period of kinetic cells to both demonstrate and continue to evaluate the robustness of the geochemical results.	In 2017 Kinetic cell monitoring was ongoing as required to support the geochemical characterization studies. As of December 31, 2017 the following kinetic tests remained active: - 7 laboratory kinetic tests ongoing from previous years - 3 waste rock humidity cells - 2 tailings humidity cells - 2 tailings columns The 17 laboratory tests that were commissioned in 2017 were decommissioned in 2018	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
29	The run-of-mine stockpile is the temporary, working stockpile for the processing plant; the low grade ore stockpile is proposed to be depleted during the latter part of operations. As a contingency only, it is proposed that should an ore stockpile remain at closure, it will be managed similar to PAG in the East Mine Rock Stockpile with a multi-layer cover and seeded. Runoff and seepage will be directed to the open pit as part of the passive water management system.	At closure, should the low grade ore stock remain, section 9.15 of the Rainy River Project Closure Plan (January 2015) stipulates that "it will be considered part of the East Mine Rock Stockpile and reclaimed in the same manner.	Ongoing
30	Site runoff and seepage will be collected, managed and treated per the Provincial and MDMER requirements.	Completed as required during 2018 in accordance with Provincial approvals (including ECA 5871-9VJQ2J and 5178-9TUPD9) and the MDMER. Surface water was monitored on and off site as per the Surface Water monitoring program. In 2018, there were no exceedances based on the Provincial or MDMER requirements.	Ongoing
31	The overall site footprint and watershed capture will be minimized to the extent practical, so as to minimize the quantity of runoff and seepage requiring treatment and management.	This commitment was incorporated into the design of the RRM.	Completed during design
32	West Creek pond and West Creek diversion flows will be measured on a continuous basis using water level transducers, supported by monthly manual measurements during the winter period, when transducer results experience interference caused by ice pressure.	The West Creek Pond and Diversion were completed and commissioned in June 2017. A water level transducer was installed in the West Creek Pond in April 2018. Continuing dry weather conditions through the summer and fall of 2018, and the removal of culverts along the West Creek Diversion prevented the establishment of a hydrometric station. One manual flow measurement was conducted in summer 2018 before the flow reduced to near zero due to dry conditions. A revised flow monitoring plan for the West Creek Diversion was presented in the 2018 update of the Rainy River Hydrometric Monitoring Plan and will be implemented when flows allow.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
33	The West Creek pond will only contain natural, non-contact water. The West Creek diversion channel will be kept separate from the constructed wetland downstream of the TMA, so as not to mix the natural creek water with excess water discharged from the TMA.	In the process of designing a system so non-contact water remains non-contact water from entering TMA and all other areas. Controls will be in place to keep clean water clean. West creek diversion is a large factor in keeping non-contact water away from the site.	Ongoing
34	West Creek Diversion will be positioned far enough from the pit perimeter to ensure integrity and stability and is expected to provide like-for-like fish habitat replacement.	The West Creek Diversion was completed and commissioned during 2017. It was designed and constructed to meet the requirements of this commitment including the implementation of fish habitat features.	Completed 2017
35	The West Creek diversion will be permanent, and there is no further consideration being given to diverting any flows from this creek into the open pit to help accelerate pit flooding at or following closure.	To date the design of the project is consistent with the requirements of this commitment. Please refer to commitment number 16	Ongoing
36	There will be secondary containment in place for tailings and contact water pipelines at the crossing of West Creek.	In 2016 tailings pipelines crossing West Creek to handle the transportation of tailings and water were double lined.	Completed 2016
37	A reliable water source for process plant operations and ancillary uses will be generated by maximizing the rate of water recycled to the process plant. Water demands are expected to be met by capturing and reusing the effluents and contact water within the site footprint.	Majority of water will be taken from the Mine Rock Pond and dewatering of TMA, recycled to the process plant and excess treated through the WTP and stored in the WMP. The Operational Environmental Compliance Approval # 5178 9TUPD9 outlines the water recycled system for the project.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
38	Water will be taken from the Pinewood River for the purpose of developing an initial water inventory, only during the construction phase. NG does not intend to take water directly from the Pinewood River thereafter, except possibly for contingency purposes.	In 2018, water was taken from the Pinewood River to supplement the site water inventory in the Water Management Pond. The water taking commenced on May 8, 2018 and continued through October 30, 2018, dependent on minimum threshold flows in the Pinewood River and other Permit to Take Water conditions. A total of 376,588 m3 was taken from the Pinewood River during 2018 to supplement the site water inventory. As 2018 was a very dry year, it may be necessary to take water from the Pinewood River in the future if the total site water inventory is insufficient for processing ore. The taking of water from the Pinewood River after the initial water inventory volume was met is on a contingency basis.	Ongoing
39	Water recycle will be maximized, using approximately 100% water recycle for the processing plant water supply.	Majority of water will be taken from the Mine Rock Pond and dewatering of TMA, recycled to the process plant and excess treated through the WTP and stored in the WMP. The Operational Environmental Compliance Approval # 5178 9TUPD9 outlines the water recycled system for the project.	Ongoing
40	Local area lakes will not be used for process water supply for the RRM.	The RRM was designed to not require the need for process water supply to be taken from area lakes. This commitment was in compliance during 2018.	Ongoing
41	All process reagents and materials, and wastes, will be handled and stored responsibly, according to supplier and safety guidance, regulatory requirements and industry best practices.	During 2018 process reagents and materials were handled and stored according to supplier and safety guidance, regulatory requirements and industry best practices. Mechanical maintenance areas have appropriate containment for used oil and other hazardous materials associated with mechanical repairs and maintenance to heavy equipment. New Gold RRM and on-site contractors producing hazardous waste were registered with HWIN. Certified hazardous waste transportation companies were contracted to remove hazardous waste from designated areas. New Gold Staff inspect these designated areas to ensure appropriate storage methods were being implemented.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
		Mill Operations stored reagents and chemicals used in ore processing either in dry storage facilities or within secondary containment areas. All reagents shipped to site are conducted by licensed transportation companies. When products arrive on site, they are offloaded by New Gold RRM operators who are trained in Transportation of Dangerous Goods. New materials being purchased by the company undergo a review of the Safety Data Sheets by the New Gold Health and Safety and Environmental Departments prior to being brought to site. The intent of this review is to ensure appropriate product use as well as appropriate handling and containment practices are in place.	
42	Any chemical spills within the process plant / chemical storage areas will be controlled through provision of secondary containment as appropriate and will not enter the environment. Spills of potentially hazardous materials during transport, or from on-site material storage and handling facilities will be managed. Measures will be taken to prevent and clean up any hydrocarbon spills (and other spills) at source to ensure such materials do not enter surrounding waters as practical. Spills will be reported to the MOECC and other appropriate agencies per the requirements of the Ontario Environmental Protection Act.	Chemicals to be used in the process plant are stored indoors, within covered cold storage areas and beamed laydown areas to protect against spills to the environment. In 2018, 17 spills were reported to the MECP as per requirements of the Ontario Environmental Protection Act. (See Appendix I for exceedance table) Regulatory letter reports contained clean up details and mitigation measures to ensure the spill does not reoccur. Internally New Gold uses a computer program called InControl to capture spill information, clean up tasks and assign accountability to responsible individuals. This system insures that the spill is documented and cleaned up appropriately in a timely manner.	Ongoing
43	The TMA dams will meet strict regulatory requirements including the requirements of the Provincial Lakes and Rivers Improvement Act and will be constructed to withstand the probable maximum flood and maximum credible earthquake. A remedial action plan would be developed in	Section 5.6.1 of the RRM Comprehensive Closure Plan Amendment (October 2017) outlines the Geotechnical Design Criteria for the TMA dams and Water Management Pond dams (WMP). It indicates that; - the dams have been designed to meet the most severe flood and earthquake criteria	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	consultation with appropriate government agencies in the event of dam breach.	being the probable maximum flood and maximum credible earthquake in accordance with the Ontario Lakes and Rivers Improvement Act requirements. - The designs were supported by geotechnical investigations of subsurface conditions conducted by Klohn Crippen Berger (2010) and AMEC (2011, 2012, 2013) - Emergency spillways will be provided for each stage of the TMA dams and WMP to safely pass the probable max flood - Adequate freeboard will be maintained in the TMA and WMP to contain he environmental design flood corresponding to a 100-year 24 hour storm event - all spillways will be rock armoured to withstand erosion from the flow rate - New Gold has successfully obtained appropriate LRIA permit approvals for the construction of all onsite dams. - An Operational Maintenance and Surveillance (OMS) manual was submitted to the MNRF as per conditions of the LRIA and accepted in August 2017, and a copy of the OMS can be found in the Supporting Documentation for Appendix Q.	
44	Runoff and seepage from the TMA and stockpiles will be captured, monitored, and either released to the environment if applicable criteria are met and/or re-used in the process plant during operations. Cyanide and metal concentrations in the TMA seepage and all treated effluent discharges to the environment will be controlled through the use of in-plant cyanide destruction and heavy metal precipitation, augmented by extended effluent aging in the TMA ponds.	Detailed design during 2018 was consistent with this commitment. Permanent seepage collection ditches and sumps were completed around the Water Management Pond and all of the completed Tailings Management Area (TMA) with systems in place to pump the runoff and seepage back into either the Water Management Pond or the Tailings Management Area to allow for extended effluent aging. Seepage collection systems will continue to be built along the downstream section of the TMA dam extensions.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
45	All active pipelines will be inspected twice per 12 hour shift and informally at other times. Should flow unexpectedly lessen or stop in a pipeline, an inspection will be immediately conducted.	The surveillance and inspections of active pipelines is outlined in Section 7.1 of the RRM Operation, Maintenance and Surveillance (OMS) for Manual Water Management Structures (WMS) dated August 2017. The OMS was reviewed by the Ministry of Natural Resources and Forestry as a part of the Lakes and Rivers Improvement Act (LRIA) Approval Process for the construction of dams. Should flow unexpectedly lessen or stop in a pipeline, a special inspection will be carried out immediately as outlined in Section 7.2 of the OMS Manual for WMS. A copy of the OMS can be found in Appendix Q.	Ongoing
46	The exposed tailings beach will be covered at closure with a layer of overburden, with flooding of the remaining tailings with a layer of water to prevent the tailings from oxidizing over the longer term. This will ensure that the tailings pond water remains of high quality, such that it will not pose a threat to wildlife.	The original mine closure plan filed in 2015 and the draft amendment submitted in October 2017 outline that at the end of the operations phase a low permeability overburden cover will be placed on the upstream side of the dam around approximately two thirds of the perimeter. The remaining one third of the length being reclaimed at closure. The cover will be seeded and armoured with nonacid generating rock. The remaining exposed tailings will have a permanent water cover of approximately 2m.	Ongoing
47	NG commits to maintaining the deposited tailings during the post closure period in a saturated condition in perpetuity to prevent the generation of ARD. NG also commits to developing and completing a monitoring plan which evaluates the integrity of the cover system (e.g. low permeability overburden zone) and the continuous saturation of the tailings.	The original mine closure plan filed in 2015 and the draft amendment submitted in October 2017 outline that at the end of the operations phase a low permeability overburden cover will be placed on the upstream side of the dam around approximately two thirds of the perimeter. The remaining one third of the length being reclaimed at closure. The cover will be seeded and armoured with nonacid generating rock. The remaining exposed tailings will have a permanent water cover of approximately 2m. Once this work is completed New Gold can focus on meeting the monitoring requirements of this commitment.	Ongoing
48	The thickness and maintenance of water cover over the TMA will be clarified in the Closure Plan.	The original mine closure plan filed in 2015 and the draft amendment submitted in October 2017 discuss a 2m water cover over the tailings at closure.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
49	A detailed monitoring plan will be developed as part of the Provincial closure planning process to ensure that the deposited tailings solids remain permanently saturated in the post-closure condition. This plan will include consideration of the low permeability overburden perimeter cover bordering the tailings dams to ensure that the deposited tailings beneath the perimeter overburden cover remain saturated, or alternatively that the overburden zone cover itself remains sufficiently saturated so as to prevent oxidation of the underlying tailings. The monitoring program will consist of the following principal elements: • Establishment of a field trial to simulate the performance of the low permeability cover, with initiation during the development phase and monitoring during operations to support the closure design to ensure saturation levels in the cover and underlying tailings to confirm, or modify, design criteria; Survey of the final tailings surface prior to flooding for closure, with results of the survey tied to TMA dam crest elevations and the spillway invert elevation; • Establishment of a water level monitoring station within the tailings pond, near to the spillway, with measurements to be taken at regular intervals;	The first Closure Plan for the Rainy River Project was filed in 2015. A Closure Plan Amendment (draft) was filed with the Ministry of Northern Development and Mines in October 2017 as the project transitioned from its construction phase into operations. It is important to note that the depositing of tailings in the TMA is in its early stages starting in September 2017. Section 6.2.4 of the Closure Plan discusses the progressive reclamation strategy for the TMA that will occur much later in the mine life, as it will be actively used for tailings deposition throughout operations and allowed to flood upon closure. At the end of mine operations the plan is to allow a low permeability overburden to cover approximately 150m in width to be placed on the upstream side of the dam around two thirds of the ultimate perimeter allowing the remaining one third to be reclaimed at closure. The purpose of the cover is to prevent the water cover from coming in contact with the dams and it will also limit oxygen diffusion into the uppermost portion of the tailings underneath. The overburden layer will be seeded with native seed mix and armoured with Non-Acid Generating (NAG) rock. The remaining tailings will have a permanent water cover of approximately 2m. As the project advances through its operational phase more research and planning will be conducted on the management of tailings at closure. Additional planning will be outlined in future closure plan amendments.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
50	In the event that observed water levels within the TMA pond were to decline to a level where there was a risk of the deposited tailings solids becoming partially unsaturated for extended periods, the available contingencies to mitigate that condition would be the following: • Periodically pump water from the Pinewood River during spring freshet, or during other high water periods, to maintain the TMA post closure water cover within an optimal zone (alternatively water could be periodically pumped to the TMA from the upper water column of the flooded open pit – pending suitable water quality); • Raise the spillway invert to further increase the depth of the TMA water cover (this action would require a widening of the spillway to continue to allow for passage of the probable maximum flood); or • Raising the dam crest, as well as the spillway invert to further increase the depth of the TMA water cover. In development of the above contingencies, trigger levels would be developed for implementation of the contingencies.	In the fall of 2017 the Rainy River Project transitioned from a construction to operational state. Currently this condition doesn't apply as the mine and Tailings Management Area (TMA) are not in a closure state. However, New Gold intends to have a 2m water cover over the tailings as discussed in the Mine Closure Plan.	Ongoing
51	Mitigation measures that will be used to reduce potential adverse effects to the Pinewood River aquatic system will include the following: • Extensive contact water recycling for process plant needs to reduce overall water demands and to minimize final effluent	There were zero discharges from the Water Management Pond (WMP) to the Pinewood River in 2017. Authorization to deposit tailings in the Tailings Management Area (TMA) Starter Cell was received September 28, 2017 and deposition stopped on April 18, 2018. Authorization to deposit tailings in the TMA Cell 2 was received April 12, 2018 and is ongoing. Prior to deposit in the TMA, process plant effluent passes through an in-plant slurry	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	discharge volumes to the Pinewood River; • Use of SO2/Air treatment for cyanide destruction and heavy metal precipitation in the process plant followed by extended effluent aging in the TMA pond and in the water management pond to achieve the highest quality effluent reasonably achievable; • Use of a constructed wetland system for final effluent polishing of a major portion of the discharge; • Management of the site for ARD control during operations and following closure to prevent adverse water quality impacts to the Pinewood River; • The DFO (DFO) Freshwater Intake End-of-Pipe Guidelines will be followed as mitigation for potential fisheries effects associated with water intakes; • Construction of the Pinewood River Highway 600 re-alignment crossing (bridge or culverts) in a manner that does not restrict fish passage; • Maintaining current fish habitat productivity; and • Implementation of an extensive monitoring plan for water quality and flow discharges, and receiving water aquatic life and habitat.	cyanide destruction (SO2/AIR) treatment facility. Effluent is aged in the TMA and Water Management Pond for an extended period prior to supplemental treatment from the WMP effluent treatment plant and the Constructed Wetlands. The WMP effluent treatment plant is in the construction phase, to be completed 2019. A pilot test of the Constructed Wetlands was conducted in summer of 2018, and construction is scheduled for 2019. Management of site for ARD control during operations and following closure to prevent adverse water quality impacts to the Pinewood River; The Mine Rock Pond was constructed and commissioned in 2017. Construction of Sediment Ponds 1 and 2, and the East Mine Rock Stockpile perimeter ditching began in summer 2018. The DFO Freshwater Intake End of Pipe Guidelines were implemented in 2016 during the construction of the Pinewood River. Fish screens were also installed on all construction dewatering pumps during the construction of diversion structures and culvert installations. The construction of the Pinewood River crossing at Highway 600 was completed in 2016 and consisted of the installation of a clear span bridge with no in water work that would restrict fish passage. On-going monitoring under the Pinewood Biological Monitoring Plan for direct effects to fish was implemented in 2015. Monitoring of Pinewood River water quality is conducted monthly as part of the Surface Water monitoring program. The Pinewood Hydrometric Monitoring program outlines monitoring for flow changes. Receiving water aquatic life and habitat are monitored under the Pinewood Biological Monitoring Plan for direct effects to fish.	

Condition/ Tracking #	Description	Status 2018	Date Completed
52	All final discharge points will have a point of control to immediately cease discharge. A control structure will be constructed at the discharge point of the treatment wetland to be in compliance with MDMER. All discharge locations will be regularly sampled in accordance with environmental approval requirements and will provide insight as to ongoing treatment system performance.	The operational detailed design for the RRM is consistent with this commitment. There are currently nine temporary discharge points for surface water effluent that report to the Pinewood River, including one that was not constructed and 5 that were not in use in 2018. There were only 5 discharges from temporary discharge points in 2018. The discharges from these temporary discharge points are batch, not constant discharges, and are measured with flow meters. Water quality is sampled before and then again during every discharge and assessed against Provincial and Federal water quality requirements. Construction of the Constructed Wetlands is scheduled for 2019/2020.	Ongoing
53	NG acknowledges the need to meet effluent criteria for any discharge to the environment. Excess water discharged to the environment will meet applicable Federal and Provincial guidelines for the protection of aquatic life, or other scientifically defensible alternatives, in the receiver, as well as any site-specific approval requirements.	There were 5 discharges from temporary discharge locations in 2018. All effluent met the environmental approval requirements.	Ongoing
54	Minimize the number of final effluent compliance points as reasonable.	Through 2018, there were nine approved effluent compliance points. Of the nine, one was not constructed, 5 were not utilized and the remaining 3 were only used a total of 5 times combined. None of the discharge points represent a constant discharge. It was necessary for the 3 effluent compliance points that were used to remain active in the early operations phase as a contingency plan, used to manage spring freshet as discharge criteria was met. During the Operational Phase, the current design requires four final discharge points; Sediment Pond 1 Discharge, Sediment Pond 2 Discharge, Water Management Pond Pipeline Discharge, and the Constructed Wetland Discharge points. In 2018, Sediment Ponds 1 and 2 were constructed however no discharges occurred. The Water Management Pond Pipeline Discharge line is also the Pinewood Water Taking line, which was still in	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
		use for water taking in 2018, so no discharges occurred.	
55	NG agrees to work with the MOE to develop a mutually acceptable minimum flow threshold, below which water from the Pinewood River would not be taken to build up the initial water inventory to support processing plant start up operations. Subject to approval(s), NG is proposing spring and open water flow thresholds of 10,000 m3/d and 5,000 m3/d, respectively, below which direct water taking from the Pinewood River downstream of McCallum Creek, would temporarily cease until river flows recover. The application of such flow restrictions would be based on day to day prorated flow data obtained from Water Survey of Canada (WSC) Station 05PC023.	Thresholds have been agreed to through the Provincial environmental approvals process, including Permit to Take Water (PTTW) 8776-9W2QN3.	Completed
56	The appropriateness of the use of the WSC station will be assessed as part of the operations planning, and if this station appears unsuitable, a separate dedicated flow monitoring station will be set up, either independently, or in association with the WSC.	A dedicated station was established on the Pinewood River on October 9, 2015 in consultation with the MOECC. In 2018, the Updated Hydrometric Monitoring Plan for the Pinewood River was submitted to the MECP, which recommends the development of two new hydrometric stations as well as upgrading of the existing hydrometric station.	Completed October 9, 2015.
57	Optimize the timing and positioning of final effluent discharges to the Pinewood River so as to limit the potential for adverse flow effects to the river.	In 2018, there were nine final effluent discharge locations obtained through the Environmental Canada Metal and Diamond Mining Effluent notification process. These discharges are included under the Permits to Take Water from the MECP to regulate the volume of water. Water quality is measured at the discharge for both Federal and Provincial regulation limits.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
58	Subject to approval(s), NG is proposing to operate the final effluent discharge from both the Constructed Wetland and the pipeline discharge from the Water Management Pond, such that a minimum 1:1 receiver to final effluent mixing ratio would be maintained in the Pinewood River, with the understanding that receiver to final effluent mixing ratios of greater than 1:1 would be the norm.	The Provincial ECA 5178-9TUPD9 received from the MECP is consistent with this commitment. The constructed wetland is scheduled for construction in 2019. In 2018 there were no discharges from the Water Management Pond.	Ongoing
59	NG commits to the discharge of effluents to the Pinewood River in a manner that will achieve rapid mixing within the river. If future operational monitoring shows that effective receiver mixing is not attained, NG commits to implement additional measures to enhance mixing to a level which is mutually acceptable to the MOE and NG. Such additional measures could include the use of rock groynes placed on either side of the channel to force mid-channel mixing and use of boulder clusters to increase flow turbulence within the mixing zone	Discharging effluent to the Pinewood River via Water Management Pond Discharge Pipeline was not required in 2018. A rock groyne, and potential alternatives, have been identified and New Gold will be required to obtain appropriate permit approvals (LRIA) prior to installation, planned for Summer 2019.	Ongoing
60	Scheduling of RRM development activities will consider environmental aspects, such as fish spawning.	During the early operating stage of the RRM activities and mitigation measures previously implemented to consider environmental aspects such as fish spawning; - construction activities near fish bearing waterbodies were scheduled outside of the fish spawning window. Fish salvage was conducted whenever construction activities affected fish bearing waters. - Culverts were removed along the West Creek Diversion during August to October, well outside of fish spawning windows as identified by the MNRF through the LRIA permit process - Ambient air quality monitoring continued with data collected from Gallinger and Highway 600	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
		stations to ensure there was no impact to air quality. - Water and dust suppressants as approved by the MECP were used to control dust on roads, excavating in the open pit and aggregate extraction to minimize impacts to air quality. - As in previous years, New Gold hired an Sediment Erosion Control expert to implement erosion control mitigation measures on site in order to reduce/eliminate sediment from entering water courses within the mine boundary - Vegetation buffers were left around creeks and water courses to protect aquatic life by preventing sediment runoff from high traffic roads and late stage construction activities. - Construction activities such as infilling Clark Creek Channel with clean nonacid generating rock continued, during the winter to lesson impacts on the environment.	
61	A No Net Loss Plan and compensation strategy will be developed and implemented by NG to create new like for like habitats as project compensation and/or enhance existing restoration programs, to offset the RRM habitat losses.	To offset habitat loss New Gold has currently completed the following: - Ownership and maintenance of over 1800 ha of overall benefit land to compensate for the loss of Boblink and Whip-Poor-Will habitat during construction; - Completion of the water diversion structures and ponds to offset for the loss of fish habitat in the former West Creek, Clark Creek and Teeple Drain systems. Monitoring of the Clark and Teeple systems commenced in 2017 and proved to support fish passage. Stockpile pond is expected to fill with 2019 freshet and activate the remaining 50% of the Stockpile diversion after filling the pond. West Creek pond and diversion allowed for suitable fish passage by the spring of 2018. White Suckers were seen spawning as far up the pond and diversion systems as the lower end of the Stockpile diversion; - Reclamation of Tait Quarry was completed in summer of 2018.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
62	Except where aquatic habitat will be overprinted (and compensated for as part of DFO authorizations) for project development, a 120 m buffer zone will be maintained adjacent to rivers and creeks to the extent practical, to protect watercourses and their associated vegetated margins.	Buffer zones are maintained by reducing tree clearing, grubbing and equipment access. New Gold regulates this by; providing construction contractors with maps of buffer zones, using flagging tape to flag off 'no entry' areas, limiting the use of equipment around water courses, conducting field inspections of work areas.	Ongoing
63	Fish flesh and fish organ tissue samples from the Pinewood River have been analyzed for metals for walleye and northern pike in the baseline condition. A commitment has been made to continue to monitoring metals in these two fish species after mine start-up. Should there be future evidence to show that fish are being taken from the Pinewood River on a more regular basis and prepared as a food source, NG would be pleased to work with these fishermen to collect and analyze a reasonable sampling to reflect any applied methods of food preparation.	The 2018, the RRM fish tissue quality monitoring program was conducted between September 10 and 14th in the Pinewood River downstream of the RRM. Fish were collected using fill nets and hoop nets. A total of 15 northern pike and 15 walleye of edible size were retained. Samples of the fish muscle tissue, liver and ovaries were removed and sent to a certified laboratory to be analyzed for metal accumulation. Chemical data collected was compared to previous data collected in 2017, 2016, 2015 and 2012 (baseline). The 2018 results indicated that tissue samples contained metal concentrations below human consumption benchmarks and were within the range of baseline (2012) concentrations. Tissue samples from six large northern pike and two large walleye revealed elevated levels of mercury concentrations. However, did not exceed the maximum acceptable concentration of mercury established by Health Canada. It is important to note that the accumulation of mercury in larger predatory fish tissue is common in northwestern Ontario. A copy of the 2018 Fish Quality Monitoring Report can be found in Appendix G.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
64	Fish tissue (dorsal muscle tissue and livers) sampling will include both northern pike and walleye. If contaminant concentrations increase over time, potential consumers and the applicable Provincial departments (MOE and MNR; MNR) would be informed and information related to increased health risks (if any) would be provided, as suggested.	Fish tissue sampling of northern pike and walleye in the Pinewood River has been conducted in the fall of 2012 (baseline), 2015, 2016 ,2017 and 2018. Statistical analysis of tissue chemical concentrations compared among the sampling period show no upward trends. The study will continue to be conducted annually and information shared with appropriate government authorities. Additional information regarding the sample results can be found in commitment number 63. A copy of the 2018 Fish Tissue Quality Monitoring Report can be found in Appendix G.	Ongoing
65	Specific erosion and sediment control measures and their locations will be provided in the permit application documents once detailed design is completed to avoid direct impacts to fish during the mine construction phase.	During 2018 erosion and Sediment Control measures were provided in the permit applications for all major infrastructure works including TMA Cell 2 and 3, Sediment Ponds 1 & 2 and Water Discharge Pond. Each permit application, filed under the Lakes and Rivers Improvement Act (LRIA) and Environmental Protection Act, contains a sediment and erosion plan for each project/works that is incorporated as a condition of the work permit approval under the section entitled "Further Submittals and Approval Conditions".	Complete, ongoing
66	Pond dams will be inspected at a regular interval by site employees for any visible signs of concern and particularly during and after major storm events. They will also be inspected periodically by a qualified geotechnical engineer at an interval that meets regulatory requirements at a minimum.	Daily inspection of the dams have been performed by the TMA operators (2 inspections per shift). The annual Dam Safety Inspection was carried out by Wood (Engineer of Record) for all dams on October 4, 2018.	Ongoing
67	Surface water: to be monitored during construction, operations and active closure phases, with post active closure monitoring expected to continue for a decade (or more) at reduced frequencies pending ongoing analysis of data	Surface water was monitored on a monthly basis per permit conditions at sites upstream and downstream of the project footprint in 2019. Results were consistent with baseline studies.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
68	Proposed (subject to modification to ensure participation and data sharing is adequate to meet the expectations of Aboriginal groups) surface water sampling program would include a First Nation training component followed by a rotating schedule whereby a First Nation representative would accompany NG staff on the monthly surface water sampling program. Laboratory results will be received by NG, reviewed and submitted to the identified individuals of each participating First Nation along with a summary explanation.	When the project was operated by Rainy River Resources, there once was a formal water sampling program with all the communities, where staff demonstrated how to take water samples and explained what the sample results meant. In 2017 the Environmental Manager met with the Rainy River Stewardship committee a few times to discuss potential programs, but the Stewardship Committee didn't pursue the option. Since 2015 New Gold has employed an Environmental Monitor from Big Grassy First Nation. This role includes environmental site monitoring including water sampling and access to training, mentorship and all data and results. The monitor is responsible to communicate with their community on a regular basis. In the event of a water quality exceedance that doesn't meet the requirements of the Metal and Diamond Mining Effluent Regulation or the Provincial Water Quality Objectives, New Gold does inform Indigenous Communities via email and through communication at the Environmental Monitoring Board Meetings.	Ongoing
69	Sampling of sediments will take place to evaluate soil quality parameters prior to undertaking any further closure activities for any contact water ponds and drainage works (including stockpile sediment ponds) where breaching is proposed.	In 2016 a topsoil sampling program was completed which included a chemical analysis of soil to be used for closure and reclamation activities. The report identified best case topsoil harvesting locations and provided information on topsoil in Overall Benefit Lands. In 2018 sediment sampling for reclamation was not completed. As the mine progresses through its operations stage New Gold intends to implement further sampling programs at contact water ponds and drainage works.	Ongoing
70	NG staff is willing to describe the ongoing water quality program and provide freshet data on request. The water management plan for the RRM provides for the management of all site contact waters in accordance with accepted industry standards including periods of high runoff,	No requests were made in 2018. A summary of water sampling data from monthly surface water sampling and water discharges are provided to the MECP office each month.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	and sequences of high precipitation years.		
71	There will be no sediment ponds associated with the aggregate pit(s).	There were no sediment ponds associated with the Roen Road Pit, Outcrop 3, Laydown 4, or Tait Quarry in 2018. There is one runoff pond located adjacent to Outcrop 3 that is used to capture runoff from the equipment laydown. During the detailed design stage it was determined that a settling pond may be required to ensure high quality effluent from the Tait Quarry (to allow for ammonia degradation in situ and settling of suspended solids) and Provincial environmental approvals were obtained for this structure. During the operation of the quarry (2015 to 2017) groundwater was not generated and the settling pond was not required. Tait Quarry has underwent reclamation in 2018.	Ongoing
72	Related to the transmission line: • Tree stumps, root mats and ground vegetation cover will be left intact to reduce the potential for surface erosion and to help maintain groundcover for plant and wildlife habitat • Vegetation (shrub) screens will be left to the extent practical along the single creek crossing that exists between Beadle and Preachers Lake, near the east end of the alignment, for erosion protection, while ensuring clearance requirements for conductors • No in-water work will be conducted and all poles will be placed above the high water mark • Industry standard sediment interception and erosion control practices will be applied wherever appropriate / needed • Should any erosion of the ground be identified at the end of the construction period (or during any intervening inspections), the	Clearing of the transmission line right of way was initiated during November 2015 with construction completed in April 2016. To ensure that all of the commitments are understood and followed, New Gold RRM conducted routine inspections and attended weekly construction meetings with the contractor. Transmission line clearing was completed April 2016. No clearing, has occurred on the transmission line since that time.	Completed November 2015 to April 2016.

Condition/ Tracking #	Description	Status 2018	Date Completed
	exposed area would be re-seeded or otherwise stabilized to control erosion until native vegetation takes hold. If the erosion is more severe, other methods such as placement of straw matting or equivalent will be used • Where required in larger quantities, construction materials will be stored a minimum distance of 200 m from any open (non-frozen) surface water, and from major access points; and • Fueling and maintenance of vehicles will not occur within 50 m of surface waterbodies.		
73	As a result of the independent First Nation review of the Final Environmental Assessment report, NG committed to a joint water quality monitoring and reporting program with the area First Nations (including Big Grassy River First Nation; BGRFN) as part of the existing monthly water quality monitoring program which is currently carried out by NG. The program will be funded by NG and form an integral part of the overall environmental management program as it relates to First Nations traditional knowledge and assurances of maintaining water quality and by extension, aquatic biota protection. The program will be developed jointly with the First Nations in lead-up to the initiation of mine construction. (Letter to Chiefs from Kyle Stanfield, October 2013).	In addition to the 2017 completion, an Environmental Monitor from Big Island First Nations is to start in 2019. New Gold is looking at a First Nations Environmental Trainee to help build capacity.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
74	NG has committed to provide a program of close coordination with Rainy River First Nations in support of the pre-existing First Nation Watershed Program and water quality protection. Company funding will be provided as part of the fisheries compensation program to further water quality enhancement programs for the Pinewood and similar agriculturally impacted waterways.	When the project was operated by Rainy River Resources, there once was a formal water sampling program with all the communities, where staff demonstrated how to take water samples and explained what the sample results meant. In 2017 the Environmental Manager met with the Rainy River Stewardship committee a few times to discuss potential programs, but the Stewardship Committee didn't pursue the option. Since 2015 New Gold has employed an Environmental Monitor from Big Grassy First Nation. This role includes environmental site monitoring including water sampling and access to training, mentorship and all data and results. The monitor is responsible to communicate with their community on a regular basis. In the event of a water quality exceedance that doesn't meet the requirements of the Metal and Diamond Mining Effluent Regulation or the Provincial Water Quality Objectives New Gold does inform Aboriginal Communities via email and through communication at the Environmental Monitoring Board Meetings. Starting in 2015 each fall New Gold hires an independent consultant who is responsible for conducting a fish tissue sampling program in the Pinewood River downstream of the site. The purpose of the study is to assess metal accumulation in walleye and northern pike tissue which are sport fish traditionally consumed by First Nation people in the Rainy River District. New Gold has allowed opportunity for First Nation Community Members to participate in the study as well as the onsite Environmental Monitor from Big Grassy First Nation. Results from this study are communicated through the Environmental Monitoring Board. To date there has been no programs brought forward to New Gold for fisheries compensation in the Pinewood or other impacted waterways. A copy of the 2018 Fish Tissue Quality Monitoring Report can be found in Appendix G..	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
75	To help limit the exposure of potentially acid generating materials to this base drainage through the former Clark Creek channel zone, a layer of non-potentially acid generating rock will be placed in the former creek channel bed area.	During 2018, non-acid generating rock was placed into the remnant Clark Creek channel ditch before East Mine Rock Stockpile advanced. This plan will continue through 2019 as the stockpile expands. The Mine Rock Pond was also commissioned, and the closure of Clark Creek channel occurred.	Ongoing
76	Groundwater: to be monitored during construction, operations and active closure phases, with post active closure monitoring expected to continue for a decade (or more) at reduced frequencies pending ongoing analysis of data.	Groundwater wells were monitored throughout 2018, four times each, if not frozen, dry or in need of repair.	Ongoing
77	A groundwater level (flow) and quality monitoring program of regular sampling and dipping of dedicated monitoring wells will be implemented to confirm that no area wells are affected by the mine. Furthermore, local well owners will be asked to participate in a well water quality program to monitor water quality in their wells.	Site Groundwater wells were monitored for levels and water quality four times each, when not frozen, damaged or dry, in 2018. Data from 2018 was reviewed for trends to quantify effects of dewatering and other RRM activities. The Offsite Groundwater Well Monitoring Program was initiated in 2017. Neighboring property owners were contacted and asked to participate in the voluntary monitoring program. The initial background data was collected for ten local wells. Background data collection continued in 2018, with nine local wells sampled.	Ongoing
78	If water quality or availability in local wells is compromised (by the RRM), NG is obligated to replace the system or offer water treatment systems to rectify issues related to water quality or availability shown to be caused by the mine.	An Off-Site Groundwater Monitoring Plan has been drafted and the gathering of background information for neighboring wells continued in 2018. Eleven neighboring property owners determined to be in the Zone of Influence (see map in plan) agreed to participate, however only nine well sampled were collected. The Off-site Groundwater Monitoring Plan will continue for the life of mine. New Gold is committed to rectifying issues related to water quality or availability shown to be caused by the mine, and the Off-Site Groundwater Monitoring Plan assists with determining the cause of issues related to water quality or availability in local wells.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
79	If local artesian wells stop flowing (related to the RRM), NG will need to provide and install a pump to replace the artesian flow used by the homeowner.	There were no reported effects on local wells related to the RRM in 2018.	Ongoing
80	A number of groundwater monitoring wells will be placed around the TMA and east mine rock stockpile and pond areas, as shown in Figure 13-3 of the Final EA Report. This groundwater monitoring network may be amended or expanded through the MOE approvals process. Water levels in these monitoring wells will be measured continuously with data downloaded semi-annually. Groundwater samples will be collected quarterly, as described in Section 13.6 of the Final EA Report.	Installation of additional groundwater monitoring wells (post baseline studies) started in 2015 and was completed in 2016 in accordance with Provincial Approval requirements. In 2018, two replacement groundwater monitoring wells were installed adjacent to existing wells that could no longer be sampled, and five groundwater monitoring wells were repaired. Two new shallow wells were also installed as recommended to improve monitoring. The groundwater monitoring wells were sampled four times in 2018, if not frozen, dry or in need of repair.	Ongoing
81	Mitigation measures that will be used to reduce potential effects on groundwater include the following: • Returning captured groundwater indirectly to the Pinewood River (after treatment and testing if necessary) during the period of mine operations to minimize potential flow effects to the river, especially during naturally occurring, low flow conditions; • Using in-plant SO2/Air treatment for cyanide destruction and heavy metal precipitation to optimize the quality of groundwater seepage associated with the TMA during operations and following mine closure; • Managing the site for ARD control, both during operations and following closure to prevent adverse water quality impacts to the Pinewood River, including that associated with any groundwater seepage;	The continued operation and construction of the RRM specific to the water management is consistent with this commitment: · Water from dewatering activities is sent to the Water Management Pond, or treated, to meet effluent quality regulations and released at licensed discharge locations. The Mill is in operation, utilizing the cyanide destruction unit. ARD is being managed in the PAG dump as committed to. Runoff from the PAG dump during 2018 reported to the Mine Rock Pond and was used for processing in the Mill. RRM is still operating, therefore the requirements for optimizing pit inflow at mine closure are not applicable at this time. Both Surface Water and Groundwater Monitoring Plans were implemented in 2015 and continued through 2018.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	• Accelerating open pit inflow following mine closure, to the extent practicable, balancing the need for managing water quality and maintaining Pinewood River flows over the interim period until the pit can be completely flooded; and • Implementing a monitoring plan for water levels, water quality and flow discharges, and receiving water aquatic life and habitat maintenance.		
82	Monitoring of key terrestrial systems and Species at Risk (SAR) will occur during the construction and operations phase, with post closure habitat development and utilization by wildlife to continue at reduced frequencies consistent with SAR Permit requirements.	Monitoring of terrestrial systems and SAR during 2018 was compliant with environmental approvals and monitoring plan requirements. During 2015 New Gold RRM implemented a site wide wildlife monitoring program that allows employees and contractors to report any wildlife sightings on the project. Education regarding SAR is provided during site orientation. In the fall of 2016, a White-Tailed Deer Tissue monitoring program was implemented to establish a baseline for potential metal and cyanide accumulation in deer tissue. Samples are collected from hunters in the area as well as a deer killed in vehicle collision. The study continued in 2017 and 2018. A summary of the 2017 study results can be found under commitment number 168. A copy of the 2017 White Tailed Deer Tissue Sampling Report can be found in Appendix P.	Ongoing
83	Puffballs: NG and AMEC would be happy to receive photos and/or samples of this species and have AMEC experts identify it. If AMEC experts are unable to identify the species they will consult with staff at the Royal Ontario Museum or the Canadian Museum of Nature.	Samples were submitted to the Royal Ontario Museum and confirmed as common species. This information was provided to the resident as of December 11, 2014. No further samples have been provided or discovered.	Ongoing
84	Rare plant surveys are proposed to be carried out along portions of the preferred transmission line corridor in late Spring / early Summer, 2014. Prior to	Surveys were completed during 2014 and a report issued. The report was referred to in the issued Errata for the EIS / EA Report. September 19, 2014	Completed Summer 2014

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	transmission line construction, additional data collection will be undertaken for that portion of the proposed transmission line routing (Alternative A) west of Highway 71, where there is a baseline data gap for rare plants surveys. This additional data collection will be undertaken to support transmission line permitting, and would consist of the following activities, spread across a 2 km corridor (1 km on either side the transmission line): transect surveys for vegetation communities including surveys targeting the presence of rare plant species. Results will be made available to MNR once the report is complete and the report will be referred to in the Errata.		
85	The principal mitigation measures that are proposed to limit short and long term adverse effects to local vegetation communities include: • Minimizing dust production along primary mine rock and overburden transportation routes by implementing dust suppression methods and thereby minimizing the zone of influence. Primary dust suppression methods will include road watering. • Annual monitoring of dust deposition on vegetation adjacent to mine roads; and • Active revegetation and encouragement of natural revegetation / recolonization of disturbed areas as part of progressive reclamation during operation and active reclamation at mine closure.	Principal mitigation measures used to limit adverse effects to local vegetation communities included using water trucks equipped with spray bars to water along primary mine rock and overburden transportation routes. Calcium Chloride, an MECP approved chemical used for suppression of road dust, was applied along major access roads and plant site roads. Revegetation along disturbed areas in Tait Quarry formed part of progressive reclamation in 2018.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
86	In regards to the transmission line: • Additional rare plant and breeding bird surveys to be undertaken in May and June, 2014 to identify any further potential environmental constraints that might require construction modification, such avoidance of disruption to rare plant sites (if present) through site specific habitat protection measures • Undertaking transmission line construction in winter (normally December 1 to March 31) to better protect ground cover in sensitive areas where the protection of wetlands, rare plants and SAR is required, and completion of the remainder of transmission line construction in the late summer and fall, outside of the breeding bird season • Vegetation removal will be reduced to the extent necessary to support construction activities and longer-term transmission line reliability (from interference with conductors and fall of adjacent hazard trees). Minimizing vegetation removal includes retaining existing low vegetation ground cover • Access to the right of way (ROW) will be provided from existing infrastructure (some of which may need to be upgraded, as reasonable for personnel, material and equipment access), but no new permanent access roads are proposed. Generally, where access is poor, the ROW will be accessed along the ROW itself. Construction vehicles will not be allowed to travel through surface waters • Mechanical means will be used for periodic vegetation height	Studies were completed during 2014 and the detailed design and construction plans are consistent with this commitment. Clearing of the transmission line right of way occurred in late November 2015 and the transmission line clearing was completed in April 2016. Some existing access roads required upgrading by adding road bedding material, but no new roads were constructed. No vegetation maintenance along the transmission line was required in 2018.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	maintenance along the transmission line, instead of herbicides.		
87	Scheduling of RRM development activities will consider environmental aspects. Clearing of forests having a density of at least 10 cavity trees per hectare with a diameter at breast height greater than 25 cm will be limited to outside of the bat roosting season (April 1 to November 15) unless cleared by a bat biologist that has surveyed the trees for bat activity. Timing of the transmission line construction will be planned to avoid the breeding bird and main tourist season, as possible.	During baseline monitoring it was determined by qualified professionals that the forest type to be cleared did not qualify as bat habitat. Each year there is no tree clearing from May 1 to August 15 (breeding bird window). Clearing of the transmission line right of way was initiated in late November 2015 and completed by April 2016.	Ongoing
88	Wildlife awareness information will be included in regular safety and environmental inductions performed by the mine, along with SAR identification and sensitivities, permit conditions and cultural awareness. Wildlife sighting logs or information boards will be installed to notify workers of local bear, wolf or other large mammal or furbearer observations. Workers and contractors will be made aware of seasonal changes in local mammal behavior or presence in proximity to the mine. Food wastes generated on site will be managed in a manner that limits the attraction of wildlife, such as Black Bear.	In 2015 New Gold RRM incorporated wildlife awareness, avoidance and SAR information to the site orientation that is still delivered to all employees and contractors. Also, during 2015 a no tolerance policy was implemented related to feeding and harassing wildlife onsite. This policy remains in effect. Regular site wide bulletins and during "tool box" talks employees are reminded about the importance of following this policy as well as reporting wildlife sightings. During 2018 New Gold RRM continued to promote the onsite wildlife reporting procedure. Documented sightings are recorded in a GIS based mapping program. The program allows visual representation on a site map in real time where sightings have been reported. This information is helpful in answering a number of scientific questions related to wildlife adaptation.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
89	All staff and contractors will be provided with training in animal encounters as part of the site orientation process.	The site orientation program includes information regarding wildlife awareness and wildlife encounters. Wildlife awareness information is also provided on an ongoing basis during field-based inspections of construction areas, and in "tool box" morning meetings	Ongoing
90	Road-killed animals or any other carcasses found onsite will be removed in a timely manner to limit the attraction of wildlife.	The limited number of road-killed animals / carcasses found within the RRM during 2018 were disposed of in an area of the site with limited to no human interaction or buried. In some scenarios samples may be taken for scientific studies.	Ongoing
91	A wildlife monitoring program will record the efficacy of these avoidance measures (will evaluate the effectiveness of the methods implemented) and annual reporting to EC and the MNR will provide the information requested by the reviewer. NG will provide opportunities to Aboriginal groups to receive the annual reports.	In May 2016 the Wildlife Monitoring Plan for the RRM was accepted by the MNRF. During 2018 aspects of the program that were implemented include a white tailed deer tissue sampling program to establish a baseline of accumulated metals and cyanide in organ tissue. Also implemented was migratory bird point count surveys and it was the third year of the bat monitoring program. Thus far all studies called for within the Monitoring Plan indicate the RRM has little impact on the local wildlife, as expected. A copy of the reports can be found in Appendix S.	Wildlife Monitoring Program submissions to MNRF; Vers. 1 January 15, 2015 Ver. 2 April 20, 2015 Vers. July 15, 2015 Vers. 4 July 30, 2015 Version 5 February 2016
92	A more detailed wildlife follow-up monitoring plan will be developed through consultation with the MNR and EC. As suggested by the reviewer, additional control sites around the periphery of the mine footprint can be developed and monitored following mine construction and periodically throughout mine operations. A draft plan will be issued to MNR and EC prior to commencement of construction. NG will provide opportunities to Aboriginal groups to participate in the development of the plan.	In February 2016 a final version of the Wildlife Monitoring Program for the project was submitted to MNRF. New Gold RRM started to implement the program during 2016. Wildlife Monitoring Program Submissions to MNRF are as follows; Version 1; January 22, 2015, Version 2; April 20, 2015; Version 3; July 9, 2015, Version 4; July 30, 2015, Version 5; February 3, 2016 (final). The plan was accepted in May 2016.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
93	The use of exclusion fencing for reptiles and amphibians will be added as a mitigation measure during construction and operations. The placement of fencing will be decided upon through consultation with the MNR and EC.	In 2018 nearly 15 kilometers of exclusion fencing was installed along the footprint of the Tailings Management Area. New Gold RRM obtains a scientific collectors permit from MNRF each year which allows for the live trapping and relocation of reptiles and amphibians that may be impacted by activities on site.	Ongoing
94	In regards to the transmission line: • Construction crews will be advised not to interfere with or harass wildlife. No hunting or fishing by construction crews will be allowed. Disciplinary actions will be taken should either occur; • Contractors will be required to handle food and food wastes in a responsible manner, and to educate workers to ensure no feeding of wildlife; and • Should any nuisance wildlife be encountered which pose a risk to construction crews, the MNR will be contacted for direction.	Construction of the transmission line was initiated in late 2015 and completed in April 2016. All Environmental permits, approvals and commitments related to the transmission line contract were communicated to the contractor during an environmental kick off meeting in November 2015. During the construction of the transmission line New Gold's RRM Environmental department conducted regular inspections of the site to ensure these commitments were being followed. Construction Completed April 2016.	Completed April 2016
95	The primary mitigation strategies for limiting adverse effects to wildlife will include: • Preventing hunting from occurring on all lands owned by NG (required for the safety of workers; this is currently ongoing during exploration as well); • Maintenance to the extent practical of a 120 m buffer zone adjacent to rivers and creeks to protect watercourses and their associated vegetated margins; • Restoration of disturbed habitats at closure, including the development of habitats capable of supporting a diversity of wildlife	The following mitigation strategies were applied during 2018; Hunting did not occur on site except for required trapping of nuisance beavers. Buffer zones were maintained around fish bearing waterways and where necessary temporary erosion control products were installed. New Gold RRM has installed speed limit signs on project roads and have implemented a site wide no tolerance policy for speeding which is enforced by radar. Wildlife crossing signs have been installed at six locations on the project site in an attempt to reduce vehicle collisions with wildlife. These locations were chosen based on the volume of wildlife sightings reported in those areas. Regular bulletins regarding wildlife are emailed and posted on site. A log of collisions resulting	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	species, including ungulates, large predators, furbearers and bats; • Enforcement of speed limits along proposed mine access roads to reduce the potential for collisions with ungulates. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept monitoring the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Inclusion of wildlife awareness information into regular safety and environmental inductions performed by the mine. Workers and contractors will be made aware of seasonal changes in local deer or large mammal behavior or presence in proximity to the mine. Workers and contractors will be made aware of seasonal changes in local mammal behavior or presence in proximity to the mine; • Treatment of the tailing's slurry to levels equal to or less than 1 mg/L weak acid dissociable cyanide before deposition in the TMA (which is well below the 50 mg/L weak acid dissociable cyanide threshold criteria outlined by the International Cyanide Management Code); • Fencing the TMA to prevent access; • Covering the exposed tailings beach at closure with a layer of overburden and flooding the remaining tailings with a layer of	in wildlife mortality log is kept and submitted in Appendix L. Wildlife awareness training is provided to all contractors and employees during site orientation. Regular effluent sampling has shown WAD cyanide in tailings generally reaches the Tailings Management Area (TMA) at 1 mg/L or below. Nearly 15 kilometers of fencing was installed around the footprint of the TMA. Tailings currently remain submerged as much as possible and will be submerged and covered with overburden at closure. The RRM follows a Best Management Plan for dust suppression that was developed and approved by the MECP in 2016. Food waste is removed on a frequent schedule and stored only in waste bins with lids until removed.	

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	water to prevent the tailings from oxidizing over the longer term. This will ensure that the tailings pond waters remain of high quality, such that they will not pose a threat to wildlife. The margins of the tailings pond will develop as wetland habitat; • Minimizing dust production along primary haulage routes by implementing dust suppression methods and thereby minimizing the RRM zone of influence; and • Disposing of food wastes generated on site in a manner that limit the attraction of wildlife, such as Black Bear and wolves.		
96	Mitigation measures that will be used to reduce potential adverse effects to amphibians will include the following: • Development of a compact RRM site to reduce overall habitat loss and to limit potential adverse effects related to sound emissions to the extent practical; • Restricting the clearing of terrestrial amphibian breeding habitats to periods outside the amphibian breeding season as directed by the MNR; • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Enforcement of speed limits along proposed mine access roads to reduce the potential adverse effects of increased vehicular traffic	During the planning stage of the project, the size of the project site was taken into consideration and a compact design was achieved as best possible. During the spring and summer, clearing restrictions are in place to protect both amphibians and birds. Noise monitoring is conducted and large equipment in the open pit is maintained to reduce sound emissions. In 2015 New Gold RRM implemented site wide speed limits and a no tolerance to speeding policy which remains in effect. Wildlife crossing signs were also installed during 2016 on project roadways known for high concentrations of wildlife. Visual observations made along project roadways did not show an increase in frog mortality. Wildlife awareness training is provided to all contractors and employees during site orientation. Bulletins regarding wildlife awareness are made throughout the year. The SO2 system is online and operational to treat tailings before they leave the Mill. During 2017 no effluent from the Mill process was discharged to the environment. Generally, abiotic conditions exist within the TMA. Cell 1	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	associated with the RRM. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • If frog mortality on roadways is found to be a problem along mine access roads or the re aligned Highway 600, silt fencing may be installed to prevent frogs from crossing the road and may direct them to the nearest culvert(s); Mitigation measures that will be used to reduce potential adverse effects to amphibians will include the following: • Inclusion of wildlife awareness information into regular safety and environmental inductions performed by the mine. Workers and contractors should continually be made aware of seasonal changes in local wildlife behavior or presence in proximity to the mine; • Treatment of tailings slurry containing cyanide and associated heavy metals from the ore leaching process in the process plant using the SO2/Air process before being discharged to the TMA; • Discharge of effluent that will result in protection of aquatic life standards in the Pinewood River so that no adverse water quality	reached capacity April 2018 and exposed tailings will be covered in 2019. Cell 2 was active from April to December of 2018 and therefore plans have not been made to cover it yet. A wildlife exclusion fence was installed around the TMA and the reptile barrier will be completed in 2019 weather permitting.	

Condition/ Tracking #	Description	Status 2018	Date Completed
	effects to amphibians are anticipated; • Maintenance of generally abiotic conditions within the TMA to discourage wildlife presence; and - Covering the exposed tailings beach at closure with a layer of overburden and flooding the remaining tailings with a layer of water to prevent the tailings from oxidizing over the longer term. This will ensure that the tailings pond waters remain of high quality such that they will not pose a threat to wildlife. Margins of the tailings pond will be developed into wetland habitat.		
97	Generally abiotic conditions will be created within the fenced TMA during operations to limit the interest of the pond to waterfowl.	Water quality is considered to be abiotic based on weekly testing results and periodic acute toxicity sampling. To the extent possible the TMA has been cleared of trees and the area is monitored daily for birds which are hazed with bangers when present.	Ongoing
98	Scheduling of RRM development activities will consider environmental aspects, such as fish spawning and bird nesting seasons. Tree and woodland clearing will be restricted to periods outside of the breeding bird season (May 1 to August 15). Clearing or modification of known Trumpeter Swan breeding habitat will be restricted to outside the breeding season (March 15 to August 15).	All scheduling of site activities during 2018 was in full consideration of environmental aspects and no known timing conflicts occurred.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
99	A monitoring plan will be developed for Common Nighthawk and Eastern Whip-poor-will, in partnership with the MNR, EC and interested First Nation Communities including the standardized information suggested well as a mortality trigger that will be decided upon during consultation with the MNR and EC, and in consideration of conditions under the Net Benefit Permit being developed by the MNR.	In accordance with ESA FF-C-001-14 a monitoring plan is under way for EWPW with the goal of implementing a management plan in 2020 with support from MNRF. EWPW and Common Nighthawk are like species and the management plan will benefit both species. Indigenous communities are playing a role in the progressive reclamation that will be dictated by the management plan.	Ongoing
100	Breeding bird surveys are proposed to be carried out along portions of the preferred transmission line corridor in late Spring / early Summer, 2014. Prior to transmission line construction, additional data collection will be undertaken for that portion of the proposed transmission line routing (Alternative A) west of Highway 71, where there is a baseline data gap for breeding bird surveys. This additional data collection will be undertaken to support transmission line permitting and would consist of point count surveys for breeding birds between late May and early July, spread across a 2 km corridor (1 km on either side the transmission line). Results will be made available to MNR once the report is complete. NG will provide opportunities to Aboriginal groups to receive the survey results.	Completed. September 19, 2014	Completed September 19th 2014
101	The primary mitigation strategies for limiting adverse effects to birds and habitat: • Inclusion of wildlife awareness information into regular safety and	The following mitigation strategies for limiting adverse effects on birds and habitat were implemented during 2018; Inclusion of wildlife awareness information in site wide health and safety bulletins and employee orientation has been implemented since 2015. Wildlife logs have been placed in lunch rooms and a site wide protocol is in place to report wildlife	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	environmental inductions performed by the mine. Wildlife sighting logs or information boards will be installed to notify workers of local observations. Workers will be made aware of seasonal changes in local animal behavior or presence in proximity to the mine; • Minimizing the level of potentially disturbing activities near any known or subsequently discovered active raptor and raven nest sites until the nest is vacated; • Annual monitoring of the Bald Eagle nest in Woodland 122 to determine seasonal eagle activity at the nest site which will guide RRM activities occurring in proximity to the nest. Should eagles continue to use the nest site and raise offspring, work will be adjusted appropriately to reduce adverse effects to the breeding success of the local pair; • Maintenance of a safe distance between RRM activities and the nest as well as maintenance of landscape buffer areas (preferably forested or natural) between the activity and nest trees. To avoid disturbing nesting Bald Eagles, no buffer is necessary around nest sites outside of the breeding season once the juvenile eagles are known to have vacated the defined significant wildlife habitat; • Limiting less typical activities in proximity to the nest site during the nest building and breeding season. The local eagle pair appears tolerant of agricultural activities and road grading	sightings to the security department via radio communication or online with the GIS wildlife viewer. Bear awareness training was also provided to interested staff in 2018. In 2016 an eagle's nest was discovered in the north west portion of the property in an area of overall benefit land (no construction). There is the second nest that has been documented on site. Both of these nests are also in areas that will not be subject to tree clearing. Annual monitoring of these nest found them both to have been active and at least one juvenile is known to have been produced in association with the nest in the south. There is a healthy population of Bald Eagles in the area, at one time more than 10 were seen feeding on a deer carcass that had been removed from a road way.	

Condition/ Tracking #	Description	Status 2018	Date Completed
102	In regards to the transmission line: • Additional rare plant and breeding bird surveys to be undertaken in May and June, 2014 to identify any further potential environmental constraints that might require construction modification, such avoidance of disruption to rare plant sites (if present) through site specific habitat protection measures; • Tree clearing to take place outside of the breeding bird nesting season, defined as the period from May 1 to July 31; • Undertaking transmission line construction in winter (normally December 1 to March 31) to better protect ground cover in sensitive areas where the protection of wetlands, rare plants and SAR is required, and completion of the remainder of transmission line construction in the late summer and fall, outside of the breeding bird season; • Direct impacts to raptor nesting areas will be avoided. There are currently no stick nests on or near the proposed ROW. Should any stick nests be identified during construction, the area will be avoided until a qualified avian biologist can be contacted for direction; • Conductor wire separation distances will be sufficiently far apart to	Construction of the transmission line was initiated in late 2015 and completed in April 2016, to ensure no impact to birds and limited impact to understory vegetation. Prior to and during the construction period no sticks nests were identified. A vegetation and breeding bird survey was conducted by qualified biologists during 2014 and no rare plants were identified in the construction area. The separation of conductor wires was reviewed during the design of the hydro line to ensure spacing distance was adequate. - Completed April 2016	Completed April 2016.

Condition/ Tracking #	Description	Status 2018	Date Completed
	preclude larger avian species, particularly raptors which frequently use hydro pole for perching or nesting, from electrocution by contacting two conductor wires simultaneously; • Construction crews will be advised not to interfere with or harass wildlife. No hunting or fishing by construction crews will be allowed. Disciplinary actions will be taken should either occur; and • Contractors will be required to handle food and food wastes in a responsible manner, and to educate workers to ensure no feeding of wildlife.		
103	The site will be rendered suitable for other compatible land uses and functions after the mine has closed and the land has been reclaimed. NG will encourage and, as practical, actively restore the RRM site to productive, naturalized vegetation communities on cessation of mining capable of supporting a diversity of wildlife species. RRM revegetation efforts at closure will include providing suitable habitat for SAR species, most notably whip-poor-will, and other species of interest, if practical.	The site will be rendered suitable for other compatible land uses and functions after the mine has closed and the land has been reclaimed. NG will encourage and, as practical, actively restore the RRM site to productive, naturalized vegetation communities on cessation of mining capable of supporting a diversity of wildlife species. RRM revegetation efforts at closure will include providing suitable habitat for SAR species, most notably whip-poor-will, and other species of interest, if practical.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
104	The RRM footprint has been altered through consultation with the MNR in order to further avoid known whip-poor-will territories where feasible, including maintenance of forest buffers between RRM components and whip-poor-will nesting and foraging habitat where practical. Provide compensatory whip-poor-will habitat that protects known territories and other identified suitable habitat. Where feasible, manage site lighting fixtures to reduce excess light production near whip-poor-will foraging areas, so as to minimize disturbing these nocturnal birds (with all appropriate health and safety issues considered).	The RRM owns and monitors over 1800 ha of overall benefit land in accordance with the Provincial ESA permit ESA FF-C-001-14 since the start of construction. Site environmental inspections address location and use of light plants as necessary while maintaining site safety aspects.	Ongoing
105	NG will implement a monitoring plan for Eastern Whip-poor-will populations and nesting in proximity to the proposed mine and transmission line sites, within compensatory habitat areas. Continue funding external research programs in collaboration with the MNR in order to further our understanding of this poorly studied species, as part of a larger overall benefits compensation package required by the Endangered Species Act permit.	A monitoring plan was developed in 2015 and implemented as required during 2018 in accordance with ESA FF-C-001-14. New Gold retains trained biologists to conduct annual monitoring. New Gold RRM intends to fund a study to investigate EWPW forage species in hopes of using that information to inform future management strategies during 2019. A draft of the EWPW Management plan will be submitted to the MNRF in early 2019, and implementation of that plan will begin in 2020 if possible.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
106	NG will implement a monitoring plan for Bobolink populations and nesting in proximity to the proposed mine site within compensatory habitat areas, and in appropriate control areas - developed through consultation with the MNR. Acquire and protect compensatory open country breeding bird habitat suitable for Bobolink breeding at a ratio of 1:1 for open-country habitat removed for RRM development.	Over all benefit land has been provided in accordance with the Provincial ESA permit ESA FF-C-001-14 and the monitoring plan therein has followed since 2015. New Gold retains trained biologists to conduct the monitoring on an annual basis.	Ongoing
107	NG will identify Barn Swallow nesting colonies prior to mine construction. Establish zones where Barn Swallow colonization is desired, tolerated or not wanted. Create artificial nesting structures to encourage recolonization or new colonization by Barn Swallows in areas where farm structures are removed. Implement a monitoring plan for Barn Swallow populations in proximity to the proposed mine and transmission line sites and in appropriate control areas.	Four artificial nesting structures were put in place in April 2015, prior to the 2015 breeding season. In 2016, two nesting attempts were made in one structure, but no eggs were ever laid. During 2018, the artificial structures were monitored however there were no nesting attempts.	Ongoing
108	Where feasible, RRM lighting fixtures will be directed in such a fashion as to reduce excess production of light to the surrounding environment (for Common Nighthawk and Short-eared Owl).	RRM site lighting fixtures were commonly used in areas close to the main process plant or in construction areas. Visual inspections in these areas were performed when light plants were in use. Issues, such as lighting fixtures oriented at improper angles, were documented in InControl, a computer tracking program used to record environmental and safety concerns. Light plant issues not addressed in a timely manner were shut down and removed from site at the area owner's expense.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
109	Monitoring of key terrestrial systems and SAR: during the construction and operations phase, with post closure habitat development and utilization by wildlife to continue at reduced frequencies consistent with SAR Permit requirements	The SAR permit No. FF-C-001-14 for the project was issued in November 2014 and the following spring SAR monitoring commenced in accordance with the permit. SAR monitoring has occurred annually since 2015 and the MNRF have received four annual monitoring reports. As the project advances opportunities for habitat development post closure will be examined.	2018 Annual SAR Monitoring Report submitted to MNRF January 15, 2019
110	Mitigation measures that will be used to reduce potential adverse effects to Eastern Whip-poor-will will include the following: • Provision of compensatory whippoor-will habitat that protects known territories and other identified suitable habitat; • Restricting the clearing of habitats to periods outside the breeding bird season which occurs from May 1 to August 15; • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Where feasible, management of site lighting fixtures to reduce excess light production near whip-poor-will foraging areas so as to minimize disturbing these nocturnal birds (with all appropriate health and safety issues considered); • Maintenance of forest buffers between RRM components and whippoor-will nesting and foraging habitat where practical; • Management of dust through dust suppression activities (best management practices); • Enforcement of speed limits along mine-controlled roads to reduce the potential adverse	These measures have been implemented since 2015 and continued to date. New Gold RRM will fund a separate / independent research program as a requirement and in accordance with the ESA permit.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	effects of increased vehicular traffic associated with the RRM. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Mitigation measures that will be used to reduce potential adverse effects to Eastern Whip-poor-will will include the following: • Environmental induction of RRM personnel, including SAR identification and sensitivities, and knowledge of Endangered Species Act permit conditions; • Implementation of a monitoring plan for Eastern Whip-poor-will populations and nesting in proximity to the proposed mine and transmission line sites, within compensatory habitat areas and in appropriate control areas; and • Continue funding external research programs in collaboration with the MNR in order to further our understanding of this poorly studied species, as part of a larger overall benefits compensation package required by the Endangered Species Act permit.		
111	The primary mitigation strategies for limiting adverse effects to Bobolink will include: • Restricting the development of open country habitats to periods outside the breeding bird season which occurs from May 1 to July	Since the start of construction (2015) New Gold RRM has implemented the mitigation strategies listed in this commitment on site.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	31; • Acquiring and protecting compensatory open country breeding bird habitat suitable for Bobolink breeding at a ratio of 1:1 for open-country habitat removed for RRM development; • Enforcement of speed limits along mine controlled roads to reduce the potential adverse effects of increased vehicular traffic associated with the RRM. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept to monitor the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; • Environmental induction of RRM personnel, including SAR identification and sensitivities and knowledge of Endangered Species Act permit conditions; • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Restoration of disturbed habitats at mine closure or encouraging development of habitats capable of supporting Bobolink and other open country species; and • Implementation of a monitoring plan for Bobolink populations and nesting in proximity to the proposed mine site within compensatory habitat areas, and in appropriate control areas.		

Condition/ Tracking #	Description	Status 2018	Date Completed
112	Mitigation measures that will be used to reduce potential adverse effects to Barn Swallows will include the following: • Identification of Barn Swallow nesting colonies prior to mine construction; • Restricting habitat displacement for mine infrastructure to periods outside the breeding bird season which occurs from May 1 to August 15; • Creation of artificial nesting structures to encourage recolonization or new colonization by Barn Swallows in areas where farm structures are removed; • Restoration of disturbed habitats at closure or encouraging development of habitats capable of providing suitable Barn Swallow foraging habitat; • Sound abatement strategies will be implemented to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Establishment of zones where Barn Swallow colonization is desired, tolerated or not wanted. These measures may be necessary to prevent colonization in areas of high human or vehicular activity that would put swallows and swallow breeding success at risk or where order and cleanliness are desired. In this case, discouraging tactics may be implemented to discourage colonization. Conversely, protection may be provided to swallows nesting in other locations where their presence is	The RRM began monitoring barn swallows within the project prior to the construction phase (pre 2015) and implemented four artificial nesting structures in 2015 prior to the breeding season to offset the removal of existing farm structures. Monitoring of the success of the nesting structures has been completed over the past four years. Nesting attempts occurred for the first time in 2016 in any of the structures. In 2018 there were no nesting attempts.During regular operation of the Truck Shop the doors are often open, regrettably a pair of barn swallows nested in the Truck Shop and one juvenile Barn swallow was found dead. The juvenile Barn swallow had tried to fledge from the nest with little success and attempts were made to save it. This was reported to MNRF and EC. Best management practices are used to keep birds from nesting in all undesired areas and when a nest is discovered the area receives an appropriate buffer zone until it is found to be abandoned. This nest was not found until after the fledgling was discovered and not in the way of operations. As the project advances toward operations the need to establish zones where barn swallow colonization is desired, tolerated or not wanted will be taken into consideration as well as the need to provide additional nesting structures.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	encouraged and does not cause problems to mine operations. • Enforcement of speed limits along mine controlled roads to reduce potential adverse effects of increased vehicular traffic associated with the RRM. Signs warning drivers of the possibility of wildlife encounters will be posted in areas of high wildlife activity. A log of collisions will be kept monitoring the effectiveness of the proposed mitigation and additional mitigation measures will be implemented if necessary; and • Implementation of a monitoring plan for Barn Swallow populations in proximity to the proposed mine and transmission line sites and in appropriate control areas.		
113	Mitigation measures that will be used to reduce potential adverse effects to all species of Special Concern and Provincially rare species will include the following: • Restriction of principal habitat displacement for mine infrastructure to periods outside the breeding bird season which MNR has indicated occurs from May 1 to August 15 • Implementation of sound abatement strategies to dampen sound infiltrating habitats surrounding high traffic areas of the mine; • Where feasible, RRM lighting fixtures will be directed in such a fashion as to reduce excess production of light to the surrounding environment.	Since the start of construction New Gold RRM has been implementing a no tree clearing policy during the breeding bird season. The project has also implemented sound abatement strategies through planning tree clearing to occur only in areas of mine infrastructure, purchasing new equipment constructed with muffler systems and implementing preventative maintenance programs to ensure all equipment is operating adequately. In 2015 speed limit signs were posted on project roads and security was equipped with radar detection equipment. During the summer of 2016 wildlife crossing signs were installed at six locations to warn drivers of the possibility of wildlife encounters. Currently Black-billed Magpie are found throughout the mine site with no colonization in high vehicular activity or areas of concern. Currently there are no mitigation measures necessary. These measures have been implemented since 2015 as part of general orientation. Seasonal changes in wildlife behavior are	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	• Establishment of zones where Black-billed Magpie colonization is desired, tolerated, or not wanted. These measures may be necessary to prevent colonization in areas of high human vehicular activity that could put magpie and magpie breeding success at risk. Discouraging tactics may be implemented to discourage colonization. Conversely, protection may be provided to magpies nesting in other locations where their presence is encouraged and does not cause problems to mine operations. • Enforcement of speed limits along mine controlled roads to reduce the potential for adverse effects of increased vehicular traffic associated with the RRM. Signs warning drivers of the possibility of wildlife. • Inclusion of wildlife awareness information into regular safety inductions performed by the mine. Workers will be made aware of seasonal changes in wildlife behavior or presence in proximity to the mine. • Treatment of tailings slurry containing cyanide and associated heavy metals in the process plant using the SO2/Air process before being discharged to the TMA; and • Restoration of disturbed habitats at closure including the development of habitats capable of supporting a diversity of wildlife species, including Species of Special Concern and rare species.	communicated via bulletins and tool box talks. Tailings have been treated as required since September 14, 2017. Progressive reclamation working towards closure is on-going, at the end of 2018 an approximate 180 ha of mine site is considered reclaimed.	

Condition/ Tracking #	Description	Status 2018	Date Completed
114	Timing of the transmission line construction will be planned to avoid the breeding bird and main tourist season, as possible.	Clearing and construction of the transmission line right of way was initiated between November 2015 and April 2016 to avoid the breeding bird season and main tourist season.	Completed November 2015 to April 2016.
115	Traditional Knowledge/Traditional Land Use (TK/TLU) data has been widely collected for the RRM, including from the closest communities of BGRFN, Rainy River First Nations and Naicatchewenin First Nation. All TK/TLU sessions were community driven, meaning that the method of data collection was community specific. The majority of the data has been broad and overreaching, which NG will continue to respect as it serves as the basis for Aboriginal Persons unique relationship to the land. TK/TLU collection will continue; information collected will be appropriately considered for construction, operation and closure phases. For example, NG will further investigate the historical travel corridor and incorporate appropriately any new information that may become available. (Letter to Chiefs from Kyle Stanfield, October 2013).	New Gold met with Elders and representatives of two communities in 2018 (Animakee Wa Zhing #37 First Nation and Anishinaabeg of Naongashiing) and gathered Traditional Knowledge for use in helping select plants and trees to plant in vegetation trial plots that will be planted in spring 2019. The information gathered from TK and trial plots will be used for reclamation as needed now and mine closure.	Ongoing
116	NG will share results of the TK/TLU data sessions in a non-public First Nations forum(s). (Letter to Chiefs from Kyle Stanfield, October 2013).	TK/TLU data is owned by individuals and communities. NG has shared available data as requested within specific communities.	Completed Prior to January 15, 2015 as part of Environmental Assessment Consultation

Condition/ Tracking #	Description	Status 2018	Date Completed
117	NG has an open invitation for First Nations, the MNO and regional stakeholders to participate in all baseline and environmental monitoring programs, including Whip-poor-will, where appropriate and to share monitoring results. NG will continue to advise of the opportunity at public forums in order to encourage anyone who's interested to participate. (Letter to Chiefs from Kyle Stanfield, October 2013).	During the completion of baseline studies as part of the Environmental Assessment Permitting Process, New Gold retained the assistance of volunteers from a number of communities to participate in data collection. In 2015 and 2016 community members from Big Grassy participated in fisheries research projects. Since the second year of construction New Gold has also employed a community member from Big Grassy as an Environmental Monitor (full-time) within the Environmental Department. Job duties of this position include; air quality, water quality and wildlife sampling and monitoring, participating in on site reclamation projects and reporting on site findings to their community. In addition New Gold has developed Environmental Monitoring Boards as a method of communicating on site environmental activities and research studies to the public.	Ongoing
118	Additional information related to Lake Sturgeon and the Rainy River First Nations management program as requested, was added to the Final EA Report. NG has committed to a program of close coordination with Rainy River First Nations in support of the pre-existing First Nation Watershed Program and water quality protection. Company funding will be provided as part of the fisheries compensation program to further water quality enhancement programs for the Pinewood and similar agriculturally-impacted waterways.	In 2017 the RRM Environmental Manager met with the Rainy River Stewardship Committee on a few occasions to discuss potential programs, however the Committee didn't pursue the option. New Gold also requested First Nation participation in the annual Fish Tissue Sampling Program in the Pinewood River (Fall 2017) however aside from the onsite First Nation Environmental Monitor there was no additional participation.	Ongoing
119	NG will reach out to the Seven Generations Education Institute and/or the MNR to obtain any additional information on baseline health of animals and fish. (Letter to Chiefs from Kyle Stanfield, October 2013).	Completed as of March 3, 2014.	March 3, 2014.

Condition/ Tracking #	Description	Status 2018	Date Completed
120	Aboriginal People will play an active role in the development of the mine Closure Plan, including development of the monitoring and mitigation programs. While the Closure Plan will be completed prior to construction, NG will consult on significant revisions periodically during operations to ensure incorporation of TK and best management practices. (Letter to Chiefs from Kyle Stanfield, October 2013).	The Aboriginal Communities participated in a joint technical review of the Closure Plan and have planned participated in the 2017 Closure Plan Amendment.	Completed August 2014.
121	Monitoring programs targeted at ungulates (moose, deer) will be coordinated with local Aboriginal people. (Letter to Chiefs from Kyle Stanfield, October 2013).	The Deer Tissue Monitoring Program was initiated in the Fall of 2016 and continued during 2017 and 2018. The intent of the project is to collect tissue samples to monitor for metal and cyanide accumulation. In 2016 Aboriginal Communities were consulted, regarding the program. Additional information related to monitoring programs and results are shared with Aboriginal Communities through Environmental Monitoring Boards. The Monitoring Boards are regular meetings organized by New Gold as an opportunity to provide project updates and environmental monitoring and sampling information. The implementation of the Monitoring Boards commenced in 2016 and became more regularly attended in 2017 and 2018.	Ongoing
122	NG would be pleased to assemble a map showing the locations of the closest First Nation community water supply intakes on receipt of the locations/coordinates. (Letter to Chiefs from Kyle Stanfield, October 2013).	Water supply intake locations known were included on map provided by New Gold Rainy River Project (October 1, 2014).	Completed October 1, 2014.

Condition/ Tracking #	Description	Status 2018	Date Completed
123	While the Draft EA has shown no impacts to Aboriginal or non-Aboriginal people's health, any new information that has a potential to impact health will be provided to Aboriginal people. (Letter to Chiefs from Kyle Stanfield, October 2013). Further, NG has committed to analyses ungulate organ meats voluntarily submitted to them by local hunters, with the results of any such analysis made available to local residents and Aboriginal communities.	No new information was obtained or new impacts predicted during 2018 related to the RRM that could affect the health of Indigenous people. The Deer Tissue Monitoring Program was run in 2018 which is the third year of the program. Copies of the 2016 and 2017 Deer Tissue Monitoring Report have been made available to all stakeholders and in 2019 the 2018 report will be distributed.	Ongoing
124	NG will work with Aboriginal groups to ensure employee overall well-being. Programs to highlight the dangers of drug use combined with drug testing will be implemented. (Letter to Chiefs from Kyle Stanfield, October 2013).	An Indigenous Community Coordinator has been employed by New Gold to act as a liaison to employees and is available to meet with employees. New Gold provides employee benefits and employee assistance programs to all staff and their families. New Gold also has seasonal public ceremonies, established tobacco offering stations and provides an employee assistance program as part of the benefits provided to all employees. Additionally, ceremonies have been provided to employees by request.	Ongoing
125	As a best practice and acting as a responsible neighbor, NG will notify local stakeholders of project activities as appropriate.	New Gold provided a site tour to for the neighbors. Additionally, in 2018, there were five public tours and two newsletters distributed district wide. Neighbour Tour - August 22, 2018 Public Tours - July 26, 2018 (2), August 2, 2018 (2), August 7, 2018 Newsletter distribution - July 27, 2018 and December 20th 2018 Blast notification is also provided for any blasts that occur outside of the usual blast times or if the blast is considered to be at a location that may impact the neighbour.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
126	NG has and will continue to actively engage the MNR and local outfitters including those that hold the Bear Management Areas that will be affected by the RRM.	During 2018 one member of the New Gold Environmental Department completed the Problem Black Bear Management Course provided by MNRF. This brings the total number of staff trained to three. New Gold then obtained an Authorization to Trap and Relocate Black Bears. Regular discussions occur with the individual who holds the Bear Management Area in which the mine resides.	Ongoing
127	NG will calculate the area of forest land that will be removed from the total forest land within BGRFN territory, utilizing public sources and provide this information to the First Nation on delineation of the traditional territory by the BGRFN.	New Gold had extensive discussions with Big Grassy River First Nation (BGRFN) regarding traditional territory. A Participation Agreement was signed in January 2015. New Gold also provided the clearing plan to BGRFN on February 13, 2015.	Completed January 2015
128	NG is consulting with First Nations and the Métis Nation of Ontario (MNO) on the Draft Closure Plan provided on March 19, 2014. NG has provided resources to these communities to undertake independent review the Draft document. Results of the independent review process will be used to help the Company develop any further commitments and/or mitigations to reduce potential impacts to Aboriginal and treaty rights. This process is expected to be completed concurrent with the conclusion of the EA process.	Nine First Nations and the MNO confirmed participation in the Draft Closure Plan technical review. The results of these independent technical reviews were submitted to New Gold in September 2014, with detailed responses provided and revisions made to the Closure Plan submitted in 2015 as appropriate based on the comments received. The Closure Plan was accepted as filed by the Ministry of Northern Development and Mines on February 23, 2015, shortly after positive decisions on both the Federal and Provincial EAs.	Completed September 2014. Closure Plan filed February 23, 2015.
129	NG is open to discussing closure objectives in relation to the results of the Traditional Knowledge / Traditional Land Use (TK / TLU) study.	The Environment department met with Elders and representatives of two communities in 2018 (Animakee Wa Zhing #37 First Nation and Anishinaabeg of Naongashiing) and gathered Traditional Knowledge for use in helping select plants and trees to plant in vegetation trial plots that will be planted in spring 2019. The information gathered from TK and trial plots will be used for reclamation as needed now and during mine closure.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
130	NG is supportive of the further development of mitigation measures in relation to traditional hunting (and plant gathering), which could potentially involve: • Continuing to involve BGRFN members in the development of adaptive management techniques related to closure planning, including the rehabilitation of habitat for wildlife; and • Restoring access to RRM lands following mine closure to the extent that such access is safe / possible.	New Gold has a Participation Agreement with BGRFN that takes this commitment into consideration.	Ongoing
131	NG has committed to provide members of the BGRFN, Big Island First Nation, Ojibways of Onigaming First Nation, Naotkamegwanning First Nation, Rainy River First Nations, Naicatchewenin First Nation and Métis represented by the MNO Region 1 Consultation Committee, the ability to access certain lands that NG is able to make available for gathering of wild medicines, berries or other vegetation. Access will be coordinated with the Aboriginal communities.	NG remains committed to providing access to all areas of the site that are safe to do so. In 2018, Indigenous communities accessed a designated ceremonial area on Gallinger Road; access to other areas was allowed when it was safe to do so and with site personnel present. Several site tours were provided: Archaeology site tour - September 19, 2018 Whitefish Bay site tour - September 6, 2018 Naicatchewenin FN site tour - August 23, 2018 Big Grassy FN site tour - August 13, 2018 RRFN/Naicatchewenin FN site tour - July 26, 2018 AON site tour - July 17, 2018 Whitefish Bay school tour - June 6,2018 Big Grassy high school site tour - May 30, 2018 RRFN site tour - January 17, 2018	Ongoing
132	NG has committed to ensure that Aboriginal communities (including BGRFN, Big Island First Nation, Ojibways of Onigaming First Nation, Naotkamegwanning First Nation, Rainy River First Nations, Naicatchewenin First Nation and Métis represented by the MNO	New Gold remains committed to the opportunity for ceremony. New Gold hosted two ceremonies in 2018, one in Spring and one in Fall. Spring Ceremony - May 23, 2018 Fall Ceremony - October 3, 2018	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	Region 1 Consultation Committee) have the ability to access the site for cultural and ceremonial purposes so that local Aboriginal people can undertake ceremonies at different times of the year to show respect for the land and its spiritual aspects. This will ensure that young people can participate in ceremonies and learn from elders and ceremonialists. Teaching through the generations will therefore be maintained.		
133	A detailed Fire Response Plan will be developed (Final EA Report, Section 8.2). This document will be made available for MNR review prior to construction initiation.	A detailed Fire Response Plan was developed in 2015. In 2016 the plan was reviewed. New Gold employees under the direction of the Health and Safety Department have established an Emergency First Response Team. Members of the team have been trained to use the onsite fire truck and fire suppression equipment.	Completed April 2016
134	134. NG will engage with local stakeholders as appropriate to provide notification of project activities and to mitigate potential impacts as practical.	NG sent out two newsletters in 2018, hosted public tours, participated in local events and provided presentations. • Newsletters: July 27, 2018 and December 20, 2018 • Public Tours: July 26, 2018, August 2, 2018, and August 7, 2018 • Archaeology Tour: September 19, 2018 • Presentation and Site Tour: Minnesota Minerals Coordinating Committee, July 20, 2018 • Baibombeh School Site Tour: June 6, 2018 • Rainy River High School Site Tour: May 30,2018 • MP-Thunder Bay/Rainy River Tour - May 16, 2018 • Engineers (LOTW chapter) Tour - May 12, 2018 • Presentation and Site Tour: Sturgeon Creek School October 23, 2018 • Presentation: St. Francis School September 27,2018 • Presentation - AKRC Mining Conference February 13, 2018 • Advisory Services Site Tour: November 1, 2018	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
		• Presentation: Mikinaak Onigaming Public School October 30, 2018	
135	Related to the transmission line: • Compensation will be provided for merchantable timber value where applicable; • Maintain transmission line set back distances of not less than 100 m from area lakes to provide effective visual screening from open waters; • Landscape screening to minimize the contrast in landscape character; for example by leaving shrub cover vegetation that will not affect the conductors (i.e., the wire) in the ROW at creek crossings; and • Minimizing land use conflicts and concerns by consulting with other users and stakeholders (i.e., Aboriginal peoples, hunters, trappers, outdoor recreationalists) to identify and implement other means of conflict resolution.	NG proactively placed newspaper advertisements to advise recreational users of construction activities along the transmission line during the hunting season in 2015, as well as engaged with the Clearwater Association.	Commitment completed 2015

Condition/ Tracking #	Description	Status 2018	Date Completed
136	NG will implement a hiring policy that encourages employment of local workers, including members of human environment regional study area First Nations and Métis communities. Where feasible, goods and services will be procured from local and regional suppliers as well as suppliers that can further demonstrate Aboriginal employee content. Provide on the job Common Core training to assist local workers to develop mining-specific skills and implement career training and development opportunities for employees once hired. NG will provide continuous, on the job safety training.	In 2015, NG implemented a Human Resource Strategy that focused on local employment which continued through 2018. As of December 31, 2018, 73% of New Gold employees were from the regional study area. Local and Indigenous content is a consideration in all RFP's issued. Training and development is provided to all operations employees to ensure legislated requirements are met. Since 2015, New Gold RRP maintains the position of a business development officer who is available on staff to support local businesses in providing goods and services to the project.	Ongoing
137	NG will continue to engage with potentially affected stakeholders as the project develops, including those local and regional businesses which may provide accommodation facilities for the RRM workforce.	NG continues to send out newsletters and engage with local stakeholders. Using external facilities (such as a local contractor's construction on the accommodation facility), NG and its' contractors continue to engage with local businesses for accommodation as post-construction activities continue. • Newsletters - distributed July 27, 2018 and December 20, 2018 • Local Ec Dev & business interest tours or meetings: January 17, 2018, April 20th 2018, September 27, 2018, October 22, 2018, November 1th 2018 • Entrepreneur workshop: August 20, 2018 • Industry Advisory Group meetings: May 24, 2018, October 31, 2018	Ongoing
138	Fish habitat compensation will be provided onsite related to the Federal Fisheries Act. A portion of this compensation habitat, notably the Clark Creek, Clark Creek pond and Teeple pond, could potentially be provided to licensed bait fishermen	NG completed an agreement with a local bait harvester on August 11, 2017.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
139	NG respects BGRFN's Aboriginal and Treaty Rights, and is working with the community to develop a collective agreement that will include mutually acceptable means for mitigation of accepted impacts.	NG and BGRFN signed a participation agreement on January 9, 2015.	Commitment completed January 9, 2015.
140	Where NG has control, commercially reasonable efforts will be made to work with Resolute, MNR and local loggers to facilitate the use of merchantable timber by local mills, in recognition of the importance of mills to the local economy.	Since 2015 the project footprint has been cleared under permits and authorizations granted from the MNRF. In 2018 local logging companies were hired to remove timber from site.	Ongoing
141	NG will make reasonable efforts to accommodate Resolute in providing access through NG lands to Crown lands over which Resolute has an interest provided that the access does not interfere with mine construction or operation; that the access does not put the safety and security of NG or Resolute personnel or property at risk; and subject to the prior execution of any land access agreement(s) which NG deems appropriate.	Authorizations granted from the MNRF. In 2017 a local logging company was hired to remove merchantable timber to support project development	Ongoing
142	As the mine approaches the end of mine life, NG will implement strategies to transition the workforce to buffer the effects of job losses, as well as an Adjustment Committee.	Not applicable during 2018 (Construction Phase and start of Operations Phase).	Ongoing
143	The health and safety of workers will be ensured by meeting applicable occupational health and safety legislation standards, as well as utilizing other best management practices for industrial hygiene hazard control as appropriate.	New Gold RRM strives to meet or exceed the health and safety regulatory requirements. New Gold RRM provides and ensures that all workers have the necessary personal protection equipment (PPE) to protect against industrial hygiene exposures. The safety department also ensures that workers receive appropriate training in regard to PPE.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
144	While the Draft EA has shown no impacts to Aboriginal or non-Aboriginal people's health, any new information that has a potential to impact health will be provided to Aboriginal groups. (Letter to Chiefs from Kyle Stanfield, October 2013). NG has committed to analyses ungulate organ meats voluntarily submitted to them by local hunters, with the results of any such analysis made available to local residents and Aboriginal communities.	No new information was obtained, or new impacts predicted during 2018 related to the RRM, that could affect the health of Indigenous or non-Indigenous people.	Ongoing
145	NG will work with Aboriginal groups to ensure employee overall well-being. Programs to highlight the dangers of drug use combined with drug testing will be implemented. (Letter to Chiefs from Kyle Stanfield, October 2013).	An Indigenous Community Coordinator has been employed by New Gold to act as a liaison to employees and is available to meet with employees. New Gold provides employee benefits and employee assistance programs to all staff and their families. New Gold also has seasonal public ceremonies, established tobacco offering stations and provides an employee assistance program as part of the benefits provided to all employees. Additionally, ceremonies have been provided to employees by request.	Ongoing
146	A blasting plan will be developed describing all proposed blasting operations at the RRM site. All personnel who handle explosives will have appropriate training; all other individuals will be restricted from access.	New Gold Rainy River developed blasting plans in 2018 that followed this commitment. All personnel who handle explosives have the appropriate training. A locked fence with signage restricts access to the explosives mixing and storage areas.	Ongoing
147	Recognizing that safety of workers is paramount, NG will attempt to reduce light pollution as possible.	New Gold ensures night shift inspections are conducted and include laydowns and work areas. Light plants and general lighting is evaluated to ensure worker safety and to minimize associated pollution and impact on wildlife.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
148	The RRM has been designed to meet all applicable fire protection system requirements and codes. Regular fire drills will occur to ensure that all workers are familiar with fire response procedures, as dictated within the environmental management system. All workers and visitors on site will receive an orientation which includes fire reporting and response procedures.	All personnel on site receive a site orientation. The site has acquired a fire truck and an ambulance. An Emergency Response Team has been created and employee members have received training on how to respond to fires and other potential onsite emergencies. In order to prepare for major events, two fire drills were held in 2018.	Ongoing
149	Should it be determined in the future that additional fire break is required, appropriate approvals will be obtained from the MNR.	The need for an additional fire break was not identified in 2018.	Ongoing
150	NG will ensure that safe access to properties is maintained during the construction and operation phases of the project. Once detailed plans are progressed, NG would welcome the opportunity to discuss further.	During the construction phase of the project (2015-2017) New Gold used signage, gates and on-site security as a means of ensuring staff, contractors, visitors and public land owners were navigating the mine site and construction work zones appropriately and safely. Additional conversations with adjacent public land owners have remained ongoing when necessary to ensure safety. To date public access has been maintained on the Marr Road via Korpi Road and signs have been installed to direct traffic accordingly. A gate house has installed at the main entrance to the site and security personnel stop all vehicles to ensure the driver and passengers have appropriate identification to be on site. Additionally, security staff are responsible for patrolling the site.	Ongoing
151	Any infrastructure, such as hydro services, that require relocation will be completed as expediently as possible, to minimize disruption to local users. It is currently envisioned that the disruption will only occur during the switchover from the existing to the (at that time) newly built line.	During the construction of the mine the two key projects that directly impacted the public were the installation of the hydro line and the realignment/construction of Highway 600. Both of these projects were completed in 2016. New Gold has always been committed to informing the public of the projects potential impacts by providing project updates through	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
		public open houses, meetings, advertisements and newsletters.	
152	The re-aligned Highway 600 will be constructed by NG to MTO standards so that NG can pursue transfer of the road to the Province after construction.	This approach was taken during 2016. Construction of re-aligned Highway 600 was completed in 2016 and officially turned over to the MTO in 2017.	Completed 2017
153	NG has had extensive consultations with the MTO in Thunder Bay related to the RRM highway planning and will continue to discuss issues related to the Highway 600 re-alignment, and associated maintenance and safety issues with MTO, the Township of Chapple, Stratton, the Rainy River Valley Safety Coalition, school bus operators, utility companies and emergency response groups.	In 2016, NG had extensive discussions with the MTO, Township of Morley, Township of Chapple and Hydro One regarding Highway 600. The re-aligned Highway 600 was opened to the public on December 23, 2015. An agreement was signed with the Township of Chapple on March 24, 2016. An agreement was signed with the Township of Morley on Feb 17, 2016. Ownership of the new portion of Highway 600 was turned over to MTO in 2017.	Completed 2017
154	A new East Access Road will connect Highway 71 with Roen Road by means of Korpi Road, to provide access for the general public, including to properties on Marr Road and for users of Crown land north of the site.	Construction of the East Access Road (Korpi Road) was completed and opened to the general public in 2016.	Completed 2016
155	NG will schedule the delivery of major equipment at off peak times where practical and ensuring that heavy loads are sized appropriately and transported only on highways that have sufficient load capacities while observing half-load seasonal restrictions.	The majority of large-scale equipment for the open pit and mechanical components for the mine were shipped to the site in 2016 and all load transport requirements and restrictions were met. As the mine continues to operate New Gold will continue to hire experienced transportation hauling companies to deliver equipment and products to the site.	Ongoing
156	Only licensed suppliers and carriers will be selected for the supply and transport of hazardous materials to the RRM site. When suppliers are selected, Rainy River will share supplier handling and transport information with the MNO.	Has been implemented. Only licensed suppliers and carriers were selected for the supply and transport of hazardous materials to the RRM. Information was shared with the MNRF by the RRM in compliance with this condition during 2016.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
157	Drivers will be required to meet all applicable regulatory training requirements, be trained in spill response procedures for the materials they transport and carry the appropriate Material Safety Data Sheets.	Drivers of licensed suppliers are required to be trained and carry the licenses, permits, documentation and signage as required.	Ongoing
158	Vehicles transporting materials to site will be required to maintain a supply of basic emergency response equipment, including communication equipment, first aid materials and a fire extinguisher, where appropriate.	All vehicles travelling onsite are required to have a spill kit, first aid kit, fire extinguisher and radio. New Gold has also provided an onsite emergency response trailer containing equipment and supplies for handling hazardous spills to the environment. In 2015 an Emergency Response Team comprised of New Gold employees was established. Since 2015 the Team has obtained training on operating fire suppression, driving the fire truck and using emergency spill containment equipment.	Ongoing
159	Notification and/or reporting of any vehicular accidents and spills will follow Provincial (Ministry of the Environment) and other applicable requirements.	During 2018, there were no incidents of vehicular accidents causing spills. Each incident where a vehicle left the road was monitored during the vehicle removal for any spills.	Ongoing
160	With regards to controlling adverse traffic effects during transmission line construction: • Ensuring that NG employees and contractors / subcontractors adhere to posted speed limits and practical speed limits along the ROW; • Contractors and their subcontractors will be required to have properly and seasonally maintained equipment; and • Maintain regular communications with the Township of Chapple, the MTO and Ontario Provincial Police representatives, to monitor and mitigate traffic effects.	Construction of the transmission line was completed between November 2015 and April 2016. There were no traffic impacts or accidents during completion.	Completed April 2016.

Condition/ Tracking #	Description	Status 2018	Date Completed
161	NG will monitor regional housing supply, particularly in the Chapple, Emo, and Fort Frances markets during the planning and construction phase of the RRM and in advance of each wave of new operations employment. Engage in regular discussions with Municipal planning officials in these communities to understand the anticipated evolution of their resale and new-home markets, and the extent to which each community desires growth or does not. NG will continue to work with hoteliers and town officials, to help avoid possible construction employment demands that would negatively affect accommodation capacity needed to support the tourist season.	To alleviate pressures on regional housing supply and hoteliers, during 2018 NG has: 1) continued to contract a local Indigenous business to provide a 400+ person accommodation facility for construction workers who are contracted by New Gold. The accommodation facility is located on Atkinson Road in Chapple Township. Atkinson Road is located 1.5km south of the junction of Barwick Road and Highway 600 (or approximately 5 km south of the open pit). The accommodation facility was built by Onikaajigan Construction, a partnership between Rainy River First Nation, Naicatchewenin First Nation and Saulteaux Consulting and Engineering. It is owned and operated by Onikaajigan Construction. New Gold exclusively leases the camp facility for the purpose of housing out of town construction workers. 2) committed to local employment Previous to 2018 3) worked with local developers to construct new accommodation (an apartment facility) in the Township of Emo 4) with the completion of a number of contracts relating to construction, a number of private rental facilities became available to the general market towards the end of 2017.	Ongoing
162	Develop suitable policies and initiatives to encourage carpooling amongst employees, with the aim of reducing commuter-related traffic and reducing the individual burden of commuting. NG may explore alternate accommodation strategies to support its employees.	Completed on April 14, 2015. A number of former local residents have come forward to request copies of the reports which NG provided. During 2018, buses were used to transport employees to site from Fort Frances, Emo, Rainy River, Barwick and Stratton.	Completed April 14, 2015.

Condition/ Tracking #	Description	Status 2018	Date Completed
163	NG will continue to discuss the RRM and potential additional demands that could be placed on the services of regional Municipalities. NG will continue to support government-led initiatives that support social sustainability during all project phases. NG with work with local service agencies to gather information about social issues or service capacity issues so that they may be addressed in a collaborative manner. NG will maintain communications with local and regional service providers to monitor and work collaboratively to address any Project-related changes that may be experienced.	In 2018, New Gold contributed financially to the Rainy River District Social Services Administration Board. Also, NG is reducing strain on the local medical system by employing a Nurse Practitioner on site that is available to all employees.	Ongoing
164	Potential health risks associated with the consumption of ungulate organ meats will be mitigated through the voluntary submission of organ meats by local hunters for analysis. Results of any such analysis would be made available to local residents and Aboriginal communities.	In 2016 New Gold implemented a deer tissue monitoring program to establish baseline data of metal and cyanide accumulation in deer tissue for the population found within the project boundary and the Rainy River District. Requests for participation in the study were mailed out to Aboriginal Communities as well as posted in public spaces throughout the District. In 2016 37 tissue and organ samples were obtained from area hunters as well as deer carcasses from motor vehicle accidents. In 2017 36 samples were submitted. The samples were sent to a certified lab to be analyzed for metal and cyanide accumulation. It is important to note that all of the contaminants which were tested for can be produced by mining operations but can also occur naturally in the environment and can be introduced by other human activities. The study continued in 2018 and is planned to run again in 2021, 2024, 2027, 2030, 2033 and 2036 or as requested/needed. A copy of the 2017 White Tailed Deer Tissue Sampling Report can be found in Appendix P. The 2018 report will be available in the spring of 2019.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
165	NG has committed to undertaking a mitigation program related to cultural heritage landscapes and built heritage resources consisting of an illustrated history of the study area.	An illustrated settlement history of the study area was completed by Dan Morisseau in 2015. The completion date was October 23, 2015.	Completed October 2015.
166	Emergency response procedures will be established as part of the environmental management system. After any incident, a review will be conducted to ensure that the required design changes and procedures and appropriate monitoring measures are in place to ensure that incident will not be repeated.	A dedicated Emergency Response Coordinator was hired in October 2018 to put more emphasis on ER preparedness.	Ongoing
167	NG has committed to ensure that First Nations (including Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Big Island First Nation, Naotkamegwanning First Nation, and Ojibways of Onigaming First Nation) and Métis community members have the: • Ability to access the site for cultural and ceremonial purposes, so that local Aboriginal people can undertake ceremonies at different times of the year to show respect for the land and its spiritual aspects.	New Gold RRM is committed to providing access to the site for cultural and ceremony purposes.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	All NG staff will undergo cultural awareness training. Temporary contractors will undergo an awareness program as part of the regular induction program when working at the mine (Letter to Chiefs from Kyle Stanfield, October 2013). This will ensure that people that work at the site are aware of indigenous culture and values, and are respectful of the principles and values of the Ojibwe people. This mitigation has been identified as a result of the Draft EA independent First Nation review and agreed to by NG. NG will follow up directly with the BGRFN regarding any additional mitigation and accommodation measures.	All New Gold RRM staff and contractors undergo Cultural Awareness training as part of the site induction. Additionally, New Gold has a Participation Agreement with BGRFN which addresses additional mitigation and accommodation measures.	
168	NG is fully agreeable to work with local Aboriginal peoples on an ongoing basis to monitor metal concentrations in country foods (notably fish muscle and liver tissues, and White-tailed Deer liver tissue; and other wildlife tissues as appropriate. A commitment to work with local Aboriginal groups to sample White-tail Deer liver tissues [and other wildlife tissues as committed to herein] for metals analysis has been made. This analysis could be expanded to include testing for additional metals. NG will work with local Aboriginal hunters to determine the most effective path forward on this topic.	In 2016 New Gold implemented a deer tissue monitoring program to establish baseline data of metal and cyanide accumulation in deer tissue found within the project boundary and the Rainy River District. Requests for participation in the study were mailed out to Aboriginal Communities as well as posted in public spaces throughout the District. In 2017 36 tissue and organ samples were obtained from area hunters as well as deer carcasses from motor vehicle accidents. The samples were sent to a certified lab to be analyzed for metal and cyanide accumulation. It is important to note that all of the contaminants which were tested for can be produced by mining operations but can also occur naturally in the environment and can be introduced by other human activities. Many of the contaminants were considered to be at negligible or low levels within most of the 37 samples tested, although a few had quite high variances with concentrations elevated over the majority of the values. These samples were not taken within the boundary of the RRM. In regard to the 2017 deer tissue report it should be noted that contaminant levels where shown to be lower in 2017 versus	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
		2016. The study continued in 2018 and is planned to run in 2021, 2024, 2027, 2030, 2033 and 2036 or as requested/needed. A copy of the 2017 White Tailed Deer Tissue Sampling Report can be found in the Supporting Documentation for Appendix XXX. The 2018 report will be available in 2019. Results from the 2018 Fish Tissue Monitoring Program indicated that there has been no accumulation of metals in the tissue and organs of northern pike and walleye in the Pinewood River as a result of the project. A copy of the 2018 Fish Tissue Quality Monitoring Report can be found in Appendix G	
169	NG will conduct a risk assessment of the potential long-term exposure of fish and wildlife to accumulated metals within the constructed wetland. Such a study will be carried out within one to two years prior to mine closure (or earlier during the project operations phase), and if a meaningful risk is determined to exist the risk will be mitigated as part of overall mine closure by removing and disposing the contaminated sediments to the bottom of the pit lake. This could readily be accomplished by a small dredging operation.	This commitment is currently not applicable to the current stage of the project. The constructed wetland is planned for construction in 2019.	Ongoing
170	Unterman McPhail will prepare a complete description of the evaluation process for resources identified of cultural heritage value or interest in a memo format.	The memo was completed September 11, 2013.	Commitment completed September 11, 2013.
171	At closure, NG will undertake an evaluation of any remaining cultural heritage resources / structures located on NG property in consultation with a qualified professional, and also incorporating any liability/public safety concerns.	Not applicable to 2018.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
172	A range of conservation approaches will be considered in the recommended Cultural Heritage Assessment Report / Cultural Heritage Documentation Reports for Sites #11 and #13 as suggested by MTCS.	Site #11 was demolished in 2015 as it was deemed to be hazardous as it was not structurally fit. Unique features, such has blacksmith hardware were removed and are currently in storage. As part of the development of the Richardson Trail, NG intends to highlight the settlement history through artifacts such as the hardware. Prior to the demolition, NG had contacted a representative of the Chapple Heritage Committee to ensure there were no other considerations. Site #13 remains in situ. Infrastructure(tails line) has been constructed prohibiting access to the structure. .	Ongoing
173	NG will provide follow-up documentation related to Cultural Heritage Assessment Report / Cultural Heritage Documentation Reports to the following local museums and archives: • Chapple Museum; • Kay-Nah-Chi-Wah-Nung Historical Centre (Manitou Mounds); • Rainy River District Women's Institute Museum; and • Fort Frances Museum and Cultural Centre.	Completed on April 14, 2015. A number of former local residents have come forward to request copies of the reports which New Gold RRM provided.	Commitment completed April 14, 2015.
174	Monitoring would occur for the following durations: • Archaeology: construction phase • Built heritage: construction phase	New Gold had an onsite Archaeologist throughout the construction phase. No additional Archaeological or built heritage resources were identified in 2018.	Completed 2015 to 2017
175	With regards to protection of cultural heritage values during transmission line construction: • Should human remains be identified during construction, all work in the vicinity of the discovery will be suspended immediately, and notification will be made to the Ontario Provincial	No human remains or cultural resources were identified during transmission line clearing in 2015 to 2016; the Transmission Line construction was completed April 2016.	Completed April 2016.

Condition/ Tracking #	Description	Status 2018	Date Completed
	Police, or local police, who will conduct a site investigation and contact the district coroner. Notification must also be made to the Ministry of Tourism, Culture and Sport, and the Registrar of Cemeteries, Ministry of Government Services. • Should cultural heritage resources (archaeological or historical materials or features) be identified during construction or operations, all activity in the vicinity of the find will be suspended and the Ministry of Tourism, Culture and Sport archaeologist be contacted. This condition provides for the potential for deeply buried sites not typically identified; and • In addition, NG will continue to engage Aboriginal people (including Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Big Island First Nation, Naotkamegwanning First Nation, Ojibways of Onigaming First Nation and Métis community members) about the transmission line construction and will respond should additional culturally significant areas be identified that could be impacted by the construction.		

Condition/ Tracking #	Description	Status 2018	Date Completed
176	Related to transmission line, construction will be supervised by a qualified archaeologist at identified areas of high archaeological potential. Regular, ongoing discussions with stakeholders, Aboriginal people and local communities will help to monitor any effects to the socio-cultural environment and identify mutually satisfactory ways to mitigate negative or enhance positive effects. A formal complaints procedure will be established to provide stakeholders and Aboriginal peoples a voice during the construction, operation and decommissioning phase of the transmission line project. A response protocol will also be established to ensure that follow up occurs.	Prior to construction activities, NG conducted the required assessments on the transmission and line, which included the field assessment of high potential areas as per the 2011 Standards and Guidelines for consultant archaeologists. NG also employs a qualified archaeologist and in 2015 had consultant archaeologist on site. No cultural resources were identified during construction. Archaeology clearance letter was received on the transmission line on Dec 29, 2014.	Completed December 29, 2014.
177	A targeted site investigation will be conducted at the end of mine life to identify soils that may have been affected by hydrocarbons or chemicals in specific areas (e.g. truck refuelling area). Soil materials found to exceed the appropriate clean up criteria for hydrocarbons will be remediated according to government requirements. If there is reason to suspect an area of soil has been affected by chemicals other than hydrocarbons, soil samples will be collected and tested. If the applicable regulatory requirements are exceeded, an appropriate method of disposal will be sought in consultation with the relevant authorities.	This condition will be applied at the time of mine closure and reclamation.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
178	Document and respond to comments, issues or concerns.	An External Feedback and Complaint Protocol was issued in follow up to the Provincial EA approval with a completion date of February 2, 2015, and continues to be implemented in 2018.	Ongoing
179	NG made 13 significant commitments (Tables 3-4 and 14-2) arising from the independent technical review of the Draft EA Report (Version 1) on behalf of Aboriginal groups which will be fulfilled.	These commitments were all met as described in this registry, or through negotiated agreements (non-public).	Ongoing
180	BGRFN undertook a second independent review of the Draft EA Report provided to the NG on October 18, 2013. The review concluded that additional work with the community was required and NG has committed to continuing the close engagement with the community in support of the RRM development.	BGFN and NG signed a Participation Agreement on January 9, 2015. In the agreement there is a defined protocol for communication and engagement.	Completed January 9, 2015.
181	Environmental monitoring will be conducted in accordance with standard practice and regulatory requirements, including any site-specific environmental approvals.	Since the start of construction New Gold has had environmental personnel assigned to environmental monitoring to satisfy regulatory requirements and permit approvals. During 2016 and 2017 several of these monitoring protocols where written into Operational Policies for the Environmental Department. New Gold's Environmental Department also launched a site wide computer program (Intelex) in 2017 which houses all of the permit conditions and compliance conditions for the RRM. Employees are assigned to these tasks and are required to enter appropriate data, reports and outcomes to ensure compliance with site-specific conditions and approvals. In addition to 2017 we are in the process of constructing an EMS system that will be in compliance with ISO 14001.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
182	Operational procedures to minimize the potential of accidents or malfunctions will be incorporated into the environmental management system. Penalties will be imposed for operational violations.	During 2018, the EMS continued to be developed and ongoing. The EMS system continues to be developed using the ISO 14001 Standards and will include operational procedures with penalties for nonconformance.	Ongoing
183	Procedures will be regularly reviewed as part of the environmental management system.	In 2018, the design of an ISO 14001 compliant Environmental Management System (EMS) was completed for the RRM. Both New Gold Corporate and the RRM have policies and procedures in place that are reviewed. Procedures will be regularly reviewed as part of the EMS.	Ongoing
184	The emergency response plan included in the environmental management system will address the primary hazardous materials on site including procedures for spill response on the trucking route to the RRM site.	During 2018, the EMS continued to be developed and ongoing to adapt to the new products and risks being added in the operation. The emergency response plan included in the RRM EMS addresses the primary hazardous materials onsite and spill response.	Ongoing
185	All chemicals used at the site will have a Material Safety Data Sheet, in order to comply with the best practices in the industry for health and safety, and to provide relevant regulatory standards for the safe use of these materials.	The Material Safety Data Sheets are provided to New Gold RRM users and are accessible from the online site wide MSDS registry. Within this system, regular review and updates to the MSDS are a required by the department for each chemical. This aspect is included as part of the RRM Health and Safety WHMIS Program. WHIMIS Program was rolled out to all employees in 2018.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
186	Monitoring details will be developed through ongoing stakeholder consultation during the EA process, and through conditions placed on regulatory instruments such as permits, authorizations and approvals, issued by the Federal and Provincial regulatory agencies.	Since the start of construction in 2015 New Gold has been developing environmental monitoring programs to reflect the requirements and conditions set out in project permits and approvals as well as concerns brought forward by the public. Modifications to design and construction delays associated with permits and weather have required that monitoring programs are reviewed annually to ensure they are meeting required specifications. Due to the large volume of conditions and monitoring details New Gold seeks qualified and experienced consultants to handle monitoring requirements when necessary.	Ongoing
187	A Follow up Monitoring Program (FMP) is provided in Section 13 of the Final EA Report, which subject to modification through the EA review process, will be implemented by NG in the manner and schedule identified, to: • Verify the accuracy of the environmental assessment of a designated project; and • Determine the effectiveness of any mitigation measures.	The Follow Up Monitoring Plan (FMP) for the Rainy River Project/Mine is designed around three central principles of environmental protection; Do no harm culture, respect for Indigenous culture and values; continuous improvement and compliance with all environmental approvals and authorizations. The FMP applies to all stages of the project and the principles of the plan have been incorporated into the regular routine of how New Gold conducts business. Key components of the FMP have been incorporated into the Environmental Monitoring System (EMS) that New Gold is currently developing. The monitoring components are also tracked through our regulatory requirements and commitments for the project. New Gold tracks compliance with these conditions using a computer program called Intelex, where assigned employees are responsible for tracking performance against these commitments and conditions.	Ongoing
188	Subject to acceptance in writing of the FMP by the Federal and Provincial governments, monitoring results will be provided to the parties involved in the FMP annually during the construction and operation phases of the RRM.	To date New Gold has provided all required monitoring information to appropriate government agencies as required or as requested.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
189	A list of FMP commitments made during the EA process will be maintained by NG, indicating where appropriate: • The nature of the commitment; • To whom, or to what group or agency the commitment was made, if specific; • Whether the commitment is related to the EA process alone; • Whether the commitment is addressed or linked to a regulatory instrument, such as a regulation or environmental approval; • Any applicable timeline if any; • The status of the commitment; and • Additional actions required to fulfil the commitment	This registry addresses these conditions.	Ongoing
190	Environmental aspects and potential impacts of the project will be managed within an environmental management system which integrates environmental performance with overall project management.	In 2018, the design of an ISO 14001 compliant Environmental Management System (EMS) was completed for the RRM. Environmental aspects and potential impacts of the mine were incorporated into the design framework of the EMS.	Ongoing
191	Implementation and maintenance of the environmental management system will be driven by the NG commitment to ongoing compliance with the environmental requirements. Worker awareness of this commitment and requirements related to their work will be communicated through formal programs such as project orientation, job training or contractor packages.	In 2018, the design of an ISO 14001 compliant Environmental Management System (EMS) was completed for the RRM. Formal training programs, through Training and Awareness requirements, will focus on RRM's commitment to ongoing environmental compliance.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
192	Periodic management reviews will be completed to consider changing circumstances which could affect the continued suitability and adequacy of the monitoring plans, and to support continual improvement in overall effectiveness.	In 2018, the design of an ISO 14001 compliant Environmental Management System (EMS) was completed for the RRM. As part of the EMS, periodic management reviews will be conducted to ensure continuous improvement.	Ongoing
193	NG proposes to amend the Closure Plan periodically as more information becomes available and as required by the Ontario Mining Act.	Comprehensive Closure Plan Amendment was submitted to MNDM on 26 Oct 2017. This amendment was necessary as the mine transitioned from construction to operations. Updates have been provided to the current closure plan.	Ongoing
194	NG is proposing to work with Aboriginal groups including Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Big Island First Nation, Naotkamegwanning First Nation, Ojibways of Onigaming First Nation and Métis community members to provide access to alternative private lands for the purposes of supporting TLU on such lands; and potentially providing compensation or incentives through collaborative agreements between the Aboriginal groups and NG. Access will be coordinated with the Aboriginal groups.	NG has negotiated agreements with Rainy River First Nations (October 10, 2014), Naicatchewenin First Nation (October 10, 2014), Big Grassy First Nation (January 9, 2015) the Metis Nation of Ontario (November 25, 2014), Big Island First Nation (October 31, 2016), Ojibways of Onigaming (May 24, 2017) and Naotkamegwanning First Nation (April 19, 2017).	Ongoing
195	NG will communicate with Aboriginal groups including Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Big Island First Nation, Naotkamegwanning First Nation, Ojibways of Onigaming First Nation and Métis community members on traditional teachings and ceremony.	NG hosts two annual ceremonies at site; additionally, Indigenous liaison personnel meet with community members to discuss the project, activities, ceremony, etc. All NG employees undertake a 4-hour Indigenous engagement session as part of onboarding. During 2018 the following ceremonies were held onsite: Spring Ceremony: May 23, 2018 Fall Ceremony: Oct 3, 2018	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
		Spirit House Opening Ceremony: March 23, 2018 Spring Blessing Ceremony: May 11, 2018	
196	NG will review the Big Grassy River First Nation Traditional Knowledge / Traditional Land Use study and discuss accommodations of the cultural heritage sites identified.	This was addressed during Participation Agreement discussions. A Participation Agreement was signed with BGFN on January 9, 2015.	Completed January 9, 2015.
197	Related to transmission line construction, environmental monitoring will include (but will not be limited to) inspection of: • ROW to ensure excessive vegetation clearing is not conducted; • Appropriateness of equipment choice and maintenance of equipment to minimize environmental impacts; • Effectiveness of erosion control measures where applicable; • Construction activities and equipment operation, including refueling exercises; • Waste management, including wood waste from clearing and domestic wastes; • Monitoring of remedial actions associated with malfunctions and accidents (if any); and • Any requirements contained in environmental approvals and permits required to construct the transmission line. At a minimum, weekly inspections by a qualified person will occur of worksites and related areas, during clearing of the ROW and construction of the transmission line. Contractors will be required to have properly trained personnel to provide guidance to construction teams in the absence	Work on the transmission line was completed in April 2016. The conditions outlined in this commitment were achieved.	Completed April 2016.

Condition/ Tracking #	Description	Status 2018	Date Completed
	of the qualified environmental persons. The results of the inspections will be documented and follow-up actions, if any, delineated. Completion of follow-up actions will be confirmed during subsequent inspections. Inspection frequency will be increased should the need be identified. The duration of post-construction inspections will depend on the results of the construction inspection. At a minimum, periodic aerial inspection will occur for environmental aspects during operation, coincident with other aerial surveys.		
198	NG will continue to communicate closely with First Nations and the MNO regarding the Project. (Letter to Chiefs from Kyle Stanfield, October 2013).	NG has several Participation Agreements / Impact Benefit Agreements in place which identify ongoing communication protocols: FFCS (with Seine River, Lac La Croix, Couchiching and Mitaanjigamiing First Nations) - March 22, 2012 Rainy River First Nations/Naicatchewenin First Nation - October 10, 2014 Big Grassy River First Nation – January 9, 2015 Metis Nation of Ontario - November 25, 2014 Anishinaabeg of Naongashiing First Nation - October 31, 2017 Ojibways of Ongigaming First Nation - May 24, 2017 Naotkamegwanning First Nation - April 19, 2017 Animakee Wa Zhing #37 First Nation - February 13, 2018 In addition, NG provides regular updates through newsletters, public presentations and individual meetings and emails with community representatives.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
199	NG is committed to working closely with the MNO. NG has provided resources to the MNO to undertake traditional studies as well as technical reviews of both the Draft EA as well as the Draft Closure Plan. NG will continue to support the MNO as part of the EA process and as mine operations begin.	NG has a Participation Agreement with the MNO (November 25, 2014) and continues with regular engagement on the RRP.	Ongoing
200	NG is committed to working closely with the area First Nations and the MNO. NG has provided resources to Aboriginal Groups to undertake traditional studies as well as technical reviews of both the Draft EA as well as the Draft Closure Plan. NG will continue to support First Nations as part of the EA process and as mine operations begin.	NG actively engages all Indigenous groups about the RRM, through newsletters, face to face meetings, site tours, business opportunities and job postings. Condition 9 of the EA approval is being fulfilled, although the level of engagement is directed by the communities.	Ongoing
201	NG will commit to clearing of flammable debris within a minimum 30 m buffer area.	In 2016 the MNRF expressed concerns regarding the proximity of slash piles to standing timber as well as the size of piles. New Gold worked with the Ministry to ensure that piles were relocated and either chipped or burnt in a controlled manner. New Gold feels that they have received appropriate guidance from the Ministry to confirm that they are meeting the conditions of this commitment.	Ongoing
202	NG is committed to continuing to engage potentially affected stakeholders as development and operation of the RRM progresses. Local municipalities will be engaged specifically in regards to contingency and emergency response procedures, prior to construction start. MNR coordination will be undertaken as appropriate.	New Gold has agreements with the Township of Chapple and the Township of Morley. The New Gold Health and Safety team has regular communication with Chapple Emergency Response.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
203	NG is committed to further discussions with potentially affected Aboriginal groups with respect to development of a protocol for the preservation of artifacts. Where practical and reasonable, artifacts that require removal will be transferred to a public institution selected through consultation with local First Nations and Métis represented by the MNO Region 1 Consultation Committee, in consultation with the MTCS. A MTCS collection transfer form will be completed by the surrendering licensee and the institution accepting the materials. Collection shall be curated to current standards.	NG will work with local Indigenous groups on the transfer of artifacts. No artifacts were transferred from the archaeologist during 2018.	Ongoing
204	NG will develop an accommodation with local trapline holders that meets the needs of both the proponent and the trappers.	New Gold worked with a bait harvester in 2017 to develop an access agreement. This was completed Aug 11, 2017. No other agreements are anticipated.	Completed August 11, 2017.
205	NG will enhance components of the Richardson Trail and mitigate the impacts in collaboration with local landowners.	NG will initiate this commitment during the operations phase of the development, as it will be much safer to access particular areas at that time. No development of the Richardson trail took place in 2018.	Ongoing

SECTION 6
NEW GOLD RAINY RIVER MINE FOLLOW UP MONITORING PLAN REGISTRY

Figure 21 Pinewood River ice going out

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Condition/ Tracking #	Description	Status 2018	Date Completed
13.1.	RRR expects that it will be responsible to carry out the FMP (Follow Up Monitoring Plan); and further, that the involved Federal and Provincial agencies and authorities will have a review and monitoring role regarding the implementation of the FMP by RRR and will require RRR to take corrective action for non-compliance as appropriate. Local Aboriginal groups are considered by RRM to be involved parties for the purposes of the FMP, and accordingly, local First Nations and Métis will be provided the results of the FMP.	Highlights of the Follow Up Monitoring Plan submitted in Section 13 of the Provincial Environmental Assessment for the Rainy River Project have been included in this Compliance Report. The Follow Up Monitoring Plan was originally provided with New Gold's Environmental Assessment to the MECP for review and input by government agencies. New Gold has involved government agencies and Indigenous groups in the implementation of their monitoring programs and results. New Gold RRM continues to meet with Environmental Monitoring Boards which are attended by local Indigenous Groups and discuss ongoing environmental monitoring, research programs and results. Popular topics of discussion include; water quality, wildlife and air quality. New Gold RRM continues to provide onsite tours for government agencies, Community members and employee's families to discuss mining operations, ore process and environmental monitoring. New Gold involved the MNRF on the creation and implementation of the Rainy River Projects Terrestrial Monitoring Plan (Finalized in 2016) The Environmental Department provides the MECP with monthly updates on water quality sampling and project updates related to water taking, construction and water quality. Additional reports associated with the monitoring programs outlined in the Follow Up Monitoring Plan have been shared with the appropriate government agencies (i.e.; Fish Tissue Sampling (DFO), Air Quality Monitoring and Acoustic Monitoring (MECP) and are included as supplemental information with this report.	Ongoing
13.2.2	For fugitive dust from roads, stockpiles and open pit operations, RRM will assess the effectiveness of planned dust control measures both visually by plume assessment, and using dust fall jars and high-volume samplers for total particulate and PM2.5. Dust fall samples will be collected monthly during the non-winter period for the construction,	Ambient air quality monitoring program continued during 2018. Data was collected from two air quality sampling stations: one to the east of the site on Gallinger Road and one to the south of the site near the beginning of the Highway 600 reroute on Gallinger Road. These stations are equipped with hi- samplers (brush motor and mass flow controlled), PQ200 samplers, samplers, and passive sampling for SO2 and NO2. The hi-samplers measure Total Suspended Particulate (TSP) and metal concentrations averaged over a 24-hour period. The metals	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	operation and active reclamation project phases. Select filter samples will be assessed for metals (full metal scan and including mercury, arsenic, cadmium and lead). Two monitoring stations will be set up at the approximate property boundary locations shown in Figure 13-1 subject to power availability and location specific constraints. Equipment siting, operations, auditing and reporting will following all appropriate MOE requirements as provided in the Operations Manual for Air Quality Monitoring in Ontario (MOE 2008).	and metalloids analyzed include arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), vanadium (V), and zinc (Zn). The PQ200 samplers measure Particulate Matter 2.5 (PM2.5) concentrations averaged over a 24-hour period. The dustfall samplers measure total deposition over a 30-day period. Passive sampling measures SO2 and NO2 concentrations over a 30-day period. There were two of TSP and metalloids AAQC limits exceedances measured at the Gallinger Road station. Both were attributed to increased light vehicle traffic along Gallinger Road. Mitigation measures included restricting light vehicle traffic and applying calcium chloride to act as a road dust suppressant. The Fugitive Dust Control Plan will be reviewed in and updated in 2019.	
13.3.2	Subject to consultation and support from area residents and the regulatory agencies, RRR plans to measure sound levels at (or near) residences positioned around the RRM site (Figure 13-1). These would include: • One residence to the south of the mine site in Black Hawk; • One residence to the east of the mine site on Gallinger Road; • One residence to the southeast of the mine site on south Gallinger Road; • One residence to the west of the mine site in Dearlock; and • One residence to the northwest of the mine site on Highway 600. A dedicated remote monitoring system may be used to provide a real time access system. All sound monitors will conform to MOE NPC-103 measurement protocols. As per MOE protocols, sound level measurements are to be	Sound was measured at the listed locations (residences) during May and June of 2018 and as related to ESA permit requirements. No project related noise exceedances were recorded in 2018. A dedicated remote monitoring system was not established during 2018.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	taken at each measurement location. Hourly Leq, L10, L90 and Lmax will be recorded. Audio samples based on trigger levels will also be recorded. Trigger levels, with automated alerts will be developed for addressing exceedances.		
13.4.2	In addition, RRR will carry out the following geochemical monitoring program: • As part of the ongoing mine rock management plan, collect and analyze blast hole drill cuttings for analysis of total inorganic carbon and total Sulphur, using a Leco furnace, as a means of segregating PAG and NPAG materials for optimal management of PAG mine rock; • Submit a subset of Leco furnace samples, collected as part of the ongoing mine rock management plan, for acid base accounting static testing and metals analysis; • Collect and analyze mill composite tailings samples, on an approximate monthly basis, for acid base accounting static testing and metals analysis; and • Conduct additional geochemical testing on an as required basis to provide further information on Project specific aspects, such as any conditions of note evolving out of developing trend analyses.	A Geochemical Monitoring Plan for the Construction and Operation Phases was issued in accordance with MECP ECA 5178-9TUPD9 requirements and was implemented in 2016. Monitoring continued through 2018 and included; analyzing blast hole drill cuttings using a Leco furnace and submission of a subset for ABA and metals analysis, per the commitment.	Ongoing
13.5.2	Collect and analyze samples, and measure rates of flow, as appropriate, from site discharges, and runoff and seepage collection facilities, at the start of their respective operations, including: • TMA discharges to the Pinewood River both directly by pipeline discharge and	A monitoring program was put in place during 2015 and continues to be in place. During 2018, surface water was monitored on and off site as per the Surface Water monitoring program. All effluent discharges in 2018 met the environmental requirements.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	through the constructed wetland; • Sedimentation Pond #1 and #2 discharges to West Creek; • Aggregate operation(s), discharges (if any); • Sewage effluent discharge; and • Runoff and seepage collected from site operations areas (TMA, overburden and mine rock stockpiles, plant site area and haul roads) in accordance with MDMER and Environmental Compliance Approval requirements.		
13.5.2 B	For each of the above, where there is a discharge to a receiver (West Creek or Pinewood River) monitor on a monthly basis (commencing at least three months before the first anticipated discharge / release) the quality of waters upstream and downstream of discharge and runoff / seepage releases at proposed monitoring locations shown in Figure 13-2, inclusive of three stations on West Creek and five stations on the Pinewood River (including Pinewood River baseline monitoring stations SW10, SW3 and SW15. The two current baseline monitoring stations on the Rainy River (SW16 and SW17) would also be maintained for monthly monitoring. Quarterly samples from selected water quality sampling stations will be collected for trace analysis of total and methyl mercury in discussion with the MOE.	The receiver monitoring was conducted on a monthly and quarterly basis as per the commitment. All samples collected from the receivers met the environmental approval requirements. In 2018, total and methyl mercury samples were collected during the open water period in the Pinewood River upstream and downstream of the site.	Ongoing
13.5.2 C.	Monitor flows as shown in Figure 13-2 commencing as soon as construction is completed on the West Creek pond and the West Creek diversion at:	Construction of the West Creek Diversion was completed in 2017, however dry conditions that persisted through 2017 and 2018 were not conducive to installation of water level transducers in the absence of water flow. A water level transducer was	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	• West Creek at the West Creek pond outflow • West Creek diversion; and • Pinewood River at Highway 617 (Water Survey of Canada Station WSC 05PC023). Flows are already being measured for the Pinewood River at WSC Station 05PC023. Note that given the importance of the WSC station to overall site water management as per Section 4.12, RRR will need to enter into an agreement with WSC to ensure that the station will be maintained throughout the RRM mine life, and that data will be made available to RRR on a daily basis, and that RRR would be immediately informed of any maintenance activities which could influence its operations.	installed in the West Creek Pond in April 2018. The WSC 05PC023 hydrometric station remains active, however New Gold installed a dedicated hydrometric station on the Pinewood River in late 2015 to supplement this data source and continued to monitor the station through 2018.	
13.5.2 D.	As data availability permits, develop annual updated statistical flow estimates for local watercourses based on flow data derived through monitoring, with such estimates to include: • Monthly averages • Annual averages • Extreme low flow statistics corresponding to 2, 5, 10 and 20 year return period conditions; and • Extreme high flow statistics corresponding to 2, 5, 10 and 20 year return period conditions.	In-stream measurements were ongoing during 2018 in the Pinewood River. A flow measurement was conducted in the West Creek Diversion in July 2018, the measurement confirmed that flows were extremely low or absent. Continued in-stream flow monitoring is planned for 2019.	Ongoing
13.5.2 E.	Carry out an environmental effect monitoring (EEM) program in accordance with the Metal Mining Guidance Document for Aquatic Environmental Effects Monitoring (EC 2012d) to assess the character and quality of aquatic resources	The Cycle 1 EEM Study Design Report was prepared for submission in 2016, the subsequent Cycle 1 biological monitoring was conducted in 2017. The cycle 1 Interpretive Report was submitted to EC by March 31, 2018. Timing of Cycle 2 EEM studies is scheduled for 2020. A copy of the Interpretative Report can be found under supporting documents.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	at the following locations: • West Creek diversion; and • Pinewood River upstream and downstream of the RRM site area.		
13.5.2 F.	Except as provided for in Item E, above, carry out commencing one year after the date of commercial production and at three year intervals thereafter, fish habitat and fisheries assessments, including sediment and benthos investigations for: • West Creek; • Clark Creek (upstream of the east mine rock stockpile); and • Pinewood River. Monitor contaminants of potential concern in fish tissues from game fish harvested from the Pinewood River coincident with monitoring carried out pursuant to Item F, above.	Fish tissue monitoring (liver, ovary and muscle tissue) of walleye and northern pike game fish from the Pinewood River has taken place every year since the fall of 2015. Yearly study results are compared to baseline data collected in 2012. During 2018, the annual fish tissue quality monitoring program was conducted between September 10 and 14th in the Pinewood River downstream of the RRM. Fish were collected using fill nets and hoop nets. A total of 15 northern pike and 15 walleye of edible size were retained. Samples of the fish muscle tissue, liver and ovaries were removed and sent to a certified laboratory to be analyzed for metal accumulation. Chemical data collected was compared to previous data collected in 2017, 2016, 2015 and 2012 (baseline). The 2018 results indicated that tissue samples contained metal concentrations below human consumption benchmarks and were within the range of baseline (2012) concentrations. Tissue samples from six large northern pike and two large walleye revealed elevated levels of mercury concentrations, however, did not exceed the maximum acceptable concentration of mercury established by Health Canada. It is important to note that the accumulation of mercury in larger predatory fish tissue is common in northwestern Ontario. A copy of the 2018 Fish Quality Monitoring Report can be found in Appendix G.	Ongoing
13.5.2 H	As a component of the RRM stormwater management plan, collect and analyze late winter snow pack samples for pH and metals to help determine the effects of dust fall accumulated within the snow pack during spring melt.	Winter snow was measured as part of the surface water monitoring program with runoff being collected onsite for processing of ore and was sampled and tested prior to any releases to environment in 2018. Passive dust fall monitoring was also active during 2018. Snow pack samples are scheduled for early March 2019. The crusher on the plant site was not active until late summer/fall of 2017.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
13.6.2	RRR will carry out groundwater system monitoring as per the following: A. Collect and analyze samples, and measure pumping rates for mine water from the open pit and underground transferred to the mine rock pond (or to the TMA during construction); B. Establish a groundwater well (piezometer) network around the open pit area to monitor groundwater levels throughout the area on a continuous basis using water level transducers, with transducer downloads to be completed twice per year, commencing at least six months prior to the start of pumping, all as shown in Figure 13-3; C. Collect groundwater samples from the groundwater well / piezometer network quarterly except where prevented by freezing conditions, and analyze the samples for applicable parameters as provided for in Provincial approvals; and D. Review groundwater monitoring data annually and update the groundwater model on three year intervals, with the first such update to be based on data obtained from the first three full years of pumping; and with the model updates to be completed within nine months of the end of the data collection period.	A) Samples are collected and analyzed prior to discharge, and pump rates are measured during discharge, for the mine water pumped from the open pit treatment sumps to the environment. B) A groundwater well program has been established that extends around the mine footprint, sampling began in early 2016. Selected piezometers / wells include water level transducers, with downloads completed quarterly in conjunction with sample collection and manual water level measurements. In 2018, water level measurements continued for the remaining mine dewatering wells established around the periphery of the open pit in 2017. C) Groundwater well samples were taken from the piezometer / well network quarterly during 2018, however some wells were not sampled due to required repairs or frozen conditions in the first and fourth quarters. D) The groundwater samples were analyzed for the parameters in the Provincial approvals, and the data was reviewed during 2018. The groundwater model was updated in 2018, with the next scheduled update for 2021.	Ongoing
13.7.1	A wildlife monitoring plan will be implemented to ensure that effects on wildlife are properly mitigated. FMP	The comprehensive Wildlife Monitoring Plan was issued May 25, 2016 (Version 5) and followed during 2018.	May 25, 2016

Condition/ Tracking #	Description	Status 2018	Date Completed
	monitoring will be based where possible, on standard survey protocols used during baseline studies so that any changes in local mammal, area-sensitive breeding bird or amphibian populations may be detected.		
13.7.2	Methods for determining adverse RRM-induced effects on mammals following the implementation of proposed mitigation measures will include: • Bat acoustic monitoring at representative locations; • Aerial helicopter survey in late winter to document numbers and distributions of White-tailed Deer, Moose and Wolves at locations representing suitable habitat directly adjacent to the RRM site; and control sites. Such surveys to be conducted during the first winter of the construction phase, the winter following the completion of construction, and at three year intervals thereafter until the end of the active mine reclamation phase; • Working with any Aboriginal hunters to document White-tailed Deer, Moose, Wolf and Black Bear harvesting activities in the RRM site area; • Implementation of a wildlife log (including collisions) of general mammal observations made by employees on the RRM site including White-tailed Deer, Moose, Black Bear and any other larger furbearers; and • Monitoring of Black Bear activity related to waste	In 2017 MNRF has requested that the aerial helicopter study be aligned with their regional monitoring. Due to limited snow pack in 2018, aerial surveys did not take place. The MNRF aerial surveys are to take place in January and/or February 2019 and will cover the District with transect lines spread out much wider than just the RRM. Bat acoustic monitoring was completed during 2018. During baseline monitoring prior to the commencement of construction it was concluded that no suitable bat habitat existed within the area of tree clearing for project development. New Gold RRM implemented a wildlife log at the site during 2015 and continued documenting wildlife sightings and interactions through 2018. In 2016 the Environmental Department started tracking sightings in a GIS database. The wildlife logs for 2018 include documented Black Bear activity. New Gold has been sending staff to receive training from the Ministry of Natural Resources and Forestry on how to live trap and relocate nuisance black bears.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	disposal (if applicable) and general site activities.		
13.7.3	Methods for determining adverse effects to breeding birds following the implementation of proposed mitigation measures will include: • Targeted point count surveys for diurnal SAR including Golden-winged Warbler, Barn Swallow and Bobolink and for woodland area-sensitive breeding birds in suitable habitat. Point counts will be based on standardized survey protocols described for the Ontario Breeding Bird Atlas Guide for Participants (OBBA 2001) so as to be consistent with baselines study methodology (Section 5.2.12); • Incidental data collection for SAR and Provincially rare species which are currently present at lower abundance including: Canada Warbler, Olive-sided Flycatcher, Short-eared Owl, American Pelican, Bald Eagle and Black-billed Magpie; • Targeted twilight surveys for Eastern Whip-poor-will in suitable habitat. Whip-poor-will monitoring efforts will follow standardized survey protocols as outlined in the whip-poor-will Roadside Survey Participant's Guide (BSC 2012); • Concurrent data collection for Common Nighthawk to be undertaken during targeted Eastern Whip-poor-will surveys as described above as no standardized survey protocols have been developed specifically for this	On an annual basis New Gold retains the expertise of a consulting firm to conduct bird surveys which fill the requirements of this condition. To support the monitoring of bird species onsite the Environmental Department implemented a site wide protocol for reporting wildlife in 2015. Through this system the following bird sightings were reported in 2018; 89 bobolink, 71 barn swallow, 5 eagle, 22 pelicans and 31 swans. Education and awareness of the reporting procedure and onsite Species at Risk is conducted through new employee/contractor orientation, site wide radio communication and publications. Monitoring on the 2 known eagles' nest near the project boundary is monitored each year through visual observation. In 2015 prior to the breeding bird window New Gold staff installed four barn swallow nesting boxes in open fields (ESA lands) to offset the loss of habitat on the mine site caused by the removal of old buildings. Each year these boxes are monitored through the breeding bird window for use. In 2018 there was no activity at any of the four locations.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	species; • Annual monitoring of active Bald Eagle nests which occur in close proximity the RRM site. Monitoring will attempt to establish fledging success; • Implementation of a wildlife log of general breeding bird observations at the RRM site by employees (focused on raptors and raptor nests, and SAR species); and • Any additional monitoring defined in ESA permits.		
13.8.2	This section considers the potential for traffic accidents on public roads related to the construction and operation of the RRM. Roads of specific interest are: • Highways 71 and 11, west of Fort Frances and south of Kenora; • Highway 600; • Teeple Road west of Highway 71; and • East Access Road. Methods for assessing traffic accidents along public roads will include: • Monitoring road surface conditions for the identified roads of interest during the winter months and working with the MTO (MTO) and the local municipalities, to ensure that roads are properly cleared, salted and sanded, as appropriate to maintain safe driving conditions; • Maintaining a record of any accidents involving RRR employees and contractors related to the RRM; and • Maintaining a record of any near misses related to potential traffic accidents along the roads of interest involving RRR employees	New Gold employees and on-site contractors are required to report all near misses and traffic accidents immediately to the New Gold safety department. A record documenting system is in place. In some instances, drug and alcohol testing may be required and can be conducted on site by trained staff. New Gold has a zero-tolerance policy in place for any employees or contractors caught driving while using a cell phone. There are also policies in place to control speeding on site. Security conduct road inspections on site each night shift. These inspections include Teeple Road, East Access Road and Highway 600. If hazards are identified on roads owned and maintained by New Gold they are addressed by an onsite construction team. Hazards identified on municipal or public roads are reported to the appropriate authority (Municipality or MTO). Reports of road hazards are communicated during the HSE Communication broadcast over all radio channels at shift start. Dedicated Security coordinator hired in October 2018 to put more emphasis on security aspects of our operations, including traffic control	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	and contractors related to the RRM.		
13.9.2	To assess potential changes to TLU that could potentially derive from implementation of the RRM, RRR will carry out, or provide financial support for, the following activities: • Subject to any terms of agreement with the local First Nations and Métis, periodically update Traditional Knowledge (TK) studies conducted for the RRM beginning five years after mine operations initiate, to determine if there have been any changes to resource harvesting patterns by local Aboriginal peoples as a result of the RRM, and the reasons for any such changes • Conduct reviews at five year intervals, of the activities of a subset of RRR Aboriginal employees (representative cross section) to determine the effects of employment on their traditional activities • Confirm any expected changes in the availability of fisheries and wildlife resources to local harvesters, based on data derived from biological monitoring programs.	No updates were conducted in 2018.	Ongoing
13.10.2	RRR will carry out the following monitoring program to ensure the protection of cultural heritage resources • Maintain a record of all cultural heritage resources known to occur in the vicinity of planned RRM developments, such that intrusion or damage to such resources can be avoided during construction, recognizing and respecting confidentiality limitations • Maintain an active dialogue	NG engaged qualified Archaeologists and Built Heritage Specialists to record all resources prior to construction commencing. NG continues to actively engage local residents and Indigenous groups through meetings and visits. Woodland Heritage Services conducted Stage 4 archaeology in 2018. NG agrees to enlist the services of Elders should Cultural Heritage resources be discovered. NG contracted post construction assessment of known Cultural Heritage sites in 2018 with reporting expected to be completed in 2019.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	with local residents and Aboriginal group representatives, having knowledge of specific areas prior to and during major construction activities, to provide guidance to supervisory staff on the likely or possible occurrence of as yet undocumented cultural heritage sites • Enlist the services of a trained archaeologist during the conduct of major construction works to support RRR as needed, where there is a reasonable potential for encountering as yet undocumented cultural heritage sites • Enlist the services of Elders or other cultural advisors in the event that cultural heritage resources are encountered (in addition to meeting all Regulatory requirements) • Conduct a post-construction assessment of the state of known cultural heritage sites in the vicinity of RRM activities / structures to confirm the integrity of such resources.		
13.11.2	RRR will carry out the following monitoring program to ensure the documentation of cultural heritage landscapes and built heritage resources as appropriate: • Develop an initial record of all cultural heritage landscapes and built heritage resources known to occur near the planned RRM developments, such that intrusion or damage to such resources can be documented; and • Conduct a post-construction assessment of the state of known cultural heritage landscapes and built heritage resources in the vicinity of	The initial record was completed by Untermann and McPhail. Untermann and McPhail began a post-construction assessment of the state of known cultural heritage resources in 2018 with completion anticipated in 2019.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
	RRM activities / structures to confirm the status of such resources.		
13.12.2	Traffic flow on local roads with more limited capacity is of greater interest, notably: • Highway 600; • Teeple Road west of Highway 71; and • The East Access Road. The intent is to document that these local roads are able to continue to function adequately, and within safe limits for both project and local traffic. Methods for measuring traffic use along local roads will include: • Periodic traffic count surveys using automated traffic counters; • Employee surveys to determine transport routes to and from the mine site; and • Ongoing discussions with MTO and the Township of Chapple to support additional traffic volume monitoring studies if appropriate.	The Ontario Provincial Police request that New Gold share any traffic complaints with them. New Gold continues to monitor traffic and work closely with the Township of Chapple to address any concerns. The East Access Road (Korpi Road) is the primary route of traffic to the mine site, greatly reducing traffic on Teeple Rd/Hwy 600. New Gold also provides bus transportation for employees to/from Fort Frances, Barwick, Stratton, Rainy River and Emo.	Ongoing
13.13.2	Methods for documenting accommodations use in association with the RRM will include conducting contractor and employee surveys to determine: • Community or nearest community of local residence; • Type of residence (rental or ownership); • Type of accommodation (existing or new); • Type of occupancy (single, shared or family); and • Whether or not the employee / contractor is an existing local resident, or new to the area.	New Gold RRM is a residential operation. As of December 31, 2018, 73% of New Gold employees were from the local human environment regional study area. New Gold provides accommodation for contractors on the site and a limited number of professional staff when local hiring is not possible.	Ongoing

Condition/ Tracking #	Description	Status 2018	Date Completed
13.14 A	It is anticipated the environmental management system will consider the following areas as significant environmental aspects of the RRM (although they may not be represented by individual management plans depending on the final environmental management system framework): • Recycling and waste reduction program; • Mine rock (PAG / NPAG) management; • Water management; • General waste management; • Hazardous materials management; • Fuel handling and storage; • Fugitive dust management; • Sound management; • Wildlife management; • Traffic management; • Cultural awareness; • Heritage management; • Emergency response; and • Response to malfunctions and accidents.	In 2018, the design of an ISO 14001 compliant Environmental Management System (EMS) was completed for the RRM. The EMS design framework does include the following areas as significant environmental aspects and are either stand alone Management Plans or a subset to a core Management Plan: Recycling and waste reduction program Mine rock (PAG / NPAG) management Water management General waste management Hazardous materials management Fuel handling and storage Fugitive dust management Sound management Wildlife management Traffic management Cultural awareness Heritage management Emergency response Response to malfunctions and accidents	Ongoing
13.14 B	Environmental management system maintenance and effectiveness will be monitored through a variety of programs, such as: • Formal and informal audits; • Environmental monitoring; • Non-conformance incidents, status of corrective actions; and • Stakeholder feedback. Periodic management reviews will completed to consider changing circumstances which could affect the continued suitability and adequacy of the plans, and to support continual improvement in overall effectiveness.	In 2018, the design of an ISO 14001 compliant Environmental Management System (EMS) was initiated for the RRM (RRM). Included in the design framework of the EMS, maintenance and effectiveness will be monitored through audits, environmental monitoring, non-conformance incidents, status of corrective actions and stakeholder feedback. Periodic management reviews will support continuous improvement.	Ongoing

SECTION 7
NEW GOLD RAINY RIVER MINE
PUBLIC CONSULTATION REGISTRY

Figure 23 Spirit House March 2018

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Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
1/3/2018	1855	E-mail	New Gold distributed the Weekly Spill Report of Dec 25-31, 2017.	No further action required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Couchiching First Nation,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation	Aboriginal
1/9/2018	1824	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with Ojibways of Onigaming First Nation. The new Business Development Officer was introduced.	Ongoing quarterly meetings are held.	Ojibways of Onigaming First Nation	Aboriginal
1/9/2018	1856	E-mail	New Gold distributed the Weekly Spill Report of Jan 1-7, 2018.	No further action required.	Ojibways of Onigaming First Nation,Rainy River First Nations,Couchiching First Nation,Naicatchewenin First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario	Aboriginal
1/9/2018	1988	Meeting	Introduction of New Gold's new Business Development Officer to the EcDev officer.	No follow-ups required.	Big Grassy First Nation	Aboriginal
1/10/2018	1989	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Naotkamegwanning First Nation	Aboriginal
1/11/2018	1990	Meeting	Introduction of New Gold's new Business Development Officer to the Chief.	No follow-ups required.	Couchiching First Nation	Aboriginal
1/11/2018	1991	Meeting	Introduction of New Gold's new Business Development Officer to the EcDev officer.	No follow-ups required.	Couchiching First Nation	Aboriginal
1/11/2018	1843	Meeting	Chiefs Meeting	Confidential minutes were taken.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
1/12/2018	1992	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Naotkamegwanning First Nation,Seven Generations Education Institute	Aboriginal
1/12/2018	1806	E-mail	New Gold distributed a poster about the Indigenous Students Awards Program that is supported through Indspire by New Gold.	No follow-ups required.	Rainy River High School,Northern Community Development Services,Shooniyaa Wa-Biitong,Fort Frances High School,Seven Generations Education Institute	Aboriginal
1/15/2018	1807	E-mail	New Gold distributed a summary of all current employment opportunities.	No further action required.	Shooniyaa Wa-Biitong,Nigigoonsiminikaaning First Nation,United Native Friendship Centre,Anishinaabeg of Naongashiing,Métis Nation of Ontario,Town of Atikokan,Big Grassy First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Seine River First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Buffalo Point First Nation,Lac La Croix First Nation,Couchiching First Nation,Mitaanjigamiing First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Anishinabe of Wauzhushk Onigum First Nation,Naicatchewenin First Nation	Aboriginal
1/16/2018	1857	E-mail	New Gold distributed the Weekly Spill Report of Jan 8-14, 2018.	No further action required.	Naicatchewenin First Nation,Couchiching First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Naotkamegwanning First Nation,Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing	Aboriginal
1/16/2018	1993	Meeting	Introduction of New Gold's new Business Development Officer to Chief and Council.	No follow-ups required.	Big Grassy First Nation	Aboriginal
1/16/2018	1994	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Anishinaabeg of Naongashiing	Aboriginal
1/17/2018	1844	E-mail	New Gold announced 2017 production and cost results.	No further action required.	Anishinaabeg of Naongashiing,Métis Nation of Ontario,Big Grassy First Nation,Naotkamegwanning First Nation,Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
1/17/2018	1808	Site Visit	New Gold provided a business development tour.	No further action required.	Rainy River First Nations	Aboriginal
1/18/2018	1825	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with Naicatchewenin and Rainy River First Nations.	Ongoing monthly meetings are held.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
1/18/2018	1809	Meeting	New Gold met with the RRFN/NFN HR sub-committee for their monthly meeting.	Regular meetings are held.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
1/18/2018	1845	Meeting	Chiefs Meeting	Confidential meeting.	Couchiching First Nation,Rainy River First Nations	Aboriginal
1/19/2018	1996	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Ojibways of Onigaming First Nation	Aboriginal
1/23/2018	1858	E-mail	New Gold distributed the Weekly Spill Report of Jan 15-21, 2018.	No further action required.	Ojibways of Onigaming First Nation,Rainy River First Nations,Couchiching First Nation,Naicatchewenin First Nation,Naotkamegwanning First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing	Aboriginal
1/24/2018	1997	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Anishinaabeg of Naongashiing	Aboriginal
1/25/2018	1810	Community Event	New Gold went to Donald Young School and read to 2 classes as part of Literacy Outreach.	No further action required.	Donald Young School	Public
1/25/2018	1998	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Rainy River First Nations	Aboriginal
1/29/2018	1859	E-mail	New Gold distributed the Weekly Spill Report of Jan 22-28, 2018.	No further action required.	Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Couchiching First Nation,Anishinaabeg of Naongashiing,Métis Nation of Ontario,Big Grassy First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Naotkamegwanning First Nation	Aboriginal
1/29/2018	1999	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Lac La Croix First Nation	Aboriginal
1/29/2018	2000	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Seine River First Nation	Aboriginal
1/31/2018	2001	Meeting	Business development opportunities were discussed with community representatives.	No follow-ups required.	Naotkamegwanning First Nation	Aboriginal
2/1/2018	2002	Meeting	General discussion about Big Grassy First Nation's existing contracts.	No follow-ups required.	Big Grassy First Nation	Aboriginal
2/2/2018	2003	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Grand Council Treaty #3	Aboriginal
2/5/2018	1826	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with Big Grassy River First Nation.	Ongoing quarterly meetings are held.	Big Grassy First Nation	Aboriginal
2/6/2018	1860	E-mail	New Gold distributed the Weekly Spill Report of Jan 29 - Feb 4, 2018.	No further action required.	Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Couchiching First Nation,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation	Aboriginal
2/6/2018	2080	Ceremony	New Gold staff participated in an Indigenous Engagement Ceremony with Elders officiating.		Animakee Wa Zhing First Nation,Naicatchewenin First Nation	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
2/7/2018	2007	Meeting	Essential Skills training program was discussed.	Initial meeting; no follow-up required.	Anishinabe of Wauzhushk Onigum First Nation,Seven Generations Education Institute	Aboriginal
2/7/2018	2004	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Shooniyaa Wa-Biitong	Aboriginal
2/7/2018	1827	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with the Métis Nation of Ontario.	Ongoing quarterly meetings are held.	Métis Nation of Ontario	Aboriginal
2/7/2018	2005	Meeting	Introduction of New Gold's new Business Development Officer.	No follow-ups required.	Métis Nation of Ontario	Aboriginal
2/7/2018	1811	External Feedback	Emo resident reported two examples of recent behaviour issues of alleged mine employees; the issue was verbal harassment of two different residents.	The Community Manager took note of the resident's concern.	General Community (> 10km of project footprint)	Public
2/13/2018	1861	E-mail	New Gold distributed the Weekly Spill Report of Feb 5-11, 2018.	No further action required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Naotkamegwanning First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Naicatchewenin First Nation,Couchiching First Nation	Aboriginal
2/13/2018	2010	Presentation	New Gold presentation on operations and economic opportunities.	No follow-ups required.	Anishinaabeg of Naongashiing,Anishinabe of Wauzhushk Onigum First Nation,Ojibways of Onigaming First Nation,Anishinaabeg of Kabapikotawangag Resource Council Inc.	Aboriginal
2/13/2018	1846	Agreement	New Gold signed a Participation Agreement with Animakee Wa Zhing First Nation.	No further action required.	Animakee Wa Zhing First Nation	Aboriginal
2/15/2018	1812	E-mail	New Gold distributed a summary of all current employment opportunities.	No further action required.	Couchiching First Nation,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Anishinabe of Wauzhushk Onigum First Nation,Animakee Wa Zhing First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Seine River First Nation,Lac La Croix First Nation,Buffalo Point First Nation,Mitaanjigamiing First Nation,Anishinaabeg of Naongashiing,Shooniyaa Wa-Biitong,Naotkamegwanning First Nation,United Native Friendship Centre,Nigigoonsiminikaaning First Nation,Big Grassy First Nation,Métis Nation of Ontario,Town of Atikokan	Aboriginal
2/15/2018	1828	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with Anishinaabeg of Naongashiing First Nation.	Ongoing quarterly meetings are held.	Anishinaabeg of Naongashiing	Aboriginal
2/15/2018	2011	Site Visit	A site tour was provided for a representative of MNO Infinity Investments	No follow-ups required.	Métis Nation of Ontario	Aboriginal
2/16/2018	2012	Meeting	Introduction of New Gold's new Business Development Officer. Discussion held on regional economic development opportunities.	No follow-ups required.	Rainy River Future Development Corporation	Aboriginal
2/20/2018	1829	Meeting	New Gold met with the RRFN/NFN HR sub-committee for their monthly meeting.	Regular meetings are held.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
2/20/2018	1830	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with Naicatchewenin and Rainy River First Nations.	Ongoing monthly meetings are held.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
2/21/2018	1847	E-mail	New Gold announced its' 2017 fourth quarter and full year financial results.	No further action required.	Naicatchewenin First Nation,Rainy River First Nations,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation	Aboriginal
2/21/2018	1831	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with Naotkamegwanning First Nation.	Ongoing quarterly meetings are held.	Naotkamegwanning First Nation	Aboriginal
2/21/2018	1832	Meeting	New Gold held a Manager's meeting with Naotkamegwanning First Nation.	Regular meetings are held.	Naotkamegwanning First Nation	Aboriginal
2/22/2018	1862	E-mail	New Gold distributed the Weekly Spill Report of Feb 12-18, 2018.	No further action required.	Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Big Grassy First Nation,Métis Nation of Ontario,Rainy River First Nations,Ojibways of Onigaming First Nation,Naicatchewenin First Nation,Couchiching First Nation	Aboriginal
2/22/2018	2013	Meeting	A site tour was provided for a community member interested in business opportunities.	No follow-ups required.	Couchiching First Nation	Aboriginal
2/23/2018	2014	Meeting	Business and employment opportunities were discussed with the Chief.	No follow-ups required.	Couchiching First Nation	Aboriginal
2/26/2018	1863	E-mail	New Gold distributed the Weekly Spill Report of Feb 19-25, 2018.	No further action required.	Couchiching First Nation,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Naotkamegwanning First Nation	Aboriginal
2/26/2018	2015	Meeting	Introductions and mutual opportunity/needs discussion.	No follow-ups required.	Ojibways of Onigaming First Nation	Aboriginal
2/28/2018	1848	E-mail	New Gold emailed Animakee Wa Zhing to ask if they are interested in the arrangement of presentations regarding the Closure Plan amendments to the community.	The community was asked to contact New Gold if they are interested in having presentations.	Animakee Wa Zhing First Nation	Aboriginal
3/1/2018	2016	Meeting	Business and employment opportunities discussed.	No follow-ups required.	Seine River First Nation	Aboriginal
3/1/2018	2017	Meeting	Business and employment opportunities discussed.	No follow-ups required.	Lac La Croix First Nation	Aboriginal
3/1/2018	1833	Meeting	New Gold held a Manager's meeting with Big Grassy River First Nation.	Regular meetings are held.	Big Grassy First Nation	Aboriginal
3/2/2018	2018	Meeting	Business and employment opportunities discussed.	No follow-ups required.	Naotkamegwanning First Nation	Aboriginal
3/7/2018	1957	Community Meeting	A community member asked if community members are being made aware when an artifact is found on site?	New Gold advised that everyone onsite is made aware of any findings there are.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1954	Community Meeting	A community member indicated that members are aware of the BC mine disaster; how is New Gold doing things differently.	The consultant described the Mount Polley incident and described the safety factor that is built in to the TMA dams.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1956	Community Meeting	A community member wanted confirmation on whether water is being recycled.	New Gold confirmed, yes - recycled water is used and very little fresh water to operate the mill.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1959	Community Meeting	A community member asked what is on the bottom of the TMA.	The consultant advised that it is lined with clay; it is an excellent liner as it is non-porous and does not allow water through.	Anishinaabeg of Naongashiing	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
3/7/2018	1813	E-mail	Closure Plan Amendment presentation by a consultant.	A community representative requested a summary of the changes from the previous Closure Plan to provide to the Chief. The presentation was emailed to the community representative on March 9, 2018.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1864	E-mail	New Gold distributed the Weekly Spill Report of Feb 26 - Mar 4, 2018.	No further action required.	Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Lac La Croix First Nation,Couchiching First Nation,Mitaanjigamiing First Nation,Seine River First Nation,Naotkamegwanning First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
3/7/2018	1958	Community Meeting	A community member asked if Indigenous employees are given the same training as all employees.	New Gold advised that all employees receive the same safety training and other trainings.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1955	Community Meeting	A community member asked what is being done with the PAG.	The consultant described the cover systems on the stockpiles for the PAG.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1950	Community Meeting	A community member advised that there was a big flood event in 2002 where highways were shutdown; what if that happens again?	New Gold advised that the mine is constructed to withstand a 100 year flood event.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1951	Community Meeting	A community member asked who does the monitoring on site?	New Gold advised that there is continuous environmental monitoring completed by the environment team; MOECC, MNRF, DFO, Environment Canada drop in and perform unannounced inspections.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1949	Community Meeting	A community member asked if there are maps of the underground water.	New Gold advised that the water balance is being updated and have not yet released any water. The water treatment facility is not yet complete. At the end of mine life, total takings from the Pinewood River is approximately 6000 litres.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1948	Community Meeting	A community member asked where the water comes from; New Gold has many water permits.	New Gold advised that there are 5 Permits to take water; one of which has 24 sources (construction phase). Now that we are in operations, most water is recycled and not much new water is needed. The current models show there may be an excess of water.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1953	Community Meeting	A community member asked how much money is set aside for reclamation.	New Gold advised that there is approximately $180 million.	Anishinaabeg of Naongashiing	Aboriginal
3/7/2018	1952	Community Meeting	A community member stated that it does not matter what they say; nothing will change.	New Gold expressed that it is unfortunate they feel this way, as New Gold is using the best available technology along with TEK. Community members are encouraged to visit the site and have discussions on the work that goes on as well as respond to any questions they may have.	Anishinaabeg of Naongashiing	Aboriginal
3/13/2018	2019	Meeting	Clarifying procurement process and strategies for working with partner companies.	No follow-ups required.	Anishinaabeg of Naongashiing	Aboriginal
3/15/2018	1865	E-mail	New Gold distributed the Weekly Spill Report of Mar 5-11, 2018.	No further action required.	Anishinaabeg of Naongashiing,Métis Nation of Ontario,Big Grassy First Nation,Naotkamegwanning First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Naicatchewenin First Nation,Couchiching First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation	Aboriginal
3/15/2018	1814	E-mail	New Gold distributed a summary of all current employment opportunities.	No further action required.	United Native Friendship Centre,Shooniyaa Wa-Biitong,Anishinaabeg of Naongashiing,Nigigoonsiminikaaning First Nation,Town of Atikokan,Big Grassy First Nation,Métis Nation of Ontario,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Lac La Croix First Nation,Mitaanjigamiing First Nation,Buffalo Point First Nation,Seine River First Nation,Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation,Couchiching First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Aboriginal
3/15/2018	2021	Meeting	Business and employment opportunities discussed.	No follow-ups required.	Animakee Wa Zhing First Nation	Aboriginal
3/15/2018	2020	Meeting	Business and employment opportunities discussed.	No follow-ups required.	Anishinaabeg of Kabapikotawangag Resource Council Inc.	Aboriginal
3/15/2018	2022	Meeting	Employment posters provided to the community.	No follow-ups required.	Ojibways of Onigaming First Nation	Aboriginal
3/19/2018	1866	E-mail	New Gold distributed the Weekly Spill Report of Mar 12-18, 2018.	No further action required.	Ojibways of Onigaming First Nation,Rainy River First Nations,Couchiching First Nation,Naicatchewenin First Nation,Seine River First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Big Grassy First Nation,Métis Nation of Ontario,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal
3/19/2018	2084	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked if the water samples are shipped out or tested on site.	New Gold Answer: Water samples are sent out and tested at a Government approved lab.	Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal
3/19/2018	2087	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked what is in the dirty water in the mill.	The consultant advised that the dirty water contains positive acid generating (PAG) material from the rocks as well as metals from the mill process.	Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
3/19/2018	2089	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked what animals will be around the wetlands.	The consultant advised that the animals that will be around the wetlands will be similar to the ones found during baseline studies.	Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal
3/19/2018	2088	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked where the water will go when the mine closes.	The consultant advised that all treated and tested water that passes Government limits will go through the Constructed Wetlands.	Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal
3/19/2018	1834	Meeting	New Gold held the quarterly Environmental Monitoring Board meeting at the mine site. A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant.	Confidential meeting minutes are taken and distributed to all members along with presentation materials. Members representing Big Grassy, MNO and Onigaming did not attend the meeting.	Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal
3/19/2018	2086	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked if there are any water fowl on the Water Management Pond.	New Gold advised that currently there are none as the tailings harden and the water on the top is recycled back to the mill.	Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal
3/19/2018	2091	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: Where is the underground? How many openings?	Consultant Answer: Area was pointed out on the map. For safety, we will backfill as we mine so that there are no tunnels of air or water. Supposed to be building the shaft now but there are bears around the portal and we are waiting of them to wake up before proceeding with the construction.	Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal
3/19/2018	2090	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked how big the wetlands are.	The consultant displayed an image of the Cell #1 start-up area; the wetlands area will be larger than that.	Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal
3/19/2018	2085	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked how much water is used.	Consultant Answer: the mill uses 24,000 m3/day, however, only 5,000 m3/day is taken from the Water Management Pond as the rest is recycled from the system. There are no plans or need, to pump any water from the Pinewood River.	Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal
3/20/2018	2081	Other	New Gold provided support to the International Boundary Water Dragon Boat Foundation's Dragon Boat Festival being held in July.		International Boundary Water Dragon Boat Foundation	Public
3/20/2018	1965	Meeting	At the Closure Plan Amendment presentation, the Environmental Monitoring Board member asked what is the life of the dam.	New Gold advised that the lifespan is forever, as tailings will need to be held in place.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2093	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: Do we do any closure outside of the mine area. Thinking of Air.	Consultant Answer: Major impacts would be on the land and water. Should air be affected then we will revisit.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2099	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: The pit will be out of service in 2025? Will the progressive reclamation start in 2025 or 2030?	Consultant Answer: Details will need to be worked out as there will be safety issues with workers in the pit. It will be captured in future closure plan amendments.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	1966	Meeting	At the Closure Plan Amendment presentation, the Environmental Monitoring Board member asked if the pit will be out of service in 2025 and will the progressive reclamation will start in 2025 or 2030.	New Gold advised that details remain to be worked out as there will be safety issues with workers in the pit. This will be captured in future Closure Plan Amendments.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2101	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: Who is the Independent Review Board?	Consultant Answer: ITRB audit everything to do with dams, stability, safety, materials, water processing etc. recommendations are followed up and not shelved	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	1837	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with Naicatchewenin and Rainy River First Nations.	Ongoing monthly meetings are held.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2098	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: What is the life of the dam?	Consultant Answer: Forever, tailings need to be held in place.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	1836	Meeting	New Gold met with the RRFN/NFN HR sub-committee for their monthly meeting.	Regular meetings are held.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	1964	Meeting	At the Closure Plan Amendment presentation, the Environmental Monitoring Board member asked that with the revised dam slope, will water push over with wave action.	New Gold advised that it cannot be filled to the top. The maximum operating water level occurs further down the dam wall and is built for wind and wave action.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2096	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: Was this the dam with issues?	Consultant Answer: No. This is the tailings dam, not a water dam.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	1962	Meeting	At the Closure Plan Amendment presentation, the Environmental Monitoring Board member if water was being drawn from the Pinewood River.	New Gold advised that no water has been take from the Pinewood River since November 2017.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
3/20/2018	1960	Meeting	At the Closure Plan Amendment presentation, the Environmental Monitoring Board member asked if any closure will be done outside of the mine area, thinking of air.	New Gold advised that major impacts would be on land an water. Should air be affected than it would be revisited.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	1961	Meeting	At the Closure Plan Amendment presentation, the Environmental Monitoring Board member asked if water is reused in operations.	New Gold advised that water is reused.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2100	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: How does New Gold deal with waste?	New Gold Answer: New Gold has our own Treatment Facility onsite.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2103	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: Is the water quality back to the Pinewood River different than what was taken out?	Consultant Answer: When water exits the Constructed Wetlands it will be clean water. It is an engineered Constructed Wetland instead of a passive system	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2102	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: Water is worse as it is recycled, how is it treated?	New Gold Answer: Water is treated before it is released. We can only release 20% of Pinewood River Flow to the Pinewood River to ensure we will not disturb the flow	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	1835	Meeting	New Gold held the quarterly Environmental Monitoring Board meeting at the mine site. Presentations on the Closure Plan Amendment (CPA) and Environmental Compliance Approval (ECA) updates were provided by a consultant.	Confidential meeting minutes are taken and distributed to all members along with presentation materials.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	1963	Meeting	At the Closure Plan Amendment presentation, the Environmental Monitoring Board member asked if the TMA was the dam with the issues.	New Gold advised that the TMA is a tailings dam, not a water dam.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2097	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: With the new design, will water push over with wave action?	Consultant Answer: No, it cannot be filled up to the top. The maximum operating water level (MOWL) occurs further down the dam wall, It is built for wind and waves, it is like a bathtub only fill so far.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2095	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: Are you drawing from the Pinewood River?	Consultant Answer: Not since November 2017	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2094	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the EMB during a regular meeting. An EMB member asked: Is water reused in operations?	New Gold Answer: Yes	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
3/20/2018	2218	Other	New Gold provided support to the Nestor Falls Winter Carnival.		Nestor Falls Recreation Committee	Public
3/20/2018	2342	Other	New Gold provided support for the Rainy Lake Concert Series.		Rainy River Future Development Corporation	Public
3/21/2018	2024	Meeting	Business and Community Development Opportunities discussed.	No follow-ups required.	Ojibways of Onigaming First Nation	Aboriginal
3/21/2018	2023	Site Visit	A mill tour was given to the Fort Frances Chiefs Secretariat Advisory Committee.	No further action required.	Couchiching First Nation,Lac La Croix First Nation	Aboriginal
3/21/2018	1838	Meeting	New Gold held a FFCS Environmental sub-committee meeting at the mine site. A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant.	Confidential meeting minutes are taken and distributed to all members along with presentation materials. The member representing Couchiching did not attend the meeting.	Seine River First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation	Aboriginal
3/21/2018	2104	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the FFCS Environmental sub-committee during a regular meeting. A committee member asked if the integrity of the dams was monitored.	New Gold advised that the dams are monitored and inspections are also performed by the Independent Tailings Review Board.	Lac La Croix First Nation,Mitaanjigamiing First Nation,Seine River First Nation	Aboriginal
3/21/2018	1815	Meeting	New Gold met with the Advisory Committee of the Fort Frances Chief Secretariat.	Regular quarterly meetings are held.	Lac La Croix First Nation,Mitaanjigamiing First Nation	Aboriginal
3/21/2018	2106	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the FFCS Environmental sub-committee during a regular meeting. A committee member asked if water quality is monitored in the sumps.	The consultant advised that the water quality in the sumps is monitored and is only discharged to the Pinewood River if clean enough after testing.	Lac La Croix First Nation,Mitaanjigamiing First Nation,Seine River First Nation	Aboriginal
3/21/2018	2105	Meeting	A presentation on the Environmental Compliance Approval (ECA) updates was provided by a consultant to the FFCS Environmental sub-committee during a regular meeting. A committee member asked what tailings are.	The consultant advised that tailings are the muddy water minus the gold and silver. It was explained that in the mill process, the metals get concentrated and cyanide extracts the ore.	Mitaanjigamiing First Nation,Seine River First Nation,Lac La Croix First Nation	Aboriginal
3/22/2018	1839	Meeting	New Gold held a meeting with Anishinaabeg of Naongashiing First Nation to develop an implementation and work plan for the participation agreement.	Regular quarterly meetings are held.	Anishinaabeg of Naongashiing	Aboriginal
3/23/2018	2026	Ceremony	A ceremony was held to open the Spirit House constructed at the mine site.	No follow-ups required.		Aboriginal
3/23/2018	1840	Meeting	New Gold held a meeting with the Métis Nation of Ontario to discuss environmental topics.	Confidential minutes were taken.	Métis Nation of Ontario	Aboriginal

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3/26/2018	1817	External Feedback	Neighbour contacted New Gold regarding the dust concerns and driving behaviours of heavy haul truck traffic on Lampi Road.	New Gold contacted the contractor hauling on the road and the neighbour's concerns will be discussed at crew meetings. Half loading began on March 27 and completes the commercial haul on Lampi Road for the season.	General Community (>10km of project footprint)	Public
3/26/2018	1867	E-mail	New Gold distributed the Weekly Spill Report of Mar 19-25, 2018.	No further action required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Lac La Croix First Nation,Mitaanjigamiing First Nation,Seine River First Nation,Naotkamegwanning First Nation,Couchiching First Nation,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Aboriginal
3/26/2018	1816	External Feedback	A site neighbour emailed New Gold regarding issues on Lampi Road; hauling trucks are causing dust concerns and the drivers are speeding as well as being inconsiderate.	New Gold contacted the contractor hauling on the road and the neighbour's concerns will be discussed at crew meetings. Half loading began on March 27 and completes the commercial haul on Lampi Road for the season.	Site Neighbour (within 10km of project footprint)	Public
3/26/2018	2028	Meeting	New Gold introduced the new First Nations Coordinator.	New Gold committed to sending a poster "Keys to Success" and an introductory letter.	Mitaanjigamiing First Nation	Aboriginal
3/26/2018	2029	Meeting	New Gold assisted Animakee Wa Zhing First Nation members with online applications.	No follow-ups required.	Animakee Wa Zhing First Nation	Aboriginal
3/27/2018	1849	Meeting	Chiefs Meeting	Confidential minutes were taken.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
3/27/2018	2107	E-mail	New Gold emailed the community as an introduction to the new Business Development Officer and Community Coordinator and also offered to visit the community to discuss and assist with New Gold's application, hiring process, and E-recruit.	Nigig will advise New Gold of a suitable date.	Nigigoonsiminikaaning First Nation	Aboriginal
3/28/2018	1818	External Feedback	Neighbour contacted New Gold regarding the dust concerns and heavy haul truck traffic on Lampi Road	New Gold contacted the contractor hauling on the road and the neighbour's concerns will be discussed at crew meetings. Half loading began on March 27 and completes the commercial haul on Lampi Road for the season.	Site Neighbour (within 10km of project footprint)	Public
3/28/2018	2030	Meeting	New Gold assisted Naotkamegwanning First Nation members with online applications.	No follow-ups required.	Naotkamegwanning First Nation	Aboriginal
4/3/2018	2031	Meeting	Discussion on the progress of a business plan was discussed.	No follow-ups required.	Naotkamegwanning First Nation	Aboriginal
4/5/2018	2032	Meeting	New Gold assisted Nigigigoonsiminikaaning First Nation members with the application process and online applications and introduced new First Nations Coordinator.	No follow-ups required.	Nigigoonsiminikaaning First Nation	Aboriginal
4/6/2018	1868	E-mail	New Gold distributed the Weekly Spill Report of Mar 26 - Apr 1, 2018.	No further action required.	Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Naotkamegwanning First Nation,Seine River First Nation,Mitaanjigamiing First Nation,Couchiching First Nation,Lac La Croix First Nation,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation	Aboriginal
4/12/2018	1869	E-mail	New Gold distributed the Weekly Spill Report of Apr 2-8, 2018.	No further action required.	Rainy River First Nations,Ojibways of Onigaming First Nation,Naicatchewenin First Nation,Couchiching First Nation,Seine River First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Naotkamegwanning First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing	Aboriginal
4/12/2018	2034	Meeting	MNDM Mining 101 presentation.	No follow-ups required.	Anishinaabeg of Naongashiing	Aboriginal
4/12/2018	1870	E-mail	Naotkamegwanning First Nation enquired how New Gold deals with contaminated soils at site.	New Gold advised that contaminated spill materials are placed into appropriate containers then transported by a certified hazardous waste carrier to be handled by a hazardous waste facility in Thunder Bay.	Naotkamegwanning First Nation	Aboriginal
4/13/2018	1819	E-mail	New Gold distributed a summary of all current employment opportunities.	No further action required.	Shooniyaa Wa-Biitong,Nigigoonsiminikaaning First Nation,United Native Friendship Centre,Anishinaabeg of Naongashiing,Big Grassy First Nation,Town of Atikokan,Métis Nation of Ontario,Naotkamegwanning First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Mitaanjigamiing First Nation,Lac La Croix First Nation,Buffalo Point First Nation,Couchiching First Nation,Anishinabe of Wauzhushk Onigum First Nation,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Aboriginal
4/13/2018	2035	Meeting	Discussion of camp employee issues. The issues were forwarded to the contract owner to follow up with the community member.	No follow-ups required.	Naicatchewenin First Nation	Aboriginal
4/16/2018	2036	Meeting	New Gold assisted Onigaming First Nation members with the application process and online applications.	No follow-ups required.	Ojibways of Onigaming First Nation	Aboriginal
4/17/2018	1842	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with Naicatchewenin and Rainy River First Nations.	Ongoing monthly meetings are held.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
4/17/2018	1820	Meeting	New Gold met with the RRFN/NFN HR sub-committee for their monthly meeting.	Regular meetings are held.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
4/17/2018	2038	Meeting	New Gold assisted Animakee Wa Zhing First Nation members with the application process and online applications.	No follow-ups required.	Animakee Wa Zhing First Nation	Aboriginal
4/17/2018	2037	Meeting	New Gold RFP Process, employment strategies were discussed.	No follow-ups required.	Nigigoonsiminikaaning First Nation	Aboriginal
4/17/2018	2041	Meeting	Discussed with Nigig: PNP-RFP Process, Essential Skills training and Haul truck training	No follow-ups required.	Nigigoonsiminikaaning First Nation	Aboriginal

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4/18/2018	1850	E-mail	A third party representing Naotkamegwanning First Nation asked New Gold if contents of TMA Cell 1 flowed into Cell 2 prior to April 12, 2018, after the concern had been sent to the MOECC.	The Environment Manager responded as follows: There has been no overflow of TMA cell 1 at any time. We monitor the tailings water levels daily and at no time have we had any overflow incident. We are well within our Maximum Operating Water Level (MOWL). Please note the MOWL is not the top of the dam, there is still 1 m of wall left, which is referred to as the "Freeboard". The freeboard has been calculated to be able to absorb a 1 in 100 year storm.	Naotkamegwanning First Nation	Aboriginal
4/19/2018	2039	Site Visit	A tour was provided for potential RRFN CEO candidate.	No follow-ups required.	Rainy River First Nations	Aboriginal
4/20/2018	1871	E-mail	New Gold distributed the Weekly Spill Report of Apr 9-15, 2018.	No further action required.	Rainy River First Nations,Ojibways of Onigaming First Nation,Naicatchewenin First Nation,Couchiching First Nation,Naotkamegwanning First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Anishinaabeg of Naongashiing,Métis Nation of Ontario,Big Grassy First Nation	Aboriginal
4/20/2018	2042	Meeting	Discussed with Couchiching: PNP-RFP Process, Essential Skills training, Haul truck training and Past contracting experience with New Gold.	No follow-ups required.	Couchiching First Nation	Aboriginal
4/20/2018	1851	Meeting	New Gold requested clarification on the communication protocol regarding their third party representative contacting the government. Discussion on requirements for WFB to acquire a specific contract.	WFB advised their contractor was not authorized to contact the government and will work through the JIC going forward. WFB will develop a business plan on this specific contract.	Naotkamegwanning First Nation	Aboriginal
4/20/2018	1821	Community Event	New Gold participated in Spring Fever Days in Emo. NG partnered with Rainy River Valley Agricultural Society and provided the food. All proceeds from the food sales went to the RRVAS toward their fairground improvement project 2018.	No further action required.		Public
4/23/2018	1872	E-mail	New Gold distributed the Weekly Spill Report of Apr 16-22, 2018.	No further action required.	Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Naotkamegwanning First Nation,Couchiching First Nation,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Aboriginal
4/23/2018	2040	Meeting	New Gold went to the community for a scheduled application, hiring and e-recruit session. There were no staff in the office and no notifications of a cancelled meeting.		Anishinaabeg of Naongashiing	Aboriginal
4/24/2018	2043	Meeting	An update on a contract was provided to a council member.	No follow-ups required.	Anishinaabeg of Naongashiing	Aboriginal
4/24/2018	1822	E-mail	New Gold sent an invitation to several communities to attend the Spring Ceremony being held May 23, 2018.	No further action required.		Aboriginal
4/25/2018	2044	Meeting	New Gold went to Big Grassy First Nation for a scheduled application, hiring and e-recruit session.	No follow-ups required.	Big Grassy First Nation	Aboriginal
4/25/2018	1852	Meeting	A member of the community of Ojibways of Onigaming First Nation is concerned that drugs are coming from the mine site into the communities.	New Gold advised that the member should call the police as it relates to illegal activities off of the mine site.	Ojibways of Onigaming First Nation	Aboriginal
4/25/2018	1841	Meeting	New Gold held a quarterly Joint Implementation Committee meeting with Ojibways of Onigaming First Nation.	Ongoing quarterly meetings are held.	Ojibways of Onigaming First Nation	Aboriginal
4/25/2018	1853	Community Event	BGFN school hosted a science forum with a business partner. New Gold attended.	No further action required.	Pagamigaabo School	Aboriginal
4/26/2018	1854	E-mail	New Gold announced 2018 First Quarter Results and that the Annual General Meeting had been held.	No further action required.	Rainy River First Nations,Naicatchewenin First Nation,Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation	Aboriginal
4/26/2018	2045	Ceremony	New Gold was invited to a Sweat Lodge Ceremony at CFN.	No follow-ups required.	Couchiching First Nation	Aboriginal
4/26/2018	2046	Meeting	New Gold RFP Process and employment strategies discussed.	No follow-ups required.	Animakee Wa Zhing First Nation	Aboriginal
4/26/2018	1823	Community Event	New Gold attended Surgeon Creek School and offered a gold panning activity as well as geology info for students and their families.	No further action required.	Sturgeon Creek School	Public
4/27/2018	2108	Conference Call	Update on licensing new graduates in Ontario.	Update to be provided by Confederation College on May 8, 2018.	Confederation College,Big Grassy First Nation	Aboriginal
5/1/2018	1873	E-mail	New Gold distributed the Weekly Spill Report of Apr 23-29, 2018.	No further action required.	Big Grassy First Nation,Métis Nation of Ontario,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Couchiching First Nation,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation	Aboriginal
5/2/2018	2109	Open House	New Gold held casual surface miner recruitment in the community.	Seven community members participated.	Naotkamegwanning First Nation	Aboriginal
5/7/2018	2053	Meeting	New Gold assisted in the application/hiring process/ e-recruit of interested community members.	No follow-ups required.	Anishinaabeg of Naongashiing	Aboriginal
5/8/2018	2110	Conference Call	Confederation College provided update on licensing graduates.	No further action required.	Confederation College,Big Grassy First Nation	Aboriginal
5/9/2018	2054	Meeting	New Gold assisted in the application/hiring process/ e-recruit of interested community members. The possibility of an entrepreneurship workshop was discussed with Big Grassy's Education Coordinator.	No follow-ups required.	Big Grassy First Nation	Aboriginal
5/9/2018	1874	E-mail	New Gold distributed the Weekly Spill Report of Apr 30 - May 6, 2018.	No further action required.	Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Couchiching First Nation	Aboriginal

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5/9/2018	2113	E-mail	New Gold announced the appointment of Ray Threlkeld as the new President and CEO of New Gold.	No further action required.	Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
5/9/2018	2111	Meeting	New Gold held a quarterly JIC meeting with the MNO.	Ongoing quarterly meetings are held and confidential minutes taken.	Métis Nation of Ontario	Aboriginal
5/9/2018	2112	Drop-in Visit/Casual Meeting	Discussion on obligations from New Gold including delivery of black dirt, support for an additional bee yard, HST implications, and noise levels near TMA.	The agreement holder will coordinate delivery of black dirt. New Gold and the agreement holder to work together on bee yard. New Gold provided information on HST implications. Environmental team provided information on TMA noise limits.	Site Neighbour (within 10km of project footprint)	Public
5/11/2018	2114	Ceremony	A Spring Blessing Ceremony was held at the Spirit House the mine site.	The ceremony was attended by New Gold employees.	Naicatchewenin First Nation	Public and Aboriginal
5/12/2018	2115	Site Visit	New Gold provided a site tour for the Professional Engineers of Ontario - Lake of the Woods Chapter.	There were 13 participants in the tour.	Professional Engineers of Ontario - Lake of the Woods Chapter	Public
5/15/2018	2116	Meeting	New Gold held a monthly meeting with Naicatchewenin and Rainy River First Nations.	Ongoing monthly meetings are held.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
5/16/2018	2117	Site Visit	Site visit, project update, coordinated tour for government official.	No follow-up required.	Thunder Bay - Rainy River	Public
5/16/2018	2118	Site Visit	New Gold provided project information about the project and access to the project to an agreement holder. A site tour was also provided.	New Gold answered questions about access to the site and will coordinate with the agreement holder.	General Community (>10km of project footprint)	Public
5/17/2018	2119	E-mail	New Gold distributed a summary of all current career opportunities to community contacts.	No further action required.	Town of Atikokan,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Nigigoonsiminikaaning First Nation,United Native Friendship Centre,Naotkamegwanning First Nation,Shooniyaa Wa-Biitong,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Animakee Wa Zhing First Nation,Seine River First Nation,Buffalo Point First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Anishinabe of Wauzhushk Onigum First Nation,Naicatchewenin First Nation,Couchiching First Nation	Public and Aboriginal
5/17/2018	2063	E-mail	New Gold distributed the Weekly Spill Report of May 6 - 13th.	No follow-ups required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Couchiching First Nation	Aboriginal
5/22/2018	2121	Meeting	Ways that New Gold and the school board can work together.	Work options limited due to mining laws. Tours for school groups will continue to be coordinated.	Rainy River District School Board	Public
5/22/2018	2120	Meeting	Review of NWA 37 agreement commitments.	JIC member present to provide all notifications to other JIC member.	Animakee Wa Zhing First Nation	Aboriginal
5/23/2018	2122	Ceremony	New Gold held Spring Ceremony at the Rainy River site with local Indigenous communities. The ceremony was officiated by an Elder from Rainy River First Nations.	The ceremony was attended by approximately 50 people.	Seine River First Nation,Mitaanjigamiing First Nation,Couchiching First Nation,Naicatchewenin First Nation	Aboriginal
5/23/2018	2123	E-mail	An EMB member called New Gold to advise their consultant would be on site in the next week to perform monitoring.	New Gold contacted the consultant to coordinate the site visit.	Rainy River First Nations	Aboriginal
5/24/2018	2125	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Is there an established baseline for water quality and quantity that is being sent to the environment?	Consultant Answer: It is the same as what the baseline studies showed.	Seine River First Nation	Aboriginal
5/24/2018	2138	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Are the materials used for dams from onsite?	New Gold Answer: Yes.	Seine River First Nation	Aboriginal
5/24/2018	2142	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Are rock stockpile pitches changed or set at a certain slope?	Consultant Answer: At other sites you can drop rock at tall lifts. Because New Gold has so much overburden clay, cannot stack lifts as high therefore change in how the dumps are built.	Seine River First Nation	Aboriginal
5/24/2018	2124	Presentation	Environmental Compliance Approval (ECA) Amendment presentation by a consultant.	The presentation was attended by 6 community members.	Seine River First Nation	Aboriginal
5/24/2018	2129	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: In the filtration system, what is the volume of water in the big tanks at the end of the mill photos?	Consultant Answer: Those are not tanks used for water storage; those tanks are leach tanks, the volume is unknown. The leach tanks do not have any relevance to water; no follow up is required.	Seine River First Nation	Aboriginal
5/24/2018	2144	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Where is the West Mine Rock Stockpile?	Consultant Answer: Pointed to the location in the map included in the PowerPoint presentation.	Seine River First Nation	Aboriginal
5/24/2018	2136	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Which communities are around Pinewood River?	New Gold Answer: Big Island and Big Grassy are likely the closest communities.	Seine River First Nation	Aboriginal

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5/24/2018	2141	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Planning on building a water plant? When will it be running?	Consultant Answer: Yes, a water plant will be built; expected timeframe is approximately 18 months.	Seine River First Nation	Aboriginal
5/24/2018	2137	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: In our water system, water flips twice a year. Would it do the same thing?	Consultant Answer: Yes, it turns over once in the spring and once in the fall. It helps mix so that you have the same water quality throughout.	Seine River First Nation	Aboriginal
5/24/2018	2133	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Any changes to the dams from Mount Polley?	Consultant Answer: Dam slope changed from 11:1 and we have a maximum operating water level (MOWL).	Seine River First Nation	Aboriginal
5/24/2018	2139	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: What is the make-up of the granular material on the surface of the dam?	Consultant Answer: NAG (non-acid generating) material – bigger than 2"--makes up the granular material on the dam surface.	Seine River First Nation	Aboriginal
5/24/2018	2134	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: If you increase the mill output, how many more loads is that?	Consultant Answer: About 1200 more loads per month.	Seine River First Nation	Aboriginal
5/24/2018	2145	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Any difference in open pit for water and underground for water?	Consultant Answer: Pump water from the pit now. Underground will still have water coming in therefore more pumps to pump out to Mine Rock Pond.	Seine River First Nation	Aboriginal
5/24/2018	2128	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Where does water from cleaning the dump trucks go?	New Gold Answer: Kept onsite, oil/water separators in ECA amendment.	Seine River First Nation	Aboriginal
5/24/2018	2130	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Does the amendment include the leach tanks?	Consultant Answer: No, there were no changes around the leach tanks from the initial design.	Seine River First Nation	Aboriginal
5/24/2018	2126	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Do communities downstream, Rainy River and Naicatchewenin, know about ECA Amendment related to Pinewood River, etc.?	Consultant Answer: Yes, they have received the ECA Amendment presentation as well.	Seine River First Nation	Aboriginal
5/24/2018	2343	Meeting	New Gold attended the Industry Advisory Group meeting.		International Joint Commission Industry Advisory Group	Public
5/24/2018	2131	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: We have seen photos of the tar sands with bird cannons. Do you use these?	New Gold Answer: Yes, however the birds get used to them. Around site we have sticks with shiny, silver tape that glitter and blow around in the wind, deterring birds from landing.	Seine River First Nation	Aboriginal
5/24/2018	2127	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member comment: I was given a document with water results and gave it to our treatment plant operator and he said that the water quality was good.	No further action required.	Seine River First Nation	Aboriginal
5/24/2018	2147	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: The result of doing this presentation is a result of a trigger?	Consultant Answer: This was triggered from changes to site since the original 2015 Environmental Compliance Approvals (ECA).	Seine River First Nation	Aboriginal
5/24/2018	2143	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: Is it better to leave stockpile as a bowl?	Consultant Answer: Put berms at toe to help hold it in place when building higher.	Seine River First Nation	Aboriginal
5/24/2018	2132	Community Meeting	A presentation on the Environmental Compliance Approval (ECA updates) was provided to Seine River community members. A Community member asked: When will wetlands be completed?	Consultant Answer: Summer 2019.	Seine River First Nation	Aboriginal
5/25/2018	2065	E-mail	New Gold distributed the Weekly Spill Report of May 14 - 20th.	No follow-ups required.	Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Rainy River First Nations,Ojibways of Onigaming First Nation,Naicatchewenin First Nation,Couchiching First Nation	Aboriginal
5/25/2018	2299	E-mail	New Gold emailed the FFCS AC member a copy of the last meeting minutes of the FFCS Enviro Sub-committee and a copy of the ECA amendment presentation provided to the community on May 24, 2018 as per the request.	No further action required.	Seine River First Nation	Aboriginal
5/25/2018	2148	Meeting	New Gold held a quarterly meeting with the Big Grassy River First Nation.	Ongoing quarterly meetings are held.	Big Grassy First Nation	Aboriginal
5/28/2018	1875	External Feedback	A resident submitted a complaint that blast rock was used in March on Lampi Road and subsequently had to replace his tires due to damage. The neighbour advised that "regular" gravel is now being used and has requested that blast rock no longer be used for road maintenance.	The Community Coordinator left a phone message with the resident that New Gold does not own Lampi Road and that the Township of Chapple maintains the road. The resident was encouraged to reach out to the Township of Chapple if there are any further concerns about maintenance on the road. It was determined that no material from the Rainy River site has been used on the Lampi Road.	General Community (>10km of project footprint)	Public

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5/29/2018	2066	E-mail	New Gold distributed the Weekly Spill Report of May 21 - 27th.	No follow-ups required.	Métis Nation of Ontario,Big Grassy First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Township of Chapple,Couchiching First Nation,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Public and Aboriginal
5/29/2018	2149	E-mail	New Gold added the Township of Chapple to the distribution list of the spill report and provided contact information for any questions.	No further action required.	Township of Chapple	Public
5/30/2018	2150	Site Visit	Site tour provided to students from Rainy River High School	There were 51 participants in the site tour. Students are from the local area as well as Big Grassy.	Rainy River High School,Big Grassy First Nation	Public and Aboriginal
5/31/2018	2064	E-mail	MNO requested information on MOECC contacts regarding spills and where reports are sent.	New Gold outlined internal spill reporting and external reporting and reporting of reportable spills in an email to MNO, as per their request.	Métis Nation of Ontario	Aboriginal
6/4/2018	2153	Drop-in Visit/Casual Meeting	New Gold visited the community and had a general discussion with the EMB member and a council member.	No further action required.	Naotkamegwanning First Nation	Aboriginal
6/4/2018	2152	Open House	New Gold visited the community for general recruitment. No members showed up to apply. New Gold discussed entrepreneurships with the EcDev officer.	No further action required. It is anticipated that 5 or 6 members will participate in the tour on June 6, 2018.	Animakee Wa Zhing First Nation	Aboriginal
6/4/2018	2151	E-mail	An RRFN EMB member requested information on New Gold's spill response to use for their community newsletter.	New Gold provided the information requested.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
6/5/2018	2154	Meeting	New Gold held a quarterly JIC meeting with Naotkamegwanning.	Ongoing quarterly meetings are held and confidential minutes taken.	Naotkamegwanning First Nation	Aboriginal
6/6/2018	2156	Site Visit	Site tour provided to students from Baibombeh School at Whitefish Bay	Approximately 7 students and 3 teachers attended	Naotkamegwanning First Nation	Aboriginal
6/6/2018	2067	E-mail	New Gold distributed the Weekly Spill Report of May 28 - June 3, 2018.	No follow-ups required.	Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Anishinaabeg of Naongashiing,Métis Nation of Ontario,Big Grassy First Nation,Naicatchewenin First Nation,Couchiching First Nation,Township of Chapple,Rainy River First Nations,Ojibways of Onigaming First Nation	Public and Aboriginal
6/6/2018	2155	Site Visit	New Gold provided a site tour to community members of NWA 37.	There were 8 participants.	Animakee Wa Zhing First Nation	Aboriginal
6/6/2018	2157	E-mail	An RRFN EMB member requested information on the deer tissue program of the previous year.	New Gold provided the sampling information as requested.	Rainy River First Nations	Aboriginal
6/11/2018	2344	Meeting	New Gold met with the Environmental Monitoring Board. Spills were discussed, ECA Amendment reviewed, and other topics discussed. Meeting minutes were taken. Naotkamegwanning and Onigaming did not attend the meeting.	Minutes are distributed to all EMB members.	Ojibways of Onigaming First Nation,Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation	Aboriginal
6/11/2018	2158	E-mail	New Gold met with the Environmental Monitoring Board for their regular meeting.	Confidential meeting minutes are kept though the ECA amendment was reviewed and hard copies of the report and appendices were distributed. Members representing Naotkamegwanning and Onigaming did not attend the meeting.	Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation	Aboriginal
6/11/2018	2294	Other	New Gold provided support for two local bee colonies.	This met the requirements of an Agreement.	Site Neighbour (within 10km of project footprint)	Public
6/12/2018	2159	Meeting	New Gold held a quarterly JIC meeting with Animakee Wa Zhing #37 First Nation.	This was the first JIC meeting; quarterly meetings to be held on an ongoing basis. Confidential minutes taken.	Animakee Wa Zhing First Nation	Aboriginal
6/13/2018	2160	E-mail	An RRFN EMB member requested information on the recent fish tissue sampling.	New Gold advised the EMB member when the next sampling of fish tissue would be taking place.	Rainy River First Nations	Aboriginal
6/15/2018	2161	E-mail	New Gold distributed a summary of all current career opportunities to community contacts.	No further action required.	Rainy River First Nations,Anishinabe of Wauzhushk Onigum First Nation,Ojibways of Onigaming First Nation,Couchiching First Nation,Naicatchewenin First Nation,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Mitaanjigamiing First Nation,Buffalo Point First Nation,Lac La Croix First Nation,Anishinaabeg of Naongashiing,United Native Friendship Centre,Nigigoonsiminikaaning First Nation,Shooniyaa Wa-Biitong,Town of Atikokan,Métis Nation of Ontario,Big Grassy First Nation	Public and Aboriginal
6/19/2018	2047	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts.	MNO requested a community information session to held at a later date. Further discussions to be held with MNO.	Métis Nation of Ontario	Aboriginal
6/19/2018	2163	Meeting	At a scheduled FFCS Advisory Committee meeting, New Gold advised Lac La Croix of an overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	No follow-up was required.	Lac La Croix First Nation	Aboriginal
6/19/2018	2164	Meeting	At a scheduled FFCS Advisory Committee meeting, New Gold advised Mitaanjigamiing of an overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	No follow-up was required.	Mitaanjigamiing First Nation	Aboriginal
6/19/2018	2165	Meeting	At a scheduled FFCS Advisory Committee meeting, New Gold advised the committee members of an overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	The Seine River FN committee member did not attend the meeting.	Seine River First Nation	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
6/19/2018	2048	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts and how to improve business opportunities.	AWZFN requested two community information sessions, one to be held on Windigo Island. These sessions were held on Aug 2 and Aug 20 in Regina Bay and on Windigo Island, respectively.	Animakee Wa Zhing First Nation	Aboriginal
6/19/2018	2049	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts and how to improve business opportunities.	NFN requested a community information session.	Naotkamegwanning First Nation	Aboriginal
6/19/2018	2051	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts and how to improve business opportunities. Couchiching advised areas of increased capacity.	No follow-ups required.	Couchiching First Nation	Aboriginal
6/19/2018	2166	Meeting	At a scheduled FFCS Advisory Committee meeting, New Gold advised the committee members of an overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	The Couchiching FN committee member did not attend the meeting.	Couchiching First Nation	Aboriginal
6/19/2018	2050	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts and how to improve business opportunities. Onigaming advised areas of interests.	Onigaming requested a community information session.	Ojibways of Onigaming First Nation	Aboriginal
6/20/2018	2069	E-mail	New Gold distributed the Weekly Spill Report of June 11 - 17, 2018.	No follow-ups required.	Ojibways of Onigaming First Nation,Rainy River First Nations,Couchiching First Nation,Township of Chapple,Naicatchewenin First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Seine River First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing	Public and Aboriginal
6/20/2018	2347	Other	New Gold provided support for the Emo fair grounds upgrades as requested by the RR Valley Agricultural Society.		Rainy River Valley Agricultural Society	Public
6/20/2018	2068	E-mail	New Gold distributed the Weekly Spill Report of June 4 - 10, 2018.	No follow-ups required.	Ojibways of Onigaming First Nation,Rainy River First Nations,Couchiching First Nation,Township of Chapple,Naicatchewenin First Nation,Animakee Wa Zhing First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Seine River First Nation,Big Grassy First Nation,Métis Nation of Ontario,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Public and Aboriginal
6/20/2018	2349	Other	New Gold provided support for the Township of Emo recreational activities for youth.		Township of Emo	Public
6/20/2018	2352	Other	New Gold provided support for the Pow wow in the Naicatchewenin community.		Naicatchewenin First Nation	Aboriginal
6/20/2018	2351	Other	New Gold provided support for the Crossroads School year end celebration.		Crossroads Public School	Public
6/20/2018	2052	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts and how to improve business opportunities.	No follow-ups required.	Mitaanjigamiing First Nation	Aboriginal
6/20/2018	2345	Other	New Gold provided support for the Ducks Unlimited supper and action for environmental projects.		Ducks Unlimited	Public
6/20/2018	2348	Other	New Gold provided sponsorship for the Fort Frances Bass Championship.		Fort Frances Canadian Bass Championship	Public
6/20/2018	2346	Other	New Gold provided support for the Fun in the Sun Canada Day activities.		Town of Fort Frances	Public
6/20/2018	2350	Other	New Gold provided support for the Fort Frances High School chem free grad.		Fort Frances High School	Public
6/20/2018	2167	Meeting	At a scheduled quarterly Big Island JIC meeting, New Gold advised Big Island of an overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	No follow-up was required.	Anishinaabeg of Naongashiing	Aboriginal
6/22/2018	2169	E-mail	New Gold sent a record of contact for the Rainy River Closure Plan Amendment as requested by the MNDM in an email of June 13, 2018.	No follow-up required at this time.	Ontario Ministry of Northern Development and Mines	Government
6/22/2018	1967	E-mail	New Gold submitted initial records of contact to MNDM for the Closure Plan Amendment.	MNDM to provide comment; comment was received on July 9, 2018.	Ontario Ministry of Northern Development and Mines	Public
6/26/2018	2070	E-mail	New Gold distributed the Weekly Spill Report of June 18 - 24, 2018.	No follow-ups required.	Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Naicatchewenin First Nation,Couchiching First Nation,Township of Chapple,Ojibways of Onigaming First Nation,Rainy River First Nations	Public and Aboriginal
6/26/2018	2057	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts and how to improve business opportunities. Nigig shared the history of their community.	No follow-ups required.	Nigigoonsiminikaaning First Nation	Aboriginal
6/26/2018	2170	Meeting	New Gold held a monthly JIC meeting with RRFN and NFN.	Ongoing monthly meetings are held and confidential minutes taken.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
6/27/2018	2171	Meeting	New Gold met with the FFCS Environmental sub-committee for their regular meeting.	Confidential meeting minutes are kept. The members from Couchiching and Mitaanjigamiing did not attend. A link to the ECA update was emailed to all members as an action to this meeting.	Seine River First Nation,Lac La Croix First Nation	Aboriginal
6/27/2018	2058	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts and how to improve business opportunities. Seine River shared/explained the history of their community.	No follow-ups required.	Seine River First Nation	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
6/28/2018	2059	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts and how to improve business opportunities. The community was generally positive and supportive of the objective nature of the process.	No follow-ups required.	Lac La Croix First Nation	Aboriginal
6/28/2018	2172	E-mail	New Gold provided additional information for the 2017 Annual Compliance Report as per correspondence from MOECC on May 25, 2018.		Canadian Environmental Assessment Agency	Government
7/4/2018	2071	E-mail	New Gold distributed the Weekly Spill Report of June 25 - July 1, 2018.	No follow-ups required.	Métis Nation of Ontario,Big Grassy First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Animakee Wa Zhing First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Township of Chapple,Couchiching First Nation,Naicatchewenin First Nation	Public and Aboriginal
7/5/2018	2173	Meeting	New Gold held a discussion with Big Island on the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	No follow-up was required.	Anishinaabeg of Naongashiing	Aboriginal
7/5/2018	2174	Meeting	New Gold discussed the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act with Big Grassy. Employment was also discussed.	No follow-up was required.	Big Grassy First Nation	Aboriginal
7/6/2018	2176	Meeting	New Gold discussed the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act with the Chief of Big Grassy.	No follow-up was required.	Big Grassy First Nation	Aboriginal
7/6/2018	2175	Meeting	New Gold met with the Chief of Big Island First Nation. Big Island is expecting to hire their Environmental Monitor in the coming month.	Big Island will advise New Gold when they have hired the Environmental Monitor.	Anishinaabeg of Naongashiing	Aboriginal
7/6/2018	2177	Meeting	New Gold discussed the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act with the Chief of Couchiching.	No follow-up was required.	Couchiching First Nation	Aboriginal
7/9/2018	2182	Phone Call	New Gold called Seine River's FFCS Advisory Committee member to discuss the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	New Gold arranged a meeting to further discuss on July 12, 2018.	Seine River First Nation	Aboriginal
7/9/2018	1969	E-mail	MNDM requested more detail on consultation efforts on the Closure Plan Amendment (2017).	New Gold is preparing a submission for MNDM with their new form.	Ontario Ministry of Northern Development and Mines	Public
7/9/2018	1968	E-mail	MNDM provided a template of their new Aboriginal Consultation form along with a summary of the consultation received on the original Closure Plan.	New Gold to use the new form when submitting records of contact.	Ontario Ministry of Northern Development and Mines	Public
7/9/2018	2180	Meeting	New Gold discussed the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act with a JIC member of NWA 37.	No follow-up was required.	Animakee Wa Zhing First Nation	Aboriginal
7/9/2018	2179	Meeting	New Gold discussed the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act with a JIC member and an EMB member of Whitefish Bay.	No follow-up was required.	Naotkamegwanning First Nation	Aboriginal
7/9/2018	2183	Text	New Gold texted the Chief of Nigigoonsiminikaaning to arrange a meeting to discuss the Teeple Dam overtopping.	A meeting was arranged for July 12, 2018.	Nigigoonsiminikaaning First Nation	Aboriginal
7/9/2018	2181	Meeting	New Gold met in Kenora with the MNO Region One Consulation Coordinator and a member to discuss the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	No follow-up was required.	Métis Nation of Ontario	Aboriginal
7/9/2018	2178	Meeting	New Gold discussed the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act with a JIC member of Onigaming.	No follow-up was required.	Ojibways of Onigaming First Nation	Aboriginal
7/10/2018	2184	Meeting	New Gold met with the Township of Chapple. Topics discussed include; explanation of the Teeple overtopping, the plan for East Mine Rock stockpile drilling and blasting for a ditch, temporary building permit requirements for underground development, and updates that will be required to the Site Plan agreement for the underground.	No follow up required on Teeple overtopping. For the East Mine Rock stockpile drilling and blasting, New Gold is to advise neighbours before blasting begins, ensure adequate traffic control, and blast only at 11am or 3pm. The contractor and Township of Chapple are working on the building permits. For the Site Plan agreement, New Gold will provide updated schedules and plans as required.	Township of Chapple	Public
7/10/2018	2185	Meeting	New Gold went to Mitaanjigamiing to discuss the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	The meeting was attended by Chief and Council and the EcDev officer.	Mitaanjigamiing First Nation	Aboriginal
7/11/2018	2072	E-mail	New Gold distributed the Weekly Spill Report of July 2 - 8, 2018.	No follow-ups required.	Mitaanjigamiing First Nation,Seine River First Nation,Lac La Croix First Nation,Animakee Wa Zhing First Nation,Métis Nation of Ontario,Big Grassy First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Township of Chapple,Couchiching First Nation,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Public and Aboriginal
7/11/2018	2186	E-mail	New Gold met with the Environmental Monitoring Board for their regular meeting.	Confidential meeting minutes are kept.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
7/11/2018	2353	Meeting	New Gold held a meeting with the Environmental Monitoring Board. Meeting minutes were taken.		Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
7/12/2018	2188	Meeting	New Gold went to Red Gut to discuss the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	The meeting was attended by the Chief and a council member.	Nigigoonsiminikaaning First Nation	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
7/12/2018	2187	Meeting	New Gold went to Seine River to discuss the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act.	The meeting was attended by two council members and one community member.	Seine River First Nation	Aboriginal
7/16/2018	2060	Meeting	New Gold discussed in depth the contract process and provided updated information for current contracts and how to improve business opportunities. The community initiated a discussion on business ideas.	No follow-ups required.	Anishinaabeg of Naongashiing	Aboriginal
7/16/2018	2189	Meeting	New Gold held a quarterly JIC meeting with Onigaming.	Ongoing quarterly meetings are held and confidential minutes taken.	Ojibways of Onigaming First Nation	Aboriginal
7/17/2018	2073	E-mail	New Gold distributed the Weekly Spill Report of July 9 - 15, 2018.	No follow-ups required.	Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Couchiching First Nation,Township of Chapple,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Seine River First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation	Public and Aboriginal
7/17/2018	2190	Meeting	New Gold held a monthly JIC meeting with RRFN and NFN.	Ongoing monthly meetings are held and confidential minutes taken.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
7/17/2018	2192	Meeting	New Gold had a Chiefs' meeting in Toronto with the Chief of Naicatchewenin First Nation.	Confidential meeting minutes are kept.	Naicatchewenin First Nation	Aboriginal
7/17/2018	2191	Site Visit	A site tour with an environmental focus was provided for Big Island community members.	No further action required.	Anishinaabeg of Naongashiing	Aboriginal
7/18/2018	2193	E-mail	New Gold distributed a summary of all current career opportunities to community contacts.	No further action required.	Mitaanjigamiing First Nation,Lac La Croix First Nation,Buffalo Point First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Métis Nation of Ontario,Town of Atikokan,Big Grassy First Nation,Anishinaabeg of Naongashiing,Nigigoonsiminikaaning First Nation,United Native Friendship Centre,Naotkamegwanning First Nation,Shooniyaa Wa-Biitong,Couchiching First Nation,Anishinabe of Wauzhushk Onigum First Nation,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation	Public and Aboriginal
7/18/2018	1971	E-mail	New Gold e-mailed a letter to the Chief that summarized the proposed changes in the 2017 Closure Plan Amendment.	There has been no response from the Chief.	Buffalo Point First Nation	Aboriginal
7/18/2018	1972	E-mail	New Gold e-mailed a letter to the Regional Councillor, MNO Region that summarized the proposed changes in the 2017 Closure Plan Amendment.	The Mineral Development Coordinator and Energy Policy Analyst reached out to New Gold for clarification on the letter (July 30, 2018). They indicated they may want to have a presentation in the future. They will advise New Gold.	Métis Nation of Ontario	Aboriginal
7/18/2018	2194	E-mail	New Gold requested assistance in biological monitoring from an agreement holder.	The agreement holder advised New Gold that he is able to participate.	General Community (>10km of project footprint)	Public
7/18/2018	1970	Hand Delivery	New Gold hand delivered a letter to the Chief that summarized the proposed changes in the 2017 Closure Plan Amendment and discussed the changes with the Chief.	New Gold discussed the changes with the Chief.	Rainy River First Nations	Aboriginal
7/19/2018	1973	Hand Delivery	New Gold hand delivered a letter to the Chief that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the changes with the Chief and two community members.	Anishinabe of Wauzhushk Onigum First Nation	Aboriginal
7/19/2018	2196	Meeting	New Gold discussed the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act, with the Chief and two council members.	No follow-up was required.	Anishinabe of Wauzhushk Onigum First Nation	Aboriginal
7/19/2018	2195	Meeting	New Gold discussed the overflow at Teeple Dam during the construction period (March 21, 2016) that resulted in a fine under the Lakes and Rivers Improvement Act, with the Chief and a community member.	No follow-up was required.	Animakee Wa Zhing First Nation	Aboriginal
7/19/2018	1974	Hand Delivery	New Gold hand delivered a letter to the Chief that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the changes with the Chief.	Animakee Wa Zhing First Nation	Aboriginal
7/20/2018	2276	Site Visit	New Gold provided a presentation and site tour to the Minnesota Minerals Coordinating Committee.	No follow up required.	Minnesota Minerals Coordinating Committee	Public
7/23/2018	1975	Hand Delivery	New Gold hand delivered a letter to a council member that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the changes with the council member and the two JIC members.	Naotkamegwanning First Nation	Aboriginal
7/23/2018	1976	Hand Delivery	New Gold hand delivered a letter to the band office that summarized the proposed changes in the 2017 Closure Plan Amendment. The letter was emailed from the band office to the Chief who was off site.	New Gold provided contact information for the Chief to call and discuss the amendment as is convenient. No follow up required.	Northwest Angle 33 First Nation	Aboriginal
7/25/2018	2293	E-mail	New Gold responded to an email from MNO requesting clarification on an email received summarizing the 2017 Closure Plan Amendment changes.	New Gold advised that the summary of changes emailed to MNO on July 18, 2018 contained no new information since the summary of changes was originally prepared by the consultant in September 2017.	Métis Nation of Ontario	Aboriginal
7/25/2018	2197	E-mail	MNO asked if the footprint of the project was expanding with the closure plan amendment and if the closure plan had been submitted.	New Gold advised that the Rainy River mine footprint did not change with the closure plan amendments; and the draft 2017 Closure Plan Amendment was submitted to MNDM on October 6, 2017.	Métis Nation of Ontario	Aboriginal
7/25/2018	2302	Meeting	Review of various PNP items.	None required.	Métis Nation of Ontario	Aboriginal
7/26/2018	2201	E-mail	New Gold announced the 2018 Second Quarter Results and Updates 2018 Outlook.	No further action required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
7/26/2018	2074	E-mail	New Gold distributed the Weekly Spill Report of July 16 - 22, 2018.	No follow-ups required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Naicatchewenin First Nation,Couchiching First Nation,Township of Chapple,Ojibways of Onigaming First Nation,Rainy River First Nations	Public and Aboriginal
7/26/2018	2285	E-mail	The MECP notified MNO - Region 1 of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Métis Nation of Ontario,Ministry of the Environment Conservation and Parks	Aboriginal
7/26/2018	2281	E-mail	The MECP notified NWA 33 of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Northwest Angle 33 First Nation,Ministry of the Environment Conservation and Parks	Aboriginal
7/26/2018	2199	Site Visit	Two site tours were provided to 93 participants from the local area.			Public
7/26/2018	2198	E-mail	New Gold e-mailed a copy of the Closure Plan Amendment presentation as provided by the consultant.	New Gold offered to schedule a teleconference meeting with their consultant to go through the presentation with MNO members if they so wished.	Métis Nation of Ontario	Aboriginal
7/26/2018	2290	E-mail	The MECP notified Big Grassy River First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Big Grassy First Nation,Ministry of the Environment Conservation and Parks	Aboriginal
7/26/2018	2278	E-mail	The MECP notified Naotkamegwanning First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Naotkamegwanning First Nation,Ministry of the Environment Conservation and Parks	Aboriginal
7/26/2018	2280	E-mail	The MECP notified Onigaming of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Ojibways of Onigaming First Nation	Aboriginal
7/26/2018	2282	E-mail	The MECP notified Lac La Croix First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Lac La Croix First Nation	Aboriginal
7/26/2018	2284	E-mail	The MECP notified Naicatchewenin First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Naicatchewenin First Nation	Aboriginal
7/26/2018	2279	E-mail	The MECP notified Seine River First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Seine River First Nation	Aboriginal
7/26/2018	2283	E-mail	The MECP notified Nigigoonsiminikaaning First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Nigigoonsiminikaaning First Nation	Aboriginal
7/26/2018	2288	E-mail	The MECP notified Buffalo Point First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Buffalo Point First Nation	Aboriginal
7/26/2018	2277	E-mail	The MECP notified Rainy River First Nations of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Rainy River First Nations	Aboriginal
7/26/2018	2287	E-mail	The MECP notified Couchiching First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Couchiching First Nation	Aboriginal
7/26/2018	2289	E-mail	The MECP notified Big Island First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Anishinaabeg of Naongashiing	Aboriginal
7/26/2018	2286	E-mail	The MECP notified Mitaanjigamiing First Nation of New Gold's Permit to Take Water (PTTW) application Ref. No. 1802-AZ4HM6. The application is for an amendment to PTTW No. 1386-9VTP2H issued to New Gold to amend the water taking from the Laydown 4 quarry.	No further action required.	Ministry of the Environment Conservation and Parks,Mitaanjigamiing First Nation	Aboriginal
7/26/2018	2200	Site Visit	New Gold provided an extensive site tour for EMB members.	No further action required.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
7/27/2018	2202	Mass Mailout	New Gold mailed out the RRP Summer 2018 Newsletter to the following communities: Rainy River, Fort Frances (includes Couchiching, Nigigoonsiminikaaning, Mitaanjigamiing, Lac La Croix, Sunset Country Métis), Devlin (includes Naicatchewenin), Emo (includes Rainy River First Nations), Barwick, Stratton, Pinewood, Sleeman (includes Big Grassy, Big Island), Nestor Falls (includes Onigaming), Mine Centre (includes Seine River), and Pawitik (includes Whitefish Bay, Northwest Angle 37 and Sioux Narrows). A digital version was also posted on the New Gold website; a link to current and previous newsletters was emailed to communities that lay outside the local mail distribution on August 2, 2018; these communities included Buffalo Point, Rat Portage (Anishinabe of Wauzhushk Onigum) and Northwest Angle 33.	No further action required.	Rainy River First Nations,Anishinabe of Wauzhushk Onigum First Nation,Ojibways of Onigaming First Nation,Sunset Country Métis,Naicatchewenin First Nation,Couchiching First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Buffalo Point First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Nigigoonsiminikaaning First Nation,Big Grassy First Nation,Northwest Angle 33 First Nation	Public and Aboriginal
7/30/2018	2203	E-mail	New Gold followed up with MNO regarding Closure Plan Amendment letter, previously emailed to MNO's JIC representative.	New Gold clarified the purpose of the letter and explained that the CPA was with MNDM for review and New Gold was offering the opportunity for further questions and comments. New Gold offered to provide further information and a presentation. MNO did not request any at this time and thanked New Gold for the phone call.	Métis Nation of Ontario	Aboriginal
7/30/2018	2075	E-mail	New Gold distributed the Weekly Spill Report of July 23 - 29, 2018.	No follow-ups required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Couchiching First Nation,Township of Chapple,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Public and Aboriginal
7/30/2018	2291	E-mail	New Gold submitted three updated management plans (Community Communications, External Feedback and Complaint Protocol and Indigenous Consultation) for review by MECP.	New Gold incorporated comments as received in correspondence of July 25, 2018.	Ministry of the Environment Conservation and Parks	Government
7/30/2018	2303	Meeting	Introductory meeting with JIC member and new interim EcDev Officer. Discussed general PNP process, current, dissolution of a partnership, and past contracting history issues.	RRFN committed to sending NG various materials.	Rainy River First Nations	Aboriginal
7/31/2018	1977	Hand Delivery	New Gold hand delivered a letter to the Chief that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the changes with the Chief. The Chief requested that the Environmental manager meet with the FFCS Chiefs to further discuss the changes.	Couchiching First Nation	Aboriginal
7/31/2018	1978	Hand Delivery	New Gold hand delivered a letter to the FFCS Environmental Subcommittee member that summarized the proposed changes in the 2017 Closure Plan Amendment. The committee member will deliver the letter to the Chief in the community.	New Gold will follow up with the Chief to confirm receipt and discuss.	Seine River First Nation	Aboriginal
8/1/2018	2304	Other	Discussed opportunities for building on the contractor's presence through the high school, such as having employees spend shift time at the high school working with the kids, possibly providing more equipment and a sign. Entrepreneurship partnerships with the contractor within the community was also discussed.	None required.	Naotkamegwanning First Nation	Aboriginal
8/1/2018	1987	E-mail	New Gold e-mailed a letter to the Chief that summarized the proposed changes in the 2017 Closure Plan Amendment.	The letter was emailed (rather than hand-delivery) at the request of the Chief.	Mitaanjigamiing First Nation	Aboriginal
8/1/2018	1979	Hand Delivery	New Gold hand delivered a letter to the Chief that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the amendment with the Chief and council. There were no concerns.	Anishinaabeg of Naongashiing	Aboriginal
8/1/2018	1980	Hand Delivery	New Gold hand delivered a letter to a council member and the band manager that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the changes with the council member and the band manager. There were no concerns about the amendment. New Gold will follow up with the Chief to confirm receipt of the letter and discuss the amendment.	Big Grassy First Nation	Aboriginal
8/1/2018	2204	Phone Call	New Gold had a phone conversation re: consultation of the Closure Plan Amendment and asked the expected timeline of MNDM approval.	New Gold offered MNO the opportunity to have the Closure Plan Amendment presentation and MNO advised that a group may do so.	Métis Nation of Ontario	Aboriginal
8/2/2018	2205	Site Visit	Two site tours were held for participants on waiting list for a tour.	Approximately 100 participants.		Public
8/2/2018	2305	Workshop	Entrepreneurship workshop for NWA37 residents to try and identify candidates to participate in contract bids.	None required.	Animakee Wa Zhing First Nation	Aboriginal
8/3/2018	1985	Hand Delivery	New Gold hand delivered a letter to a Council Member that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the changes with a Council Member and attempted to follow up with the Chief.	Lac La Croix First Nation	Aboriginal
8/3/2018	2306	Meeting	Review of PNP/RFP process and an update on which items are moving forward imminently, which ones will come later, and which may be stalled.	None required.	Big Grassy First Nation	Aboriginal
8/3/2018	1986	Hand Delivery	New Gold hand delivered a letter to the secretary that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the letter with the secretary and it was to be presented at the Council meeting the following day.	Nigigoonsiminikaaning First Nation	Aboriginal
8/3/2018	1982	Hand Delivery	New Gold hand delivered a letter to a council member and the band manager that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the changes with the council member and the band manager. New Gold confirmed receipt with the Chief.	Couchiching First Nation	Aboriginal

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8/3/2018	2307	Meeting	Review of PNP/RFP process and an update on which items are moving forward imminently, which ones will come later, and which may be stalled.	None required.	Rainy River First Nations	Aboriginal
8/4/2018	1983	Hand Delivery	New Gold hand delivered a letter to a council member and the band manager that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the changes with the council member and the band manager. There were no concerns about the amendment. New Gold confirmed receipt of the letter with the Chief and discussed the amendment.	Big Grassy First Nation	Aboriginal
8/7/2018	2207	Site Visit	Tour provided to participants on waiting list	Approximately 20 participants.		Public
8/8/2018	2076	E-mail	New Gold distributed the Weekly Spill Report of July 30- Aug 5, 2018.	No follow-ups required.	Métis Nation of Ontario,Anishinaabeg of Naongashiing,Big Grassy First Nation,Seine River First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Couchiching First Nation,Township of Chapple,Naicatchewenin First Nation	Public and Aboriginal
8/8/2018	2208	Site Visit	New Gold provided a general site tour and a guided visit to the archaeological site south of West Mine Rock stockpile.	There were 9 tour participants.	Mitaanjigamiing First Nation	Aboriginal
8/9/2018	2209	Conference Call	Call to provide information on status of Water Treatment Plant on site.	No follow-up required at this time.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
8/9/2018	2214	Conference Call	Call to provide information on status of Water Treatment Plant on site.	No follow-up required at this time.	Naotkamegwanning First Nation	Aboriginal
8/9/2018	2216	Conference Call	Call to provide information on status of Water Treatment Plant on site.	No follow-up at this time.	Animakee Wa Zhing First Nation	Aboriginal
8/9/2018	2212	Conference Call	Call to provide information on status of Water Treatment Plant on site.	New Gold attempted to call the Chief, no response	Lac La Croix First Nation	Aboriginal
8/9/2018	2210	Conference Call	Call to provide information on status of Water Treatment Plant on site.	No follow-up required at this time.	Couchiching First Nation	Aboriginal
8/9/2018	2217	Site Visit	New Gold provided a general site tour to the site lookout.	There were 15 tour participants.	Seine River First Nation	Aboriginal
8/9/2018	2211	Conference Call	Call to provide information on status of Water Treatment Plant on site.	No follow-up required at this time.	Seine River First Nation	Aboriginal
8/9/2018	2215	Conference Call	Call to provide information on status of Water Treatment Plant on site.	No follow-up required at this time.	Anishinaabeg of Naongashiing	Aboriginal
8/9/2018	2292	E-mail	New Gold received an email from MECP advising receipt of updated Management Plans (Community Communications, External Feedback and Complaint Protocol, and Indigenous Consultation).	The plans incorporated comments received from MECP in correspondence of July 25, 2018.	Ministry of the Environment Conservation and Parks	Government
8/9/2018	2213	Conference Call	Call to provide information on status of Water Treatment Plant on site.	No follow-up required at this time.	Big Grassy First Nation	Aboriginal
8/10/2018	2354	External Feedback	A site neighbour called to complain about the excessive dust on Lampi Road due to the heavy usage by dump trucks.	The neighbour was encouraged to contact the Township with his concerns as well as they are responsible for the maintenance of Lampi Road.	Site Neighbour (within 10km of project footprint)	Public
8/10/2018	2219	Conference Call	Call to provide information on status of Water Treatment Plant on site.	A follow-up meeting will be held in the community on September 13, 2018.	Mitaanjigamiing First Nation	Aboriginal
8/10/2018	1984	Hand Delivery	New Gold hand delivered a letter to the Chief that summarized the proposed changes in the 2017 Closure Plan Amendment.	New Gold discussed the changes with the Chief and Council and a presentation to Community Members was requested, tentatively scheduled for August 22, 2018.	Ojibways of Onigaming First Nation	Aboriginal
8/10/2018	2220	Meeting	New Gold met with the Chief and council members to answer questions about the water treatment plant.	No further action required.	Ojibways of Onigaming First Nation	Aboriginal
8/11/2018	2221	Site Visit	Site tour provided to family members of employees; a lunch was provided at the Emo sports field.	Three bus tours provided; there were a total of 120 tour participants.		Public
8/13/2018	2077	E-mail	New Gold distributed the Weekly Spill Report of Aug 6 - 12, 2018.	No follow-ups required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Township of Chapple,Couchiching First Nation	Public and Aboriginal
8/13/2018	2308	Site Visit	Site visit to look at business opportunity available at site.	NG to develop and provide RFP.	Big Grassy First Nation	Aboriginal
8/13/2018	2224	Meeting	New Gold met with the JIC members to discuss business opportunities and provide further detail on the water treatment plant.	No further action required.	Naotkamegwanning First Nation	Aboriginal
8/13/2018	2222	Drop-in Visit/Casual Meeting	New Gold attended Chief and Council meeting to provide more information on Water Treatment Plant at site.	No further action required.	Mitaanjigamiing First Nation	Aboriginal
8/13/2018	2223	Meeting	New Gold met with the Chief to provide further detail on the water treatment plant.	No further action required.	Mitaanjigamiing First Nation	Aboriginal
8/14/2018	2226	Letter	New Gold mailed out the updated managements plans (3 - including: Community Communications, External Feedback Procedure and Indigenous Consultation) to Indigenous groups.	No further action required.	Couchiching First Nation,Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Buffalo Point First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Nigigoonsiminikaaning First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Northwest Angle 33 First Nation	Aboriginal
8/15/2018	2227	Meeting	New Gold held a quarterly meeting with the Big Grassy River First Nation.	Ongoing quarterly meetings are held.	Big Grassy First Nation	Aboriginal
8/15/2018	2309	Meeting	General update meeting on business opportunities and review of PNPs.	None required.	Naotkamegwanning First Nation	Aboriginal
8/16/2018	2355	Presentation	New Gold and Seven Generations presented the simulator in Rat Portage First Nation.	The presentation was at the AKRC Youth gathering.	Seven Generations Education Institute,Anishinaabeg of Kabapikotawangag Resource Council Inc.,Anishinabe of Wauzhushk Onigum First Nation	Aboriginal
8/16/2018	2310	Meeting	Update which items are moving forward imminently, which ones will come later, and which may be stalled.	None required.	Ojibways of Onigaming First Nation	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
8/17/2018	2228	E-mail	New Gold distributed a summary of all current career opportunities to community contacts.	No further action required.	Couchiching First Nation,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Anishinabe of Wauzhushk Onigum First Nation,Rainy River First Nations,Shooniyaa Wa-Biitong,Nigigoonsiminikaaning First Nation,United Native Friendship Centre,Anishinaabeg of Naongashiing,Big Grassy First Nation,Town of Atikokan,Métis Nation of Ontario,Mitaanjigamiing First Nation,Buffalo Point First Nation,Lac La Croix First Nation,Seine River First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation	Public and Aboriginal
8/18/2018	2229	Site Visit	Site tour provided to family members of employees; a lunch was provided at the Emo sports field.	Two bus tours provided; there were a total of 78 tour participants.		Public
8/20/2018	2078	E-mail	New Gold distributed the Weekly Spill Report of Aug 13 - 19, 2018.	No follow-ups required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Township of Chapple,Couchiching First Nation,Naicatchewenin First Nation	Public and Aboriginal
8/20/2018	2311	Workshop	Entrepreneurship workshop for NWA37 residents to try and identify candidates to participate in contract bids.	None required.	Animakee Wa Zhing First Nation	Aboriginal
8/21/2018	2232	E-mail	New Gold extended an invitation to communities to visit the active archaeological site at the mine site in September.	No further action at this time.	Naicatchewenin First Nation,Couchiching First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Mitaanjigamiing First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Nigigoonsiminikaaning First Nation,Big Grassy First Nation	Aboriginal
8/21/2018	2231	E-mail	New Gold thanked MNDM for correspondence received and provided updated contact information to MNDM.	MNDM confirmed receipt of the updated contact information.	Ontario Ministry of Northern Development and Mines	Government
8/21/2018	2230	E-mail	New Gold was copied on an email by the MNO to MNDM indicating they would be conducting a high level review and advising any concerns.	No further action required.	Métis Nation of Ontario	Aboriginal
8/22/2018	2313	Meeting	Discussed plans for the community's industrial park and potential for NG to participate / use the park.	None required.	Nigigoonsiminikaaning First Nation	Aboriginal
8/22/2018	2233	Site Visit	Site tour provided to project neighbours; a lunch at the accommodation camp followed.	Thirty three neighbours participated in the tour.	Site Neighbour (within 10km of project footprint)	Public and Aboriginal
8/22/2018	2312	Meeting	Update which items are moving forward imminently, which ones will come later, and which may be stalled.	None required.	Rainy River First Nations	Aboriginal
8/23/2018	2234	Site Visit	New Gold provided a site tour to community members of Northwest Bay.	Fifteen community members participated in the tour.	Naicatchewenin First Nation	Aboriginal
8/23/2018	2235	Meeting	New Gold met with MNO to have a general discussion on business opportunities.	No further action required.	Métis Nation of Ontario	Aboriginal
8/23/2018	2236	Meeting	New Gold met with an Elder from NWA 37 to offer tobacco and request his presence at the Fall Ceremony.	The elder accepted the tobacco and will perform Fall Ceremony.	Animakee Wa Zhing First Nation	Aboriginal
8/27/2018	2237	Meeting	New Gold held a monthly JIC meeting with RRFN and NFN.	Ongoing monthly meetings are held and confidential minutes taken.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
8/28/2018	2239	Letter	New Gold received a letter from the community advising that their community is now 'Animakee Wa Zhing #37' and provided an updated mailing address.	New Gold updated contact information.	Animakee Wa Zhing First Nation	Aboriginal
8/28/2018	2238	Conference Call	New Gold held a teleconference call to provide information to the MNO on status of Water Treatment Plant on site.	No follow up at this time.	Métis Nation of Ontario	Aboriginal
8/29/2018	2079	E-mail	New Gold distributed the Weekly Spill Report of Aug 20 - 26, 2018.	No follow-ups required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Couchiching First Nation,Township of Chapple,Naicatchewenin First Nation	Public and Aboriginal
8/29/2018	2240	E-mail	MNO emailed New Gold a follow-up question to the teleconference call on the water treatment plant. MNO asked if amendments are required for existing approvals for the redesign of the water treatment plant.	New Gold called MNO and advised that no new PTTW permits were required for the redesigned water treatment plant.	Métis Nation of Ontario	Aboriginal
8/29/2018	2315	Meeting	Opportunity for Big Grassy to outline for NG the activity they have had to date, successes, and concerns.	None required.	Big Grassy First Nation	Aboriginal
8/29/2018	2314	Meeting	Update which items are moving forward imminently, which ones will come later, and which may be stalled.	None required.	Anishinaabeg of Naongashiing	Aboriginal
8/30/2018	2242	E-mail	New Gold sent out the invitation for the next quarterly EMB meeting. A link to the 2017 Annual Compliance Report was included in the invitation.		Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
8/30/2018	2241	E-mail	New Gold sent out the invitation for the next quarterly EMB meeting. A link to the 2017 Annual Compliance Report was included in the invitation.		Ojibways of Onigaming First Nation,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario	Aboriginal
8/31/2018	2243	E-mail	New Gold distributed the 2016 Wildlife Monitoring Report to members of the EMB as it was not included with the 2016 Annual Compliance Report, as is typical.	No follow-ups required.	Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Ojibways of Onigaming First Nation	Aboriginal
8/31/2018	2244	E-mail	New Gold distributed the 2016 Wildlife Monitoring Report to members of the EMB as it was not included with the 2016 Annual Compliance Report, as is typical.	No follow-ups required.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
9/4/2018	2316	Meeting	New Gold visited the community to provide information on business opportunities and a potential applicant.	None required.	Naotkamegwanning First Nation	Aboriginal
9/4/2018	2317	Meeting	New Gold visited the community to provide information on an upcoming archaeology tour.	None required.	Animakee Wa Zhing First Nation	Aboriginal
9/4/2018	2245	Phone Call	New Gold called the EcDev officer to discuss the commitment. New Gold offered assistance if required.	No assistance was required at this time but NWA37 is aware they can request anytime.	Animakee Wa Zhing First Nation	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
9/5/2018	2248	E-mail	New Gold distributed the Weekly Spill Report of Aug 27 - Sept 3, 2018.	No follow-ups required.	Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Métis Nation of Ontario,Big Grassy First Nation,Naicatchewenin First Nation,Township of Chapple,Couchiching First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Public and Aboriginal
9/5/2018	2247	E-mail	New Gold was copied on a letter sent to MECP from NWA 33 regarding the application for PTTW ref # 1802-AZ4HM6 along with other environmental concerns.	New Gold sent a response to address the community's concerns dated September 21, 2018.	Northwest Angle 33 First Nation	Aboriginal
9/6/2018	2250	Site Visit	New Gold provided a site tour that included the following locations: TMA Cells 1 and 2, Contango Pilot Test, WMP, Treatment train location, Water Discharge Pond and Constructed Wetland location, Open pit (Alfri's lookout), and Teeple Dam.	No further action required. The group's primary goal for the visit was to see the WMP, TMA and Teeple Dam, which were all included in the tour.	Naotkamegwanning First Nation	Aboriginal
9/6/2018	2249	E-mail	New Gold held a quarterly meeting with Naotkamegwanning First Nation.	Ongoing quarterly meetings are held.	Naotkamegwanning First Nation	Aboriginal
9/7/2018	2246	E-mail	New Gold emailed the Township to advise of the timing of the blasting to take place and summarize the commitments agreed to.	No further action required.	Township of Chapple	Public
9/10/2018	2252	E-mail	New Gold distributed the Weekly Spill Report of Sept 3-9, 2018.	No follow-ups required.	Township of Chapple,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Naotkamegwanning First Nation,Seine River First Nation,Couchiching First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario	Public and Aboriginal
9/10/2018	2251	E-mail	New Gold invited communities to the Fall Ceremony.		Couchiching First Nation,Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Animakee Wa Zhing First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Mitaanjigamiing First Nation,Lac La Croix First Nation,Buffalo Point First Nation,Seine River First Nation,Naotkamegwanning First Nation,Shooniyaa Wa-Biitong,Nigigoonsiminikaaning First Nation,United Native Friendship Centre,Anishinaabeg of Naongashiing,Big Grassy First Nation,Town of Atikokan,Métis Nation of Ontario	Aboriginal
9/10/2018	2356	External Feedback	A site neighbour called to complain about the excessive dust on Hwy 600. The neighbour had also contacted the MOECC with their concern.	The Environmental Manager stopped by the neighbour to discuss the issue and advised New Gold's lack of jurisdiction on the provincial highway. The Community Coordinator contacted the highway service provider to notify them of the concern. They had already been in contact with the neighbour.	Site Neighbour (within 10km of project footprint)	Public
9/11/2018	2254	Letter	New Gold received a letter requesting information on the project from a former neighbour.	New Gold sent previous newsletters and a fact sheet to the requestor.	General Community (>10km of project footprint)	Public
9/11/2018	2318	Meeting	Reviewed an RFP, the scope of work and changes since last discussing this contract.	None required.	Big Grassy First Nation	Aboriginal
9/11/2018	2253	E-mail	New Gold provided an update to neighbours on the upcoming blasting north of Teeple Road. The neighbours were invited to contact the Community team with any questions or concerns.	No questions or concerns at this time.	Site Neighbour (within 10km of project footprint)	Public
9/12/2018	2257	E-mail	New Gold shared a summary letter regarding the Closure Plan Amendment with Big Island's IBA Coordinator.	No follow up required at this time.	Anishinaabeg of Naongashiing	Aboriginal
9/12/2018	2296	E-mail	New Gold announced the recent appointment of the new President and CEO.	No further action required.	Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
9/12/2018	2256	E-mail	New Gold invited communities to the Fall Ceremony.		Anishinaabeg of Naongashiing,Nigigoonsiminikaaning First Nation,Mitaanjigamiing First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Couchiching First Nation	Aboriginal
9/12/2018	2255	Meeting	New Gold held a quarterly JIC meeting with the MNO.	Ongoing quarterly meetings are held and confidential minutes taken.	Métis Nation of Ontario	Aboriginal
9/12/2018	2258	E-mail	New Gold emailed MNO a summary of their phone conversation held earlier in the day. New Gold confirmed that no new Permits to Take Water are required for the water treatment plant.	No further action required.	Métis Nation of Ontario	Aboriginal
9/12/2018	2259	E-mail	New Gold was advised by the JIC member to ensure the JIC member was the sole contact for the MNO on the distribution list for Ceremony invites and Employment Opportunities.	The distribution list was updated as requested.	Métis Nation of Ontario	Aboriginal
9/13/2018	2260	E-mail	New Gold provided the Township of Chapple an updated schedule on the blasting near East Mine Rock stockpile.	No questions or concerns at this time.	Township of Chapple	Public
9/13/2018	2261	E-mail	New Gold extended an invitation to communities to invite Elders and all other members to participate in an informal meeting to discuss what plants, trees and other vegetation should be planted in areas that are ready for reclamation now, and in future. New Gold provided many potential dates for the meeting.	The EMB members were asked to coordinate a meeting date with Elders and community members and contact New Gold with the preferred meeting date and time.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
9/13/2018	2319	Meeting	Review general PNP process and discuss upcoming contract RFP.	None required.	Rainy River First Nations	Aboriginal
9/13/2018	2262	E-mail	New Gold extended an invitation to communities to invite Elders and all other members to participate in an informal meeting to discuss what plants, trees and other vegetation should be planted in areas that are ready for reclamation now, and in future. New Gold provided many potential dates for the meeting.	The EMB members were asked to coordinate a meeting date with Elders and community members and contact New Gold with the preferred meeting date and time.	Ojibways of Onigaming First Nation,Animakee Wa Zhing First Nation,Métis Nation of Ontario,Big Grassy First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing	Aboriginal

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9/17/2018	2263	E-mail	The Big Island EMB member requested a link to the Closure Plan Amendment.	New Gold emailed the link as requested.	Anishinaabeg of Naongashiing	Aboriginal
9/17/2018	2264	E-mail	New Gold distributed the Weekly Spill Report of Sept 10-16, 2018.	No follow-ups required.	Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Seine River First Nation,Naotkamegwanning First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Township of Chapple,Couchiching First Nation	Public and Aboriginal
9/17/2018	2265	E-mail	New Gold sent an invitation to Whitefish Bay's EMB member to extend to Elders for an information session to share Traditional Knowledge.	Meeting date set for October 3, 2018 at the arena in Whitefish Bay; focus will be how to use Traditional Knowledge for reclamation and revegetation activities at the mine state.	Naotkamegwanning First Nation	Aboriginal
9/18/2018	2297	E-mail	New Gold announced the appointment of VP, Investor Relations for New Gold.	No further action required.	Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing	Aboriginal
9/18/2018	2266	Meeting	New Gold had their regular meeting with the FFCS Advisory Committee.	Confidential meeting minutes are taken.	Seine River First Nation	Aboriginal
9/18/2018	2320	Meeting	-Review NGD process and community business opportunities related to PNPs. -From PNP to RFP. -How to find partners, how to help partners increase bid strength, and how to develop strong agreements.	None required.	Animakee Wa Zhing First Nation	Aboriginal
9/19/2018	2267	Site Visit	New Gold hosted the first of two archaeology site tours at the Stage 4 excavation south of the West Mine Rock Pond.	Six community members participated in the site tour.	Anishinaabeg of Naongashiing,Rainy River First Nations,Anishinaabeg of Kabapikotawangag Resource Council Inc.	Aboriginal
9/19/2018	2321	Meeting	New Gold met with the community to discuss an existing contract.	None required.		Aboriginal
9/19/2018	2271	E-mail	New Gold sent out the invitation for the next FFCS Environmental sub-committee meeting. A link to the 2017 Annual Compliance Report was included in the invitation.		Seine River First Nation,Lac La Croix First Nation,Couchiching First Nation,Mitaanjigamiing First Nation	Aboriginal
9/19/2018	2270	Meeting	New Gold held a quarterly JIC meeting with Animakee Wa Zhing #37 First Nation.	Confidential meeting minutes taken.	Animakee Wa Zhing First Nation	Aboriginal
9/19/2018	2322	Meeting	-Review NGD process and community business opportunities related to PNPs. -From PNP to RFP. -How to find partners, how to help partners increase bid strength, and how to develop strong agreements. - Discussed process of dissolution of a shared business	None required.	Naicatchewenin First Nation	Aboriginal
9/20/2018	2274	E-mail	New Gold distributed a summary of all current career opportunities to community contacts.	No further action required.	Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation,Couchiching First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Mitaanjigamiing First Nation,Buffalo Point First Nation,Lac La Croix First Nation,Naotkamegwanning First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Town of Atikokan,Métis Nation of Ontario,Big Grassy First Nation,Nigigoonsiminikaaning First Nation,United Native Friendship Centre,Shooniyaa Wa-Biitong,Anishinaabeg of Naongashiing	Aboriginal
9/20/2018	2298	E-mail	New Gold announced that it has entered into a definitive share purchase agreement to sell the Mesquite Mine.	No further action required.	Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing	Aboriginal
9/20/2018	2272	Meeting	New Gold held a monthly JIC meeting with RRFN and NFN.	Ongoing monthly meetings are held and confidential minutes taken.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
9/20/2018	2362	Other	New Gold provided support for the Whitefish Bay Fall Bass Classic.		Naotkamegwanning First Nation	Public and Aboriginal
9/20/2018	2359	Other	New Gold provided support for the FF Chamber of Commerce business awards.		Fort Frances Chamber of Commerce	Public
9/20/2018	2364	Other	New Gold provided support for the Tour de Fort Concert Series.		Tour de Fort	Public
9/20/2018	2357	External Feedback	A Stratton resident contacted New Gold to advise the inappropriate use of a private road by the New Gold coach.	New Gold contacted the manager of the coach buses; the drivers were advised to stop using the road as a turnaround.	General Community (>10km of project footprint)	Public
9/20/2018	2324	Meeting	Worked with BGFN and his associates with a business partner to develop a business plan for a contract.	None required.	Big Grassy First Nation	Aboriginal
9/20/2018	2358	Other	New Gold provided support for the Pow wow in the Big Grassy community.		Big Grassy First Nation	Aboriginal
9/20/2018	2363	Other	New Gold provided support for the Riverside Health Foundation Fall Gala Event.		Riverside Foundation for Health Care	Public
9/20/2018	2361	Other	New Gold provided support for the Anishinaabeg of Naongashiing golf tournament.		Anishinaabeg of Naongashiing	Aboriginal
9/20/2018	2360	Other	New Gold provided sponsorship for the Fort Frances Curling Club.		Fort Frances Curling Club	Public
9/20/2018	2273	Meeting	New Gold held a quarterly JIC meeting with AON.	Confidential meeting minutes are taken.	Anishinaabeg of Naongashiing	Aboriginal
9/24/2018	2295	E-mail	New Gold distributed the Weekly Spill Report of Sept 17-23, 2018.	No follow ups required.	Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Seine River First Nation,Naotkamegwanning First Nation,Lac La Croix First Nation,Couchiching First Nation,Mitaanjigamiing First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Township of Chapple,Naicatchewenin First Nation	Public and Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
9/25/2018	2365	External Feedback	A site neighbour contacted New Gold to express concern about a recent blast at the East Mine Rock Stockpile. There was significant vibration and a long crack formed in their shop.	Vibration monitor readings were analyzed and did not show any excessive readings. New Gold went to see the neighbour and share the information; the blasting at that location was short term and the engineering department advised of the issue. Future blasts were closely monitored and no other issues were experienced by the neighbour. The blasting is completed at that location.	Site Neighbour (within 10km of project footprint)	Public
9/26/2018	2268	Site Visit	New Gold cancelled the second archaeological site tour at the Stage 4 excavation south of the West Mine Rock Pond.	Archaeological tour concluded work earlier than anticipated due to poor weather conditions at site.		Aboriginal
9/26/2018	2275	E-mail	New Gold responded to the community's concerns regarding environmental performance in the past few years.	New Gold emailed the letter as per the Chief's request. New Gold extended an invitation to the Chief to call the Environmental Manager at anytime to discuss concerns and offered a site tour at the Chief's convenience.	Northwest Angle 33 First Nation	Aboriginal
9/27/2018	2325	Meeting	Introductory meet with LLC's new Mineral Development Advisor, to review New Gold processes and opportunities.	None required.	Lac La Croix First Nation	Aboriginal
9/27/2018	2269	Presentation	New Gold gave a presentation to 3 classes of Grade 4 students on mining and geology.	Approximately 50 grade four students were in attendance at the presentations. The teachers thanked the presenter for taking the time to talk with their students.	St. Francis School	Public
9/28/2018	2300	Other	An agreement holder provided several days of consulting and assisting New Gold with fish sampling and fish salvage.	No further action required.	General Community (>10km of project footprint)	Public
9/28/2018	2366	E-mail	An EMB member emailed New Gold and asked what changes were implemented to prevent future spills in the mill fuel storage laydown area after receiving the information in a weekly spill report.	New Gold emailed the actions the mill implemented following the spill to prevent recurrences.	Métis Nation of Ontario	Aboriginal
10/2/2018	2326	E-mail	New Gold distributed the Weekly Spill Report of Sept 24-30, 2018	None required.	Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Township of Chapple,Couchiching First Nation,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation	Public and Aboriginal
10/3/2018	2301	Ceremony	New Gold held Fall Ceremony at the Rainy River site with local Indigenous communities. The ceremony was officiated by an Elder from Animakee Wa Zhing #37 First Nation.	There were approximately 40 participants.	Rainy River First Nations,Animakee Wa Zhing First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation	Aboriginal
10/4/2018	2328	E-mail	MNO inquired about how costs and expenses of Traditional Knowledge Information sessions will be covered.	New Gold advised MNO how the costs would be managed for info session participants.	Métis Nation of Ontario	Aboriginal
10/4/2018	2368	E-mail	A new EMB member requested copies of all the EMB's previous minutes.	New Gold emailed copies of all of the meeting minutes as requested.	Anishinaabeg of Naongashiing	Aboriginal
10/4/2018	2367	Meeting	New Gold held a JIC meeting with RRFN/NFN.	Confidential meeting minutes were taken.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
10/4/2018	2327	Meeting	New Gold met with the community to discuss concerns about the RFP process.	The BDO met with the New Relations Coordinator at a later date (Oct 24/2018) to address the concerns.	Ojibways of Onigaming First Nation	Aboriginal
10/9/2018	2329	E-mail	New Gold distributed the Weekly Spill Report of Oct 1-7, 2018.	None required.	Naicatchewenin First Nation,Couchiching First Nation,Township of Chapple,Ojibways of Onigaming First Nation,Rainy River First Nations,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Naotkamegwanning First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation	Public and Aboriginal
10/15/2018	2333	E-mail	New Gold distributed the Weekly Spill Report of Oct 8-14, 2018.	None required.	Lac La Croix First Nation,Seine River First Nation,Mitaanjigamiing First Nation,Animakee Wa Zhing First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Township of Chapple,Couchiching First Nation,Naicatchewenin First Nation	Public and Aboriginal
10/15/2018	2369	Meeting	New Gold provided information on the plans for casual surface miner training.		Big Grassy First Nation	Aboriginal
10/15/2018	2332	Meeting	New Gold met with the community to discuss the status of a commitment.	New Gold provided further information to assist the community in meeting the hiring commitment.	Anishinaabeg of Naongashiing	Aboriginal
10/16/2018	2334	E-mail	New Gold responded to a previous request from Onigaming about a technical review of the CP Amendment.	New Gold advised Onigaming that a third party review was not warranted at this time but was willing to provide further community meetings with the consultant to answer any new questions.	Ojibways of Onigaming First Nation	Aboriginal
10/16/2018	2370	Meeting	New Gold provided recruitment assistance for employment needs for a site contractor.		Anishinaabeg of Naongashiing,Big Grassy First Nation	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
10/17/2018	2371	Meeting	New Gold held a quarterly EMB meeting with MNO, AON, AWZFN. The Onigaming, Whitefish Bay and Big Grassy reps were not in attendance.	The current application for a LRIA work permit to do a stage 2 TMA dam raise was discussed. The draft application will be emailed to all EMB members. Other discussions were held on monitoring, spills and upcoming TK sessions. Meeting minutes were taken and distributed on November 5, 2018 along with 2017 Annual Air Quality reports and the Deer Tissue Sample Poster.	Big Grassy First Nation,Métis Nation of Ontario,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Ojibways of Onigaming First Nation	Aboriginal
10/18/2018	2335	E-mail	New Gold distributed a summary of all current career opportunities to community contacts.	None required.	Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Seine River First Nation,Couchiching First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Buffalo Point First Nation,Anishinaabeg of Naongashiing,Shooniyaa Wa-Biitong,United Native Friendship Centre,Nigigoonsiminikaaning First Nation,Métis Nation of Ontario,Town of Atikokan,Big Grassy First Nation	Public and Aboriginal
10/18/2018	2372	Drop-in Visit/Casual Meeting	New Gold provided information on potential employment for contractors on site.		Rainy River First Nations	Aboriginal
10/20/2018	2373	External Feedback	A site neighbour contacted New Gold to share their complaint over property trespass taking place. It was assumed the trespassers were employees as the incidents happened around shift change.	New Gold encouraged the neighbour to contact the OPP and all employees were reminded to be respectful of neighbours as most of the property around the mine site is private property.	Site Neighbour (within 10km of project footprint)	Public
10/22/2018	2376	Meeting	New Gold attended the Atikokan Training and Education Focus Group meeting to have a discussion on gaps in education services for employers and agencies in Atikokan and outlying communities.		Town of Atikokan	Public and Aboriginal
10/22/2018	2375	Meeting	New Gold held a monthly JIC meeting with RRFN/NFN.	Confidential meeting minutes were taken.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
10/23/2018	2336	E-mail	NG announced management changes.	None required.	Rainy River First Nations,Ojibways of Onigaming First Nation,Naicatchewenin First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation	Aboriginal
10/23/2018	2379	Meeting	New Gold met with the FFCS Environmental sub-committee. Various topics were discussed and New Gold provided an update on the ECA. Members representing Couchiching, Mitaanjigamiing and Seine River were not in attendance. Minutes of this meeting were distributed on November 6, 2018.	Meeting minutes were taken and are distributed to all committee members.	Couchiching First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Fort Frances Chiefs Secretariat,Seine River First Nation	Aboriginal
10/23/2018	2377	Drop-in Visit/Casual Meeting	New Gold provided support to a local community during a search for a missing community member.		Anishinaabeg of Naongashiing	Aboriginal
10/23/2018	2340	Presentation	New Gold presented to Sturgeon Creek School students (Gr. 5-8) on topics of geology, environment and job opportunities. A mine site bus tour was provided of the general layout with tour guides discussing mine and mill operations. Conditions in the pit did not allow the coach bus to view overlook.	Approximately 55 students and staff participated in the presentations and tour.	Sturgeon Creek School	Public
10/24/2018	2337	E-mail	New Gold distributed the Weekly Spill Report of October 15-21, 2018	None required.	Naotkamegwanning First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Couchiching First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Township of Chapple,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Public and Aboriginal
10/24/2018	2380	Meeting	New Gold met with Whitefish Bay to discuss the status of specific contracts.	Confidential discussion held.	Naotkamegwanning First Nation	Aboriginal
10/24/2018	2381	Meeting	New Gold met with Whitefish Bay to provide information on the plans for casual surface miner training.		Naotkamegwanning First Nation	Aboriginal
10/24/2018	2383	E-mail	New Gold provided an update to neighbours on the blasting north of Teeple Road. Work to extend until the end of November. The neighbours were invited to contact the Community team with any questions or concerns.	No questions or concerns at this time.	Site Neighbour (within 10km of project footprint)	Public
10/24/2018	2338	E-mail	New Gold responded to a previous request from MNO about a technical review of the CP Amendment.	New Gold advised MNO that a third party review was not warranted at this time but was willing to provide further community meetings with the consultant to answer any new questions.	Métis Nation of Ontario	Aboriginal
10/24/2018	2382	Meeting	New Gold met with Onigaming to discuss an agreement commitment.	Confidential discussion held.	Ojibways of Onigaming First Nation	Aboriginal
10/24/2018	2339	E-mail	RRFN advised New Gold that they were cancelling a scheduled community site tour.	The site tour was cancelled due to lack of community interest.	Rainy River First Nations	Aboriginal
10/25/2018	2387	E-mail	New Gold announced that it has released 2018 third quarter results.	No follow up required.	Rainy River First Nations,Ojibways of Onigaming First Nation,Naicatchewenin First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation	Aboriginal
10/25/2018	2385	Drop-in Visit/Casual Meeting	New Gold visited Naicatchewenin to have discussion with an employee and a potential candidate.	No follow up required.	Naicatchewenin First Nation	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
10/25/2018	2386	External Feedback	A neighbour contacted New Gold to ask if New Gold was hauling on Heatwole Road as there had been an increase in hauling traffic.	The neighbour was advised that New Gold was not hauling on Heatwole Road but was aware that MTO was performing road maintenance in the area. New Gold provided MTO's contact information.	Site Neighbour (within 10km of project footprint)	Public
10/25/2018	2384	Drop-in Visit/Casual Meeting	The new Community Coordinator was introduced to a project neighbour. The neighbour expressed concern about contractor traffic on Hwy 600 to the accommodation camp.	The camp manager advised that the traffic flow is personal vehicles in the mornings and evenings around shift changes. The information was shared with the neighbour; they had no other concerns at this time.	Site Neighbour (within 10km of project footprint)	Public
10/27/2018	2389	Presentation	New Gold gave a presentation outlining the procurement process at a NWA37 community meeting.	Over 100 community members participated in the presentation.	Animakee Wa Zhing First Nation	Aboriginal
10/29/2018	2390	E-mail	New Gold distributed the Weekly Spill Report of October 22 - 28, 2018.		Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Naicatchewenin First Nation,Township of Chapple,Couchiching First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations	Aboriginal
10/29/2018	2391	Postal Mail	MNO requested copies of three management plans.	New Gold mailed the following management plans to MNO: 1) Community Communications Plan; 2) External Feedback and Complaint Protocol; and 3) Indigenous Consultation Plan	Métis Nation of Ontario	Aboriginal
10/30/2018	2392	Meeting	New Gold met with two teachers from the Onigaming School (Grade 5-6 & 7-8) to discuss having a Presentation at the school with a focus on the environment & future career opportunities.	The community team will coordinate the presentation in November.	Ojibways of Onigaming First Nation,Mikinaak Onigaming School	Aboriginal
10/31/2018	2395	E-mail	New Gold emailed the draft LRIA application package for the Stage Two construction of the TMA to members of the EMB. JIC members were copied on the email.	Recipients were encouraged to contact the Environmental Manager with any questions or concerns.	Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Ojibways of Onigaming First Nation	Aboriginal
10/31/2018	2393	E-mail	New Gold emailed the draft LRIA application package for the Stage Two construction of the TMA to members of the FFCS Environmental sub-committee. Advisory committee members were copied on the email.	Recipients were encouraged to contact the Environmental Manager with any questions or concerns	Seine River First Nation,Mitaanjigamiing First Nation,Fort Frances Chiefs Secretariat,Lac La Croix First Nation,Couchiching First Nation	Aboriginal
10/31/2018	2397	Meeting	New Gold participated in an Industry Advisory Group teleconference.		International Joint Commission Industry Advisory Group	Public
10/31/2018	2394	E-mail	New Gold emailed the draft LRIA application package for the Stage Two construction of the TMA to members of the RRFN/NFN EMB. JIC members were copied on the email.	Recipients were encouraged to contact the Environmental Manager with any questions or concerns.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
11/1/2018	2399	Phone Call	A neighbour called with concern about a beaver dam blocking a culvert near Teeple and Gallinger Road. He wants to prevent any spring flooding.	The environment team was asked to arrange the clearing of the blocked culvert.	Site Neighbour (within 10km of project footprint)	Public
11/1/2018	2401	External Feedback	A project neighbour contacted New Gold to advise of a beaver dam blocking the culvert at Teeple & Gallinger Roads and he was concerned that the dam may cause flooding of his property in the spring.	New Gold made arrangements with the Township of Chapple to remove the dam and the neighbour was advised. The Township removed the beaver dam.	Site Neighbour (within 10km of project footprint)	Public
11/1/2018	2398	Meeting	New Gold discussed business planning for an employee interested in becoming involved with a local business opportunity.		Métis Nation of Ontario	Aboriginal
11/1/2018	2400	Site Visit	New Gold provided a site tour of the mine and mill for employees of Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services.	There were 10 participants in the tour	Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services	Aboriginal
11/1/2018	2402	Community Meeting	New Gold travelled to the community for an information session for Traditional Knowledge for vegetation trial plots - reclamation and closure.	Community elders shared information on vegetation and trees they would like to see at the mine site at closure. Notes were taken; vegetation plots will be designed using TK.	Animakee Wa Zhing First Nation	Aboriginal
11/2/2018	2403	Meeting	New Gold met with the business development representative to discuss any potential concerns.	No questions or concerns at this time.	Métis Nation of Ontario	Aboriginal
11/5/2018	2409	E-mail	New Gold distributed the Weekly Spill Report of October 29 - November 4, 2018		Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation,Seine River First Nation,Naotkamegwanning First Nation,Lac La Croix First Nation,Couchiching First Nation,Mitaanjigamiing First Nation,Naicatchewenin First Nation,Township of Chapple,Ojibways of Onigaming First Nation,Rainy River First Nations	Aboriginal
11/5/2018	2411	E-mail	New Gold announced the appointment of a new Executive VP and CFO.	No follow up required.	Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation	Aboriginal
11/5/2018	2405	Drop-in Visit/Casual Meeting	New Gold met with the Ec Dev Officer to discuss a contract coming up for renewal.	Confidential discussion held.	Naotkamegwanning First Nation	Aboriginal
11/5/2018	2406	Drop-in Visit/Casual Meeting	New Gold held a discussion with the community's Ontario Works employee about casual surface miner training.	No questions or concerns at this time.	Naotkamegwanning First Nation	Aboriginal
11/5/2018	2407	Drop-in Visit/Casual Meeting	New Gold met with a JIC member and council member to discuss a Participation Agreement commitment.	Confidential discussion held.	Ojibways of Onigaming First Nation	Aboriginal
11/5/2018	2410	Meeting	New Gold held a quarterly JIC meeting with Onigaming.	Confidential meeting minutes were taken.	Ojibways of Onigaming First Nation	Aboriginal
11/6/2018	2413	Community Meeting	New Gold attended the SN-NF Police Service Board Meeting and presented two speed awareness signs to the township.	The speed signs were donated as part of New Gold's Community Investment Program.	Township of Sioux Narrows - Nestor Falls	Public

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
11/7/2018	2414	E-mail	The MECP notified communities of New Gold's Permit to Take Water (PTTW) application Ref. No. 3704-AW72YD & 3500-B4HJ4H.		Big Grassy First Nation,Northwest Angle 33 First Nation,Nigigoonsiminikaaning First Nation,Anishinaabeg of Naongashiing,Mitaanjigamiing First Nation,Lac La Croix First Nation,Buffalo Point First Nation,Naotkamegwanning First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Couchiching First Nation,Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation	Aboriginal
11/8/2018	2415	Meeting	New Gold met with community staff members and interested applicants to provide information on the upcoming casual surface miner training program.	No questions or concerns at this time.	Naotkamegwanning First Nation	Aboriginal
11/9/2018	2416	Drop-in Visit/Casual Meeting	New Gold met with a local resident interested in finding out more about employment opportunities with New Gold.		General Community (>10km of project footprint)	Public
11/11/2018	2396	Community Event	New Gold provided a coach bus for the local Air Cadets to attend various Remembrance Day events in the region.		908 Rainy Lake Royal Canadian Air Cadets	Public
11/12/2018	2419	E-mail	New Gold emailed the Annual Corporate Responsibility Report.	No follow up required.	Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation	Aboriginal
11/12/2018	2418	E-mail	New Gold distributed the Weekly Spill Report of November 5 - 11, 2018.		Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Couchiching First Nation,Township of Chapple,Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation	Public and Aboriginal
11/13/2018	2422	Meeting	New Gold held a quarterly JIC meeting with Big Grassy.	Confidential meeting minutes were taken.	Big Grassy First Nation	Aboriginal
11/13/2018	2421	Meeting	New Gold met with the Ec Dev Officer for a general discussion on the project.	Confidential discussion held.	Big Grassy First Nation	Aboriginal
11/13/2018	2420	Meeting	New Gold met with a community member interested in employment at the mine.		Rainy River First Nations	Aboriginal
11/14/2018	2424	Community Meeting	New Gold held a TK information session on vegetation trial plots for reclamation and closure in the Big Island community; the EMB rep for the community shared Elders knowledge that he had gathered.	Community elders shared information on vegetation and trees they would like to see at the mine site at closure. Notes were taken; vegetation plots will be designed using TK. New Gold emailed AON the map of trial plots.	Anishinaabeg of Naongashiing	Aboriginal
11/14/2018	2519	E-mail	New Gold distributed a summary of all current employment opportunities.	No further action required.	Town of Atikokan,Métis Nation of Ontario,Big Grassy First Nation,Shooniyaa Wa-Biitong,Nigigoonsiminikaaning First Nation,Anishinaabeg of Naongashiing,United Native Friendship Centre,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Seine River First Nation,Buffalo Point First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Couchiching First Nation,Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation	Aboriginal
11/14/2018	2423	Open House	New Gold coordinated a Community Information Session to provide information on employment opportunities, business opportunities and general project information.	JIC members coordinated the event as part of an agreement commitment.	Animakee Wa Zhing First Nation	Aboriginal
11/15/2018	2425	Drop-in Visit/Casual Meeting	New Gold donated a laptop to an Elder for the purposes of writing a book.		Animakee Wa Zhing First Nation	Aboriginal
11/15/2018	2417	Meeting	New Gold and the RRFN/NFN EMB were unable to coordinate a meeting date for Q3/Q4.	Efforts continue to coordinate a meeting date that suits all parties in Q1 2019.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
11/16/2018	2427	Meeting	New Gold and the community discussed concerns regarding the purchasing process.	n/a	Rainy River First Nations	Aboriginal
11/19/2018	2428	E-mail	New Gold distributed the Weekly Spill Report of November 12 - 18, 2018.		Rainy River First Nations,Ojibways of Onigaming First Nation,Naicatchewenin First Nation,Township of Chapple,Couchiching First Nation,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Seine River First Nation,Big Grassy First Nation,Anishinaabeg of Naongashiing,Métis Nation of Ontario	Aboriginal
11/20/2018	2429	Meeting	New Gold held a monthly JIC meeting with RRFN/NFN.	Confidential meeting minutes were taken.	Naicatchewenin First Nation,Rainy River First Nations	Aboriginal
11/21/2018	2430	Presentation	New Gold gave a presentation to the school about employment opportunities and environmental matters. A community member employed by New Gold spoke about his work experience.		Ojibways of Onigaming First Nation,Mikinaak Onigaming School	Aboriginal
11/22/2018	2431	Meeting	New Gold met with the Chief to discuss issues with New Gold.	Confidential discussion held; New Gold alleviated the level of the Chief's concerns.	Nigigoonsiminikaaning First Nation	Aboriginal
11/26/2018	2432	Drop-in Visit/Casual Meeting	New Gold met with Big Island to advise of employment opportunities with a contractor at New Gold.		Anishinaabeg of Naongashiing	Aboriginal
11/26/2018	2433	Drop-in Visit/Casual Meeting	New Gold met with the Chief and council; C&C advised that an employment offer was made for a position committed within the Agreement.		Anishinaabeg of Naongashiing	Aboriginal
11/27/2018	2434	E-mail	New Gold distributed the Weekly Spill Report of November 19 - 25, 2018.		Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Animakee Wa Zhing First Nation,Seine River First Nation,Naotkamegwanning First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Naicatchewenin First Nation,Couchiching First Nation,Township of Chapple	Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
11/28/2018	2435	Meeting	New Gold met with the Chief and members of staff to introduce the General Manager and have a general discussion. Concerns were raised regarding past procurement practices and current difficulties securing contracts.	The Chief indicated that members are primarily concerned with the environment rather than any monies or profit from the mine. The General Manager offered to be contacted at anytime and committed to quarterly meetings and attend any community meetings.	Big Grassy First Nation	Aboriginal
11/28/2018	2436	Meeting	New Gold met with the Chief to introduce the General Manager and have a general discussion. Concerns were raised regarding past procurement practices and current difficulties securing contracts.	Confidential discussion held on agreement matters.	Anishinaabeg of Naongashiing	Aboriginal
11/29/2018	2437	Meeting	New Gold met with six of the Chiefs of the FFCS to introduce the General Manager and have a discussion about concerns regarding past procurement practices and current difficulties securing contracts.		Nigigoonsiminikaaning First Nation,Fort Frances Chiefs Secretariat,Couchiching First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Rainy River First Nations	Aboriginal
11/29/2018	2438	E-mail	New Gold provided information on gold recovery and environmental sampling and testing to RRFN for use in community newsletters, as per RRFN's request.		Rainy River First Nations	Aboriginal
11/30/2018	2441	E-mail	The New Gold GM sent an email to community leaders to introduce himself and provide his contact details.		Rainy River First Nations,Ojibways of Onigaming First Nation,Couchiching First Nation,Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation,Animakee Wa Zhing First Nation,Buffalo Point First Nation,Seine River First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Nigigoonsiminikaaning First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario,Northwest Angle 33 First Nation	Aboriginal
11/30/2018	2439	Meeting	New Gold met with Onigaming to introduce the General Manager and have a discussion about concerns regarding past procurement practices and current difficulties securing contracts.		Ojibways of Onigaming First Nation	Aboriginal
11/30/2018	2440	Meeting	The EMB member for WFB requested a meeting with the Environmental Manager to discuss the TMA Stage Two LRIA Application (draft) that had been emailed.	New Gold met with community representatives to discuss the draft LRIA application on TMA Stage Two, provide further detail and answer questions. A site tour was offered to view the TMA area in the spring.	Animakee Wa Zhing First Nation,Naotkamegwanning First Nation	Aboriginal
12/2/2018	2442	Community Event	New Gold participated in the Fort Frances Christmas Parade with a themed float.		Town of Fort Frances	Public
12/3/2018	2446	E-mail	New Gold distributed the Weekly Spill Report of November 26 - December 2, 2018.		Anishinaabeg of Naongashiing,Métis Nation of Ontario,Big Grassy First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Naicatchewenin First Nation,Couchiching First Nation,Township of Chapple,Ojibways of Onigaming First Nation,Rainy River First Nations	Aboriginal
12/3/2018	2445	Drop-in Visit/Casual Meeting	New Gold met with the community for a year end visit.	Confidential discussion held on agreement matters.	Nigigoonsiminikaaning First Nation	Aboriginal
12/3/2018	2443	Drop-in Visit/Casual Meeting	New Gold met with the community for a year end visit.	Confidential discussion held on agreement matters.	Lac La Croix First Nation	Aboriginal
12/3/2018	2444	Drop-in Visit/Casual Meeting	New Gold met with the community for a year end visit.	Confidential discussion held on agreement matters and employee concerns.	Seine River First Nation	Aboriginal
12/4/2018	2449	E-mail	RRFN shared information sheets on their environmental monitoring program and sampling and testing. RRFN also coordinated a site visit for the person taking samples for testing.	RRFN will be distributing these information sheets within the community.	Rainy River First Nations	Aboriginal
12/4/2018	2448	Drop-in Visit/Casual Meeting	New Gold met with the community for a year end visit.	New Gold provided information on a posted millwright apprenticeship.	Big Grassy First Nation	Aboriginal
12/4/2018	2447	Drop-in Visit/Casual Meeting	New Gold met with the community for a year end visit.	Confidential discussion held on agreement matters.	Anishinaabeg of Naongashiing	Aboriginal
12/5/2018	2453	E-mail	New Gold provided an update to neighbours on the blasting taking place north of Teeple Road. The neighbours were invited to contact the Community team with any questions or concerns.	No questions or concerns at this time	Site Neighbour (within 10km of project footprint)	Public
12/5/2018	2450	Meeting	New Gold met with Seven Gens for a year end visit.	Seven Gens advised that they have submitted a proposal for simulators. They will be certified driver's license testers.	Seven Generations Education Institute	Aboriginal
12/5/2018	2451	Meeting	New Gold met with Shooniiya for a year end visit.	Shooniiya indicated that they had been very successful in recruitment and hiring for a local business.	Shooniyaa Wa-Biitong	Aboriginal
12/5/2018	2452	Meeting	New Gold stopped in to meet with MNO for a year end visit but they were unavailable. New Gold was able to meet with MNO's Infinity Investments.		Métis Nation of Ontario	Aboriginal
12/6/2018	2454	E-mail	New Gold distributed the millwright apprenticeship career opportunity to community contacts.		Town of Atikokan,Métis Nation of Ontario,Big Grassy First Nation,Shooniyaa Wa-Biitong,Nigigoonsiminikaaning First Nation,Anishinaabeg of Naongashiing,United Native Friendship Centre,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Seine River First Nation,Buffalo Point First Nation,Lac La Croix First Nation,Mitaanjigamiing First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Couchiching First Nation,Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation	Aboriginal
12/7/2018	2455	Drop-in Visit/Casual Meeting	New Gold met with the community for a year end visit.	The Chief indicated that he is happy with the number of members working at New Gold.	Couchiching First Nation	Aboriginal
12/10/2018	2467	Other	New Gold provided support for the Fort Frances and District Physician and Recruitment and Retention Committee.		Fort Frances and District Physician and Recruitment and Retention Committee	Public and Aboriginal

Date	Record No.	Consultation Type	Topics	Notes on Implementation	Stakeholders	Focus
12/10/2018	2464	Other	New Gold provided support for family activities of the Canadian Parents for French.		Canadian Parents for French	Public
12/10/2018	2466	Other	New Gold provided support for the Fort Frances Sports Hall of Fame.		Fort Frances Sports Hall of Fame	Public
12/10/2018	2458	E-mail	New Gold distributed the Weekly Spill Report of December 3 - 9, 2018.		Township of Chapple,Naicatchewenin First Nation,Couchiching First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Mitaanjigamiing First Nation,Seine River First Nation,Lac La Croix First Nation,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario	Aboriginal
12/10/2018	2459	E-mail	New Gold announced Senior Management Reorganization	No follow up required.	Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario	Aboriginal
12/10/2018	2463	Other	New Gold provided support for the Emo Holly Daze fireworks.		Emo Chamber of Commerce	Public
12/10/2018	2461	Other	New Gold provided support for the Fort Frances Blue Line hockey club.		Fort Frances Blue Line Club	Public
12/10/2018	2460	Other	New Gold provided sponsorship for the Emo Devlin Barwick Minor Hockey Association.		Emo Devlin Barwick Minor Hockey Association	Public
12/10/2018	2457	Hand Delivery	New Gold delivered Christmas wreaths to project neighbours.		Site Neighbour (within 10km of project footprint)	Public
12/10/2018	2465	Other	New Gold provided support for the Indigenous Art Workshops.		Fort Frances Museum & Cultural Centre	Public and Aboriginal
12/10/2018	2462	Other	New Gold provided support for the Animkii Judo Club.		Animkii Judo Club	Public and Aboriginal
12/12/2018	2469	Meeting	New Gold held a quarterly JIC meeting with MNO.	Confidential meeting minutes were taken.	Métis Nation of Ontario	Aboriginal
12/12/2018	2468	E-mail	New Gold organized an employee clothing/small household items drive to provide support to a Mitaanjigamiing family who experienced loss from a house fire.		Mitaanjigamiing First Nation	Aboriginal
12/13/2018	2470	Meeting	New Gold held a quarterly JIC meeting with AON.	Confidential meeting minutes were taken.	Anishinaabeg of Naongashiing	Aboriginal
12/14/2018	2472	Community Meeting	New Gold travelled to the community for a year end visit. There are no concerns at this time. Discussion was held on contracts. A council member wanted to know if New Gold's GM and CEO would meet with the Chief and Council in the New Year.	The GM and CEO will be scheduling meetings with the Chief and Council in the new year.	Naotkamegwanning First Nation	Aboriginal
12/14/2018	2471	E-mail	MNO and New Gold communicated several times through email to organize a meeting and presentation on the Closure Plan Amendment and discussion on Traditional Knowledge.	New Gold sent MNO a number of dates in March that the consultant would be available to provide the presentation on the Closure Plan Amendment.	Métis Nation of Ontario	Aboriginal
12/15/2018	2473	E-mail	New Gold distributed the latest PNP package.		Métis Nation of Ontario,Big Grassy First Nation,Anishinaabeg of Naongashiing,Mitaanjigamiing First Nation,Lac La Croix First Nation,Seine River First Nation,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Couchiching First Nation,Naicatchewenin First Nation	Aboriginal
12/17/2018	2480	E-mail	New Gold distributed the Weekly Spill Report of December 10 - 16, 2018.		Township of Chapple,Naicatchewenin First Nation,Ojibways of Onigaming First Nation,Rainy River First Nations,Animakee Wa Zhing First Nation,Seine River First Nation,Naotkamegwanning First Nation,Lac La Croix First Nation,Couchiching First Nation,Mitaanjigamiing First Nation,Anishinaabeg of Naongashiing,Big Grassy First Nation,Métis Nation of Ontario	Aboriginal
12/20/2018	2481	Mass Mailout	New Gold mailed the RRP Winter 2018 Newsletter to the following communities: Rainy River, Fort Frances (includes Couchiching, Nigigoonsiminikaaning, Mitaanjigamiing, Lac La Croix, Sunset Country Métis), Devlin (includes Naicatchewenin), Emo (includes Rainy River First Nations), Barwick, Stratton, Pinewood, Sleeman (includes Big Grassy, Big Island), Nestor Falls (includes Onigaming), Mine Centre (includes Seine River), and Pawitik (includes Whitefish Bay, Northwest Angle 37 and Sioux Narrows). A digital version was also posted on the New Gold website. A digital copy of the newsletter was emailed to all communities, including those that lay outside of the local mail distribution on December 20, 2018 (those communities are: Buffalo Point, Rat Portage (Anishinabe of Wauzhushk Onigum) and Northwest Angle 33).		Town of Atikokan,Métis Nation of Ontario,Big Grassy First Nation,Shooniyaa Wa-Biitong,Town of Fort Frances,Anishinaabeg of Naongashiing,Nigigoonsiminikaaning First Nation,United Native Friendship Centre,Lac La Croix First Nation,Mitaanjigamiing First Nation,Buffalo Point First Nation,Seine River First Nation,Naotkamegwanning First Nation,Animakee Wa Zhing First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Rainy River First Nations,Ojibways of Onigaming First Nation,Sunset Country Métis,Naicatchewenin First Nation,Anishinabe of Wauzhushk Onigum First Nation,Township of Chapple,Town of Rainy River,Couchiching First Nation	Public and Aboriginal
12/20/2018	2484	Letter	New Gold sent participating project neighbours the results of the 2018 offsite groundwater monitoring program. New Gold offered to answer any questions the participants may have about the testing and results.	This is an annual program.	Site Neighbour (within 10km of project footprint)	Public
12/20/2018	2482	Meeting	New Gold held a JIC meeting with Big Grassy.	Confidential meeting minutes were taken.	Big Grassy First Nation	Aboriginal
12/20/2018	2483	Meeting	New Gold held a monthly JIC meeting with RRFN/NFN.	Confidential meeting minutes were taken.	Rainy River First Nations,Naicatchewenin First Nation	Aboriginal
12/24/2018	2485	E-mail	New Gold distributed a summary of all current career opportunities to community contacts.	No follow up required.	Couchiching First Nation,Anishinabe of Wauzhushk Onigum First Nation,Naicatchewenin First Nation,Rainy River First Nations,Ojibways of Onigaming First Nation,Pwi-Di-Goo-Zing Ne-Yaa-Zhing Advisory Services,Animakee Wa Zhing First Nation,Naotkamegwanning First Nation,Buffalo Point First Nation,Seine River First Nation,Mitaanjigamiing First Nation,Lac La Croix First Nation,United Native Friendship Centre,Nigigoonsiminikaaning First Nation,Shooniyaa Wa-Biitong,Big Grassy First Nation,Anishinaabeg of Naongashiing,Métis Nation of Ontario,Town of Atikokan	Public and Aboriginal

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SECTION 8
NEW GOLD RAINY RIVER MINE
CONCLUSION

Figure 24 December sunrise

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Conclusion

This Environmental Compliance Report was prepared by New Gold Inc. RRM. The quality of information and conclusions are based on:

i) Information available at the time of preparation, and
ii) The assumptions, conditions and qualifications set forth in this document.

If you require further information, please contact Sylvie St.Jean, RRM Environmental Manager at (807) 707-3497.

Sylvie St.Jean
Environmental Manager
New Gold
Rainy River Mine

Figure 25 Drone flying over heritage lands west of Mine, August 18, 2018

New Gold
Rainy River Mine

Environmental Assessment
Compliance Report
Reporting Period
January to December 2018

Per Provincial Environmental Assessment
Notice of Approval Condition 5
EA 05-09-02/EAIMS 13102

And

Per Federal Environmental Assessment
Decision Statement Condition 2.3

BINDER 2 0F 2

MARCH 31, 2019

Version 1

NEW GOLD RAINY RIVER MINE
APPENDIX A
GEOCHEMICAL MONITORING RESULTS

newgold™ Rainy River

Report

Document Title: 2018 Geochemical Monitoring Plan Report	**Document Number:** (GEOL)-RPT-2018 Geochemical Monitoring Report
Owner: Geology	

Review Coding	
☐	Code 1 – Reviewed with No Comments
☐	Code 2 – Reviewed with Minor Comments
☐	Code 3 – Reviewed with Major Comments
☐	Code 4 – Not Accepted
☐	Code 5 – Information Only

Rev	Rev Date	Issued For	Prepared By	Reviewed By	Approved By
A	26 Mar 2019		T. Griffith	Sylvie St.Jean Jason Pattison	Tim Schwartz
B					
C					
D					
E					

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newgold™ Rainy River	**GEOL-RPT-2018** **Geochemical Monitoring Report**
Owner: Geology	**Status:** Approved
Review Frequency: Annual	**Date Approved:** 26 Mar 2019

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1.0 Purpose

To provide evidence that New Gold Rainy River Mine (RRM) met all geochemical monitoring requirements stipulated in the "Construction and Operation Phases Geochemical Monitoring Plan" (Geochemical Monitoring Plan; AFW, 2016) during 2018; and thus, is compliant with Environmental Compliance Approvals #5781-9VJQ2J Condition 10(10) and #5178-9TUPD9 Condition 8(12). The approach and methodology provided in the Geochemical Monitoring Plan is based upon requirements under the Ontario Mining Act with guidance found in the *Prediction Manual for Drainage Chemistry from Sulfidic Geologic Materials* (MEND, 2009).

2.0 Scope

This report provides information as per the Geochemical Monitoring Plan:

- Summary of current mine rock classification and segregation approach
- Description of database developed to manage data and information
- Geochemical classification of mine rock produced from the open pit in 2018
- Placement locations of all mine rock within the RRM site
- Assessment of quality assurance/quality control audit data
    - Laboratory duplicates analyzed for carbon and sulfur at the RRM onsite Leco facility to check precision of data used for operational classification of mine rock and overburden
    - Samples submitted to off-site laboratories for acid-base accounting (ABA) analysis to check accuracy of the onsite Leco analyses
- Appendices that provide tabulated audit data and laboratory reports (under separate cover).

3.0 Mine Rock Classification and Segregation

3.1 Summary of Current Mine Rock Classification and Segregation Approach

Operationally, mine rock and overburden are classified as potentially acid generating (PAG) or not potentially acid generating (NPAG) defined by the relative content of sulfur and carbon. Based on ore-body knowledge, carbon is assumed to be entirely present as inorganic species. Total sulfur and total carbon contents are determined using a Leco Carbon-Sulfur analyzer, with combustion analysis and infra-red detection as per method CSA06V. The acid generating potential and neutralization potential are calculated from the total carbon and sulfur using the following calculations (MEND 2009):

- Neutralization Potential (kg $CaCO_3$/t rock) = Total Carbon (wt.%) * 83.3
- Acid Potential (kg CaCO3/t rock) = Total Sulfur (wt.%) * 31.25

The neutralization potential ratio (NPR) is calculated as the quotient of neutralizing potential (NP) and acid generating potential (AP) such that NPR = NP/AP. If the NPR is greater than 2, the

material is classified as NPAG. If the NPR is less than 2, the material is classified as PAG (AFW, 2013).

A second level of characterization was developed for PAG rock produced from the open pit based on inferred time to acid onset. This system was originally designed to account for three levels of PAG and is identified in Table 1 of the Geochemical Monitoring Plan:

- PAG 1 inferred to have the potential to generate acidic conditions within five years of production or less
- PAG 2 inferred to have the potential to generate acidic conditions within five to 15 years of production, and
- PAG 3 inferred to remain circumneutral for at least 15 years.

These three PAG sub-classifications were based on neutralization potential with threshold values of available NP of <12.5 kg $CaCO_3$/t, 12.5 to 19 kg $CaCO_3$/t and > 19 kg $CaCO_3$/t, respectively. Available NP was defined as the measured Sobek NP minus 10 kg $CaCO_3$/t, to account for the silicate-neutralization potential that reports to the Sobek analysis but may not react fast enough to neutralize acidity produced by oxidation of pyrite and other sulfide minerals. To date, RRM has only implemented the PAG1/PAG2 designation. PAG1 material has always been stockpiled in the EMRS. During construction, PAG2/3 rock was used in construction of the upstream side of the TMA embankment where it will be inundated by tailings. To date there is no difference in the way PAG 2 and PAG 3 materials are managed or stored on site. This conservative approach with respect to mine rock and overburden management does not overestimate the lag period to potential onset of acidic conditions for PAG materials.

Mine rock blast holes are spaced on an average 7.0 x 7.5 m grid with a 10 m bench height as per section 5.4 of the Geochemical Monitoring Plan. Cuttings from every primary blast hole are sampled and analyzed for total carbon and total sulfur to generate AP and NP values. These values guide classification of each mining block as PAG1, PAG 2/3, or NPAG determine material destination.

4.0 Database Management

All blast hole and audit geochemistry data are maintained in an onsite database as specified in Section 7.1 of the Geochemical Monitoring Plan. The database is accessed through the Hexagon Mine Plan software database platform. It includes (but is not limited to) sample identification, sample location, lithology, material disposition, and analytical results. Data and analytical results included in the 2018 monitoring report are based on a download from the database dated March 23, 2019 for the period January 1st, 2018 to December 31st, 2018.

5.0 Geologic Materials Classification and Destination

5.1 Open Pit Material Classification

During 2018, RRM collected and analyzed 21,911 blast-hole samples of 3 different geologic lithologies from the open pit. Lithological and geochemical classifications of these materials are summarized in Table 1.

Table 1. Lithological and Geochemical Classifications for Samples from Open Pit.

Lithology	No. of samples	% of 2018 t Samples	Geochemical Classification	No. of samples	% of lithology
Mafic Volcanics	549	2.5	PAG 2/3	328	60
			NPAG	221	40
Intermediate Volcanics	4,441	20.3	PAG 1	22	0.50
			PAG 2/3	1281	29
			NPAG	3131	71
			LGO	5	0.1
			HGO	2	0.0
Dacite Volcanics	16,921	77.2	PAG 1	1770	10
			PAG 2/3	4487	27
			NPAG	206	1
			LGO	2021	12
			MGO	2698	16
			HGO	5739	34

Note: PAG (Potentially Acid Generating); NPAG (Not Potentially Acid Generating), LGO (Low-grade Ore), MGO (Medium-grade Ore), HGO (High-grade Ore).

5.2 Materials Placement

During 2018, RRM produced PAG1 mine rock, PAG2/3 mine rock, NPAG mine rock, and ore from the open pit. Overburden and basal till were not sampled through blast hole monitoring. Disposal destination of these materials is summarized in Table 2.

Table 2: Placement of Open Pit Geologic Materials

Material Description	Placement Locations
PAG 1 mine rock	EMRS / TMA
PAG 2/3 mine rock	EMRS / TMA
NPAG mine rock	WMRS/TMA/EMRS
Low-grade ore	Low Grade Ore Stockpile
Medium-grade ore	Medium Grade Ore Stockpile
High-grade ore	Mill / ROM Stockpile

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6.0 Assessments

6.1 Quality Assurance/Quality Control Procedures

Two categories of quality assurance samples were submitted for analysis as stipulated in section 7.2 of the Geochemical Monitoring Plan:

- Laboratory duplicates were analyzed onsite to demonstrate acceptable method precision in total carbon and total sulfur analyses by combustion/IR (Leco).
- Sample splits were sent to an independent laboratory for ABA analysis to check that the onsite laboratory produces data of sufficient quality to ensure that geologic materials produced from the open pit are assigned the correct geochemical classification.

Analytical data from laboratory duplicate and ABA audit samples collected in 2018 are provided under separate cover in Appendix A. As stated in the Geochemical Monitoring Plan, blast hole sampling, including laboratory duplicates and sample splits, must be submitted in a ratio of 1 in 20 (5%). In 2018 carbon/sulfur duplicate samples and ABA audit samples were submitted for 10.2% and 7.3% of samples collected, respectively.

6.2 Laboratory Duplicates

During 2018; a total of 2,244 duplicates were analyzed for total carbon and total sulfur. Figures 1 and 2 show the duplicate values plotted against original values with the 1:1 line for reference. Relative percent difference (RPD) was calculated for each duplicate pair using the following equation:

$$RPD = \frac{ABS(S-D)}{\frac{S+D}{2}} \times 100$$

Where:

RPD = Relative Percent Difference
S = Sample Result (Original)
D= Duplicate Result

The acceptable RPD range defined for this study is ± 20% for those samples with concentrations greater than five times the detection limit based on U.S. Environmental Protection Agency (U.S. EPA) guidance (U.S.EPA, 2004). Original and duplicate data are provided under separate cover in Appendix A.

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6.3 Original and Duplicates: Carbon

Visual inspection of Figure 1 indicates that the match between total carbon analyses and duplicates is generally good with minor scatter and no systematic deviation. RPDs were calculated for 2,244 pairs of duplicate total carbon analyses. Of the 2,244 pairs, approximately 98% (2,209 pairs) met the acceptable RPD range. This means they have RPDs below 20% and contain carbon at more than five times the detection limit of 0.005 wt.%, as defined in Table 2 of the Geochemical Monitoring Plan.

6.4 Original and Duplicates: Sulfur

Visual inspection of Figure 2 indicates that the match between total sulfur analyses and duplicates is good with minor scatter and no systematic error. RPDs were calculated for 2,244 pairs of duplicate total sulfur analyses. Of the 2,244 pairs, approximately 99% (2,222 pairs) met the acceptable RPD range. This means they have RPDs below 20% and contain sulfur at more than five times the detection limit of 0.005 wt. %.

6.5 Acid-Base Accounting (ABA) Audit Results

During 2018, 1,601 samples were submitted for auditing by an independent analytical laboratory. Samples were sent to ALS Laboratories Ltd. in North Vancouver, British Columbia, Canada. Laboratory reports are provided under separate cover in Appendix B.

6.6 On-site Leco NPR Determination vs. Independent Laboratories

Descriptive statistics for Sobek, Leco and ARD Model NPR values are provided in Table 3. Data are plotted in Figure 3 and box-and-whisker plots are shown in Figure 4. The median NPR values determined by modified Sobek (independent laboratory) and Leco (on-site laboratory) are in close agreement (1.1 and 1.0, respectively).

The Leco NPR values tend to be lower than the Sobek numbers at the lower end of the NPR distribution (see Figure 3). This is because the Sobek neutralization potential includes some contribution of NP from faster-acting silicates whereas the NP calculated from Leco carbon analyses accounts for only carbonate neutralization potential (Duke and Logsdon, 2018).

Mine rock is classified and managed onsite based on the Leco NPR (carbonate-NPR), so this small deviation results in a conservative method of materials classification. This means if material is misallocated, it will result in NPAG material being classified as PAG and not PAG classified as NPAG.

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Table 3. Descriptive Statistics for Sobek, Leco and ARD Model NPR Values

Descriptive Statistics	Sobek NPR	Leco NPR	ICP NPR
Sample Size	1601	1601	1601
Minimum	0.01	0.00	0.00
Maximum	46	41	51
Median	1.1	1.0	1.0
90th Percentile	3.7	3.3	3.2
10th Percentile	0.3	0.2	0.0

6.7 ARD Block Model Classifications

For mine planning purposes, RRM has develop an ARD block model to estimate material inventories, volumes, and production schedules. The ARD designations in the block model are based on the following calculations (AFW, 2013):

- ICP-Proxy AP (kg $CaCO_3$/t) = ICP sulfur (wt. %) * 31.25
- ICP-Proxy NP (kg $CaCO_3$/t) = [ICP calcium (wt. %) * 37.14] -19.0

Neutralization potential ratio (NPR) values calculated from ICP data are compared to laboratory Sobek values in Figures 3 and 4. Descriptive statistics are presented in Table 3. During 2018, block model values closely agree with laboratory audit data. However, there is an observed deviation at lower NPR values between Leco and Sobek NPR values. According to Duke and Logsdon (Technical Memorandum dated March 2018), this is caused by the conservative nature of the carbonate NP represented by the Leco calculation (i.e., does not account for silicate NP). Referencing Table 3, the median NPR from the ARD block model calculations is 1.0 and compares favorably with 1.1 for the Sobek NPR.

7.0 Conclusions

During 2018, duplicates and audit samples were submitted for 10.2% and 7.3% of blast hole samples collected, well above the 5% proportion defined in section 7.2 of the RRM Geochemical Monitoring Plan. Carbon and sulfur duplicate data indicate good precision with 99% and 98% for onsite Leco analyses. ABA audit data show that the RRM onsite laboratory data compares favorably with independent laboratory data. The ARD block model continues to provide NPR estimates appropriate for PAG material segregation purposes.

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8.0 References

AFW. 2013. Rainy River Gold Project—Report on Metal Leaching and Acid Rock Drainage Characterization of Mine Rock and Tailings. TC111504, prepared by AMEC Environment and Infrastructure, submitted to Rainy River Resources Ltd., May 2013.

AFW. 2016. Rainy River Project, Construction and Operation Phases Geochemical Monitoring Plan, Version 3, Prepared by Amec Foster Wheeler, January 2016

Duke and Logsdon. 2018. Rainy River Mine 2017 Annual Geochemical Monitoring Report. Technical Memorandum, prepared by Kate Duke - Duke Hydrochem, LLC and Mark Logsdon - Geochimica, Inc., March 2018.

MEND. 2009. Prediction Manual for Drainage Chemistry from Sulphidic Geologic Materials. Report 1.20.1, Version 0.0, Prepared by W.A. Price of CANMET – Mining and Mineral Sciences Laboratories for MEND, December 2009.

U.S. Environmental Protection Agency (U.S. EPA). 2004. USEPA Contract Laboratory Program, National Functional Guidelines for Inorganic Data Review, U.S. EPA Report EPA 540-R-04-004, October 2004.

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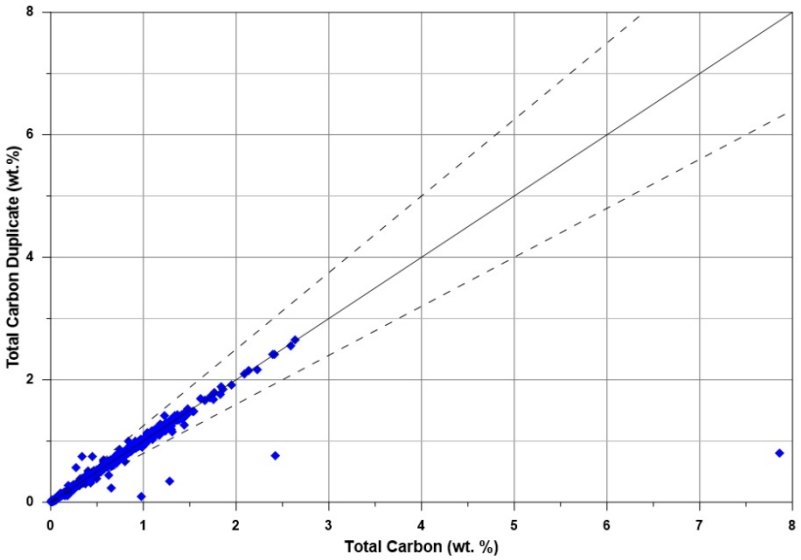

Figure 1: Comparison of 2018 original and coarse duplicate carbon data from RRM onsite Leco facility. Solid line = 1:1; dotted lines indicate +/-20%.

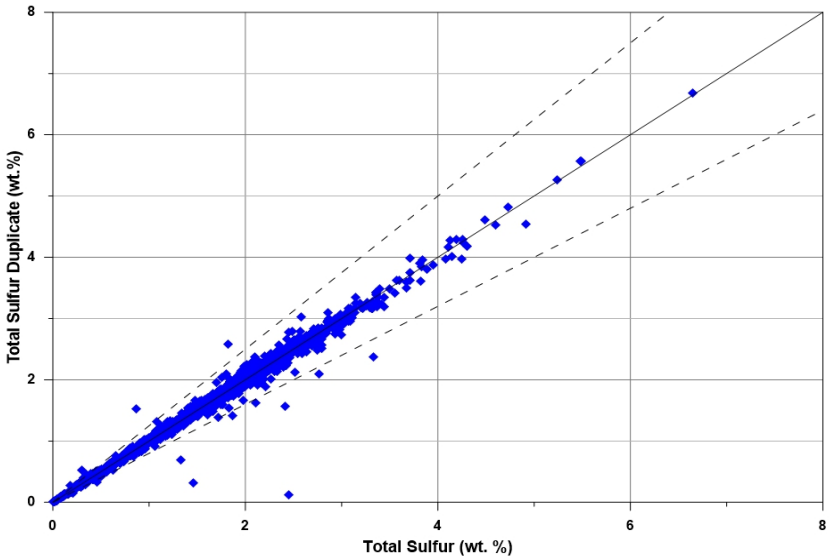

Figure 2:Comparison of 2018 original and coarse duplicate sulfur data from RRM onsite Leco facility. Solid line = 1:1; dotted lines indicate +/- 20%.

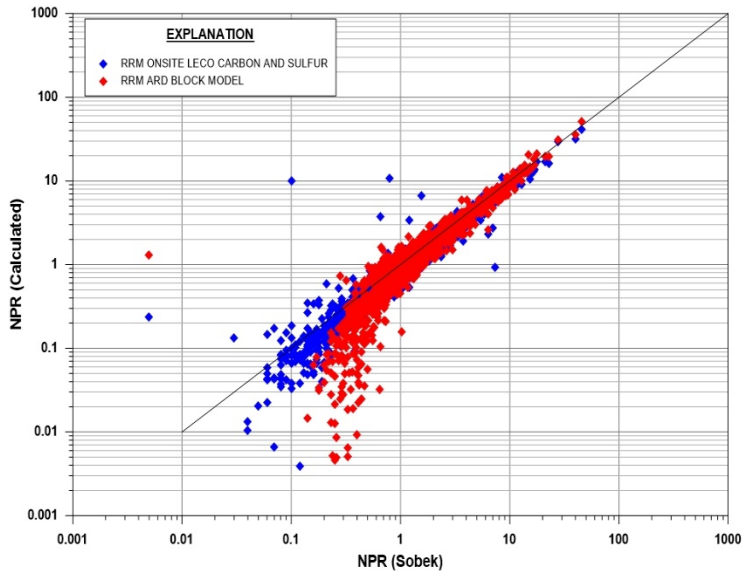

Figure 3: Scatter plot showing comparison of NPR calculated from onsite Leco carbon and sulfur, ARD block model and independent laboratory Sobek analyses.

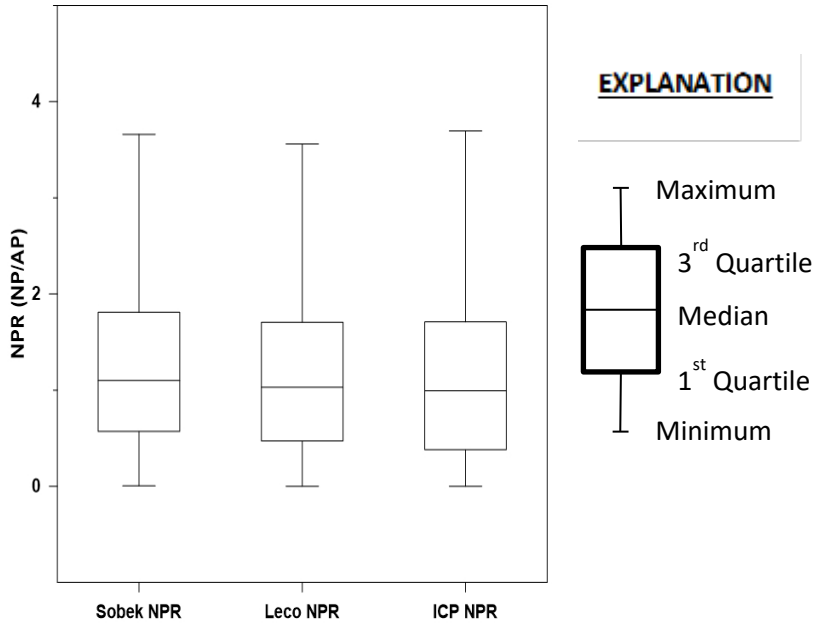

Figure 4: Box- and-whisker plots comparison of NPR calculated from; onsite Leco carbon and sulfur, ARD block model and Sobek analyses.

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APPENDIX A -1

2018 CARBON SULFUR DUPLICATE DATA

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1127013076	1/6/2018	0.26	0.26	0.0%	0.47	0.49	4.2%
1127013115	1/6/2018	0.38	0.38	0.0%	0.52	0.52	0.0%
1127013117	1/6/2018	0.49	0.48	2.1%	0.34	0.32	6.1%
1129050002	1/6/2018	0.56	0.56	0.0%	2.39	2.43	1.7%
1129050043	1/6/2018	0.07	0.06	15.4%	2.26	2.33	3.1%
1129050513	1/6/2018	0.18	0.18	0.0%	1.53	1.51	1.3%
1127014032	1/17/2018	0.89	0.9	1.1%	0.78	0.77	1.3%
1127014039	1/17/2018	0.37	0.41	10.3%	0.37	0.4	7.8%
1127014410	1/17/2018	1.01	0.99	2.0%	1.42	1.36	4.3%
1127014426	1/17/2018	0.5	0.51	2.0%	2.97	3.02	1.7%
1127014501	1/17/2018	0.85	0.83	2.4%	0.71	0.7	1.4%
1127014517	1/17/2018	0.37	0.37	0.0%	0.95	0.95	0.0%
1127014528	1/17/2018	0.6	0.6	0.0%	1.03	0.99	4.0%
1127015010	1/17/2018	0.5	0.5	0.0%	0.63	0.63	0.0%
1127015030	1/17/2018	0.39	0.37	5.3%	0.59	0.58	1.7%
1127015033	1/17/2018	0.49	0.5	2.0%	0.45	0.45	0.0%
1127015059	1/17/2018	0.61	0.6	1.7%	0.89	0.89	0.0%
1129048020	1/17/2018	0.54	0.54	0.0%	2.38	2.31	3.0%
1129048040	1/17/2018	0.63	0.62	1.6%	2.6	2.6	0.0%
1129048081	1/17/2018	0.68	0.69	1.5%	2.94	2.99	1.7%
1129049031	1/17/2018	0.96	0.95	1.0%	2.22	2.16	2.7%
1129049402	1/17/2018	0.71	0.73	2.8%	1.82	1.93	5.9%
1129049417	1/17/2018	1.03	1.07	3.8%	2.51	2.65	5.4%
1127013133	1/18/2018	0.35	0.35	0.0%	0.47	0.45	4.3%
1127013154	1/18/2018	0.3	0.3	0.0%	0.42	0.41	2.4%
1127013158	1/18/2018	0.34	0.34	0.0%	0.42	0.42	0.0%
1127014008	1/18/2018	0.47	0.47	0.0%	0.73	0.75	2.7%
1127014022	1/18/2018	1.07	1.06	0.9%	2.44	2.53	3.6%
1127014027	1/18/2018	0.68	0.68	0.0%	3.84	3.96	3.1%
1127014051	1/18/2018	0.74	0.7	5.6%	1.36	1.34	1.5%
1127014121	1/18/2018	0.71	0.71	0.0%	0.88	0.86	2.3%
1128031007	1/18/2018	0.17	0.17	0.0%	2.59	2.59	0.0%
1128031031	1/18/2018	0.07	0.07	0.0%	1.99	1.91	4.1%
1128031048	1/18/2018	0.22	0.21	4.7%	1.91	1.9	0.5%
1128031052	1/18/2018	0.48	0.49	2.1%	3.55	3.41	4.0%
1128031079	1/18/2018	0.54	0.55	1.8%	3.05	2.97	2.7%
1128031089	1/18/2018	1.36	1.35	0.7%	2.4	2.45	2.1%
1128031114	1/18/2018	0.79	0.78	1.3%	1.57	1.51	3.9%
1128031117	1/18/2018	0.83	0.82	1.2%	1.67	1.58	5.5%
1129048027	1/18/2018	0.45	0.75	50.0%	2.41	1.57	42.2%
1129048047	1/18/2018	0.95	0.94	1.1%	2.32	2.24	3.5%
1129048405	1/18/2018	0.09	0.11	20.0%	1.8	1.74	3.4%
1129048418	1/18/2018	0.83	0.82	1.2%	1.82	1.83	0.5%
1129048421	1/18/2018	0.94	0.96	2.1%	2.23	2.3	3.1%
1129048502	1/18/2018	0.34	0.35	2.9%	2.44	2.55	4.4%
1129048515	1/18/2018	0.07	0.07	0.0%	1.88	1.93	2.6%
1129048522	1/18/2018	0.64	0.63	1.6%	1.96	1.93	1.5%
1129049215	1/18/2018	0.75	0.75	0.0%	1.61	1.61	0.0%
1129049254	1/18/2018	0.19	0.2	5.1%	2.7	2.67	1.1%
1129049501	1/18/2018	0.32	0.32	0.0%	2.13	1.91	10.9%
1129050507	1/18/2018	0.23	0.23	0.0%	1.43	1.42	0.7%
1130053526	1/18/2018	0.86	0.87	1.2%	1.95	1.97	1.0%
1131065709	1/18/2018	0.39	0.38	2.6%	2.36	2.35	0.4%
1131065711	1/18/2018	0.06	0.05	18.2%	1.81	1.85	2.2%
1131065743	1/18/2018	0.1	0.1	0.0%	2.35	2.34	0.4%
1131065756	1/18/2018	0.16	0.16	0.0%	1.89	1.95	3.1%
1131065808	1/18/2018	0.07	0.08	13.3%	1.43	1.57	9.3%
1129050402	1/19/2018	0.57	0.66	14.6%	2.45	2.77	12.3%
1128032015	1/20/2018	0.87	0.9	3.4%	1.87	1.86	0.5%
1128032030	1/20/2018	1.25	1.3	3.9%	1.57	1.62	3.1%
1128032045	1/20/2018	1.16	1.17	0.9%	1.74	1.75	0.6%
1128032047	1/20/2018	1.05	1.03	1.9%	1.61	1.59	1.3%
1128032079	1/20/2018	1.3	1.19	8.8%	1.29	1.19	8.1%
1128034039	1/20/2018	0.54	0.55	1.8%	1.36	1.42	4.3%
1128034040	1/20/2018	0.34	0.75	75.2%	0.87	1.53	55.0%
1127017110	1/21/2018	0.51	0.49	4.0%	1.43	1.35	5.8%
1127017124	1/21/2018	0.53	0.52	1.9%	1.31	1.3	0.8%
1127017137	1/21/2018	0.37	0.35	5.6%	1.75	1.69	3.5%
1128033105	1/23/2018	1.95	1.92	1.6%	0.62	0.62	0.0%
1128033109	1/23/2018	1.77	1.79	1.1%	2.44	2.43	0.4%
1128033118	1/23/2018	1.18	1.19	0.8%	0.69	0.72	4.3%
1128033127	1/23/2018	1	1.01	1.0%	1.18	1.19	0.8%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1128033140	1/23/2018	0.54	0.57	5.4%	0.61	0.63	3.2%
1128033157	1/23/2018	0.34	0.34	0.0%	0.62	0.6	3.3%
1128033158	1/23/2018	0.44	0.43	2.3%	0.7	0.69	1.4%
1128033607	1/23/2018	0.84	0.99	16.4%	0.33	0.33	0.0%
1129051423	1/24/2018	0.83	0.84	1.2%	2.14	2.2	2.8%
1129051530	1/24/2018	0.79	0.8	1.3%	1.47	1.46	0.7%
1130057783	1/24/2018	0.08	0.09	11.8%	1.87	1.84	1.6%
1130057884	1/24/2018	0.03	0.04	28.6%	2.06	2.06	0.0%
1129051038	1/25/2018	0.99	0.99	0.0%	1.79	1.73	3.4%
1129051407	1/25/2018	0.98	0.99	1.0%	2.24	2.21	1.3%
1130057531	1/25/2018	0.04	0.04	0.0%	2.67	2.69	0.7%
1130057750	1/25/2018	0.07	0.06	15.4%	2.56	2.62	2.3%
1130057874	1/25/2018	0.28	0.28	0.0%	2.12	2.1	0.9%
1127018202	1/27/2018	0.91	0.88	3.4%	0.99	0.95	4.1%
1127018212	1/27/2018	0.98	0.98	0.0%	1.08	1.08	0.0%
1127018227	1/27/2018	0.74	0.74	0.0%	1.06	1.08	1.9%
1130057516	1/27/2018	0.005	0.005	0.0%	1.87	1.83	2.2%
1130057606	1/27/2018	0.005	0.005	0.0%	1.58	1.64	3.7%
1130057612	1/27/2018	0.005	0.005	0.0%	0.72	0.74	2.7%
1130057712	1/27/2018	0.13	0.12	8.0%	1.5	1.49	0.7%
1130057763	1/27/2018	0.12	0.12	0.0%	1.94	1.93	0.5%
1130057805	1/27/2018	0.12	0.12	0.0%	2.09	2.1	0.5%
1130057814	1/27/2018	0.43	0.41	4.8%	3.31	3.17	4.3%
1130057865	1/27/2018	0.02	0.02	0.0%	2.42	2.44	0.8%
1130057910	1/27/2018	0.005	0.01	66.7%	1.84	1.82	1.1%
1127018068	1/30/2018	0.74	0.72	2.7%	1.82	1.75	3.9%
1127018077	1/30/2018	0.51	0.52	1.9%	2.69	2.77	2.9%
1127018112	1/30/2018	1.62	1.69	4.2%	1.84	1.77	3.9%
1127018120	1/30/2018	1.06	1.07	0.9%	2.05	2.06	0.5%
1127018122	1/30/2018	1.2	1.2	0.0%	1.99	2.01	1.0%
1127018244	1/30/2018	0.88	0.9	2.2%	2.06	2.16	4.7%
1127018256	1/30/2018	0.19	0.2	5.1%	2.79	2.83	1.4%
1128036009	1/30/2018	1.04	1.05	1.0%	1.58	1.6	1.3%
1128036055	1/30/2018	0.91	1	9.4%	1.48	1.66	11.5%
1128036091	1/30/2018	0.65	0.6	8.0%	1.77	1.59	10.7%
1128036207	1/30/2018	1.26	1.28	1.6%	1.45	1.51	4.1%
1127018150	1/31/2018	0.96	0.93	3.2%	2.27	2.37	4.3%
1127018158	1/31/2018	1.53	1.48	3.3%	1.75	1.71	2.3%
1128036006	1/31/2018	1.04	1.03	1.0%	1.71	1.69	1.2%
1128036095	1/31/2018	0.69	0.69	0.0%	0.9	0.93	3.3%
1127019002	2/6/2018	0.23	0.24	4.3%	0.32	0.32	0.0%
1127019019	2/6/2018	0.29	0.28	3.5%	0.38	0.38	0.0%
1127019078	2/6/2018	1.28	1.26	1.6%	2.54	2.52	0.8%
1127019123	2/6/2018	0.67	0.67	0.0%	3.08	3.1	0.6%
1128037026	2/6/2018	0.42	0.45	6.9%	1.79	1.8	0.6%
1128037054	2/6/2018	1.44	1.26	13.3%	2	1.89	5.7%
1128037072	2/6/2018	0.27	0.27	0.0%	1.79	1.75	2.3%
1128037087	2/6/2018	0.13	0.13	0.0%	2.06	2.07	0.5%
1128037106	2/6/2018	0.41	0.39	5.0%	2.36	2.22	6.1%
1128037116	2/6/2018	0.21	0.21	0.0%	2.29	2.31	0.9%
1128037132	2/6/2018	0.86	0.87	1.2%	1.88	1.98	5.2%
1128037147	2/6/2018	0.2	0.21	4.9%	2.46	2.5	1.6%
1128037162	2/6/2018	0.05	0.04	22.2%	2.16	2.22	2.7%
1128037171	2/6/2018	0.95	0.99	4.1%	2.09	2.13	1.9%
1128037198	2/6/2018	0.75	0.86	13.7%	2.27	2.43	6.8%
1128038040	2/6/2018	0.6	0.6	0.0%	1.08	1.09	0.9%
1131066224	2/6/2018	0.34	0.31	9.2%	2.38	2.41	1.3%
1131066245	2/6/2018	0.12	0.11	8.7%	1.47	1.47	0.0%
1131066246	2/6/2018	0.18	0.19	5.4%	1.3	1.32	1.5%
1131066274	2/6/2018	0.09	0.1	10.5%	0.95	0.94	1.1%
1131066276	2/6/2018	0.47	0.5	6.2%	0.9	0.95	5.4%
1131066288	2/6/2018	0.25	0.25	0.0%	1.49	1.49	0.0%
1131066297	2/6/2018	0.31	0.31	0.0%	1.87	1.41	28.0%
1131066307	2/6/2018	0.59	0.62	5.0%	2.03	2.06	1.5%
1131066352	2/6/2018	0.02	0.02	0.0%	1.62	1.65	1.8%
1131066356	2/6/2018	0.24	0.24	0.0%	1.53	1.54	0.7%
1131066380	2/6/2018	0.13	0.13	0.0%	1.98	1.95	1.5%
1131066426	2/6/2018	0.14	0.14	0.0%	1.97	1.99	1.0%
1131067015	2/6/2018	0.74	0.77	4.0%	1.66	1.68	1.2%
1131067037	2/6/2018	0.27	0.26	3.8%	1.33	1.35	1.5%
1131067039	2/6/2018	0.22	0.21	4.7%	2.47	2.54	2.8%
1131067091	2/6/2018	0.05	0.05	0.0%	4.92	4.54	8.0%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
2137007201	2/7/2018	0.21	0.21	0.0%	0.11	0.11	0.0%
1127019041	2/8/2018	0.42	0.42	0.0%	0.22	0.22	0.0%
1127019506	2/8/2018	0.34	0.34	0.0%	0.25	0.26	3.9%
1128038034	2/8/2018	0.43	0.41	4.8%	1.98	2.07	4.4%
1128038035	2/8/2018	0.61	0.61	0.0%	1.65	1.67	1.2%
1127019052	2/9/2018	0.88	0.88	0.0%	0.83	0.89	7.0%
1127019104	2/9/2018	0.53	0.54	1.9%	0.07	0.06	15.4%
1127019217	2/9/2018	0.56	0.55	1.8%	0.37	0.4	7.8%
1127019520	2/9/2018	0.41	0.4	2.5%	0.64	0.61	4.8%
1127019534	2/9/2018	0.3	0.28	6.9%	0.58	0.57	1.7%
1128038012	2/9/2018	0.89	0.87	2.3%	1.5	1.48	1.3%
1128038064	2/9/2018	0.44	0.43	2.3%	2.29	2.21	3.6%
1128038069	2/9/2018	1.13	1.11	1.8%	1.87	1.99	6.2%
1128038105	2/9/2018	0.97	0.94	3.1%	1.67	1.67	0.0%
1128038130	2/9/2018	0.91	0.9	1.1%	1.4	1.31	6.6%
1128038137	2/9/2018	1.36	1.36	0.0%	1.73	1.64	5.3%
2137007165	2/9/2018	0.4	0.39	2.5%	0.03	0.03	0.0%
1127019070	2/10/2018	1.03	1.01	2.0%	2.02	2.03	0.5%
1127019126	2/10/2018	0.9	0.91	1.1%	2.22	2.17	2.3%
1127019148	2/10/2018	0.92	0.9	2.2%	0.92	0.91	1.1%
1127019152	2/10/2018	0.92	0.91	1.1%	0.86	0.84	2.4%
1127019189	2/10/2018	1.1	1.11	0.9%	2.41	2.41	0.0%
1127019207	2/10/2018	0.36	0.36	0.0%	2.9	2.96	2.0%
1128038122	2/10/2018	0.29	0.29	0.0%	2.15	2.26	5.0%
1127022081	2/11/2018	0.32	0.34	6.1%	0.41	0.43	4.8%
1127022087	2/11/2018	0.76	0.78	2.6%	0.35	0.39	10.8%
1129098210	2/11/2018	0.07	0.07	0.0%	1.94	1.98	2.0%
1129098217	2/11/2018	0.05	0.05	0.0%	1.68	1.68	0.0%
1129098312	2/11/2018	0.21	0.22	4.7%	2	1.99	0.5%
1129098367	2/11/2018	0.04	0.03	28.6%	1.97	1.95	1.0%
1131068002	2/11/2018	0.9	0.89	1.1%	1.13	1.15	1.8%
1131068011	2/11/2018	0.1	0.1	0.0%	2.6	2.54	2.3%
1127022004	2/12/2018	0.5	0.49	2.0%	0.18	0.18	0.0%
1127022042	2/12/2018	0.39	0.4	2.5%	2.5	2.48	0.8%
1127022351	2/12/2018	0.56	0.58	3.5%	0.35	0.36	2.8%
1129098330	2/12/2018	0.05	0.06	18.2%	2.37	2.37	0.0%
1128039031	2/15/2018	0.65	0.66	1.5%	1.85	1.87	1.1%
1129052001	2/16/2018	0.36	0.38	5.4%	2.33	2.47	5.8%
1129052003	2/16/2018	0.57	0.57	0.0%	1.96	1.97	0.5%
1129052026	2/16/2018	0.03	0.04	28.6%	2.53	2.48	2.0%
1129052048	2/16/2018	0.46	0.47	2.2%	1.64	1.65	0.6%
1129052050	2/16/2018	0.07	0.08	13.3%	2.22	2.29	3.1%
1129052054	2/16/2018	0.04	0.05	22.2%	1.3	1.35	3.8%
1129052067	2/16/2018	0.89	0.88	1.1%	1.53	1.53	0.0%
1129052077	2/16/2018	0.2	0.2	0.0%	2.7	2.71	0.4%
1129053023	2/16/2018	0.3	0.3	0.0%	1.72	1.7	1.2%
1129053047	2/16/2018	0.24	0.24	0.0%	2.02	2.03	0.5%
1129053075	2/16/2018	1.12	1.13	0.9%	0.94	0.94	0.0%
1129053079	2/16/2018	0.74	0.76	2.7%	1.42	1.45	2.1%
1129053134	2/16/2018	1.01	1.01	0.0%	2.09	2.1	0.5%
1131069039	2/16/2018	0.21	0.21	0.0%	0.74	0.74	0.0%
1131069042	2/16/2018	0.11	0.11	0.0%	1.39	1.42	2.1%
1129098201	2/17/2018	0.06	0.06	0.0%	2.38	2.46	3.3%
1131069008	2/17/2018	0.1	0.13	26.1%	0.97	1	3.0%
1131069017	2/17/2018	0.19	0.19	0.0%	2.46	2.36	4.1%
1131069024	2/17/2018	0.21	0.22	4.7%	1.96	2.15	9.2%
1131069046	2/17/2018	0.13	0.14	7.4%	0.32	0.32	0.0%
1131069053	2/17/2018	0.23	0.23	0.0%	1.24	1.3	4.7%
1131069075	2/17/2018	0.31	0.28	10.2%	1.66	1.49	10.8%
1131069107	2/17/2018	0.14	0.15	6.9%	0.27	0.27	0.0%
1129053014	2/18/2018	0.07	0.06	15.4%	2.67	2.65	0.8%
1129053019	2/18/2018	0.23	0.23	0.0%	2.22	2.28	2.7%
1129053059	2/18/2018	0.34	0.31	9.2%	2.4	2.2	8.7%
1129053081	2/18/2018	0.32	0.32	0.0%	2.02	1.98	2.0%
1129053124	2/18/2018	1.47	1.43	2.8%	1.02	1	2.0%
1129053164	2/18/2018	0.48	0.48	0.0%	1.3	1.27	2.3%
1127021014	2/20/2018	0.43	0.44	2.3%	0.58	0.6	3.4%
1127021029	2/20/2018	0.4	0.41	2.5%	0.19	0.19	0.0%
1127021043	2/20/2018	0.37	0.38	2.7%	1.08	1.1	1.8%
1127021048	2/20/2018	0.57	0.56	1.8%	0.63	0.65	3.1%
1127021088	2/20/2018	0.66	0.62	6.3%	0.16	0.14	13.3%
1127021094	2/20/2018	0.36	0.36	0.0%	0.65	0.63	3.1%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1127021105	2/20/2018	0.63	0.62	1.6%	0.23	0.22	4.4%
1127021129	2/20/2018	0.64	0.61	4.8%	0.14	0.14	0.0%
1127021140	2/20/2018	0.44	0.44	0.0%	0.41	0.47	13.6%
1127021377	2/20/2018	0.46	0.44	4.4%	0.1	0.1	0.0%
1128040021	2/20/2018	1.27	1.25	1.6%	1.79	1.73	3.4%
1128040036	2/20/2018	0.93	0.93	0.0%	1.22	1.23	0.8%
1128040056	2/20/2018	1.45	1.45	0.0%	2.22	2.29	3.1%
1128040071	2/20/2018	0.84	0.86	2.4%	0.95	0.93	2.1%
1128040082	2/20/2018	1.05	1.05	0.0%	2.31	2.42	4.7%
1128040141	2/20/2018	1.34	1.35	0.7%	1.85	1.9	2.7%
1128040159	2/20/2018	1.28	0.34	116.0%	2.28	2.25	1.3%
1128040172	2/20/2018	0.47	0.46	2.2%	1.89	1.87	1.1%
1128040158	2/21/2018	1.02	1.01	1.0%	2.25	2.25	0.0%
1129057029	2/21/2018	0.44	0.45	2.2%	0.26	0.26	0.0%
1127023044	2/22/2018	0.61	0.61	0.0%	0.4	0.41	2.5%
1127023064	2/22/2018	0.55	0.56	1.8%	1.6	1.59	0.6%
1127023074	2/22/2018	0.4	0.4	0.0%	1.06	1.01	4.8%
1127023091	2/22/2018	0.67	0.61	9.4%	1.33	0.69	63.4%
1127024060	2/22/2018	0.75	0.74	1.3%	1.2	1.19	0.8%
1127024091	2/22/2018	0.78	0.79	1.3%	1.24	1.27	2.4%
1127024124	2/22/2018	0.6	0.6	0.0%	0.84	0.85	1.2%
1128040094	2/22/2018	0.4	0.41	2.5%	2.28	2.34	2.6%
1128040143	2/22/2018	1.34	1.35	0.7%	2.04	2.1	2.9%
1129057064	2/22/2018	0.25	0.23	8.3%	0.54	0.5	7.7%
1129057065	2/22/2018	0.38	0.38	0.0%	0.42	0.4	4.9%
1127024033	2/23/2018	0.49	0.48	2.1%	1.27	1.22	4.0%
1127024114	2/23/2018	0.2	0.2	0.0%	3.08	3.14	1.9%
1129057150	2/23/2018	0.9	0.91	1.1%	1.97	2.01	2.0%
1129057166	2/23/2018	0.31	0.28	10.2%	1.42	1.38	2.9%
1129057173	2/23/2018	1.13	1.11	1.8%	1.81	1.84	1.6%
1127024081	2/24/2018	0.74	0.73	1.4%	2.03	2.06	1.5%
1129057134	2/24/2018	1	0.99	1.0%	1.33	1.4	5.1%
1129057136	2/24/2018	1.28	1.29	0.8%	1.93	1.92	0.5%
1127023008	2/25/2018	0.61	0.6	1.7%	0.78	0.76	2.6%
1127023011	2/25/2018	0.29	0.28	3.5%	0.43	0.41	4.8%
1127024003	2/25/2018	0.63	0.62	1.6%	1.45	1.48	2.0%
1129056010	2/25/2018	0.02	0.02	0.0%	0.95	0.96	1.0%
1129056015	2/25/2018	0.02	0.03	40.0%	1.98	1.99	0.5%
1129056044	2/25/2018	0.02	0.02	0.0%	1.82	2.58	34.5%
1129056048	2/25/2018	0.07	0.07	0.0%	2.31	2.3	0.4%
1127024039	2/26/2018	0.64	0.64	0.0%	2.16	2.2	1.8%
1127024137	2/26/2018	0.97	1.02	5.0%	1.61	1.7	5.4%
1129055003	2/26/2018	0.05	0.06	18.2%	1.62	1.64	1.2%
1129055009	2/26/2018	0.05	0.05	0.0%	3.6	3.63	0.8%
1129055025	2/26/2018	0.41	0.44	7.1%	1.55	1.58	1.9%
1129055091	2/28/2018	0.02	0.03	40.0%	2.45	2.47	0.8%
1129055102	2/28/2018	0.06	0.04	40.0%	1.75	1.75	0.0%
1129055114	2/28/2018	0.15	0.11	30.8%	2.13	2.15	0.9%
1129055119	2/28/2018	0.04	0.03	28.6%	2.77	2.1	27.5%
1129055147	2/28/2018	0.07	0.07	0.0%	2.28	2.38	4.3%
1129055149	2/28/2018	0.09	0.09	0.0%	1.63	1.58	3.1%
1127024020	3/1/2018	1.15	1.14	0.9%	1.51	1.48	2.0%
1128039011	3/1/2018	1.16	1.16	0.0%	2.12	2.1	0.9%
1128039038	3/1/2018	0.87	0.88	1.1%	2.22	2.18	1.8%
1128039065	3/1/2018	0.79	0.78	1.3%	2.22	2.3	3.5%
1128039073	3/1/2018	1.07	1.08	0.9%	1.93	1.95	1.0%
1128039081	3/1/2018	1.24	1.17	5.8%	1.92	2.07	7.5%
1128039112	3/1/2018	1.34	1.39	3.7%	1.65	1.7	3.0%
1128039118	3/1/2018	0.45	0.45	0.0%	2.34	2.35	0.4%
1128039153	3/1/2018	1.23	1.22	0.8%	1.71	1.66	3.0%
1128036014	3/2/2018	0.92	0.88	4.4%	1.07	1	6.8%
1128037010	3/2/2018	1.23	1.19	3.3%	1.49	1.56	4.6%
1128037018	3/2/2018	0.7	0.7	0.0%	1.59	1.64	3.1%
1128037039	3/2/2018	1.18	1.17	0.9%	1.9	1.91	0.5%
1129056237	3/2/2018	0.48	0.48	0.0%	2.33	2.33	0.0%
1129055044	3/3/2018	0.06	0.07	15.4%	1.79	1.71	4.6%
1129055050	3/3/2018	0.13	0.12	8.0%	1.9	1.83	3.8%
1129055057	3/3/2018	0.07	0.06	15.4%	1.27	1.21	4.8%
1129056003	3/3/2018	0.07	0.07	0.0%	1.54	1.49	3.3%
1129056258	3/3/2018	0.52	0.52	0.0%	1.8	1.85	2.7%
1126002020	3/4/2018	0.64	0.63	1.6%	0.16	0.16	0.0%
1126002040	3/4/2018	0.69	0.72	4.3%	0.13	0.14	7.4%

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Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1126002125	3/4/2018	0.74	0.72	2.7%	0.44	0.45	2.2%
1126002136	3/4/2018	0.79	0.77	2.6%	2.09	2.01	3.9%
1127035102	3/4/2018	2.14	2.15	0.5%	0.32	0.32	0.0%
1127035113	3/4/2018	2.64	2.65	0.4%	0.44	0.47	6.6%
1127035134	3/4/2018	2.09	2.09	0.0%	0.11	0.1	9.5%
1127035144	3/4/2018	1.44	1.44	0.0%	0.35	0.36	2.8%
1127035305	3/4/2018	0.64	0.65	1.6%	0.17	0.17	0.0%
1127035336	3/4/2018	0.9	0.9	0.0%	0.34	0.34	0.0%
1127035356	3/4/2018	0.66	0.67	1.5%	0.35	0.46	27.2%
1127035367	3/4/2018	0.55	0.53	3.7%	0.23	0.24	4.3%
1126002101	3/5/2018	0.76	0.78	2.6%	0.24	0.24	0.0%
1126002104	3/5/2018	0.59	0.59	0.0%	0.74	0.74	0.0%
1126002149	3/5/2018	0.42	0.41	2.4%	1.03	1.01	2.0%
1126002193	3/5/2018	1.13	1.13	0.0%	2.25	2.21	1.8%
1127035005	3/5/2018	2.4	2.42	0.8%	0.77	0.77	0.0%
1127035020	3/5/2018	1.83	1.76	3.9%	2.33	2.14	8.5%
1127035035	3/5/2018	2.23	2.17	2.7%	0.18	0.17	5.7%
1127035037	3/5/2018	2.41	2.41	0.0%	0.24	0.25	4.1%
1127035156	3/5/2018	0.67	0.68	1.5%	0.66	0.66	0.0%
1127035166	3/5/2018	0.62	0.64	3.2%	0.12	0.13	8.0%
1127035182	3/5/2018	0.68	0.65	4.5%	0.32	0.33	3.1%
1127035381	3/5/2018	0.73	0.72	1.4%	0.12	0.11	8.7%
1127035396	3/5/2018	0.73	0.7	4.2%	0.46	0.38	19.0%
1126001016	3/7/2018	0.23	0.22	4.4%	1.87	1.88	0.5%
1126001034	3/7/2018	0.65	0.65	0.0%	2.34	2.36	0.9%
1126001056	3/7/2018	0.47	0.46	2.2%	0.08	0.08	0.0%
1126001072	3/7/2018	1.35	1.35	0.0%	0.97	0.99	2.0%
1126001078	3/7/2018	1.48	1.52	2.7%	1.51	1.5	0.7%
1126001098	3/7/2018	0.67	0.66	1.5%	0.5	0.5	0.0%
1126001100	3/7/2018	0.64	0.63	1.6%	0.32	0.35	9.0%
1126001104	3/7/2018	0.5	0.51	2.0%	0.25	0.26	3.9%
1128041052	3/7/2018	0.71	0.7	1.4%	2.31	2.32	0.4%
1128041065	3/7/2018	0.9	0.91	1.1%	2.28	2.26	0.9%
1128041085	3/7/2018	0.28	0.28	0.0%	2.41	2.25	6.9%
1128041113	3/7/2018	0.65	0.65	0.0%	2.69	2.72	1.1%
1128041118	3/7/2018	0.73	0.71	2.8%	2.09	2	4.4%
1126001009	3/8/2018	0.52	0.51	1.9%	0.46	0.45	2.2%
1126001028	3/8/2018	1.21	1.2	0.8%	3.57	3.62	1.4%
1127035998	3/8/2018	0.48	0.5	4.1%	0.82	0.87	5.9%
1128041010	3/8/2018	0.67	0.67	0.0%	2.6	2.55	1.9%
1128041020	3/8/2018	0.48	0.48	0.0%	1.9	1.93	1.6%
1128041040	3/8/2018	0.54	0.54	0.0%	2.4	2.44	1.7%
1128043306	3/8/2018	0.11	0.12	8.7%	1.65	1.66	0.6%
1128043308	3/8/2018	0.21	0.22	4.7%	1.77	1.83	3.3%
1128041182	3/9/2018	0.91	0.94	3.2%	1.98	1.94	2.0%
1128041228	3/9/2018	0.77	0.77	0.0%	1.57	1.54	1.9%
1128043314	3/9/2018	0.23	0.25	8.3%	1.73	1.81	4.5%
1128043338	3/9/2018	0.35	0.35	0.0%	2.05	2.1	2.4%
1128043346	3/9/2018	0.33	0.33	0.0%	1.67	1.71	2.4%
1128043370	3/9/2018	0.72	0.7	2.8%	0.82	0.85	3.6%
1128043414	3/9/2018	0.87	0.87	0.0%	1.24	1.18	5.0%
1128042003	3/10/2018	0.86	0.85	1.2%	1.9	1.96	3.1%
1128042007	3/10/2018	0.23	0.25	8.3%	1.49	1.51	1.3%
1128042097	3/10/2018	0.06	0.06	0.0%	1.55	1.54	0.6%
1128042136	3/10/2018	0.14	0.14	0.0%	1.29	1.31	1.5%
1128043356	3/10/2018	0.34	0.31	9.2%	1.56	1.62	3.8%
1128043360	3/10/2018	0.08	0.06	28.6%	1.76	1.81	2.8%
1128043444	3/10/2018	1.11	1.1	0.9%	1.57	1.57	0.0%
1128043449	3/10/2018	0.07	0.06	15.4%	1.31	1.3	0.8%
1128043489	3/10/2018	0.22	0.21	4.7%	2.11	2.08	1.4%
1128042047	3/11/2018	0.37	0.36	2.7%	2.19	2.2	0.5%
1128042085	3/11/2018	0.94	0.94	0.0%	1.83	1.87	2.2%
1128042167	3/11/2018	0.19	0.22	14.6%	1.49	1.47	1.4%
1128042169	3/11/2018	0.72	0.73	1.4%	1.66	1.71	3.0%
1128043471	3/11/2018	0.16	0.14	13.3%	1.88	1.99	5.7%
1128043499	3/11/2018	0.04	0.05	22.2%	2.25	2.26	0.4%
1126001137	3/12/2018	0.43	0.44	2.3%	0.84	0.82	2.4%
1128042105	3/12/2018	0.08	0.08	0.0%	1.34	1.46	8.6%
1128042147	3/12/2018	0.9	0.9	0.0%	1.37	1.38	0.7%
1128042209	3/12/2018	1.13	1.13	0.0%	1.69	1.69	0.0%
1128042210	3/12/2018	1.03	1.03	0.0%	1.45	1.53	5.4%
1128043437	3/12/2018	0.72	0.72	0.0%	2.15	2.16	0.5%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1128044073	3/12/2018	0.65	0.64	1.6%	1.48	1.5	1.3%
1128042221	3/13/2018	0.85	0.85	0.0%	2.23	2.25	0.9%
1128042189	3/15/2018	1.16	1.13	2.6%	1.31	1.29	1.5%
1128044006	3/15/2018	0.05	0.05	0.0%	1.83	1.87	2.2%
1128044028	3/15/2018	0.12	0.12	0.0%	3.71	3.63	2.2%
1128044035	3/15/2018	1.46	1.46	0.0%	2.15	2.15	0.0%
1128044037	3/15/2018	0.56	0.53	5.5%	0.99	0.99	0.0%
1128044061	3/15/2018	0.72	0.71	1.4%	2.43	2.41	0.8%
1128044078	3/15/2018	0.55	0.55	0.0%	2.05	2.03	1.0%
1128044123	3/15/2018	1.2	1.24	3.3%	0.95	0.96	1.0%
1127025309	3/17/2018	0.51	0.53	3.8%	0.23	0.25	8.3%
1127025316	3/17/2018	0.39	0.39	0.0%	0.39	0.39	0.0%
1127025323	3/17/2018	0.36	0.33	8.7%	0.35	0.34	2.9%
1127025349	3/17/2018	0.44	0.45	2.2%	1.07	1.08	0.9%
1127025361	3/17/2018	0.45	0.46	2.2%	1.31	1.33	1.5%
1127025387	3/17/2018	0.41	0.41	0.0%	0.65	0.64	1.6%
1127025394	3/17/2018	0.81	0.81	0.0%	0.18	0.19	5.4%
1127025409	3/17/2018	0.6	0.6	0.0%	0.44	0.46	4.4%
1127025425	3/17/2018	0.75	0.74	1.3%	0.73	0.69	5.6%
1127026015	3/17/2018	0.25	0.25	0.0%	1.36	1.35	0.7%
1127026023	3/17/2018	0.88	0.9	2.2%	1.76	1.79	1.7%
1127026040	3/17/2018	0.51	0.52	1.9%	0.58	0.59	1.7%
1127026060	3/17/2018	0.44	0.44	0.0%	1.32	1.34	1.5%
1127026077	3/17/2018	0.47	0.45	4.3%	0.92	0.83	10.3%
1127026088	3/17/2018	0.65	0.68	4.5%	0.39	0.47	18.6%
1127026110	3/17/2018	0.39	0.38	2.6%	2.13	2.11	0.9%
1127026124	3/17/2018	0.61	0.62	1.6%	1.27	1.29	1.6%
1127026126	3/17/2018	0.74	0.78	5.3%	1.3	1.3	0.0%
1127026138	3/17/2018	0.43	0.43	0.0%	0.77	0.79	2.6%
1127026153	3/17/2018	0.64	0.68	6.1%	2.09	2.2	5.1%
1127026168	3/17/2018	0.63	0.62	1.6%	1.04	1	3.9%
1127026178	3/17/2018	0.6	0.61	1.7%	0.47	0.47	0.0%
1126003041	3/18/2018	0.13	0.13	0.0%	1.12	1.12	0.0%
1126003065	3/18/2018	0.1	0.11	9.5%	0.64	0.64	0.0%
1126003070	3/18/2018	0.39	0.4	2.5%	0.27	0.31	13.8%
1126003074	3/18/2018	0.64	0.65	1.6%	0.83	0.91	9.2%
1126003083	3/18/2018	0.17	0.16	6.1%	1.27	1.29	1.6%
1126003124	3/18/2018	0.6	0.6	0.0%	0.22	0.23	4.4%
1126003144	3/18/2018	0.6	0.6	0.0%	0.2	0.19	5.1%
1127025435	3/18/2018	0.99	0.99	0.0%	0.43	0.4	7.2%
1127025443	3/18/2018	0.5	0.52	3.9%	0.32	0.4	22.2%
1127025456	3/18/2018	0.54	0.56	3.6%	0.08	0.09	11.8%
1130094005	3/18/2018	0.08	0.08	0.0%	1.26	1.27	0.8%
1130094020	3/18/2018	0.05	0.05	0.0%	1.55	1.61	3.8%
1128045015	3/21/2018	0.59	0.58	1.7%	1.35	1.36	0.7%
1128045040	3/21/2018	0.31	0.3	3.3%	1.84	1.77	3.9%
1128045055	3/21/2018	0.52	0.54	3.8%	0.63	0.66	4.7%
1128045075	3/21/2018	1.01	1.01	0.0%	1.38	1.35	2.2%
1128045103	3/21/2018	0.33	0.33	0.0%	0.13	0.13	0.0%
1128045108	3/21/2018	0.2	0.2	0.0%	1.48	1.44	2.7%
1128045110	3/21/2018	0.4	0.51	24.2%	1.72	1.39	21.2%
1128045149	3/21/2018	1.25	1.26	0.8%	0.86	0.83	3.6%
1128045151	3/21/2018	0.59	0.59	0.0%	1.64	1.7	3.6%
1128046123	3/21/2018	0.65	0.66	1.5%	2.11	2.16	2.3%
1128046125	3/21/2018	0.56	0.54	3.6%	1.82	1.71	6.2%
1128046144	3/21/2018	0.58	0.58	0.0%	1.74	1.84	5.6%
1128046154	3/21/2018	0.27	0.27	0.0%	1.87	1.91	2.1%
1128048092	3/21/2018	0.14	0.14	0.0%	2.2	2.31	4.9%
1128048095	3/21/2018	0.24	0.25	4.1%	2.75	2.79	1.4%
1128048097	3/21/2018	0.52	0.52	0.0%	1.76	1.83	3.9%
1128048131	3/21/2018	0.43	0.42	2.4%	2.15	2.1	2.4%
1126003009	3/23/2018	0.3	0.33	9.5%	0.9	0.97	7.5%
1126003017	3/23/2018	0.12	0.12	0.0%	0.85	0.79	7.3%
1126003038	3/23/2018	0.32	0.32	0.0%	1.21	1.28	5.6%
1127031114	3/23/2018	0.32	0.33	3.1%	1.86	1.9	2.1%
1127031129	3/23/2018	0.21	0.21	0.0%	1.84	1.97	6.8%
1128045508	3/23/2018	0.53	0.53	0.0%	0.55	0.56	1.8%
1128046108	3/23/2018	0.9	0.89	1.1%	1.84	1.85	0.5%
1128047065	3/23/2018	0.22	0.17	25.6%	2.17	1.94	11.2%
1128047076	3/23/2018	0.02	0.02	0.0%	2.03	2.09	2.9%
1128047099	3/23/2018	0.08	0.08	0.0%	1.85	1.81	2.2%
1128047118	3/23/2018	0.44	0.43	2.3%	2	2	0.0%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1128047134	3/23/2018	0.43	0.43	0.0%	1.53	1.53	0.0%
1128047145	3/23/2018	0.97	0.98	1.0%	1.69	1.72	1.8%
1127033013	3/24/2018	1.2	1.2	0.0%	1.7	1.7	0.0%
1127033018	3/24/2018	1.1	1.06	3.7%	1.2	1.19	0.8%
1127033030	3/24/2018	1.01	1.01	0.0%	1.7	1.72	1.2%
1128047034	3/24/2018	0.19	0.19	0.0%	1.67	1.72	2.9%
1128047048	3/24/2018	0.65	0.23	95.5%	2.21	1.89	15.6%
1128048046	3/24/2018	0.76	0.72	5.4%	2.72	2.67	1.9%
1128048055	3/24/2018	0.71	0.75	5.5%	1.82	1.93	5.9%
1127031101	3/25/2018	0.34	0.33	3.0%	2.03	2	1.5%
1127031141	3/25/2018	0.13	0.12	8.0%	1.66	1.66	0.0%
1127033034	3/25/2018	1.17	1.2	2.5%	1.62	1.66	2.4%
1127033053	3/25/2018	1.24	1.24	0.0%	1.65	1.66	0.6%
1128048109	3/25/2018	0.41	0.39	5.0%	3.1	3.12	0.6%
1128048144	3/25/2018	0.38	0.39	2.6%	2.76	2.84	2.9%
1127030037	3/26/2018	0.66	0.63	4.7%	1.81	1.72	5.1%
1127030048	3/26/2018	1.05	1.05	0.0%	1.58	1.68	6.1%
1127031077	3/26/2018	0.25	0.24	4.1%	2.55	2.49	2.4%
1128047019	3/26/2018	0.03	0.03	0.0%	3.32	3.16	4.9%
1128048008	3/26/2018	0.16	0.16	0.0%	1.72	1.71	0.6%
1128048019	3/26/2018	0.44	0.46	4.4%	1.94	2.01	3.5%
1128048031	3/26/2018	0.05	0.04	22.2%	2.71	2.74	1.1%
1130101007	3/26/2018	1	1	0.0%	0.38	0.36	5.4%
1127030027	3/29/2018	1.45	1.46	0.7%	1.74	1.77	1.7%
1127030059	3/29/2018	0.12	0.13	8.0%	4.27	4.23	0.9%
1127030079	3/29/2018	0.95	0.94	1.1%	2	2.01	0.5%
1127030105	3/29/2018	0.06	0.06	0.0%	2.69	2.64	1.9%
1127030133	3/29/2018	0.98	0.92	6.3%	2.3	2.14	7.2%
1127030138	3/29/2018	0.73	0.74	1.4%	1.84	1.88	2.2%
1127027106	3/30/2018	0.6	0.61	1.7%	1.49	1.48	0.7%
1127027117	3/30/2018	0.57	0.57	0.0%	0.88	0.84	4.7%
1127027126	3/30/2018	0.51	0.51	0.0%	2.17	2.24	3.2%
1127027131	3/30/2018	0.65	0.68	4.5%	1.1	1.12	1.8%
1127027146	3/30/2018	0.43	0.43	0.0%	2.33	2.33	0.0%
1127027157	3/30/2018	0.63	0.64	1.6%	0.68	0.68	0.0%
1127027170	3/30/2018	0.88	0.88	0.0%	1.74	1.78	2.3%
1127027210	3/30/2018	1.02	1.02	0.0%	1.87	1.87	0.0%
1128046003	3/30/2018	0.74	0.73	1.4%	1.95	1.92	1.6%
1128046010	3/30/2018	1.01	1.02	1.0%	2.03	2.07	2.0%
1128046025	3/30/2018	0.65	0.65	0.0%	2.46	2.39	2.9%
1128046039	3/30/2018	0.68	0.67	1.5%	1.99	1.97	1.0%
1128046043	3/30/2018	0.85	0.86	1.2%	2.33	2.37	1.7%
1131072019	3/30/2018	0.22	0.21	4.7%	1.77	1.7	4.0%
1131072040	3/30/2018	0.09	0.09	0.0%	0.97	0.97	0.0%
1131072059	3/30/2018	0.2	0.18	10.5%	2.06	2.1	1.9%
1131072080	3/30/2018	0.19	0.19	0.0%	1.62	1.7	4.8%
1131072105	3/30/2018	0.19	0.19	0.0%	1.84	1.85	0.5%
1128047061	3/31/2018	0.19	0.19	0.0%	2.26	2.21	2.2%
1127029108	4/1/2018	0.71	0.71	0.0%	2	1.94	3.0%
1127029143	4/1/2018	0.67	0.67	0.0%	1.92	1.85	3.7%
1127032008	4/1/2018	0.25	0.25	0.0%	1.13	1.13	0.0%
1127032012	4/1/2018	0.28	0.28	0.0%	1.18	1.21	2.5%
1127032022	4/1/2018	0.21	0.2	4.9%	1.01	1.03	2.0%
1127032035	4/1/2018	0.33	0.33	0.0%	1.27	1.19	6.5%
1127032058	4/1/2018	0.25	0.26	3.9%	1.03	1.02	1.0%
1127032092	4/1/2018	0.46	0.43	6.7%	1.34	1.27	5.4%
1127032101	4/1/2018	0.53	0.57	7.3%	1.08	1.32	20.0%
1127032118	4/1/2018	0.24	0.23	4.3%	1.16	1.13	2.6%
1127032126	4/1/2018	0.9	0.89	1.1%	0.92	0.91	1.1%
1127032137	4/1/2018	0.69	0.71	2.9%	1.36	1.38	1.5%
1127032149	4/1/2018	0.91	0.92	1.1%	0.7	0.7	0.0%
1127032156	4/1/2018	0.82	0.8	2.5%	1.27	1.3	2.3%
1127036060	4/1/2018	0.41	0.41	0.0%	0.8	0.79	1.3%
1127036090	4/1/2018	0.39	0.4	2.5%	0.54	0.55	1.8%
1127036106	4/1/2018	0.25	0.25	0.0%	1.43	1.5	4.8%
1127036041	4/2/2018	0.27	0.27	0.0%	0.18	0.17	5.7%
1127029158	4/3/2018	0.87	0.88	1.1%	2.3	2.35	2.2%
1127037110	4/4/2018	0.7	0.71	1.4%	1.99	2.05	3.0%
1127037126	4/4/2018	0.28	0.28	0.0%	2.35	2.36	0.4%
1127037142	4/4/2018	0.62	0.68	9.2%	1.22	1.33	8.6%
1127037157	4/4/2018	0.32	0.32	0.0%	2.25	2.25	0.0%
1127037173	4/4/2018	1.02	1.02	0.0%	1.48	1.48	0.0%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1130101071	4/4/2018	0.71	0.78	9.4%	0.45	0.51	12.5%
1127037177	4/5/2018	0.32	0.32	0.0%	2.21	2.25	1.8%
1230001098	4/5/2018	0.03	0.03	0.0%	1.58	1.54	2.6%
1230001169	4/5/2018	0.02	0.02	0.0%	1.07	1.16	8.1%
1230001184	4/5/2018	0.1	0.09	10.5%	1.07	1.12	4.6%
1230001206	4/5/2018	0.05	0.05	0.0%	2.38	2.42	1.7%
1127034019	4/6/2018	0.53	0.53	0.0%	1.42	1.45	2.1%
1127034024	4/6/2018	0.38	0.35	8.2%	1.61	1.51	6.4%
1127034041	4/6/2018	0.28	0.28	0.0%	2.54	2.58	1.6%
1127034061	4/6/2018	0.09	0.1	10.5%	1.56	1.58	1.3%
1127034066	4/6/2018	0.18	0.17	5.7%	1.47	1.44	2.1%
1127034085	4/6/2018	0.41	0.44	7.1%	1.57	1.65	5.0%
1127034096	4/6/2018	0.02	0.02	0.0%	2.01	1.93	4.1%
1127034148	4/6/2018	0.14	0.13	7.4%	2.5	2.45	2.0%
1127034199	4/6/2018	0.08	0.08	0.0%	3.05	3.09	1.3%
1230001090	4/6/2018	0.23	0.23	0.0%	1.08	1.05	2.8%
1230001103	4/6/2018	0.16	0.16	0.0%	0.84	0.86	2.4%
1230001175	4/6/2018	0.11	0.11	0.0%	1.89	1.85	2.1%
1230001179	4/6/2018	0.04	0.04	0.0%	4.25	3.97	6.8%
1230001197	4/6/2018	0.1	0.1	0.0%	0.77	0.8	3.8%
1127034157	4/7/2018	0.12	0.11	8.7%	2.36	2.31	2.1%
1127034166	4/7/2018	0.75	0.75	0.0%	1.8	1.78	1.1%
1127034186	4/7/2018	0.24	0.23	4.3%	2.19	2.14	2.3%
1127034190	4/7/2018	0.4	0.4	0.0%	1.81	1.86	2.7%
1230001026	4/7/2018	0.42	0.43	2.4%	0.75	0.74	1.3%
1230001045	4/7/2018	0.03	0.03	0.0%	0.9	0.88	2.2%
1230001056	4/7/2018	0.13	0.13	0.0%	0.88	0.92	4.4%
1127034117	4/8/2018	0.35	0.35	0.0%	1.93	1.78	8.1%
1127038071	4/8/2018	0.69	0.7	1.4%	1.91	1.93	1.0%
1126004015	4/9/2018	0.43	0.42	2.4%	0.36	0.34	5.7%
1127038035	4/9/2018	0.9	0.9	0.0%	1.76	1.72	2.3%
1127038037	4/9/2018	1.2	1.16	3.4%	1.64	1.59	3.1%
1127038056	4/9/2018	1.19	1.21	1.7%	1.64	1.66	1.2%
1127041005	4/12/2018	0.49	0.48	2.1%	2.86	2.97	3.8%
1127041074	4/12/2018	0.9	0.88	2.2%	2.39	2.49	4.1%
1127041118	4/12/2018	0.88	0.93	5.5%	2.79	2.51	10.6%
1127041129	4/12/2018	0.93	0.93	0.0%	2.57	2.62	1.9%
1127041135	4/12/2018	0.26	0.25	3.9%	2.77	2.71	2.2%
1127041153	4/12/2018	0.31	0.3	3.3%	2.19	2.2	0.5%
1127041171	4/12/2018	0.39	0.4	2.5%	2.07	2.15	3.8%
1127041175	4/12/2018	0.47	0.47	0.0%	1.99	1.9	4.6%
1127041184	4/12/2018	0.09	0.09	0.0%	2.31	2.24	3.1%
1127041189	4/12/2018	0.24	0.24	0.0%	2.13	2.06	3.3%
1127041204	4/12/2018	0.13	0.12	8.0%	2.16	2.27	5.0%
1127041234	4/12/2018	1.17	1.1	6.2%	2.14	2.25	5.0%
1127041269	4/12/2018	0.68	0.67	1.5%	2.03	2.12	4.3%
1230002025	4/14/2018	0.03	0.03	0.0%	1.52	1.65	8.2%
1230002041	4/14/2018	0.04	0.04	0.0%	2.13	2.19	2.8%
1230002062	4/14/2018	0.01	0.01	0.0%	1.17	1.08	8.0%
1230002087	4/14/2018	0.04	0.04	0.0%	1.76	1.82	3.4%
1230002090	4/14/2018	0.04	0.04	0.0%	2.86	3.09	7.7%
1230002116	4/14/2018	0.13	0.13	0.0%	1.54	1.67	8.1%
1127041023	4/16/2018	0.74	0.73	1.4%	1.73	1.74	0.6%
1127041054	4/16/2018	0.4	0.4	0.0%	2.48	2.54	2.4%
1127041101	4/16/2018	0.5	0.53	5.8%	1.82	2.04	11.4%
1127041198	4/16/2018	0.59	0.58	1.7%	2.02	2.02	0.0%
1127041299	4/16/2018	0.63	0.63	0.0%	1.9	1.8	5.4%
1126004050	4/18/2018	0.09	0.1	10.5%	1.58	1.62	2.5%
1126004058	4/18/2018	0.25	0.25	0.0%	1	1.05	4.9%
1126004064	4/18/2018	0.78	0.77	1.3%	0.38	0.43	12.3%
1126004084	4/18/2018	0.25	0.25	0.0%	1.03	1.02	1.0%
1126004087	4/18/2018	0.39	0.39	0.0%	0.65	0.76	15.6%
1126004103	4/18/2018	0.45	0.44	2.2%	1.62	1.65	1.8%
1126004107	4/18/2018	0.44	0.45	2.2%	1.17	1.17	0.0%
1126004115	4/18/2018	0.48	0.47	2.1%	0.44	0.45	2.2%
1126004127	4/18/2018	0.54	0.49	9.7%	0.44	0.41	7.1%
1126004138	4/18/2018	0.38	0.43	12.3%	0.61	0.65	6.3%
1126004143	4/18/2018	0.5	0.48	4.1%	0.8	0.78	2.5%
1126010229	4/18/2018	0.57	0.56	1.8%	0.65	0.66	1.5%
1126004167	4/19/2018	0.34	0.34	0.0%	0.54	0.55	1.8%
1127042019	4/19/2018	0.31	0.31	0.0%	1.93	1.89	2.1%
1127042029	4/19/2018	0.09	0.1	10.5%	1.55	1.57	1.3%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1127042055	4/19/2018	0.25	0.25	0.0%	2.14	2.18	1.9%
1127042170	4/19/2018	0.16	0.16	0.0%	1.28	1.35	5.3%
1127042213	4/19/2018	0.31	0.31	0.0%	1.38	1.33	3.7%
1127042239	4/19/2018	0.75	0.73	2.7%	1.13	1.1	2.7%
1230003105	4/19/2018	0.06	0.05	18.2%	2.21	2.24	1.3%
1230003115	4/19/2018	0.17	0.18	5.7%	0.34	0.36	5.7%
1230003121	4/19/2018	0.07	0.07	0.0%	2.04	2.02	1.0%
1230003147	4/19/2018	0.11	0.11	0.0%	0.69	0.69	0.0%
1230003157	4/19/2018	0.09	0.09	0.0%	0.6	0.62	3.3%
1230003167	4/19/2018	0.12	0.11	8.7%	1.39	1.35	2.9%
1230003176	4/19/2018	0.24	0.24	0.0%	1.63	1.63	0.0%
1230003183	4/19/2018	0.17	0.16	6.1%	1.25	1.18	5.8%
1230003218	4/19/2018	0.41	0.4	2.5%	4.49	4.61	2.6%
1230003979	4/19/2018	0.04	0.05	22.2%	1.89	1.92	1.6%
1230003989	4/19/2018	0.31	0.32	3.2%	1.63	1.62	0.6%
1126005014	4/20/2018	0.36	0.36	0.0%	0.74	0.67	9.9%
1126005024	4/20/2018	0.33	0.34	3.0%	0.91	0.91	0.0%
1126010005	4/20/2018	0.61	0.62	1.6%	0.49	0.52	5.9%
1126010103	4/20/2018	0.43	0.42	2.4%	0.63	0.65	3.1%
1126010165	4/20/2018	0.56	0.57	1.8%	0.86	0.84	2.4%
1126010170	4/20/2018	0.53	0.54	1.9%	0.74	0.75	1.3%
1126010184	4/20/2018	0.31	0.31	0.0%	0.65	0.65	0.0%
1126010190	4/20/2018	0.31	0.3	3.3%	0.48	0.47	2.1%
1126010195	4/20/2018	0.38	0.39	2.6%	0.59	0.58	1.7%
1126010213	4/20/2018	0.35	0.36	2.8%	0.74	0.73	1.4%
1127042156	4/20/2018	0.44	0.44	0.0%	1.83	1.82	0.5%
1127042251	4/20/2018	0.1	0.09	10.5%	1.95	1.98	1.5%
1230003210	4/20/2018	0.68	0.67	1.5%	3	2.74	9.1%
1230004144	4/20/2018	0.58	0.58	0.0%	2.66	2.69	1.1%
1127042102	4/21/2018	0.23	0.23	0.0%	1.91	1.9	0.5%
1127042122	4/21/2018	0.59	0.6	1.7%	3.95	3.87	2.0%
1127042158	4/21/2018	0.66	0.67	1.5%	2.05	2.12	3.4%
1230003073	4/21/2018	0.05	0.05	0.0%	2.43	2.66	9.0%
1230003230	4/21/2018	0.24	0.24	0.0%	2.46	2.41	2.1%
1230004085	4/21/2018	0.45	0.46	2.2%	1.5	1.53	2.0%
1230004099	4/21/2018	0.48	0.48	0.0%	1.13	1.13	0.0%
1230004117	4/21/2018	0.53	0.52	1.9%	1.43	1.41	1.4%
1126011015	4/22/2018	0.68	0.68	0.0%	1.1	1.11	0.9%
1126011226	4/22/2018	0.28	0.28	0.0%	0.55	0.54	1.8%
1126011246	4/22/2018	0.52	0.52	0.0%	0.33	0.3	9.5%
1126011250	4/22/2018	0.48	0.47	2.1%	0.62	0.56	10.2%
1127042133	4/22/2018	0.28	0.27	3.6%	1.63	1.62	0.6%
1230003019	4/22/2018	0.05	0.05	0.0%	1.66	1.64	1.2%
1230003021	4/22/2018	0.12	0.12	0.0%	1.57	1.55	1.3%
1230003034	4/22/2018	0.03	0.03	0.0%	2.32	2.37	2.1%
1230004062	4/22/2018	0.7	0.69	1.4%	1.02	1.01	1.0%
1126011007	4/23/2018	0.57	0.57	0.0%	0.29	0.3	3.4%
1126011025	4/23/2018	0.99	0.98	1.0%	0.7	0.64	9.0%
1126011181	4/23/2018	0.32	0.33	3.1%	0.97	0.93	4.2%
1126011184	4/23/2018	0.45	0.45	0.0%	0.35	0.35	0.0%
1230003042	4/23/2018	0.28	0.28	0.0%	1.2	1.2	0.0%
1230003053	4/23/2018	0.14	0.14	0.0%	0.96	0.87	9.8%
1126011141	4/25/2018	0.27	0.28	3.6%	0.3	0.31	3.3%
1126011151	4/25/2018	0.29	0.27	7.1%	0.3	0.53	55.4%
1126011171	4/25/2018	0.38	0.37	2.7%	0.62	0.61	1.6%
1126015058	4/25/2018	0.27	0.26	3.8%	0.73	0.74	1.4%
1126015127	4/25/2018	0.28	0.28	0.0%	1.46	1.46	0.0%
1230004025	4/25/2018	0.93	0.91	2.2%	0.94	0.89	5.5%
1230004042	4/25/2018	1.14	1.14	0.0%	0.81	0.81	0.0%
1230004043	4/25/2018	0.69	0.69	0.0%	1.04	1.03	1.0%
1126011101	4/26/2018	0.74	0.77	4.0%	0.19	0.19	0.0%
1126011122	4/26/2018	0.29	0.29	0.0%	0.26	0.26	0.0%
1126012007	4/26/2018	0.34	0.33	3.0%	0.51	0.47	8.2%
1126012071	4/26/2018	0.34	0.38	11.1%	1.19	1.3	8.8%
1126012080	4/26/2018	0.29	0.3	3.4%	0.22	0.22	0.0%
1126012119	4/26/2018	0.44	0.39	12.0%	0.21	0.18	15.4%
1126012125	4/26/2018	0.28	0.29	3.5%	0.42	0.44	4.7%
1126012138	4/26/2018	0.34	0.33	3.0%	0.42	0.37	12.7%
1126012139	4/26/2018	0.32	0.39	19.7%	0.32	0.4	22.2%
1126015020	4/26/2018	0.26	0.25	3.9%	1.48	1.44	2.7%
1126015041	4/26/2018	0.3	0.3	0.0%	2.42	2.23	8.2%
1126015071	4/26/2018	0.22	0.21	4.7%	3.5	3.49	0.3%

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Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1126015123	4/26/2018	1.05	1.03	1.9%	2.71	2.83	4.3%
1130101111	4/26/2018	0.95	0.94	1.1%	0.44	0.46	4.4%
1126012046	4/27/2018	0.44	0.46	4.4%	0.29	0.29	0.0%
1126012114	4/27/2018	0.36	0.32	11.8%	0.31	0.28	10.2%
1126012109	4/28/2018	0.41	0.4	2.5%	0.19	0.18	5.4%
1126012148	4/28/2018	0.35	0.33	5.9%	0.36	0.37	2.7%
1126007008	4/30/2018	0.81	0.85	4.8%	0.94	0.98	4.2%
1126007039	4/30/2018	0.78	0.81	3.8%	1.13	1.17	3.5%
1126007056	4/30/2018	0.99	0.96	3.1%	1.31	1.23	6.3%
1126007067	4/30/2018	0.96	0.94	2.1%	1.28	1.26	1.6%
1126007102	4/30/2018	0.73	0.73	0.0%	1.04	1.09	4.7%
1126007109	4/30/2018	0.76	0.76	0.0%	0.93	0.96	3.2%
1126007134	4/30/2018	0.59	0.6	1.7%	0.79	0.83	4.9%
1126007150	4/30/2018	0.45	0.48	6.5%	1.63	1.68	3.0%
1126007165	4/30/2018	0.62	0.62	0.0%	1.94	1.95	0.5%
1126007307	4/30/2018	0.76	0.72	5.4%	1.76	1.85	5.0%
1126013020	4/30/2018	0.56	0.56	0.0%	0.23	0.22	4.4%
1126013069	4/30/2018	0.38	0.39	2.6%	0.59	0.64	8.1%
1126013078	4/30/2018	0.55	0.55	0.0%	0.27	0.27	0.0%
1126013079	4/30/2018	0.54	0.54	0.0%	0.16	0.17	6.1%
1126014009	4/30/2018	0.27	0.3	10.5%	1.19	1.31	9.6%
1126014074	4/30/2018	0.7	0.68	2.9%	1.16	1.18	1.7%
1126014115	4/30/2018	0.54	0.56	3.6%	1.2	1.21	0.8%
1126015028	4/30/2018	0.34	0.35	2.9%	2.86	2.82	1.4%
1126015044	4/30/2018	0.33	0.35	5.9%	2.06	2.19	6.1%
1126015083	4/30/2018	0.27	0.29	7.1%	3.15	3.35	6.2%
1126007028	5/2/2018	0.5	0.5	0.0%	0.56	0.6	6.9%
1126007043	5/2/2018	0.93	0.94	1.1%	0.63	0.62	1.6%
1126007079	5/2/2018	0.84	0.82	2.4%	0.72	0.71	1.4%
1126007324	5/2/2018	0.78	0.77	1.3%	1.54	1.48	4.0%
1126007344	5/2/2018	0.62	0.61	1.6%	2.82	2.78	1.4%
1126007354	5/2/2018	0.37	0.37	0.0%	2.08	2.09	0.5%
1126007360	5/2/2018	1.19	1.17	1.7%	2.1	2.23	6.0%
1126007383	5/2/2018	0.56	0.55	1.8%	2.12	2.17	2.3%
1126013044	5/2/2018	0.77	0.77	0.0%	0.4	0.4	0.0%
1126007171	5/3/2018	0.86	0.87	1.2%	1.08	1.07	0.9%
1126014018	5/3/2018	0.69	0.67	2.9%	1.15	1.13	1.8%
1126014031	5/3/2018	0.27	0.28	3.6%	1.09	1.07	1.9%
1126014093	5/3/2018	0.17	0.15	12.5%	2.19	2.01	8.6%
1126014094	5/3/2018	0.33	0.34	3.0%	2.25	2.3	2.2%
1126014096	5/3/2018	0.57	0.59	3.4%	1.49	1.52	2.0%
4137501024	5/3/2018	0.08	0.08	0.0%	0.02	0.02	0.0%
1126007403	5/4/2018	0.89	0.88	1.1%	2.68	2.65	1.1%
1126014042	5/4/2018	0.61	0.58	5.0%	1.27	1.27	0.0%
1126014138	5/4/2018	0.63	0.6	4.9%	1.37	1.4	2.2%
1126014175	5/4/2018	0.22	0.22	0.0%	1.3	1.35	3.8%
1126016073	5/4/2018	1.23	1.22	0.8%	2.11	1.62	26.3%
1126014020	5/5/2018	0.86	0.86	0.0%	2.31	2.33	0.9%
1126015137	5/5/2018	0.22	0.21	4.7%	2.2	2.38	7.9%
1126015138	5/5/2018	0.21	0.21	0.0%	2.58	3.02	15.7%
1126016007	5/5/2018	1.1	1.08	1.8%	2.06	2.06	0.0%
1126016043	5/5/2018	1.24	1.23	0.8%	1.63	1.7	4.2%
1126016045	5/5/2018	1.04	1.12	7.4%	1.76	2.04	14.7%
1126016076	5/5/2018	1.09	1.05	3.7%	1.74	1.72	1.2%
1126016111	5/5/2018	0.79	0.79	0.0%	2.87	3	4.4%
1126016115	5/5/2018	0.25	0.2	22.2%	5.48	5.57	1.6%
1126018119	5/6/2018	1.25	1.23	1.6%	2.24	2.29	2.2%
1126019008	5/6/2018	0.61	0.64	4.8%	1.38	1.39	0.7%
1126019039	5/6/2018	0.69	0.67	2.9%	1.19	1.17	1.7%
1126019224	5/6/2018	0.73	0.73	0.0%	0.63	0.63	0.0%
1126019257	5/6/2018	0.34	0.36	5.7%	1.79	1.73	3.4%
1230005231	5/6/2018	0.37	0.37	0.0%	1.73	1.76	1.7%
1126014180	5/7/2018	0.21	0.2	4.9%	1.05	1.08	2.8%
1126016150	5/7/2018	0.14	0.12	15.4%	2.09	2.17	3.8%
1126018065	5/7/2018	0.22	0.22	0.0%	2.1	2.11	0.5%
1126018080	5/7/2018	0.98	0.98	0.0%	2.68	2.66	0.7%
1126018086	5/7/2018	0.93	0.93	0.0%	1.19	1.29	8.1%
1126016066	5/8/2018	1.16	1.16	0.0%	1.97	2.07	5.0%
1126018005	5/8/2018	0.4	0.4	0.0%	2.09	2.12	1.4%
1126018009	5/8/2018	0.49	0.47	4.2%	1.85	1.83	1.1%
1126018010	5/8/2018	0.63	0.63	0.0%	1.77	1.78	0.6%
1126018060	5/8/2018	0.8	0.81	1.2%	2.4	2.45	2.1%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1126018077	5/8/2018	1.11	1.1	0.9%	2.47	2.42	2.0%
1126019225	5/8/2018	0.64	0.65	1.6%	0.96	0.99	3.1%
1126019258	5/8/2018	0.22	0.21	4.7%	1.49	1.42	4.8%
1230005110	5/8/2018	0.05	0.05	0.0%	2.39	2.49	4.1%
1230005145	5/8/2018	0.03	0.03	0.0%	2.42	2.23	8.2%
1230005153	5/8/2018	0.06	0.06	0.0%	1.76	1.76	0.0%
1230005169	5/8/2018	0.33	0.35	5.9%	1.9	1.89	0.5%
1230005209	5/8/2018	0.02	0.02	0.0%	2.17	2.24	3.2%
1230005219	5/8/2018	0.43	0.43	0.0%	1.4	1.43	2.1%
4137501044	5/8/2018	0.12	0.11	8.7%	0.79	0.78	1.3%
4137501060	5/8/2018	0.07	0.08	13.3%	0.05	0.05	0.0%
4137501072	5/8/2018	0.09	0.1	10.5%	0.18	0.18	0.0%
4137501082	5/8/2018	0.16	0.16	0.0%	0.13	0.13	0.0%
4137501120	5/8/2018	0.07	0.08	13.3%	0.15	0.14	6.9%
4137501174	5/8/2018	0.24	0.25	4.1%	0.11	0.11	0.0%
1126016001	5/9/2018	0.63	0.62	1.6%	1.95	1.95	0.0%
1126016015	5/9/2018	1.24	1.21	2.4%	2.53	2.5	1.2%
1126018045	5/9/2018	1.28	1.29	0.8%	1.54	1.54	0.0%
1126019164	5/9/2018	0.43	0.43	0.0%	0.84	0.87	3.5%
1126019186	5/9/2018	0.45	0.44	2.2%	2.39	2.32	3.0%
1126019189	5/9/2018	0.78	0.76	2.6%	1.75	1.66	5.3%
1126024101	5/9/2018	0.49	0.48	2.1%	1.87	1.85	1.1%
1126019101	5/10/2018	0.87	0.88	1.1%	0.69	0.67	2.9%
1126019108	5/10/2018	0.56	0.56	0.0%	2.03	1.99	2.0%
1126019140	5/10/2018	0.58	0.57	1.7%	2.74	2.63	4.1%
1127039011	5/10/2018	1.23	1.26	2.4%	2.71	2.79	2.9%
1127039107	5/10/2018	0.48	0.48	0.0%	1.92	1.91	0.5%
1127039117	5/10/2018	0.25	0.25	0.0%	1.41	1.44	2.1%
1126019175	5/11/2018	0.74	0.76	2.7%	2.18	2.21	1.4%
1126024069	5/11/2018	0.04	0.04	0.0%	1.53	1.52	0.7%
1126024139	5/11/2018	0.49	0.48	2.1%	2.02	2.02	0.0%
1127039017	5/11/2018	0.69	0.69	0.0%	1.43	1.44	0.7%
4137501122	5/11/2018	0.16	0.16	0.0%	0.03	0.03	0.0%
4137501156	5/11/2018	0.2	0.2	0.0%	0.01	0.01	0.0%
1126019026	5/12/2018	1.15	1.11	3.5%	2.29	2.21	3.6%
1126019114	5/12/2018	0.95	0.96	1.0%	1.8	1.8	0.0%
1126024160	5/12/2018	0.1	0.1	0.0%	2.01	2.01	0.0%
1126024155	5/13/2018	0.35	0.34	2.9%	1.86	1.83	1.6%
1229002066	5/13/2018	0.02	0.02	0.0%	1.39	1.33	4.4%
1229002085	5/13/2018	0.01	0.01	0.0%	2.15	2.14	0.5%
1126024008	5/14/2018	0.78	0.81	3.8%	1.99	2.22	10.9%
1126024038	5/15/2018	0.1	0.1	0.0%	2.37	2.49	4.9%
1126024047	5/15/2018	0.96	0.96	0.0%	1.84	1.82	1.1%
1126024064	5/15/2018	0.14	0.15	6.9%	2.31	2.29	0.9%
4137501166	5/15/2018	0.22	0.22	0.0%	0.04	0.04	0.0%
1126021142	5/16/2018	1.23	1.41	13.6%	1.8	2.09	14.9%
1229002063	5/16/2018	0.01	0.01	0.0%	2.38	2.27	4.7%
1229002089	5/16/2018	0.35	0.34	2.9%	2.39	2.33	2.5%
1229002116	5/16/2018	0.16	0.17	6.1%	2.1	2.07	1.4%
1229002024	5/17/2018	0.02	0.01	66.7%	1.23	1.26	2.4%
1229002029	5/17/2018	0.01	0.01	0.0%	1.65	1.6	3.1%
1229002049	5/17/2018	0.02	0.03	40.0%	2.16	2.13	1.4%
1229002095	5/17/2018	0.02	0.02	0.0%	1.8	1.81	0.6%
1229002159	5/17/2018	0.64	0.69	7.5%	2.25	2.18	3.2%
1229002161	5/17/2018	0.42	0.41	2.4%	2.04	1.95	4.5%
1126021015	5/18/2018	0.58	0.58	0.0%	1.18	1.13	4.3%
1126021020	5/18/2018	1.3	1.36	4.5%	0.75	0.76	1.3%
1126021045	5/18/2018	0.43	0.42	2.4%	0.05	0.05	0.0%
1126022103	5/18/2018	0.49	0.48	2.1%	0.34	0.34	0.0%
1229001116	5/18/2018	0.36	0.36	0.0%	1.84	1.87	1.6%
1229002165	5/18/2018	0.11	0.11	0.0%	0.59	0.58	1.7%
1126022078	5/19/2018	0.5	0.39	24.7%	0.18	0.27	40.0%
1229001094	5/19/2018	0.01	0.005	66.7%	0.32	0.3	6.5%
1229001110	5/19/2018	0.04	0.04	0.0%	2.86	2.87	0.3%
1229001113	5/19/2018	0.13	0.14	7.4%	1.97	1.95	1.0%
1229003075	5/19/2018	0.11	0.15	30.8%	1.28	1.26	1.6%
1229003056	5/20/2018	0.52	0.54	3.8%	1.9	2.02	6.1%
1229003059	5/20/2018	0.38	0.39	2.6%	2.25	2.24	0.4%
1229003076	5/20/2018	0.7	0.7	0.0%	2.36	2.34	0.9%
1229001027	5/21/2018	0.01	0.01	0.0%	1.99	1.9	4.6%
1229003053	5/21/2018	0.62	0.63	1.6%	2.3	2.25	2.2%
1126021032	5/22/2018	0.64	0.61	4.8%	0.49	0.46	6.3%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1126021034	5/22/2018	0.68	0.69	1.5%	1.43	1.47	2.8%
1126021039	5/22/2018	0.8	0.8	0.0%	0.55	0.57	3.6%
1126021123	5/22/2018	0.65	0.69	6.0%	0.25	0.29	14.8%
1126022009	5/22/2018	0.44	0.44	0.0%	0.25	0.25	0.0%
1126022021	5/22/2018	0.47	0.47	0.0%	0.38	0.38	0.0%
1229001021	5/22/2018	0.005	0.005	0.0%	1.61	1.6	0.6%
1229001038	5/22/2018	0.2	0.2	0.0%	1.92	1.9	1.0%
1229001056	5/22/2018	0.06	0.07	15.4%	1.65	1.69	2.4%
1229001062	5/22/2018	0.01	0.01	0.0%	1.86	1.81	2.7%
1229001082	5/22/2018	0.1	0.09	10.5%	1.68	1.65	1.8%
1229001101	5/22/2018	0.02	0.02	0.0%	2.56	2.7	5.3%
1126022125	5/23/2018	0.62	0.64	3.2%	0.31	0.31	0.0%
1229003012	5/23/2018	0.33	0.3	9.5%	2.75	2.49	9.9%
1229003014	5/23/2018	0.25	0.24	4.1%	2.63	2.53	3.9%
1229003041	5/23/2018	0.36	0.35	2.8%	2.52	2.62	3.9%
1229003613	5/23/2018	0.22	0.21	4.7%	0.93	0.9	3.3%
1229003619	5/23/2018	0.86	0.84	2.4%	2.22	2.23	0.4%
1229003660	5/23/2018	0.12	0.13	8.0%	0.99	0.95	4.1%
1126022164	5/24/2018	0.47	0.46	2.2%	0.33	0.32	3.1%
1126022168	5/24/2018	0.47	0.49	4.2%	0.22	0.24	8.7%
1229003048	5/24/2018	0.49	0.5	2.0%	2.5	2.61	4.3%
1126025003	5/26/2018	1.34	1.41	5.1%	2.35	2.57	8.9%
1126025161	5/26/2018	0.47	0.41	13.6%	1.06	0.92	14.1%
1126025176	5/26/2018	0.43	0.43	0.0%	1.22	1.25	2.4%
1229003027	5/26/2018	0.14	0.15	6.9%	1.57	1.54	1.9%
1229003605	5/26/2018	0.24	0.21	13.3%	0.5	0.43	15.1%
1229003624	5/26/2018	0.27	0.28	3.6%	1.95	1.95	0.0%
1229003666	5/26/2018	0.14	0.15	6.9%	0.39	0.4	2.5%
1125006108	5/27/2018	0.71	0.7	1.4%	0.78	0.77	1.3%
1125006112	5/27/2018	0.84	0.86	2.4%	1.4	1.37	2.2%
1125006125	5/27/2018	0.84	0.85	1.2%	1.12	1.21	7.7%
1126025131	5/27/2018	0.8	0.81	1.2%	2.26	2.41	6.4%
1126025144	5/27/2018	0.77	0.76	1.3%	0.54	0.55	1.8%
1126025159	5/27/2018	0.47	0.5	6.2%	0.25	0.28	11.3%
1126025203	5/27/2018	0.25	0.25	0.0%	1.12	1.12	0.0%
1126025205	5/27/2018	0.31	0.31	0.0%	1.14	1.2	5.1%
1125006060	5/28/2018	0.23	0.23	0.0%	1.17	1.23	5.0%
1125006095	5/28/2018	0.34	0.33	3.0%	0.52	0.53	1.9%
1126025108	5/28/2018	0.69	0.67	2.9%	0.75	0.74	1.3%
1125006055	5/30/2018	0.36	0.36	0.0%	1	1	0.0%
1125006082	5/30/2018	0.42	0.44	4.7%	0.74	0.75	1.3%
1126025113	5/30/2018	0.8	0.79	1.3%	1.35	1.29	4.5%
1126025136	5/30/2018	0.39	0.41	5.0%	0.17	0.16	6.1%
1125005008	5/31/2018	0.25	0.24	4.1%	1.5	1.49	0.7%
1125005041	5/31/2018	0.41	0.43	4.8%	1.22	1.19	2.5%
1125006021	5/31/2018	0.29	0.29	0.0%	1.63	1.66	1.8%
1125006032	5/31/2018	0.21	0.19	10.0%	2.06	1.93	6.5%
1126020013	5/31/2018	0.28	0.27	3.6%	1.36	1.35	0.7%
1126020052	5/31/2018	0.18	0.17	5.7%	1.89	1.82	3.8%
1126020056	5/31/2018	0.29	0.3	3.4%	1.57	1.54	1.9%
1126020074	5/31/2018	0.53	0.53	0.0%	1.14	1.15	0.9%
1126020078	5/31/2018	0.57	0.57	0.0%	0.93	0.93	0.0%
1126020097	5/31/2018	0.47	0.47	0.0%	1.11	1.12	0.9%
1126020119	5/31/2018	0.39	0.38	2.6%	1.12	1.26	11.8%
1126020130	5/31/2018	0.22	0.22	0.0%	1.71	1.7	0.6%
1126020142	5/31/2018	0.8	0.76	5.1%	0.99	0.95	4.1%
1126020168	5/31/2018	0.35	0.36	2.8%	2	1.99	0.5%
1126020195	5/31/2018	0.44	0.43	2.3%	2.17	2.18	0.5%
1125004122	6/1/2018	0.84	0.8	4.9%	0.82	0.78	5.0%
1125005076	6/1/2018	1.24	1.25	0.8%	1.17	1.17	0.0%
1125005087	6/1/2018	0.38	0.38	0.0%	0.84	0.84	0.0%
1125005092	6/1/2018	0.47	0.46	2.2%	0.98	0.96	2.1%
1125005099	6/1/2018	0.16	0.17	6.1%	1.17	1.19	1.7%
1126020145	6/1/2018	0.29	0.28	3.5%	1.09	1.07	1.9%
1126020153	6/1/2018	0.56	0.55	1.8%	1.04	1.02	1.9%
1126026169	6/1/2018	0.29	0.29	0.0%	0.63	0.63	0.0%
1125003054	6/2/2018	0.39	0.38	2.6%	0.25	0.25	0.0%
1125005062	6/2/2018	0.39	0.39	0.0%	0.97	0.97	0.0%
1126026141	6/2/2018	0.28	0.28	0.0%	1.16	1.17	0.9%
1126026172	6/2/2018	0.44	0.43	2.3%	0.92	0.9	2.2%
1126026202	6/2/2018	0.21	0.21	0.0%	0.83	0.84	1.2%
1126026229	6/2/2018	0.33	0.34	3.0%	0.98	0.97	1.0%

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Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1125003021	6/3/2018	0.43	0.43	0.0%	0.54	0.53	1.9%
1126026131	6/3/2018	0.23	0.24	4.3%	1.49	1.51	1.3%
1126026252	6/3/2018	0.19	0.19	0.0%	1.2	1.19	0.8%
1126026282	6/3/2018	0.68	0.68	0.0%	1.07	1.1	2.8%
1127040071	6/3/2018	0.86	0.86	0.0%	1.36	1.35	0.7%
1127040099	6/3/2018	0.08	0.09	11.8%	4.13	4.28	3.6%
1127040111	6/3/2018	0.16	0.16	0.0%	1.36	1.37	0.7%
1125003043	6/4/2018	0.37	0.37	0.0%	0.28	0.29	3.5%
1126026223	6/4/2018	0.09	0.09	0.0%	1.55	1.51	2.6%
1127040048	6/4/2018	0.34	0.35	2.9%	2.71	2.79	2.9%
1127040050	6/4/2018	0.31	0.3	3.3%	2.06	1.99	3.5%
1125004116	6/5/2018	0.54	0.53	1.9%	0.2	0.2	0.0%
1125005050	6/5/2018	0.59	0.58	1.7%	0.43	0.42	2.4%
1127040009	6/5/2018	0.77	0.75	2.6%	1.85	1.75	5.6%
1127040021	6/5/2018	0.3	0.32	6.5%	2.57	2.79	8.2%
1127040095	6/5/2018	0.42	0.42	0.0%	2.04	2.02	1.0%
1125004040	6/6/2018	0.68	0.67	1.5%	0.25	0.25	0.0%
1125004043	6/6/2018	0.6	0.62	3.3%	0.45	0.48	6.5%
1127040032	6/6/2018	0.64	0.62	3.2%	1.55	1.56	0.6%
1127040036	6/6/2018	0.38	0.38	0.0%	2.1	2.08	1.0%
1127040419	6/6/2018	0.32	0.34	6.1%	2.29	2.4	4.7%
1127040425	6/6/2018	1.08	1.11	2.7%	1.87	1.89	1.1%
1125004011	6/7/2018	0.65	0.63	3.1%	0.41	0.4	2.5%
1127040001	6/7/2018	0.05	0.05	0.0%	2.34	2.31	1.3%
1127040003	6/7/2018	0.11	0.11	0.0%	1.41	1.42	0.7%
1127040402	6/7/2018	0.04	0.04	0.0%	2.53	2.63	3.9%
1127040412	6/7/2018	0.13	0.13	0.0%	2.38	2.43	2.1%
1127040469	6/7/2018	0.34	0.32	6.1%	2.19	2.08	5.2%
1125003142	6/9/2018	0.64	0.65	1.6%	0.59	0.59	0.0%
1125003166	6/9/2018	0.46	0.47	2.2%	0.9	0.91	1.1%
1125004048	6/9/2018	0.93	0.92	1.1%	3.37	3.27	3.0%
1125004065	6/9/2018	1.73	1.74	0.6%	2.27	2.29	0.9%
1126028029	6/9/2018	0.38	0.42	10.0%	2.05	2.24	8.9%
1126028052	6/9/2018	0.33	0.33	0.0%	2.39	2.35	1.7%
1126028113	6/9/2018	1.37	1.35	1.5%	1.62	1.61	0.6%
1126028120	6/9/2018	0.81	0.81	0.0%	2.12	2.12	0.0%
1126028405	6/9/2018	0.66	0.67	1.5%	1.99	1.99	0.0%
1126028419	6/9/2018	0.65	0.65	0.0%	2.8	2.77	1.1%
1125003125	6/10/2018	0.37	0.38	2.7%	0.83	0.84	1.2%
1125003130	6/10/2018	0.42	0.4	4.9%	0.25	0.25	0.0%
1125003218	6/10/2018	0.57	0.57	0.0%	0.36	0.36	0.0%
1125003232	6/10/2018	0.61	0.63	3.2%	0.21	0.22	4.7%
1126028102	6/10/2018	1.02	1.03	1.0%	1.62	1.63	0.6%
1126028455	6/10/2018	0.52	0.52	0.0%	2.62	2.62	0.0%
1125003014	6/11/2018	0.54	0.53	1.9%	0.19	0.19	0.0%
1125003033	6/11/2018	0.43	0.43	0.0%	0.26	0.25	3.9%
1126026149	6/11/2018	0.92	0.94	2.2%	1.93	1.96	1.5%
1126027113	6/11/2018	1.28	1.31	2.3%	1.75	1.64	6.5%
1126027134	6/11/2018	0.6	0.58	3.4%	0.82	0.83	1.2%
1126027139	6/11/2018	0.81	0.82	1.2%	0.51	0.54	5.7%
1126027174	6/11/2018	2.42	0.76	104.4%	2.42	2.33	3.8%
4136401040	6/11/2018	0.2	0.19	5.1%	0.73	0.71	2.8%
1125003046	6/12/2018	0.53	0.52	1.9%	0.35	0.35	0.0%
1125003061	6/12/2018	0.39	0.39	0.0%	0.25	0.25	0.0%
1125003086	6/12/2018	0.74	0.74	0.0%	0.29	0.3	3.4%
1125003100	6/12/2018	0.77	0.75	2.6%	0.34	0.34	0.0%
1126026219	6/12/2018	0.91	0.9	1.1%	1.44	1.48	2.7%
1126026258	6/12/2018	0.79	0.75	5.2%	1.31	1.22	7.1%
1126027042	6/12/2018	1.23	1.26	2.4%	1.61	1.63	1.2%
1125007018	6/14/2018	0.55	0.56	1.8%	0.12	0.12	0.0%
1125007040	6/14/2018	0.75	0.73	2.7%	0.29	0.29	0.0%
1125007048	6/14/2018	0.41	0.44	7.1%	1.3	1.35	3.8%
1125007064	6/14/2018	0.05	0.06	18.2%	0.96	0.93	3.2%
1125007086	6/14/2018	0.34	0.33	3.0%	0.77	0.75	2.6%
1126026212	6/14/2018	1.66	1.67	0.6%	1.58	1.53	3.2%
1126026262	6/14/2018	0.97	0.94	3.1%	1.48	1.44	2.7%
1126027013	6/14/2018	0.95	0.94	1.1%	2.22	2.18	1.8%
1126027020	6/14/2018	1.45	1.43	1.4%	2.43	2.42	0.4%
1126027198	6/14/2018	1.39	1.4	0.7%	1.62	1.64	1.2%
1126027221	6/14/2018	0.24	0.25	4.1%	0.74	0.73	1.4%
1126027228	6/14/2018	0.71	0.72	1.4%	1.49	1.49	0.0%
1126027243	6/14/2018	1.08	1.11	2.7%	1.61	1.62	0.6%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1125007092	6/15/2018	0.44	0.43	2.3%	2.13	2.08	2.4%
1125022013	6/15/2018	0.7	0.69	1.4%	0.73	0.73	0.0%
1126026155	6/15/2018	0.75	0.75	0.0%	1.13	1.15	1.8%
1126026156	6/15/2018	0.81	0.84	3.6%	1.7	1.95	13.7%
1126030011	6/15/2018	0.24	0.24	0.0%	1.83	1.8	1.7%
1126030031	6/15/2018	0.34	0.35	2.9%	3.15	3.25	3.1%
1126030075	6/15/2018	0.74	0.75	1.3%	1.58	1.57	0.6%
1125021015	6/16/2018	0.57	0.57	0.0%	0.19	0.16	17.1%
1125021019	6/16/2018	0.36	0.37	2.7%	1.58	1.62	2.5%
1125021034	6/16/2018	0.61	0.6	1.7%	0.36	0.34	5.7%
1125022124	6/16/2018	0.49	0.49	0.0%	0.52	0.5	3.9%
1125022129	6/16/2018	0.66	0.67	1.5%	0.23	0.24	4.3%
1126030058	6/16/2018	0.67	0.66	1.5%	1.33	1.33	0.0%
1126030068	6/16/2018	0.25	0.25	0.0%	1.83	1.86	1.6%
1126030085	6/16/2018	0.28	0.27	3.6%	1.6	1.61	0.6%
1126030133	6/16/2018	0.17	0.17	0.0%	2.32	2.28	1.7%
1125008121	6/17/2018	0.38	0.38	0.0%	0.43	0.41	4.8%
1125021037	6/17/2018	0.56	0.55	1.8%	0.28	0.29	3.5%
1125021116	6/17/2018	0.69	0.68	1.5%	1.03	1.03	0.0%
1125021122	6/17/2018	0.57	0.58	1.7%	0.21	0.22	4.7%
1125021130	6/17/2018	0.65	0.65	0.0%	0.13	0.14	7.4%
1125021164	6/17/2018	0.72	0.71	1.4%	0.41	0.4	2.5%
1126030096	6/17/2018	0.33	0.33	0.0%	1.69	1.66	1.8%
1125008116	6/18/2018	0.36	0.35	2.8%	0.59	0.57	3.4%
1125008150	6/18/2018	0.36	0.36	0.0%	0.8	0.79	1.3%
1125008151	6/18/2018	0.31	0.31	0.0%	0.83	0.8	3.7%
1125021106	6/18/2018	0.62	0.63	1.6%	0.5	0.52	3.9%
1125021109	6/18/2018	0.78	0.76	2.6%	0.22	0.22	0.0%
1126031202	6/18/2018	0.15	0.14	6.9%	2.02	2	1.0%
1126031208	6/18/2018	0.47	0.47	0.0%	2.4	2.41	0.4%
1126031241	6/18/2018	0.2	0.2	0.0%	3.36	3.43	2.1%
1125021179	6/19/2018	0.9	0.94	4.3%	0.2	0.2	0.0%
1126031005	6/19/2018	0.36	0.36	0.0%	3	2.94	2.0%
1126031054	6/19/2018	0.67	0.68	1.5%	2.73	2.78	1.8%
1126031063	6/19/2018	0.21	0.21	0.0%	2.05	2.05	0.0%
1126031182	6/19/2018	0.62	0.61	1.6%	1.92	1.86	3.2%
1126031232	6/19/2018	0.33	0.33	0.0%	1.92	1.9	1.0%
1125008003	6/20/2018	0.82	0.8	2.5%	0.13	0.13	0.0%
1126029076	6/20/2018	0.36	0.36	0.0%	2.51	2.48	1.2%
1126029122	6/20/2018	0.77	0.76	1.3%	2.15	2.08	3.3%
1126029602	6/20/2018	0.6	0.59	1.7%	2.19	2.12	3.2%
1126031029	6/20/2018	0.28	0.27	3.6%	1.99	2.01	1.0%
1126031122	6/20/2018	0.67	0.65	3.0%	1.32	1.31	0.8%
1126031140	6/20/2018	0.21	0.19	10.0%	3.14	3.09	1.6%
1126031145	6/20/2018	0.12	0.13	8.0%	2	2	0.0%
1126031165	6/20/2018	0.36	0.36	0.0%	3.11	3.01	3.3%
1125008109	6/21/2018	0.64	0.66	3.1%	0.23	0.21	9.1%
1126029040	6/21/2018	0.98	0.99	1.0%	2.47	2.41	2.5%
1126029079	6/21/2018	0.61	0.61	0.0%	2.27	2.32	2.2%
1126029113	6/21/2018	0.3	0.31	3.3%	2.36	2.37	0.4%
1126029508	6/21/2018	1.1	1.03	6.6%	2.54	2.44	4.0%
1126029521	6/21/2018	0.9	0.9	0.0%	2.14	2.31	7.6%
1126029524	6/21/2018	0.81	0.78	3.8%	2.5	2.54	1.6%
1126031045	6/21/2018	0.62	0.61	1.6%	2.8	2.73	2.5%
1126031105	6/21/2018	0.24	0.24	0.0%	2.23	2.18	2.3%
1125008143	6/22/2018	0.38	0.36	5.4%	0.41	0.41	0.0%
1125008178	6/22/2018	0.42	0.41	2.4%	0.22	0.19	14.6%
1126029010	6/22/2018	0.91	0.88	3.4%	2.28	2.23	2.2%
1126029015	6/22/2018	0.82	0.82	0.0%	1.79	1.77	1.1%
1126029022	6/22/2018	0.65	0.66	1.5%	2.49	2.52	1.2%
1126029049	6/22/2018	0.79	0.79	0.0%	1.81	1.85	2.2%
1126029086	6/22/2018	1.42	1.36	4.3%	2.08	2.16	3.8%
1126031152	6/22/2018	0.14	0.14	0.0%	4.6	4.52	1.8%
1125008185	6/23/2018	0.32	0.31	3.2%	0.94	0.94	0.0%
1126032096	6/24/2018	0.48	0.47	2.1%	1.79	1.8	0.6%
1126032406	6/24/2018	0.21	0.22	4.7%	1.93	1.96	1.5%
1126032419	6/24/2018	0.64	0.63	1.6%	2.3	2.26	1.8%
1126032434	6/24/2018	0.91	0.92	1.1%	3.01	2.99	0.7%
1126032451	6/24/2018	0.21	0.25	17.4%	1.94	1.92	1.0%
1232001003	6/24/2018	0.56	0.57	1.8%	0.52	0.5	3.9%
1232001014	6/24/2018	0.37	0.4	7.8%	0.8	0.88	9.5%
1232001022	6/24/2018	0.71	0.72	1.4%	0.46	0.47	2.2%
1232001060	6/24/2018	0.32	0.31	3.2%	1.13	1.13	0.0%
1232001079	6/24/2018	0.51	0.51	0.0%	1.37	1.4	2.2%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1232001124	6/24/2018	0.32	0.34	6.1%	0.9	0.91	1.1%
1232001157	6/24/2018	0.53	0.53	0.0%	0.63	0.65	3.1%
1232002016	6/24/2018	0.12	0.12	0.0%	2.44	2.37	2.9%
1232002028	6/24/2018	0.12	0.12	0.0%	2.39	2.33	2.5%
1232001071	6/25/2018	0.56	0.56	0.0%	0.44	0.43	2.3%
1125019031	6/26/2018	0.45	0.44	2.2%	0.62	0.63	1.6%
1125019059	6/26/2018	0.51	0.51	0.0%	0.82	0.8	2.5%
1125019081	6/26/2018	0.33	0.34	3.0%	1.25	1.26	0.8%
1125019415	6/26/2018	0.72	0.74	2.7%	0.78	0.79	1.3%
1125019431	6/26/2018	0.32	0.32	0.0%	0.29	0.3	3.4%
1126032008	6/26/2018	0.23	0.24	4.3%	1.94	1.92	1.0%
1126032028	6/26/2018	0.51	0.51	0.0%	1.95	1.94	0.5%
1126032047	6/26/2018	0.62	0.65	4.7%	1.66	1.76	5.8%
1126032050	6/26/2018	0.71	0.73	2.8%	2	2.06	3.0%
1126032067	6/26/2018	0.29	0.28	3.5%	1.55	1.64	5.6%
1126032070	6/26/2018	0.21	0.22	4.7%	1.53	1.54	0.7%
1126032429	6/26/2018	0.92	0.9	2.2%	1.68	1.74	3.5%
1126033055	6/26/2018	1	1	0.0%	1.48	1.49	0.7%
1126033510	6/26/2018	0.09	0.09	0.0%	2.67	2.68	0.4%
1126033518	6/26/2018	0.07	0.07	0.0%	2.25	2.15	4.5%
1126033532	6/26/2018	0.22	0.22	0.0%	2.07	2.06	0.5%
1232002021	6/26/2018	0.09	0.09	0.0%	2.63	2.62	0.4%
1125019024	6/27/2018	0.86	0.87	1.2%	0.38	0.38	0.0%
1125019029	6/27/2018	0.56	0.55	1.8%	0.17	0.16	6.1%
1125019072	6/27/2018	0.41	0.42	2.4%	0.22	0.22	0.0%
1125020010	6/27/2018	0.51	0.51	0.0%	1.56	1.54	1.3%
1125020112	6/27/2018	0.65	0.65	0.0%	2.7	2.7	0.0%
1126033009	6/28/2018	0.32	0.32	0.0%	2.5	2.49	0.4%
1126033013	6/28/2018	0.07	0.07	0.0%	1.87	1.84	1.6%
1126033035	6/28/2018	0.61	0.6	1.7%	2.06	2.03	1.5%
1126033060	6/28/2018	0.77	0.78	1.3%	1.68	1.65	1.8%
1125019054	6/29/2018	0.7	0.7	0.0%	0.48	0.48	0.0%
1125019110	6/29/2018	0.55	0.55	0.0%	0.8	0.8	0.0%
1125020108	6/29/2018	0.45	0.45	0.0%	1.46	1.47	0.7%
1126033067	6/29/2018	0.4	0.38	5.1%	1.83	1.87	2.2%
1126033090	6/29/2018	0.69	0.69	0.0%	1.89	1.84	2.7%
1126033107	6/29/2018	0.3	0.29	3.4%	1.78	1.69	5.2%
1125019116	6/30/2018	0.6	0.6	0.0%	0.69	0.7	1.4%
1125019169	6/30/2018	0.32	0.32	0.0%	0.52	0.5	3.9%
1125020118	6/30/2018	0.47	0.5	6.2%	0.8	0.8	0.0%
1125020127	6/30/2018	0.52	0.52	0.0%	0.64	0.63	1.6%
1125020170	6/30/2018	0.78	0.78	0.0%	2.01	2.03	1.0%
1125020176	6/30/2018	0.51	0.51	0.0%	0.79	0.8	1.3%
1125020195	6/30/2018	0.69	0.7	1.4%	1.22	1.21	0.8%
1232002101	6/30/2018	0.15	0.15	0.0%	2.58	2.55	1.2%
1232002478	6/30/2018	0.25	0.22	12.8%	2.1	1.99	5.4%
1232002479	6/30/2018	0.28	0.27	3.6%	2.59	2.43	6.4%
1125009010	7/1/2018	0.41	0.42	2.4%	1.81	1.9	4.9%
1125009040	7/1/2018	0.51	0.53	3.8%	1.26	1.3	3.1%
1125020215	7/1/2018	0.76	0.76	0.0%	1.16	1.17	0.9%
1125023009	7/1/2018	1.72	1.71	0.6%	1.38	1.39	0.7%
1125009004	7/3/2018	0.83	0.81	2.4%	1.95	1.83	6.3%
1125009227	7/3/2018	0.14	0.14	0.0%	1.11	1.05	5.6%
1125009275	7/3/2018	0.42	0.4	4.9%	1.95	1.87	4.2%
1125009292	7/3/2018	0.98	0.96	2.1%	2.54	2.48	2.4%
1125009297	7/3/2018	0.54	0.53	1.9%	3.22	3.17	1.6%
1125009307	7/3/2018	0.31	0.31	0.0%	2.33	2.35	0.9%
1125020025	7/3/2018	7.86	0.8	163.0%	1.37	1.41	2.9%
1125020177	7/3/2018	0.5	0.5	0.0%	0.58	0.57	1.7%
1125020202	7/3/2018	0.54	0.53	1.9%	0.8	0.76	5.1%
1125023023	7/3/2018	0.61	0.66	7.9%	0.18	0.19	5.4%
1125023034	7/3/2018	0.84	0.83	1.2%	2.2	2.17	1.4%
1125023111	7/3/2018	0.94	0.95	1.1%	2.66	2.72	2.2%
1125023154	7/3/2018	1.2	1.22	1.7%	2.68	2.73	1.8%
1125023190	7/3/2018	1.25	1.24	0.8%	3.03	3.03	0.0%
1125023197	7/3/2018	0.56	0.56	0.0%	1.06	1.04	1.9%
1125009320	7/4/2018	0.73	0.74	1.4%	2.63	2.7	2.6%
1125009332	7/4/2018	1.02	1.03	1.0%	1.66	1.63	1.8%
1125009347	7/4/2018	0.4	0.4	0.0%	3.44	3.34	2.9%
1125009370	7/4/2018	1.04	1.05	1.0%	2.39	2.34	2.1%
1125023123	7/4/2018	1.25	1.22	2.4%	0.34	0.33	3.0%
1125010193	7/5/2018	0.57	0.6	5.1%	1.58	1.58	0.0%
1125023212	7/5/2018	0.81	0.82	1.2%	1.46	1.54	5.3%
1125009383	7/8/2018	1.38	1.37	0.7%	2.1	2.06	1.9%

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Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1125009390	7/8/2018	1.15	1.16	0.9%	2.59	2.57	0.8%
1125010009	7/8/2018	1.3	1.25	3.9%	1.59	1.55	2.5%
1125010014	7/8/2018	0.85	0.84	1.2%	2.38	2.34	1.7%
1125010024	7/8/2018	1.08	1.1	1.8%	1.76	1.8	2.2%
1125010105	7/8/2018	0.98	1.01	3.0%	1.84	1.93	4.8%
1125010128	7/8/2018	1.12	1.11	0.9%	1.6	1.58	1.3%
1125010139	7/8/2018	1.01	1	1.0%	2.07	2.06	0.5%
1125010150	7/8/2018	0.77	0.77	0.0%	1.49	1.47	1.4%
1125010170	7/8/2018	1.07	1.07	0.0%	2.03	2.07	2.0%
1125010175	7/8/2018	1.28	1.22	4.8%	1.85	1.75	5.6%
1125010217	7/8/2018	1.06	1.04	1.9%	1.85	1.86	0.5%
1125016003	7/8/2018	0.46	0.46	0.0%	2.56	2.48	3.2%
1125016019	7/8/2018	0.38	0.38	0.0%	1.65	1.63	1.2%
1125016040	7/8/2018	0.38	0.38	0.0%	0.77	0.76	1.3%
1125016051	7/8/2018	0.71	0.7	1.4%	0.65	0.63	3.1%
1125016057	7/8/2018	0.81	0.81	0.0%	2.21	2.24	1.3%
1125016071	7/8/2018	0.34	0.34	0.0%	0.79	0.79	0.0%
1125016084	7/8/2018	0.6	0.59	1.7%	1.19	1.21	1.7%
1125016092	7/8/2018	0.69	0.66	4.4%	1.93	1.88	2.6%
1125016095	7/8/2018	0.44	0.44	0.0%	1.42	1.44	1.4%
1125016111	7/8/2018	0.19	0.19	0.0%	1.34	1.3	3.0%
1125012024	7/9/2018	0.51	0.52	1.9%	1.45	1.48	2.0%
1125016167	7/9/2018	0.19	0.17	11.1%	1.26	1.22	3.2%
1125016188	7/9/2018	0.23	0.24	4.3%	1.77	1.81	2.2%
1125016205	7/9/2018	0.37	0.37	0.0%	1.32	1.32	0.0%
1125016212	7/9/2018	0.12	0.13	8.0%	1.05	1.06	0.9%
1125016218	7/9/2018	0.47	0.48	2.1%	1.48	1.51	2.0%
1125015017	7/10/2018	1.42	1.42	0.0%	1.59	1.58	0.6%
1125015054	7/10/2018	1.31	1.15	13.0%	2.51	2.65	5.4%
1125015074	7/10/2018	0.76	0.79	3.9%	2.19	2.29	4.5%
1125015096	7/10/2018	0.12	0.12	0.0%	2.58	2.59	0.4%
1125015119	7/10/2018	0.1	0.1	0.0%	1.86	1.83	1.6%
1125015125	7/10/2018	1.03	0.98	5.0%	1.66	1.78	7.0%
1125015158	7/10/2018	0.1	0.09	10.5%	2.1	2.37	12.1%
1125015163	7/10/2018	0.06	0.06	0.0%	5.49	5.57	1.4%
1125015186	7/10/2018	0.07	0.07	0.0%	1.46	1.39	4.9%
1125012003	7/11/2018	0.45	0.45	0.0%	0.91	0.87	4.5%
1125012018	7/11/2018	0.67	0.67	0.0%	1.07	1.05	1.9%
1125012049	7/11/2018	0.25	0.29	14.8%	1.42	1.53	7.5%
1125012058	7/11/2018	0.23	0.23	0.0%	1.51	1.49	1.3%
1125012059	7/11/2018	0.26	0.26	0.0%	1.59	1.61	1.3%
1125012064	7/11/2018	0.59	0.64	8.1%	1.36	1.36	0.0%
1125012069	7/11/2018	0.63	0.64	1.6%	1.24	1.11	11.1%
1125012121	7/11/2018	0.48	0.48	0.0%	0.92	0.93	1.1%
1125012129	7/11/2018	0.51	0.52	1.9%	1.11	1.09	1.8%
1125012142	7/11/2018	0.26	0.27	3.8%	1.08	1.18	8.8%
1125012160	7/11/2018	0.77	0.75	2.6%	1.65	1.69	2.4%
1125012178	7/11/2018	0.29	0.3	3.4%	2.51	2.49	0.8%
1125012190	7/11/2018	1.03	1	3.0%	1.3	1.29	0.8%
1125012205	7/11/2018	0.84	0.85	1.2%	1.8	1.77	1.7%
1125012223	7/11/2018	1.22	1.17	4.2%	1.08	1.12	3.6%
1125015050	7/11/2018	0.24	0.23	4.3%	4.08	3.97	2.7%
1232002481	7/11/2018	0.31	0.32	3.2%	1.79	1.8	0.6%
1125015405	7/12/2018	1.01	0.97	4.0%	1.92	1.84	4.3%
1125015420	7/12/2018	0.53	0.52	1.9%	1.97	1.96	0.5%
1125024080	7/13/2018	0.58	0.59	1.7%	2.02	2	1.0%
1125024083	7/13/2018	0.62	0.6	3.3%	2.32	2.22	4.4%
1125024017	7/14/2018	0.25	0.25	0.0%	1.77	1.8	1.7%
1125024039	7/14/2018	0.72	0.73	1.4%	2.43	2.43	0.0%
1125024055	7/14/2018	0.15	0.16	6.5%	1.9	1.99	4.6%
1125024076	7/14/2018	0.4	0.38	5.1%	1.59	1.54	3.2%
1125024098	7/14/2018	0.4	0.39	2.5%	1.53	1.52	0.7%
1125024162	7/14/2018	0.5	0.5	0.0%	2.41	2.46	2.1%
1125024173	7/14/2018	0.46	0.47	2.2%	1.52	1.49	2.0%
1125024180	7/14/2018	0.31	0.31	0.0%	3.26	3.21	1.5%
1125024194	7/14/2018	0.45	0.45	0.0%	2.06	2.06	0.0%
1125110566	7/14/2018	0.39	0.39	0.0%	1.98	1.94	2.0%
1125011141	7/15/2018	0.74	0.74	0.0%	1	0.97	3.0%
1125017222	7/15/2018	1.22	1.22	0.0%	1.84	1.83	0.5%
1125024031	7/15/2018	0.73	0.71	2.8%	1.66	1.6	3.7%
1125024034	7/15/2018	0.29	0.29	0.0%	2.19	2.21	0.9%
1125024112	7/15/2018	0.16	0.16	0.0%	2.19	2.17	0.9%
1125024130	7/15/2018	0.46	0.47	2.2%	1.82	1.84	1.1%
1125024167	7/15/2018	0.81	0.8	1.2%	2.11	2.09	1.0%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1125011011	7/16/2018	0.33	0.32	3.1%	2.83	2.82	0.4%
1125011017	7/16/2018	0.79	0.81	2.5%	0.83	0.8	3.7%
1125011028	7/16/2018	0.46	0.47	2.2%	1.32	1.32	0.0%
1125011045	7/16/2018	0.89	0.89	0.0%	1.02	1.03	1.0%
1125011079	7/16/2018	0.54	0.54	0.0%	0.63	0.65	3.1%
1125017171	7/16/2018	0.41	0.39	5.0%	2.16	2.06	4.7%
1125017200	7/16/2018	0.79	0.81	2.5%	1.89	1.95	3.1%
1125017211	7/16/2018	0.65	0.65	0.0%	2.64	2.6	1.5%
1125017220	7/16/2018	1.37	1.39	1.4%	1.79	1.82	1.7%
1125017249	7/16/2018	1.23	1.22	0.8%	2.12	2.1	0.9%
1125011083	7/17/2018	0.79	0.78	1.3%	0.81	0.76	6.4%
1125011145	7/17/2018	0.4	0.4	0.0%	1.52	1.52	0.0%
1125017020	7/17/2018	0.85	0.84	1.2%	2.48	2.49	0.4%
1125017143	7/17/2018	0.98	1	2.0%	2.27	2.28	0.4%
1125017160	7/17/2018	0.36	0.37	2.7%	2.03	1.96	3.5%
1125017188	7/17/2018	0.7	0.7	0.0%	2.62	2.48	5.5%
1125011070	7/18/2018	0.26	0.28	7.4%	2.75	2.82	2.5%
1125011095	7/18/2018	1.1	1.08	1.8%	2.07	2.12	2.4%
1125011122	7/18/2018	0.61	0.61	0.0%	2.39	2.45	2.5%
1125011130	7/18/2018	0.59	0.59	0.0%	3.19	3.25	1.9%
1125011170	7/18/2018	0.98	0.99	1.0%	1.48	1.52	2.7%
1125017108	7/18/2018	0.31	0.31	0.0%	1.94	1.93	0.5%
1125017125	7/18/2018	0.96	1	4.1%	2.23	2.35	5.2%
1125018202	7/18/2018	1.43	1.44	0.7%	1.58	1.61	1.9%
1125018208	7/18/2018	1.08	1.08	0.0%	1.94	1.99	2.5%
1125018250	7/18/2018	0.95	0.96	1.0%	2.02	2.07	2.4%
1125018271	7/18/2018	1.17	1.19	1.7%	1.79	1.8	0.6%
1125018227	7/19/2018	1.14	1.17	2.6%	1.96	2.03	3.5%
1125018286	7/19/2018	0.89	0.88	1.1%	2.09	2.05	1.9%
1125018296	7/19/2018	0.99	0.9	9.5%	2.27	2.01	12.1%
1125018313	7/19/2018	1.32	1.34	1.5%	1.97	2.01	2.0%
1125018339	7/19/2018	1.39	1.35	2.9%	1.99	2	0.5%
1125025016	7/20/2018	0.02	0.02	0.0%	1.24	1.25	0.8%
1125025041	7/20/2018	0.55	0.55	0.0%	1.93	1.95	1.0%
1125025067	7/20/2018	0.14	0.17	19.4%	2.27	2.25	0.9%
1125025079	7/20/2018	0.48	0.48	0.0%	2.49	2.79	11.4%
1125026108	7/20/2018	0.26	0.26	0.0%	2.37	2.4	1.3%
1125027025	7/20/2018	0.28	0.28	0.0%	1.41	1.43	1.4%
1125027047	7/20/2018	0.34	0.38	11.1%	1.76	1.73	1.7%
1125025008	7/22/2018	0.83	0.82	1.2%	1.96	1.94	1.0%
1125025015	7/22/2018	0.49	0.5	2.0%	1.7	1.74	2.3%
1125025073	7/22/2018	0.64	0.63	1.6%	2.57	2.52	2.0%
1125025087	7/22/2018	0.11	0.11	0.0%	0.2	0.2	0.0%
1125025128	7/22/2018	0.91	0.91	0.0%	2.21	2.19	0.9%
1125025140	7/22/2018	0.65	0.64	1.6%	1.86	1.84	1.1%
1125025147	7/22/2018	0.84	0.9	6.9%	1.84	1.82	1.1%
1125025155	7/22/2018	0.76	0.77	1.3%	1.76	1.72	2.3%
1125025162	7/22/2018	0.85	0.88	3.5%	1.75	1.84	5.0%
1125027002	7/22/2018	0.95	0.98	3.1%	1.4	1.54	9.5%
1125027003	7/22/2018	0.86	0.88	2.3%	1.93	1.95	1.0%
1125027078	7/22/2018	0.42	0.42	0.0%	1.92	1.84	4.3%
1125027143	7/22/2018	0.26	0.25	3.9%	1.87	1.82	2.7%
1125027178	7/22/2018	0.16	0.16	0.0%	1.91	1.96	2.6%
1125027198	7/22/2018	0.33	0.3	9.5%	2.32	2.27	2.2%
1125025167	7/23/2018	1	1.02	2.0%	1.73	1.69	2.3%
1125025180	7/23/2018	0.79	0.78	1.3%	1.79	1.76	1.7%
1125025199	7/23/2018	0.65	0.67	3.0%	1.73	1.75	1.1%
1125026002	7/23/2018	0.83	0.83	0.0%	1.05	1.08	2.8%
1125026039	7/23/2018	0.22	0.21	4.7%	1.64	1.66	1.2%
1125026054	7/23/2018	0.24	0.23	4.3%	1.75	1.68	4.1%
1125027119	7/23/2018	0.27	0.28	3.6%	1.92	1.87	2.6%
1232002143	7/23/2018	0.14	0.15	6.9%	1.78	1.74	2.3%
1232002472	7/23/2018	0.21	0.21	0.0%	2.29	2.3	0.4%
1125025416	7/24/2018	0.71	0.69	2.9%	1.95	1.9	2.6%
1125026059	7/24/2018	0.36	0.36	0.0%	2	2	0.0%
1125026070	7/24/2018	0.25	0.25	0.0%	2.83	2.75	2.9%
1125026083	7/24/2018	0.23	0.24	4.3%	2.56	2.68	4.6%
1125027415	7/24/2018	0.3	0.3	0.0%	1.87	1.85	1.1%
1125027427	7/24/2018	0.38	0.38	0.0%	1.83	1.8	1.7%
1125026090	7/25/2018	0.24	0.23	4.3%	2.32	2.42	4.2%
1125026099	7/25/2018	0.27	0.26	3.8%	2.2	2.19	0.5%
1125026109	7/25/2018	0.26	0.25	3.9%	2.26	2.18	3.6%
1125026127	7/25/2018	0.31	0.32	3.2%	2.2	2.2	0.0%
1125026120	7/26/2018	0.31	0.32	3.2%	1.91	1.99	4.1%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1125026135	7/26/2018	0.39	0.38	2.6%	1.73	1.72	0.6%
1125027100	7/26/2018	0.41	0.41	0.0%	1.94	1.91	1.6%
1125027207	7/26/2018	0.34	0.34	0.0%	1.83	1.88	2.7%
1125027403	7/26/2018	0.58	0.55	5.3%	2.34	2.21	5.7%
1232002202	7/26/2018	0.27	0.29	7.1%	2.05	2.19	6.6%
1124001275	7/27/2018	0.73	0.7	4.2%	1.2	1.14	5.1%
1125027205	7/27/2018	0.34	0.35	2.9%	1.63	1.66	1.8%
1125027224	7/27/2018	0.6	0.61	1.7%	1.73	1.67	3.5%
1125027233	7/27/2018	0.63	0.64	1.6%	1.67	1.69	1.2%
1125028037	7/27/2018	0.12	0.12	0.0%	2.02	2.13	5.3%
1125028508	7/27/2018	0.12	0.12	0.0%	1.88	1.88	0.0%
1124001235	7/28/2018	0.79	0.79	0.0%	2.02	2.01	0.5%
1124001254	7/28/2018	0.45	0.44	2.2%	1.58	1.57	0.6%
1125028027	7/28/2018	0.13	0.14	7.4%	2	2.11	5.4%
1232002529	7/28/2018	0.1	0.1	0.0%	2.57	2.66	3.4%
1124001191	7/29/2018	0.97	0.99	2.0%	2.15	2.18	1.4%
1124001202	7/29/2018	0.74	0.74	0.0%	2.09	2.09	0.0%
1124001220	7/29/2018	0.52	0.53	1.9%	2.07	2.13	2.9%
1125027225	7/29/2018	0.65	0.65	0.0%	1.79	1.8	0.6%
1125028039	7/29/2018	0.41	0.4	2.5%	1.53	1.55	1.3%
1125028059	7/29/2018	0.15	0.14	6.9%	1.98	1.98	0.0%
1125028062	7/29/2018	0.32	0.31	3.2%	3.02	2.9	4.1%
1125028148	7/29/2018	0.29	0.28	3.5%	2.13	2.13	0.0%
1125028165	7/29/2018	0.44	0.43	2.3%	1.98	1.93	2.6%
1125028171	7/29/2018	0.09	0.09	0.0%	1.6	1.61	0.6%
1125028530	7/29/2018	0.59	0.59	0.0%	2.46	2.41	2.1%
1125014179	7/30/2018	0.3	0.28	6.9%	1.82	1.73	5.1%
1125028073	7/30/2018	0.67	0.69	2.9%	2.08	2.19	5.2%
1125028112	7/30/2018	0.15	0.16	6.5%	1.28	1.3	1.6%
1125028117	7/30/2018	0.13	0.13	0.0%	1.5	1.53	2.0%
1125028130	7/30/2018	0.19	0.17	11.1%	2.62	2.59	1.2%
1124001159	7/31/2018	1	1.01	1.0%	1.81	1.83	1.1%
1124001175	7/31/2018	0.94	0.96	2.1%	1.68	1.7	1.2%
1124001176	7/31/2018	0.85	0.84	1.2%	1.95	1.95	0.0%
1125014018	7/31/2018	0.58	0.58	0.0%	0.09	0.09	0.0%
1125029008	7/31/2018	1.04	1.13	8.3%	1.95	2.12	8.4%
1125029023	7/31/2018	0.54	0.54	0.0%	1.95	1.96	0.5%
1125029162	7/31/2018	0.43	0.44	2.3%	1.79	1.86	3.8%
1124002058	8/1/2018	0.59	0.6	1.7%	0.83	0.82	1.2%
1125014105	8/1/2018	0.67	0.66	1.5%	0.55	0.54	1.8%
1125014171	8/1/2018	0.56	0.61	8.5%	0.95	1.03	8.1%
1125029105	8/1/2018	1.35	1.35	0.0%	1.96	1.94	1.0%
1125029169	8/1/2018	1.14	1.19	4.3%	1.33	1.39	4.4%
1232002613	8/1/2018	0.15	0.13	14.3%	2.93	2.75	6.3%
1.232E+10	8/1/2018	0.04	0.04	0.0%	2.76	2.6	6.0%
1124002047	8/2/2018	0.54	0.54	0.0%	1.25	1.24	0.8%
1124002073	8/2/2018	0.72	0.69	4.3%	0.87	0.83	4.7%
1125014132	8/2/2018	1.03	1.01	2.0%	0.43	0.43	0.0%
1125029107	8/2/2018	1.66	1.67	0.6%	4.26	4.29	0.7%
1125029125	8/2/2018	0.95	0.98	3.1%	1.52	1.52	0.0%
1125029148	8/2/2018	0.42	0.42	0.0%	2.06	2.08	1.0%
1124002017	8/3/2018	0.43	0.42	2.4%	0.98	0.96	2.1%
1125014148	8/3/2018	0.44	0.41	7.1%	1.12	1.05	6.5%
1124002035	8/4/2018	0.47	0.45	4.3%	0.7	0.64	9.0%
1125014129	8/4/2018	0.9	0.9	0.0%	0.46	0.45	2.2%
1125014163	8/4/2018	0.42	0.41	2.4%	0.86	0.83	3.6%
1125014198	8/4/2018	0.86	0.86	0.0%	0.56	0.5	11.3%
1124001005	8/5/2018	1.05	1.05	0.0%	2.67	2.65	0.8%
1124001020	8/5/2018	1.06	1.07	0.9%	2.65	2.63	0.8%
1124001130	8/5/2018	1.13	1.16	2.6%	2.13	2.08	2.4%
1124001141	8/5/2018	1.07	1.06	0.9%	1.98	1.96	1.0%
1124001110	8/6/2018	0.98	0.97	1.0%	2.7	2.6	3.8%
1124001112	8/6/2018	0.9	0.9	0.0%	2.11	2.1	0.5%
1124003007	8/7/2018	0.75	0.72	4.1%	3.67	3.5	4.7%
1124003065	8/7/2018	0.76	0.73	4.0%	2.61	2.56	1.9%
1124003071	8/7/2018	1.14	1.17	2.6%	2.45	2.55	4.0%
1124003101	8/7/2018	1.07	1.07	0.0%	2.21	2.18	1.4%
1124003116	8/7/2018	1.2	1.2	0.0%	2.03	2.01	1.0%
1124003151	8/7/2018	1.01	1.02	1.0%	2.34	2.36	0.9%
1124004006	8/7/2018	0.68	0.65	4.5%	1.73	1.68	2.9%
1124004025	8/7/2018	0.72	0.72	0.0%	2.2	2.14	2.8%
1124004034	8/7/2018	0.99	0.99	0.0%	2.23	2.27	1.8%
1124004037	8/7/2018	0.96	0.98	2.1%	2.16	2.21	2.3%
1124004061	8/7/2018	0.34	0.34	0.0%	2.02	2.03	0.5%

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Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1124004084	8/7/2018	0.76	0.76	0.0%	2.04	2.03	0.5%
1124004108	8/7/2018	0.77	0.78	1.3%	1.6	1.48	7.8%
1124004120	8/7/2018	0.05	0.05	0.0%	2.1	2.07	1.4%
1124004131	8/7/2018	0.47	0.48	2.1%	2.14	2.22	3.7%
1124004163	8/7/2018	0.74	0.74	0.0%	2.13	2.13	0.0%
2138017070	8/7/2018	0.17	0.18	5.7%	0.21	0.21	0.0%
2138017086	8/7/2018	0.38	0.35	8.2%	0.02	0.02	0.0%
2138017120	8/7/2018	0.26	0.26	0.0%	0.23	0.23	0.0%
1124003021	8/8/2018	1.21	1.2	0.8%	1.77	1.76	0.6%
1124003064	8/8/2018	0.54	0.55	1.8%	2.03	1.95	4.0%
1124003095	8/8/2018	0.39	0.36	8.0%	1.75	1.6	9.0%
1124003161	8/8/2018	0.84	0.83	1.2%	1.46	1.54	5.3%
1124007074	8/8/2018	0.78	0.78	0.0%	0.91	0.89	2.2%
1124003025	8/9/2018	1.13	1.13	0.0%	1.87	1.84	1.6%
1124003109	8/9/2018	1.16	1.12	3.5%	2.19	2.14	2.3%
1124007079	8/9/2018	0.35	0.35	0.0%	0.41	0.4	2.5%
1124003046	8/10/2018	0.87	0.88	1.1%	1.9	1.98	4.1%
1124003308	8/10/2018	0.72	0.73	1.4%	2.29	2.38	3.9%
1124006005	8/10/2018	0.43	0.47	8.9%	0.5	0.5	0.0%
1124007058	8/10/2018	0.44	0.4	9.5%	0.37	0.35	5.6%
1124007085	8/10/2018	0.45	0.44	2.2%	0.5	0.51	2.0%
2138017040	8/10/2018	0.25	0.25	0.0%	0.49	0.49	0.0%
2138017052	8/10/2018	0.51	0.52	1.9%	0.2	0.2	0.0%
2138017056	8/10/2018	0.3	0.3	0.0%	0.07	0.08	13.3%
2138017105	8/10/2018	0.3	0.3	0.0%	0.13	0.14	7.4%
1124003319	8/11/2018	0.7	0.72	2.8%	1.49	1.61	7.7%
1124007083	8/11/2018	0.47	0.5	6.2%	0.25	0.26	3.9%
2138017208	8/11/2018	0.25	0.26	3.9%	0.21	0.22	4.7%
1124005005	8/12/2018	1.02	1.03	1.0%	1.8	1.86	3.3%
1124005020	8/12/2018	0.82	0.82	0.0%	1.68	1.7	1.2%
1124007021	8/12/2018	0.59	0.58	1.7%	0.69	0.7	1.4%
1124007048	8/12/2018	0.42	0.43	2.4%	0.87	0.88	1.1%
1124007052	8/12/2018	0.44	0.45	2.2%	0.67	0.69	2.9%
1124005047	8/13/2018	0.88	0.88	0.0%	2.05	2.05	0.0%
1124005069	8/13/2018	0.79	0.8	1.3%	2.32	2.32	0.0%
1124005216	8/13/2018	0.98	1.03	5.0%	1.87	1.93	3.2%
1124006028	8/13/2018	0.38	0.38	0.0%	0.62	0.62	0.0%
1124007026	8/13/2018	0.49	0.48	2.1%	0.32	0.32	0.0%
1124005212	8/14/2018	1.15	1.15	0.0%	1.82	1.84	1.1%
1124005907	8/14/2018	0.96	0.97	1.0%	2.24	2.27	1.3%
1124006040	8/14/2018	0.42	0.43	2.4%	0.47	0.49	4.2%
1124006044	8/14/2018	0.53	0.55	3.7%	0.44	0.45	2.2%
2137009040	8/14/2018	0.22	0.22	0.0%	0.72	0.76	5.4%
1124005103	8/15/2018	0.75	0.76	1.3%	2.17	2.18	0.5%
1124005109	8/15/2018	0.47	0.47	0.0%	1.99	2.02	1.5%
1124005174	8/15/2018	1	1	0.0%	2.09	2.12	1.4%
1124005192	8/15/2018	0.5	0.5	0.0%	1.93	1.98	2.6%
1124007004	8/15/2018	0.61	0.62	1.6%	0.24	0.27	11.8%
1124005127	8/16/2018	0.91	0.92	1.1%	1.91	1.94	1.6%
1124005148	8/16/2018	0.89	0.87	2.3%	2.6	2.53	2.7%
1124005164	8/17/2018	0.77	0.79	2.6%	1.77	1.81	2.2%
1124016021	8/17/2018	1.37	1.43	4.3%	2.16	2.24	3.6%
1124016037	8/17/2018	0.63	0.62	1.6%	1.76	1.7	3.5%
2137009014	8/17/2018	0.49	0.51	4.0%	0.23	0.25	8.3%
2137009032	8/17/2018	0.26	0.25	3.9%	0.05	0.05	0.0%
2137009092	8/17/2018	0.26	0.26	0.0%	0.06	0.06	0.0%
2137009104	8/17/2018	0.62	0.63	1.6%	0.13	0.13	0.0%
1124016044	8/18/2018	0.49	0.5	2.0%	2.3	2.32	0.9%
1124016076	8/18/2018	1.54	1.48	4.0%	1.49	1.42	4.8%
1124010002	8/19/2018	0.6	0.59	1.7%	0.27	0.26	3.8%
1124016098	8/19/2018	0.57	0.58	1.7%	4.73	4.82	1.9%
1124016100	8/19/2018	1.21	1.2	0.8%	2.1	2.06	1.9%
1124016104	8/19/2018	0.68	0.69	1.5%	2.11	2.1	0.5%
1124016121	8/19/2018	0.52	0.52	0.0%	1.01	1.01	0.0%
2137009048	8/19/2018	0.22	0.22	0.0%	0.27	0.28	3.6%
1124010003	8/20/2018	0.79	0.77	2.6%	0.52	0.5	3.9%
1124010015	8/20/2018	0.33	0.34	3.0%	0.93	0.93	0.0%
1124010043	8/20/2018	0.71	0.7	1.4%	0.21	0.21	0.0%
1124010071	8/20/2018	0.43	0.42	2.4%	0.19	0.18	5.4%
1232002502	8/20/2018	0.17	0.17	0.0%	2.3	2.4	4.3%
1232002867	8/20/2018	0.15	0.15	0.0%	2.58	2.51	2.8%
1232002901	8/20/2018	0.19	0.19	0.0%	1.05	1.06	0.9%
2138018124	8/20/2018	0.25	0.25	0.0%	0.13	0.14	7.4%
1.232E+10	8/20/2018	0.22	0.22	0.0%	2.81	2.82	0.4%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1124010039	8/21/2018	0.63	0.64	1.6%	0.96	0.99	3.1%
1124010089	8/21/2018	0.56	0.56	0.0%	0.25	0.26	3.9%
1124010077	8/22/2018	0.45	0.47	4.3%	1.12	1.14	1.8%
1124014036	8/22/2018	0.74	0.76	2.7%	0.89	0.82	8.2%
1124014075	8/22/2018	0.48	0.46	4.3%	0.61	0.6	1.7%
2138018030	8/22/2018	0.22	0.18	20.0%	0.04	0.04	0.0%
2138018074	8/22/2018	0.29	0.3	3.4%	0.01	0.01	0.0%
1124014026	8/23/2018	0.5	0.53	5.8%	0.85	0.85	0.0%
1124014054	8/23/2018	0.57	0.61	6.8%	0.46	0.47	2.2%
1124014062	8/23/2018	0.93	0.94	1.1%	1.92	2	4.1%
1124014098	8/23/2018	0.67	0.7	4.4%	0.71	0.72	1.4%
2138018080	8/23/2018	0.1	0.09	10.5%	0.11	0.11	0.0%
1124014006	8/24/2018	0.95	0.92	3.2%	0.41	0.37	10.3%
1124014030	8/24/2018	0.83	0.83	0.0%	0.36	0.35	2.8%
1124014043	8/24/2018	1.05	1.07	1.9%	0.69	0.71	2.9%
1124014080	8/24/2018	0.75	0.75	0.0%	0.38	0.39	2.6%
1124014108	8/24/2018	0.86	0.87	1.2%	1.15	1.14	0.9%
1124017089	8/24/2018	0.19	0.19	0.0%	3.09	3.17	2.6%
1124017023	8/26/2018	0.17	0.16	6.1%	0.85	0.86	1.2%
1124017049	8/26/2018	0.75	0.74	1.3%	0.79	0.86	8.5%
1124017113	8/26/2018	0.28	0.28	0.0%	1.86	1.88	1.1%
1124017116	8/26/2018	0.13	0.13	0.0%	1.44	1.42	1.4%
1124020006	8/26/2018	1.02	1.02	0.0%	1.62	1.62	0.0%
1124020046	8/26/2018	0.1	0.12	18.2%	1.82	1.82	0.0%
1232002726	8/26/2018	0.09	0.1	10.5%	1.98	1.66	17.6%
1232002770	8/26/2018	0.04	0.04	0.0%	2.05	1.92	6.5%
1232002789	8/26/2018	0.15	0.14	6.9%	2.41	2.4	0.4%
2137010056	8/26/2018	0.34	0.35	2.9%	0.11	0.11	0.0%
2137010098	8/26/2018	0.52	0.51	1.9%	0.01	0.005	66.7%
2137010122	8/26/2018	0.52	0.5	3.9%	0.04	0.04	0.0%
2138019214	8/26/2018	0.24	0.26	8.0%	0.14	0.14	0.0%
1124017005	8/27/2018	0.49	0.51	4.0%	1.33	1.28	3.8%
1124017025	8/27/2018	0.44	0.44	0.0%	1.38	1.45	4.9%
1124017028	8/27/2018	0.09	0.11	20.0%	2.02	2.25	10.8%
1124017075	8/27/2018	0.2	0.19	5.1%	2.63	2.52	4.3%
1124020033	8/28/2018	0.62	0.6	3.3%	2.18	2.01	8.1%
1124020048	8/28/2018	0.46	0.46	0.0%	1.74	1.73	0.6%
1124020085	8/28/2018	0.66	0.64	3.1%	1.56	1.51	3.3%
1124020097	8/28/2018	0.17	0.16	6.1%	2.01	1.96	2.5%
1124015017	8/29/2018	0.66	0.66	0.0%	0.09	0.08	11.8%
1124015148	8/29/2018	0.56	0.55	1.8%	0.48	0.47	2.1%
1124015181	8/29/2018	0.51	0.52	1.9%	0.78	0.75	3.9%
1124018043	8/29/2018	0.3	0.31	3.3%	1.61	1.54	4.4%
1124018082	8/29/2018	0.59	0.59	0.0%	2.17	2.09	3.8%
2137010036	8/29/2018	0.22	0.22	0.0%	0.37	0.38	2.7%
2137012144	8/29/2018	0.43	0.43	0.0%	0.18	0.18	0.0%
1124015106	8/30/2018	0.49	0.46	6.3%	0.31	0.3	3.3%
1124015115	8/30/2018	0.62	0.63	1.6%	1.21	1.23	1.6%
1124015139	8/30/2018	0.58	0.6	3.4%	0.29	0.29	0.0%
1124015205	8/30/2018	0.59	0.58	1.7%	0.68	0.66	3.0%
1124018021	8/30/2018	0.22	0.22	0.0%	1.08	1.11	2.7%
1124015154	8/31/2018	0.5	0.5	0.0%	0.49	0.49	0.0%
1124018098	8/31/2018	0.23	0.24	4.3%	1.46	1.43	2.1%
1124018127	8/31/2018	0.19	0.19	0.0%	1.15	1.12	2.6%
1124018135	8/31/2018	0.29	0.29	0.0%	4.3	4.18	2.8%
1124015165	9/1/2018	0.59	0.59	0.0%	1.56	1.57	0.6%
1124015168	9/1/2018	0.72	0.72	0.0%	0.75	0.75	0.0%
2138019154	9/1/2018	0.44	0.43	2.3%	0.03	0.03	0.0%
2138019220	9/1/2018	0.23	0.23	0.0%	0.69	0.66	4.4%
1124013179	9/2/2018	0.41	0.42	2.4%	0.3	0.31	3.3%
1124013197	9/2/2018	0.45	0.45	0.0%	1.23	1.21	1.6%
1124021060	9/2/2018	0.51	0.52	1.9%	1.3	1.34	3.0%
2137012152	9/2/2018	0.24	0.25	4.1%	0.07	0.07	0.0%
2137012190	9/2/2018	0.43	0.32	29.3%	0.08	0.06	28.6%
2137012198	9/2/2018	0.46	0.47	2.2%	0.04	0.05	22.2%
1124013137	9/3/2018	0.44	0.44	0.0%	0.42	0.38	10.0%
1124013140	9/3/2018	0.79	0.79	0.0%	0.27	0.29	7.1%
1124018011	9/3/2018	0.16	0.16	0.0%	1.49	1.62	8.4%
1124018035	9/3/2018	0.29	0.3	3.4%	1.58	1.62	2.5%
1124013013	9/4/2018	0.48	0.46	4.3%	0.24	0.27	11.8%
1124013106	9/4/2018	0.6	0.61	1.7%	0.22	0.21	4.7%
1124013126	9/4/2018	0.36	0.36	0.0%	0.46	0.46	0.0%
1124021065	9/4/2018	0.18	0.2	10.5%	1.9	1.96	3.1%
1124013006	9/5/2018	0.62	0.62	0.0%	0.54	0.55	1.8%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1124021006	9/6/2018	0.3	0.28	6.9%	2.8	2.73	2.5%
1124021021	9/6/2018	0.08	0.09	11.8%	1.4	1.36	2.9%
1124021033	9/6/2018	0.07	0.06	15.4%	1.67	1.72	2.9%
1124021035	9/6/2018	0.3	0.29	3.4%	1.69	1.7	0.6%
1124021038	9/6/2018	0.54	0.54	0.0%	1.25	1.23	1.6%
1124021086	9/6/2018	0.17	0.17	0.0%	1.81	1.84	1.6%
1124021124	9/6/2018	0.18	0.17	5.7%	2	2	0.0%
1124012098	9/8/2018	0.39	0.4	2.5%	0.96	0.96	0.0%
1124012108	9/8/2018	0.36	0.38	5.4%	0.92	0.87	5.6%
1124012116	9/8/2018	0.75	0.75	0.0%	1.54	1.54	0.0%
1124012121	9/8/2018	0.65	0.67	3.0%	0.5	0.49	2.0%
1124012128	9/8/2018	0.46	0.47	2.2%	0.44	0.48	8.7%
1124012134	9/8/2018	0.31	0.34	9.2%	0.59	0.61	3.3%
1124019114	9/8/2018	0.16	0.16	0.0%	1.41	1.42	0.7%
1124019124	9/8/2018	0.16	0.16	0.0%	1.25	1.21	3.3%
1124019145	9/8/2018	0.15	0.14	6.9%	1.07	1.03	3.8%
1124019151	9/8/2018	0.45	0.45	0.0%	1.55	1.59	2.5%
1124019185	9/8/2018	0.53	0.54	1.9%	0.58	0.59	1.7%
1124021053	9/8/2018	0.1	0.11	9.5%	2.43	2.44	0.4%
2137012010	9/8/2018	0.21	0.21	0.0%	0.22	0.23	4.4%
2137012020	9/8/2018	0.34	0.34	0.0%	0.23	0.23	0.0%
2137012028	9/8/2018	0.18	0.19	5.4%	0.39	0.42	7.4%
2137012062	9/8/2018	0.58	0.59	1.7%	0.12	0.12	0.0%
2137012078	9/8/2018	0.39	0.39	0.0%	0.05	0.05	0.0%
2137012110	9/8/2018	0.23	0.24	4.3%	0.2	0.21	4.9%
2138019192	9/8/2018	1.84	1.89	2.7%	0.1	0.1	0.0%
1124012033	9/9/2018	0.53	0.52	1.9%	0.43	0.41	4.8%
1124012073	9/9/2018	0.53	0.53	0.0%	0.54	0.54	0.0%
1124019079	9/9/2018	0.55	0.56	1.8%	1.24	1.24	0.0%
1124019094	9/9/2018	0.59	0.61	3.3%	1.21	1.23	1.6%
1124019133	9/9/2018	0.53	0.51	3.8%	0.13	0.13	0.0%
2137012140	9/9/2018	0.59	0.57	3.4%	0.09	0.08	11.8%
1124012012	9/10/2018	0.38	0.3	23.5%	0.17	0.16	6.1%
1124012022	9/10/2018	0.68	0.68	0.0%	0.37	0.38	2.7%
1124012024	9/10/2018	0.6	0.59	1.7%	0.46	0.45	2.2%
1124012058	9/10/2018	0.28	0.3	6.9%	0.61	0.64	4.8%
1124019009	9/10/2018	0.34	0.34	0.0%	1.33	1.31	1.5%
2137015022	9/10/2018	0.39	0.4	2.5%	0.01	0.01	0.0%
1124012048	9/11/2018	0.68	0.68	0.0%	0.75	0.73	2.7%
1124019006	9/11/2018	0.24	0.24	0.0%	1.33	1.33	0.0%
1124019043	9/11/2018	0.4	0.41	2.5%	1.51	1.52	0.7%
1124019047	9/11/2018	0.4	0.39	2.5%	0.47	0.44	6.6%
1124019067	9/11/2018	0.47	0.49	4.2%	1.86	1.94	4.2%
1124022121	9/11/2018	1.19	1.19	0.0%	1.64	1.7	3.6%
1124022149	9/11/2018	1.19	1.2	0.8%	1.72	1.75	1.7%
1124022164	9/11/2018	0.33	0.34	3.0%	1.98	1.99	0.5%
1124022162	9/12/2018	0.38	0.39	2.6%	1.15	1.2	4.3%
1124023005	9/12/2018	0.61	0.6	1.7%	2.18	2.16	0.9%
1124023010	9/12/2018	0.7	0.7	0.0%	2.27	2.26	0.4%
1124023125	9/12/2018	0.19	0.19	0.0%	1.76	1.7	3.5%
1124023136	9/12/2018	0.4	0.4	0.0%	1.76	1.8	2.2%
1124023163	9/12/2018	0.37	0.38	2.7%	1.58	1.54	2.6%
1124023173	9/12/2018	0.17	0.16	6.1%	1.45	1.47	1.4%
1124023187	9/12/2018	0.16	0.16	0.0%	1.51	1.54	2.0%
2137015084	9/12/2018	0.16	0.17	6.1%	0.005	0.01	66.7%
1124023103	9/13/2018	0.63	0.61	3.2%	2.02	1.95	3.5%
1124022009	9/14/2018	1.2	1.24	3.3%	2.01	2.05	2.0%
1124022024	9/14/2018	1.01	1.02	1.0%	1.62	1.62	0.0%
1123001004	9/16/2018	0.79	0.79	0.0%	1.93	1.88	2.6%
1123001022	9/16/2018	0.58	0.57	1.7%	1.8	1.79	0.6%
1123001105	9/16/2018	1.11	1.14	2.7%	2.23	2.24	0.4%
1123001289	9/16/2018	0.52	0.51	1.9%	2.02	2.05	1.5%
1124023015	9/16/2018	0.37	0.38	2.7%	1.74	1.78	2.3%
1124023030	9/16/2018	0.42	0.43	2.4%	2.03	2.01	1.0%
1124023035	9/16/2018	0.25	0.26	3.9%	1.67	1.73	3.5%
1124023117	9/16/2018	0.34	0.34	0.0%	1.48	1.47	0.7%
1123001015	9/17/2018	0.31	0.32	3.2%	2.09	2.18	4.2%
1123001109	9/17/2018	1.02	1.01	1.0%	2.78	2.76	0.7%
1123001301	9/17/2018	1.11	1.11	0.0%	2.2	2.17	1.4%
1124024022	9/17/2018	0.65	0.66	1.5%	0.73	0.75	2.7%
1124024027	9/17/2018	0.23	0.22	4.4%	1.1	1.15	4.4%
1124024057	9/17/2018	0.21	0.2	4.9%	1.28	1.28	0.0%
1124024061	9/17/2018	0.51	0.51	0.0%	0.9	0.91	1.1%
1124024095	9/17/2018	0.66	0.63	4.7%	1.83	1.85	1.1%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
2137015028	9/18/2018	0.36	0.35	2.8%	0.03	0.03	0.0%
2137015066	9/18/2018	0.44	0.43	2.3%	0.01	0.005	66.7%
2137015068	9/18/2018	0.27	0.27	0.0%	0.005	0.005	0.0%
1124024085	9/19/2018	0.32	0.34	6.1%	1.91	1.87	2.1%
1124026129	9/20/2018	0.53	0.52	1.9%	0.87	0.84	3.5%
1124026150	9/20/2018	1.77	1.79	1.1%	2.27	2.29	0.9%
1124026180	9/20/2018	0.71	0.71	0.0%	1.81	1.84	1.6%
1124026191	9/20/2018	0.81	0.8	1.2%	0.56	0.53	5.5%
1124026230	9/20/2018	0.84	0.86	2.4%	0.23	0.22	4.4%
2137014038	9/20/2018	0.05	0.06	18.2%	0.09	0.09	0.0%
1124026005	9/21/2018	0.35	0.35	0.0%	0.02	0.02	0.0%
1124026144	9/21/2018	1.27	1.29	1.6%	2.72	2.78	2.2%
1124026159	9/21/2018	0.62	0.62	0.0%	2.54	2.43	4.4%
1124026177	9/21/2018	0.82	0.81	1.2%	0.75	0.72	4.1%
1124027007	9/21/2018	0.33	0.34	3.0%	2.13	2.16	1.4%
1124027046	9/21/2018	0.4	0.39	2.5%	2.34	2.38	1.7%
1124027068	9/21/2018	0.47	0.47	0.0%	1.93	1.89	2.1%
1124027099	9/21/2018	0.23	0.23	0.0%	1.35	1.31	3.0%
1124026024	9/22/2018	0.75	0.76	1.3%	0.27	0.28	3.6%
1124026033	9/22/2018	0.69	0.68	1.5%	0.8	0.76	5.1%
1124026123	9/22/2018	0.22	0.22	0.0%	0.46	0.44	4.4%
1124026172	9/22/2018	0.4	0.4	0.0%	0.5	0.47	6.2%
1124026218	9/22/2018	0.29	0.27	7.1%	0.64	0.63	1.6%
1124027012	9/22/2018	0.22	0.21	4.7%	1.72	1.75	1.7%
1124027043	9/22/2018	0.42	0.42	0.0%	2.01	1.99	1.0%
1124027078	9/22/2018	0.11	0.11	0.0%	1.82	1.82	0.0%
1123001147	9/23/2018	0.88	0.89	1.1%	1.91	1.94	1.6%
1123001156	9/23/2018	0.85	0.86	1.2%	1.52	1.56	2.6%
1123001161	9/23/2018	0.97	0.97	0.0%	1.33	1.33	0.0%
1123001186	9/23/2018	0.93	0.94	1.1%	2.23	2.27	1.8%
1123001201	9/23/2018	0.99	1	1.0%	1.9	1.96	3.1%
1123001266	9/23/2018	0.6	0.6	0.0%	2.55	2.54	0.4%
1124025011	9/23/2018	0.96	0.98	2.1%	1.49	1.52	2.0%
1124025121	9/23/2018	0.8	0.8	0.0%	1.15	1.13	1.8%
1124025149	9/23/2018	0.8	0.81	1.2%	1.52	1.56	2.6%
1124025005	9/24/2018	0.32	0.31	3.2%	1.96	1.9	3.1%
1124025142	9/24/2018	0.29	0.31	6.7%	0.8	0.81	1.2%
2137014042	9/25/2018	0.27	0.27	0.0%	0.07	0.06	15.4%
2137014068	9/25/2018	0.47	0.48	2.1%	0.03	0.03	0.0%
2137014116	9/25/2018	0.4	0.4	0.0%	0.1	0.11	9.5%
1123001127	9/26/2018	1.22	1.22	0.0%	1.73	1.69	2.3%
1123001184	9/26/2018	0.96	0.96	0.0%	2.19	2.2	0.5%
1124025146	9/26/2018	0.76	0.74	2.7%	2.41	2.35	2.5%
2137014056	9/27/2018	0.48	0.48	0.0%	0.04	0.04	0.0%
2137014062	9/27/2018	0.43	0.42	2.4%	0.02	0.02	0.0%
2137014088	9/27/2018	0.52	0.54	3.8%	0.02	0.02	0.0%
2137014138	9/27/2018	0.47	0.46	2.2%	0.01	0.01	0.0%
1123002005	9/28/2018	0.8	0.8	0.0%	0.89	0.89	0.0%
1123002018	9/28/2018	0.75	0.75	0.0%	1.04	1.03	1.0%
1123002031	9/28/2018	0.32	0.32	0.0%	0.56	0.56	0.0%
1123002036	9/28/2018	0.85	0.86	1.2%	0.64	0.64	0.0%
1123002044	9/30/2018	0.25	0.24	4.1%	0.52	0.49	5.9%
1123002054	9/30/2018	0.53	0.53	0.0%	0.71	0.7	1.4%
1123002076	9/30/2018	0.51	0.52	1.9%	0.32	0.33	3.1%
1123003047	9/30/2018	0.59	0.59	0.0%	0.8	0.78	2.5%
1123003103	9/30/2018	0.34	0.33	3.0%	0.82	0.8	2.5%
1123003114	9/30/2018	0.47	0.48	2.1%	1.22	1.21	0.8%
1123003134	9/30/2018	0.72	0.69	4.3%	1.12	1.11	0.9%
1123003146	9/30/2018	0.49	0.49	0.0%	0.57	0.57	0.0%
2137020078	9/30/2018	0.11	0.12	8.7%	0.04	0.04	0.0%
2137023196	9/30/2018	0.46	0.46	0.0%	0.03	0.03	0.0%
2137023236	9/30/2018	0.47	0.46	2.2%	0.14	0.14	0.0%
2137023242	9/30/2018	0.26	0.25	3.9%	0.2	0.2	0.0%
2137023268	9/30/2018	0.29	0.27	7.1%	0.21	0.2	4.9%
1123002092	10/1/2018	0.49	0.48	2.1%	0.14	0.13	7.4%
2137020030	10/1/2018	0.36	0.36	0.0%	0.38	0.38	0.0%
2137023048	10/1/2018	0.34	0.34	0.0%	0.01	0.01	0.0%
2137023108	10/1/2018	0.39	0.4	2.5%	0.19	0.19	0.0%
1123003005	10/2/2018	1.1	1.12	1.8%	0.56	0.59	5.2%
1123003020	10/2/2018	0.57	0.55	3.6%	1.32	1.34	1.5%
1123003036	10/2/2018	0.56	0.56	0.0%	0.34	0.35	2.9%
1123003067	10/2/2018	0.72	0.73	1.4%	0.08	0.07	13.3%
1123003097	10/2/2018	0.52	0.55	5.6%	0.43	0.41	4.8%
1123003141	10/2/2018	0.34	0.35	2.9%	1.06	1.08	1.9%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1123009024	10/2/2018	0.96	0.97	1.0%	2.17	2.21	1.8%
1123009038	10/2/2018	0.8	0.82	2.5%	3.07	2.96	3.6%
1123009068	10/2/2018	0.34	0.34	0.0%	3.36	3.42	1.8%
1123009071	10/2/2018	1.09	1.08	0.9%	2.38	2.37	0.4%
1123009074	10/2/2018	1.17	1.18	0.9%	1.9	1.98	4.1%
1123009108	10/2/2018	0.88	0.87	1.1%	2.09	2.03	2.9%
1123009149	10/2/2018	0.66	0.69	4.4%	2.98	2.82	5.5%
2137020002	10/2/2018	0.53	0.51	3.8%	0.03	0.03	0.0%
1123009075	10/3/2018	1.18	1.15	2.6%	1.88	1.74	7.7%
1123009134	10/3/2018	0.93	0.9	3.3%	1.96	1.92	2.1%
1123009176	10/3/2018	0.87	0.88	1.1%	1.62	1.65	1.8%
1123009184	10/3/2018	0.87	0.89	2.3%	1.9	1.95	2.6%
1123009201	10/3/2018	0.87	0.87	0.0%	1.61	1.58	1.9%
1123009036	10/5/2018	0.39	0.41	5.0%	2.63	2.59	1.5%
1123009037	10/5/2018	0.93	0.97	4.2%	2.09	2.15	2.8%
1123009065	10/5/2018	0.9	0.9	0.0%	1.88	1.87	0.5%
1123009119	10/5/2018	0.55	0.55	0.0%	1.45	1.49	2.7%
1123009180	10/5/2018	1.11	1.1	0.9%	1.61	1.57	2.5%
1123009222	10/5/2018	0.94	0.93	1.1%	1.35	1.34	0.7%
1123005030	10/6/2018	1.19	1.26	5.7%	0.4	0.44	9.5%
1123005038	10/6/2018	0.65	0.65	0.0%	0.4	0.38	5.1%
1123005065	10/6/2018	0.55	0.55	0.0%	0.44	0.46	4.4%
1123005211	10/6/2018	0.39	0.39	0.0%	1.17	1.15	1.7%
2137021046	10/6/2018	0.2	0.2	0.0%	0.18	0.19	5.4%
2137023056	10/6/2018	0.48	0.48	0.0%	0.02	0.02	0.0%
2137023098	10/6/2018	0.39	0.4	2.5%	0.09	0.09	0.0%
2137023164	10/6/2018	0.49	0.5	2.0%	0.28	0.29	3.5%
1123005078	10/7/2018	0.77	0.76	1.3%	0.58	0.58	0.0%
1123005108	10/7/2018	0.68	0.68	0.0%	0.23	0.25	8.3%
1123005101	10/8/2018	0.63	0.61	3.2%	0.7	0.68	2.9%
1231002011	10/8/2018	0.53	0.54	1.9%	2.72	2.57	5.7%
1231002015	10/8/2018	0.96	0.94	2.1%	1.79	1.81	1.1%
1231002019	10/8/2018	0.35	0.35	0.0%	1.07	1.04	2.8%
1231002040	10/8/2018	0.65	0.66	1.5%	1.2	1.23	2.5%
1231002041	10/8/2018	0.46	0.46	0.0%	1.09	1.08	0.9%
1231002053	10/8/2018	0.49	0.47	4.2%	1.57	1.49	5.2%
1231002060	10/8/2018	0.72	0.73	1.4%	1.28	1.3	1.6%
1123004012	10/9/2018	0.52	0.54	3.8%	0.42	0.41	2.4%
1123004123	10/9/2018	0.36	0.37	2.7%	0.32	0.32	0.0%
1123004160	10/9/2018	0.46	0.46	0.0%	0.36	0.37	2.7%
1123013011	10/9/2018	1.1	1.17	6.2%	1.4	1.4	0.0%
1123013038	10/9/2018	0.47	0.49	4.2%	1.71	1.8	5.1%
1231002070	10/9/2018	0.73	0.73	0.0%	1.17	1.16	0.9%
1231002126	10/9/2018	0.45	0.46	2.2%	2.01	2.09	3.9%
1123004005	10/10/2018	0.5	0.51	2.0%	0.33	0.34	3.0%
1123004128	10/10/2018	0.42	0.43	2.4%	0.38	0.41	7.6%
1123013025	10/10/2018	0.36	0.34	5.7%	1.51	1.4	7.6%
1123013045	10/10/2018	0.22	0.22	0.0%	1.08	1.01	6.7%
1123013065	10/10/2018	0.45	0.43	4.5%	1.88	1.75	7.2%
1123013072	10/10/2018	0.65	0.65	0.0%	3.03	3.03	0.0%
1123013097	10/10/2018	0.86	0.88	2.3%	1.77	1.84	3.9%
1123013110	10/10/2018	0.18	0.17	5.7%	1.1	1.08	1.8%
1123011021	10/11/2018	0.47	0.47	0.0%	1.13	1.13	0.0%
1123011147	10/11/2018	0.48	0.47	2.1%	1.37	1.38	0.7%
1123011198	10/11/2018	0.54	0.57	5.4%	1.11	1.13	1.8%
1231002075	10/11/2018	0.49	0.46	6.3%	0.84	0.75	11.3%
1231002104	10/11/2018	0.51	0.51	0.0%	0.69	0.7	1.4%
1231002110	10/11/2018	0.47	0.4	16.1%	0.51	0.46	10.3%
1123011014	10/13/2018	0.74	0.74	0.0%	0.7	0.7	0.0%
1123011101	10/13/2018	0.39	0.39	0.0%	1.73	1.8	4.0%
1123011125	10/13/2018	0.74	0.7	5.6%	1.69	1.57	7.4%
1123011166	10/13/2018	0.66	0.64	3.1%	1.34	1.35	0.7%
1123011168	10/13/2018	0.7	0.71	1.4%	1.73	1.69	2.3%
1123011170	10/13/2018	0.68	0.7	2.9%	1.74	1.71	1.7%
2137023012	10/13/2018	0.52	0.51	1.9%	0.07	0.07	0.0%
1123006059	10/14/2018	0.48	0.44	8.7%	0.21	0.15	33.3%
1123006083	10/14/2018	0.25	0.26	3.9%	0.89	0.92	3.3%
1123006094	10/14/2018	0.52	0.52	0.0%	0.51	0.51	0.0%
1123006107	10/14/2018	0.24	0.25	4.1%	1.17	1.24	5.8%
1123006121	10/14/2018	0.29	0.27	7.1%	1.32	1.34	1.5%
1123014102	10/14/2018	0.25	0.24	4.1%	2.96	2.95	0.3%
1123014119	10/14/2018	0.24	0.24	0.0%	2.55	2.48	2.8%
1123014128	10/14/2018	0.49	0.48	2.1%	1.65	1.67	1.2%
1123014155	10/14/2018	0.41	0.39	5.0%	2.13	2.01	5.8%

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Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1123014181	10/14/2018	0.14	0.14	0.0%	2.79	2.57	8.2%
1123014190	10/14/2018	0.26	0.25	3.9%	1.86	1.75	6.1%
1123014192	10/14/2018	0.72	0.73	1.4%	1.51	1.52	0.7%
1123014214	10/14/2018	0.14	0.14	0.0%	1.59	1.67	4.9%
1123014247	10/14/2018	0.47	0.47	0.0%	1.36	1.25	8.4%
1123014253	10/14/2018	0.6	0.6	0.0%	1.85	1.89	2.1%
1123006007	10/17/2018	0.58	0.58	0.0%	0.45	0.43	4.5%
1123006013	10/17/2018	1.01	1.04	2.9%	0.11	0.12	8.7%
1123006021	10/17/2018	0.92	0.9	2.2%	0.17	0.17	0.0%
1123006031	10/17/2018	0.53	0.55	3.7%	0.34	0.36	5.7%
1123006053	10/17/2018	0.38	0.41	7.6%	1.46	0.31	129.9%
1123014003	10/17/2018	0.28	0.28	0.0%	1.66	1.75	5.3%
1123014014	10/17/2018	0.37	0.37	0.0%	1.14	1.13	0.9%
1123014025	10/17/2018	0.21	0.22	4.7%	1.79	1.85	3.3%
1123014031	10/17/2018	0.3	0.29	3.4%	1.46	1.43	2.1%
1123014225	10/17/2018	0.24	0.25	4.1%	3.2	3.18	0.6%
1123014288	10/17/2018	0.23	0.23	0.0%	1.18	1.21	2.5%
1123014305	10/17/2018	0.35	0.36	2.8%	1.89	1.9	0.5%
2137021805	10/17/2018	0.24	0.25	4.1%	0.3	0.31	3.3%
2.137E+10	10/17/2018	0.41	0.4	2.5%	0.37	0.33	11.4%
1123015009	10/19/2018	0.3	0.31	3.3%	1.47	1.49	1.4%
1123015017	10/19/2018	0.48	0.47	2.1%	1.72	1.71	0.6%
1123015034	10/19/2018	0.43	0.45	4.5%	1.03	1.04	1.0%
1123015057	10/19/2018	0.66	0.65	1.5%	1.21	1.22	0.8%
1124028005	10/19/2018	0.11	0.12	8.7%	1.55	1.56	0.6%
1124028036	10/19/2018	0.11	0.12	8.7%	1.37	1.37	0.0%
1124028117	10/19/2018	0.21	0.2	4.9%	2.95	2.86	3.1%
1124028120	10/19/2018	0.51	0.53	3.8%	2.13	2.15	0.9%
1124028148	10/19/2018	0.15	0.16	6.5%	2.04	1.98	3.0%
1124028169	10/19/2018	0.26	0.27	3.8%	1.83	1.54	17.2%
1124028177	10/19/2018	0.46	0.46	0.0%	2.77	2.8	1.1%
1124028191	10/19/2018	0.31	0.31	0.0%	2.06	2.01	2.5%
1124028197	10/19/2018	0.41	0.4	2.5%	2.16	2.17	0.5%
1124028232	10/19/2018	0.14	0.13	7.4%	1.02	1	2.0%
1124029315	10/19/2018	0.64	0.65	1.6%	2.09	2.13	1.9%
1124029372	10/19/2018	0.27	0.28	3.6%	2.26	2.27	0.4%
1124029394	10/19/2018	0.25	0.23	8.3%	2.33	2.38	2.1%
1124029420	10/19/2018	0.29	0.29	0.0%	1.19	1.19	0.0%
1124029440	10/19/2018	0.56	0.56	0.0%	1.31	1.31	0.0%
1124029705	10/19/2018	0.24	0.24	0.0%	3.83	3.84	0.3%
1124029715	10/19/2018	0.27	0.28	3.6%	2.6	2.59	0.4%
1124029720	10/19/2018	0.78	0.77	1.3%	1.85	1.87	1.1%
1124029737	10/19/2018	0.32	0.32	0.0%	1.5	1.5	0.0%
1124029745	10/19/2018	0.21	0.21	0.0%	2.71	2.73	0.7%
1123015066	10/20/2018	0.67	0.67	0.0%	1.38	1.32	4.4%
1123015080	10/20/2018	0.36	0.36	0.0%	1.35	1.34	0.7%
1124028217	10/20/2018	0.18	0.16	11.8%	1.68	1.56	7.4%
1124028254	10/20/2018	0.16	0.17	6.1%	1.38	1.34	2.9%
1124029347	10/20/2018	0.12	0.13	8.0%	2.7	2.78	2.9%
2137021108	10/20/2018	0.22	0.25	12.8%	0.61	0.63	3.2%
2137021985	10/20/2018	0.26	0.25	3.9%	0.12	0.11	8.7%
1123012032	10/21/2018	1.18	1.14	3.4%	1.98	1.9	4.1%
1123012154	10/21/2018	1.07	1.04	2.8%	2.11	2.09	1.0%
1123012179	10/21/2018	1.27	1.27	0.0%	1.7	1.67	1.8%
1123018023	10/21/2018	0.52	0.54	3.8%	0.49	0.5	2.0%
1123018111	10/21/2018	0.83	0.83	0.0%	0.41	0.44	7.1%
1124028228	10/21/2018	0.26	0.23	12.2%	1.37	1.37	0.0%
1124028246	10/21/2018	0.13	0.12	8.0%	1.37	1.35	1.5%
1124029305	10/21/2018	0.15	0.16	6.5%	3.81	3.9	2.3%
1124029334	10/21/2018	0.17	0.17	0.0%	2.02	2.01	0.5%
1123012008	10/22/2018	0.9	0.91	1.1%	1.86	1.88	1.1%
1123012020	10/22/2018	1.1	1.12	1.8%	2.21	2.21	0.0%
1123012049	10/22/2018	1.06	1.06	0.0%	2.22	2.23	0.4%
1123012114	10/22/2018	1.12	1.11	0.9%	2.25	2.33	3.5%
1123012152	10/22/2018	1.16	1.2	3.4%	1.58	1.65	4.3%
1123012189	10/22/2018	1	1.02	2.0%	1.96	2	2.0%
1123018026	10/22/2018	1.03	1.05	1.9%	0.34	0.29	15.9%
1123018049	10/22/2018	0.74	0.79	6.5%	0.15	0.15	0.0%
1123018118	10/22/2018	0.33	0.33	0.0%	1.63	1.64	0.6%
1124028022	10/22/2018	0.13	0.12	8.0%	1.69	1.72	1.8%
1123008003	10/23/2018	0.4	0.39	2.5%	0.13	0.12	8.0%
1123008019	10/23/2018	0.5	0.5	0.0%	0.75	0.76	1.3%
1123008034	10/23/2018	0.33	0.33	0.0%	0.03	0.03	0.0%
1123008104	10/23/2018	0.51	0.51	0.0%	0.12	0.14	15.4%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1123008152	10/23/2018	0.55	0.53	3.7%	0.22	0.19	14.6%
1123008170	10/23/2018	0.86	0.85	1.2%	0.62	0.57	8.4%
1123008190	10/23/2018	0.59	0.6	1.7%	0.61	0.58	5.0%
1123008204	10/23/2018	0.64	0.64	0.0%	0.37	0.37	0.0%
1123012067	10/23/2018	0.8	0.79	1.3%	2.2	2.22	0.9%
1122004028	10/26/2018	0.74	0.72	2.7%	1.28	1.28	0.0%
1122004041	10/26/2018	0.58	0.58	0.0%	1.04	1.01	2.9%
1122004058	10/26/2018	0.31	0.29	6.7%	1.17	1.12	4.4%
1122004067	10/26/2018	0.4	0.41	2.5%	0.64	0.64	0.0%
1122004079	10/26/2018	0.39	0.38	2.6%	0.95	0.91	4.3%
1123008124	10/26/2018	1.86	1.85	0.5%	1.61	1.43	11.8%
1123008142	10/26/2018	0.65	0.67	3.0%	1.03	1.09	5.7%
1123018129	10/26/2018	0.4	0.39	2.5%	1.58	1.63	3.1%
1123018325	10/26/2018	0.26	0.26	0.0%	1.76	1.72	2.3%
1123008048	10/27/2018	0.71	0.72	1.4%	1.25	1.32	5.4%
1123008230	10/27/2018	0.99	1	1.0%	2.64	2.46	7.1%
1123018381	10/27/2018	0.65	0.66	1.5%	1.41	1.36	3.6%
1123008254	10/28/2018	1.02	0.96	6.1%	3.33	2.37	33.7%
1123017004	10/28/2018	0.2	0.21	4.9%	1.58	1.62	2.5%
1123017054	10/28/2018	0.34	0.33	3.0%	1.78	1.78	0.0%
1123017074	10/28/2018	0.12	0.11	8.7%	1.95	1.85	5.3%
1123017093	10/28/2018	0.36	0.36	0.0%	1.89	1.96	3.6%
1123017104	10/28/2018	0.42	0.43	2.4%	1.83	1.82	0.5%
1123017129	10/28/2018	0.45	0.48	6.5%	1.41	1.52	7.5%
1231005009	10/28/2018	0.11	0.12	8.7%	0.47	0.46	2.2%
1231005055	10/28/2018	0.08	0.08	0.0%	0.28	0.29	3.5%
1231005092	10/28/2018	0.15	0.13	14.3%	0.51	0.49	4.0%
1231005099	10/28/2018	0.13	0.13	0.0%	0.5	0.49	2.0%
1231005126	10/28/2018	0.07	0.07	0.0%	0.48	0.46	4.3%
1231005129	10/28/2018	0.11	0.11	0.0%	0.29	0.27	7.1%
1231005166	10/28/2018	0.4	0.4	0.0%	0.67	0.67	0.0%
1231005196	10/28/2018	0.17	0.17	0.0%	1.19	1.1	7.9%
1231005206	10/28/2018	0.15	0.17	12.5%	0.34	0.36	5.7%
1231005246	10/28/2018	0.02	0.02	0.0%	0.72	0.71	1.4%
2137022012	10/28/2018	0.16	0.16	0.0%	0.21	0.21	0.0%
2137022058	10/28/2018	0.08	0.07	13.3%	0.16	0.14	13.3%
2137022094	10/28/2018	0.07	0.08	13.3%	0.24	0.25	4.1%
2137022074	10/30/2018	0.1	0.1	0.0%	0.23	0.24	4.3%
2137022152	10/30/2018	0.12	0.12	0.0%	0.33	0.33	0.0%
1122003016	10/31/2018	0.56	0.58	3.5%	1.86	1.88	1.1%
1122003042	10/31/2018	0.84	0.82	2.4%	2.26	2.19	3.1%
1122003049	10/31/2018	0.94	0.93	1.1%	2.43	2.51	3.2%
1122003085	10/31/2018	1.36	1.4	2.9%	1.84	1.87	1.6%
1122004101	10/31/2018	0.6	0.6	0.0%	1.14	1.17	2.6%
1122004107	10/31/2018	0.58	0.56	3.5%	0.96	0.97	1.0%
1122004131	10/31/2018	0.35	0.34	2.9%	0.63	0.52	19.1%
1123016005	10/31/2018	0.52	0.52	0.0%	2.29	2.33	1.7%
1123016006	10/31/2018	0.06	0.06	0.0%	3.36	3.39	0.9%
1123016024	10/31/2018	0.4	0.41	2.5%	1.91	1.86	2.7%
1123016037	10/31/2018	0.46	0.48	4.3%	2.01	2.04	1.5%
1123016126	10/31/2018	0.31	0.31	0.0%	2.19	2.21	0.9%
1123016156	10/31/2018	0.3	0.31	3.3%	1.97	2.02	2.5%
1123016161	10/31/2018	0.57	0.59	3.4%	1.89	1.88	0.5%
1123016173	10/31/2018	0.53	0.53	0.0%	1.79	1.82	1.7%
1123016199	10/31/2018	0.78	0.77	1.3%	1.25	1.26	0.8%
1123016220	10/31/2018	0.33	0.35	5.9%	1.69	1.72	1.8%
1123016711	10/31/2018	0.21	0.2	4.9%	1.61	1.63	1.2%
1123017042	10/31/2018	0.14	0.13	7.4%	1.51	1.45	4.1%
1123017110	10/31/2018	0.21	0.2	4.9%	1.63	1.62	0.6%
1123017149	10/31/2018	0.18	0.19	5.4%	1.74	1.72	1.2%
1123017176	10/31/2018	0.12	0.11	8.7%	3.41	3.23	5.4%
1123017194	10/31/2018	0.19	0.21	10.0%	2.76	2.78	0.7%
1123017206	10/31/2018	0.64	0.63	1.6%	1.16	1.15	0.9%
1123017224	10/31/2018	0.48	0.48	0.0%	1.66	1.57	5.6%
1123018302	11/1/2018	0.13	0.14	7.4%	0.67	0.66	1.5%
1122003068	11/2/2018	0.63	0.63	0.0%	1.51	1.48	2.0%
1122003093	11/2/2018	0.83	0.82	1.2%	1.95	2	2.5%
1123016102	11/2/2018	0.68	0.69	1.5%	1.81	1.85	2.2%
1123020002	11/2/2018	0.88	0.88	0.0%	1.82	1.83	0.5%
1123020016	11/2/2018	0.6	0.63	4.9%	2.37	2.45	3.3%
1123020048	11/2/2018	0.43	0.44	2.3%	1.76	1.75	0.6%
1123020067	11/2/2018	0.24	0.24	0.0%	1.18	1.14	3.4%
1123020069	11/2/2018	0.24	0.24	0.0%	0.85	0.87	2.3%
1123020088	11/2/2018	0.46	0.46	0.0%	1.55	1.61	3.8%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1123020105	11/2/2018	0.41	0.41	0.0%	1.59	1.61	1.3%
1123020113	11/2/2018	0.31	0.3	3.3%	1.94	1.96	1.0%
1123020130	11/2/2018	0.42	0.43	2.4%	1.25	1.24	0.8%
1123020154	11/2/2018	0.4	0.41	2.5%	2	2.02	1.0%
1123020189	11/2/2018	0.18	0.18	0.0%	2.1	2.08	1.0%
1123020201	11/2/2018	0.43	0.44	2.3%	1.37	1.37	0.0%
1123020218	11/2/2018	0.5	0.5	0.0%	1.52	1.51	0.7%
1232007411	11/2/2018	0.08	0.08	0.0%	3.32	3.19	4.0%
1232007415	11/2/2018	0.1	0.09	10.5%	2.3	2.32	0.9%
1232007461	11/2/2018	0.25	0.22	12.8%	2.06	2.04	1.0%
1232007491	11/2/2018	0.27	0.56	69.9%	2.45	0.12	181.3%
1232007505	11/2/2018	0.21	0.21	0.0%	2.24	2.28	1.8%
1122002180	11/3/2018	1.15	1.13	1.8%	1.7	1.77	4.0%
1122005020	11/3/2018	0.45	0.43	4.5%	0.89	0.88	1.1%
1122005044	11/3/2018	0.5	0.5	0.0%	0.17	0.17	0.0%
1122005096	11/3/2018	0.43	0.42	2.4%	0.43	0.43	0.0%
1123016179	11/3/2018	0.58	0.58	0.0%	1.29	1.29	0.0%
1123019195	11/3/2018	0.33	0.34	3.0%	1.58	1.61	1.9%
1123020169	11/3/2018	0.63	0.63	0.0%	1.02	1.01	1.0%
1122002005	11/4/2018	1.06	1.07	0.9%	2.02	2.03	0.5%
1122002023	11/4/2018	0.89	0.9	1.1%	2.14	2.05	4.3%
1122002030	11/4/2018	0.97	0.97	0.0%	2.16	2.11	2.3%
1122002108	11/4/2018	1.04	1.04	0.0%	2.38	2.38	0.0%
1122002156	11/4/2018	0.98	1.01	3.0%	2.27	2.21	2.7%
1123019032	11/4/2018	0.12	0.12	0.0%	1.4	1.42	1.4%
1122002128	11/6/2018	1.19	1.18	0.8%	2.19	2.25	2.7%
1122005005	11/6/2018	0.55	0.55	0.0%	0.33	0.31	6.3%
1122005035	11/6/2018	0.33	0.34	3.0%	0.88	0.9	2.2%
1122005215	11/6/2018	0.63	0.63	0.0%	1	0.98	2.0%
1122005218	11/6/2018	0.68	0.69	1.5%	0.76	0.81	6.4%
1232007430	11/6/2018	0.21	0.21	0.0%	2.52	2.51	0.4%
1232007496	11/6/2018	0.13	0.12	8.0%	2.52	2.52	0.0%
1232007526	11/6/2018	0.25	0.24	4.1%	2.53	2.52	0.4%
1122005086	11/7/2018	0.87	0.83	4.7%	1.21	1.24	2.4%
1122005109	11/7/2018	1.04	1.11	6.5%	0.89	0.9	1.1%
1123019014	11/7/2018	0.35	0.36	2.8%	3.71	3.75	1.1%
1123019049	11/7/2018	0.15	0.16	6.5%	1.28	1.23	4.0%
1123019058	11/7/2018	0.41	0.41	0.0%	2.93	3	2.4%
1123019065	11/7/2018	0.26	0.26	0.0%	2.54	2.54	0.0%
1123019137	11/7/2018	0.11	0.1	9.5%	1.02	1.05	2.9%
1123019146	11/7/2018	0.26	0.25	3.9%	2.14	2.12	0.9%
1123019155	11/7/2018	0.27	0.27	0.0%	2.94	2.93	0.3%
1123019174	11/7/2018	0.12	0.12	0.0%	2.44	2.28	6.8%
1122006001	11/8/2018	0.53	0.56	5.5%	0.86	0.88	2.3%
1122006202	11/8/2018	0.34	0.31	9.2%	1.04	0.99	4.9%
1123023006	11/8/2018	0.56	0.55	1.8%	2.71	2.68	1.1%
1123023030	11/8/2018	0.42	0.43	2.4%	2.23	2.14	4.1%
1123023113	11/8/2018	0.24	0.25	4.1%	0.78	0.78	0.0%
1123023129	11/8/2018	0.25	0.26	3.9%	2.07	2.22	7.0%
1123023132	11/8/2018	0.69	0.65	6.0%	2.66	2.73	2.6%
1123023152	11/8/2018	0.22	0.2	9.5%	0.84	0.87	3.5%
1123023183	11/8/2018	1.09	1.17	7.1%	1.53	1.46	4.7%
1123023212	11/8/2018	0.34	0.34	0.0%	0.61	0.61	0.0%
1232007316	11/8/2018	0.13	0.13	0.0%	3.71	3.99	7.3%
1232007520	11/8/2018	0.3	0.31	3.3%	2.27	2.19	3.6%
1122006017	11/9/2018	0.51	0.5	2.0%	0.83	0.83	0.0%
1122006031	11/9/2018	0.58	0.56	3.5%	0.29	0.25	14.8%
1122006037	11/9/2018	0.3	0.32	6.5%	1.51	1.49	1.3%
1122006072	11/9/2018	0.48	0.48	0.0%	1.2	1.19	0.8%
1123019164	11/9/2018	0.12	0.12	0.0%	2.77	2.79	0.7%
1123023037	11/9/2018	0.5	0.47	6.2%	0.51	0.43	17.0%
2136003018	11/9/2018	0.4	0.39	2.5%	0.2	0.2	0.0%
2136003072	11/9/2018	0.39	0.39	0.0%	0.28	0.28	0.0%
1122008005	11/11/2018	0.54	0.53	1.9%	0.53	0.48	9.9%
1122008018	11/11/2018	0.83	0.82	1.2%	2.05	2.02	1.5%
1122008035	11/11/2018	1.1	1.05	4.7%	2.93	2.8	4.5%
1122008123	11/11/2018	1.18	1.13	4.3%	1.53	1.54	0.7%
1122008170	11/11/2018	0.26	0.24	8.0%	1.54	1.47	4.7%
1122008195	11/11/2018	0.7	0.72	2.8%	0.93	0.97	4.2%
1122010122	11/11/2018	0.54	0.53	1.9%	1.74	1.7	2.3%
1122010127	11/11/2018	1.76	1.68	4.7%	2.54	2.62	3.1%
1122010236	11/11/2018	0.3	0.29	3.4%	3.31	3.25	1.8%
1122010255	11/11/2018	0.57	0.57	0.0%	3.4	3.49	2.6%
1122010289	11/11/2018	0.63	0.63	0.0%	1.45	1.53	5.4%

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Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1122010294	11/11/2018	1.05	1.03	1.9%	2.2	2.23	1.4%
1122010298	11/11/2018	0.52	0.53	1.9%	3.89	3.81	2.1%
1122010332	11/11/2018	0.18	0.17	5.7%	0.9	0.84	6.9%
1122007099	11/12/2018	1.13	1.19	5.2%	1.55	1.61	3.8%
1122007125	11/12/2018	0.37	0.37	0.0%	2.79	2.85	2.1%
1122007149	11/12/2018	0.88	0.85	3.5%	1.89	1.81	4.3%
1122010175	11/12/2018	0.42	0.4	4.9%	2.03	2.05	1.0%
1122010197	11/12/2018	1.05	1.04	1.0%	2.5	2.53	1.2%
1122010336	11/12/2018	0.3	0.29	3.4%	1.06	0.98	7.8%
1122012019	11/12/2018	0.28	0.27	3.6%	1.75	1.68	4.1%
1122012053	11/12/2018	0.07	0.07	0.0%	2.07	2.02	2.4%
1122012067	11/12/2018	0.31	0.32	3.2%	1.65	1.67	1.2%
1122012090	11/12/2018	0.33	0.33	0.0%	1.95	1.98	1.5%
1122010010	11/13/2018	0.41	0.42	2.4%	1.82	1.84	1.1%
1122010146	11/13/2018	0.62	0.58	6.7%	1.84	1.97	6.8%
1122010182	11/13/2018	0.26	0.28	7.4%	1.39	1.39	0.0%
1122010308	11/13/2018	0.48	0.49	2.1%	2.07	2.02	2.4%
1122010313	11/13/2018	0.38	0.38	0.0%	1.68	1.68	0.0%
1122008107	11/14/2018	0.38	0.36	5.4%	0.63	0.59	6.6%
1122008133	11/14/2018	1.1	1.12	1.8%	1.81	1.9	4.9%
1122008187	11/14/2018	1.1	1.12	1.8%	2.43	2.36	2.9%
1122008189	11/14/2018	0.86	0.85	1.2%	2.24	2.26	0.9%
1122009093	11/14/2018	0.76	0.76	0.0%	0.5	0.5	0.0%
1122009095	11/14/2018	0.62	0.64	3.2%	0.36	0.37	2.7%
1122009117	11/14/2018	0.57	0.56	1.8%	0.35	0.32	9.0%
1122009144	11/14/2018	0.55	0.53	3.7%	0.74	0.68	8.5%
1122009163	11/14/2018	0.46	0.48	4.3%	0.75	0.78	3.9%
1122012116	11/14/2018	0.29	0.28	3.5%	2.29	2.28	0.4%
1122012127	11/14/2018	0.23	0.23	0.0%	1.88	1.88	0.0%
1122012137	11/14/2018	0.28	0.3	6.9%	2.4	2.49	3.7%
1122012161	11/14/2018	0.36	0.36	0.0%	1.42	1.45	2.1%
1232007543	11/14/2018	0.41	0.4	2.5%	2.48	2.48	0.0%
1122007004	11/16/2018	0.77	0.77	0.0%	2.05	2.07	1.0%
1122007030	11/16/2018	1.39	1.37	1.4%	2.39	2.42	1.2%
1122009026	11/16/2018	0.25	0.27	7.7%	1	1.03	3.0%
1122009039	11/16/2018	0.95	0.95	0.0%	0.46	0.47	2.2%
1122009040	11/16/2018	1.09	1.09	0.0%	0.37	0.35	5.6%
1122009070	11/16/2018	0.17	0.16	6.1%	0.65	0.66	1.5%
1122009151	11/16/2018	0.22	0.22	0.0%	0.88	0.87	1.1%
1122009306	11/16/2018	0.14	0.14	0.0%	1.55	1.53	1.3%
1122011030	11/16/2018	0.56	0.55	1.8%	0.3	0.31	3.3%
1122011200	11/16/2018	0.65	0.66	1.5%	0.84	0.82	2.4%
1122012026	11/16/2018	0.17	0.16	6.1%	2.69	2.56	5.0%
1122012147	11/16/2018	0.25	0.24	4.1%	1.21	1.25	3.3%
1122012165	11/16/2018	0.15	0.14	6.9%	0.96	0.97	1.0%
1122012168	11/16/2018	0.94	0.91	3.2%	1.59	1.5	5.8%
1231003049	11/16/2018	0.58	0.58	0.0%	1.1	1.12	1.8%
1231003059	11/16/2018	0.5	0.49	2.0%	1.68	1.73	2.9%
1231003090	11/16/2018	0.91	0.92	1.1%	1.16	1.12	3.5%
1231008018	11/16/2018	0.18	0.18	0.0%	1.5	1.51	0.7%
1231008116	11/16/2018	0.33	0.33	0.0%	3.05	3.02	1.0%
1231008268	11/16/2018	0.18	0.18	0.0%	2.85	2.94	3.1%
1231009086	11/16/2018	0.07	0.07	0.0%	3.44	3.19	7.5%
1231009091	11/16/2018	0.21	0.21	0.0%	2.92	2.86	2.1%
1231009175	11/16/2018	0.14	0.15	6.9%	2.75	2.71	1.5%
1122007011	11/17/2018	1.2	1.24	3.3%	2.54	2.64	3.9%
1122007060	11/17/2018	1.15	1.13	1.8%	2.37	2.31	2.6%
1122007079	11/17/2018	0.62	0.59	5.0%	1.39	1.38	0.7%
1122009001	11/17/2018	0.5	0.5	0.0%	0.76	0.8	5.1%
1122009020	11/17/2018	1.18	1.27	7.3%	0.4	0.43	7.2%
1231008009	11/17/2018	0.16	0.16	0.0%	0.77	0.75	2.6%
1231008174	11/17/2018	0.04	0.04	0.0%	2.36	2.34	0.9%
1122014150	11/18/2018	0.2	0.21	4.9%	2.76	2.71	1.8%
1122014166	11/18/2018	0.53	0.52	1.9%	1.87	1.78	4.9%
1122016080	11/18/2018	0.46	0.46	0.0%	1.71	1.69	1.2%
1122014028	11/19/2018	0.2	0.2	0.0%	1.64	1.59	3.1%
1122014111	11/19/2018	0.33	0.34	3.0%	2.41	2.45	1.6%
1122014114	11/19/2018	0.27	0.28	3.6%	3.09	3.01	2.6%
1122014185	11/19/2018	0.16	0.15	6.5%	2.67	2.7	1.1%
1122016021	11/19/2018	0.45	0.47	4.3%	1.25	1.29	3.1%
1122016032	11/19/2018	0.5	0.5	0.0%	2.31	2.43	5.1%
1122016047	11/19/2018	0.17	0.18	5.7%	1.29	1.32	2.3%
1122016069	11/19/2018	0.28	0.28	0.0%	1.36	1.41	3.6%
1122016117	11/19/2018	0.36	0.33	8.7%	1.68	1.62	3.6%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1122016151	11/19/2018	0.16	0.17	6.1%	1.02	1.07	4.8%
1122016157	11/19/2018	0.26	0.27	3.8%	1.25	1.22	2.4%
1122016169	11/19/2018	0.18	0.18	0.0%	0.71	0.73	2.8%
1231003031	11/19/2018	0.17	0.17	0.0%	0.96	0.97	1.0%
1231003078	11/19/2018	0.42	0.4	4.9%	1.89	1.85	2.1%
1231003237	11/19/2018	0.07	0.08	13.3%	5.24	5.27	0.6%
1231003320	11/19/2018	0.74	0.74	0.0%	1.28	1.31	2.3%
1231003366	11/19/2018	0.51	0.51	0.0%	1.92	1.93	0.5%
1231008335	11/19/2018	0.34	0.33	3.0%	2.48	2.5	0.8%
1231008360	11/19/2018	0.29	0.29	0.0%	2.86	2.95	3.1%
1122011018	11/20/2018	0.43	0.42	2.4%	0.51	0.49	4.0%
1122011101	11/20/2018	0.46	0.45	2.2%	0.7	0.67	4.4%
1122011126	11/20/2018	0.5	0.5	0.0%	0.28	0.26	7.4%
1122011129	11/20/2018	0.61	0.61	0.0%	0.27	0.31	13.8%
1122011147	11/20/2018	0.58	0.61	5.0%	0.07	0.07	0.0%
1122011187	11/20/2018	0.49	0.5	2.0%	0.42	0.44	4.7%
1122014664	11/20/2018	0.32	0.33	3.1%	2.37	2.42	2.1%
1122015207	11/20/2018	0.35	0.36	2.8%	0.61	0.65	6.3%
1122016010	11/20/2018	0.66	0.64	3.1%	0.29	0.28	3.5%
1122016142	11/20/2018	0.63	0.64	1.6%	0.55	0.51	7.5%
1231003274	11/20/2018	0.98	1	2.0%	1.37	1.29	6.0%
1231003364	11/20/2018	0.9	0.88	2.2%	2.17	2.21	1.8%
1231008243	11/20/2018	0.19	0.18	5.4%	2.99	3.07	2.6%
1122011122	11/21/2018	0.63	0.62	1.6%	0.41	0.4	2.5%
1230010172	11/21/2018	0.05	0.05	0.0%	1.91	1.89	1.1%
1230010181	11/21/2018	0.04	0.04	0.0%	1.75	1.66	5.3%
1230010224	11/21/2018	0.13	0.14	7.4%	1.46	1.5	2.7%
1230010241	11/21/2018	0.78	0.79	1.3%	2.81	2.77	1.4%
1122014009	11/23/2018	0.44	0.44	0.0%	2.62	2.54	3.1%
1122014197	11/23/2018	0.99	1	1.0%	1.48	1.47	0.7%
1122015003	11/23/2018	0.98	0.1	163.0%	0.13	0.12	8.0%
1122015103	11/23/2018	0.66	0.66	0.0%	0.63	0.59	6.6%
1122015108	11/23/2018	2.59	2.55	1.6%	1.05	1.04	1.0%
1122015164	11/23/2018	1.41	1.43	1.4%	0.49	0.49	0.0%
1122015174	11/23/2018	0.79	0.77	2.6%	0.71	0.71	0.0%
1122015033	11/26/2018	0.55	0.55	0.0%	0.51	0.54	5.7%
1122015152	11/26/2018	0.71	0.72	1.4%	0.51	0.5	2.0%
1122015193	11/26/2018	0.9	0.93	3.3%	0.51	0.52	1.9%
1122015212	11/26/2018	0.62	0.62	0.0%	0.45	0.41	9.3%
1122018005	11/26/2018	0.22	0.22	0.0%	1.05	1.05	0.0%
1122018012	11/26/2018	0.15	0.14	6.9%	1.4	1.37	2.2%
1122018029	11/26/2018	0.12	0.12	0.0%	1.73	1.77	2.3%
1122018106	11/26/2018	0.13	0.13	0.0%	0.82	0.83	1.2%
1122018125	11/26/2018	0.14	0.15	6.9%	1.15	1.13	1.8%
1122018132	11/26/2018	0.2	0.19	5.1%	1.13	1.15	1.8%
1122018165	11/26/2018	0.22	0.23	4.4%	1.6	1.55	3.2%
1122018189	11/26/2018	0.49	0.47	4.2%	1.87	1.83	2.2%
1122018210	11/26/2018	0.44	0.44	0.0%	2.76	2.59	6.4%
1122018213	11/26/2018	0.43	0.44	2.3%	1.8	1.74	3.4%
1230010286	11/26/2018	0.17	0.17	0.0%	2.24	2.33	3.9%
1230010328	11/26/2018	0.18	0.19	5.4%	1.51	1.5	0.7%
1230010345	11/26/2018	0.18	0.19	5.4%	1.15	1.13	1.8%
1230010402	11/26/2018	0.22	0.2	9.5%	1.23	1.16	5.9%
1230010408	11/26/2018	0.39	0.39	0.0%	0.63	0.68	7.6%
1230010436	11/26/2018	0.13	0.12	8.0%	0.67	0.66	1.5%
1230010460	11/26/2018	0.06	0.05	18.2%	1.83	1.8	1.7%
1230010466	11/26/2018	0.13	0.13	0.0%	1.22	1.19	2.5%
1230010495	11/26/2018	0.25	0.23	8.3%	1.93	1.87	3.2%
1231008040	11/26/2018	0.23	0.22	4.4%	3.03	2.98	1.7%
1231008046	11/26/2018	0.2	0.2	0.0%	2.6	2.63	1.1%
1231008057	11/26/2018	0.19	0.19	0.0%	3.67	3.6	1.9%
1231008078	11/26/2018	0.3	0.3	0.0%	4.19	4.29	2.4%
1231008101	11/26/2018	0.19	0.18	5.4%	2.73	2.76	1.1%
1231008165	11/26/2018	0.18	0.17	5.7%	2.84	2.76	2.9%
1231008183	11/26/2018	0.16	0.15	6.5%	3.37	3.19	5.5%
1231008277	11/26/2018	0.11	0.11	0.0%	3.13	3.1	1.0%
1231008339	11/26/2018	0.27	0.28	3.6%	2.68	2.69	0.4%
1231009024	11/26/2018	0.32	0.33	3.1%	2.95	2.86	3.1%
1231009158	11/26/2018	0.05	0.05	0.0%	2.79	2.67	4.4%
1231009212	11/26/2018	0.15	0.15	0.0%	2.61	2.55	2.3%
1231009214	11/26/2018	0.19	0.18	5.4%	2.91	2.87	1.4%
1122001016	11/29/2018	0.22	0.22	0.0%	1.79	1.76	1.7%
1122001025	11/29/2018	0.51	0.52	1.9%	1.94	2	3.0%
1122001109	11/29/2018	0.35	0.34	2.9%	1.72	1.72	0.0%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1122001126	11/29/2018	0.97	0.99	2.0%	2.1	2.11	0.5%
1122018172	11/29/2018	0.18	0.18	0.0%	1.94	1.97	1.5%
1122019056	11/29/2018	0.5	0.49	2.0%	1.26	1.21	4.0%
1122019175	11/29/2018	0.47	0.48	2.1%	1.78	1.75	1.7%
1122019215	11/29/2018	0.21	0.21	0.0%	4.15	4.01	3.4%
1122020011	11/29/2018	0.65	0.68	4.5%	0.94	1	6.2%
1122020021	11/29/2018	0.2	0.22	9.5%	0.78	0.81	3.8%
1122020117	11/29/2018	0.75	0.74	1.3%	1.14	1.15	0.9%
1122020164	11/29/2018	0.35	0.33	5.9%	0.65	0.63	3.1%
1230010006	11/29/2018	0.49	0.48	2.1%	0.9	0.83	8.1%
1230010026	11/29/2018	0.24	0.24	0.0%	1.5	1.53	2.0%
1230010053	11/29/2018	0.28	0.28	0.0%	1.36	1.42	4.3%
1230010061	11/29/2018	0.7	0.7	0.0%	1.01	1.02	1.0%
1231008216	11/29/2018	0.11	0.11	0.0%	3.29	3.18	3.4%
1231008323	11/29/2018	0.17	0.18	5.7%	3.14	3.17	1.0%
1231009076	11/29/2018	0.09	0.09	0.0%	2.09	2.19	4.7%
1231009220	11/29/2018	0.52	0.53	1.9%	2.41	2.36	2.1%
1231009289	11/29/2018	0.35	0.35	0.0%	3.38	3.34	1.2%
2136006012	11/29/2018	0.35	0.36	2.8%	0.37	0.37	0.0%
2136006054	11/29/2018	0.25	0.24	4.1%	0.09	0.09	0.0%
2136006088	11/29/2018	0.04	0.04	0.0%	0.02	0.02	0.0%
2136006110	11/29/2018	0.44	0.45	2.2%	0.06	0.06	0.0%
2136006136	11/29/2018	0.26	0.27	3.8%	0.08	0.08	0.0%
2136006166	11/29/2018	0.3	0.3	0.0%	0.97	1.02	5.0%
1122019014	12/1/2018	0.43	0.44	2.3%	1.32	1.3	1.5%
1122019026	12/1/2018	0.29	0.28	3.5%	1.64	1.64	0.0%
1122019052	12/1/2018	0.17	0.17	0.0%	1.1	1.13	2.7%
1122019155	12/1/2018	0.19	0.19	0.0%	2.19	2.19	0.0%
2136004078	12/1/2018	0.26	0.27	3.8%	0.14	0.14	0.0%
1122019071	12/2/2018	0.17	0.18	5.7%	1.33	1.35	1.5%
1122019089	12/2/2018	0.68	0.7	2.9%	1.45	1.49	2.7%
1122019094	12/2/2018	0.25	0.24	4.1%	1.22	1.21	0.8%
1122019100	12/2/2018	0.24	0.24	0.0%	2.47	2.58	4.4%
1122019112	12/2/2018	0.2	0.19	5.1%	1.02	1.02	0.0%
1122019122	12/2/2018	0.18	0.19	5.4%	1.69	1.58	6.7%
1122019130	12/2/2018	0.2	0.21	4.9%	1.12	1.16	3.5%
1122019140	12/2/2018	0.25	0.26	3.9%	2.08	2.04	1.9%
1122019160	12/2/2018	0.3	0.31	3.3%	2.16	2.09	3.3%
1122019254	12/2/2018	0.85	0.87	2.3%	1.78	1.73	2.8%
2136004178	12/2/2018	0.49	0.48	2.1%	0.01	0.01	0.0%
2136004242	12/2/2018	0.49	0.49	0.0%	0.02	0.02	0.0%
1122019244	12/5/2018	0.43	0.43	0.0%	1.98	1.99	0.5%
1122021016	12/5/2018	0.31	0.31	0.0%	2.12	2.16	1.9%
1122021030	12/5/2018	1.34	1.34	0.0%	2.1	2.08	1.0%
1122021037	12/5/2018	0.38	0.4	5.1%	2.16	2.16	0.0%
2136001022	12/5/2018	0.22	0.22	0.0%	0.2	0.19	5.1%
2136001030	12/5/2018	0.19	0.19	0.0%	0.31	0.3	3.3%
2136001038	12/5/2018	0.41	0.41	0.0%	0.11	0.1	9.5%
2136001056	12/5/2018	0.23	0.24	4.3%	0.11	0.1	9.5%
2136001064	12/5/2018	0.19	0.2	5.1%	0.21	0.22	4.7%
2136001094	12/5/2018	0.29	0.27	7.1%	0.09	0.09	0.0%
1122019024	12/6/2018	0.31	0.32	3.2%	2.5	2.56	2.4%
1122019063	12/6/2018	0.5	0.48	4.1%	1.95	1.93	1.0%
2136004070	12/6/2018	0.35	0.35	0.0%	0.18	0.17	5.7%
2136004110	12/6/2018	0.47	0.47	0.0%	0.42	0.41	2.4%
2136004202	12/6/2018	0.5	0.51	2.0%	0.02	0.02	0.0%
2136004254	12/6/2018	0.55	0.55	0.0%	0.03	0.03	0.0%
2136004258	12/6/2018	0.27	0.26	3.8%	0.57	0.55	3.6%
2136004316	12/6/2018	0.24	0.24	0.0%	0.05	0.05	0.0%
1121009053	12/8/2018	1.05	1.05	0.0%	1.95	1.95	0.0%
1121009075	12/8/2018	1.13	1.1	2.7%	1.72	1.71	0.6%
2136005084	12/8/2018	0.08	0.09	11.8%	0.27	0.28	3.6%
1231008312	12/9/2018	0.12	0.12	0.0%	2.4	2.35	2.1%
1231009065	12/9/2018	0.24	0.24	0.0%	1.73	1.7	1.7%
1231009101	12/9/2018	0.12	0.13	8.0%	1.99	2.02	1.5%
1231009181	12/9/2018	0.17	0.17	0.0%	1.98	2.01	1.5%
1231009282	12/9/2018	0.13	0.12	8.0%	1.74	1.71	1.7%
1231010005	12/9/2018	0.1	0.11	9.5%	2.91	2.85	2.1%
1231010038	12/9/2018	0.14	0.15	6.9%	2.07	2.29	10.1%
1231010068	12/9/2018	0.19	0.19	0.0%	2.74	2.81	2.5%
1231010069	12/9/2018	0.13	0.13	0.0%	2.58	2.52	2.4%
1231010075	12/9/2018	0.09	0.09	0.0%	3.27	3.25	0.6%
1231010084	12/9/2018	0.42	0.42	0.0%	1.87	1.91	2.1%
1231010100	12/9/2018	0.19	0.19	0.0%	2.74	2.77	1.1%

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Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1231010116	12/9/2018	0.28	0.28	0.0%	2.07	2.07	0.0%
1231010133	12/9/2018	0.19	0.2	5.1%	2.21	2.23	0.9%
1231010160	12/9/2018	0.21	0.2	4.9%	1.85	1.91	3.2%
2136001122	12/10/2018	0.5	0.51	2.0%	0.32	0.31	3.2%
2136001132	12/10/2018	0.12	0.12	0.0%	0.19	0.19	0.0%
2136001136	12/10/2018	0.27	0.27	0.0%	0.03	0.03	0.0%
1121009016	12/12/2018	0.82	0.81	1.2%	1.3	1.29	0.8%
1121009017	12/12/2018	0.45	0.45	0.0%	1.08	1.08	0.0%
1121009034	12/12/2018	1.07	1.07	0.0%	2.01	2.03	1.0%
1121009036	12/12/2018	1.04	1.03	1.0%	1.91	1.92	0.5%
1121009042	12/12/2018	0.7	0.69	1.4%	1.53	1.55	1.3%
1121009046	12/12/2018	0.48	0.47	2.1%	3.07	3.07	0.0%
1121009094	12/12/2018	1.09	1.09	0.0%	2.48	2.53	2.0%
1121009134	12/12/2018	0.44	0.4	9.5%	2.64	2.72	3.0%
1122020027	12/12/2018	0.62	0.61	1.6%	1.24	1.21	2.4%
1122020034	12/12/2018	1.02	1.01	1.0%	1.54	1.52	1.3%
1122020103	12/12/2018	1.11	1.12	0.9%	1.5	1.45	3.4%
1122020106	12/12/2018	0.7	0.7	0.0%	1.67	1.64	1.8%
1122020154	12/12/2018	0.92	0.94	2.2%	1.67	1.72	2.9%
1122020201	12/12/2018	1.01	0.99	2.0%	1.11	1.13	1.8%
1122021009	12/12/2018	0.13	0.13	0.0%	3.27	3.26	0.3%
1122021120	12/12/2018	0.52	0.51	1.9%	1.87	1.93	3.2%
1122021129	12/12/2018	0.43	0.43	0.0%	2.83	2.84	0.4%
1122021145	12/12/2018	0.1	0.11	9.5%	2.45	2.41	1.6%
1122021163	12/12/2018	0.7	0.71	1.4%	1.77	1.78	0.6%
1122021173	12/12/2018	0.24	0.25	4.1%	2.2	2.09	5.1%
2136006178	12/12/2018	0.34	0.35	2.9%	0.39	0.4	2.5%
2136006180	12/12/2018	0.46	0.47	2.2%	0.32	0.32	0.0%
1121001038	12/14/2018	0.71	0.63	11.9%	0.59	0.59	0.0%
1121001046	12/14/2018	0.57	0.69	19.0%	0.51	0.5	2.0%
1121001066	12/14/2018	0.39	0.4	2.5%	0.67	0.66	1.5%
1121001085	12/14/2018	0.18	0.18	0.0%	0.85	0.84	1.2%
1121001090	12/14/2018	0.62	0.64	3.2%	1.58	1.54	2.6%
1121001109	12/14/2018	0.96	0.95	1.0%	1.07	1.01	5.8%
1121001134	12/14/2018	0.19	0.19	0.0%	1.12	1.02	9.3%
1121001142	12/14/2018	0.16	0.17	6.1%	0.66	0.69	4.4%
1121001216	12/14/2018	0.2	0.21	4.9%	1.07	1.08	0.9%
1121001227	12/14/2018	0.21	0.22	4.7%	1.25	1.32	5.4%
1121002043	12/14/2018	0.69	0.68	1.5%	1.94	1.9	2.1%
1121002054	12/14/2018	0.82	0.83	1.2%	0.58	0.58	0.0%
1121002079	12/14/2018	0.46	0.46	0.0%	0.49	0.46	6.3%
1121002080	12/14/2018	0.44	0.45	2.2%	1.08	1.09	0.9%
1121009173	12/14/2018	1.03	1.03	0.0%	1.81	1.78	1.7%
1122020001	12/15/2018	0.97	0.94	3.1%	1.87	1.77	5.5%
1122020171	12/15/2018	0.73	0.74	1.4%	0.46	0.48	4.3%
1122020181	12/15/2018	0.79	0.79	0.0%	0.41	0.4	2.5%
1121001073	12/16/2018	0.63	0.59	6.6%	1.54	1.63	5.7%
1121001118	12/16/2018	0.25	0.24	4.1%	0.93	0.91	2.2%
1121001156	12/16/2018	0.28	0.28	0.0%	0.6	0.6	0.0%
1121001174	12/16/2018	0.38	0.36	5.4%	1.69	1.69	0.0%
1121001253	12/16/2018	0.19	0.28	38.3%	3.82	3.61	5.7%
1121003078	12/16/2018	0.86	0.87	1.2%	2.03	2.05	1.0%
2136004010	12/16/2018	0.18	0.17	5.7%	0.09	0.09	0.0%
2136005094	12/16/2018	0.07	0.06	15.4%	0.11	0.1	9.5%
2136005146	12/16/2018	0.63	0.44	35.5%	0.04	0.03	28.6%
1121001182	12/17/2018	0.09	0.1	10.5%	1.44	1.48	2.7%
1121001186	12/17/2018	0.3	0.3	0.0%	6.65	6.68	0.5%
1121003088	12/17/2018	0.59	0.6	1.7%	2.45	2.44	0.4%
1121001005	12/18/2018	0.46	0.45	2.2%	0.54	0.57	5.4%
1121001013	12/18/2018	0.61	0.61	0.0%	0.86	0.87	1.2%
1121001201	12/18/2018	0.12	0.12	0.0%	1.69	1.71	1.2%
1121003056	12/18/2018	0.11	0.11	0.0%	2.52	2.49	1.2%
1121001052	12/19/2018	0.42	0.41	2.4%	1.95	1.92	1.6%
1232008071	12/20/2018	0.38	0.37	2.7%	2.07	2.07	0.0%
2136004044	12/20/2018	0.2	0.2	0.0%	0.42	0.44	4.7%
2136004050	12/20/2018	0.43	0.45	4.5%	0.16	0.16	0.0%
2136005114	12/20/2018	0.33	0.33	0.0%	0.16	0.16	0.0%
1121003019	12/21/2018	0.39	0.4	2.5%	1.29	1.24	4.0%
1121003025	12/21/2018	0.03	0.03	0.0%	4.11	4.16	1.2%
1121003059	12/21/2018	0.08	0.08	0.0%	2.29	2.38	3.9%
1121003062	12/21/2018	0.76	0.77	1.3%	2.01	2.04	1.5%
1121003095	12/21/2018	0.34	0.34	0.0%	2.4	2.38	0.8%
1121003098	12/21/2018	0.9	0.89	1.1%	2.77	2.78	0.4%
1121003127	12/21/2018	0.12	0.12	0.0%	2.71	2.62	3.4%

APPENDIX A-1: CARBON AND SULFUR DUPLICATE DATA FROM RAINY RIVER MINE ONSITE LECO FACILITY

Sample Site Name	Sanple Date	Total Carbon (wt.%)[1]	Total Carbon Duplicate (wt. %)	Carbon Relative Percent Difference (RPD)	Total Sulfur (wt.%)	Total Sulfur Duplicate (wt.%)	Sulfur Relative Percent Difference (RPD)
1121003138	12/21/2018	0.8	0.66	19.2%	2.52	2.12	17.2%
1232008036	12/21/2018	0.51	0.51	0.0%	1.48	1.48	0.0%
1232008093	12/21/2018	0.14	0.15	6.9%	1.82	1.83	0.5%
1232008102	12/21/2018	0.52	0.52	0.0%	1.82	1.85	1.6%
1121003159	12/24/2018	0.98	0.96	2.1%	2.01	1.97	2.0%
1232008121	12/24/2018	0.49	0.47	4.2%	2.31	2.17	6.3%
1232008177	12/24/2018	0.35	0.37	5.6%	1.43	1.46	2.1%
1232008179	12/24/2018	0.37	0.37	0.0%	2.28	2.28	0.0%
2136005072	12/24/2018	0.45	0.47	4.3%	0.12	0.12	0.0%
1231011039	12/26/2018	0.68	0.63	7.6%	0.76	0.75	1.3%
1231011066	12/26/2018	0.06	0.07	15.4%	0.56	0.58	3.5%
1231011079	12/26/2018	0.39	0.38	2.6%	0.99	1	1.0%
1231011120	12/26/2018	0.08	0.08	0.0%	3.32	3.28	1.2%
1231011187	12/26/2018	0.02	0.02	0.0%	0.72	0.69	4.3%
1232008058	12/26/2018	0.69	0.67	2.9%	1.81	1.77	2.2%
2136007052	12/26/2018	0.34	0.34	0.0%	0.21	0.2	4.9%
2136007072	12/26/2018	0.48	0.5	4.1%	0.04	0.04	0.0%
1231011105	12/27/2018	0.15	0.15	0.0%	0.94	0.96	2.1%
1231011108	12/27/2018	0.05	0.05	0.0%	0.44	0.44	0.0%
1231011160	12/27/2018	0.06	0.06	0.0%	1.9	1.9	0.0%
1231011216	12/27/2018	0.11	0.11	0.0%	1.2	1.15	4.3%
1231011232	12/27/2018	0.03	0.03	0.0%	2.45	2.43	0.8%
1231011248	12/27/2018	0.02	0.02	0.0%	0.93	0.92	1.1%
1231011251	12/27/2018	0.08	0.09	11.8%	1.48	1.51	2.0%
1232008164	12/27/2018	0.23	0.23	0.0%	1.46	1.44	1.4%
2136007090	12/27/2018	0.2	0.2	0.0%	0.1	0.1	0.0%
1121004004	12/28/2018	0.18	0.18	0.0%	2.26	2.26	0.0%
1121004009	12/28/2018	0.29	0.28	3.5%	2.52	2.54	0.8%
1231011281	12/28/2018	0.08	0.06	28.6%	1.23	1.2	2.5%
1231011298	12/28/2018	0.03	0.03	0.0%	2.2	2.16	1.8%
1231011320	12/28/2018	0.02	0.02	0.0%	2.21	2.29	3.6%
1231011341	12/28/2018	0.01	0.04	120.0%	2.99	3	0.3%
1231011358	12/28/2018	0.01	0.02	66.7%	1.92	1.95	1.6%
1231011379	12/28/2018	0.03	0.03	0.0%	1.16	1.17	0.9%
1231011402	12/28/2018	0.12	0.12	0.0%	2.47	2.45	0.8%
1121004029	12/29/2018	0.18	0.19	5.4%	3.09	2.96	4.3%
1121004032	12/29/2018	0.15	0.14	6.9%	3.07	3.17	3.2%
1121004090	12/29/2018	0.24	0.26	8.0%	2.18	2.19	0.5%
1232008024	12/29/2018	0.16	0.17	6.1%	1.33	1.35	1.5%
1232008133	12/29/2018	0.26	0.24	8.0%	2.15	2.13	0.9%
1232008136	12/29/2018	0.34	0.34	0.0%	1.3	1.27	2.3%
2136007020	12/29/2018	0.42	0.42	0.0%	0.46	0.33	32.9%
2136007112	12/29/2018	0.27	0.24	11.8%	0.15	0.13	14.3%
1121004027	12/30/2018	0.16	0.16	0.0%	2.49	2.51	0.8%
1121004072	12/30/2018	0.3	0.3	0.0%	1.83	1.82	0.5%
1121004107	12/30/2018	0.09	0.09	0.0%	2.33	2.32	0.4%
1121004116	12/31/2018	0.22	0.23	4.4%	2.61	2.52	3.5%
1121004118	12/31/2018	0.18	0.11	48.3%	1.44	1.49	3.4%
1121004708	12/31/2018	0.4	0.41	2.5%	2.2	2.17	1.4%
2136007138	12/31/2018	0.22	0.21	4.7%	0.07	0.07	0.0%

[1]wt. % = weight percent

APPENDIX A-2

2018 ABA AUDIT DATA

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APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1129050022	1/6/2018	0.03	2.29	2.50	71.56	0.03	0.19	2.35	0.00	73.44	0.00	6	72.5	0.08
1130057523	1/25/2018	0.03	0.26	2.50	8.13	0.31	0.11	0.27	0.00	8.44	0.00	3	8.4	0.36
1130057624	1/27/2018	0.01	2.03	0.83	63.44	0.01	0.11	2.01	0.00	62.81	0.00	2	51.3	0.04
1130057906	1/27/2018	0.01	2.57	0.83	80.31	0.01	0.08	2.5	0.00	78.13	0.00	3	71.3	0.04
1131065736	1/18/2018	0.18	2.81	15.01	87.81	0.17	0.14	2.57	0.00	80.31	0.00	6	81.9	0.07
1131065794	1/18/2018	0.01	0.13	0.42	4.06	0.10	0.18	0.22	0.00	6.88	0.00	1	5.6	0.18
1131066263	2/6/2018	0.06	1.93	5.00	60.31	0.08	0.12	1.84	0.00	57.50	0.00	4	52.8	0.08
1131066325	2/6/2018	0.14	1.41	11.68	44.06	0.26	0.19	1.42	0.00	44.38	0.00	6	42.5	0.14
1131066347	2/6/2018	0.18	1.04	15.01	32.50	0.46	0.51	1.04	0.00	32.50	0.00	18	28.1	0.64
1131066377	2/6/2018	0.10	2.64	8.34	82.50	0.10	0.39	2.67	0.00	83.44	0.00	11	73.8	0.15
1131066378	2/6/2018	0.12	2.09	10.01	65.31	0.15	0.48	1.94	0.00	60.63	0.00	13	62.2	0.21
1131066416	2/6/2018	0.03	1.83	2.50	57.19	0.04	0.07	1.74	0.00	54.38	0.00	4	56.3	0.07
1131068039	2/11/2018	0.02	0.18	1.67	5.63	0.30	0.1	0.19	0.00	5.94	0.00	3	5.9	0.51
1131069006	2/16/2018	0.14	0.95	11.68	29.69	0.39	0.51	0.98	0.00	30.63	0.00	11	28.1	0.39
1131069105	2/16/2018	0.12	0.49	10.01	15.31	0.65	0.92	0.49	15.17	15.31	0.99	12	16.3	0.74
1131069001	2/17/2018	0.24	4.43	20.02	138.44	0.14	0.73	4.15	8.11	129.69	0.06	22	139.1	0.16
1131069047	2/17/2018	0.14	0.29	11.68	9.06	1.29	0.55	0.29	1.43	9.06	0.16	9	8.8	1.03
1131069087	2/17/2018	0.13	0.41	10.84	12.81	0.85	0.41	0.42	0.00	13.13	0.00	7	13.4	0.52
1130094001	3/18/2018	0.14	2.03	11.68	63.44	0.18	0.14	1.89	0.00	59.06	0.00	6	59.4	0.1
1130094016	3/18/2018	0.08	1.52	6.67	47.50	0.14	0.13	1.46	0.00	45.63	0.00	6	44.7	0.13
1131072036	3/30/2018	0.06	1.21	5.00	37.81	0.13	0.05	1.28	0.00	40.00	0.00	1	40	0.03
1131072046	3/30/2018	0.23	1.68	19.18	52.50	0.37	0.56	1.65	1.80	51.56	0.03	15	51.3	0.29
1131072075	3/30/2018	0.07	1.46	5.84	45.63	0.13	0.25	1.4	0.00	43.75	0.00	6	42.8	0.14
1131072124	3/30/2018	0.37	1.52	30.86	47.50	0.65	0.69	1.5	6.63	46.88	0.14	25	45.6	0.55
1230001133	4/6/2018	0.04	1.80	3.34	56.25	0.06	0.09	1.75	0.00	54.69	0.00	3	53.8	0.06
1230001041	4/7/2018	0.20	2.13	16.68	66.56	0.25	0.49	2.05	0.00	64.06	0.00	17	65.3	0.26
1230001077	4/7/2018	0.38	0.89	31.69	27.81	1.14	1.08	0.9	21.11	28.13	0.75	35	27.2	1.29
1230001017	4/8/2018	0.35	0.64	29.19	20.00	1.46	1.51	0.63	37.08	19.69	1.88	34	18.8	1.81
1231001051	4/12/2018	0.10	2.19	8.34	68.44	0.12	0.24	2.19	0.00	68.44	0.00	8	66.3	0.12
1230003097	4/19/2018	0.09	1.71	7.51	53.44	0.14	0.7	1.85	7.00	57.81	0.12	13	57.2	0.23
1230003120	4/19/2018	0.14	1.13	11.68	35.31	0.33	0.96	1.12	16.65	35.00	0.48	16	35.6	0.45
1230003124	4/19/2018	0.29	2.12	24.19	66.25	0.37	0.55	2.01	1.43	62.81	0.02	25	61.6	0.41
1230003126	4/19/2018	0.10	2.07	8.34	64.69	0.13	0.5	2.05	0.00	64.06	0.00	11	66.3	0.17
1230003150	4/19/2018	0.10	1.48	8.34	46.25	0.18	0.74	1.58	8.48	49.38	0.17	14	48.4	0.29
1230003170	4/19/2018	0.16	1.03	13.34	32.19	0.41	0.97	0.98	17.03	30.63	0.56	16	33.1	0.48
1230003012	4/22/2018	0.03	2.12	2.50	66.25	0.04	0.17	2.15	0.00	67.19	0.00	7	68.8	0.1
1230003024	4/22/2018	0.13	1.40	10.84	43.75	0.25	0.77	1.54	9.60	48.13	0.20	13	43.4	0.3
1230003062	4/22/2018	0.22	2.59	18.35	80.94	0.23	1.27	2.73	28.17	85.31	0.33	26	77.5	0.34
1230003066	4/22/2018	0.24	2.55	20.02	79.69	0.25	0.92	2.35	15.17	73.44	0.21	26	75	0.35
1230003702	4/23/2018	0.20	1.38	16.68	43.13	0.39	1.35	1.58	31.14	49.38	0.63	24	43.8	0.55
1131065701	5/28/2018	0.26	2.53	21.68	79.06	0.27	0.46	2.44	0.00	76.25	0.00	22	77.2	0.29
1127014001	1/17/2018	0.38	0.73	31.69	22.81	1.39	1.97	0.87	54.17	27.19	1.99	49	23.8	2.06
1127014003	1/17/2018	0.56	0.50	46.70	15.63	2.99	2.3	0.5	66.42	15.63	4.25	53	14.7	3.61
1127014015	1/18/2018	1.26	1.87	105.08	58.44	1.80	3.61	1.9	115.08	59.38	1.94	146	58.4	2.5

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1127014054	1/18/2018	0.94	1.88	78.40	58.75	1.33	3.07	1.9	95.02	59.38	1.60	79	59.1	1.34
1127014103	1/18/2018	0.61	0.81	50.87	25.31	2.01	2.28	0.82	65.68	25.63	2.56	60	23.4	2.56
1127014112	1/18/2018	0.69	0.74	57.55	23.13	2.49	2.56	0.79	76.08	24.69	3.08	65	21.3	3.06
1127014406	1/17/2018	0.54	0.53	45.04	16.56	2.72	1.84	0.53	49.34	16.56	2.98	50	16.6	3.02
1127014425	1/17/2018	0.65	1.03	54.21	32.19	1.68	2.44	0.97	71.62	30.31	2.36	90	31.3	2.88
1127014514	1/17/2018	0.58	1.55	48.37	48.44	1.00	2.09	1.58	58.62	49.38	1.19	52	47.8	1.09
1127015007	1/17/2018	0.33	0.45	27.52	14.06	1.96	1.4	0.45	33.00	14.06	2.35	39	14.1	2.77
1127015008	1/17/2018	0.23	0.56	19.18	17.50	1.10	1.3	0.57	29.28	17.81	1.64	27	17.2	1.57
1127017101	1/21/2018	0.29	1.19	24.19	37.19	0.65	1.55	1.15	38.57	35.94	1.07	31	35	0.89
1127017102	1/21/2018	1.28	0.92	106.75	28.75	3.71	1.6	2.15	40.42	67.19	0.60	45	68.1	0.66
1127017119	1/21/2018	0.33	1.73	27.52	54.06	0.51	1.34	1.69	30.77	52.81	0.58	33	53.4	0.62
1128033101	1/23/2018	0.74	0.40	61.72	12.50	4.94	2.3	0.41	66.42	12.81	5.18	65	12.5	5.2
1128033153	1/23/2018	0.33	0.80	27.52	25.00	1.10	1.26	0.81	27.80	25.31	1.10	33	23.1	1.43
1128034006	1/20/2018	0.56	1.09	46.70	34.06	1.37	1.96	1.08	53.79	33.75	1.59	55	33.1	1.66
1128036002	1/31/2018	1.01	0.79	84.23	24.69	3.41	2.9	0.84	88.71	26.25	3.38	80	24.7	3.24
1128036037	1/31/2018	1.03	1.09	85.90	34.06	2.52	2.89	1.15	88.33	35.94	2.46	81	32.2	2.52
1128036039	1/30/2018	0.84	1.36	70.06	42.50	1.65	1.77	1.39	46.74	43.44	1.08	63	39.7	1.59
1128036061	1/31/2018	0.44	0.93	36.70	29.06	1.26	1.62	0.97	41.17	30.31	1.36	40	27.5	1.45
1128036069	1/30/2018	0.55	1.69	45.87	52.81	0.87	1.83	1.68	48.97	52.50	0.93	47	51.6	0.91
1128036071	1/30/2018	0.70	0.80	58.38	25.00	2.34	2.12	0.79	59.74	24.69	2.42	58	21.6	2.69
1128036099	1/31/2018	0.38	0.70	31.69	21.88	1.45	1.31	0.69	29.65	21.56	1.38	35	20.6	1.7
1128036220	1/30/2018	1.15	1.25	95.91	39.06	2.46	2.65	1.33	79.42	41.56	1.91	97	38.4	2.52
1129048015	1/17/2018	0.88	1.35	73.39	42.19	1.74	1.97	1.5	54.17	46.88	1.16	71	41.9	1.7
1129048021	1/17/2018	0.34	2.34	28.36	73.13	0.39	0.75	2.27	8.86	70.94	0.12	29	65.3	0.44
1129048035	1/18/2018	0.10	1.45	8.34	45.31	0.18	0.35	1.53	0.00	47.81	0.00	10	46.9	0.21
1129048036	1/18/2018	0.17	1.44	14.18	45.00	0.32	0.28	1.42	0.00	44.38	0.00	11	43.8	0.25
1129048065	1/17/2018	0.37	2.98	30.86	93.13	0.33	0.99	3.47	17.77	108.44	0.16	30	103.1	0.29
1129048086	1/18/2018	0.61	2.20	50.87	68.75	0.74	1.22	2.27	26.31	70.94	0.37	49	68.8	0.71
1129048401	1/18/2018	0.15	2.63	12.51	82.19	0.15	0.32	2.4	0.00	75.00	0.00	12	78.8	0.15
1129048406	1/18/2018	0.07	1.50	5.84	46.88	0.12	0.2	1.4	0.00	43.75	0.00	6	43.4	0.14
1129048511	1/18/2018	0.16	1.89	13.34	59.06	0.23	0.54	1.81	1.06	56.56	0.02	18	55	0.33
1129048518	1/18/2018	0.19	1.50	15.85	46.88	0.34	0.67	1.52	5.88	47.50	0.12	19	47.5	0.4
1129049074	1/17/2018	0.60	2.94	50.04	91.88	0.54	2.22	2.74	63.45	85.63	0.74	56	85.3	0.66
1129049245	1/18/2018	0.53	2.10	44.20	65.63	0.67	1.79	2.01	47.48	62.81	0.76	50	59.4	0.84
1129049250	1/18/2018	0.33	2.68	27.52	83.75	0.33	0.58	2.58	2.54	80.63	0.03	15	81.6	0.18
1129049413	1/18/2018	0.93	0.95	77.56	29.69	2.61	3.07	0.94	95.02	29.38	3.23	94	30.3	3.1
1129050030	1/19/2018	0.63	2.54	52.54	79.38	0.66	2.08	2.57	58.25	80.31	0.73	52	75.3	0.69
1129050500	1/19/2018	0.94	2.30	78.40	71.88	1.09	2.44	2.28	71.62	71.25	1.01	71	71.3	1
1129051034	1/25/2018	0.96	1.96	80.06	61.25	1.31	1.88	1.96	50.82	61.25	0.83	76	58.4	1.3
1129051419	1/24/2018	0.50	1.92	41.70	60.00	0.70	1.07	1.77	20.74	55.31	0.37	40	56.3	0.71
1129051511	1/25/2018	1.00	2.24	83.40	70.00	1.19	1.87	2.17	50.45	67.81	0.74	78	66.9	1.17
1129051526	1/24/2018	0.99	1.39	82.57	43.44	1.90	1.9	1.35	51.57	42.19	1.22	75	41.6	1.8
1131066220	2/6/2018	0.17	2.42	14.18	75.63	0.19	0.49	2.38	0.00	74.38	0.00	14	69.7	0.2
1131066239	2/6/2018	0.17	2.33	14.18	72.81	0.19	0.67	2.33	5.88	72.81	0.08	18	67.8	0.27

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1131066290	2/6/2018	0.23	1.23	19.18	38.44	0.50	0.79	1.28	10.34	40.00	0.26	24	38.8	0.62
1131066312	2/6/2018	0.18	1.66	15.01	51.88	0.29	0.67	1.6	5.88	50.00	0.12	16	50.9	0.31
1131066386	2/6/2018	0.21	1.43	17.51	44.69	0.39	0.58	1.46	2.54	45.63	0.06	20	40	0.5
1127019502	2/8/2018	0.49	0.19	40.87	5.94	6.88	1.48	0.17	35.97	5.31	6.77	43	5.6	7.64
1127019535	2/8/2018	0.30	0.66	25.02	20.63	1.21	0.98	0.66	17.40	20.63	0.84	31	21.3	1.46
1127019024	2/9/2018	0.47	2.19	39.20	68.44	0.57	1.44	2.17	34.48	67.81	0.51	42	63.1	0.67
1127019025	2/9/2018	0.50	0.41	41.70	12.81	3.25	1.57	0.43	39.31	13.44	2.93	43	13.8	3.13
1127019166	2/9/2018	0.38	0.34	31.69	10.63	2.98	1.23	0.36	26.68	11.25	2.37	37	9.7	3.82
1127019224	2/9/2018	0.42	0.39	35.03	12.19	2.87	1.23	0.42	26.68	13.13	2.03	38	14.1	2.7
1127019527	2/9/2018	0.23	0.65	19.18	20.31	0.94	0.8	0.64	10.71	20.00	0.54	26	22.2	1.17
1127019119	2/10/2018	0.76	0.94	63.38	29.38	2.16	2.17	1.01	61.59	31.56	1.95	62	29.1	2.13
1127019178	2/10/2018	0.87	1.18	72.56	36.88	1.97	2.9	1.21	88.71	37.81	2.35	79	36.9	2.14
1127022331	2/11/2018	1.13	0.92	94.24	28.75	3.28	2.39	1.02	69.76	31.88	2.19	80	29.7	2.69
1127022041	2/12/2018	0.39	0.57	32.53	17.81	1.83	1.36	0.6	31.51	18.75	1.68	41	18.1	2.26
1128039004	2/15/2018	0.33	2.14	27.52	66.88	0.41	0.61	2.24	3.66	70.00	0.05	24	66.6	0.36
1128039025	2/15/2018	0.34	2.33	28.36	72.81	0.39	0.57	2.39	2.17	74.69	0.03	23	78.1	0.29
1129053100	2/18/2018	1.01	1.06	84.23	33.13	2.54	2.45	1.1	71.99	34.38	2.09	81	35.3	2.29
1129053179	2/18/2018	0.34	1.09	28.36	34.06	0.83	1.71	1.17	44.51	36.56	1.22	36	40.9	0.88
1127021010	2/20/2018	0.34	0.74	28.36	23.13	1.23	1.16	0.74	24.08	23.13	1.04	36	24.1	1.5
1127021025	2/20/2018	0.47	0.50	39.20	15.63	2.51	1.36	0.53	31.51	16.56	1.90	45	15.9	2.82
1127021044	2/20/2018	0.46	1.16	38.36	36.25	1.06	1.45	1.21	34.85	37.81	0.92	43	37.2	1.16
1128040002	2/20/2018	0.35	1.31	29.19	40.94	0.71	1.15	1.37	23.71	42.81	0.55	32	42.8	0.75
1128040032	2/20/2018	0.75	1.56	62.55	48.75	1.28	1.46	1.58	35.22	49.38	0.71	61	48.1	1.27
1128040052	2/20/2018	0.70	1.70	58.38	53.13	1.10	1.41	1.64	33.37	51.25	0.65	59	53.1	1.11
1128040065	2/20/2018	0.72	1.68	60.05	52.50	1.14	1.46	1.77	35.22	55.31	0.64	59	57.2	1.03
1128040077	2/20/2018	0.32	2.15	26.69	67.19	0.40	0.69	2.1	6.63	65.63	0.10	27	68.4	0.39
1129057019	2/21/2018	0.60	1.97	50.04	61.56	0.81	1.96	1.91	53.79	59.69	0.90	54	61.9	0.87
1127023041	2/22/2018	0.43	1.08	35.86	33.75	1.06	1.69	1.13	43.77	35.31	1.24	42	35.6	1.18
1127023068	2/22/2018	0.74	1.02	61.72	31.88	1.94	2.46	1.11	72.36	34.69	2.09	65	33.8	1.93
1127023119	2/22/2018	0.76	1.13	63.38	35.31	1.79	2.5	1.16	73.85	36.25	2.04	67	35	1.91
1128040401	2/22/2018	1.16	2.82	96.74	88.13	1.10	2.36	2.76	68.65	86.25	0.80	98	85.9	1.14
1129057120	2/22/2018	0.60	0.54	50.04	16.88	2.97	1.92	0.59	52.31	18.44	2.84	53	19.4	2.74
1129057130	2/22/2018	0.50	1.32	41.70	41.25	1.01	1.52	1.43	37.45	44.69	0.84	41	43.8	0.94
1127023023	2/23/2018	0.36	0.59	30.02	18.44	1.63	1.28	0.66	28.54	20.63	1.38	36	18.4	1.95
1127023037	2/23/2018	0.48	1.11	40.03	34.69	1.15	1.7	1.17	44.14	36.56	1.21	46	33.8	1.36
1129057108	2/23/2018	0.84	2.25	70.06	70.31	1.00	1.85	2.21	49.71	69.06	0.72	66	68.8	0.96
1129057169	2/23/2018	0.67	1.27	55.88	39.69	1.41	2.02	1.3	56.02	40.63	1.38	57	40.3	1.41
1127023004	2/25/2018	0.56	0.59	46.70	18.44	2.53	1.67	0.65	43.02	20.31	2.12	47	18.8	2.51
1127024001	2/25/2018	0.61	1.31	50.87	40.94	1.24	2.13	1.37	60.11	42.81	1.40	54	40.3	1.34
1128039044	3/1/2018	1.48	2.09	123.43	65.31	1.89	2.66	2.14	79.79	66.88	1.19	122	68.4	1.78
1128039061	3/1/2018	0.91	1.97	75.89	61.56	1.23	2.1	1.8	58.99	56.25	1.05	63	60.6	1.04
1128039094	3/1/2018	0.16	3.11	13.34	97.19	0.14	0.48	3.01	0.00	94.06	0.00	14	98.4	0.14
1128039139	3/1/2018	1.27	2.42	105.92	75.63	1.40	2.44	2.5	71.62	78.13	0.92	100	79.4	1.26
1128036050	3/2/2018	0.91	0.84	75.89	26.25	2.89	2.45	0.79	71.99	24.69	2.92	78	25.3	3.08

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1126002174	3/5/2018	0.56	2.32	46.70	72.50	0.64	2.52	2.07	74.59	64.69	1.15	56	66.6	0.84
1126002186	3/5/2018	0.50	1.22	41.70	38.13	1.09	2.11	1.18	59.37	36.88	1.61	49	35.3	1.39
1126001005	3/7/2018	0.94	4.66	78.40	145.63	0.54	3.33	4.35	104.68	135.94	0.77	168	139.4	1.21
1128041108	3/7/2018	0.91	2.22	75.89	69.38	1.09	1.8	1.9	47.85	59.38	0.81	75	59.4	1.26
1128041006	3/8/2018	0.29	2.69	24.19	84.06	0.29	0.73	2.57	8.11	80.31	0.10	25	78.1	0.32
1128041016	3/8/2018	0.69	1.48	57.55	46.25	1.24	1.42	1.57	33.74	49.06	0.69	59	44.7	1.32
1128041031	3/8/2018	0.69	2.81	57.55	87.81	0.66	1.43	2.68	34.11	83.75	0.41	60	81.3	0.74
1128041036	3/8/2018	0.48	2.71	40.03	84.69	0.47	1.19	2.6	25.20	81.25	0.31	43	77.2	0.56
1128041137	3/9/2018	0.19	2.68	15.85	83.75	0.19	0.54	2.63	1.06	82.19	0.01	18	78.1	0.23
1127025301	3/17/2018	0.49	0.77	40.87	24.06	1.70	1.63	0.77	41.54	24.06	1.73	47	23.4	2.01
1127025302	3/17/2018	0.50	0.39	41.70	12.19	3.42	0.98	0.81	17.40	25.31	0.69	31	25.6	1.21
1127025304	3/17/2018	0.32	0.71	26.69	22.19	1.20	1.2	0.7	25.57	21.88	1.17	35	21.3	1.65
1127025311	3/17/2018	0.43	0.37	35.86	11.56	3.10	1.3	0.35	29.28	10.94	2.68	38	11.9	3.2
1127025342	3/17/2018	0.39	0.74	32.53	23.13	1.41	1.23	0.72	26.68	22.50	1.19	37	22.5	1.64
1127025345	3/17/2018	0.50	0.44	41.70	13.75	3.03	1.6	0.42	40.42	13.13	3.08	47	13.8	3.42
1127025350	3/17/2018	0.44	0.80	36.70	25.00	1.47	1.46	0.83	35.22	25.94	1.36	42	25.9	1.62
1127025405	3/17/2018	0.50	0.26	41.70	8.13	5.13	1.66	0.27	42.65	8.44	5.06	47	9.1	5.19
1127026012	3/17/2018	0.55	0.88	45.87	27.50	1.67	2.15	0.94	60.85	29.38	2.07	50	26.3	1.9
1127026021	3/17/2018	1.11	2.40	92.57	75.00	1.23	2.29	2.27	66.05	70.94	0.93	81	73.1	1.11
1127026068	3/17/2018	1.09	1.92	90.91	60.00	1.52	2.45	1.88	71.99	58.75	1.23	95	57.2	1.66
1127026174	3/17/2018	0.66	0.56	55.04	17.50	3.15	2.26	0.59	64.94	18.44	3.52	59	18.1	3.26
1126003045	3/18/2018	1.09	1.67	90.91	52.19	1.74	3.48	1.72	110.25	53.75	2.05	137	50.6	2.71
1126003068	3/18/2018	1.01	2.46	84.23	76.88	1.10	3.27	2.18	102.45	68.13	1.50	83	76.6	1.08
1126003079	3/18/2018	0.68	1.41	56.71	44.06	1.29	2.94	1.36	90.19	42.50	2.12	63	41.9	1.5
1126003032	3/21/2018	0.42	0.09	35.03	2.81	12.45	1.71	0.07	44.51	2.19	20.35	42	2.8	14.93
1128045003	3/21/2018	0.52	0.69	43.37	21.56	2.01	1.78	0.66	47.11	20.63	2.28	50	20.6	2.42
1128045010	3/21/2018	0.36	0.52	30.02	16.25	1.85	1.55	0.49	38.57	15.31	2.52	37	15.6	2.37
1128045063	3/21/2018	0.33	0.17	27.52	5.31	5.18	1.02	0.15	18.88	4.69	4.03	32	5	6.4
1128045071	3/21/2018	0.37	1.47	30.86	45.94	0.67	1.36	1.4	31.51	43.75	0.72	38	43.4	0.87
1128046120	3/21/2018	0.28	2.19	23.35	68.44	0.34	1.26	2.06	27.80	64.38	0.43	32	65	0.49
1128046133	3/21/2018	0.67	1.19	55.88	37.19	1.50	2.09	1.29	58.62	40.31	1.45	60	39.1	1.54
1128046140	3/21/2018	0.64	1.56	53.38	48.75	1.09	2.04	1.51	56.77	47.19	1.20	60	43.1	1.39
1128045017	3/23/2018	0.49	1.84	40.87	57.50	0.71	1.66	1.74	42.65	54.38	0.78	36	54.4	0.66
1128045020	3/23/2018	0.91	1.61	75.89	50.31	1.51	2.35	1.57	68.28	49.06	1.39	75	47.8	1.57
1128045023	3/23/2018	0.87	2.09	72.56	65.31	1.11	2.35	2.05	68.28	64.06	1.07	71	59.1	1.2
1128046101	3/23/2018	0.49	2.14	40.87	66.88	0.61	1.39	2.09	32.62	65.31	0.50	45	64.4	0.7
1127027010	3/30/2018	0.62	1.40	51.71	43.75	1.18	1.97	1.38	54.17	43.13	1.26	53	44.7	1.19
1127027138	3/30/2018	0.79	0.47	65.89	14.69	4.49	2.17	0.45	61.59	14.06	4.38	66	15.6	4.22
1127027186	3/30/2018	0.40	1.19	33.36	37.19	0.90	1.24	1.23	27.05	38.44	0.70	36	36.6	0.98
1127027187	3/30/2018	0.56	0.89	46.70	27.81	1.68	1.91	0.92	51.94	28.75	1.81	52	29.7	1.75
1127027205	3/30/2018	0.54	1.68	45.04	52.50	0.86	1.73	1.72	45.25	53.75	0.84	50	54.1	0.92
1128046021	3/30/2018	0.57	2.45	47.54	76.56	0.62	1.75	2.39	46.00	74.69	0.62	46	76.9	0.6
1128046038	3/30/2018	0.66	1.91	55.04	59.69	0.92	2.31	1.95	66.79	60.94	1.10	58	55.9	1.04
1128047001	3/31/2018	0.26	2.38	21.68	74.38	0.29	1.45	2.49	34.85	77.81	0.45	28	74.4	0.38

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1128047058	3/31/2018	0.21	1.69	17.51	52.81	0.33	1.48	1.71	35.97	53.44	0.67	28	53.8	0.52
1127029104	4/1/2018	1.26	2.20	105.08	68.75	1.53	2.37	2.12	69.02	66.25	1.04	105	66.9	1.57
1127032052	4/1/2018	0.17	0.51	14.18	15.94	0.89	1.2	0.52	25.57	16.25	1.57	24	15.9	1.51
1127032053	4/1/2018	0.22	0.85	18.35	26.56	0.69	1.58	0.83	39.68	25.94	1.53	31	24.1	1.29
1127036033	4/1/2018	0.60	1.43	50.04	44.69	1.12	2.41	1.4	70.51	43.75	1.61	59	45.6	1.29
1127036094	4/1/2018	0.34	1.17	28.36	36.56	0.78	1.75	1.11	46.00	34.69	1.33	39	35.9	1.09
1127041001	4/12/2018	0.72	3.30	60.05	103.13	0.58	1.46	3.25	35.22	101.56	0.35	59	106.6	0.55
1127041019	4/12/2018	0.94	1.81	78.40	56.56	1.39	1.96	1.93	53.79	60.31	0.89	78	56.6	1.38
1127041069	4/12/2018	0.99	1.92	82.57	60.00	1.38	1.84	1.94	49.34	60.63	0.81	78	64.1	1.22
1127041043	4/16/2018	1.00	2.24	83.40	70.00	1.19	2.89	2.21	88.33	69.06	1.28	89	69.4	1.28
1127041045	4/16/2018	1.01	2.35	84.23	73.44	1.15	2.68	2.22	80.54	69.38	1.16	81	70.3	1.15
1127041050	4/16/2018	0.87	2.59	72.56	80.94	0.90	2.57	2.54	76.45	79.38	0.96	72	77.5	0.93
1127041295	4/16/2018	0.73	1.51	60.88	47.19	1.29	2.34	1.55	67.91	48.44	1.40	65	50.3	1.29
1126004046	4/18/2018	0.95	1.20	79.23	37.50	2.11	3.25	1.23	101.71	38.44	2.65	114	37.8	3.01
1126004060	4/18/2018	0.29	0.73	24.19	22.81	1.06	1.35	0.88	31.14	27.50	1.13	33	26.3	1.26
1126004099	4/18/2018	0.29	0.59	24.19	18.44	1.31	1.93	0.57	52.68	17.81	2.96	36	19.1	1.89
1126004113	4/18/2018	0.52	0.21	43.37	6.56	6.61	1.05	0.62	20.00	19.38	1.03	29	18.8	1.55
1126004139	4/18/2018	0.27	0.50	22.52	15.63	1.44	1.24	0.53	27.05	16.56	1.63	34	15.3	2.22
1126004150	4/18/2018	0.22	0.57	18.35	17.81	1.03	1.15	0.62	23.71	19.38	1.22	30	20	1.5
1126010214	4/18/2018	0.57	1.39	47.54	43.44	1.09	1.97	1.44	54.17	45.00	1.20	54	45	1.2
1126010225	4/18/2018	0.57	0.90	47.54	28.13	1.69	2.07	0.88	57.88	27.50	2.10	55	27.8	1.98
1126004165	4/19/2018	0.55	0.86	45.87	26.88	1.71	1.96	0.85	53.79	26.56	2.03	54	28.8	1.88
1127042024	4/19/2018	0.30	1.90	25.02	59.38	0.42	1.72	1.8	44.88	56.25	0.80	37	57.2	0.65
1127042149	4/19/2018	0.20	1.84	16.68	57.50	0.29	1.15	1.79	23.71	55.94	0.42	29	59.1	0.49
1127042150	4/19/2018	0.28	1.31	23.35	40.94	0.57	1.66	1.34	42.65	41.88	1.02	36	41.3	0.87
1230003193	4/19/2018	0.17	1.99	14.18	62.19	0.23	0.76	1.83	9.23	57.19	0.16	18	58.1	0.31
1230003195	4/19/2018	0.19	2.56	15.85	80.00	0.20	1.15	2.44	23.71	76.25	0.31	26	82.5	0.32
1230003198	4/19/2018	0.54	2.77	45.04	86.56	0.52	1.77	2.6	46.74	81.25	0.58	50	86.9	0.58
1230003213	4/19/2018	0.21	2.76	17.51	86.25	0.20	0.92	2.62	15.17	81.88	0.19	24	80.6	0.3
1126005010	4/20/2018	0.36	0.67	30.02	20.94	1.43	1.53	0.76	37.82	23.75	1.59	39	24.1	1.62
1126005030	4/20/2018	0.48	0.82	40.03	25.63	1.56	1.65	0.81	42.28	25.31	1.67	48	25	1.92
1126010001	4/20/2018	0.34	0.48	28.36	15.00	1.89	1.33	0.51	30.40	15.94	1.91	34	16.3	2.09
1126010140	4/20/2018	0.85	1.13	70.89	35.31	2.01	2.44	1.11	71.62	34.69	2.06	75	35.9	2.09
1126010143	4/20/2018	0.70	1.35	58.38	42.19	1.38	2.1	1.35	58.99	42.19	1.40	65	45.3	1.43
1126010161	4/20/2018	0.46	0.45	38.36	14.06	2.73	1.59	0.44	40.05	13.75	2.91	42	14.1	2.99
1126010188	4/20/2018	0.68	1.10	56.71	34.38	1.65	2.27	1.13	65.31	35.31	1.85	62	36.3	1.71
1127042001	4/20/2018	0.51	1.40	42.53	43.75	0.97	1.7	1.35	44.14	42.19	1.05	44	41.6	1.06
1127042208	4/20/2018	0.16	1.81	13.34	56.56	0.24	0.63	1.8	4.40	56.25	0.08	17	56.3	0.3
1230003220	4/20/2018	0.56	2.83	46.70	88.44	0.53	2.05	2.67	57.14	83.44	0.68	53	85.3	0.62
1230003996	4/20/2018	0.65	2.61	54.21	81.56	0.66	2.08	2.44	58.25	76.25	0.76	59	78.4	0.75
1230004131	4/20/2018	0.26	1.99	21.68	62.19	0.35	1.13	1.95	22.97	60.94	0.38	30	64.7	0.46
1127042113	4/21/2018	0.29	1.95	24.19	60.94	0.40	1.89	1.98	51.19	61.88	0.83	37	61.6	0.6
1230003232	4/21/2018	0.50	1.52	41.70	47.50	0.88	1.41	1.49	33.37	46.56	0.72	45	45.6	0.99
1230004104	4/21/2018	0.71	2.04	59.21	63.75	0.93	2.15	1.94	60.85	60.63	1.00	64	60.9	1.05

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1230004105	4/21/2018	0.43	2.13	35.86	66.56	0.54	1.47	2.09	35.60	65.31	0.55	44	65	0.68
1230004119	4/21/2018	0.51	2.21	42.53	69.06	0.62	1.77	2.07	46.74	64.69	0.72	49	67.2	0.73
1230004142	4/21/2018	0.57	2.54	47.54	79.38	0.60	1.76	2.38	46.37	74.38	0.62	53	75.9	0.7
1126011219	4/22/2018	0.64	0.72	53.38	22.50	2.37	1.86	0.71	50.08	22.19	2.26	57	21.6	2.64
1126011231	4/22/2018	0.47	0.19	39.20	5.94	6.60	1.65	0.2	42.28	6.25	6.76	46	5.6	8.18
1230004064	4/22/2018	0.89	2.33	74.23	72.81	1.02	2.14	2.44	60.48	76.25	0.79	74	74.1	1
1230004076	4/22/2018	0.27	1.78	22.52	55.63	0.40	1.12	1.91	22.60	59.69	0.38	27	55.3	0.49
1126011001	4/23/2018	0.57	0.81	47.54	25.31	1.88	1.64	0.77	41.91	24.06	1.74	48	23.4	2.05
1126011149	4/23/2018	0.21	1.37	17.51	42.81	0.41	0.75	1.33	8.86	41.56	0.21	26	42.2	0.62
1126011118	4/25/2018	0.31	0.27	25.85	8.44	3.06	1.18	0.28	24.83	8.75	2.84	33	8.4	3.91
1126011119	4/25/2018	0.26	0.68	21.68	21.25	1.02	0.97	0.72	17.03	22.50	0.76	30	21.3	1.41
1126011131	4/25/2018	0.49	0.68	40.87	21.25	1.92	1.71	0.79	44.51	24.69	1.80	44	24.4	1.81
1230003305	4/25/2018	0.26	2.16	21.68	67.50	0.32	1.08	2.25	21.11	70.31	0.30	26	71.3	0.36
1230004037	4/25/2018	0.86	1.68	71.72	52.50	1.37	2.23	1.73	63.82	54.06	1.18	72	54.1	1.33
1230004050	4/25/2018	0.88	1.86	73.39	58.13	1.26	2.27	2.04	65.31	63.75	1.02	74	60.6	1.22
1230004058	4/25/2018	0.68	1.44	56.71	45.00	1.26	2.09	1.52	58.62	47.50	1.23	59	44.7	1.32
1126012051	4/26/2018	0.22	0.63	18.35	19.69	0.93	1.78	0.23	47.11	7.19	6.55	48	6.6	7.31
1126012059	4/26/2018	0.35	0.82	29.19	25.63	1.14	1.18	0.85	24.83	26.56	0.93	34	24.1	1.41
1126012077	4/26/2018	0.39	0.64	32.53	20.00	1.63	1.58	0.69	39.68	21.56	1.84	46	20.9	2.2
1126012066	4/27/2018	0.17	1.16	14.18	36.25	0.39	0.8	1.34	10.71	41.88	0.26	24	40.6	0.59
1126012086	4/27/2018	0.48	0.23	40.03	7.19	5.57	1.85	0.24	49.71	7.50	6.63	49	6.6	7.47
1126012085	4/28/2018	0.23	0.35	19.18	10.94	1.75	0.98	0.38	17.40	11.88	1.47	29	10.9	2.65
1126012106	4/28/2018	0.44	0.46	36.70	14.38	2.55	1.53	0.47	37.82	14.69	2.58	47	14.4	3.27
1126012133	4/28/2018	0.62	0.52	51.71	16.25	3.18	2.15	0.53	60.85	16.56	3.67	53	15	3.53
1126007040	4/30/2018	0.97	1.33	80.90	41.56	1.95	2.57	1.33	76.45	41.56	1.84	73	39.7	1.84
1126007092	4/30/2018	0.90	1.18	75.06	36.88	2.04	2.33	1.24	67.54	38.75	1.74	73	36.6	2
1126007155	5/2/2018	0.66	0.71	55.04	22.19	2.48	2.3	0.75	66.42	23.44	2.83	56	21.3	2.64
1126019035	5/6/2018	0.62	1.77	51.71	55.31	0.93	2.09	1.81	58.62	56.56	1.04	53	53.1	1
1126019253	5/6/2018	0.43	1.60	35.86	50.00	0.72	1.67	1.71	43.02	53.44	0.81	40	50.6	0.79
1126018034	5/7/2018	0.15	1.32	12.51	41.25	0.30	1.01	1.34	18.51	41.88	0.44	21	39.4	0.53
1126019221	5/8/2018	0.62	1.41	51.71	44.06	1.17	2.32	1.45	67.16	45.31	1.48	56	43.1	1.3
1126019132	5/9/2018	0.50	0.71	41.70	22.19	1.88	2.35	1.19	68.28	37.19	1.84	60	35.6	1.68
1126019162	5/9/2018	0.54	0.93	45.04	29.06	1.55	1.91	1.05	51.94	32.81	1.58	47	29.7	1.58
1126019136	5/10/2018	0.60	0.48	50.04	15.00	3.34	2.44	0.55	71.62	17.19	4.17	59	15.3	3.85
1127039112	5/10/2018	0.62	1.57	51.71	49.06	1.05	2.16	1.68	61.22	52.50	1.17	54	50	1.08
1127039013	5/11/2018	1.10	1.86	91.74	58.13	1.58	2.69	1.88	80.91	58.75	1.38	83	55.6	1.49
1127039037	5/11/2018	1.00	2.34	83.40	73.13	1.14	2.44	2.39	71.62	74.69	0.96	78	68.4	1.14
1126024147	5/13/2018	0.42	1.51	35.03	47.19	0.74	1.89	1.59	51.19	49.69	1.03	40	47.2	0.85
1126021148	5/17/2018	1.07	2.06	89.24	64.38	1.39	3.44	2.12	108.76	66.25	1.64	77	61.9	1.24
1126025102	5/26/2018	1.18	2.74	98.41	85.63	1.15	3.81	2.64	122.50	82.50	1.48	85	89.1	0.95
1126025152	5/26/2018	0.48	0.48	40.03	15.00	2.67	1.79	0.5	47.48	15.63	3.04	46	15.3	3
1126025170	5/26/2018	0.44	0.88	36.70	27.50	1.33	2.04	0.91	56.77	28.44	2.00	43	27.2	1.58
1126025200	5/26/2018	0.32	0.92	26.69	28.75	0.93	1.88	0.98	50.82	30.63	1.66	36	29.4	1.23
1125006067	5/27/2018	0.33	0.70	27.52	21.88	1.26	1.43	0.72	34.11	22.50	1.52	35	19.7	1.78

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Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1125006073	5/27/2018	0.43	1.01	35.86	31.56	1.14	2.03	1.03	56.39	32.19	1.75	47	31.3	1.5
1125006077	5/27/2018	0.30	0.46	25.02	14.38	1.74	1.24	0.47	27.05	14.69	1.84	31	13.4	2.31
1126025130	5/27/2018	0.76	1.60	63.38	50.00	1.27	3.08	1.88	95.39	58.75	1.62	71	57.8	1.23
1126025185	5/27/2018	0.45	0.83	37.53	25.94	1.45	2.18	0.86	61.97	26.88	2.31	45	25.6	1.76
1128036001	5/28/2018	0.88	0.77	73.39	24.06	3.05	2.4	0.73	70.14	22.81	3.07	76	23.1	3.29
1125006047	5/30/2018	0.16	1.31	13.34	40.94	0.33	1.48	1.33	35.97	41.56	0.87	25	38.4	0.65
1125006056	5/30/2018	0.28	0.86	23.35	26.88	0.87	2.18	0.93	61.97	29.06	2.13	32	27.2	1.18
1125005003	5/31/2018	0.47	0.64	39.20	20.00	1.96	2.53	0.69	74.96	21.56	3.48	49	19.1	2.57
1125005035	5/31/2018	0.56	0.41	46.70	12.81	3.65	2.73	0.45	82.39	14.06	5.86	53	13.1	4.04
1125006014	5/31/2018	1.23	0.97	102.58	30.31	3.38	3.69	0.92	118.05	28.75	4.11	145	26.9	5.4
1125006018	5/31/2018	0.09	1.15	7.51	35.94	0.21	0.72	1.22	7.74	38.13	0.20	13	35.3	0.37
1126020003	5/31/2018	0.19	1.80	15.85	56.25	0.28	0.78	1.73	9.97	54.06	0.18	21	53.4	0.39
1126020027	5/31/2018	0.25	1.16	20.85	36.25	0.58	1.3	1.19	29.28	37.19	0.79	25	37.2	0.67
1126020060	5/31/2018	0.70	1.66	58.38	51.88	1.13	1.77	1.67	46.74	52.19	0.90	55	51.6	1.07
1126020084	5/31/2018	0.45	1.26	37.53	39.38	0.95	1.72	1.32	44.88	41.25	1.09	41	37.2	1.1
1126020246	5/31/2018	0.17	1.93	14.18	60.31	0.24	0.63	1.81	4.40	56.56	0.08	18	55.3	0.33
1125005070	6/1/2018	0.41	1.37	34.19	42.81	0.80	1.41	1.3	33.37	40.63	0.82	40	44.4	0.9
1125005083	6/1/2018	0.37	1.76	30.86	55.00	0.56	1.42	1.73	33.74	54.06	0.62	38	51.6	0.74
1125006023	6/1/2018	0.47	0.77	39.20	24.06	1.63	1.96	0.79	53.79	24.69	2.18	47	21.9	2.15
1126020122	6/1/2018	0.66	1.57	55.04	49.06	1.12	1.6	1.53	40.42	47.81	0.85	51	46.6	1.1
1126020123	6/1/2018	0.63	1.59	52.54	49.69	1.06	1.79	1.55	47.48	48.44	0.98	50	48.1	1.04
1126020210	6/1/2018	0.84	1.34	70.06	41.88	1.67	2.1	1.36	58.99	42.50	1.39	66	36.3	1.82
1125003036	6/2/2018	0.35	0.41	29.19	12.81	2.28	1.28	0.41	28.54	12.81	2.23	35	12.8	2.73
1126026002	6/2/2018	0.43	0.12	35.86	3.75	9.56	1.3	0.11	29.28	3.44	8.52	37	3.8	9.87
1126026133	6/2/2018	0.33	1.28	27.52	40.00	0.69	1.59	1.27	40.05	39.69	1.01	34	40	0.85
1126026135	6/2/2018	0.54	0.44	45.04	13.75	3.28	2.68	0.44	80.54	13.75	5.86	52	14.4	3.62
1126026168	6/2/2018	0.43	0.99	35.86	30.94	1.16	2.12	0.95	59.74	29.69	2.01	40	26.3	1.52
1125003005	6/3/2018	0.30	0.50	25.02	15.63	1.60	1.13	0.52	22.97	16.25	1.41	34	14.4	2.37
1126026273	6/3/2018	0.36	0.97	30.02	30.31	0.99	1.52	0.98	37.45	30.63	1.22	36	30.3	1.19
1125003002	6/4/2018	0.38	0.36	31.69	11.25	2.82	1.42	0.35	33.74	10.94	3.08	38	10.3	3.68
1125005046	6/5/2018	0.40	1.13	33.36	35.31	0.94	2.25	1.13	64.57	35.31	1.83	45	32.8	1.37
1125004028	6/6/2018	0.40	0.29	33.36	9.06	3.68	1.65	0.31	42.28	9.69	4.36	43	8.8	4.91
1125005037	6/6/2018	0.61	0.18	50.87	5.63	9.04	2.1	0.16	58.99	5.00	11.80	56	4.7	11.95
1125004013	6/7/2018	0.48	0.18	40.03	5.63	7.12	1.79	0.18	47.48	5.63	8.44	49	5.3	9.22
1125004031	6/7/2018	0.43	0.66	35.86	20.63	1.74	1.49	0.68	36.34	21.25	1.71	40	20.6	1.94
1125004034	6/9/2018	0.89	3.67	74.23	114.69	0.65	3.05	3.39	94.28	105.94	0.89	71	108.8	0.65
1126028015	6/9/2018	0.54	1.92	45.04	60.00	0.75	1.28	1.94	28.54	60.63	0.47	46	53.4	0.86
1126027030	6/11/2018	1.37	2.42	114.26	75.63	1.51	2.88	2.34	87.96	73.13	1.20	105	75.6	1.39
1126027047	6/11/2018	1.18	2.64	98.41	82.50	1.19	2.19	2.69	62.34	84.06	0.74	77	80	0.96
1126027130	6/11/2018	0.93	2.08	77.56	65.00	1.19	2.27	2.08	65.31	65.00	1.00	77	62.5	1.23
1126027142	6/11/2018	0.23	1.42	19.18	44.38	0.43	0.84	1.35	12.20	42.19	0.29	22	42.2	0.52
1126027164	6/12/2018	1.24	2.57	103.42	80.31	1.29	2.6	2.52	77.56	78.75	0.98	106	77.2	1.37
1125007012	6/14/2018	1.12	2.69	93.41	84.06	1.11	3.54	2.38	112.48	74.38	1.51	150	81.9	1.83
1125007029	6/14/2018	0.59	0.90	49.21	28.13	1.75	2.48	0.9	73.11	28.13	2.60	57	25.9	2.2

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1125007036	6/14/2018	0.97	2.76	80.90	86.25	0.94	3.08	2.58	95.39	80.63	1.18	135	85	1.59
1125007089	6/14/2018	0.58	1.13	48.37	35.31	1.37	2.14	1.13	60.48	35.31	1.71	54	35.6	1.52
1126026150	6/14/2018	0.99	1.58	82.57	49.38	1.67	2.16	1.62	61.22	50.63	1.21	78	49.1	1.59
1126027004	6/14/2018	0.84	0.79	70.06	24.69	2.84	2.68	0.8	80.54	25.00	3.22	71	25.6	2.77
1126027009	6/14/2018	0.66	1.19	55.04	37.19	1.48	2.2	1.23	62.71	38.44	1.63	58	38.4	1.51
1126027201	6/14/2018	1.27	2.25	105.92	70.31	1.51	2.47	2.35	72.74	73.44	0.99	101	65.3	1.55
1126027217	6/14/2018	0.95	2.16	79.23	67.50	1.17	2.25	2.1	64.57	65.63	0.98	73	64.1	1.14
1126030042	6/15/2018	0.32	2.06	26.69	64.38	0.41	1.06	2.01	20.37	62.81	0.32	30	63.4	0.47
1126030119	6/16/2018	0.45	1.68	37.53	52.50	0.71	1.35	1.73	31.14	54.06	0.58	42	52.5	0.8
1125008148	6/17/2018	0.50	1.45	41.70	45.31	0.92	1.81	1.44	48.22	45.00	1.07	50	42.8	1.17
1126029503	6/20/2018	0.94	1.69	78.40	52.81	1.48	2.04	1.66	56.77	51.88	1.09	75	48.4	1.55
1126029504	6/20/2018	0.85	1.52	70.89	47.50	1.49	1.77	1.47	46.74	45.94	1.02	62	43.4	1.43
1126029606	6/20/2018	1.02	1.96	85.07	61.25	1.39	1.86	1.97	50.08	61.56	0.81	76	60.6	1.25
1125008171	6/21/2018	0.41	0.42	34.19	13.13	2.61	1.45	0.41	34.85	12.81	2.72	41	12.2	3.36
1126029029	6/21/2018	0.77	2.31	64.22	72.19	0.89	1.86	2.2	50.08	68.75	0.73	66	70.3	0.94
1126029030	6/21/2018	0.97	2.06	80.90	64.38	1.26	2.08	1.99	58.25	62.19	0.94	81	61.6	1.32
1126029517	6/21/2018	0.47	2.95	39.20	92.19	0.43	1.35	2.6	31.14	81.25	0.38	42	85	0.49
1125008203	6/22/2018	0.51	0.22	42.53	6.88	6.19	2.03	0.23	56.39	7.19	7.85	53	6.6	8.08
1126029012	6/22/2018	0.71	2.45	59.21	76.56	0.77	1.72	2.44	44.88	76.25	0.59	60	78.4	0.76
1125008173	6/23/2018	0.45	0.30	37.53	9.38	4.00	1.65	0.31	42.28	9.69	4.36	46	9.4	4.91
1126032401	6/24/2018	0.30	1.77	25.02	55.31	0.45	1.92	1.82	52.31	56.88	0.92	34	51.6	0.66
1126032415	6/24/2018	0.22	3.16	18.35	98.75	0.19	0.73	3.12	8.11	97.50	0.08	20	95.9	0.21
1126032447	6/24/2018	0.29	1.91	24.19	59.69	0.41	1.65	2.07	42.28	64.69	0.65	29	58.4	0.5
1125019411	6/26/2018	0.57	0.66	47.54	20.63	2.30	1.69	0.7	43.77	21.88	2.00	50	21.3	2.35
1126032004	6/26/2018	0.29	2.02	24.19	63.13	0.38	1.77	1.99	46.74	62.19	0.75	37	62.2	0.59
1126033026	6/26/2018	0.18	1.81	15.01	56.56	0.27	1.71	1.86	44.51	58.13	0.77	28	47.8	0.59
1126033505	6/26/2018	0.32	2.14	26.69	66.88	0.40	1.72	2.23	44.88	69.69	0.64	32	67.5	0.47
1125019056	6/27/2018	0.51	0.56	42.53	17.50	2.43	1.55	0.56	38.57	17.50	2.20	42	17.8	2.36
1125019018	6/29/2018	0.62	1.34	51.71	41.88	1.23	1.7	1.33	44.14	41.56	1.06	52	41.9	1.24
1125019098	6/29/2018	0.92	0.65	76.73	20.31	3.78	2.83	0.65	86.11	20.31	4.24	77	20.6	3.73
1125019163	6/30/2018	0.42	1.11	35.03	34.69	1.01	1.16	1.04	24.08	32.50	0.74	35	31.9	1.1
1125020136	6/30/2018	0.60	0.87	50.04	27.19	1.84	2.12	0.87	59.74	27.19	2.20	55	25.3	2.17
1125023005	7/1/2018	0.94	0.91	78.40	28.44	2.76	2.28	0.86	65.68	26.88	2.44	75	28.4	2.64
1125023147	7/1/2018	0.74	3.77	61.72	117.81	0.52	1.71	3.23	44.51	100.94	0.44	99	106.6	0.93
1125020001	7/3/2018	0.73	0.92	60.88	28.75	2.12	2.02	1.08	56.02	33.75	1.66	62	34.4	1.8
1125020157	7/3/2018	0.56	0.92	46.70	28.75	1.62	1.89	0.93	51.19	29.06	1.76	52	29.7	1.75
1125020181	7/3/2018	0.62	0.66	51.71	20.63	2.51	2.06	0.63	57.51	19.69	2.92	55	20.6	2.67
1125020200	7/3/2018	0.68	0.98	56.71	30.63	1.85	1.85	0.93	49.71	29.06	1.71	50	29.4	1.7
1125023013	7/3/2018	0.63	0.20	52.54	6.25	8.41	2.26	0.19	64.94	5.94	10.94	57	5.9	9.6
1125023019	7/3/2018	1.38	2.08	115.09	65.00	1.77	4.34	2	142.19	62.50	2.28	171	66.6	2.57
1125023107	7/3/2018	0.36	2.10	30.02	65.63	0.46	1.72	1.91	44.88	59.69	0.75	35	65	0.54
1125023167	7/3/2018	0.93	0.29	77.56	9.06	8.56	2.6	0.29	77.56	9.06	8.56	70	9.1	7.72
1125023187	7/3/2018	1.03	3.81	85.90	119.06	0.72	3.27	3.34	102.45	104.38	0.98	72	112.2	0.64
1125023208	7/5/2018	0.68	1.13	56.71	35.31	1.61	1.91	1.17	51.94	36.56	1.42	52	34.1	1.53

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1125016107	7/8/2018	0.14	0.92	11.68	28.75	0.41	0.88	0.95	13.68	29.69	0.46	18	29.4	0.61
1125012115	7/9/2018	0.20	0.41	16.68	12.81	1.30	1.32	0.44	30.02	13.75	2.18	28	11.9	2.36
1125012095	7/11/2018	0.37	1.12	30.86	35.00	0.88	1.61	1.12	40.80	35.00	1.17	41	33.8	1.21
1125012113	7/11/2018	0.35	0.50	29.19	15.63	1.87	1.54	0.6	38.20	18.75	2.04	36	17.8	2.02
1125012152	7/11/2018	0.18	0.81	15.01	25.31	0.59	1.11	0.8	22.23	25.00	0.89	25	24.4	1.03
1125012156	7/11/2018	0.53	1.73	44.20	54.06	0.82	1.57	1.69	39.31	52.81	0.74	45	50.9	0.88
1125012174	7/11/2018	0.44	1.12	36.70	35.00	1.05	1.58	1.15	39.68	35.94	1.10	44	35.6	1.24
1125012201	7/11/2018	0.84	1.34	70.06	41.88	1.67	2.01	1.33	55.65	41.56	1.34	67	39.4	1.7
1125011137	7/15/2018	0.70	1.25	58.38	39.06	1.49	2.43	1.33	71.25	41.56	1.71	63	41.6	1.52
1125011056	7/16/2018	0.86	1.34	71.72	41.88	1.71	2.57	1.36	76.45	42.50	1.80	75	42.2	1.78
1125017229	7/16/2018	1.11	1.80	92.57	56.25	1.65	2.27	1.76	65.31	55.00	1.19	80	53.4	1.5
1125017016	7/17/2018	0.66	2.46	55.04	76.88	0.72	1.3	2.37	29.28	74.06	0.40	52	73.8	0.71
1125017157	7/17/2018	0.43	2.16	35.86	67.50	0.53	0.92	2.25	15.17	70.31	0.22	33	70.3	0.47
1125011126	7/18/2018	0.68	1.80	56.71	56.25	1.01	2.22	1.8	63.45	56.25	1.13	60	58.1	1.03
1125017136	7/18/2018	0.46	2.37	38.36	74.06	0.52	0.65	2.31	5.14	72.19	0.07	20	74.1	0.27
1125018309	7/19/2018	0.62	1.56	51.71	48.75	1.06	2.05	1.57	57.14	49.06	1.16	53	48.4	1.09
1125027010	7/20/2018	0.98	1.30	81.73	40.63	2.01	3.01	1.32	92.79	41.25	2.25	91	38.8	2.35
1125027052	7/20/2018	0.22	1.33	18.35	41.56	0.44	1.77	1.33	46.74	41.56	1.12	31	40.3	0.77
1125025144	7/22/2018	0.59	1.88	49.21	58.75	0.84	1.63	1.87	41.54	58.44	0.71	50	56.9	0.88
1125025159	7/22/2018	0.67	1.75	55.88	54.69	1.02	1.75	1.92	46.00	60.00	0.77	57	57.2	1
1125027008	7/22/2018	0.66	1.52	55.04	47.50	1.16	2.27	1.57	65.31	49.06	1.33	59	50.3	1.17
1125027174	7/22/2018	0.54	1.78	45.04	55.63	0.81	1.95	1.9	53.42	59.38	0.90	49	58.4	0.84
1125027188	7/22/2018	0.34	1.67	28.36	52.19	0.54	1.2	1.66	25.57	51.88	0.49	30	51.6	0.58
1125027130	7/23/2018	0.66	1.81	55.04	56.56	0.97	2.27	1.84	65.31	57.50	1.14	59	57.8	1.02
1125025407	7/24/2018	1.01	2.04	84.23	63.75	1.32	2.39	2.03	69.76	63.44	1.10	75	63.4	1.18
1125025411	7/24/2018	0.73	1.44	60.88	45.00	1.35	1.77	2.07	46.74	64.69	0.72	49	63.4	0.77
1124001281	7/27/2018	0.67	1.07	55.88	33.44	1.67	2.23	1.14	63.82	35.63	1.79	59	33.4	1.76
1125027220	7/27/2018	0.65	1.98	54.21	61.88	0.88	2.18	1.97	61.97	61.56	1.01	55	60	0.92
1125027226	7/27/2018	0.74	1.83	61.72	57.19	1.08	2.42	1.85	70.88	57.81	1.23	61	56.9	1.07
1125027244	7/27/2018	0.68	2.21	56.71	69.06	0.82	2.24	2.25	64.19	70.31	0.91	57	67.8	0.84
1124001284	7/28/2018	0.76	0.98	63.38	30.63	2.07	2.51	1.07	74.22	33.44	2.22	67	30.3	2.21
1125014012	7/31/2018	0.78	1.47	65.05	45.94	1.42	2.7	1.44	81.28	45.00	1.81	66	44.4	1.49
1125014014	7/31/2018	0.85	5.57	70.89	174.06	0.41	2.9	5.03	88.71	157.19	0.56	123	166.9	0.74
1124002054	8/1/2018	0.31	1.21	25.85	37.81	0.68	0.87	1.2	13.31	37.50	0.35	29	41.3	0.7
1125014101	8/1/2018	0.56	1.53	46.70	47.81	0.98	2.65	1.49	79.42	46.56	1.71	54	42.5	1.27
1125014116	8/1/2018	0.37	0.66	30.86	20.63	1.50	2.09	0.65	58.62	20.31	2.89	38	20.6	1.84
1124002069	8/2/2018	0.70	2.19	58.38	68.44	0.85	2.05	2.08	57.14	65.00	0.88	56	66.3	0.85
1124002090	8/2/2018	0.38	0.61	31.69	19.06	1.66	1.41	0.6	33.37	18.75	1.78	35	19.1	1.84
1125014122	8/2/2018	0.46	0.74	38.36	23.13	1.66	1.21	0.7	25.94	21.88	1.19	37	22.2	1.67
1124002006	8/3/2018	0.48	1.57	40.03	49.06	0.82	1.7	1.51	44.14	47.19	0.94	43	45.6	0.94
1124002043	8/3/2018	0.46	0.99	38.36	30.94	1.24	2.17	0.7	61.59	21.88	2.82	50	21.3	2.35
1125014127	8/3/2018	0.95	2.31	79.23	72.19	1.10	3.31	2.15	103.93	67.19	1.55	75	72.8	1.03
1124002028	8/4/2018	0.38	1.33	31.69	41.56	0.76	1.56	1.32	38.94	41.25	0.94	38	40.3	0.94
1125014158	8/4/2018	0.68	0.66	56.71	20.63	2.75	2.32	0.69	67.16	21.56	3.11	61	20.6	2.96

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Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1125014159	8/4/2018	0.73	0.68	60.88	21.25	2.87	2.48	0.67	73.11	20.94	3.49	66	20.3	3.25
1124003001	8/8/2018	0.76	1.76	63.38	55.00	1.15	1.94	1.77	53.05	55.31	0.96	64	53.8	1.19
1124007053	8/10/2018	0.80	0.70	66.72	21.88	3.05	2.54	0.71	75.34	22.19	3.40	70	21.9	3.2
1124007006	8/13/2018	0.29	0.71	24.19	22.19	1.09	1.37	0.68	31.88	21.25	1.50	32	23.4	1.37
1124005919	8/14/2018	0.28	1.81	23.35	56.56	0.41	1.96	1.8	53.79	56.25	0.96	29	56.6	0.51
1124007011	8/15/2018	0.33	0.95	27.52	29.69	0.93	1.64	0.91	41.91	28.44	1.47	35	27.5	1.27
1124016016	8/17/2018	0.58	1.04	48.37	32.50	1.49	1.65	1.05	42.28	32.81	1.29	43	31.3	1.38
1124016065	8/18/2018	0.66	0.85	55.04	26.56	2.07	2.05	0.8	57.14	25.00	2.29	55	23.1	2.38
1124016092	8/19/2018	0.49	1.33	40.87	41.56	0.98	1.66	1.36	42.65	42.50	1.00	41	40.3	1.02
1124016114	8/19/2018	0.52	1.12	43.37	35.00	1.24	1.75	1.12	46.00	35.00	1.31	44	32.5	1.35
1124010058	8/20/2018	0.29	1.04	24.19	32.50	0.74	0.99	1.01	17.77	31.56	0.56	25	29.4	0.85
1124010008	8/21/2018	0.56	0.68	46.70	21.25	2.20	1.54	0.68	38.20	21.25	1.80	38	20	1.9
1124010082	8/21/2018	0.34	0.47	28.36	14.69	1.93	1.36	0.45	31.51	14.06	2.24	25	13.1	1.9
1124014027	8/23/2018	0.28	0.81	23.35	25.31	0.92	1.56	1.07	38.94	33.44	1.16	30	31.6	0.95
1124014029	8/23/2018	0.44	0.49	36.70	15.31	2.40	1.72	0.51	44.88	15.94	2.82	36	14.7	2.45
1124014066	8/23/2018	0.43	0.98	35.86	30.63	1.17	2.06	0.98	57.51	30.63	1.88	37	28.4	1.3
1124014067	8/23/2018	0.89	0.79	74.23	24.69	3.01	3.09	0.8	95.76	25.00	3.83	69	23.8	2.91
1124014090	8/24/2018	1.04	1.69	86.74	52.81	1.64	3.22	1.59	100.59	49.69	2.02	134	47.5	2.82
1124017001	8/26/2018	0.18	1.39	15.01	43.44	0.35	1.39	1.43	32.62	44.69	0.73	28	44.4	0.63
1124020087	8/28/2018	0.17	1.69	14.18	52.81	0.27	1.64	1.6	41.91	50.00	0.84	31	50.6	0.61
1124020089	8/28/2018	0.19	1.57	15.85	49.06	0.32	1.8	1.56	47.85	48.75	0.98	33	47.2	0.7
1124018044	8/29/2018	0.45	1.96	37.53	61.25	0.61	2.04	1.83	56.77	57.19	0.99	49	56.3	0.87
1124020049	8/29/2018	0.28	1.34	23.35	41.88	0.56	1.92	1.34	52.31	41.88	1.25	30	37.8	0.79
1124018123	8/31/2018	0.20	1.16	16.68	36.25	0.46	0.9	1.17	14.43	36.56	0.39	23	36.9	0.62
1124013192	9/2/2018	0.67	0.13	55.88	4.06	13.75	2.32	0.14	67.16	4.38	15.35	63	3.8	16.8
1124013120	9/4/2018	0.45	0.73	37.53	22.81	1.65	1.35	0.76	31.14	23.75	1.31	42	23.8	1.77
1124012085	9/8/2018	0.76	1.03	63.38	32.19	1.97	2.14	1.02	60.48	31.88	1.90	63	31.3	2.02
1124012094	9/8/2018	0.36	0.59	30.02	18.44	1.63	1.18	0.59	24.83	18.44	1.35	38	17.2	2.21
1124012104	9/8/2018	0.48	0.96	40.03	30.00	1.33	1.56	1.03	38.94	32.19	1.21	48	31.3	1.54
1124012111	9/8/2018	0.49	1.06	40.87	33.13	1.23	1.59	1.09	40.05	34.06	1.18	45	33.8	1.33
1124012122	9/8/2018	0.45	0.97	37.53	30.31	1.24	1.54	0.95	38.20	29.69	1.29	40	26.6	1.51
1124012029	9/9/2018	0.44	0.29	36.70	9.06	4.05	1.37	0.28	31.88	8.75	3.64	41	9.1	4.52
1124012008	9/10/2018	0.86	0.61	71.72	19.06	3.76	2.36	0.62	68.65	19.38	3.54	61	18.1	3.37
1124012018	9/10/2018	0.71	0.50	59.21	15.63	3.79	1.88	0.53	50.82	16.56	3.07	49	15.6	3.14
1124012044	9/10/2018	0.48	0.46	40.03	14.38	2.78	1.69	0.5	43.77	15.63	2.80	41	14.4	2.85
1124012064	9/10/2018	0.51	0.58	42.53	18.13	2.35	1.57	0.59	39.31	18.44	2.13	44	18.1	2.43
1124023001	9/12/2018	0.76	2.08	63.38	65.00	0.98	2.05	2.02	57.14	63.13	0.91	53	62.5	0.85
1124023006	9/12/2018	0.54	2.09	45.04	65.31	0.69	1.59	1.99	40.05	62.19	0.64	39	63.4	0.61
1124023132	9/12/2018	0.62	1.85	51.71	57.81	0.89	2.27	1.79	65.31	55.94	1.17	58	55.6	1.04
1124023159	9/12/2018	0.07	1.75	5.84	54.69	0.11	1.56	1.72	38.94	53.75	0.72	15	53.8	0.28
1124023018	9/16/2018	0.46	2.00	38.36	62.50	0.61	2.32	2	67.16	62.50	1.07	44	62.2	0.71
1124023022	9/16/2018	0.22	1.71	18.35	53.44	0.34	1.75	1.67	46.00	52.19	0.88	27	51.9	0.52
1124023113	9/16/2018	0.36	1.41	30.02	44.06	0.68	1.84	1.44	49.34	45.00	1.10	38	44.1	0.86
1124024008	9/17/2018	0.29	1.04	24.19	32.50	0.74	1.13	1.07	22.97	33.44	0.69	29	30.9	0.94

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1124026125	9/20/2018	0.35	0.84	29.19	26.25	1.11	1.79	0.91	47.48	28.44	1.67	35	25	1.4
1124026138	9/20/2018	0.90	1.82	75.06	56.88	1.32	2.94	1.72	90.19	53.75	1.68	71	52.2	1.36
1124026151	9/20/2018	1.14	0.88	95.08	27.50	3.46	3.01	0.95	92.79	29.69	3.13	85	26.9	3.16
1124026168	9/20/2018	0.49	1.02	40.87	31.88	1.28	2	1.06	55.28	33.13	1.67	42	30.9	1.36
1124026226	9/20/2018	0.99	1.72	82.57	53.75	1.54	2.74	1.71	82.76	53.44	1.55	71	49.1	1.45
1124026001	9/21/2018	1.54	1.47	128.44	45.94	2.80	4.22	1.4	137.73	43.75	3.15	171	43.1	3.97
1124026016	9/21/2018	0.86	2.09	71.72	65.31	1.10	2.98	2	91.68	62.50	1.47	75	60.3	1.24
1124026140	9/21/2018	0.70	0.32	58.38	10.00	5.84	2.43	0.37	71.25	11.56	6.16	65	10.6	6.12
1124026154	9/21/2018	0.72	0.06	60.05	1.88	32.03	2.31	0.06	66.79	1.88	35.62	63	1.6	40.32
1124027001	9/21/2018	0.50	2.65	41.70	82.81	0.50	1.34	2.52	30.77	78.75	0.39	41	81.3	0.5
1124027021	9/21/2018	0.61	2.11	50.87	65.94	0.77	1.76	2.11	46.37	65.94	0.70	47	63.1	0.74
1124027032	9/21/2018	0.76	2.17	63.38	67.81	0.93	1.93	2.2	52.68	68.75	0.77	63	66.6	0.95
1124027064	9/21/2018	0.13	1.64	10.84	51.25	0.21	0.51	1.73	0.00	54.06	0.00	14	52.5	0.27
1124027088	9/21/2018	0.09	1.67	7.51	52.19	0.14	0.33	1.68	0.00	52.50	0.00	10	49.7	0.2
1124027126	9/21/2018	0.56	2.05	46.70	64.06	0.73	2.05	2	57.14	62.50	0.91	52	60.9	0.85
1124026020	9/22/2018	0.80	1.29	66.72	40.31	1.66	2.78	1.31	84.25	40.94	2.06	71	41.3	1.72
1124026029	9/22/2018	1.45	4.80	120.93	150.00	0.81	4.71	4.48	155.93	140.00	1.11	163	143.8	1.13
1124026116	9/22/2018	0.78	0.40	65.05	12.50	5.20	2.89	0.4	88.33	12.50	7.07	72	11.3	6.4
1124026119	9/22/2018	0.85	1.73	70.89	54.06	1.31	2.96	1.76	90.93	55.00	1.65	74	54.4	1.36
1124026208	9/22/2018	0.82	1.33	68.39	41.56	1.65	3.1	1.35	96.13	42.19	2.28	76	40.6	1.87
1124027074	9/22/2018	0.36	1.68	30.02	52.50	0.57	1.22	1.73	26.31	54.06	0.49	31	51.6	0.6
1123001117	9/23/2018	0.48	1.80	40.03	56.25	0.71	1.56	1.8	38.94	56.25	0.69	47	56.3	0.84
1123001157	9/23/2018	0.85	1.59	70.89	49.69	1.43	2.83	1.61	86.11	50.31	1.71	75	48.4	1.55
1123001234	9/23/2018	0.62	1.75	51.71	54.69	0.95	2.18	1.74	61.97	54.38	1.14	59	54.7	1.08
1124025107	9/23/2018	0.99	1.39	82.57	43.44	1.90	2.18	1.41	61.97	44.06	1.41	80	44.4	1.8
1124025126	9/23/2018	1.24	0.98	103.42	30.63	3.38	2.51	1.03	74.22	32.19	2.31	96	30	3.2
1124025001	9/24/2018	0.38	1.48	31.69	46.25	0.69	1.36	1.5	31.51	46.88	0.67	32	46.6	0.69
1124025119	9/24/2018	0.47	1.42	39.20	44.38	0.88	1.65	1.42	42.28	44.38	0.95	42	42.8	0.98
1123002001	9/28/2018	0.91	1.29	75.89	40.31	1.88	2.88	1.23	87.96	38.44	2.29	76	37.8	2.01
1123002014	9/28/2018	0.84	0.65	70.06	20.31	3.45	2.7	0.65	81.28	20.31	4.00	74	20.6	3.59
1123002032	9/28/2018	0.42	0.60	35.03	18.75	1.87	1.53	0.59	37.82	18.44	2.05	40	18.4	2.17
1123002037	9/30/2018	0.86	0.63	71.72	19.69	3.64	2.66	0.6	79.79	18.75	4.26	71	18.4	3.85
1123002039	9/30/2018	0.40	0.47	33.36	14.69	2.27	1.54	0.5	38.20	15.63	2.44	38	14.7	2.59
1123002040	9/30/2018	0.23	0.58	19.18	18.13	1.06	1.01	0.64	18.51	20.00	0.93	26	18.8	1.39
1123003080	9/30/2018	1.03	1.16	85.90	36.25	2.37	2.94	1.14	90.19	35.63	2.53	83	35.9	2.31
1123003100	9/30/2018	0.50	0.90	41.70	28.13	1.48	1.56	0.92	38.94	28.75	1.35	39	27.8	1.4
1123003001	10/2/2018	0.96	1.20	80.06	37.50	2.14	2.94	1.25	90.19	39.06	2.31	78	35	2.23
1123003032	10/2/2018	0.54	0.59	45.04	18.44	2.44	2.16	0.61	61.22	19.06	3.21	46	18.8	2.45
1123003046	10/2/2018	0.58	0.61	48.37	19.06	2.54	1.94	0.6	53.05	18.75	2.83	50	18.4	2.71
1123003130	10/2/2018	0.65	2.02	54.21	63.13	0.86	1.88	1.95	50.82	60.94	0.83	54	60.9	0.89
1123005025	10/7/2018	0.37	1.07	30.86	33.44	0.92	1.6	0.99	40.42	30.94	1.31	37	30.6	1.21
1123005090	10/8/2018	0.48	1.01	40.03	31.56	1.27	1.76	0.95	46.37	29.69	1.56	41	28.8	1.43
1123005100	10/8/2018	0.72	0.95	60.05	29.69	2.02	2.72	0.96	82.02	30.00	2.73	67	28.1	2.38
1123004008	10/9/2018	0.56	0.22	46.70	6.88	6.79	1.73	0.24	45.25	7.50	6.03	48	6.6	7.31

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1123004001	10/10/2018	0.38	0.50	31.69	15.63	2.03	1.18	0.5	24.83	15.63	1.59	34	15	2.27
1123013021	10/10/2018	0.28	1.01	23.35	31.56	0.74	1.62	0.99	41.17	30.94	1.33	34	29.1	1.17
1123013023	10/10/2018	0.32	1.00	26.69	31.25	0.85	1.77	1.06	46.74	33.13	1.41	37	30.6	1.21
1123013106	10/10/2018	0.13	0.86	10.84	26.88	0.40	1.62	0.88	41.17	27.50	1.50	20	29.1	0.69
1123011025	10/11/2018	0.47	0.54	39.20	16.88	2.32	1.3	0.52	29.28	16.25	1.80	38	15	2.53
1123011194	10/11/2018	0.32	1.08	26.69	33.75	0.79	0.95	1.04	16.28	32.50	0.50	25	31.9	0.78
1123011017	10/13/2018	0.42	0.59	35.03	18.44	1.90	1.48	0.6	35.97	18.75	1.92	35	17.8	1.96
1123011109	10/13/2018	0.43	1.25	35.86	39.06	0.92	1.37	1.23	31.88	38.44	0.83	36	37.2	0.97
1123011149	10/13/2018	0.44	0.35	36.70	10.94	3.36	1.4	0.36	33.00	11.25	2.93	39	10.3	3.78
1123011163	10/13/2018	0.50	1.17	41.70	36.56	1.14	1.62	1.16	41.17	36.25	1.14	39	35.6	1.09
1123006079	10/14/2018	0.78	1.22	65.05	38.13	1.71	2.85	1.17	86.85	36.56	2.38	67	36.3	1.85
1123008032	10/23/2018	1.07	1.84	89.24	57.50	1.55	2.74	1.83	82.76	57.19	1.45	86	53.4	1.61
1123008178	10/23/2018	0.55	0.17	45.87	5.31	8.63	1.88	0.19	50.82	5.94	8.56	50	5	10
1122004035	10/26/2018	0.74	1.19	61.72	37.19	1.66	2.33	1.2	67.54	37.50	1.80	64	35.9	1.78
1122004063	10/26/2018	0.65	0.40	54.21	12.50	4.34	1.59	0.4	40.05	12.50	3.20	37	11.3	3.29
1122004075	10/26/2018	0.92	0.68	76.73	21.25	3.61	2.84	0.69	86.48	21.56	4.01	76	20.3	3.74
1123018125	10/26/2018	0.78	0.80	65.05	25.00	2.60	2.22	0.77	63.45	24.06	2.64	64	21.9	2.93
1123008129	10/27/2018	1.09	2.93	90.91	91.56	0.99	3.55	2.73	112.85	85.31	1.32	82	88.4	0.93
1123008246	10/27/2018	1.48	2.52	123.43	78.75	1.57	4.23	2.41	138.10	75.31	1.83	173	73.1	2.37
1123008250	10/28/2018	0.90	2.36	75.06	73.75	1.02	2.94	2.21	90.19	69.06	1.31	81	64.1	1.26
1122004097	10/31/2018	0.57	0.73	47.54	22.81	2.08	1.94	0.69	53.05	21.56	2.46	53	21.6	2.46
1122004103	10/31/2018	0.71	0.78	59.21	24.38	2.43	2.51	0.81	74.22	25.31	2.93	67	25.6	2.61
1123016020	10/31/2018	0.24	2.06	20.02	64.38	0.31	2.06	1.96	57.51	61.25	0.94	34	57.5	0.59
1123016169	10/31/2018	0.28	1.51	23.35	47.19	0.49	2.16	1.53	61.22	47.81	1.28	34	45.6	0.75
1123020101	11/2/2018	0.33	0.79	27.52	24.69	1.11	1.78	0.79	47.11	24.69	1.91	36	23.1	1.56
1122005016	11/3/2018	0.35	0.62	29.19	19.38	1.51	1.67	0.64	43.02	20.00	2.15	37	19.4	1.91
1122005040	11/3/2018	0.22	0.54	18.35	16.88	1.09	1.59	0.54	40.05	16.88	2.37	29	17.8	1.63
1123020165	11/3/2018	0.36	1.73	30.02	54.06	0.56	1.5	1.71	36.71	53.44	0.69	36	52.5	0.69
1122005206	11/4/2018	0.39	0.65	32.53	20.31	1.60	1.52	0.67	37.45	20.94	1.79	37	20	1.85
1122005014	11/6/2018	0.45	0.98	37.53	30.63	1.23	2.02	1.02	56.02	31.88	1.76	46	30.6	1.5
1122005082	11/7/2018	0.76	1.15	63.38	35.94	1.76	2.34	1.14	67.91	35.63	1.91	68	36.6	1.86
1122005087	11/7/2018	0.81	1.05	67.55	32.81	2.06	2.44	1.13	71.62	35.31	2.03	68	35.9	1.89
1122005211	11/7/2018	0.90	1.05	75.06	32.81	2.29	0.62	0.05	4.03	1.56	2.58	12	1.9	6.4
1123023026	11/8/2018	0.60	1.61	50.04	50.31	0.99	1.86	1.65	50.08	51.56	0.97	51	50.9	1
1123023109	11/8/2018	0.38	0.43	31.69	13.44	2.36	1.81	0.44	48.22	13.75	3.51	36	12.5	2.88
1123023148	11/8/2018	0.68	1.39	56.71	43.44	1.31	2.1	1.36	58.99	42.50	1.39	58	42.2	1.37
1123023179	11/8/2018	0.60	1.26	50.04	39.38	1.27	1.92	1.25	52.31	39.06	1.34	52	39.4	1.32
1122006012	11/9/2018	0.31	1.11	25.85	34.69	0.75	1.41	1.09	33.37	34.06	0.98	32	34.1	0.94
1122006013	11/9/2018	0.41	1.09	34.19	34.06	1.00	1.67	1.1	43.02	34.38	1.25	39	35.9	1.09
1122006025	11/9/2018	0.62	1.33	51.71	41.56	1.24	2.35	1.28	68.28	40.00	1.71	58	40.3	1.44
1122006068	11/9/2018	0.20	0.98	16.68	30.63	0.54	1.83	0.98	48.97	30.63	1.60	20	29.7	0.67
1123023033	11/9/2018	0.34	0.99	28.36	30.94	0.92	1.52	1.06	37.45	33.13	1.13	33	30.3	1.09
1122008001	11/11/2018	0.33	1.04	27.52	32.50	0.85	1.13	1.05	22.97	32.81	0.70	34	32.5	1.05
1122008014	11/11/2018	0.58	0.81	48.37	25.31	1.91	1.9	0.79	51.57	24.69	2.09	49	24.1	2.04

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1122008164	11/14/2018	0.34	1.03	28.36	32.19	0.88	1.38	1.11	32.25	34.69	0.93	32	33.4	0.96
1122009083	11/14/2018	0.16	0.89	13.34	27.81	0.48	1.77	0.92	46.74	28.75	1.63	27	27.8	0.97
1122009113	11/14/2018	0.33	0.79	27.52	24.69	1.11	1.79	0.83	47.48	25.94	1.83	37	25	1.48
1122009133	11/14/2018	0.25	1.06	20.85	33.13	0.63	1.7	1.06	44.14	33.13	1.33	34	32.8	1.04
1122009031	11/16/2018	0.54	1.03	45.04	32.19	1.40	2.06	1.09	57.51	34.06	1.69	50	33.4	1.5
1122009061	11/16/2018	0.67	0.93	55.88	29.06	1.92	2.9	0.92	88.71	28.75	3.09	106	28.4	3.73
1122011217	11/16/2018	0.42	0.17	35.03	5.31	6.59	1.36	0.18	31.51	5.63	5.60	39	5	7.8
1122009005	11/17/2018	0.64	0.30	53.38	9.38	5.69	2.59	0.32	77.19	10.00	7.72	60	8.8	6.86
1122015120	11/26/2018	1.50	2.98	125.10	93.13	1.34	4.12	2.76	134.02	86.25	1.55	178	90.6	1.96
1122019149	11/29/2018	0.37	1.11	30.86	34.69	0.89	1.92	1.06	52.31	33.13	1.58	41	32.5	1.26
1122019010	12/1/2018	0.27	1.35	22.52	42.19	0.53	1.27	1.38	28.17	43.13	0.65	30	42.5	0.71
1127013055	1/6/2018	0.41	0.48	34.19	15.00	2.28	1.37	0.45	31.88	14.06	2.27	42	14.4	2.92
1127013073	1/6/2018	0.40	0.40	33.36	12.50	2.67	1.36	0.41	31.51	12.81	2.46	40	11.3	3.56
1127013082	1/18/2018	0.49	0.42	40.87	13.13	3.11	1.68	0.41	43.40	12.81	3.39	46	13.4	3.42
1127013106	1/6/2018	0.51	0.36	42.53	11.25	3.78	1.63	0.37	41.54	11.56	3.59	44	10.9	4.02
1127013109	1/6/2018	0.64	0.45	53.38	14.06	3.80	1.9	0.47	51.57	14.69	3.51	53	14.4	3.69
1127013113	1/18/2018	0.45	0.56	37.53	17.50	2.14	1.54	0.56	38.20	17.50	2.18	44	16.6	2.66
1127013140	1/18/2018	0.41	0.38	34.19	11.88	2.88	1.39	0.39	32.62	12.19	2.68	41	11.3	3.64
1127013150	1/18/2018	0.23	0.43	19.18	13.44	1.43	0.95	0.44	16.28	13.75	1.18	27	13.1	2.06
1127018204	1/27/2018	0.97	0.92	80.90	28.75	2.81	2.59	0.98	77.19	30.63	2.52	76	27.5	2.76
1128033129	1/23/2018	0.94	1.26	78.40	39.38	1.99	2.47	1.07	72.74	33.44	2.18	71	32.5	2.18
1128033603	1/23/2018	0.67	0.17	55.88	5.31	10.52	2.5	0.16	73.85	5.00	14.77	67	4.4	15.31
1127022068	2/11/2018	0.42	0.28	35.03	8.75	4.00	1.3	0.3	29.28	9.38	3.12	40	9.7	4.13
1127022100	2/11/2018	0.52	0.35	43.37	10.94	3.97	1.67	0.38	43.02	11.88	3.62	47	10.9	4.3
1127022007	2/12/2018	0.41	0.27	34.19	8.44	4.05	1.4	0.23	33.00	7.19	4.59	42	7.2	5.84
1127022037	2/12/2018	0.41	1.86	34.19	58.13	0.59	1.4	1.82	33.00	56.88	0.58	40	57.5	0.7
1127021009	2/20/2018	0.39	0.28	32.53	8.75	3.72	1.33	0.28	30.40	8.75	3.47	40	9.1	4.41
1127021039	2/20/2018	0.59	0.20	49.21	6.25	7.87	1.69	0.22	43.77	6.88	6.37	51	6.9	7.42
1127021074	2/20/2018	0.62	0.12	51.71	3.75	13.79	1.87	0.14	50.45	4.38	11.53	51	4.1	12.55
1127021080	2/20/2018	0.56	0.36	46.70	11.25	4.15	1.4	0.37	33.00	11.56	2.85	46	10.6	4.33
1127021101	2/20/2018	0.47	0.15	39.20	4.69	8.36	1.57	0.18	39.31	5.63	6.99	45	4.7	9.6
1127021110	2/20/2018	0.41	0.38	34.19	11.88	2.88	1.25	0.41	27.43	12.81	2.14	37	12.8	2.89
1127021125	2/20/2018	0.48	0.34	40.03	10.63	3.77	1.42	0.35	33.74	10.94	3.08	42	10.9	3.84
1127021136	2/20/2018	0.45	0.23	37.53	7.19	5.22	1.47	0.26	35.60	8.13	4.38	42	8.4	4.98
1127035110	3/4/2018	2.58	1.78	215.17	55.63	3.87	5.97	1.79	202.73	55.94	3.62	237	53.4	4.44
1127035405	3/5/2018	0.57	0.71	47.54	22.19	2.14	1.87	0.72	50.45	22.50	2.24	51	22.5	2.27
1126001124	3/8/2018	0.52	0.34	43.37	10.63	4.08	1.73	0.35	45.25	10.94	4.14	54	9.7	5.57
1127025367	3/17/2018	0.52	0.51	43.37	15.94	2.72	1.63	0.46	41.54	14.38	2.89	48	14.4	3.34
1127025368	3/17/2018	0.48	0.28	40.03	8.75	4.58	1.56	0.27	38.94	8.44	4.61	44	8.4	5.21
1127026001	3/17/2018	0.62	0.50	51.71	15.63	3.31	1.77	0.5	46.74	15.63	2.99	53	14.4	3.69
1127026004	3/17/2018	0.34	0.23	28.36	7.19	3.95	1.04	0.2	19.63	6.25	3.14	30	6.6	4.57
1127026005	3/17/2018	0.41	0.46	34.19	14.38	2.38	1.36	0.42	31.51	13.13	2.40	33	13.8	2.4
1127026006	3/17/2018	0.54	0.50	45.04	15.63	2.88	2.02	0.5	56.02	15.63	3.59	51	14.7	3.47
1127026053	3/17/2018	0.36	0.45	30.02	14.06	2.14	1.44	0.42	34.48	13.13	2.63	32	13.1	2.44

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1127026090	3/17/2018	0.68	1.24	56.71	38.75	1.46	1.85	1.05	49.71	32.81	1.51	53	32.5	1.63
1126003026	3/18/2018	0.46	0.22	38.36	6.88	5.58	1.47	0.22	35.60	6.88	5.18	44	7.5	5.87
1126003048	3/18/2018	0.45	0.51	37.53	15.94	2.35	1.47	0.52	35.60	16.25	2.19	44	16.6	2.66
1126003120	3/18/2018	0.22	0.88	18.35	27.50	0.67	1.64	0.94	41.91	29.38	1.43	30	26.3	1.14
1126003139	3/18/2018	0.67	0.14	55.88	4.38	12.77	2.28	0.17	65.68	5.31	12.36	63	4.4	14.4
1127025421	3/18/2018	0.77	0.28	64.22	8.75	7.34	2.01	0.28	55.65	8.75	6.36	62	9.1	6.84
1126003005	3/23/2018	0.53	0.57	44.20	17.81	2.48	2.21	0.59	63.08	18.44	3.42	52	15.9	3.26
1130101131	3/24/2018	0.85	0.41	70.89	12.81	5.53	2.54	0.41	75.34	12.81	5.88	72	12.2	5.91
1130101009	3/26/2018	0.76	0.45	63.38	14.06	4.51	2.43	0.5	71.25	15.63	4.56	69	14.4	4.8
1130101067	4/4/2018	1.03	0.74	85.90	23.13	3.71	2.76	0.7	83.51	21.88	3.82	109	24.7	4.42
1126004067	4/18/2018	0.51	0.26	42.53	8.13	5.23	1.64	0.29	41.91	9.06	4.62	46	10	4.6
1126005018	4/20/2018	0.67	0.12	55.88	3.75	14.90	2.05	0.12	57.14	3.75	15.24	60	4.4	13.71
1126011011	4/23/2018	0.79	0.31	65.89	9.69	6.80	2.01	0.31	55.65	9.69	5.74	65	9.4	6.93
1126011032	4/23/2018	0.97	0.62	80.90	19.38	4.18	2.37	0.61	69.02	19.06	3.62	69	17.5	3.94
1126011104	4/26/2018	0.43	0.69	35.86	21.56	1.66	1.41	0.7	33.37	21.88	1.53	41	20.9	1.96
1126012081	4/26/2018	0.25	0.28	20.85	8.75	2.38	1.19	0.35	25.20	10.94	2.30	36	10.6	3.39
1126012094	4/26/2018	0.40	0.40	33.36	12.50	2.67	1.56	0.44	38.94	13.75	2.83	43	13.1	3.28
1130101034	4/26/2018	1.84	0.75	153.46	23.44	6.55	6.09	0.82	207.18	25.63	8.09	206	24.4	8.45
1130101047	4/26/2018	1.94	2.23	161.80	69.69	2.32	4.68	2.02	154.82	63.13	2.45	204	64.1	3.18
1130101103	4/26/2018	2.09	0.62	174.31	19.38	9.00	6.01	0.66	204.21	20.63	9.90	220	19.1	11.54
1130101110	4/26/2018	1.55	2.29	129.27	71.56	1.81	4.24	2.08	138.47	65.00	2.13	171	67.8	2.52
1126012006	4/27/2018	0.49	0.35	40.87	10.94	3.74	1.54	0.39	38.20	12.19	3.13	46	10.6	4.33
1126007003	4/30/2018	0.37	0.50	30.86	15.63	1.97	1.48	0.53	35.97	16.56	2.17	35	14.7	2.38
1126007035	4/30/2018	1.07	1.04	89.24	32.50	2.75	2.25	1.05	64.57	32.81	1.97	70	32.8	2.13
1126013015	4/30/2018	0.68	0.51	56.71	15.94	3.56	2.16	0.53	61.22	16.56	3.70	60	15.3	3.92
1126013063	4/30/2018	0.77	0.24	64.22	7.50	8.56	2.39	0.25	69.76	7.81	8.93	65	7.2	9.04
1126013064	4/30/2018	0.57	0.33	47.54	10.31	4.61	1.84	0.31	49.34	9.69	5.09	51	9.7	5.26
1126013065	4/30/2018	0.54	0.18	45.04	5.63	8.01	1.84	0.21	49.34	6.56	7.52	49	6.3	7.84
1130101038	4/30/2018	1.55	1.73	129.27	54.06	2.39	4.46	1.72	146.64	53.75	2.73	183	52.8	3.47
1126007010	5/2/2018	0.56	0.67	46.70	20.94	2.23	1.99	0.73	54.91	22.81	2.41	49	20.9	2.34
1126007030	5/2/2018	0.28	0.52	23.35	16.25	1.44	1.27	0.56	28.17	17.50	1.61	28	16.3	1.72
1126007062	5/2/2018	0.62	0.73	51.71	22.81	2.27	1.87	0.8	50.45	25.00	2.02	50	23.1	2.16
1126007082	5/2/2018	0.95	0.45	79.23	14.06	5.63	3.02	0.45	93.16	14.06	6.62	80	13.4	5.95
1126013040	5/2/2018	0.54	0.25	45.04	7.81	5.76	1.79	0.27	47.48	8.44	5.63	50	7.5	6.67
1126021023	5/18/2018	0.43	0.16	35.86	5.00	7.17	1.98	0.16	54.54	5.00	10.91	41	4.4	9.37
1126022104	5/18/2018	0.47	0.33	39.20	10.31	3.80	1.56	0.36	38.94	11.25	3.46	45	10.9	4.11
1126022073	5/19/2018	0.62	0.27	51.71	8.44	6.13	2.19	0.28	62.34	8.75	7.12	59	8.1	7.26
1126022109	5/19/2018	0.59	0.25	49.21	7.81	6.30	1.88	0.28	50.82	8.75	5.81	49	7.8	6.27
1126022145	5/21/2018	0.91	0.19	75.89	5.94	12.78	2.53	0.21	74.96	6.56	11.42	69	5.9	11.62
1126021028	5/22/2018	1.35	0.61	112.59	19.06	5.91	4.25	0.68	138.85	21.25	6.53	121	19.1	6.35
1126022001	5/22/2018	0.46	0.58	38.36	18.13	2.12	1.54	0.57	38.20	17.81	2.14	41	17.2	2.39
1126022006	5/22/2018	0.51	0.21	42.53	6.56	6.48	1.92	0.22	52.31	6.88	7.61	49	6.3	7.84
1126022016	5/22/2018	0.50	0.28	41.70	8.75	4.77	1.68	0.29	43.40	9.06	4.79	45	9.1	4.97
1126022076	5/23/2018	0.72	0.61	60.05	19.06	3.15	1.96	0.5	53.79	15.63	3.44	51	15	3.4

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Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1126022142	5/23/2018	0.68	0.64	56.71	20.00	2.84	1.81	0.68	48.22	21.25	2.27	50	22.5	2.22
1126022036	5/24/2018	0.54	0.40	45.04	12.50	3.60	1.71	0.4	44.51	12.50	3.56	46	12.5	3.68
1126022049	5/24/2018	0.57	0.19	47.54	5.94	8.01	1.81	0.18	48.22	5.63	8.57	48	5.6	8.53
1126022043	5/25/2018	0.61	0.24	50.87	7.50	6.78	2.11	0.29	59.37	9.06	6.55	51	7.5	6.8
1126022045	5/25/2018	0.54	0.24	45.04	7.50	6.00	1.87	0.27	50.45	8.44	5.98	48	7.8	6.14
1126025121	5/27/2018	0.82	0.64	68.39	20.00	3.42	2.78	0.66	84.25	20.63	4.08	71	19.4	3.66
1126025119	5/28/2018	0.69	0.59	57.55	18.44	3.12	2.6	0.62	77.56	19.38	4.00	61	17.5	3.49
1126025117	5/30/2018	0.93	0.93	77.56	29.06	2.67	3.17	0.95	98.73	29.69	3.33	79	27.2	2.91
1125003039	6/2/2018	0.45	0.19	37.53	5.94	6.32	1.6	0.2	40.42	6.25	6.47	42	5.9	7.07
1125004085	6/2/2018	0.54	0.51	45.04	15.94	2.83	1.8	0.51	47.85	15.94	3.00	48	15.3	3.13
1125003016	6/4/2018	0.23	0.31	19.18	9.69	1.98	0.92	0.32	15.17	10.00	1.52	27	9.1	2.98
1125003161	6/9/2018	0.49	0.46	40.87	14.38	2.84	1.61	0.48	40.80	15.00	2.72	45	13.4	3.35
1125003126	6/10/2018	0.46	0.37	38.36	11.56	3.32	1.62	0.37	41.17	11.56	3.56	44	10.9	4.02
1125003208	6/10/2018	0.62	0.55	51.71	17.19	3.01	1.66	0.58	42.65	18.13	2.35	52	16.9	3.08
1125003227	6/10/2018	0.63	0.60	52.54	18.75	2.80	2.04	0.59	56.77	18.44	3.08	59	18.8	3.15
1125003010	6/11/2018	0.43	0.67	35.86	20.94	1.71	1.39	0.67	32.62	20.94	1.56	44	20.9	2.1
1125003026	6/11/2018	0.31	0.28	25.85	8.75	2.95	1.11	0.31	22.23	9.69	2.29	34	8.8	3.89
1125003030	6/12/2018	0.56	0.21	46.70	6.56	7.12	1.7	0.19	44.14	5.94	7.43	49	5.3	9.22
1125003091	6/12/2018	0.47	0.31	39.20	9.69	4.05	1.58	0.32	39.68	10.00	3.97	44	9.7	4.54
1125007033	6/14/2018	0.84	0.14	70.06	4.38	16.01	2.48	0.12	73.11	3.75	19.50	71	3.1	22.72
1125022009	6/15/2018	0.44	0.04	36.70	1.25	29.36	1.8	0.05	47.85	1.56	30.63	43	1.6	27.52
1125022027	6/15/2018	0.74	0.41	61.72	12.81	4.82	2.32	0.43	67.16	13.44	5.00	65	13.4	4.84
1125022167	6/15/2018	0.62	0.36	51.71	11.25	4.60	1.94	0.37	53.05	11.56	4.59	50	11.6	4.32
1125021011	6/16/2018	0.57	0.33	47.54	10.31	4.61	1.87	0.35	50.45	10.94	4.61	48	9.7	4.95
1125022108	6/16/2018	1.09	0.39	90.91	12.19	7.46	2.99	0.38	92.05	11.88	7.75	77	12.5	6.16
1125022166	6/16/2018	0.70	0.29	58.38	9.06	6.44	1.84	0.29	49.34	9.06	5.44	51	8.8	5.83
1125008113	6/17/2018	0.53	1.00	44.20	31.25	1.41	1.62	0.97	41.17	30.31	1.36	49	31.3	1.57
1125021001	6/17/2018	0.40	0.37	33.36	11.56	2.89	1.17	0.35	24.45	10.94	2.24	36	9.7	3.72
1125021005	6/17/2018	0.90	0.72	75.06	22.50	3.34	2	0.68	55.28	21.25	2.60	67	20.6	3.25
1125021118	6/17/2018	0.62	0.23	51.71	7.19	7.19	1.81	0.25	48.22	7.81	6.17	52	7.2	7.23
1125021156	6/17/2018	0.60	0.42	50.04	13.13	3.81	1.73	0.43	45.25	13.44	3.37	54	11.9	4.55
1125021189	6/17/2018	0.81	0.24	67.55	7.50	9.01	2.29	0.21	66.05	6.56	10.06	68	5.3	12.8
1125021143	6/18/2018	0.58	0.25	48.37	7.81	6.19	1.63	0.24	41.54	7.50	5.54	49	7.2	6.82
1125008021	6/21/2018	0.43	0.43	35.86	13.44	2.67	1.15	0.41	23.71	12.81	1.85	38	13.1	2.9
1125008124	6/22/2018	0.58	0.35	48.37	10.94	4.42	1.71	0.34	44.51	10.63	4.19	52	10	5.2
1124007068	8/9/2018	0.49	0.37	40.87	11.56	3.53	1.92	0.39	52.31	12.19	4.29	46	11.6	3.98
1124006013	8/11/2018	0.35	0.42	29.19	13.13	2.22	1.26	0.41	27.80	12.81	2.17	36	12.8	2.81
1124007064	8/11/2018	0.50	0.44	41.70	13.75	3.03	1.62	0.48	41.17	15.00	2.74	46	15	3.07
1124007001	8/12/2018	0.69	0.45	57.55	14.06	4.09	2.08	0.42	58.25	13.13	4.44	63	12.5	5.04
1124006024	8/13/2018	0.42	0.53	35.03	16.56	2.11	1.53	0.53	37.82	16.56	2.28	39	17.5	2.23
1124007028	8/14/2018	0.33	0.52	27.52	16.25	1.69	1.19	0.49	25.20	15.31	1.65	29	16.6	1.75
1124010027	8/19/2018	0.54	0.37	45.04	11.56	3.90	1.89	0.37	51.19	11.56	4.43	51	11.3	4.53
1124010068	8/19/2018	0.42	0.31	35.03	9.69	3.62	1.34	0.32	30.77	10.00	3.08	39	9.4	4.16
1124010005	8/21/2018	0.68	0.36	56.71	11.25	5.04	2.18	0.35	61.97	10.94	5.67	57	10.3	5.53

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1124014020	8/22/2018	0.51	0.55	42.53	17.19	2.47	1.84	0.54	49.34	16.88	2.92	49	16.3	3.02
1124014016	8/23/2018	0.59	0.40	49.21	12.50	3.94	1.67	0.43	43.02	13.44	3.20	42	12.2	3.45
1124014001	8/24/2018	0.72	0.97	60.05	30.31	1.98	2.38	1.01	69.39	31.56	2.20	62	29.4	2.11
1124014003	8/24/2018	0.62	0.51	51.71	15.94	3.24	1.71	0.52	44.51	16.25	2.74	46	15.3	3
1124014014	8/24/2018	0.78	0.17	65.05	5.31	12.25	2.53	0.17	74.96	5.31	14.11	69	4.4	15.77
1124014032	8/24/2018	0.87	0.17	72.56	5.31	13.66	2.41	0.18	70.51	5.63	12.53	69	5	13.8
1124014008	8/26/2018	0.21	0.55	17.51	17.19	1.02	1.4	0.56	33.00	17.50	1.89	27	16.3	1.66
1124015013	8/29/2018	0.61	0.30	50.87	9.38	5.43	1.69	0.28	43.77	8.75	5.00	53	8.4	6.28
1124015027	8/29/2018	0.63	0.10	52.54	3.13	16.81	2.11	0.09	59.37	2.81	21.11	55	3.1	17.6
1124015152	8/29/2018	0.50	0.57	41.70	17.81	2.34	1.62	0.56	41.17	17.50	2.35	47	17.5	2.69
1124015102	8/30/2018	0.57	0.14	47.54	4.38	10.87	1.8	0.12	47.85	3.75	12.76	47	4.4	10.74
1124015201	8/30/2018	0.83	0.88	69.22	27.50	2.52	2.44	0.84	71.62	26.25	2.73	69	27.8	2.48
1124015176	8/31/2018	1.95	0.73	162.63	22.81	7.13	4.12	0.71	134.02	22.19	6.04	182	21.9	8.32
1124013169	9/2/2018	0.36	0.54	30.02	16.88	1.78	1.19	0.56	25.20	17.50	1.44	40	17.8	2.25
1124013163	9/3/2018	0.48	0.34	40.03	10.63	3.77	1.55	0.39	38.57	12.19	3.16	48	11.6	4.15
1124013172	9/3/2018	0.57	0.34	47.54	10.63	4.47	1.85	0.35	49.71	10.94	4.54	57	10.6	5.36
1124013174	9/3/2018	0.73	0.20	60.88	6.25	9.74	2.4	0.21	70.14	6.56	10.69	64	6.3	10.24
1124013024	9/4/2018	0.49	0.15	40.87	4.69	8.72	1.51	0.15	37.08	4.69	7.91	45	4.1	11.08
1124013101	9/4/2018	0.54	0.17	45.04	5.31	8.48	1.6	0.19	40.42	5.94	6.81	51	5.3	9.6
1124013001	9/5/2018	0.61	0.42	50.87	13.13	3.88	1.9	0.41	51.57	12.81	4.02	52	12.2	4.27
1124019165	9/8/2018	0.43	0.31	35.86	9.69	3.70	1.65	0.29	42.28	9.06	4.67	45	8.4	5.33
1124019103	9/9/2018	0.62	1.25	51.71	39.06	1.32	2.06	1.25	57.51	39.06	1.47	58	38.4	1.51
1124012051	9/10/2018	0.75	0.70	62.55	21.88	2.86	2.42	0.72	70.88	22.50	3.15	63	20.9	3.01
1124012001	9/11/2018	0.82	0.72	68.39	22.50	3.04	2.22	0.72	63.45	22.50	2.82	60	21.6	2.78
1124012004	9/11/2018	0.97	0.81	80.90	25.31	3.20	2.26	0.87	64.94	27.19	2.39	65	24.7	2.63
1123002067	9/30/2018	0.56	0.53	46.70	16.56	2.82	1.75	0.52	46.00	16.25	2.83	49	15	3.27
1123002091	9/30/2018	0.47	0.23	39.20	7.19	5.45	1.45	0.27	34.85	8.44	4.13	43	8.4	5.1
1123002082	10/1/2018	0.38	0.44	31.69	13.75	2.30	1.19	0.42	25.20	13.13	1.92	35	13.1	2.67
1123002106	10/1/2018	0.54	0.21	45.04	6.56	6.86	1.71	0.2	44.51	6.25	7.12	49	6.3	7.84
1123003016	10/2/2018	0.40	0.42	33.36	13.13	2.54	1.25	0.45	27.43	14.06	1.95	37	13.1	2.82
1123003041	10/2/2018	0.50	0.16	41.70	5.00	8.34	1.51	0.18	37.08	5.63	6.59	46	5	9.2
1123003119	10/2/2018	0.46	0.51	38.36	15.94	2.41	1.51	0.52	37.08	16.25	2.28	43	14.4	2.99
1123005032	10/6/2018	0.89	0.37	74.23	11.56	6.42	2.3	0.39	66.42	12.19	5.45	67	11.9	5.64
1123005059	10/6/2018	0.96	0.20	80.06	6.25	12.81	3.11	0.22	96.51	6.88	14.04	78	6.3	12.48
1123005061	10/6/2018	0.75	0.51	62.55	15.94	3.92	2.25	0.54	64.57	16.88	3.83	63	15.6	4.03
1123005086	10/6/2018	0.74	0.18	61.72	5.63	10.97	2.18	0.23	61.97	7.19	8.62	58	6.9	8.44
1123005207	10/6/2018	0.51	0.46	42.53	14.38	2.96	1.68	0.5	43.40	15.63	2.78	42	13.8	3.05
1123005102	10/7/2018	0.71	0.89	59.21	27.81	2.13	2.07	0.87	57.88	27.19	2.13	49	25.3	1.94
1123004024	10/9/2018	0.56	0.36	46.70	11.25	4.15	1.65	0.45	42.28	14.06	3.01	50	12.8	3.9
1123004153	10/9/2018	0.42	0.41	35.03	12.81	2.73	1.28	0.19	28.54	5.94	4.81	37	5.3	6.96
1123004119	10/10/2018	0.68	0.43	56.71	13.44	4.22	2.01	0.45	55.65	14.06	3.96	55	13.1	4.19
1123004157	10/10/2018	0.99	0.45	82.57	14.06	5.87	2.85	0.46	86.85	14.38	6.04	72	13.8	5.24
1123006055	10/14/2018	0.49	0.15	40.87	4.69	8.72	1.65	0.16	42.28	5.00	8.46	44	4.1	10.83
1123006072	10/14/2018	0.48	0.41	40.03	12.81	3.12	1.7	0.42	44.14	13.13	3.36	45	12.8	3.51

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1123006098	10/14/2018	0.33	0.23	27.52	7.19	3.83	1.57	0.25	39.31	7.81	5.03	34	6.6	5.18
1123006117	10/14/2018	0.71	0.54	59.21	16.88	3.51	2.12	0.54	59.74	16.88	3.54	60	15.9	3.76
1123006132	10/14/2018	0.67	0.61	55.88	19.06	2.93	2.11	0.62	59.37	19.38	3.06	57	17.8	3.2
1123006001	10/17/2018	0.77	0.92	64.22	28.75	2.23	2.26	0.92	64.94	28.75	2.26	64	28.4	2.25
1123006017	10/17/2018	0.66	0.99	55.04	30.94	1.78	2.13	0.99	60.11	30.94	1.94	57	28.8	1.98
1123006052	10/17/2018	0.49	0.35	40.87	10.94	3.74	1.69	0.36	43.77	11.25	3.89	48	10.3	4.65
1123018079	10/21/2018	0.79	0.24	65.89	7.50	8.78	2.37	0.23	69.02	7.19	9.60	67	6.9	9.75
1123018107	10/21/2018	0.82	0.34	68.39	10.63	6.44	2.39	0.34	69.76	10.63	6.57	71	10.3	6.88
1123018048	10/22/2018	0.60	0.56	50.04	17.50	2.86	2.16	0.59	61.22	18.44	3.32	60	16.6	3.62
1123008166	10/23/2018	0.48	1.21	40.03	37.81	1.06	1.36	1.18	31.51	36.88	0.85	42	37.8	1.11
1123008199	10/23/2018	0.76	0.83	63.38	25.94	2.44	1.95	0.78	53.42	24.38	2.19	56	22.8	2.45
1123008200	10/23/2018	0.61	1.03	50.87	32.19	1.58	1.75	1.02	46.00	31.88	1.44	50	32.5	1.54
1123008120	10/26/2018	1.90	1.97	158.46	61.56	2.57	4.44	1.81	145.90	56.56	2.58	204	60.3	3.38
1123008138	10/26/2018	1.40	1.66	116.76	51.88	2.25	3.29	1.67	103.19	52.19	1.98	151	49.7	3.04
1123008148	10/26/2018	0.56	0.85	46.70	26.56	1.76	1.74	0.89	45.62	27.81	1.64	48	27.5	1.75
1123008224	10/27/2018	0.88	0.60	73.39	18.75	3.91	2.23	0.61	63.82	19.06	3.35	74	17.8	4.15
1122004125	10/31/2018	0.44	0.39	36.70	12.19	3.01	1.7	0.39	44.14	12.19	3.62	45	11.3	4
1122004129	10/31/2018	0.62	0.34	51.71	10.63	4.87	2.14	0.36	60.48	11.25	5.38	57	11.3	5.07
1122005092	11/3/2018	0.43	0.63	35.86	19.69	1.82	1.8	0.63	47.85	19.69	2.43	42	19.4	2.17
1122005001	11/6/2018	0.51	0.33	42.53	10.31	4.12	1.76	0.36	46.37	11.25	4.12	48	10	4.8
1122006066	11/9/2018	0.71	0.42	59.21	13.13	4.51	2.24	0.4	64.19	12.50	5.14	57	13.1	4.34
1122009159	11/14/2018	0.49	0.59	40.87	18.44	2.22	1.77	0.61	46.74	19.06	2.45	49	18.1	2.7
1122009022	11/16/2018	0.81	0.28	67.55	8.75	7.72	3.03	0.31	93.53	9.69	9.66	73	7.8	9.34
1122009054	11/16/2018	0.60	0.63	50.04	19.69	2.54	2.06	0.64	57.51	20.00	2.88	56	17.8	3.14
1122011026	11/16/2018	0.89	0.51	74.23	15.94	4.66	2.9	0.55	88.71	17.19	5.16	78	15.3	5.09
1122011169	11/16/2018	0.58	0.33	48.37	10.31	4.69	1.88	0.36	50.82	11.25	4.52	54	10	5.4
1122011196	11/16/2018	0.40	0.36	33.36	11.25	2.97	1.35	0.39	31.14	12.19	2.55	41	11.3	3.64
1122009016	11/17/2018	0.78	0.24	65.05	7.50	8.67	2.67	0.25	80.16	7.81	10.26	70	6.6	10.67
1122011014	11/20/2018	0.50	0.48	41.70	15.00	2.78	1.53	0.54	37.82	16.88	2.24	43	15.3	2.81
1122011143	11/20/2018	0.40	0.20	33.36	6.25	5.34	1.35	0.24	31.14	7.50	4.15	39	6.3	6.24
1122011187	11/20/2018	0.49	0.42	40.87	13.13	3.11	1.64	0.42	41.91	13.13	3.19	45	12.2	3.69
1122015203	11/20/2018	0.57	0.44	47.54	13.75	3.46	1.64	0.45	41.91	14.06	2.98	50	12.8	3.9
1122016179	11/20/2018	0.83	0.51	69.22	15.94	4.34	2.69	0.53	80.91	16.56	4.88	70	15	4.67
1122011114	11/21/2018	0.44	0.48	36.70	15.00	2.45	1.29	0.52	28.91	16.25	1.78	40	14.1	2.84
1122011118	11/21/2018	0.34	0.28	28.36	8.75	3.24	1.09	0.29	21.48	9.06	2.37	34	7.8	4.35
1122015023	11/23/2018	1.20	2.31	100.08	72.19	1.39	2.98	2.11	91.68	65.94	1.39	152	65.9	2.31
1122015029	11/23/2018	0.61	1.39	50.87	43.44	1.17	1.74	1.35	45.62	42.19	1.08	51	41.6	1.23
1122015122	11/23/2018	1.59	1.28	132.61	40.00	3.32	4.03	1.27	130.67	39.69	3.29	164	39.1	4.2
1122015160	11/23/2018	0.48	0.46	40.03	14.38	2.78	1.64	0.47	41.91	14.69	2.85	45	13.8	3.27
1122015170	11/23/2018	0.70	0.11	58.38	3.44	16.98	2.31	0.11	66.79	3.44	19.43	59	2.8	20.98
1122015150	11/26/2018	0.48	0.81	40.03	25.31	1.58	1.62	0.83	41.17	25.94	1.59	44	24.4	1.81
1122015189	11/26/2018	1.07	0.07	89.24	2.19	40.79	3.08	0.06	95.39	1.88	50.88	86	1.9	45.87
1127017107	1/21/2018	0.52	1.21	43.37	37.81	1.15	2.03	1.21	56.39	37.81	1.49	58	36.9	1.57
1127017148	1/21/2018	0.18	1.34	15.01	41.88	0.36	0.82	1.3	11.45	40.63	0.28	23	41.3	0.56

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Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1127018064	1/30/2018	0.18	1.64	15.01	51.25	0.29	0.94	1.61	15.91	50.31	0.32	22	47.8	0.46
1127018073	1/30/2018	0.65	1.25	54.21	39.06	1.39	2.05	1.18	57.14	36.88	1.55	55	36.3	1.52
1127018084	1/27/2018	0.33	1.27	27.52	39.69	0.69	1.41	1.29	33.37	40.31	0.83	33	33.8	0.98
1127018090	1/30/2018	0.08	2.96	6.67	92.50	0.07	0.34	2.79	0.00	87.19	0.00	14	81.9	0.17
1127018092	1/30/2018	0.22	3.78	18.35	118.13	0.16	0.63	3.63	4.40	113.44	0.04	21	105.6	0.2
1127018098	1/30/2018	1.14	2.31	95.08	72.19	1.32	2.7	2.19	81.28	68.44	1.19	93	70.6	1.32
1127018108	1/30/2018	1.23	1.57	102.58	49.06	2.09	2.58	1.66	76.82	51.88	1.48	99	44.7	2.22
1127018146	1/31/2018	1.19	2.69	99.25	84.06	1.18	2.74	2.61	82.76	81.56	1.01	96	81.6	1.18
1127018153	1/31/2018	1.41	1.92	117.59	60.00	1.96	2.99	1.89	92.05	59.06	1.56	116	57.8	2.01
1127018223	1/30/2018	0.60	1.25	50.04	39.06	1.28	1.9	1.32	51.57	41.25	1.25	51	36.9	1.38
1127018241	1/30/2018	0.65	1.40	54.21	43.75	1.24	2.14	1.39	60.48	43.44	1.39	57	43.1	1.32
1127018265	1/30/2018	0.72	1.35	60.05	42.19	1.42	2.09	1.37	58.62	42.81	1.37	57	41.6	1.37
1128031001	1/18/2018	0.28	1.46	23.35	45.63	0.51	1.65	1.43	42.28	44.69	0.95	33	43.4	0.76
1128031003	1/18/2018	0.33	1.55	27.52	48.44	0.57	1.39	1.56	32.62	48.75	0.67	36	46.3	0.78
1128031020	1/18/2018	0.49	2.35	40.87	73.44	0.56	1.33	2.28	30.40	71.25	0.43	41	70.6	0.58
1128031069	1/18/2018	0.45	3.55	37.53	110.94	0.34	0.92	3.52	15.17	110.00	0.14	27	112.2	0.24
1128031083	1/18/2018	0.73	2.74	60.88	85.63	0.71	2.07	2.9	57.88	90.63	0.64	57	91.6	0.62
1128032026	1/20/2018	0.58	1.42	48.37	44.38	1.09	2.35	1.78	68.28	55.63	1.23	80	55.3	1.45
1128032075	1/20/2018	1.18	1.70	98.41	53.13	1.85	2.6	1.65	77.56	51.56	1.50	98	52.8	1.86
1130057723	1/27/2018	0.22	1.90	18.35	59.38	0.31	0.31	1.89	0.00	59.06	0.00	14	54.7	0.26
1130057729	1/25/2018	0.06	2.17	5.00	67.81	0.07	0.1	2.05	0.00	64.06	0.00	5	63.8	0.08
1130057753	1/27/2018	0.38	1.98	31.69	61.88	0.51	0.87	1.97	13.31	61.56	0.22	30	59.4	0.51
1130057771	1/25/2018	0.11	3.48	9.17	108.75	0.08	0.22	3.35	0.00	104.69	0.00	10	92.5	0.11
1130057779	1/24/2018	0.10	2.77	8.34	86.56	0.10	0.22	2.59	0.00	80.94	0.00	11	79.1	0.14
1130057786	1/24/2018	0.01	2.02	0.42	63.13	0.01	0.12	2.24	0.00	70.00	0.00	5	69.7	0.07
1130057787	1/24/2018	0.05	2.04	4.17	63.75	0.07	0.21	2.04	0.00	63.75	0.00	8	54.7	0.15
1128037194	2/6/2018	0.26	2.24	21.68	70.00	0.31	0.57	2.17	2.17	67.81	0.03	23	66.3	0.35
1128038022	2/9/2018	0.72	2.01	60.05	62.81	0.96	1.43	2	34.11	62.50	0.55	59	65	0.91
1128038026	2/9/2018	1.06	1.98	88.40	61.88	1.43	1.98	1.95	54.54	60.94	0.89	85	59.7	1.42
1128038109	2/9/2018	1.02	1.58	85.07	49.38	1.72	2.47	1.58	72.74	49.38	1.47	80	50.6	1.58
1128038126	2/9/2018	0.90	1.76	75.06	55.00	1.36	2.07	1.79	57.88	55.94	1.03	72	57.8	1.25
1128038133	2/9/2018	0.76	2.46	63.38	76.88	0.82	1.4	2.44	33.00	76.25	0.43	61	75	0.81
1127019194	2/10/2018	1.11	2.03	92.57	63.44	1.46	2.21	2.04	63.08	63.75	0.99	83	62.2	1.33
1129098228	2/11/2018	0.05	2.16	4.17	67.50	0.06	0.21	2.19	0.00	68.44	0.00	10	68.1	0.15
1129098230	2/11/2018	0.19	1.74	15.85	54.38	0.29	0.64	1.78	4.77	55.63	0.09	21	56.3	0.37
1129098237	2/11/2018	0.47	2.05	39.20	64.06	0.61	1.34	2.01	30.77	62.81	0.49	40	60.9	0.66
1129098310	2/11/2018	0.11	1.67	9.17	52.19	0.18	0.39	1.74	0.00	54.38	0.00	15	54.4	0.28
1129098339	2/11/2018	0.06	1.88	5.00	58.75	0.09	0.18	1.77	0.00	55.31	0.00	7	60.6	0.12
1129098343	2/11/2018	0.05	1.43	4.17	44.69	0.09	0.24	1.48	0.00	46.25	0.00	10	45.3	0.22
1129098363	2/11/2018	0.09	2.05	7.51	64.06	0.12	0.28	2.06	0.00	64.38	0.00	12	66.6	0.18
1129098370	2/11/2018	0.08	1.98	6.67	61.88	0.11	0.17	2.02	0.00	63.13	0.00	10	65	0.15
1129098280	2/12/2018	0.07	2.09	5.84	65.31	0.09	0.18	2.04	0.00	63.75	0.00	9	63.8	0.14
1129098334	2/12/2018	0.08	2.60	6.67	81.25	0.08	0.21	2.54	0.00	79.38	0.00	8	81.3	0.1
1129098353	2/12/2018	0.26	1.98	21.68	61.88	0.35	0.52	1.98	0.31	61.88	0.01	21	63.4	0.33

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1129052043	2/16/2018	0.48	2.57	40.03	80.31	0.50	1.03	2.47	19.25	77.19	0.25	36	81.6	0.44
1129052150	2/16/2018	0.06	2.44	5.00	76.25	0.07	0.23	2.46	0.00	76.88	0.00	10	79.1	0.13
1129053069	2/16/2018	0.88	1.09	73.39	34.06	2.15	1.86	1.26	50.08	39.38	1.27	71	40	1.78
1129053120	2/16/2018	0.95	1.45	79.23	45.31	1.75	1.71	1.48	44.51	46.25	0.96	73	45.6	1.6
1129053008	2/18/2018	0.13	4.38	10.84	136.88	0.08	0.28	4.14	0.00	129.38	0.00	13	141.3	0.09
1129053009	2/18/2018	0.26	2.69	21.68	84.06	0.26	0.48	2.61	0.00	81.56	0.00	21	94.4	0.22
1129053010	2/18/2018	0.41	3.38	34.19	105.63	0.32	0.79	3.18	10.34	99.38	0.10	33	111.9	0.29
1129053037	2/18/2018	0.08	2.53	6.67	79.06	0.08	0.19	2.47	0.00	77.19	0.00	7	81.6	0.09
1129053043	2/18/2018	0.26	1.66	21.68	51.88	0.42	0.71	1.69	7.37	52.81	0.14	25	54.7	0.46
1127024096	2/22/2018	0.71	2.02	59.21	63.13	0.94	1.43	2.02	34.11	63.13	0.54	56	67.2	0.83
1127024083	2/23/2018	0.44	2.81	36.70	87.81	0.42	0.99	2.76	17.77	86.25	0.21	37	85	0.44
1129057060	2/23/2018	0.50	2.13	41.70	66.56	0.63	0.94	2.14	15.91	66.88	0.24	42	69.4	0.61
1129057103	2/23/2018	0.35	2.21	29.19	69.06	0.42	0.64	2.09	4.77	65.31	0.07	28	69.4	0.4
1129057140	2/25/2018	0.26	2.43	21.68	75.94	0.29	0.5	2.48	0.00	77.50	0.00	21	74.1	0.28
1128039007	3/1/2018	0.85	1.65	70.89	51.56	1.37	1.74	1.98	45.62	61.88	0.74	81	66.3	1.22
1128039017	3/1/2018	1.14	1.84	95.08	57.50	1.65	2.05	1.95	57.14	60.94	0.94	85	63.4	1.34
1128039050	3/1/2018	1.11	2.24	92.57	70.00	1.32	1.96	2.23	53.79	69.69	0.77	81	74.4	1.09
1128039084	3/1/2018	1.26	2.50	105.08	78.13	1.35	2.09	2.43	58.62	75.94	0.77	100	81.9	1.22
1128042075	3/11/2018	1.17	1.66	97.58	51.88	1.88	2.68	1.73	80.54	54.06	1.49	98	51.6	1.9
1128042084	3/11/2018	1.19	1.72	99.25	53.75	1.85	2.52	1.51	74.59	47.19	1.58	96	45	2.13
1128042101	3/12/2018	0.27	1.43	22.52	44.69	0.50	0.92	1.41	15.17	44.06	0.34	28	41.9	0.67
1128042144	3/12/2018	0.20	1.88	16.68	58.75	0.28	0.87	1.95	13.31	60.94	0.22	23	59.7	0.39
1128042175	3/12/2018	0.76	1.24	63.38	38.75	1.64	2.49	1.29	73.48	40.31	1.82	67	36.9	1.82
1128044001	3/15/2018	0.21	3.45	17.51	107.81	0.16	0.42	3.34	0.00	104.38	0.00	18	104.1	0.17
1128044002	3/15/2018	0.12	2.70	10.01	84.38	0.12	0.29	2.49	0.00	77.81	0.00	14	76.3	0.18
1128044051	3/15/2018	0.11	2.61	9.17	81.56	0.11	0.37	2.37	0.00	74.06	0.00	13	79.7	0.16
1128044057	3/15/2018	0.13	4.82	10.84	150.63	0.07	0.41	5.13	0.00	160.31	0.00	14	160.3	0.09
1128044119	3/15/2018	0.41	1.51	34.19	47.19	0.72	0.99	1.58	17.77	49.38	0.36	36	48.8	0.74
1128045089	3/21/2018	0.60	1.46	50.04	45.63	1.10	1.38	1.43	32.25	44.69	0.72	54	44.1	1.23
1128048087	3/21/2018	0.13	2.17	10.84	67.81	0.16	0.46	2.26	0.00	70.63	0.00	14	70	0.2
1128048088	3/21/2018	0.11	2.50	9.17	78.13	0.12	0.39	2.38	0.00	74.38	0.00	13	76.3	0.17
1128047085	3/23/2018	0.03	1.64	2.50	51.25	0.05	0.14	1.63	0.00	50.94	0.00	8	50.3	0.16
1128047088	3/23/2018	0.05	1.58	4.17	49.38	0.08	0.16	1.58	0.00	49.38	0.00	9	50	0.18
1128047167	3/23/2018	0.69	1.66	57.55	51.88	1.11	1.54	1.71	38.20	53.44	0.71	58	49.4	1.17
1128048137	3/23/2018	0.19	5.34	15.85	166.88	0.09	0.45	4.97	0.00	155.31	0.00	15	168.1	0.09
1127033007	3/24/2018	1.27	1.25	105.92	39.06	2.71	2.93	1.32	89.82	41.25	2.18	107	39.7	2.7
1127033011	3/24/2018	0.87	1.24	72.56	38.75	1.87	2.41	1.38	70.51	43.13	1.63	75	40.3	1.86
1128048080	3/24/2018	0.54	2.46	45.04	76.88	0.59	1.42	2.32	33.74	72.50	0.47	47	71.3	0.66
1127030089	3/26/2018	0.77	1.90	64.22	59.38	1.08	2.44	1.9	71.62	59.38	1.21	69	59.1	1.17
1128047030	3/26/2018	0.03	1.98	2.50	61.88	0.04	0.26	1.92	0.00	60.00	0.00	11	57.8	0.19
1127030016	3/29/2018	0.52	2.54	43.37	79.38	0.55	1.63	2.49	41.54	77.81	0.53	47	70.9	0.66
1127030042	3/29/2018	0.37	2.65	30.86	82.81	0.37	1.35	2.58	31.14	80.63	0.39	38	80	0.48
1127030071	3/29/2018	0.95	1.82	79.23	56.88	1.39	2.19	1.85	62.34	57.81	1.08	78	56.9	1.37
1127030129	3/29/2018	0.87	1.59	72.56	49.69	1.46	1.98	1.67	54.54	52.19	1.05	73	52.5	1.39

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1127030134	3/29/2018	0.77	2.29	64.22	71.56	0.90	2.3	2.26	66.42	70.63	0.94	67	72.2	0.93
1127027014	3/30/2018	0.52	1.94	43.37	60.63	0.72	1.03	1.87	19.25	58.44	0.33	40	58.1	0.69
1127027015	3/30/2018	0.70	1.93	58.38	60.31	0.97	1.42	1.94	33.74	60.63	0.56	59	57.5	1.03
1127027127	3/30/2018	0.51	2.10	42.53	65.63	0.65	1.08	2.06	21.11	64.38	0.33	40	65.6	0.61
1127027194	3/30/2018	0.77	2.27	64.22	70.94	0.91	1.69	2.21	43.77	69.06	0.63	65	69.7	0.93
1127029114	4/1/2018	0.99	1.72	82.57	53.75	1.54	1.9	1.85	51.57	57.81	0.89	76	55.6	1.37
1127034031	4/6/2018	0.55	1.23	45.87	38.44	1.19	1.3	1.23	29.28	38.44	0.76	47	39.1	1.2
1127034152	4/6/2018	0.17	3.49	14.18	109.06	0.13	0.47	3.62	0.00	113.13	0.00	18	108.4	0.17
1127042025	4/19/2018	0.27	1.96	22.52	61.25	0.37	1.43	1.9	34.11	59.38	0.57	30	62.5	0.48
1127042042	4/19/2018	0.24	1.79	20.02	55.94	0.36	1.05	1.84	20.00	57.50	0.35	26	55.9	0.46
1127042184	4/19/2018	0.03	2.17	2.50	67.81	0.04	0.16	2.74	0.00	85.63	0.00	7	89.1	0.08
1127042233	4/19/2018	0.68	1.60	56.71	50.00	1.13	1.86	1.63	50.08	50.94	0.98	59	50.9	1.16
1127042235	4/19/2018	0.87	1.18	72.56	36.88	1.97	2.66	1.21	79.79	37.81	2.11	77	37.5	2.05
1127042183	4/21/2018	0.13	2.21	10.84	69.06	0.16	0.52	2.15	0.31	67.19	0.00	17	67.5	0.25
1126015053	4/25/2018	0.12	1.24	10.01	38.75	0.26	0.67	1.22	5.88	38.13	0.15	16	35.6	0.45
1126015109	4/25/2018	0.34	1.07	28.36	33.44	0.85	1.52	1.11	37.45	34.69	1.08	34	32.8	1.04
1126015002	4/26/2018	0.37	2.30	30.86	71.88	0.43	1.07	1.87	20.74	58.44	0.35	28	59.4	0.47
1126015003	4/26/2018	0.51	1.36	42.53	42.50	1.00	1.77	1.26	46.74	39.38	1.19	50	38.1	1.31
1126015011	4/26/2018	0.34	1.53	28.36	47.81	0.59	1.22	1.63	26.31	50.94	0.52	36	46.9	0.77
1126015080	4/26/2018	0.09	3.67	7.51	114.69	0.07	0.31	3.57	0.00	111.56	0.00	11	107.8	0.1
1126015108	4/26/2018	0.26	1.93	21.68	60.31	0.36	1.1	1.89	21.85	59.06	0.37	28	58.8	0.48
1126007088	4/30/2018	0.46	1.30	38.36	40.63	0.94	1.42	1.34	33.74	41.88	0.81	42	39.4	1.07
1126007125	4/30/2018	0.59	2.32	49.21	72.50	0.68	1.32	2.4	30.02	75.00	0.40	49	71.9	0.68
1126007145	4/30/2018	0.45	1.12	37.53	35.00	1.07	1.23	1.14	26.68	35.63	0.75	39	33.4	1.17
1126007321	4/30/2018	1.07	1.96	89.24	61.25	1.46	2.7	2.01	81.28	62.81	1.29	92	61.6	1.49
1126014050	4/30/2018	0.38	2.02	31.69	63.13	0.50	1.44	2.13	34.48	66.56	0.52	39	65	0.6
1126014073	4/30/2018	0.59	1.32	49.21	41.25	1.19	1.74	1.4	45.62	43.75	1.04	52	41.6	1.25
1126014113	4/30/2018	0.46	1.42	38.36	44.38	0.86	1.63	1.51	41.54	47.19	0.88	45	43.8	1.03
1126015147	4/30/2018	0.62	2.80	51.71	87.50	0.59	1.46	2.84	35.22	88.75	0.40	50	87.2	0.57
1126007346	5/2/2018	0.60	2.38	50.04	74.38	0.67	1.17	2.48	24.45	77.50	0.32	48	75	0.64
1126007362	5/2/2018	1.44	2.36	120.10	73.75	1.63	2.68	2.39	80.54	74.69	1.08	117	73.1	1.6
1126007378	5/2/2018	0.65	2.15	54.21	67.19	0.81	1.3	2.23	29.28	69.69	0.42	50	65	0.77
1126007399	5/2/2018	1.25	2.24	104.25	70.00	1.49	2.78	2.31	84.25	72.19	1.17	106	67.8	1.56
1126007390	5/3/2018	1.20	2.88	100.08	90.00	1.11	2.49	2.75	73.48	85.94	0.86	103	87.2	1.18
1126014053	5/3/2018	0.37	1.26	30.86	39.38	0.78	1.79	1.32	47.48	41.25	1.15	42	38.1	1.1
1126014055	5/3/2018	0.18	2.32	15.01	72.50	0.21	1.14	2.22	23.34	69.38	0.34	24	66.9	0.36
1126014002	5/4/2018	0.45	2.89	37.53	90.31	0.42	1.57	2.81	39.31	87.81	0.45	40	87.8	0.46
1126014103	5/4/2018	0.57	1.75	47.54	54.69	0.87	2.01	1.84	55.65	57.50	0.97	49	53.4	0.92
1126016080	5/4/2018	0.48	3.77	40.03	117.81	0.34	1.56	3.61	38.94	112.81	0.35	43	116.3	0.37
1126015120	5/5/2018	0.26	1.95	21.68	60.94	0.36	0.88	2.07	13.68	64.69	0.21	25	59.4	0.42
1126016057	5/5/2018	1.03	1.86	85.90	58.13	1.48	2.5	1.77	73.85	55.31	1.34	80	52.2	1.53
1126016061	5/5/2018	1.15	2.00	95.91	62.50	1.53	2.72	2.14	82.02	66.88	1.23	89	61.6	1.45
1126016147	5/5/2018	0.23	2.32	19.18	72.50	0.26	0.92	2.51	15.17	78.44	0.19	24	73.8	0.33
1126018108	5/6/2018	1.27	2.20	105.92	68.75	1.54	2.74	2.22	82.76	69.38	1.19	101	68.1	1.48

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Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1126018115	5/6/2018	1.07	2.06	89.24	64.38	1.39	2.65	2.23	79.42	69.69	1.14	80	62.8	1.27
1126018136	5/6/2018	0.97	1.93	80.90	60.31	1.34	2.16	1.97	61.22	61.56	0.99	77	59.4	1.3
1126019214	5/6/2018	1.01	1.40	84.23	43.75	1.93	2.63	1.46	78.68	45.63	1.72	78	43.1	1.81
1126016139	5/7/2018	0.93	2.18	77.56	68.13	1.14	2.59	2.22	77.19	69.38	1.11	73	70.6	1.03
1126016156	5/7/2018	1.48	2.07	123.43	64.69	1.91	3.73	2.13	119.53	66.56	1.80	120	63.8	1.88
1126018114	5/7/2018	1.14	2.10	95.08	65.63	1.45	2.62	2.13	78.31	66.56	1.18	89	63.1	1.41
1126016103	5/8/2018	1.31	1.09	109.25	34.06	3.21	3.18	1.13	99.11	35.31	2.81	109	32.2	3.39
1126024097	5/10/2018	0.54	1.72	45.04	53.75	0.84	2.28	1.9	65.68	59.38	1.11	54	54.1	1
1126024151	5/10/2018	0.96	1.42	80.06	44.38	1.80	2.93	1.65	89.82	51.56	1.74	89	46.9	1.9
1127039003	5/10/2018	0.35	1.29	29.19	40.31	0.72	1.12	2.57	22.60	80.31	0.28	40	75.9	0.53
1127039007	5/10/2018	0.80	2.28	66.72	71.25	0.94	1.94	2.47	53.05	77.19	0.69	68	71.3	0.95
1126019150	5/11/2018	1.05	2.53	87.57	79.06	1.11	2.35	2.42	68.28	75.63	0.90	83	72.2	1.15
1126019022	5/12/2018	1.30	2.03	108.42	63.44	1.71	2.54	1.93	75.34	60.31	1.25	88	58.8	1.5
1126024004	5/14/2018	0.90	2.07	75.06	64.69	1.16	2.75	2.14	83.14	66.88	1.24	73	62.8	1.16
1126024043	5/15/2018	0.85	2.31	70.89	72.19	0.98	2.27	2.3	65.31	71.88	0.91	71	74.4	0.95
1126024060	5/15/2018	0.93	2.12	77.56	66.25	1.17	2.73	2.14	82.39	66.88	1.23	76	71.3	1.07
1125005004	5/31/2018	0.17	1.07	14.18	33.44	0.42	1.67	1.12	43.02	35.00	1.23	25	32.2	0.78
1127040081	6/3/2018	0.17	4.62	14.18	144.38	0.10	0.4	4.09	0.00	127.81	0.00	16	155.6	0.1
1127040082	6/3/2018	0.16	4.19	13.34	130.94	0.10	0.38	3.86	0.00	120.63	0.00	15	136.6	0.11
1127040101	6/3/2018	0.22	2.58	18.35	80.63	0.23	0.3	2.55	0.00	79.69	0.00	15	79.1	0.19
1127040044	6/4/2018	0.30	3.00	25.02	93.75	0.27	0.95	2.88	16.28	90.00	0.18	27	85	0.32
1127040017	6/5/2018	0.51	2.31	42.53	72.19	0.59	0.42	2.21	0.00	69.06	0.00	13	61.3	0.21
1127040405	6/7/2018	0.15	1.39	12.51	43.44	0.29	0.59	1.6	2.91	50.00	0.06	20	48.4	0.41
1127040415	6/7/2018	0.22	2.83	18.35	88.44	0.21	0.75	2.61	8.86	81.56	0.11	23	81.3	0.28
1127040480	6/7/2018	0.14	1.85	11.68	57.81	0.20	0.42	1.79	0.00	55.94	0.00	14	53.1	0.26
1125007004	6/14/2018	0.45	0.58	37.53	18.13	2.07	2.19	0.59	62.34	18.44	3.38	46	17.5	2.63
1126026241	6/14/2018	1.04	1.39	86.74	43.44	2.00	1.92	1.37	52.31	42.81	1.22	80	41.3	1.94
1126026119	6/15/2018	0.95	2.02	79.23	63.13	1.26	1.93	2.03	52.68	63.44	0.83	73	63.8	1.15
1126030109	6/16/2018	0.44	1.89	36.70	59.06	0.62	1.06	1.96	20.37	61.25	0.33	38	55.9	0.68
1126030129	6/16/2018	0.26	2.17	21.68	67.81	0.32	0.93	2.2	15.54	68.75	0.23	26	67.2	0.39
1126030060	6/17/2018	0.63	2.13	52.54	66.56	0.79	1.39	2.11	32.62	65.94	0.49	51	65.3	0.78
1126031238	6/18/2018	0.07	2.90	5.84	90.63	0.06	0.28	2.68	0.00	83.75	0.00	11	80	0.14
1126031245	6/18/2018	0.05	3.21	4.17	100.31	0.04	0.2	2.89	0.00	90.31	0.00	8	88.8	0.09
1126031036	6/19/2018	1.03	1.33	85.90	41.56	2.07	2.43	1.31	71.25	40.94	1.74	79	40.3	1.96
1126031257	6/19/2018	0.22	2.47	18.35	77.19	0.24	0.43	2.3	0.00	71.88	0.00	21	72.5	0.29
1126031258	6/19/2018	0.21	3.07	17.51	95.94	0.18	0.48	2.79	0.00	87.19	0.00	20	90.9	0.22
1126031265	6/19/2018	0.10	0.45	8.34	14.06	0.59	1.45	1.98	34.85	61.88	0.56	49	57.5	0.85
1126031277	6/19/2018	0.31	2.22	25.85	69.38	0.37	0.73	2.1	8.11	65.63	0.12	32	63.4	0.5
1126031173	6/20/2018	0.31	2.20	25.85	68.75	0.38	0.74	2.1	8.48	65.63	0.13	27	62.8	0.43
1126033101	6/26/2018	1.13	1.33	94.24	41.56	2.27	2.79	1.42	84.62	44.38	1.91	97	41.6	2.33
1126033528	6/26/2018	0.17	2.10	14.18	65.63	0.22	0.58	2.14	2.54	66.88	0.04	20	66.9	0.3
1126033030	6/28/2018	0.76	1.81	63.38	56.56	1.12	2.14	1.75	60.48	54.69	1.11	65	55.3	1.18
1126033046	6/28/2018	0.86	1.45	71.72	45.31	1.58	2.51	1.42	74.22	44.38	1.67	73	37.8	1.93
1126033088	6/28/2018	0.92	1.50	76.73	46.88	1.64	2.84	1.45	86.48	45.31	1.91	82	47.2	1.74

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1126033062	6/29/2018	0.54	2.09	45.04	65.31	0.69	1.69	2.02	43.77	63.13	0.69	51	59.1	0.86
1125020165	6/30/2018	0.67	1.20	55.88	37.50	1.49	2.21	1.28	63.08	40.00	1.58	62	38.4	1.61
1125020187	6/30/2018	0.41	2.75	34.19	85.94	0.40	1.43	2.64	34.11	82.50	0.41	40	84.4	0.47
1125009223	7/3/2018	0.32	1.42	26.69	44.38	0.60	1.2	1.45	25.57	45.31	0.56	32	45	0.71
1125009270	7/3/2018	0.17	2.96	14.18	92.50	0.15	0.66	2.79	5.51	87.19	0.06	19	95	0.2
1125009288	7/3/2018	1.29	2.45	107.59	76.56	1.41	2.48	2.35	73.11	73.44	1.00	103	72.5	1.42
1125009331	7/4/2018	1.11	1.79	92.57	55.94	1.65	2.2	1.76	62.71	55.00	1.14	86	56.3	1.53
1125009342	7/4/2018	1.10	2.26	91.74	70.63	1.30	2.48	2.27	73.11	70.94	1.03	87	70.9	1.23
1125009366	7/4/2018	1.20	2.37	100.08	74.06	1.35	2.74	2.29	82.76	71.56	1.16	101	73.4	1.38
1125009379	7/4/2018	1.18	1.83	98.41	57.19	1.72	2.58	1.81	76.82	56.56	1.36	88	56.3	1.56
1125010179	7/5/2018	1.03	2.06	85.90	64.38	1.33	2.3	1.99	66.42	62.19	1.07	85	61.3	1.39
1125009357	7/8/2018	0.38	2.33	31.69	72.81	0.44	1.22	2.24	26.31	70.00	0.38	36	70.6	0.51
1125010034	7/8/2018	0.65	2.78	54.21	86.88	0.62	1.47	2.65	35.60	82.81	0.43	53	80.6	0.66
1125010101	7/8/2018	0.75	2.28	62.55	71.25	0.88	2.4	2.2	70.14	68.75	1.02	67	67.2	1
1125010120	7/8/2018	0.99	1.47	82.57	45.94	1.80	2.91	1.45	89.08	45.31	1.97	82	43.4	1.89
1125010141	7/8/2018	0.82	2.52	68.39	78.75	0.87	1.86	2.42	50.08	75.63	0.66	67	74.1	0.9
1125010146	7/8/2018	0.82	1.84	68.39	57.50	1.19	2.17	1.76	61.59	55.00	1.12	69	50.6	1.36
1125010159	7/8/2018	1.11	1.75	92.57	54.69	1.69	2.47	1.8	72.74	56.25	1.29	94	55.3	1.7
1125010201	7/8/2018	1.13	1.96	94.24	61.25	1.54	2.37	1.96	69.02	61.25	1.13	88	60.6	1.45
1125016015	7/8/2018	0.30	1.96	25.02	61.25	0.41	0.99	1.97	17.77	61.56	0.29	28	61.9	0.45
1125016030	7/8/2018	0.49	1.40	40.87	43.75	0.93	1.75	1.4	46.00	43.75	1.05	47	44.1	1.07
1125016031	7/8/2018	0.50	1.53	41.70	47.81	0.87	1.71	1.55	44.51	48.44	0.92	47	46.9	1
1125016037	7/8/2018	0.62	1.56	51.71	48.75	1.06	1.83	1.53	48.97	47.81	1.02	50	45.9	1.09
1125016080	7/8/2018	0.66	0.99	55.04	30.94	1.78	2.1	1.02	58.99	31.88	1.85	57	29.7	1.92
1125016088	7/8/2018	0.67	1.21	55.88	37.81	1.48	2.01	1.23	55.65	38.44	1.45	53	35.6	1.49
1125016122	7/8/2018	0.23	1.30	19.18	40.63	0.47	1.12	1.28	22.60	40.00	0.56	28	39.7	0.71
1125015001	7/10/2018	1.56	1.57	130.10	49.06	2.65	3.06	1.65	94.65	51.56	1.84	133	50.6	2.63
1125015070	7/10/2018	0.30	2.96	25.02	92.50	0.27	0.96	2.82	16.65	88.13	0.19	30	88.4	0.34
1125015084	7/10/2018	0.23	1.88	19.18	58.75	0.33	1.01	1.84	18.51	57.50	0.32	29	58.1	0.5
1125015109	7/10/2018	1.29	1.97	107.59	61.56	1.75	2.7	2.04	81.28	63.75	1.27	104	58.8	1.77
1125012102	7/11/2018	0.58	1.35	48.37	42.19	1.15	1.34	1.33	30.77	41.56	0.74	51	43.1	1.18
1125012186	7/11/2018	1.00	1.47	83.40	45.94	1.82	1.79	1.45	47.48	45.31	1.05	76	44.4	1.71
1125015046	7/11/2018	1.13	2.27	94.24	70.94	1.33	2.64	2.22	79.05	69.38	1.14	88	72.5	1.21
1125015154	7/11/2018	0.14	1.62	11.68	50.63	0.23	0.56	1.57	1.80	49.06	0.04	21	50	0.42
1125015401	7/12/2018	0.65	3.77	54.21	117.81	0.46	1.52	3.55	37.45	110.94	0.34	45	115	0.39
1125015416	7/12/2018	0.79	1.81	65.89	56.56	1.16	2.73	1.85	82.39	57.81	1.43	69	58.8	1.17
1125024201	7/15/2018	0.27	1.90	22.52	59.38	0.38	0.95	1.86	16.28	58.13	0.28	30	54.1	0.55
1125011005	7/16/2018	0.93	2.11	77.56	65.94	1.18	1.86	2.08	50.08	65.00	0.77	77	65.3	1.18
1125011007	7/16/2018	1.12	2.11	93.41	65.94	1.42	2.68	2.16	80.54	67.50	1.19	88	66.9	1.32
1125011012	7/16/2018	0.16	2.91	13.34	90.94	0.15	0.64	2.8	4.77	87.50	0.05	19	89.7	0.21
1125011163	7/17/2018	0.38	2.93	31.69	91.56	0.35	1.17	2.81	24.45	87.81	0.28	34	87.5	0.39
1125011040	7/18/2018	0.67	2.57	55.88	80.31	0.70	1.44	2.53	34.48	79.06	0.44	56	81.6	0.69
1125011073	7/18/2018	0.42	2.44	35.03	76.25	0.46	1.05	2.38	20.00	74.38	0.27	36	74.1	0.49
1125011089	7/18/2018	0.41	2.91	34.19	90.94	0.38	0.96	2.76	16.65	86.25	0.19	35	92.2	0.38

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1125011091	7/18/2018	0.75	2.29	62.55	71.56	0.87	1.56	2.23	38.94	69.69	0.56	59	69.7	0.85
1125011118	7/18/2018	0.68	1.80	56.71	56.25	1.01	1.64	1.79	41.91	55.94	0.75	57	55.6	1.02
1125018240	7/18/2018	1.21	2.37	100.91	74.06	1.36	2.38	2.36	69.39	73.75	0.94	87	73.4	1.18
1125026078	7/20/2018	0.07	1.88	5.84	58.75	0.10	0.33	1.88	0.00	58.75	0.00	12	55.9	0.21
1125027042	7/22/2018	0.71	1.12	59.21	35.00	1.69	2.48	1.47	73.11	45.94	1.59	84	44.1	1.91
1125027072	7/22/2018	0.75	1.78	62.55	55.63	1.12	2.13	1.76	60.11	55.00	1.09	65	50.3	1.29
1125026033	7/23/2018	0.57	1.76	47.54	55.00	0.86	1.38	1.73	32.25	54.06	0.60	53	55	0.96
1125027115	7/23/2018	0.36	1.97	30.02	61.56	0.49	1.21	2.19	25.94	68.44	0.38	25	66.3	0.38
1125026086	7/25/2018	0.12	1.99	10.01	62.19	0.16	0.24	2.06	0.00	64.38	0.00	11	63.4	0.17
1125026116	7/26/2018	0.07	3.81	5.84	119.06	0.05	0.19	3.8	0.00	118.75	0.00	8	101.3	0.08
1125027076	7/27/2018	0.23	3.63	19.18	113.44	0.17	0.98	3.64	17.40	113.75	0.15	24	105	0.23
1125027111	7/27/2018	0.28	1.59	23.35	49.69	0.47	1.65	1.63	42.28	50.94	0.83	34	48.1	0.71
1125028033	7/27/2018	0.12	0.76	10.01	23.75	0.42	0.46	0.79	0.00	24.69	0.00	14	23.1	0.61
1125028504	7/27/2018	0.44	2.25	36.70	70.31	0.52	1.28	2.21	28.54	69.06	0.41	40	70.6	0.57
1124001265	7/28/2018	0.69	1.68	57.55	52.50	1.10	2.21	1.76	63.08	55.00	1.15	62	55.3	1.12
1125028097	7/28/2018	0.15	1.48	12.51	46.25	0.27	0.39	1.54	0.00	48.13	0.00	15	44.7	0.34
1124001195	7/29/2018	0.98	2.20	81.73	68.75	1.19	2.06	2.24	57.51	70.00	0.82	78	68.8	1.13
1124001210	7/29/2018	0.65	1.80	54.21	56.25	0.96	1.62	1.84	41.17	57.50	0.72	54	53.1	1.02
1125028020	7/30/2018	0.40	3.06	33.36	95.63	0.35	0.46	2.97	0.00	92.81	0.00	13	95.6	0.14
1125028077	7/30/2018	0.27	4.18	22.52	130.63	0.17	0.56	3.92	1.80	122.50	0.01	17	120.9	0.14
1125028106	7/30/2018	0.37	1.36	30.86	42.50	0.73	1.27	1.43	28.17	44.69	0.63	37	43.8	0.85
1125028108	7/30/2018	0.11	1.89	9.17	59.06	0.16	0.3	1.91	0.00	59.69	0.00	11	56.3	0.2
1124001171	7/31/2018	1.08	1.57	90.07	49.06	1.84	2.58	1.57	76.82	49.06	1.57	83	49.7	1.67
1124001177	7/31/2018	0.69	2.04	57.55	63.75	0.90	2.11	2.07	59.37	64.69	0.92	61	64.7	0.94
1124001155	8/1/2018	1.17	1.98	97.58	61.88	1.58	2.79	2.02	84.62	63.13	1.34	101	63.1	1.6
1125029121	8/2/2018	0.49	1.69	40.87	52.81	0.77	0.8	1.6	10.71	50.00	0.21	34	47.8	0.71
1124001016	8/5/2018	1.14	2.39	95.08	74.69	1.27	2.5	2.16	73.85	67.50	1.09	94	65.6	1.43
1124001123	8/5/2018	1.22	1.80	101.75	56.25	1.81	2.55	1.8	75.71	56.25	1.35	100	60.3	1.66
1124001126	8/5/2018	1.20	2.05	100.08	64.06	1.56	2.67	1.94	80.16	60.63	1.32	100	54.4	1.84
1124001131	8/5/2018	1.18	1.87	98.41	58.44	1.68	2.46	1.78	72.36	55.63	1.30	99	56.3	1.76
1124001107	8/6/2018	0.97	2.68	80.90	83.75	0.97	2.12	2.53	59.74	79.06	0.76	76	77.2	0.98
1124003005	8/7/2018	0.44	2.36	36.70	73.75	0.50	1.02	2.17	18.88	67.81	0.28	36	64.4	0.56
1124003009	8/7/2018	1.14	2.76	95.08	86.25	1.10	2.34	2.47	67.91	77.19	0.88	97	77.8	1.25
1124003084	8/7/2018	1.13	2.22	94.24	69.38	1.36	2.43	2.1	71.25	65.63	1.09	86	62.8	1.37
1124003092	8/7/2018	0.88	2.44	73.39	76.25	0.96	1.64	2.35	41.91	73.44	0.57	69	72.5	0.95
1124003135	8/7/2018	1.26	2.11	105.08	65.94	1.59	2.94	2.02	90.19	63.13	1.43	100	66.3	1.51
1124003061	8/8/2018	0.56	2.37	46.70	74.06	0.63	1.34	2.27	30.77	70.94	0.43	46	70.3	0.65
1124003125	8/8/2018	0.51	2.40	42.53	75.00	0.57	1.15	2.17	23.71	67.81	0.35	40	66.6	0.6
1124003131	8/8/2018	0.82	1.35	68.39	42.19	1.62	1.8	1.38	47.85	43.13	1.11	66	41.9	1.58
1124003147	8/8/2018	0.94	2.14	78.40	66.88	1.17	2.4	2.11	70.14	65.94	1.06	78	61.6	1.27
1124003015	8/9/2018	0.96	1.78	80.06	55.63	1.44	2.13	2.2	60.11	68.75	0.87	80	61.6	1.3
1124003049	8/9/2018	1.19	2.08	99.25	65.00	1.53	2.51	1.97	74.22	61.56	1.21	96	60.6	1.58
1124003304	8/10/2018	0.96	2.12	80.06	66.25	1.21	2.31	2.06	66.79	64.38	1.04	77	63.1	1.22
1124003017	8/11/2018	1.12	1.96	93.41	61.25	1.53	2.28	1.96	65.68	61.25	1.07	85	62.2	1.37

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1124003317	8/11/2018	0.59	1.75	49.21	54.69	0.90	2.05	1.74	57.14	54.38	1.05	46	56.9	0.81
1124003329	8/11/2018	1.07	2.06	89.24	64.38	1.39	2.49	2.09	73.48	65.31	1.13	80	60.9	1.31
1124016032	8/17/2018	1.09	1.70	90.91	53.13	1.71	2.85	1.76	86.85	55.00	1.58	93	53.4	1.74
1124016072	8/18/2018	0.84	3.62	70.06	113.13	0.62	1.49	3.36	36.34	105.00	0.35	57	100.6	0.57
1124017076	8/24/2018	0.02	0.01	1.67	0.16	10.68	1.92	2.81	52.31	87.81	0.60	71	88.4	0.8
1124017070	8/26/2018	0.63	1.39	52.54	43.44	1.21	2.23	1.37	63.82	42.81	1.49	57	41.3	1.38
1124017071	8/26/2018	0.21	0.98	17.51	30.63	0.57	1.3	0.97	29.28	30.31	0.97	27	27.5	0.98
1124017100	8/26/2018	1.05	2.26	87.57	70.63	1.24	2.25	2.22	64.57	69.38	0.93	78	69.1	1.13
1124020037	8/26/2018	0.46	2.30	38.36	71.88	0.53	1.72	2.3	44.88	71.88	0.62	48	68.8	0.7
1124017016	8/27/2018	0.38	1.24	31.69	38.75	0.82	1.43	1.27	34.11	39.69	0.86	39	40	0.98
1124017037	8/27/2018	0.05	3.53	4.17	110.31	0.04	0.41	3.5	0.00	109.38	0.00	12	103.8	0.12
1124020054	8/28/2018	0.42	1.96	35.03	61.25	0.57	1.75	2.02	46.00	63.13	0.73	44	61.9	0.71
1124020075	8/28/2018	0.01	3.46	0.42	108.13	0.00	0.34	3.31	0.00	103.44	0.00	12	101.6	0.12
1124018091	8/29/2018	0.55	1.39	45.87	43.44	1.06	1.73	1.32	45.25	41.25	1.10	48	39.7	1.21
1124018017	8/30/2018	0.50	1.50	41.70	46.88	0.89	1.68	1.51	43.40	47.19	0.92	45	44.7	1.01
1124018042	8/30/2018	0.28	1.29	23.35	40.31	0.58	1.78	1.26	47.11	39.38	1.20	34	37.5	0.91
1124018094	8/31/2018	0.33	2.24	27.52	70.00	0.39	1.24	2.09	27.05	65.31	0.41	40	66.6	0.6
1124018131	8/31/2018	0.45	1.34	37.53	41.88	0.90	1.55	1.29	38.57	40.31	0.96	42	39.7	1.06
1124018075	9/1/2018	0.22	2.23	18.35	69.69	0.26	0.66	1.58	5.51	49.38	0.11	25	53.1	0.47
1124018077	9/1/2018	0.24	0.98	20.02	30.63	0.65	1.18	1.15	24.83	35.94	0.69	36	35.9	1
1124018007	9/3/2018	0.79	1.71	65.89	53.44	1.23	2.57	1.68	76.45	52.50	1.46	78	52.2	1.49
1124018028	9/3/2018	0.55	1.97	45.87	61.56	0.75	1.92	1.89	52.31	59.06	0.89	54	59.7	0.9
1124021052	9/4/2018	0.12	1.61	10.01	50.31	0.20	0.41	1.6	0.00	50.00	0.00	12	51.9	0.23
1124021054	9/4/2018	0.10	1.79	8.34	55.94	0.15	0.53	1.74	0.68	54.38	0.01	13	52.8	0.25
1124021115	9/4/2018	0.22	2.32	18.35	72.50	0.25	0.77	2.19	9.60	68.44	0.14	25	70	0.36
1124021118	9/4/2018	0.99	1.81	82.57	56.56	1.46	2.38	1.81	69.39	56.56	1.23	79	57.2	1.38
1124021024	9/6/2018	0.16	2.22	13.34	69.38	0.19	0.6	2.09	3.28	65.31	0.05	22	65	0.34
1124021043	9/6/2018	0.22	2.11	18.35	65.94	0.28	0.82	2.04	11.45	63.75	0.18	24	65.6	0.37
1124021127	9/6/2018	0.48	2.44	40.03	76.25	0.53	1.97	2.37	54.17	74.06	0.73	51	76.3	0.67
1124019104	9/8/2018	0.56	1.51	46.70	47.19	0.99	2.48	1.51	73.11	47.19	1.55	56	45.6	1.23
1124019110	9/8/2018	0.34	1.46	28.36	45.63	0.62	1.42	1.46	33.74	45.63	0.74	39	45.3	0.86
1124019141	9/8/2018	0.47	1.68	39.20	52.50	0.75	1.7	1.59	44.14	49.69	0.89	45	48.4	0.93
1124019060	9/9/2018	0.26	1.19	21.68	37.19	0.58	1.2	1.17	25.57	36.56	0.70	30	35.9	0.83
1124019036	9/10/2018	0.67	1.27	55.88	39.69	1.41	2.56	1.31	76.08	40.94	1.86	67	38.8	1.73
1124019002	9/11/2018	0.27	0.77	22.52	24.06	0.94	1.37	0.77	31.88	24.06	1.32	30	21.9	1.37
1124019027	9/11/2018	0.67	1.72	55.88	53.75	1.04	2.31	1.78	66.79	55.63	1.20	58	53.1	1.09
1124019040	9/11/2018	0.40	1.31	33.36	40.94	0.81	1.6	1.29	40.42	40.31	1.00	40	38.8	1.03
1124019050	9/11/2018	0.10	1.39	8.34	43.44	0.19	0.88	1.41	13.68	44.06	0.31	15	42.5	0.35
1124022109	9/11/2018	0.66	1.54	55.04	48.13	1.14	2.1	1.55	58.99	48.44	1.22	55	49.1	1.12
1124022145	9/11/2018	1.10	1.45	91.74	45.31	2.02	2.52	1.45	74.59	45.31	1.65	86	44.4	1.94
1124022163	9/12/2018	0.46	1.46	38.36	45.63	0.84	1.39	1.45	32.62	45.31	0.72	37	42.8	0.86
1124022018	9/14/2018	0.90	1.93	75.06	60.31	1.24	2.43	1.87	71.25	58.44	1.22	68	57.2	1.19
1123001179	9/16/2018	0.95	2.34	79.23	73.13	1.08	2.31	2.29	66.79	71.56	0.93	77	70.3	1.1
1124022002	9/16/2018	1.22	2.07	101.75	64.69	1.57	2.34	2.05	67.91	64.06	1.06	87	61.3	1.42

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1124022003	9/16/2018	1.30	2.16	108.42	67.50	1.61	2.53	2.16	74.96	67.50	1.11	91	66.3	1.37
1123001297	9/17/2018	0.37	3.56	30.86	111.25	0.28	1.26	3.4	27.80	106.25	0.26	37	109.4	0.34
1124024034	9/17/2018	0.27	0.65	22.52	20.31	1.11	1.31	0.71	29.65	22.19	1.34	28	19.4	1.45
1124024053	9/17/2018	0.44	1.10	36.70	34.38	1.07	1.72	1.1	44.88	34.38	1.31	42	32.5	1.29
1124024087	9/17/2018	0.76	2.15	63.38	67.19	0.94	1.79	2.1	47.48	65.63	0.72	62	64.1	0.97
1124024064	9/19/2018	0.63	1.47	52.54	45.94	1.14	1.64	1.5	41.91	46.88	0.89	52	44.7	1.16
1123001111	9/23/2018	0.90	2.57	75.06	80.31	0.93	2.35	2.6	68.28	81.25	0.84	75	77.8	0.96
1123001198	9/23/2018	1.06	2.06	88.40	64.38	1.37	2.33	2.16	67.54	67.50	1.00	87	65	1.34
1123001262	9/23/2018	1.08	2.20	90.07	68.75	1.31	2.72	2.23	82.02	69.69	1.18	86	68.4	1.26
1123001306	9/23/2018	0.39	1.53	32.53	47.81	0.68	1.43	3.36	34.11	105.00	0.32	37	100.3	0.37
1123001180	9/26/2018	0.92	2.10	76.73	65.63	1.17	2.41	2.11	70.51	65.94	1.07	81	67.5	1.2
1123009007	10/2/2018	0.85	1.68	70.89	52.50	1.35	1.94	1.78	53.05	55.63	0.95	71	51.9	1.37
1123009008	10/2/2018	0.90	1.53	75.06	47.81	1.57	2.26	1.56	64.94	48.75	1.33	74	45.3	1.63
1123009012	10/2/2018	1.13	1.40	94.24	43.75	2.15	2.31	1.53	66.79	47.81	1.40	81	45	1.8
1123009013	10/2/2018	1.23	1.31	102.58	40.94	2.51	2.52	1.43	74.59	44.69	1.67	86	43.1	1.99
1123009024	10/2/2018	0.96	2.17	80.06	67.81	1.18	2.11	2.05	59.37	64.06	0.93	73	64.1	1.14
1123009124	10/2/2018	0.74	2.43	61.72	75.94	0.81	1.59	2.37	40.05	74.06	0.54	58	72.5	0.8
1123009043	10/3/2018	1.25	2.42	104.25	75.63	1.38	2.53	2.33	74.96	72.81	1.03	86	70.6	1.22
1123009159	10/3/2018	0.80	2.23	66.72	69.69	0.96	2.39	2.24	69.76	70.00	1.00	69	67.8	1.02
1123009173	10/3/2018	1.00	2.16	83.40	67.50	1.24	2.07	2.05	57.88	64.06	0.90	77	61.9	1.24
1123009004	10/5/2018	0.45	2.48	37.53	77.50	0.48	1.02	2.42	18.88	75.63	0.25	31	77.5	0.4
1123009005	10/5/2018	0.80	2.30	66.72	71.88	0.93	1.75	2.41	46.00	75.31	0.61	60	73.4	0.82
1123009015	10/5/2018	1.19	2.00	99.25	62.50	1.59	2.46	2	72.36	62.50	1.16	89	64.1	1.39
1123009025	10/5/2018	0.85	1.63	70.89	50.94	1.39	1.65	1.64	42.28	51.25	0.82	69	49.1	1.41
1123009035	10/5/2018	0.96	2.09	80.06	65.31	1.23	2.26	2.07	64.94	64.69	1.00	72	62.2	1.16
1123009171	10/5/2018	0.27	1.85	22.52	57.81	0.39	1.05	1.79	20.00	55.94	0.36	27	52.8	0.51
1123009211	10/5/2018	0.45	1.42	37.53	44.38	0.85	1.68	1.42	43.40	44.38	0.98	43	44.7	0.96
1123013004	10/9/2018	0.41	2.05	34.19	64.06	0.53	1.62	2.03	41.17	63.44	0.65	40	59.7	0.67
1123013017	10/9/2018	0.22	4.09	18.35	127.81	0.14	0.77	3.91	9.60	122.19	0.08	21	121.3	0.17
1123013034	10/9/2018	0.94	2.22	78.40	69.38	1.13	2.25	2.18	64.57	68.13	0.95	76	65.9	1.15
1123013057	10/9/2018	0.93	2.60	77.56	81.25	0.95	2.1	2.54	58.99	79.38	0.74	74	75	0.99
1123013002	10/10/2018	0.38	1.57	31.69	49.06	0.65	1.69	1.51	43.77	47.19	0.93	39	48.8	0.8
1123013068	10/10/2018	0.26	1.83	21.68	57.19	0.38	1.06	1.84	20.37	57.50	0.35	29	53.1	0.55
1123013093	10/10/2018	0.37	2.99	30.86	93.44	0.33	1.22	2.88	26.31	90.00	0.29	35	90.9	0.38
1123014146	10/14/2018	0.34	2.65	28.36	82.81	0.34	0.48	2.51	0.00	78.44	0.00	13	79.1	0.16
1123014165	10/14/2018	0.19	2.64	15.85	82.50	0.19	0.7	2.6	7.00	81.25	0.09	20	81.6	0.25
1123014177	10/14/2018	0.21	1.75	17.51	54.69	0.32	0.68	1.71	6.26	53.44	0.12	19	53.1	0.36
1123014186	10/14/2018	0.15	2.60	12.51	81.25	0.15	0.44	2.47	0.00	77.19	0.00	13	76.3	0.17
1123014219	10/14/2018	0.29	2.12	24.19	66.25	0.37	0.98	2.09	17.40	65.31	0.27	26	65	0.4
1123014232	10/14/2018	0.11	1.64	9.17	51.25	0.18	0.4	1.66	0.00	51.88	0.00	12	47.2	0.25
1123014001	10/17/2018	0.55	1.53	45.87	47.81	0.96	1.76	1.56	46.37	48.75	0.95	47	48.1	0.98
1123014275	10/17/2018	0.39	3.05	32.53	95.31	0.34	1.09	3.01	21.48	94.06	0.23	31	94.1	0.33
1123014284	10/17/2018	0.23	1.54	19.18	48.13	0.40	0.95	1.45	16.28	45.31	0.36	19	45.3	0.42
1123014301	10/17/2018	0.30	1.53	25.02	47.81	0.52	1.54	1.49	38.20	46.56	0.82	31	47.8	0.65

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Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1124028001	10/19/2018	0.11	2.21	9.17	69.06	0.13	0.42	2.26	0.00	70.63	0.00	12	65.3	0.18
1124028032	10/19/2018	0.10	2.29	8.34	71.56	0.12	0.34	2.42	0.00	75.63	0.00	11	74.7	0.15
1124028106	10/19/2018	0.30	2.15	25.02	67.19	0.37	1.05	2.08	20.00	65.00	0.31	28	67.2	0.42
1124028108	10/19/2018	0.49	1.45	40.87	45.31	0.90	1.54	1.44	38.20	45.00	0.85	41	45	0.91
1124028109	10/19/2018	0.26	2.11	21.68	65.94	0.33	0.95	2.22	16.28	69.38	0.23	24	66.6	0.36
1124028113	10/19/2018	0.29	1.05	24.19	32.81	0.74	1.15	1.09	23.71	34.06	0.70	30	33.4	0.9
1124028144	10/19/2018	0.55	2.02	45.87	63.13	0.73	1.73	2.09	45.25	65.31	0.69	47	62.8	0.75
1124028150	10/19/2018	0.31	3.44	25.85	107.50	0.24	1.08	3.35	21.11	104.69	0.20	32	103.1	0.31
1124028163	10/19/2018	0.92	1.33	76.73	41.56	1.85	2.63	1.38	78.68	43.13	1.82	75	40.6	1.85
1124028173	10/19/2018	0.19	1.12	15.85	35.00	0.45	0.52	1.08	0.31	33.75	0.01	14	34.7	0.4
1124029382	10/19/2018	0.57	2.71	47.54	84.69	0.56	1.45	2.67	34.85	83.44	0.42	48	83.8	0.57
1124029389	10/19/2018	0.21	2.69	17.51	84.06	0.21	0.53	2.56	0.68	80.00	0.01	21	81.6	0.26
1124029405	10/19/2018	0.22	2.25	18.35	70.31	0.26	0.66	2.27	5.51	70.94	0.08	21	71.3	0.29
1124029433	10/19/2018	0.71	1.52	59.21	47.50	1.25	1.73	1.46	45.25	45.63	0.99	64	43.1	1.48
1124029436	10/19/2018	0.17	1.37	14.18	42.81	0.33	0.54	1.38	1.06	43.13	0.02	18	40.6	0.44
1124029701	10/19/2018	0.26	2.51	21.68	78.44	0.28	0.78	2.33	9.97	72.81	0.14	23	70	0.33
1124029716	10/19/2018	0.28	2.05	23.35	64.06	0.36	0.65	1.93	5.14	60.31	0.09	23	60.3	0.38
1124029733	10/19/2018	0.76	2.59	63.38	80.94	0.78	1.35	2.45	31.14	76.56	0.41	57	79.1	0.72
1124029741	10/19/2018	0.17	4.17	14.18	130.31	0.11	0.45	4	0.00	125.00	0.00	14	125.6	0.11
1124029330	10/20/2018	0.08	2.74	6.67	85.63	0.08	0.32	2.67	0.00	83.44	0.00	11	81.9	0.13
1123012131	10/21/2018	1.10	1.92	91.74	60.00	1.53	2.36	1.97	68.65	61.56	1.12	94	61.9	1.52
1123012173	10/21/2018	1.18	1.92	98.41	60.00	1.64	2.22	1.85	63.45	57.81	1.10	88	59.7	1.47
1124029301	10/21/2018	0.07	1.78	5.84	55.63	0.10	0.2	1.84	0.00	57.50	0.00	7	51.6	0.14
1123012045	10/22/2018	0.94	2.20	78.40	68.75	1.14	1.9	2.13	51.57	66.56	0.77	77	69.4	1.11
1123012063	10/22/2018	1.00	2.44	83.40	76.25	1.09	2.59	2.36	77.19	73.75	1.05	83	72.5	1.14
1123012144	10/22/2018	1.00	1.71	83.40	53.44	1.56	2.15	1.72	60.85	53.75	1.13	79	52.5	1.5
1123012148	10/22/2018	1.15	1.96	95.91	61.25	1.57	2.48	1.93	73.11	60.31	1.21	94	55.6	1.69
1123012001	10/23/2018	0.92	2.20	76.73	68.75	1.12	2.67	2.14	80.16	66.88	1.20	75	63.8	1.18
1123018087	10/23/2018	0.37	1.20	30.86	37.50	0.82	1.35	1.22	31.14	38.13	0.82	37	37.8	0.98
1123018314	10/26/2018	0.43	1.42	35.86	44.38	0.81	1.42	1.4	33.74	43.75	0.77	37	43.1	0.86
1123018370	10/27/2018	0.64	1.65	53.38	51.56	1.04	2.09	1.66	58.62	51.88	1.13	57	46.6	1.22
1123017029	10/28/2018	0.80	1.80	66.72	56.25	1.19	2.04	1.77	56.77	55.31	1.03	65	51.3	1.27
1123017044	10/28/2018	0.14	1.89	11.68	59.06	0.20	0.55	1.86	1.43	58.13	0.02	17	60.9	0.28
1123017051	10/28/2018	0.26	1.94	21.68	60.63	0.36	1.02	1.86	18.88	58.13	0.32	27	56.6	0.48
1122003012	10/31/2018	0.63	1.38	52.54	43.13	1.22	2.35	1.43	68.28	44.69	1.53	59	40.6	1.45
1122003029	10/31/2018	0.53	1.86	44.20	58.13	0.76	2.1	1.96	58.99	61.25	0.96	53	55.9	0.95
1122003080	10/31/2018	1.07	2.70	89.24	84.38	1.06	2.31	2.73	66.79	85.31	0.78	85	89.4	0.95
1123017219	10/31/2018	0.28	1.79	23.35	55.94	0.42	1.03	1.77	19.25	55.31	0.35	31	54.7	0.57
1123020012	11/2/2018	0.53	2.26	44.20	70.63	0.63	1.03	2.28	19.25	71.25	0.27	44	76.9	0.57
1123020029	11/2/2018	0.18	2.56	15.01	80.00	0.19	0.35	2.43	0.00	75.94	0.00	17	79.7	0.21
1123020044	11/2/2018	0.51	1.42	42.53	44.38	0.96	1.88	1.5	50.82	46.88	1.08	50	45.3	1.1
1123020061	11/2/2018	0.26	1.73	21.68	54.06	0.40	0.93	1.83	15.54	57.19	0.27	27	55.3	0.49
1123020082	11/2/2018	0.19	1.81	15.85	56.56	0.28	0.35	1.79	0.00	55.94	0.00	16	54.7	0.29
1123020109	11/2/2018	0.67	1.26	55.88	39.38	1.42	1.63	1.29	41.54	40.31	1.03	57	37.5	1.52

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1123020126	11/2/2018	0.33	1.49	27.52	46.56	0.59	1.25	1.47	27.43	45.94	0.60	33	42.2	0.78
1123020150	11/2/2018	0.31	1.79	25.85	55.94	0.46	0.8	1.86	10.71	58.13	0.18	26	55.3	0.47
1123020185	11/2/2018	0.50	1.46	41.70	45.63	0.91	1.71	1.47	44.51	45.94	0.97	49	46.3	1.06
1123020214	11/2/2018	0.48	1.42	40.03	44.38	0.90	1.69	1.43	43.77	44.69	0.98	51	43.8	1.17
1122002175	11/3/2018	1.22	1.85	101.75	57.81	1.76	2.75	1.83	83.14	57.19	1.45	104	58.1	1.79
1123019191	11/3/2018	0.26	1.20	21.68	37.50	0.58	0.67	1.2	5.88	37.50	0.16	20	37.8	0.53
1123020197	11/3/2018	1.03	1.16	85.90	36.25	2.37	3.53	1.15	112.10	35.94	3.12	88	37.5	2.35
1122002018	11/4/2018	0.78	1.97	65.05	61.56	1.06	2	2.01	55.28	62.81	0.88	64	64.4	0.99
1122002019	11/4/2018	0.62	2.31	51.71	72.19	0.72	1.5	2.24	36.71	70.00	0.52	49	66.6	0.74
1123019028	11/4/2018	0.14	1.49	11.68	46.56	0.25	0.41	1.48	0.00	46.25	0.00	16	41.9	0.38
1123019133	11/4/2018	0.09	1.08	7.51	33.75	0.22	0.44	1.1	0.00	34.38	0.00	14	34.7	0.4
1123019009	11/7/2018	0.23	2.59	19.18	80.94	0.24	0.66	2.52	5.51	78.75	0.07	18	81.9	0.22
1123019010	11/7/2018	0.32	3.06	26.69	95.63	0.28	0.95	3	16.28	93.75	0.17	26	95	0.27
1123019045	11/7/2018	0.10	1.14	8.34	35.63	0.23	0.28	1.27	0.00	39.69	0.00	11	38.4	0.29
1123019101	11/7/2018	0.51	2.22	42.53	69.38	0.61	1.11	2.19	22.23	68.44	0.32	41	68.8	0.6
1123019140	11/7/2018	0.07	2.05	5.84	64.06	0.09	0.29	2	0.00	62.50	0.00	10	64.7	0.15
1123019151	11/7/2018	0.05	2.00	4.17	62.50	0.07	0.14	1.99	0.00	62.19	0.00	8	57.2	0.14
1123023002	11/8/2018	0.80	2.03	66.72	63.44	1.05	2.04	1.98	56.77	61.88	0.92	68	64.4	1.06
1123023008	11/8/2018	0.58	2.17	48.37	67.81	0.71	1.19	2.12	25.20	66.25	0.38	46	65	0.71
1123019209	11/9/2018	0.08	2.91	6.67	90.94	0.07	0.31	2.78	0.00	86.88	0.00	11	91.9	0.12
1122008031	11/11/2018	1.15	1.82	95.91	56.88	1.69	2.61	1.82	77.94	56.88	1.37	89	57.5	1.55
1122008130	11/11/2018	1.36	1.35	113.42	42.19	2.69	3.47	1.28	109.88	40.00	2.75	113	42.8	2.64
1122010106	11/11/2018	0.31	2.68	25.85	83.75	0.31	1.2	2.62	25.57	81.88	0.31	31	83.1	0.37
1122010119	11/11/2018	0.52	2.01	43.37	62.81	0.69	2.12	2.11	59.74	65.94	0.91	49	63.8	0.77
1122010234	11/11/2018	0.21	2.36	17.51	73.75	0.24	0.67	2.25	5.88	70.31	0.08	19	73.8	0.26
1122010278	11/11/2018	0.25	2.54	20.85	79.38	0.26	0.86	2.58	12.94	80.63	0.16	25	78.8	0.32
1122010283	11/11/2018	0.69	3.76	57.55	117.50	0.49	1.65	3.57	42.28	111.56	0.38	52	114.4	0.45
1122010318	11/11/2018	0.17	1.67	14.18	52.19	0.27	0.52	1.57	0.31	49.06	0.01	16	49.1	0.33
1122010345	11/11/2018	0.13	2.31	10.84	72.19	0.15	0.49	2.32	0.00	72.50	0.00	14	69.4	0.2
1122007095	11/12/2018	1.20	1.78	100.08	55.63	1.80	2.84	1.88	86.48	58.75	1.47	102	56.6	1.8
1122007124	11/12/2018	1.02	1.70	85.07	53.13	1.60	2.56	1.74	76.08	54.38	1.40	80	53.4	1.5
1122010155	11/12/2018	1.22	2.38	101.75	74.38	1.37	3.28	2.48	102.82	77.50	1.33	109	74.7	1.46
1122010170	11/12/2018	1.32	2.55	110.09	79.69	1.38	2.63	2.51	78.68	78.44	1.00	103	79.7	1.29
1122010213	11/12/2018	0.96	2.62	80.06	81.88	0.98	2.29	2.51	66.05	78.44	0.84	74	76.3	0.97
1122010217	11/12/2018	0.24	2.80	20.02	87.50	0.23	0.87	2.93	13.31	91.56	0.15	27	90.3	0.3
1122012010	11/12/2018	0.28	3.54	23.35	110.63	0.21	0.99	3.3	17.77	103.13	0.17	29	109.1	0.27
1122010266	11/13/2018	0.59	1.66	49.21	51.88	0.95	2.28	1.7	65.68	53.13	1.24	54	48.8	1.11
1122008118	11/14/2018	0.99	2.23	82.57	69.69	1.18	2.19	2.22	62.34	69.38	0.90	81	71.9	1.13
1122012158	11/14/2018	0.42	1.06	35.03	33.13	1.06	1.56	1.09	38.94	34.06	1.14	41	34.1	1.2
1122007026	11/16/2018	0.61	1.76	50.87	55.00	0.92	1.93	1.75	52.68	54.69	0.96	56	53.1	1.05
1122012022	11/16/2018	0.52	1.51	43.37	47.19	0.92	2.05	1.55	57.14	48.44	1.18	39	49.1	0.79
1122012038	11/16/2018	0.40	0.92	33.36	28.75	1.16	1.47	0.92	35.60	28.75	1.24	39	27.2	1.43
1122007038	11/17/2018	1.21	1.65	100.91	51.56	1.96	2.54	1.71	75.34	53.44	1.41	102	50	2.04
1122007051	11/17/2018	0.39	2.49	32.53	77.81	0.42	1.17	2.59	24.45	80.94	0.30	36	75	0.48

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1122007092	11/17/2018	0.71	1.89	59.21	59.06	1.00	2.05	1.99	57.14	62.19	0.92	61	57.2	1.07
1122009028	11/17/2018	0.30	1.42	25.02	44.38	0.56	1.43	1.43	34.11	44.69	0.76	36	43.8	0.82
1122014021	11/19/2018	0.39	1.54	32.53	48.13	0.68	1.32	1.56	30.02	48.75	0.62	34	45.3	0.75
1122014157	11/19/2018	0.10	2.11	8.34	65.94	0.13	0.39	2.15	0.00	67.19	0.00	13	62.8	0.21
1122014181	11/19/2018	0.13	1.03	10.84	32.19	0.34	0.47	1.07	0.00	33.44	0.00	15	29.7	0.51
1122016028	11/19/2018	0.44	1.40	36.70	43.75	0.84	1.79	1.41	47.48	44.06	1.08	49	44.4	1.1
1122016065	11/19/2018	0.48	1.78	40.03	55.63	0.72	1.55	1.81	38.57	56.56	0.68	45	54.7	0.82
1122016165	11/19/2018	0.20	1.37	16.68	42.81	0.39	1.19	1.42	25.20	44.38	0.57	25	42.5	0.59
1122014022	11/20/2018	0.40	1.22	33.36	38.13	0.88	1.08	1.23	21.11	38.44	0.55	28	35.6	0.79
1122016094	11/20/2018	0.28	1.43	23.35	44.69	0.52	1.63	1.39	41.54	43.44	0.96	30	42.8	0.7
1122016132	11/20/2018	0.48	1.63	40.03	50.94	0.79	1.56	1.69	38.94	52.81	0.74	43	49.1	0.88
1122016147	11/20/2018	0.60	1.28	50.04	40.00	1.25	2.19	1.31	62.34	40.94	1.52	58	36.3	1.6
1122016176	11/20/2018	0.37	1.63	30.86	50.94	0.61	1.69	1.63	43.77	50.94	0.86	38	48.1	0.79
1122014005	11/23/2018	0.85	1.37	70.89	42.81	1.66	2.69	1.35	80.91	42.19	1.92	70	40	1.75
1122018001	11/26/2018	0.18	2.40	15.01	75.00	0.20	0.51	2.28	0.00	71.25	0.00	15	68.4	0.22
1122018102	11/26/2018	0.15	1.98	12.51	61.88	0.20	0.52	2.01	0.31	62.81	0.00	16	61.6	0.26
1122018145	11/26/2018	0.11	1.92	9.17	60.00	0.15	0.42	2.02	0.00	63.13	0.00	12	56.9	0.21
1122018161	11/26/2018	0.10	1.17	8.34	36.56	0.23	0.49	1.18	0.00	36.88	0.00	15	35	0.43
1122018190	11/26/2018	0.24	1.55	20.02	48.44	0.41	0.86	1.54	12.94	48.13	0.27	20	47.2	0.42
1122018206	11/26/2018	0.21	1.04	17.51	32.50	0.54	0.7	1.06	7.00	33.13	0.21	22	30	0.73
1122018215	11/26/2018	0.33	2.42	27.52	75.63	0.36	1.17	2.39	24.45	74.69	0.33	32	74.4	0.43
1122001134	11/29/2018	0.78	1.96	65.05	61.25	1.06	2.15	1.9	60.85	59.38	1.02	63	58.4	1.08
1122018173	11/29/2018	0.18	1.67	15.01	52.19	0.29	0.48	1.63	0.00	50.94	0.00	15	49.4	0.3
1122019208	11/29/2018	0.72	2.18	60.05	68.13	0.88	1.77	2.14	46.74	66.88	0.70	58	68.8	0.84
1122019006	12/1/2018	0.39	1.54	32.53	48.13	0.68	1.29	1.55	28.91	48.44	0.60	35	47.2	0.74
1122019050	12/1/2018	0.43	1.67	35.86	52.19	0.69	1.35	1.55	31.14	48.44	0.64	38	49.1	0.77
1129051403	1/25/2018	1.00	1.95	83.40	60.94	1.37	1.77	1.94	46.74	60.63	0.77	76	56.6	1.34
1130053515	1/18/2018	0.84	1.35	70.06	42.19	1.66	1.72	1.4	44.88	43.75	1.03	67	40	1.68
1130057500	1/27/2018	0.14	1.72	11.68	53.75	0.22	0.47	1.7	0.00	53.13	0.00	14	44.7	0.31
1130057602	1/27/2018	0.07	1.41	5.84	44.06	0.13	0.08	1.48	0.00	46.25	0.00	4	40.9	0.1
1130057608	1/27/2018	0.06	1.12	5.00	35.00	0.14	0.23	1.17	0.00	36.56	0.00	6	32.5	0.18
1130057720	1/27/2018	0.26	2.16	21.68	67.50	0.32	0.5	2.15	0.00	67.19	0.00	20	55.9	0.36
1130057801	1/27/2018	0.06	3.73	5.00	116.56	0.04	0.13	3.54	0.00	110.63	0.00	6	103.8	0.06
1130057846	1/25/2018	0.36	2.14	30.02	66.88	0.45	0.62	2	4.03	62.50	0.06	27	61.3	0.44
1130057860	1/27/2018	0.05	1.13	4.17	35.31	0.12	0.13	1.15	0.00	35.94	0.00	5	29.7	0.17
1131067010	2/6/2018	0.15	3.22	12.51	100.63	0.12	0.24	3.19	0.00	99.69	0.00	8	96.9	0.08
1131067013	2/6/2018	0.78	1.16	65.05	36.25	1.79	1.97	1.2	54.17	37.50	1.44	68	35.6	1.91
1131067052	2/6/2018	0.15	2.73	12.51	85.31	0.15	0.13	2.85	0.00	89.06	0.00	5	85.6	0.06
1131067102	2/6/2018	0.09	1.55	7.51	48.44	0.15	0.13	1.56	0.00	48.75	0.00	4	43.1	0.09
1129098296	2/12/2018	0.04	2.46	3.34	76.88	0.04	0.15	2.3	0.00	71.88	0.00	6	75.3	0.08
1129098319	2/12/2018	0.06	1.78	5.00	55.63	0.09	0.21	1.77	0.00	55.31	0.00	10	55.3	0.18
1129052024	2/16/2018	0.06	1.93	5.00	60.31	0.08	0.21	1.94	0.00	60.63	0.00	6	61.3	0.1
1129052030	2/16/2018	0.22	1.84	18.35	57.50	0.32	0.37	1.78	0.00	55.63	0.00	16	57.5	0.28
1129052070	2/16/2018	0.14	2.11	11.68	65.94	0.18	0.31	2.18	0.00	68.13	0.00	14	67.8	0.21

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1129098288	2/16/2018	0.07	2.31	5.84	72.19	0.08	0.29	2.25	0.00	70.31	0.00	8	73.8	0.11
1128040017	2/20/2018	0.60	2.70	50.04	84.38	0.59	1.15	2.55	23.71	79.69	0.30	50	81.6	0.61
1128040120	2/20/2018	0.37	1.95	30.86	60.94	0.51	0.73	1.93	8.11	60.31	0.13	31	64.4	0.48
1128040134	2/20/2018	0.64	2.20	53.38	68.75	0.78	1.24	2.12	27.05	66.25	0.41	52	69.7	0.75
1128040136	2/20/2018	0.76	2.28	63.38	71.25	0.89	1.37	2.21	31.88	69.06	0.46	62	73.4	0.84
1129057051	2/21/2018	0.04	1.31	3.34	40.94	0.08	0.23	1.29	0.00	40.31	0.00	9	39.4	0.23
1128040089	2/22/2018	1.00	2.46	83.40	76.88	1.08	2.08	2.42	58.25	75.63	0.77	81	78.4	1.03
1128040090	2/22/2018	0.87	2.73	72.56	85.31	0.85	1.52	2.64	37.45	82.50	0.45	71	86.3	0.82
1128040154	2/22/2018	1.03	2.42	85.90	75.63	1.14	1.86	2.32	50.08	72.50	0.69	90	80.3	1.12
1129057088	2/22/2018	0.56	1.56	46.70	48.75	0.96	2.07	1.51	57.88	47.19	1.23	56	46.9	1.19
1129055021	2/26/2018	0.66	1.82	55.04	56.88	0.97	1.19	1.77	25.20	55.31	0.46	50	50.6	0.99
1128043354	3/8/2018	0.07	1.70	5.84	53.13	0.11	0.35	1.79	0.00	55.94	0.00	11	51.3	0.21
1128042058	3/9/2018	0.17	2.65	14.18	82.81	0.17	0.57	2.49	2.17	77.81	0.03	17	73.1	0.23
1128042050	3/10/2018	0.19	1.47	15.85	45.94	0.34	0.46	1.46	0.00	45.63	0.00	16	41.3	0.39
1128042057	3/10/2018	0.09	2.70	7.51	84.38	0.09	0.34	2.69	0.00	84.06	0.00	11	83.8	0.13
1128042065	3/10/2018	0.09	1.55	7.51	48.44	0.15	0.3	1.67	0.00	52.19	0.00	11	51.6	0.21
1128043429	3/10/2018	0.96	1.83	80.06	57.19	1.40	2.16	1.85	61.22	57.81	1.06	75	55	1.36
1128042035	3/11/2018	0.14	1.55	11.68	48.44	0.24	0.55	1.62	1.43	50.63	0.03	14	46.9	0.3
1128043433	3/11/2018	0.13	2.47	10.84	77.19	0.14	0.41	2.38	0.00	74.38	0.00	14	70.3	0.2
1128043494	3/11/2018	0.21	2.24	17.51	70.00	0.25	0.67	2.28	5.88	71.25	0.08	20	69.7	0.29
1128042134	3/12/2018	0.09	1.77	7.51	55.31	0.14	0.4	1.8	0.00	56.25	0.00	12	53.8	0.22
1128042205	3/12/2018	0.47	2.00	39.20	62.50	0.63	1.29	1.99	28.91	62.19	0.46	42	63.1	0.67
1128043348	3/12/2018	0.36	1.60	30.02	50.00	0.60	0.65	1.58	5.14	49.38	0.10	31	47.2	0.66
1128042220	3/13/2018	1.09	1.93	90.91	60.31	1.51	2.27	2.02	65.31	63.13	1.03	84	60.3	1.39
1128045096	3/21/2018	0.48	1.41	40.03	44.06	0.91	1.69	1.4	43.77	43.75	1.00	46	40.9	1.12
1128045145	3/21/2018	0.55	1.34	45.87	41.88	1.10	1.78	1.3	47.11	40.63	1.16	52	39.4	1.32
1128046168	3/21/2018	0.31	1.95	25.85	60.94	0.42	1.03	1.93	19.25	60.31	0.32	29	54.7	0.53
1127032065	4/1/2018	0.47	1.44	39.20	45.00	0.87	1.57	1.47	39.31	45.94	0.86	44	46.3	0.95
1127032152	4/1/2018	1.41	0.78	117.59	24.38	4.82	2.42	0.75	70.88	23.44	3.02	107	22.2	4.82
1127036083	4/1/2018	0.23	2.13	19.18	66.56	0.29	0.89	2.06	14.05	64.38	0.22	22	64.7	0.34
1230001163	4/5/2018	0.17	1.59	14.18	49.69	0.29	0.18	1.56	0.00	48.75	0.00	11	48.4	0.23
1230001167	4/5/2018	0.02	1.63	1.67	50.94	0.03	0.21	1.63	0.00	50.94	0.00	5	50.3	0.1
1230001209	4/5/2018	0.03	1.35	2.50	42.19	0.06	0.28	1.27	0.00	39.69	0.00	8	41.6	0.19
1127034070	4/6/2018	0.43	1.97	35.86	61.56	0.58	1.37	2.15	31.88	67.19	0.47	40	61.3	0.65
1230001061	4/6/2018	0.26	1.34	21.68	41.88	0.52	0.55	1.41	1.43	44.06	0.03	26	40.9	0.64
1230001066	4/6/2018	0.05	3.05	4.17	95.31	0.04	0.15	3.15	0.00	98.44	0.00	7	98.8	0.07
1230001153	4/6/2018	0.07	1.25	5.84	39.06	0.15	0.07	1.22	0.00	38.13	0.00	7	37.2	0.19
1230001156	4/6/2018	0.03	1.64	2.50	51.25	0.05	0.18	1.72	0.00	53.75	0.00	7	49.4	0.14
1230001204	4/6/2018	0.13	0.92	10.84	28.75	0.38	0.14	0.88	0.00	27.50	0.00	5	27.5	0.18
1127034125	4/7/2018	0.65	1.56	54.21	48.75	1.11	1.85	1.5	49.71	46.88	1.06	57	46.6	1.22
1127034182	4/7/2018	0.69	1.59	57.55	49.69	1.16	2.15	1.56	60.85	48.75	1.25	60	48.4	1.24
1230001052	4/7/2018	0.16	1.40	13.34	43.75	0.31	0.43	1.45	0.00	45.31	0.00	14	42.2	0.33
1230002222	4/8/2018	0.06	1.62	5.00	50.63	0.10	0.13	1.48	0.00	46.25	0.00	5	48.1	0.1
1230002012	4/14/2018	0.05	1.43	4.17	44.69	0.09	0.8	2	10.71	62.50	0.17	25	65.9	0.38

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1230002037	4/14/2018	0.03	1.88	2.50	58.75	0.04	0.11	1.79	0.00	55.94	0.00	4	56.3	0.07
1230002057	4/14/2018	0.02	2.40	1.67	75.00	0.02	0.09	2.51	0.00	78.44	0.00	5	78.8	0.06
1230002076	4/14/2018	0.03	1.63	2.50	50.94	0.05	0.03	1.54	0.00	48.13	0.00	3	46.9	0.06
1230002127	4/14/2018	0.07	2.94	5.84	91.88	0.06	0.2	2.97	0.00	92.81	0.00	7	91.9	0.08
1230002003	4/15/2018	0.06	1.89	5.00	59.06	0.08	0.1	1.96	0.00	61.25	0.00	5	59.1	0.08
1127042162	4/21/2018	0.70	1.90	58.38	59.38	0.98	2.32	1.9	67.16	59.38	1.13	63	60.3	1.04
1126016009	5/4/2018	1.14	1.99	95.08	62.19	1.53	2.98	2.04	91.68	63.75	1.44	88	63.1	1.39
1126016036	5/5/2018	0.88	2.37	73.39	74.06	0.99	2.3	2.38	66.42	74.38	0.89	66	70.6	0.93
1126016046	5/5/2018	0.96	1.76	80.06	55.00	1.46	2.54	1.87	75.34	58.44	1.29	77	54.1	1.42
1126016035	5/8/2018	1.19	2.37	99.25	74.06	1.34	2.53	2.52	74.96	78.75	0.95	89	73.8	1.21
1126018058	5/8/2018	0.84	1.57	70.06	49.06	1.43	2.83	1.64	86.11	51.25	1.68	73	48.8	1.5
1126019243	5/8/2018	1.23	2.07	102.58	64.69	1.59	2.61	2.08	77.94	65.00	1.20	108	60	1.8
1126018041	5/9/2018	0.59	1.56	49.21	48.75	1.01	2.2	1.73	62.71	54.06	1.16	56	50.6	1.11
1126019156	5/9/2018	0.61	2.09	50.87	65.31	0.78	1.76	2.19	46.37	68.44	0.68	50	65.9	0.76
1126019233	5/9/2018	0.93	2.77	77.56	86.56	0.90	2.25	2.98	64.57	93.13	0.69	81	88.1	0.92
1126020040	5/31/2018	0.49	1.26	40.87	39.38	1.04	2.09	1.32	58.62	41.25	1.42	49	39.4	1.24
1126020080	5/31/2018	0.32	1.35	26.69	42.19	0.63	1.63	1.41	41.54	44.06	0.94	34	40	0.85
1126020138	5/31/2018	0.32	1.25	26.69	39.06	0.68	1.48	1.36	35.97	42.50	0.85	34	39.4	0.86
1127040039	6/5/2018	0.57	2.05	47.54	64.06	0.74	1.05	1.95	20.00	60.94	0.33	42	59.1	0.71
1127040040	6/5/2018	0.62	3.25	51.71	101.56	0.51	1.29	3.13	28.91	97.81	0.30	47	97.2	0.48
1127040028	6/6/2018	0.35	2.81	29.19	87.81	0.33	0.81	2.67	11.08	83.44	0.13	29	75.3	0.39
1127040453	6/7/2018	0.46	1.17	38.36	36.56	1.05	1.06	1.12	20.37	35.00	0.58	38	34.7	1.1
1125024059	7/13/2018	0.76	2.17	63.38	67.81	0.93	2.22	2.12	63.45	66.25	0.96	64	70.3	0.91
1125024041	7/14/2018	1.00	2.10	83.40	65.63	1.27	2.44	2	71.62	62.50	1.15	74	65.6	1.13
1125024056	7/14/2018	0.17	1.48	14.18	46.25	0.31	0.56	1.47	1.80	45.94	0.04	18	44.4	0.41
1125024115	7/14/2018	0.21	2.97	17.51	92.81	0.19	0.76	2.78	9.23	86.88	0.11	24	91.3	0.26
1125024150	7/14/2018	0.28	1.37	23.35	42.81	0.55	0.85	1.3	12.57	40.63	0.31	27	38.1	0.71
1125024049	7/15/2018	1.10	1.80	91.74	56.25	1.63	3.16	1.78	98.36	55.63	1.77	87	55	1.58
1125024073	7/15/2018	0.28	1.67	23.35	52.19	0.45	1.13	1.58	22.97	49.38	0.47	31	50.6	0.61
1124004001	8/7/2018	0.84	2.35	70.06	73.44	0.95	1.74	2.23	45.62	69.69	0.65	66	68.1	0.97
1124004002	8/7/2018	1.01	2.28	84.23	71.25	1.18	2.01	2.08	55.65	65.00	0.86	78	63.4	1.23
1124004010	8/7/2018	0.43	1.19	35.86	37.19	0.96	1.28	1.78	28.54	55.63	0.51	49	57.2	0.86
1124004030	8/7/2018	0.52	2.30	43.37	71.88	0.60	0.97	2.13	17.03	66.56	0.26	37	65.6	0.56
1124004054	8/7/2018	1.02	2.20	85.07	68.75	1.24	2.14	2.03	60.48	63.44	0.95	79	62.8	1.26
1124004070	8/7/2018	0.59	1.95	49.21	60.94	0.81	1.04	1.88	19.63	58.75	0.33	42	57.2	0.73
1124004100	8/7/2018	0.62	2.02	51.71	63.13	0.82	1.37	1.87	31.88	58.44	0.55	52	59.1	0.88
1124004104	8/7/2018	0.91	1.78	75.89	55.63	1.36	2.07	1.76	57.88	55.00	1.05	75	51.3	1.46
1124004127	8/7/2018	0.69	1.84	57.55	57.50	1.00	1.68	1.68	43.40	52.50	0.83	56	53.1	1.05
1124005001	8/12/2018	0.89	2.01	74.23	62.81	1.18	1.93	2.02	52.68	63.13	0.83	71	59.4	1.2
1124005016	8/12/2018	0.74	2.13	61.72	66.56	0.93	1.75	2.03	46.00	63.44	0.73	56	66.3	0.85
1124005225	8/12/2018	0.68	2.25	56.71	70.31	0.81	1.8	2.2	47.85	68.75	0.70	53	71.3	0.74
1124005043	8/13/2018	0.88	1.98	73.39	61.88	1.19	2.46	1.84	72.36	57.50	1.26	69	64.1	1.08
1124005065	8/13/2018	0.70	2.05	58.38	64.06	0.91	1.88	2.11	50.82	65.94	0.77	56	66.6	0.84
1124005035	8/14/2018	0.79	2.00	65.89	62.50	1.05	2.47	1.96	72.74	61.25	1.19	63	65.9	0.96

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1124005041	8/14/2018	0.94	1.96	78.40	61.25	1.28	2.88	1.89	87.96	59.06	1.49	75	64.7	1.16
1124005105	8/15/2018	0.68	1.87	56.71	58.44	0.97	1.97	1.8	54.17	56.25	0.96	55	57.5	0.96
1124005122	8/15/2018	0.69	1.84	57.55	57.50	1.00	2.12	1.73	59.74	54.06	1.10	57	54.4	1.05
1124005187	8/15/2018	0.73	1.83	60.88	57.19	1.06	1.82	1.75	48.59	54.69	0.89	55	57.2	0.96
1124005123	8/16/2018	0.65	1.88	54.21	58.75	0.92	2.07	1.81	57.88	56.56	1.02	54	55.9	0.97
1124005140	8/16/2018	0.71	2.50	59.21	78.13	0.76	1.99	2.49	54.91	77.81	0.71	56	73.8	0.76
1124005160	8/17/2018	0.75	1.86	62.55	58.13	1.08	2.18	1.87	61.97	58.44	1.06	58	54.4	1.07
1123009130	10/3/2018	1.10	1.84	91.74	57.50	1.60	2.29	1.83	66.05	57.19	1.15	81	54.1	1.5
1123009135	10/3/2018	0.98	2.75	81.73	85.94	0.95	2.12	2.68	59.74	83.75	0.71	77	85.3	0.9
1123014107	10/14/2018	0.72	1.55	60.05	48.44	1.24	2.29	1.67	66.05	52.19	1.27	58	50.3	1.15
1123014114	10/14/2018	0.56	1.63	46.70	50.94	0.92	1.75	1.61	46.00	50.31	0.91	45	49.4	0.91
1123014173	10/14/2018	0.50	1.27	41.70	39.69	1.05	1.96	1.49	53.79	46.56	1.16	47	41.6	1.13
1123014010	10/17/2018	0.34	1.61	28.36	50.31	0.56	1.94	1.61	53.05	50.31	1.05	35	52.2	0.67
1123014020	10/17/2018	0.14	1.84	11.68	57.50	0.20	1.52	1.84	37.45	57.50	0.65	17	52.8	0.32
1123018114	10/21/2018	0.68	0.14	56.71	4.38	12.96	2.83	0.15	86.11	4.69	18.37	68	4.1	16.74
1123018056	10/22/2018	0.26	1.36	21.68	42.50	0.51	1.6	1.33	40.42	41.56	0.97	31	37.8	0.82
1123018074	10/22/2018	0.44	1.85	36.70	57.81	0.63	1.92	1.77	52.31	55.31	0.95	46	52.5	0.88
1123018021	10/23/2018	0.56	0.77	46.70	24.06	1.94	2.18	0.81	61.97	25.31	2.45	51	24.7	2.07
1123017100	10/28/2018	0.23	1.17	19.18	36.56	0.52	1.16	1.14	24.08	35.63	0.68	26	35.3	0.74
1123017125	10/28/2018	0.11	1.36	9.17	42.50	0.22	0.84	1.31	12.20	40.94	0.30	16	37.8	0.42
1123017164	10/28/2018	0.40	1.11	33.36	34.69	0.96	1.73	1.1	45.25	34.38	1.32	41	32.5	1.26
1122003063	10/31/2018	1.02	2.36	85.07	73.75	1.15	2.35	2.36	68.28	73.75	0.93	85	70.9	1.2
1122003064	10/31/2018	0.79	1.97	65.89	61.56	1.07	2.26	1.95	64.94	60.94	1.07	74	57.2	1.29
1123016033	10/31/2018	0.06	0.17	5.00	5.31	0.94	2.39	1.81	69.76	56.56	1.23	59	54.1	1.09
1123016122	10/31/2018	0.61	1.80	50.87	56.25	0.90	2.22	1.71	63.45	53.44	1.19	58	50.6	1.15
1123016195	10/31/2018	0.44	1.79	36.70	55.94	0.66	2.29	1.7	66.05	53.13	1.24	45	51.6	0.87
1123016221	10/31/2018	0.35	1.53	29.19	47.81	0.61	2.14	1.52	60.48	47.50	1.27	38	42.8	0.89
1123017062	10/31/2018	0.54	1.41	45.04	44.06	1.02	1.8	1.39	47.85	43.44	1.10	49	41.3	1.19
1123017069	10/31/2018	0.27	1.92	22.52	60.00	0.38	0.92	1.85	15.17	57.81	0.26	26	59.1	0.44
1123017086	10/31/2018	0.11	2.24	9.17	70.00	0.13	0.5	2.11	0.00	65.94	0.00	16	63.4	0.25
1123017145	10/31/2018	0.40	1.11	33.36	34.69	0.96	1.8	1.03	47.85	32.19	1.49	41	29.1	1.41
1123017172	10/31/2018	0.22	3.14	18.35	98.13	0.19	0.73	2.98	8.11	93.13	0.09	22	98.1	0.22
1123017189	10/31/2018	0.14	1.37	11.68	42.81	0.27	0.79	1.32	10.34	41.25	0.25	17	39.7	0.43
1123017241	10/31/2018	0.40	1.34	33.36	41.88	0.80	1.57	1.3	39.31	40.63	0.97	44	38.4	1.14
1122010006	11/13/2018	0.28	2.41	23.35	75.31	0.31	1.64	2.34	41.91	73.13	0.57	27	70	0.39
1122010025	11/13/2018	0.32	1.55	26.69	48.44	0.55	1.99	1.48	54.91	46.25	1.19	33	46.9	0.7
1122010143	11/13/2018	0.28	1.69	23.35	52.81	0.44	1.99	1.71	54.91	53.44	1.03	35	51.6	0.68
1122010270	11/13/2018	0.22	1.31	18.35	40.94	0.45	1.56	1.39	38.94	43.44	0.90	23	41.9	0.55
1122009089	11/14/2018	0.10	1.12	8.34	35.00	0.24	1.79	1.16	47.48	36.25	1.31	1	34.4	0.005
1122012108	11/14/2018	0.25	1.89	20.85	59.06	0.35	0.84	1.84	12.20	57.50	0.21	23	58.1	0.4
1122012128	11/14/2018	0.21	1.70	17.51	53.13	0.33	1.02	1.63	18.88	50.94	0.37	28	52.8	0.53
1122009066	11/16/2018	0.12	1.30	10.01	40.63	0.25	1.16	1.34	24.08	41.88	0.58	18	41.3	0.44
1122014107	11/18/2018	0.68	2.35	56.71	73.44	0.77	1.78	2.53	47.11	79.06	0.60	57	76.9	0.74
1122014105	11/19/2018	0.25	1.20	20.85	37.50	0.56	0.96	1.55	16.65	48.44	0.34	25	48.8	0.51

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Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1122016114	11/19/2018	0.25	1.07	20.85	33.44	0.62	1.62	1.15	41.17	35.94	1.15	31	33.8	0.92
1122016152	11/19/2018	0.11	0.73	9.17	22.81	0.40	1.1	0.79	21.85	24.69	0.89	17	22.2	0.77
1122014101	11/20/2018	0.44	1.28	36.70	40.00	0.92	2.05	1.31	57.14	40.94	1.40	48	38.1	1.26
1128031013	1/18/2018	0.83	1.88	69.22	58.75	1.18	1.71	1.82	44.51	56.88	0.78	59	57.5	1.03
1128031085	1/18/2018	1.37	2.01	114.26	62.81	1.82	2.66	2.03	79.79	63.44	1.26	98	62.8	1.56
1128031105	1/18/2018	1.08	2.12	90.07	66.25	1.36	2.39	2.12	69.76	66.25	1.05	85	66.3	1.28
1128032006	1/20/2018	1.09	2.32	90.91	72.50	1.25	2.49	2.2	73.48	68.75	1.07	97	66.3	1.46
1128032009	1/20/2018	0.74	1.51	61.72	47.19	1.31	2	1.51	55.28	47.19	1.17	65	46.3	1.41
1128032041	1/20/2018	1.11	2.06	92.57	64.38	1.44	2.23	1.83	63.82	57.19	1.12	89	52.8	1.69
1128032057	1/20/2018	1.03	1.42	85.90	44.38	1.94	2.28	1.38	65.68	43.13	1.52	80	42.5	1.88
1128034015	1/20/2018	0.55	1.50	45.87	46.88	0.98	1.38	1.28	32.25	40.00	0.81	28	39.1	0.72
1128034032	1/20/2018	0.71	1.36	59.21	42.50	1.39	2.26	1.36	64.94	42.50	1.53	63	43.1	1.46
1129049016	1/17/2018	0.73	2.15	60.88	67.19	0.91	2.31	2.03	66.79	63.44	1.05	62	64.7	0.96
1129049020	1/17/2018	0.66	1.99	55.04	62.19	0.89	2.27	1.97	65.31	61.56	1.06	57	60	0.95
1129049207	1/18/2018	0.24	1.82	20.02	56.88	0.35	0.91	1.86	14.80	58.13	0.25	24	57.2	0.42
1129049225	1/18/2018	0.39	2.00	32.53	62.50	0.52	1.49	2.06	36.34	64.38	0.56	40	59.1	0.68
1129050027	1/19/2018	0.48	2.49	40.03	77.81	0.51	1.74	2.53	45.62	79.06	0.58	44	76.6	0.57
1129050034	1/6/2018	0.00	1.95	0.00	60.94	0.00	0.8	1.96	10.71	61.25	0.17	20	61.3	0.33
1128037001	2/6/2018	1.17	1.40	97.58	43.75	2.23	2.68	1.47	80.54	45.94	1.75	98	44.1	2.22
1128037020	2/6/2018	1.01	1.89	84.23	59.06	1.43	2.42	1.87	70.88	58.44	1.21	84	56.9	1.48
1128037021	2/6/2018	0.97	1.85	80.90	57.81	1.40	2.31	1.86	66.79	58.13	1.15	78	53.8	1.45
1128037050	2/6/2018	1.59	1.66	132.61	51.88	2.56	2.17	1.64	61.59	51.25	1.20	88	43.8	2.01
1128037098	2/6/2018	0.98	2.36	81.73	73.75	1.11	1.95	2.24	53.42	70.00	0.76	77	70.6	1.09
1128037112	2/6/2018	0.14	2.21	11.68	69.06	0.17	0.25	2.09	0.00	65.31	0.00	11	65.3	0.17
1128037128	2/6/2018	0.46	2.09	38.36	65.31	0.59	1.3	2.05	29.28	64.06	0.46	37	59.4	0.62
1128038092	2/8/2018	0.29	2.10	24.19	65.63	0.37	0.59	1.96	2.91	61.25	0.05	25	60.6	0.41
1129052011	2/16/2018	0.25	1.04	20.85	32.50	0.64	0.62	1.04	4.03	32.50	0.12	18	31.9	0.56
1129052013	2/16/2018	0.03	1.80	2.50	56.25	0.04	0.12	1.8	0.00	56.25	0.00	5	59.1	0.08
1129053064	2/16/2018	0.49	1.87	40.87	58.44	0.70	0.76	1.65	9.23	51.56	0.18	35	60	0.58
1129053111	2/18/2018	0.08	1.59	6.67	49.69	0.13	0.17	1.6	0.00	50.00	0.00	8	50	0.16
1127024027	2/24/2018	0.13	1.38	10.84	43.13	0.25	1.1	1.54	21.85	48.13	0.45	18	45.6	0.39
1129056006	2/25/2018	0.03	1.17	2.50	36.56	0.07	0.25	1.28	0.00	40.00	0.00	7	35.6	0.2
1129056030	2/25/2018	0.02	2.62	1.67	81.88	0.02	0.15	2.63	0.00	82.19	0.00	4	77.5	0.05
1129056034	2/25/2018	0.39	3.02	32.53	94.38	0.34	1.12	3.08	22.60	96.25	0.23	32	92.5	0.35
1127024038	2/26/2018	0.61	2.14	50.87	66.88	0.76	1.95	2.12	53.42	66.25	0.81	53	65.3	0.81
1128037014	3/2/2018	1.19	1.87	99.25	58.44	1.70	2.44	1.82	71.62	56.88	1.26	98	57.8	1.7
1128043317	3/9/2018	0.28	1.64	23.35	51.25	0.46	0.95	1.76	16.28	55.00	0.30	28	52.5	0.53
1128043350	3/9/2018	0.28	2.36	23.35	73.75	0.32	0.92	2.38	15.17	74.38	0.20	29	76.9	0.38
1128043373	3/9/2018	0.71	2.17	59.21	67.81	0.87	1.65	2.15	42.28	67.19	0.63	62	67.5	0.92
1128043410	3/9/2018	0.22	1.55	18.35	48.44	0.38	0.7	1.57	7.00	49.06	0.14	24	49.1	0.49
1128043423	3/9/2018	0.05	1.56	4.17	48.75	0.09	0.25	1.57	0.00	49.06	0.00	11	46.9	0.23
1128043416	3/10/2018	0.52	1.11	43.37	34.69	1.25	1.4	1.11	33.00	34.69	0.95	48	33.1	1.45
1128043465	3/10/2018	0.35	2.23	29.19	69.69	0.42	0.86	2.24	12.94	70.00	0.18	33	68.1	0.48
1128043485	3/10/2018	0.36	1.74	30.02	54.38	0.55	1	1.67	18.14	52.19	0.35	35	51.9	0.67

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1128043454	3/12/2018	0.54	1.39	45.04	43.44	1.04	1.09	1.47	21.48	45.94	0.47	43	43.8	0.98
1127026106	3/17/2018	0.60	1.65	50.04	51.56	0.97	2.1	1.65	58.99	51.56	1.14	55	49.1	1.12
1128048121	3/21/2018	0.35	2.46	29.19	76.88	0.38	0.86	2.57	12.94	80.31	0.16	29	75.6	0.38
1127031118	3/23/2018	0.07	4.48	5.84	140.00	0.04	0.26	4.09	0.00	127.81	0.00	8	126.6	0.06
1127031151	3/23/2018	0.80	2.34	66.72	73.13	0.91	1.79	2.27	47.48	70.94	0.67	65	68.8	0.95
1127031178	3/23/2018	0.45	1.26	37.53	39.38	0.95	1.5	1.27	36.71	39.69	0.92	45	36.9	1.22
1128047069	3/23/2018	0.19	1.85	15.85	57.81	0.27	0.73	2.03	8.11	63.44	0.13	17	62.5	0.27
1128047120	3/23/2018	0.92	1.69	76.73	52.81	1.45	1.86	1.66	50.08	51.88	0.97	72	48.1	1.5
1128047044	3/24/2018	0.05	1.91	4.17	59.69	0.07	0.33	1.86	0.00	58.13	0.00	6	55.6	0.11
1128048042	3/24/2018	0.41	2.56	34.19	80.00	0.43	0.95	2.45	16.28	76.56	0.21	31	74.1	0.42
1128048052	3/24/2018	0.26	1.82	21.68	56.88	0.38	0.54	1.78	1.06	55.63	0.02	20	54.7	0.37
1127031097	3/25/2018	0.06	2.44	5.00	76.25	0.07	0.32	2.34	0.00	73.13	0.00	12	70.3	0.17
1127031133	3/25/2018	0.12	1.91	10.01	59.69	0.17	0.81	1.9	11.08	59.38	0.19	19	57.2	0.33
1128048069	3/25/2018	0.48	1.98	40.03	61.88	0.65	1.62	1.96	41.17	61.25	0.67	43	55.6	0.77
1128048112	3/25/2018	0.49	2.31	40.87	72.19	0.57	1.38	2.26	32.25	70.63	0.46	41	65.3	0.63
1127030010	3/26/2018	1.16	2.11	96.74	65.94	1.47	2.47	2.06	72.74	64.38	1.13	95	64.7	1.47
1127031088	3/26/2018	0.09	1.30	7.51	40.63	0.18	0.42	1.4	0.00	43.75	0.00	15	40.6	0.37
1128047015	3/26/2018	0.04	2.08	3.34	65.00	0.05	0.24	2.07	0.00	64.69	0.00	8	63.1	0.13
1128048058	3/26/2018	0.15	2.57	12.51	80.31	0.16	0.49	2.52	0.00	78.75	0.00	14	75	0.19
1127030050	3/29/2018	0.49	1.80	40.87	56.25	0.73	1.35	1.77	31.14	55.31	0.56	44	56.3	0.78
1127030101	3/29/2018	0.07	1.50	5.84	46.88	0.12	0.34	1.53	0.00	47.81	0.00	11	49.4	0.22
1127032002	4/1/2018	0.38	1.23	31.69	38.44	0.82	1.61	1.25	40.80	39.06	1.04	42	40	1.05
1127032073	4/1/2018	0.40	1.00	33.36	31.25	1.07	1.32	1	30.02	31.25	0.96	39	31.3	1.25
1127034039	4/6/2018	0.24	2.08	20.02	65.00	0.31	0.84	1.98	12.20	61.88	0.20	27	62.2	0.43
1127034053	4/6/2018	0.08	1.77	6.67	55.31	0.12	0.32	1.75	0.00	54.69	0.00	10	50.6	0.2
1127034075	4/6/2018	0.34	2.21	28.36	69.06	0.41	1.19	2.26	25.20	70.63	0.36	35	68.8	0.51
1127034094	4/6/2018	10.70	2.85	892.38	89.06	10.02	0.26	3.17	0.00	99.06	0.00	9	94.1	0.1
1127034134	4/7/2018	0.39	1.66	32.53	51.88	0.63	1.16	1.65	24.08	51.56	0.47	39	50	0.78
1127034057	4/8/2018	0.08	1.53	6.67	47.81	0.14	0.36	1.54	0.00	48.13	0.00	13	49.4	0.26
1127038031	4/8/2018	1.07	1.69	89.24	52.81	1.69	2.72	1.75	82.02	54.69	1.50	92	50.3	1.83
1127038060	4/8/2018	1.33	1.22	110.92	38.13	2.91	3.07	1.51	95.02	47.19	2.01	111	43.1	2.57
1127038013	4/9/2018	1.13	2.03	94.24	63.44	1.49	3.04	2.03	93.91	63.44	1.48	95	61.3	1.55
1127038030	4/9/2018	0.63	1.80	52.54	56.25	0.93	2.07	1.86	57.88	58.13	1.00	58	57.2	1.01
1127041124	4/12/2018	0.88	2.02	73.39	63.13	1.16	1.74	1.94	45.62	60.63	0.75	73	65.3	1.12
1127041136	4/12/2018	0.32	2.28	26.69	71.25	0.37	0.68	2.23	6.26	69.69	0.09	27	61.6	0.44
1127041170	4/12/2018	0.50	2.19	41.70	68.44	0.61	1.11	2.19	22.23	68.44	0.32	43	66.6	0.65
1127041181	4/12/2018	0.57	1.23	47.54	38.44	1.24	1.37	1.27	31.88	39.69	0.80	48	38.1	1.26
1127041214	4/12/2018	0.56	2.11	46.70	65.94	0.71	1.2	2.09	25.57	65.31	0.39	47	63.1	0.74
1127041193	4/16/2018	0.38	2.00	31.69	62.50	0.51	1.23	2.11	26.68	65.94	0.40	35	64.1	0.55
1126004054	4/18/2018	0.69	1.10	57.55	34.38	1.67	2.37	1.21	69.02	37.81	1.83	61	36.6	1.67
1126004082	4/18/2018	0.34	1.89	28.36	59.06	0.48	1.33	1.83	30.40	57.19	0.53	37	54.4	0.68
1126004134	4/18/2018	0.29	1.46	24.19	45.63	0.53	1.37	1.36	31.88	42.50	0.75	36	44.7	0.81
1126014154	5/3/2018	0.31	1.08	25.85	33.75	0.77	1.38	1.09	32.25	34.06	0.95	30	31.9	0.94
1126014171	5/4/2018	0.24	1.05	20.02	32.81	0.61	1.36	1.13	31.51	35.31	0.89	26	32.2	0.81

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Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1126014159	5/5/2018	0.17	1.32	14.18	41.25	0.34	0.87	1.38	13.31	43.13	0.31	22	40.6	0.54
1126016005	5/5/2018	0.80	2.34	66.72	73.13	0.91	2.49	2.41	73.48	75.31	0.98	65	76.3	0.85
1126016023	5/5/2018	1.00	2.40	83.40	75.00	1.11	2.57	2.42	76.45	75.63	1.01	78	75	1.04
1126018054	5/8/2018	1.32	1.45	110.09	45.31	2.43	3.02	1.49	93.16	46.56	2.00	110	44.1	2.5
1126018073	5/8/2018	1.16	1.63	96.74	50.94	1.90	2.85	1.73	86.85	54.06	1.61	90	49.7	1.81
1126018048	5/9/2018	1.07	1.83	89.24	57.19	1.56	2.68	2.02	80.54	63.13	1.28	90	59.1	1.52
1126018050	5/9/2018	1.10	2.15	91.74	67.19	1.37	2.69	2.25	80.91	70.31	1.15	87	66.3	1.31
1126024027	5/10/2018	0.76	2.63	63.38	82.19	0.77	2.72	2.8	82.02	87.50	0.94	69	83.4	0.83
1126024019	5/11/2018	0.11	1.90	9.17	59.38	0.15	0.46	1.82	0.00	56.88	0.00	13	53.8	0.24
1126024083	5/12/2018	0.11	1.98	9.17	61.88	0.15	0.52	1.93	0.31	60.31	0.01	14	58.4	0.24
1126024156	5/12/2018	0.50	1.37	41.70	42.81	0.97	1.74	1.31	45.62	40.94	1.11	48	40.3	1.19
1126020012	5/31/2018	0.28	1.03	23.35	32.19	0.73	1.39	1.12	32.62	35.00	0.93	29	33.8	0.86
1126020066	5/31/2018	0.14	1.68	11.68	52.50	0.22	0.69	1.7	6.63	53.13	0.12	14	54.1	0.26
1126020135	5/31/2018	0.54	1.63	45.04	50.94	0.88	1.88	1.74	50.82	54.38	0.93	43	49.4	0.87
1126020164	5/31/2018	0.29	2.11	24.19	65.94	0.37	1.14	2.24	23.34	70.00	0.33	29	65	0.45
1126020191	5/31/2018	0.36	2.92	30.02	91.25	0.33	0.93	2.76	15.54	86.25	0.18	27	87.2	0.31
1126026106	6/3/2018	0.34	1.26	28.36	39.38	0.72	1.44	1.2	34.48	37.50	0.92	33	36.6	0.9
1126026108	6/3/2018	0.41	1.68	34.19	52.50	0.65	1.68	1.7	43.40	53.13	0.82	42	47.5	0.88
1126026165	6/3/2018	0.25	2.10	20.85	65.63	0.32	0.98	2.09	17.40	65.31	0.27	26	64.1	0.41
1127040421	6/6/2018	0.75	1.81	62.55	56.56	1.11	1.72	1.77	44.88	55.31	0.81	58	53.8	1.08
1127040465	6/7/2018	0.29	2.37	24.19	74.06	0.33	0.87	2.27	13.31	70.94	0.19	29	70.9	0.41
1126028044	6/9/2018	0.84	2.68	70.06	83.75	0.84	1.55	2.63	38.57	82.19	0.47	66	80.3	0.82
1126028050	6/9/2018	0.45	1.78	37.53	55.63	0.67	1.4	1.83	33.00	57.19	0.58	39	57.8	0.67
1126028103	6/9/2018	1.01	2.15	84.23	67.19	1.25	2.18	2.13	61.97	66.56	0.93	80	64.1	1.25
1126028116	6/9/2018	0.98	2.31	81.73	72.19	1.13	2.31	2.28	66.79	71.25	0.94	80	69.4	1.15
1126028092	6/10/2018	0.93	2.05	77.56	64.06	1.21	2.2	2.1	62.71	65.63	0.96	75	60.6	1.24
1126028449	6/10/2018	1.00	2.32	83.40	72.50	1.15	2.26	2.21	64.94	69.06	0.94	82	67.5	1.21
1126026145	6/11/2018	0.63	1.57	52.54	49.06	1.07	1.66	1.58	42.65	49.38	0.86	46	50	0.92
1126026210	6/12/2018	0.97	1.48	80.90	46.25	1.75	1.98	1.49	54.54	46.56	1.17	77	45	1.71
1126027161	6/12/2018	0.63	2.69	52.54	84.06	0.63	1.36	2.6	31.51	81.25	0.39	52	77.8	0.67
1126026121	6/14/2018	0.60	2.88	50.04	90.00	0.56	1.27	2.77	28.17	86.56	0.33	34	85	0.4
1126030007	6/15/2018	0.17	2.97	14.18	92.81	0.15	0.59	2.78	2.91	86.88	0.03	17	93.1	0.18
1126030027	6/15/2018	0.71	1.09	59.21	34.06	1.74	1.89	1.1	51.19	34.38	1.49	61	34.4	1.77
1126030053	6/15/2018	0.33	1.08	27.52	33.75	0.82	1.1	1.13	21.85	35.31	0.62	36	35	1.03
1126030064	6/16/2018	0.33	1.42	27.52	44.38	0.62	0.9	1.55	14.43	48.44	0.30	32	45	0.71
1126031022	6/18/2018	0.96	1.63	80.06	50.94	1.57	1.92	1.62	52.31	50.63	1.03	73	47.5	1.54
1126031198	6/18/2018	0.18	1.36	15.01	42.50	0.35	0.72	1.36	7.74	42.50	0.18	24	41.9	0.57
1126031001	6/19/2018	0.39	2.81	32.53	87.81	0.37	1.2	2.68	25.57	83.75	0.31	35	84.1	0.42
1126031050	6/19/2018	0.44	2.22	36.70	69.38	0.53	1.18	2.04	24.83	63.75	0.39	35	62.8	0.56
1126031059	6/19/2018	0.38	2.72	31.69	85.00	0.37	1.15	2.5	23.71	78.13	0.30	35	78.8	0.44
1126031196	6/19/2018	0.04	2.06	3.34	64.38	0.05	0.17	1.92	0.00	60.00	0.00	9	57.8	0.16
1126029061	6/20/2018	0.99	2.15	82.57	67.19	1.23	2.48	2.43	73.11	75.94	0.96	90	77.2	1.17
1126029064	6/20/2018	0.29	2.40	24.19	75.00	0.32	0.64	2.31	4.77	72.19	0.07	22	70	0.31
1126029101	6/20/2018	0.77	2.97	64.22	92.81	0.69	1.48	2.67	35.97	83.44	0.43	58	82.8	0.7

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1126029118	6/20/2018	0.75	2.09	62.55	65.31	0.96	2.18	2.03	61.97	63.44	0.98	61	62.8	0.97
1126029624	6/20/2018	0.87	2.11	72.56	65.94	1.10	1.89	1.9	51.19	59.38	0.86	70	58.4	1.2
1126031023	6/20/2018	0.78	1.73	65.05	54.06	1.20	1.57	1.66	39.31	51.88	0.76	62	51.3	1.21
1126031141	6/20/2018	0.34	2.30	28.36	71.88	0.39	1.09	2.29	21.48	71.56	0.30	31	65	0.48
1126031148	6/20/2018	0.11	1.28	9.17	40.00	0.23	0.45	1.23	0.00	38.44	0.00	18	38.4	0.47
1126029057	6/21/2018	1.29	2.24	107.59	70.00	1.54	2.04	2.18	56.77	68.13	0.83	76	68.4	1.11
1126029083	6/21/2018	0.65	2.13	54.21	66.56	0.81	1.66	1.79	42.65	55.94	0.76	47	53.4	0.88
1126031101	6/21/2018	0.17	1.85	14.18	57.81	0.25	0.59	1.86	2.91	58.13	0.05	18	57.8	0.31
1126032080	6/24/2018	0.48	1.73	40.03	54.06	0.74	1.74	1.84	45.62	57.50	0.79	43	54.7	0.79
1126032024	6/26/2018	0.66	1.89	55.04	59.06	0.93	2.29	2.06	66.05	64.38	1.03	58	60.9	0.95
1125009001	7/3/2018	0.76	1.37	63.38	42.81	1.48	2.47	1.34	72.74	41.88	1.74	69	41.9	1.65
1125016150	7/8/2018	0.40	1.44	33.36	45.00	0.74	1.68	1.48	43.40	46.25	0.94	39	42.5	0.92
1125016153	7/8/2018	0.37	1.49	30.86	46.56	0.66	1.43	1.43	34.11	44.69	0.76	33	43.1	0.77
1125012020	7/9/2018	0.33	0.73	27.52	22.81	1.21	1.57	0.75	39.31	23.44	1.68	34	22.5	1.51
1125012054	7/9/2018	1.27	1.56	105.92	48.75	2.17	4.66	1.53	154.07	47.81	3.22	159	47.2	3.37
1125016163	7/9/2018	0.20	1.21	16.68	37.81	0.44	1.12	1.19	22.60	37.19	0.61	24	34.7	0.69
1125016184	7/9/2018	0.28	1.85	23.35	57.81	0.40	1.1	1.82	21.85	56.88	0.38	27	55.3	0.49
1125016200	7/9/2018	0.40	1.32	33.36	41.25	0.81	1.3	1.3	29.28	40.63	0.72	39	39.4	0.99
1125016203	7/9/2018	0.32	1.72	26.69	53.75	0.50	1.24	1.66	27.05	51.88	0.52	35	50.3	0.7
1125015148	7/10/2018	0.08	2.27	6.67	70.94	0.09	0.36	2.21	0.00	69.06	0.00	12	70	0.17
1125015176	7/10/2018	0.23	1.68	19.18	52.50	0.37	0.88	1.68	13.68	52.50	0.26	25	53.1	0.47
1125015197	7/10/2018	0.13	3.14	10.84	98.13	0.11	0.49	3.01	0.00	94.06	0.00	14	96.6	0.14
1125012014	7/11/2018	0.35	1.48	29.19	46.25	0.63	1.35	1.45	31.14	45.31	0.69	36	44.7	0.81
1125012041	7/11/2018	0.42	1.81	35.03	56.56	0.62	1.01	1.76	18.51	55.00	0.34	38	54.4	0.7
1125012065	7/11/2018	0.31	1.16	25.85	36.25	0.71	1.26	1.17	27.80	36.56	0.76	28	35.9	0.78
1125024158	7/13/2018	0.55	2.27	45.87	70.94	0.65	1.5	2.17	36.71	67.81	0.54	42	70.9	0.59
1125024021	7/14/2018	0.66	3.51	55.04	109.69	0.50	1.67	3.24	43.02	101.25	0.42	52	109.1	0.48
1125024035	7/14/2018	0.11	2.20	9.17	68.75	0.13	0.39	2.08	0.00	65.00	0.00	15	66.3	0.23
1125024144	7/14/2018	0.28	2.20	23.35	68.75	0.34	0.75	2.11	8.86	65.94	0.13	23	65.6	0.35
1125024156	7/14/2018	0.30	2.46	25.02	76.88	0.33	0.61	2.31	3.66	72.19	0.05	18	77.8	0.23
1125017216	7/15/2018	0.96	1.77	80.06	55.31	1.45	1.98	1.79	54.54	55.94	0.97	71	54.7	1.3
1125024001	7/15/2018	0.45	4.05	37.53	126.56	0.30	1.39	3.71	32.62	115.94	0.28	42	122.5	0.34
1125017207	7/16/2018	1.08	1.66	90.07	51.88	1.74	2.38	1.61	69.39	50.31	1.38	86	52.5	1.64
1125024009	7/16/2018	0.21	1.70	17.51	53.13	0.33	0.58	1.64	2.54	51.25	0.05	20	50.3	0.4
1125017007	7/17/2018	0.34	2.28	28.36	71.25	0.40	0.88	2.21	13.68	69.06	0.20	29	71.6	0.41
1125017146	7/17/2018	1.28	2.30	106.75	71.88	1.49	2.51	2.24	74.22	70.00	1.06	102	70.9	1.44
1125017104	7/18/2018	1.11	2.41	92.57	75.31	1.23	2.54	2.3	75.34	71.88	1.05	89	74.4	1.2
1125018246	7/18/2018	1.23	1.81	102.58	56.56	1.81	2.62	1.88	78.31	58.75	1.33	101	57.8	1.75
1125018256	7/18/2018	1.24	1.99	103.42	62.19	1.66	2.72	2.04	82.02	63.75	1.29	100	64.4	1.55
1125018231	7/19/2018	0.72	1.93	60.05	60.31	1.00	2.39	1.97	69.76	61.56	1.13	61	60.9	1
1125018335	7/19/2018	1.02	1.73	85.07	54.06	1.57	2.73	1.86	82.39	58.13	1.42	80	54.4	1.47
1125025099	7/20/2018	0.42	2.45	35.03	76.56	0.46	1.61	2.21	40.80	69.06	0.59	45	66.9	0.67
1125025095	7/22/2018	0.88	2.15	73.39	67.19	1.09	2.38	1.9	69.39	59.38	1.17	68	57.5	1.18
1125028087	7/29/2018	0.49	2.60	40.87	81.25	0.50	1.08	2.59	21.11	80.94	0.26	29	80.3	0.36

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1125028526	7/29/2018	0.72	3.56	60.05	111.25	0.54	1.55	3.49	38.57	109.06	0.35	57	106.6	0.53
1125028126	7/30/2018	0.48	2.96	40.03	92.50	0.43	1.14	2.85	23.34	89.06	0.26	37	90.9	0.41
1125029004	7/31/2018	0.94	1.98	78.40	61.88	1.27	2.61	1.89	77.94	59.06	1.32	76	61.3	1.24
1125029001	8/1/2018	0.58	1.60	48.37	50.00	0.97	1.77	1.54	46.74	48.13	0.97	48	48.4	0.99
1125029101	8/3/2018	0.96	2.78	80.06	86.88	0.92	2.17	2.75	61.59	85.94	0.72	73	89.7	0.81
1125029133	8/3/2018	0.72	1.64	60.05	51.25	1.17	2.05	1.62	57.14	50.63	1.13	58	49.4	1.17
1124016010	8/18/2018	0.98	1.51	81.73	47.19	1.73	2.96	1.48	90.93	46.25	1.97	82	46.6	1.76
1124016087	8/18/2018	0.63	1.79	52.54	55.94	0.94	1.99	1.78	54.91	55.63	0.99	52	53.4	0.97
1124016127	8/19/2018	1.19	2.32	99.25	72.50	1.37	2.62	2.27	78.31	70.94	1.10	90	67.8	1.33
1124017045	8/26/2018	0.19	1.00	15.85	31.25	0.51	1.86	0.98	50.08	30.63	1.64	30	29.4	1.02
1124020002	8/26/2018	0.95	1.66	79.23	51.88	1.53	2.44	1.7	71.62	53.13	1.35	80	52.2	1.53
1124020015	8/28/2018	0.98	1.93	81.73	60.31	1.36	2.55	2.03	75.71	63.44	1.19	82	61.6	1.33
1124021017	9/6/2018	0.26	1.76	21.68	55.00	0.39	0.99	1.77	17.77	55.31	0.32	30	56.3	0.53
1124021001	9/8/2018	0.23	1.88	19.18	58.75	0.33	0.91	1.82	14.80	56.88	0.26	27	57.5	0.47
1124021002	9/8/2018	0.13	1.59	10.84	49.69	0.22	0.56	1.61	1.80	50.31	0.04	23	49.4	0.47
1124022158	9/12/2018	0.69	2.79	57.55	87.19	0.66	1.99	2.72	54.91	85.00	0.65	57	87.2	0.65
1124023153	9/12/2018	0.65	1.76	54.21	55.00	0.99	2.12	1.8	59.74	56.25	1.06	59	54.7	1.08
1124023175	9/12/2018	0.74	1.74	61.72	54.38	1.14	2.3	1.75	66.42	54.69	1.21	64	50.6	1.26
1124023121	9/13/2018	0.30	1.58	25.02	49.38	0.51	1.87	1.56	50.45	48.75	1.03	36	48.1	0.75
1124022021	9/14/2018	1.02	2.19	85.07	68.44	1.24	2.26	2.11	64.94	65.94	0.98	67	62.8	1.07
1123001018	9/16/2018	0.41	1.84	34.19	57.50	0.59	1.53	1.83	37.82	57.19	0.66	29	54.4	0.53
1123001101	9/16/2018	0.81	2.07	67.55	64.69	1.04	2.39	2.04	69.76	63.75	1.09	70	60	1.17
1123001255	9/16/2018	0.78	1.97	65.05	61.56	1.06	2.44	1.92	71.62	60.00	1.19	68	59.7	1.14
1123001011	9/17/2018	0.54	2.02	45.04	63.13	0.71	2.27	1.95	65.31	60.94	1.07	47	57.5	0.82
1123011005	10/13/2018	0.68	2.46	56.71	76.88	0.74	1.84	2.42	49.34	75.63	0.65	53	81.9	0.65
1123011010	10/13/2018	0.87	1.64	72.56	51.25	1.42	2.45	1.6	71.99	50.00	1.44	71	52.5	1.35
1123011119	10/13/2018	0.91	1.70	75.89	53.13	1.43	2.37	1.74	69.02	54.38	1.27	68	53.4	1.27
1123006027	10/17/2018	0.28	1.41	23.35	44.06	0.53	1.86	1.43	50.08	44.69	1.12	36	42.5	0.85
1123015001	10/19/2018	0.29	1.65	24.19	51.56	0.47	1.76	1.66	46.37	51.88	0.89	34	48.1	0.71
1123015005	10/19/2018	0.16	1.03	13.34	32.19	0.41	1.15	1.02	23.71	31.88	0.74	26	29.7	0.88
1123015030	10/19/2018	0.51	1.64	42.53	51.25	0.83	1.9	1.76	51.57	55.00	0.94	46	46.9	0.98
1123015043	10/19/2018	0.38	2.11	31.69	65.94	0.48	1.34	2.12	30.77	66.25	0.46	39	62.8	0.62
1123015053	10/19/2018	0.55	1.14	45.87	35.63	1.29	2.08	1.26	58.25	39.38	1.48	57	36.9	1.55
1124028211	10/19/2018	0.02	0.32	1.67	10.00	0.17	0.23	1.22	0.00	38.13	0.00	9	34.1	0.26
1123015062	10/20/2018	0.57	1.35	47.54	42.19	1.13	1.93	1.36	52.68	42.50	1.24	54	39.1	1.38
1123015079	10/20/2018	0.47	1.29	39.20	40.31	0.97	1.77	1.37	46.74	42.81	1.09	45	38.1	1.18
1124028205	10/21/2018	0.75	1.05	62.55	32.81	1.91	2.72	1.12	82.02	35.00	2.34	67	31.3	2.14
1124028224	10/21/2018	0.15	2.00	12.51	62.50	0.20	0.59	2.03	2.91	63.44	0.05	15	60	0.25
1124028243	10/21/2018	0.14	2.20	11.68	68.75	0.17	0.64	2.21	4.77	69.06	0.07	16	65.3	0.24
1123012140	10/22/2018	1.07	2.07	89.24	64.69	1.38	2.4	2.06	70.14	64.38	1.09	93	67.8	1.37
1122004024	10/26/2018	0.52	1.90	43.37	59.38	0.73	1.7	1.89	44.14	59.06	0.75	42	54.4	0.77
1122003045	10/31/2018	1.07	2.23	89.24	69.69	1.28	2.32	2.15	67.16	67.19	1.00	87	66.3	1.31
1123016001	10/31/2018	0.59	1.36	49.21	42.50	1.16	2.77	1.44	83.88	45.00	1.86	60	41.6	1.44
1123016053	10/31/2018	0.50	1.44	41.70	45.00	0.93	2.33	1.47	67.54	45.94	1.47	45	40.9	1.1

APPENDIX A-2: ACID-BASE ACCOUNTING AUDIT DATA

Sample Site Name	Date	Total Carbon RRM Leco (wt.%)[1]	Total Sulfur RRM Leco (wt.%)	Leco NP[2] (kg $CaCO_3$/t)	Leco AP (kg $CaCO_3$/t)[3]	Leco NPR[4]	ICP Calcium (wt. %)	ICP Sulfur (wt. %)	ICP NP (kg CaCO3/t)[5]	ICP AP (kg CaCO3/t)	ICP NPR	Sobek NP (kg $CaCO_3$/t)	MPA[6] (kg $CaCO_3$/t)	Sobek NPR
1123016136	10/31/2018	0.25	1.86	20.85	58.13	0.36	1.77	1.86	46.74	58.13	0.80	35	56.9	0.62
1123016704	10/31/2018	0.67	1.29	55.88	40.31	1.39	2.43	1.26	71.25	39.38	1.81	64	37.8	1.69
1123016143	11/2/2018	0.92	1.40	76.73	43.75	1.75	3.24	1.5	101.33	46.88	2.16	81	46.3	1.75
1123016056	11/3/2018	0.14	2.38	11.68	74.38	0.16	0.85	2.32	12.57	72.50	0.17	20	73.8	0.27
1122002001	11/4/2018	1.03	1.91	85.90	59.69	1.44	2.11	1.94	59.37	60.63	0.98	81	60.3	1.34
1122002104	11/4/2018	1.14	2.52	95.08	78.75	1.21	2.38	2.56	69.39	80.00	0.87	87	78.4	1.11
1122002124	11/6/2018	1.00	2.48	83.40	77.50	1.08	2.33	2.47	67.54	77.19	0.87	81	80.3	1.01
1123019054	11/7/2018	0.10	2.53	8.34	79.06	0.11	0.26	2.5	0.00	78.13	0.00	11	77.5	0.14
1123023018	11/8/2018	0.97	1.61	80.90	50.31	1.61	1.94	1.66	53.05	51.88	1.02	74	51.9	1.43
1123023145	11/8/2018	1.03	1.38	85.90	43.13	1.99	2.1	1.5	58.99	46.88	1.26	80	44.4	1.8
1123023201	11/8/2018	1.03	1.52	85.90	47.50	1.81	1.92	1.51	52.31	47.19	1.11	74	45.6	1.62
1122012063	11/12/2018	0.27	1.53	22.52	47.81	0.47	1.41	1.54	33.37	48.13	0.69	34	46.3	0.74
1122012086	11/12/2018	0.72	1.35	60.05	42.19	1.42	2.1	1.37	58.99	42.81	1.38	60	41.9	1.43
1122012112	11/14/2018	0.48	1.10	40.03	34.38	1.16	1.95	1.11	53.42	34.69	1.54	49	35	1.4
1122012123	11/14/2018	0.31	1.79	25.85	55.94	0.46	1.46	1.85	35.22	57.81	0.61	34	54.7	0.62
1122018025	11/26/2018	0.36	1.72	30.02	53.75	0.56	1.15	1.81	23.71	56.56	0.42	29	51.6	0.56
1122018122	11/26/2018	0.18	2.17	15.01	67.81	0.22	0.55	2.14	1.43	66.88	0.02	16	64.7	0.25

[1]wt.% = weight percent

[2]NP = neutralization potential

[3]AP = acid potential

[4]NPR - neutralization potential ratio (NP/AP or NP/MPA)

[5]kg CaCO3/t = kilograms of calcium carbonate equivalent per tonne of rock

[6]MPA = Maximum potential acidity

APPENDIX B

2018 LABORATORY RESULTS

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

CERTIFICATE TB18054441

Project: Mine Site Lab Pulps January

P.O. No.: 4500009909

This report is for 132 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 12-MAR-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JASON PATTISON	STEPHEN SABO

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-24	Pulp Login - Rcd w/o Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
ATTN: JASON PATTISON
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1127013106		0.47	88.1	0.017	0.3	1.12	5	80	50	<0.5	<2	1.63	<0.5	9	86	19
1129031031		Not Recvd														
1129031085		0.52		0.231	1.0	0.60	56	70	30	<0.5	2	2.66	3.8	9	71	32
1129031069		0.55		1.465	2.7	1.52	85	50	30	<0.5	2	0.92	6.5	9	72	74
1128031003		0.51		1.370	1.3	1.75	55	40	60	<0.5	<2	1.39	1.1	8	79	46
1127013109		0.52		0.034	0.3	1.18	6	40	50	<0.5	<2	1.90	<0.5	10	78	23
1127013082		0.45		0.050	0.3	1.35	6	30	70	<0.5	2	1.68	<0.5	10	63	29
1129031020		0.52		0.866	1.1	0.88	105	30	30	<0.5	<2	1.33	5.9	9	44	37
1129050034		0.36		0.265	2.0	1.58	28	30	50	<0.5	<2	0.80	0.9	10	84	36
1128031001		0.44		0.251	0.5	2.43	67	30	50	<0.5	<2	1.65	<0.5	10	140	25
1128031083		0.43		2.12	3.2	0.98	59	20	30	<0.5	<2	2.07	14.0	9	52	98
1128031105		0.43		0.187	1.3	0.94	39	20	30	<0.5	<2	2.39	2.0	9	59	28
1129049207		0.53		0.609	2.0	1.04	30	20	20	<0.5	<2	0.91	1.1	10	40	32
1129049250		0.44		0.077	2.0	0.78	47	10	30	<0.5	<2	0.58	1.1	9	107	24
1127013150		0.57		0.029	0.3	1.16	4	10	90	<0.5	<2	0.95	<0.5	10	84	40
1127013055		0.53		0.031	0.3	1.18	7	<10	70	<0.5	<2	1.37	<0.5	8	54	22
V829031		0.06		<0.005	<0.2	0.59	<2	<10	30	<0.5	<2	0.31	<0.5	5	7	16
1129050022		0.46		0.370	3.1	0.97	32	<10	30	<0.5	<2	0.19	1.0	10	162	49
1129049225		0.56		0.149	1.4	1.40	45	<10	50	<0.5	<2	1.49	1.1	10	33	40
1129048518		0.56		0.260	1.0	1.09	40	<10	30	<0.5	<2	0.67	<0.5	8	50	28
1129049245		0.48		0.172	1.9	1.01	54	<10	40	<0.5	<2	1.79	1.1	8	40	32
1129048511		0.41		0.133	1.0	1.05	28	<10	30	<0.5	<2	0.54	<0.5	9	66	43
1127013113		0.49		0.053	0.4	1.27	5	<10	60	<0.5	<2	1.54	<0.5	10	228	39
1127013073		0.54		0.026	0.2	1.18	4	<10	50	<0.5	<2	1.36	<0.5	10	85	27
1127013140		0.56		0.025	0.2	1.15	4	<10	60	<0.5	<2	1.39	<0.5	9	81	33
1129048035		0.54		0.130	0.7	1.52	66	<10	50	<0.5	<2	0.35	<0.5	9	101	29
1127014003		0.56		0.067	0.2	2.89	9	<10	100	<0.5	<2	2.30	<0.5	124	114	49
1131065794		0.53		0.010	<0.2	0.98	22	<10	10	<0.5	<2	0.18	<0.5	7	31	11
1130053515		0.41		0.705	1.1	1.46	58	<10	60	<0.5	<2	1.72	1.5	8	62	65
1129048086		0.40		0.319	5.6	0.62	43	<10	20	<0.5	<2	1.22	3.1	10	76	54
1127014054		0.46		0.049	0.9	2.76	17	<10	60	<0.5	<2	3.07	0.8	31	78	74
1127014015		0.57		0.904	3.6	3.25	16	170	70	<0.5	2	3.61	3.0	30	69	105
1131065701		0.56		0.266	1.9	0.61	253	10	30	<0.5	<2	0.46	14.5	7	56	63
1131065736		0.54		0.332	1.4	0.50	213	<10	20	<0.5	<2	0.14	15.0	8	87	57
V829032		0.06		1.395	4.1	1.22	<2	<10	60	<0.5	<2	0.62	<0.5	12	7	57
1127014112		0.58		0.019	0.2	1.46	3	<10	50	<0.5	<2	2.56	<0.5	13	57	5
1127014103		0.48		0.018	0.3	1.49	10	<10	60	<0.5	2	2.28	0.7	11	71	28
1129048015		0.47		0.110	2.9	0.78	49	<10	30	<0.5	<2	1.97	0.9	6	64	54
1129048021		0.49		0.160	2.8	0.77	16	<10	30	<0.5	<2	0.75	1.0	8	85	30
1127014514		0.55		0.029	0.3	2.42	12	<10	60	<0.5	<2	2.09	<0.5	23	62	42

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOR	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1127013106		1.92	<10	<1	0.15	10	0.61	376	1	0.06	9	400	2	0.37	<2	1
1129031031																
1129031085		2.14	<10	<1	0.27	<10	0.97	1580	<1	0.02	12	430	134	2.03	<2	<1
1129031069		4.20	<10	1	0.23	10	0.84	780	1	0.03	11	430	33	3.52	<2	1
1128031003		2.12	<10	<1	0.32	20	0.70	649	1	0.06	7	560	33	1.56	<2	1
1127013109		2.10	10	<1	0.15	10	0.67	384	1	0.07	9	390	3	0.47	<2	1
1127013082		2.13	<10	<1	0.20	10	0.83	353	<1	0.05	15	430	3	0.41	<2	2
1129031020		2.52	<10	<1	0.21	10	0.58	815	<1	0.02	15	420	27	2.28	<2	<1
1129050034		2.11	<10	<1	0.20	10	0.66	497	1	0.03	13	400	37	1.96	<2	1
1128031001		2.31	10	<1	0.26	20	0.77	660	1	0.14	11	550	23	1.43	<2	1
1128031083		2.91	<10	2	0.24	10	0.60	1195	1	0.02	10	430	56	2.90	<2	<1
1128031105		2.11	<10	1	0.21	10	1.11	2010	1	0.02	13	410	277	2.12	<2	<1
1129049207		1.96	<10	<1	0.14	10	0.69	910	1	0.03	14	520	94	1.86	<2	<1
1129049250		2.51	<10	<1	0.17	10	0.38	495	1	0.04	12	460	101	2.58	<2	<1
1127013150		1.89	10	<1	0.37	10	0.64	277	1	0.07	11	410	3	0.44	<2	2
1127013055		2.04	10	<1	0.37	10	0.72	374	3	0.05	9	370	9	0.45	<2	1
V829031		1.20	<10	<1	0.19	10	0.26	180	1	0.04	9	290	26	0.02	<2	1
1129050022		2.39	<10	<1	0.23	10	0.46	171	1	0.04	15	490	16	2.35	<2	<1
1129049225		2.30	<10	<1	0.24	20	0.90	764	1	0.08	11	510	50	2.06	<2	<1
1129048518		1.85	<10	<1	0.13	20	0.57	565	1	0.04	8	490	13	1.52	<2	<1
1129049245		2.09	<10	<1	0.20	10	0.66	780	<1	0.05	9	430	48	2.01	<2	<1
1129048511		2.10	<10	<1	0.13	20	0.72	480	1	0.04	12	620	29	1.81	<2	<1
1127013113		2.16	<10	<1	0.22	10	0.74	362	<1	0.07	13	400	11	0.56	<2	2
1127013073		1.98	<10	<1	0.17	20	0.73	317	1	0.07	14	430	3	0.41	<2	2
1127013140		2.02	<10	<1	0.25	10	0.70	351	2	0.06	11	400	2	0.39	<2	1
1129048035		2.01	<10	<1	0.20	10	0.76	667	1	0.04	10	540	19	1.53	<2	<1
1127014003		2.86	10	<1	0.44	20	1.34	535	1	0.23	49	560	4	0.50	<2	4
1131065794		0.53	<10	<1	0.01	<10	0.16	52	1	0.02	5	20	<2	0.22	<2	<1
1130053515		1.90	<10	<1	0.28	10	1.07	1255	1	0.06	11	420	37	1.40	<2	1
1129048086		2.18	<10	<1	0.16	10	0.71	1205	1	0.03	11	450	249	2.27	2	<1
1127014054		7.41	10	1	0.18	10	1.48	1210	<1	0.07	47	660	8	1.90	<2	9
1127014015		8.46	10	<1	0.26	10	1.86	1460	2	0.17	46	700	13	1.90	<2	14
1131065701		2.68	<10	<1	0.23	10	0.42	1095	1	0.01	10	390	69	2.44	<2	<1
1131065736		2.62	<10	1	0.19	10	0.24	618	1	0.01	12	400	35	2.57	<2	<1
V829032		2.77	<10	<1	0.25	10	0.49	289	7	0.12	16	740	3	0.06	<2	2
1127014112		2.65	10	<1	0.18	20	1.14	647	<1	0.07	20	700	2	0.79	<2	2
1127014103		2.70	<10	1	0.24	20	0.78	719	1	0.07	16	570	6	0.82	<2	2
1129048015		1.67	<10	<1	0.18	10	0.97	1620	1	0.03	11	520	27	1.50	<2	<1
1129048021		2.15	<10	<1	0.16	10	0.44	1095	1	0.03	11	430	72	2.27	2	<1
1127014514		4.94	10	<1	0.26	10	1.11	778	1	0.15	16	580	5	1.58	<2	5

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOR	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1127013106		33	<20	0.02	<10	<10	14	<10	52	0.52	0.35	44	9.0	33	10.9	4.02
1129031031																
1129031085		22	<20	<0.01	<10	<10	3	<10	833	1.44	2.01	98	8.9	35	62.8	1.56
1129031069		16	<20	<0.01	<10	<10	5	<10	1425	0.42	3.59	27	8.3	-85	112.2	0.24
1128031003		23	<20	<0.01	<10	<10	8	<10	290	0.35	1.48	36	8.8	-10	46.3	0.78
1127013109		42	<20	0.01	<10	<10	13	<10	39	0.65	0.46	53	9.2	39	14.4	3.69
1127013082		36	<20	0.03	<10	<10	19	<10	51	0.51	0.43	46	9.4	33	13.4	3.42
1129031020		18	<20	<0.01	<10	<10	3	<10	1360	0.49	2.26	41	8.8	-30	70.6	0.58
1129050034		23	<20	<0.01	<10	<10	6	<10	225	0.17	1.96	20	8.3	-41	61.3	0.33
1128031001		47	<20	0.01	<10	<10	9	<10	97	0.28	1.39	33	8.7	-10	43.4	0.76
1128031083		19	<20	<0.01	<10	<10	4	<10	3020	0.70	2.93	57	8.7	-35	91.6	0.62
1128031105		34	<20	<0.01	<10	<10	4	<10	487	1.12	2.12	85	8.9	19	66.3	1.28
1129049207		16	<20	<0.01	<10	<10	4	<10	257	0.26	1.83	24	8.8	-33	57.2	0.42
1129049250		21	<20	<0.01	<10	<10	3	<10	249	0.34	2.61	15	8.6	-67	81.6	0.18
1127013150		29	<20	0.07	<10	<10	23	10	39	0.24	0.42	27	9.5	14	13.1	2.06
1127013055		25	<20	0.04	<10	<10	18	<10	76	0.42	0.46	42	9.5	28	14.4	2.92
V829031		9	20	0.09	<10	10	22	<10	34	0.03						
1129050022		18	<20	<0.01	<10	<10	4	<10	248	0.02	2.32	6	8.5	-67	72.5	0.08
1129049225		35	<20	<0.01	<10	<10	6	<10	298	0.40	1.89	40	8.9	-19	59.1	0.68
1129048518		23	<20	<0.01	<10	<10	3	<10	76	0.19	1.52	19	8.6	-29	47.5	0.40
1129049245		31	<20	<0.01	<10	<10	4	<10	259	0.55	1.90	50	8.9	-9	59.4	0.84
1129048511		21	<20	<0.01	<10	<10	4	<10	136	0.17	1.76	18	8.6	-37	55.0	0.33
1127013113		33	<20	0.04	<10	<10	21	10	65	0.47	0.53	44	9.3	27	16.6	2.66
1127013073		28	<20	0.03	<10	<10	21	10	46	0.41	0.36	40	9.3	29	11.3	3.56
1127013140		25	<20	0.04	<10	<10	20	10	58	0.41	0.36	41	9.4	30	11.3	3.64
1129048035		23	<20	<0.01	<10	<10	6	<10	91	0.09	1.50	10	8.9	-37	46.9	0.21
1127014003		94	<20	0.06	<10	<10	44	20	118	0.58	0.47	53	9.3	38	14.7	3.61
1131065794		12	<20	<0.01	<10	<10	5	<10	28	0.02	0.18	1	7.7	-5	5.6	0.18
1130053515		36	<20	<0.01	<10	<10	6	<10	363	0.85	1.28	67	9.1	27	40.0	1.68
1129048086		18	<20	<0.01	<10	<10	2	<10	778	0.65	2.20	49	9.0	-20	68.8	0.71
1127014054		78	<20	0.07	<10	<10	128	<10	314	0.98	1.89	79	8.9	20	59.1	1.34
1127014015		106	<20	0.10	<10	<10	180	<10	631	1.33	1.87	146	9.3	88	58.4	2.50
1131065701		21	<20	<0.01	<10	<10	3	<10	3510	0.27	2.47	22	8.8	-55	77.2	0.29
1131065736		5	<20	<0.01	<10	<10	3	<10	3530	0.19	2.62	6	8.6	-76	81.9	0.07
V829032		16	<20	0.35	<10	<10	77	<10	52	0.05						
1127014112		57	<20	0.04	<10	<10	33	<10	81	0.71	0.68	65	9.5	44	21.3	3.06
1127014103		35	<20	0.05	<10	<10	27	10	177	0.63	0.75	60	9.1	37	23.4	2.56
1129048015		28	<20	<0.01	<10	<10	3	<10	214	0.93	1.34	71	9.1	29	41.9	1.70
1129048021		18	<20	<0.01	<10	<10	3	<10	247	0.35	2.09	29	8.8	-36	65.3	0.44
1127014514		57	<20	0.06	<10	<10	63	10	188	0.58	1.53	52	8.5	4	47.8	1.09

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VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method Analyte Units LOR	OA-VOL08 FIZZ RAT Unity 1
1127013106		2
1129031031		
1129031085		3
1129031069		2
1128031003		2
1127013109		2
1127013082		2
1129031020		2
1129050034		2
1128031001		2
1128031083		2
1128031105		2
1129049207		2
1129049250		1
1127013150		2
1127013055		2
V829031		
1129050022		1
1129049225		2
1129048518		2
1129049245		2
1129048511		2
1127013113		2
1127013073		2
1127013140		2
1129048035		1
1127014003		2
1131065794		1
1130053515		2
1129048086		2
1127014054		2
1127014015		3
1131065701		2
1131065736		1
V829032		
1127014112		2
1127014103		2
1129048015		2
1129048021		2
1127014514		2

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CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1129048065		0.43		0.261	4.8	0.89	31	<10	20	<0.5	<2	0.99	0.9	11	95	58
1127014001		0.50		0.051	0.5	1.44	13	<10	40	<0.5	<2	1.97	0.9	11	65	39
1129048036		0.61		0.075	0.6	1.18	38	<10	30	<0.5	<2	0.28	<0.5	8	98	15
1127014425		0.51		0.037	0.5	2.23	11	<10	100	<0.5	<2	2.44	0.5	22	75	65
1129049016		0.53		3.79	5.8	0.72	29	<10	30	<0.5	3	2.31	2.3	8	49	106
1129050027		0.47		0.178	2.0	0.93	25	<10	40	<0.5	<2	1.74	0.9	10	43	23
1127014406		0.53		0.029	0.2	2.11	7	<10	30	<0.5	<2	1.84	<0.5	13	65	44
1127015008		0.49		0.045	0.4	1.94	8	<10	40	<0.5	<2	1.30	<0.5	9	63	25
1129050500		0.52		0.249	2.0	0.62	41	<10	30	<0.5	<2	2.44	0.6	10	59	33
1129050030		0.57	94.5	0.108	1.3	0.67	33	<10	40	<0.5	<2	2.08	<0.5	10	40	18
1129049020		0.51		0.613	3.0	0.77	44	<10	30	<0.5	<2	2.27	0.8	8	65	49
1127015007		0.47		0.079	0.6	1.54	23	20	40	<0.5	2	1.40	<0.5	8	59	16
1129049074		0.54		0.232	1.6	1.41	45	10	40	<0.5	<2	2.22	0.7	12	50	48
V829033		0.06		0.199	1.5	0.75	3	10	40	<0.5	<2	0.41	<0.5	10	11	49
1129049413		0.60		0.057	0.8	1.50	27	10	40	<0.5	<2	3.07	<0.5	11	35	21
1129048406		0.44		0.372	0.7	1.04	44	10	20	<0.5	<2	0.20	<0.5	9	76	22
1129015004		0.56		0.074	1.1	1.98	33	10	30	<0.5	<2	2.18	2.2	7	45	19
1129048401		0.48		0.140	2.3	0.61	41	10	20	<0.5	2	0.32	1.1	11	107	45
1128034015		0.44		0.256	0.5	2.08	44	10	40	<0.5	2	1.38	0.5	9	27	21
1128034032		0.48		0.139	0.7	1.36	41	10	40	<0.5	<2	2.26	<0.5	9	39	23
1128034006		0.52		0.212	0.9	1.28	39	10	30	<0.5	<2	1.96	<0.5	9	37	19
1128032009		0.54		0.292	1.8	1.02	40	10	20	<0.5	<2	2.00	3.0	8	33	38
1128032026		0.42		1.115	1.0	0.65	50	10	20	<0.5	<2	2.35	3.2	9	93	23
1128032041		0.51		0.353	0.9	0.61	38	10	30	<0.5	<2	2.23	1.9	8	47	34
1128032006		0.36		0.142	2.4	1.09	43	10	20	<0.5	<2	2.49	1.9	9	42	60
1128032075		0.56		1.340	1.2	0.56	43	10	30	<0.5	<2	2.60	2.6	8	47	55
1128032057		0.52		1.025	0.8	0.64	52	10	20	<0.5	<2	2.28	0.9	8	56	43
1127017119		0.50		0.242	0.9	1.44	64	10	30	<0.5	2	1.34	0.5	11	47	23
1127017107		0.52		1.055	1.1	1.90	52	10	50	<0.5	<2	2.03	1.9	13	74	45
1128033603		0.45		0.018	0.3	2.27	7	10	<10	<0.5	<2	2.50	<0.5	30	330	50
1127017102		0.44		0.294	1.1	1.52	59	10	40	<0.5	<2	1.60	0.8	10	45	24
1128033129		0.52		0.086	0.7	1.31	13	10	30	<0.5	2	2.47	<0.5	12	66	22
V829034		0.06		0.419	4.6	0.71	<2	10	50	<0.5	<2	0.36	<0.5	6	6	22
1127017148		0.49		0.688	1.7	1.82	45	10	30	<0.5	<2	0.82	6.1	9	29	48
1129051034		0.57		0.233	1.3	0.41	54	10	20	<0.5	2	1.88	0.9	8	58	33
1127017101		0.50		0.181	1.0	1.89	47	10	40	<0.5	<2	1.55	<0.5	9	43	24
1129051511		0.55		0.370	3.4	0.41	64	10	20	<0.5	2	1.87	1.4	8	70	74
1130057787		0.52		0.941	1.1	0.84	183	<10	30	<0.5	<2	0.21	4.2	11	48	42
1130057786		0.51		0.497	1.5	0.58	135	<10	20	<0.5	<2	0.12	5.5	9	74	59
1129051403		0.47		0.419	1.0	0.55	46	10	20	<0.5	2	1.77	0.8	9	73	53

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOR	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1129048065		3.44	<10	<1	0.15	10	0.58	837	<1	0.03	15	430	19	3.47	<2	<1
1127014001		2.32	10	1	0.20	10	0.71	431	1	0.09	11	430	4	0.87	<2	1
1129048036		2.13	<10	<1	0.12	10	0.74	1715	<1	0.03	10	450	7	1.42	<2	<1
1127014425		4.91	10	<1	0.43	10	1.02	617	<1	0.11	37	600	5	0.97	<2	4
1129049016		2.02	<10	1	0.16	10	0.45	830	1	0.03	10	440	175	2.03	3	<1
1129050027		2.34	<10	<1	0.21	10	0.33	579	1	0.06	14	470	30	2.53	<2	<1
1127014406		3.00	10	<1	0.14	10	1.16	579	<1	0.11	23	430	3	0.53	<2	4
1127015008		1.99	10	<1	0.18	10	0.87	373	<1	0.16	13	400	8	0.57	<2	1
1129050500		2.32	<10	<1	0.17	10	0.66	779	1	0.04	12	490	33	2.28	<2	<1
1129050030		2.47	<10	<1	0.17	10	0.36	637	<1	0.04	13	500	35	2.57	<2	<1
1129049020		1.96	<10	<1	0.17	10	0.42	751	1	0.03	12	440	48	1.97	<2	<1
1127015007		1.61	<10	<1	0.15	10	0.67	385	<1	0.10	11	380	9	0.45	<2	1
1129049074		2.71	<10	<1	0.15	20	0.64	898	1	0.13	18	540	66	2.74	<2	1
V829033		2.30	<10	<1	0.19	10	0.32	229	4	0.13	11	500	20	0.04	<2	2
1129049413		2.20	<10	<1	0.15	20	0.86	665	<1	0.07	16	530	15	0.94	<2	1
1129048406		1.80	<10	<1	0.11	20	0.61	739	1	0.03	9	500	21	1.40	<2	<1
1129015004		1.38	<10	<1	0.15	10	0.76	523	1	0.11	10	350	23	0.53	2	1
1129048401		2.31	<10	<1	0.11	10	0.38	834	1	0.03	10	480	70	2.40	<2	<1
1128034015		2.18	<10	<1	0.19	20	0.74	561	<1	0.10	9	560	28	1.28	<2	1
1128034032		1.93	<10	<1	0.17	10	0.75	583	1	0.06	10	490	22	1.36	<2	1
1128034006		1.87	<10	<1	0.15	10	0.64	565	<1	0.05	10	500	12	1.08	<2	1
1128032009		1.61	<10	<1	0.17	10	0.79	1100	1	0.02	11	400	311	1.51	<2	<1
1128032026		1.93	<10	<1	0.19	10	0.69	1150	1	0.02	11	410	47	1.78	<2	<1
1128032041		1.90	<10	<1	0.22	10	0.78	1275	1	0.02	11	420	59	1.83	<2	<1
1128032006		2.18	<10	<1	0.19	<10	1.18	1280	<1	0.02	12	380	238	2.20	2	1
1128032075		1.81	<10	<1	0.21	10	0.74	1450	1	0.02	11	410	202	1.65	<2	<1
1128032057		1.63	<10	<1	0.18	10	0.73	1240	<1	0.02	10	400	70	1.38	2	<1
1127017119		2.15	<10	<1	0.15	20	0.73	518	1	0.03	11	510	24	1.69	<2	1
1127017107		2.60	10	<1	0.19	20	1.21	730	1	0.03	24	780	68	1.21	<2	2
1128033603		3.67	<10	<1	0.01	<10	2.34	601	1	0.05	119	210	2	0.16	<2	4
1127017102		2.45	<10	<1	0.17	20	0.73	619	1	0.04	11	560	27	2.15	<2	1
1128033129		2.58	10	<1	0.09	10	0.72	316	1	0.07	14	410	<2	1.07	<2	2
V829034		1.53	<10	<1	0.14	10	0.18	173	14	0.11	8	340	21	0.03	<2	1
1127017148		2.17	<10	<1	0.19	20	0.88	633	<1	0.03	10	480	109	1.30	<2	1
1129051034		1.91	<10	<1	0.15	10	0.79	1450	1	0.02	10	420	86	1.96	<2	1
1127017101		1.56	<10	<1	0.18	10	0.80	415	<1	0.07	10	410	27	1.15	<2	1
1129051511		2.10	<10	<1	0.15	<10	0.79	1320	1	0.02	11	410	131	2.17	<2	<1
1130057787		2.31	<10	<1	0.20	10	0.46	178	1	0.02	16	330	15	2.04	<2	1
1130057786		2.11	<10	<1	0.20	10	0.24	71	1	0.01	11	400	13	2.24	<2	<1
1129051403		2.05	<10	<1	0.09	<10	0.95	880	1	0.03	14	410	36	1.94	<2	1

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SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOR	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1129048065		18	<20	<0.01	<10	<10	4	<10	238	0.46	3.30	30	8.3	-73	103.1	0.29
1127014001		48	<20	0.02	<10	<10	20	<10	208	0.51	0.76	49	9.0	25	23.8	2.06
1129048036		16	<20	<0.01	<10	<10	4	<10	93	0.17	1.40	11	8.6	-33	43.8	0.25
1127014425		69	<20	0.10	<10	<10	107	<10	191	0.67	1.00	90	9.0	59	31.3	2.88
1129049016		21	<20	<0.01	<10	<10	3	<10	543	0.73	2.07	62	8.2	-3	64.7	0.96
1129050027		37	<20	<0.01	<10	<10	3	10	255	0.52	2.45	44	8.6	-33	76.6	0.57
1127014406		57	<20	0.03	<10	<10	50	10	124	0.54	0.53	50	8.9	33	16.6	3.02
1127015008		80	<20	0.02	<10	<10	17	10	60	0.24	0.55	27	9.1	10	17.2	1.57
1129050500		32	<20	<0.01	<10	<10	3	<10	133	0.93	2.28	71	9.0	0	71.3	1.00
1129050030		30	<20	<0.01	<10	<10	3	10	104	0.63	2.41	52	8.7	-23	75.3	0.69
1129049020		20	<20	<0.01	<10	<10	3	<10	229	0.65	1.92	57	8.9	-3	60.0	0.95
1127015007		50	<20	<0.01	<10	<10	10	<10	66	0.35	0.45	39	9.0	25	14.1	2.77
1129049074		102	<20	<0.01	<10	<10	7	<10	155	0.59	2.73	56	9.0	-29	85.3	0.66
V829033		18	<20	0.35	<10	<10	54	<10	56	0.02						
1129049413		77	<20	<0.01	<10	<10	10	<10	95	0.96	0.97	94	9.1	64	30.3	3.10
1129048406		16	<20	<0.01	<10	<10	4	<10	108	0.07	1.39	6	8.5	-37	43.4	0.14
1129015004		52	<20	<0.01	<10	<10	5	<10	487	0.50	0.52	47	8.9	31	16.3	2.89
1129048401		13	<20	<0.01	<10	<10	3	<10	249	0.16	2.52	12	8.5	-67	78.8	0.15
1128034015		37	<20	<0.01	<10	<10	7	<10	144	0.24	1.25	28	8.7	-11	39.1	0.72
1128034032		46	<20	<0.01	<10	<10	6	<10	85	0.72	1.38	63	8.9	20	43.1	1.46
1128034006		38	<20	<0.01	<10	<10	6	<10	87	0.56	1.06	55	9.0	22	33.1	1.66
1128032009		24	<20	<0.01	<10	<10	4	<10	770	0.73	1.48	65	9.0	19	46.3	1.41
1128032026		22	<20	<0.01	<10	<10	3	<10	721	0.95	1.77	80	8.9	25	55.3	1.45
1128032041		20	<20	<0.01	<10	<10	3	<10	418	1.03	1.69	89	8.8	36	52.8	1.69
1128032006		37	<20	<0.01	<10	<10	4	<10	480	1.08	2.12	97	8.9	31	66.3	1.46
1128032075		19	<20	<0.01	<10	<10	3	<10	620	1.16	1.69	98	9.0	45	52.8	1.86
1128032057		18	<20	<0.01	<10	<10	2	<10	196	1.00	1.36	80	9.0	38	42.5	1.88
1127017119		27	<20	<0.01	<10	<10	7	<10	115	0.33	1.71	33	8.8	-20	53.4	0.62
1127017107		68	<20	0.03	<10	<10	23	<10	531	0.52	1.18	58	8.7	21	36.9	1.57
1128033603		31	<20	0.10	<10	<10	59	<10	50	0.74	0.14	67	9.4	63	4.4	15.31
1127017102		31	<20	<0.01	<10	<10	7	<10	180	0.42	2.18	45	8.6	-23	68.1	0.66
1128033129		53	<20	<0.01	<10	<10	24	<10	21	0.77	1.04	71	9.1	39	32.5	2.18
V829034		18	<20	0.25	<10	10	32	<10	40	0.01						
1127017148		25	<20	<0.01	<10	<10	9	<10	1560	0.19	1.32	23	8.8	-18	41.3	0.56
1129051034		17	<20	<0.01	<10	<10	2	<10	202	0.97	1.87	76	9.0	18	58.4	1.30
1127017101		48	<20	<0.01	<10	<10	5	<10	80	0.29	1.12	31	8.9	-4	35.0	0.89
1129051511		21	<20	<0.01	<10	<10	2	<10	298	1.00	2.14	78	9.0	11	66.9	1.17
1130057787		12	<20	0.01	<10	<10	9	<10	1040	0.05	1.75	8	8.2	-47	54.7	0.15
1130057786		8	<20	<0.01	<10	<10	3	<10	1370	0.02	2.23	5	8.0	-65	69.7	0.07
1129051403		24	<20	<0.01	<10	<10	3	<10	192	1.06	1.81	76	8.8	19	56.6	1.34

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Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method Analyte Units LOR	OA-VOL08 FIZZ RAT Unity 1
1129048065		2
1127014001		2
1129048036		1
1127014425		3
1129049016		2
1129050027		2
1127014406		2
1127015008		2
1129050500		2
1129050030		2
1129049020		2
1127015007		2
1129049074		2
V829033		
1129049413		3
1129048406		1
1129015004		2
1129048401		1
1128034015		2
1128034032		2
1128034006		2
1128032009		2
1128032026		2
1128032041		3
1128032006		3
1128032075		3
1128032057		2
1127017119		2
1127017107		2
1128033603		2
1127017102		2
1128033129		2
V829034		
1127017148		2
1129051034		2
1127017101		2
1129051511		2
1130057787		1
1130057786		1
1129051403		2

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CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1130057729		0.44		1.880	5.3	0.41	92	10	60	<0.5	<2	0.10	15.0	7	42	69
1130057779		0.54		0.371	3.3	0.72	177	<10	20	<0.5	<2	0.22	11.0	9	50	99
1129051526		0.52		0.120	2.5	0.77	64	<10	40	<0.5	<2	1.90	0.8	7	57	135
1130057846		0.48		0.336	2.0	0.67	92	<10	20	<0.5	<2	0.62	6.6	8	76	102
1128033101		0.51		0.119	0.7	1.56	27	10	70	<0.5	2	2.30	<0.5	9	80	19
1128033153		0.46		0.061	0.9	1.31	51	10	40	<0.5	2	1.26	<0.5	8	62	16
1129051419		0.55		0.110	1.4	0.89	70	<10	30	<0.5	<2	1.07	1.5	9	46	78
1130057777		0.50		3.11	5.0	1.07	203	10	30	<0.5	2	0.12	12.4	8	67	115
1130057771		0.51		1.190	3.5	0.62	361	<10	20	<0.5	<2	0.22	31.9	7	38	113
1129051028		0.55		1.405	27.6	0.45	77	<10	30	<0.5	2	1.05	4.4	8	68	160
1129051059		0.51		3.42	22.3	0.38	60	<10	30	<0.5	2	2.04	4.7	8	69	157
1130057523		0.58		0.013	0.2	0.46	7	<10	20	<0.5	<2	0.11	<0.5	7	51	9
1129051009		0.47		0.291	4.0	0.37	33	<10	30	<0.5	<2	3.02	2.2	8	83	66
1130057647		0.54		0.348	1.6	0.81	117	<10	20	<0.5	<2	0.04	3.1	11	62	29
1130057844		0.51		0.156	0.6	0.97	90	<10	20	<0.5	<2	0.14	6.3	8	57	28
V829035		0.06		6.50	5.1	0.82	<2	<10	50	<0.5	<2	0.54	<0.5	8	10	41
1130057500		0.57		0.455	0.4	0.44	48	<10	20	<0.5	<2	0.47	1.3	7	39	19
1130057624		0.55		0.514	0.9	0.50	72	<10	20	<0.5	<2	0.11	19.3	11	31	60
1130057753		0.51		0.992	2.0	0.46	208	10	40	<0.5	<2	0.87	11.8	8	34	79
1130057602		0.56	94.1	0.170	0.3	0.62	27	<10	30	<0.5	<2	0.08	1.2	11	43	27
1130057723		0.43		1.555	1.3	0.51	378	<10	30	<0.5	2	0.31	24.2	8	59	191
1130057608		0.44		0.308	0.3	1.39	42	10	40	<0.5	<2	0.23	<0.5	13	45	20
1130057906		0.42		0.206	0.8	0.43	86	<10	30	<0.5	<2	0.08	30.7	9	45	66
1130057720		0.53		7.24	4.3	0.45	79	<10	30	<0.5	2	0.50	6.7	8	60	34
1127018204		0.55		0.054	0.6	0.81	62	<10	30	<0.5	<2	2.59	1.0	6	37	11
1130057801		0.53		1.590	4.7	0.39	320	<10	40	<0.5	2	0.13	11.3	9	73	127
1127018084		0.46		0.599	1.3	1.68	58	10	30	<0.5	<2	1.41	3.5	11	49	54
1130057860		0.54		0.107	0.3	0.59	65	<10	40	<0.5	<2	0.13	1.6	8	62	14
1127018090		0.57		1.575	2.9	1.28	86	<10	30	<0.5	<2	0.34	10.0	8	46	82
1127018108		0.56		0.196	1.6	0.46	77	<10	20	<0.5	<2	2.58	1.3	11	57	29
1127018092		0.52		2.68	3.2	1.24	97	<10	20	<0.5	2	0.63	4.2	10	80	92
1127018241		0.52		0.498	1.3	1.31	41	<10	30	<0.5	<2	2.14	2.4	9	54	35
V829036		0.06		<0.005	<0.2	0.61	<2	<10	30	<0.5	<2	0.33	<0.5	5	7	17
1128036071		0.57		0.124	1.5	1.01	72	<10	20	<0.5	<2	2.12	<0.5	7	55	15
1127018223		0.53		0.435	0.8	1.15	82	<10	30	<0.5	<2	1.90	0.9	10	57	21
1127018265		0.56		0.116	0.7	1.21	101	<10	30	<0.5	<2	2.09	0.5	10	50	20
1127018098		0.55		1.230	3.0	0.53	95	<10	30	<0.5	<2	2.70	4.6	9	53	70
1128036039		0.45		0.036	2.8	0.65	103	<10	20	<0.5	<2	1.77	0.6	9	91	19
1127018064		0.41		0.899	0.9	1.89	55	10	40	<0.5	<2	0.94	6.1	11	48	57
1127018073		0.50		0.233	1.3	1.29	52	<10	30	<0.5	<2	2.05	2.6	10	38	40

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOR	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1130057729		1.78	<10	<1	0.30	10	0.05	310	<1	0.01	9	350	176	2.05	3	<1
1130057779		2.76	<10	<1	0.19	10	0.48	510	1	0.01	10	430	114	2.59	<2	<1
1129051526		1.73	<10	<1	0.16	10	0.94	1410	3	0.02	8	400	61	1.35	<2	<1
1130057846		2.46	<10	<1	0.17	10	0.53	1310	1	0.01	9	420	52	2.00	2	<1
1128033101		1.87	<10	<1	0.19	20	0.80	431	<1	0.09	12	450	4	0.41	<2	1
1128033153		1.49	<10	<1	0.18	10	0.64	385	1	0.09	12	390	8	0.81	<2	1
1129051419		1.90	<10	<1	0.15	10	0.60	1350	1	0.02	11	400	40	1.77	<2	<1
1130057777		3.12	<10	<1	0.28	10	0.67	578	1	0.01	11	410	211	2.71	<2	<1
1130057771		3.01	<10	<1	0.31	10	0.20	392	<1	0.01	8	370	136	3.35	<2	<1
1129051028		1.95	<10	1	0.19	10	0.44	1280	1	0.02	12	410	537	2.19	6	<1
1129051059		1.93	<10	1	0.18	<10	0.89	2260	2	0.02	11	410	668	2.24	23	<1
1130057523		0.51	<10	<1	0.02	<10	0.07	73	<1	0.01	6	260	3	0.27	<2	1
1129051009		1.89	<10	1	0.19	<10	0.67	2150	<1	0.02	10	400	185	2.14	3	<1
1130057647		1.70	<10	<1	0.12	10	0.66	306	1	0.01	15	100	165	1.33	<2	1
1130057844		2.02	<10	<1	0.19	10	0.63	367	<1	0.01	10	350	14	1.50	<2	<1
V829035		1.68	<10	<1	0.18	10	0.36	185	16	0.13	10	610	9	0.08	<2	2
1130057500		1.75	<10	<1	0.18	10	0.17	465	1	0.01	8	420	19	1.70	<2	<1
1130057624		1.61	<10	1	0.12	10	0.04	32	4	0.02	12	70	6	2.01	<2	<1
1130057753		1.89	<10	<1	0.31	10	0.21	1260	<1	0.01	8	460	256	1.97	<2	<1
1130057602		1.97	<10	<1	0.16	20	0.32	245	<1	0.01	10	240	12	1.48	<2	<1
1130057723		2.02	<10	1	0.27	10	0.17	1125	1	0.01	9	400	80	1.89	3	<1
1130057608		2.42	<10	<1	0.14	20	0.85	887	<1	0.01	14	640	7	1.17	<2	1
1130057906		1.97	<10	1	0.21	10	0.08	62	<1	0.01	13	310	17	2.50	<2	<1
1130057720		2.23	<10	1	0.24	10	0.22	1365	1	0.01	9	680	43	2.15	<2	<1
1127018204		1.63	<10	<1	0.16	10	0.74	695	<1	0.04	8	370	22	0.98	2	1
1130057801		3.20	<10	<1	0.25	10	0.05	451	1	0.01	9	410	464	3.54	4	<1
1127018084		2.31	<10	<1	0.18	20	0.80	664	<1	0.03	11	560	67	1.29	<2	1
1130057860		1.44	<10	<1	0.18	20	0.29	338	1	0.01	8	460	12	1.15	<2	<1
1127018090		3.23	<10	<1	0.20	10	0.83	475	<1	0.02	11	370	55	2.79	<2	<1
1127018108		2.07	<10	<1	0.20	10	0.81	2130	1	0.02	13	470	99	1.66	<2	1
1127018092		4.38	<10	<1	0.18	10	0.81	535	2	0.01	11	390	87	3.63	<2	<1
1127018241		1.76	<10	<1	0.13	10	0.94	583	<1	0.03	8	380	22	1.39	<2	1
V829036		1.21	<10	<1	0.19	10	0.25	185	1	0.03	8	300	29	0.04	<2	1
1128036071		1.45	<10	<1	0.13	10	0.73	504	<1	0.04	10	430	8	0.79	2	<1
1127018223		1.93	<10	<1	0.15	20	0.76	734	1	0.02	9	530	26	1.32	2	1
1127018265		2.15	<10	<1	0.16	20	0.82	887	<1	0.02	9	540	44	1.37	<2	1
1127018098		2.26	<10	<1	0.18	10	0.68	1690	1	0.01	12	450	252	2.19	2	<1
1128036039		1.77	<10	<1	0.13	10	0.74	721	<1	0.05	11	410	9	1.39	<2	1
1127018064		2.52	<10	<1	0.20	20	0.85	622	<1	0.04	11	560	61	1.61	<2	1
1127018073		2.13	<10	<1	0.14	20	0.81	644	<1	0.04	10	580	33	1.18	3	1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOR	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1130057729		56	<20	<0.01	<10	<10	2	<10	3430	0.07	2.04	5	8.5	-59	63.8	0.08
1130057779		7	<20	<0.01	<10	<10	3	<10	2590	0.11	2.53	11	7.9	-68	79.1	0.14
1129051526		28	<20	<0.01	<10	<10	3	<10	199	1.01	1.33	75	9.0	33	41.6	1.80
1130057846		9	<20	<0.01	<10	<10	3	<10	1450	0.38	1.96	27	8.7	-34	61.3	0.44
1128033101		60	<20	<0.01	<10	<10	16	<10	106	0.77	0.40	65	9.4	53	12.5	5.20
1128033153		30	<20	<0.01	<10	<10	7	<10	61	0.35	0.74	33	9.0	10	23.1	1.43
1129051419		17	<20	<0.01	<10	<10	3	<10	336	0.52	1.80	40	8.8	-16	56.3	0.71
1130057777		7	<20	<0.01	<10	<10	5	<10	2810	0.10	2.52	8	8.3	-71	78.8	0.10
1130057771		10	<20	<0.01	<10	<10	3	<10	7430	0.12	2.96	10	8.3	-83	92.5	0.11
1129051028		14	<20	<0.01	<10	<10	2	<10	1055	0.54	1.94	45	8.8	-16	60.6	0.74
1129051059		18	<20	<0.01	<10	<10	2	<10	1135	1.15	1.85	94	9.0	36	57.8	1.63
1130057523		7	<20	<0.01	<10	<10	3	<10	55	0.04	0.27	3	7.8	-5	8.4	0.36
1129051009		26	<20	<0.01	<10	<10	2	<10	571	1.34	2.12	108	9.0	42	66.3	1.63
1130057647		9	<20	<0.01	<10	<10	7	<10	777	0.02	1.23	3	8.6	-35	38.4	0.08
1130057844		7	<20	<0.01	<10	<10	4	<10	1605	0.06	1.38	7	8.6	-36	43.1	0.16
V829035		21	<20	0.24	<10	<10	51	<10	36	0.02						
1130057500		7	<20	<0.01	<10	<10	3	<10	364	0.15	1.43	14	8.8	-31	44.7	0.31
1130057624		23	<20	<0.01	<10	<10	2	<10	4340	0.02	1.64	2	8.1	-49	51.3	0.04
1130057753		24	<20	<0.01	<10	<10	2	<10	2660	0.40	1.90	30	8.9	-29	59.4	0.51
1130057602		7	<20	<0.01	<10	<10	5	<10	218	0.07	1.31	4	8.2	-37	40.9	0.10
1130057723		19	<20	<0.01	<10	<10	2	<10	5960	0.24	1.75	14	8.4	-41	54.7	0.26
1130057608		20	<20	<0.01	<10	<10	8	<10	201	0.07	1.04	6	8.1	-27	32.5	0.18
1130057906		8	<20	<0.01	<10	<10	2	<10	7250	0.02	2.28	3	7.8	-68	71.3	0.04
1130057720		11	<20	<0.01	<10	<10	3	<10	1720	0.28	1.79	20	8.5	-36	55.9	0.36
1127018204		47	<20	<0.01	<10	<10	3	<10	247	1.03	0.88	76	8.9	49	27.5	2.76
1130057801		8	<20	<0.01	<10	<10	2	<10	2540	0.06	3.32	6	7.9	-98	103.8	0.06
1127018084		28	<20	0.01	<10	<10	8	<10	876	0.36	1.08	33	8.8	-1	33.8	0.98
1130057860		10	<20	<0.01	<10	<10	2	<10	449	0.05	0.95	5	8.8	-25	29.7	0.17
1127018090		10	<20	<0.01	<10	<10	4	<10	2550	0.09	2.62	14	8.7	-68	81.9	0.17
1127018108		17	<20	<0.01	<10	<10	3	<10	331	1.28	1.43	99	9.0	54	44.7	2.22
1127018092		9	<20	<0.01	<10	<10	5	<10	1060	0.22	3.38	21	8.4	-85	105.6	0.20
1127018241		21	<20	<0.01	<10	<10	5	<10	665	0.72	1.38	57	8.8	14	43.1	1.32
V829036		9	20	0.10	<10	10	23	<10	36	0.03						
1128036071		21	<20	<0.01	<10	<10	4	<10	71	0.73	0.69	58	9.2	36	21.6	2.69
1127018223		23	<20	<0.01	<10	<10	5	<10	221	0.62	1.18	51	8.9	14	36.9	1.38
1127018265		21	<20	<0.01	<10	<10	8	<10	129	0.72	1.33	57	8.7	15	41.6	1.37
1127018098		25	<20	<0.01	<10	<10	3	<10	1160	1.13	2.26	93	9.0	22	70.6	1.32
1128036039		19	<20	<0.01	<10	<10	3	<10	139	0.81	1.27	63	9.4	23	39.7	1.59
1127018064		27	<20	<0.01	<10	<10	9	<10	1485	0.17	1.53	22	8.8	-26	47.8	0.46
1127018073		21	<20	<0.01	<10	<10	7	<10	637	0.64	1.16	55	9.0	19	36.3	1.52

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Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method Analyte Units LOR	OA-VOL08 FIZZ RAT Unity 1
1130057729		1
1130057779		1
1129051526		2
1130057846		2
1128033101		2
1128033153		2
1129051419		2
1130057777		1
1130057771		1
1129051028		2
1129051059		3
1130057523		1
1129051009		3
1130057647		1
1130057844		1
V829035		
1130057500		1
1130057624		1
1130057753		2
1130057602		1
1130057723		1
1130057608		1
1130057906		1
1130057720		1
1127018204		2
1130057801		1
1127018084		2
1130057860		1
1127018090		1
1127018108		3
1127018092		1
1127018241		2
V829036		
1128036071		2
1127018223		2
1127018265		2
1127018098		3
1128036039		2
1127018064		2
1127018073		2

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CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1128036220		0.52		0.152	5.1	0.55	568	<10	30	<0.5	<2	2.65	0.8	8	60	17
1128036069		0.54		0.068	1.3	0.99	185	<10	30	<0.5	2	1.83	0.9	8	64	14
1128036099		0.57		0.047	0.6	1.17	20	<10	40	<0.5	<2	1.31	<0.5	8	50	19
1127018146		0.48		0.413	2.1	0.48	70	<10	40	<0.5	<2	2.74	2.9	11	84	68
1127018153		0.51		0.801	2.1	0.51	54	<10	30	<0.5	<2	2.99	3.2	8	69	54
1128036002		0.44		0.058	0.7	1.21	37	<10	40	<0.5	<2	2.90	<0.5	6	73	19
1128036061		0.45		0.040	0.6	1.26	42	<10	40	<0.5	<2	1.62	<0.5	8	95	22
1128036037		0.57		0.052	1.6	0.89	260	<10	30	<0.5	<2	2.89	<0.5	7	68	14
1131066378		0.44		0.169	1.3	1.34	15	<10	40	<0.5	<2	0.48	<0.5	10	69	38
V829037		0.06		0.423	5.1	0.83	<2	<10	50	<0.5	<2	0.42	<0.5	6	7	23
1129031013		0.57		0.791	2.3	0.53	35	<10	40	<0.5	<2	1.71	3.4	12	227	66
1129051021		0.52		0.819	3.2	0.82	24	<10	30	<0.5	<2	0.50	0.9	8	44	47

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CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOR	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1128036220		1.76	<10	<1	0.16	10	0.79	1220	1	0.04	9	370	15	1.33	3	1
1128036069		1.93	<10	1	0.14	10	0.50	513	1	0.08	10	380	10	1.68	<2	1
1128036099		1.40	<10	<1	0.18	10	0.73	320	1	0.06	9	330	14	0.69	<2	1
1127018146		2.60	<10	<1	0.24	10	0.74	1575	2	0.02	14	420	149	2.61	3	<1
1127018153		2.12	<10	<1	0.25	10	0.95	2170	1	0.02	12	390	411	1.89	2	<1
1128036002		1.72	<10	<1	0.16	10	0.93	496	1	0.08	7	350	20	0.84	<2	1
1128036061		1.71	<10	<1	0.18	10	0.68	370	1	0.09	10	370	18	0.97	<2	1
1128036037		1.81	<10	<1	0.15	10	0.79	812	2	0.06	10	400	7	1.15	<2	<1
1131066378		2.18	<10	<1	0.13	20	0.85	518	1	0.07	10	510	11	1.94	<2	<1
V829037		1.70	<10	<1	0.15	10	0.21	188	17	0.14	8	370	24	0.03	<2	1
1129031013		1.86	<10	<1	0.27	10	0.39	941	1	0.02	16	410	528	1.82	2	<1
1129051021		1.93	<10	<1	0.14	10	0.30	573	<1	0.03	11	420	56	2.07	<2	<1

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Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOR	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1128036220		31	<20	<0.01	<10	<10	2	<10	241	1.20	1.23	97	9.2	59	38.4	2.52
1128036069		41	<20	<0.01	<10	<10	5	<10	261	0.54	1.65	47	9.2	-5	51.6	0.91
1128036099		38	<20	<0.01	<10	<10	7	<10	93	0.38	0.66	35	9.3	14	20.6	1.70
1127018146		22	<20	<0.01	<10	<10	2	<10	783	1.20	2.61	96	9.2	14	81.6	1.18
1127018153		24	<20	<0.01	<10	<10	3	<10	820	1.48	1.85	116	9.2	58	57.8	2.01
1128036002		113	<20	<0.01	<10	<10	5	<10	147	1.00	0.79	80	9.4	55	24.7	3.24
1128036061		46	<20	<0.01	<10	<10	6	<10	94	0.45	0.88	40	9.2	13	27.5	1.45
1128036037		40	<20	<0.01	<10	<10	3	<10	111	1.06	1.03	81	9.2	49	32.2	2.52
1131066378		23	<20	<0.01	<10	<10	6	<10	136	0.12	1.99	13	8.3	-49	62.2	0.21
V829037		21	20	0.28	<10	10	35	<10	44	0.04						
1129031013		16	<20	<0.01	<10	<10	3	<10	897	0.83	1.84	59	9.1	2	57.5	1.03
1129051021		17	<20	<0.01	<10	<10	3	<10	225	0.15	2.05	15	8.4	-49	64.1	0.23

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method Analyte Units LOR	OA-VOL08 FIZZ RAT Unity 1
1128036220		3
1128036069		2
1128036099		2
1127018146		3
1127018153		3
1128036002		2
1128036061		2
1128036037		2
1131066378		1
V829037		
1129031013		2
1129051021		1

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CERTIFICATE OF ANALYSIS TB18054441

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-24	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

CERTIFICATE TB18073654

Project: Mine Site Lab Pulps February

P.O. No.: 4500009909

This report is for 143 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 3-APR-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
ATTN: JASON PATTISON
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1128037014		0.38	91.5	0.960	1.1	0.64	32	<10	30	<0.5	<2	2.44	5.1	7	83	92
1128036001		0.60		0.093	0.4	1.03	111	<10	40	<0.5	<2	2.40	<0.5	6	45	17
1128036050		0.55		0.141	0.8	1.12	38	<10	40	<0.5	<2	2.45	<0.5	5	45	18
1131066312		0.55		0.191	1.3	1.29	25	<10	40	<0.5	<2	0.67	<0.5	9	29	44
1131066220		0.48		0.117	0.5	1.13	13	<10	30	<0.5	<2	0.49	<0.5	13	97	31
1128037020		0.44		1.220	2.7	0.55	49	<10	20	<0.5	<2	2.42	2.8	7	138	57
1128037021		0.63		0.411	2.3	0.53	45	<10	20	<0.5	2	2.31	1.8	8	60	54
1131067102		0.47		0.093	1.4	0.29	43	<10	20	<0.5	<2	0.13	0.6	9	161	28
1128037001		0.35		0.803	1.8	0.81	62	<10	30	<0.5	2	2.68	1.8	9	77	34
1128037093		0.47		0.661	3.2	0.43	54	<10	20	<0.5	<2	1.19	1.9	8	139	43
1131067052		0.43		0.332	1.8	0.42	64	<10	40	<0.5	<2	0.13	8.5	11	105	70
1131066290		0.48		0.100	0.3	1.39	40	<10	30	<0.5	<2	0.79	<0.5	10	51	24
1131066377		0.45		0.191	1.0	1.13	22	<10	20	<0.5	<2	0.39	0.5	12	73	49
1128037050		0.44		3.70	3.6	0.45	43	<10	20	<0.5	<2	2.17	5.1	7	109	148
1131067010		0.60		0.464	1.3	0.29	173	<10	20	<0.5	<2	0.24	5.4	13	121	43
1131067013		0.57		0.166	0.6	1.16	20	<10	40	<0.5	2	1.97	0.8	12	169	47
1128037098		0.52		0.443	2.5	0.46	38	<10	20	<0.5	2	1.95	7.7	8	120	107
V829038		0.06		6.34	4.9	0.83	<2	<10	50	<0.5	<2	0.52	<0.5	7	10	38
1128037128		0.51		0.986	3.1	0.63	44	<10	20	<0.5	<2	1.30	1.6	8	155	36
1128037112		0.53		0.696	2.6	0.43	33	<10	30	<0.5	2	0.25	1.9	9	109	33
1131066386		0.58		0.257	1.5	1.17	32	<10	30	<0.5	<2	0.58	1.2	9	103	57
1131066325		0.52		0.215	1.5	0.94	27	<10	20	<0.5	<2	0.19	0.6	8	128	29
1131066263		0.46		0.274	3.2	0.71	32	<10	20	<0.5	2	0.12	7.3	8	88	58
1131066347		0.45		0.077	0.6	1.06	25	<10	30	<0.5	<2	0.51	1.0	8	64	34
1131066416		0.45		0.418	3.6	1.04	19	<10	20	<0.5	<2	0.07	7.4	10	92	158
1131066239		0.45		0.086	0.7	1.08	11	<10	40	<0.5	2	0.67	0.7	10	75	18
1128037194		0.48		0.297	3.2	0.42	29	<10	20	<0.5	<2	0.57	3.4	7	86	62
1127019502		0.55		0.018	<0.2	1.11	5	<10	40	<0.5	<2	1.48	<0.5	8	112	25
1127019535		0.55		0.096	0.3	1.21	6	<10	50	<0.5	<2	0.98	<0.5	8	89	63
1128038092		0.53		6.40	2.0	0.70	44	<10	20	<0.5	2	0.59	1.4	8	72	89
1127019024		0.55		0.189	0.5	1.23	17	<10	60	<0.5	<2	1.44	<0.5	14	115	36
1127019527		0.55		0.055	0.2	1.21	8	<10	50	<0.5	<2	0.80	<0.5	8	93	32
1127019224		0.56		0.024	<0.2	1.07	5	<10	40	<0.5	<2	1.23	<0.5	7	112	17
1128038026		0.55		0.745	1.8	0.48	34	<10	30	<0.5	2	1.98	2.2	8	76	44
1127019166		0.54		0.021	0.3	1.27	6	<10	50	<0.5	<2	1.23	<0.5	9	109	55
1127019025		0.55		0.024	<0.2	1.31	6	<10	40	<0.5	<2	1.57	<0.5	9	137	18
1127019178		0.53		0.016	0.4	1.20	28	<10	30	<0.5	<2	2.90	<0.5	7	49	8
1128038022		0.51		0.209	1.8	0.53	22	<10	30	<0.5	<2	1.43	1.0	9	78	21
1128038109		0.54		1.410	0.9	0.82	51	<10	20	<0.5	<2	2.47	0.7	8	71	36
V829039		0.06		0.197	1.4	0.85	2	<10	40	<0.5	<2	0.46	<0.5	10	11	53

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

***** See Appendix Page for comments regarding this certificate *****

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VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOR	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1128037014		1.95	<10	1	0.25	10	0.79	1350	1	0.01	10	390	177	1.82	<2	<1
1128036001		1.41	<10	<1	0.14	10	0.69	391	<1	0.05	8	330	19	0.73	<2	1
1128036050		1.47	<10	1	0.16	10	0.84	465	1	0.05	7	330	21	0.79	<2	1
1131066312		1.96	<10	1	0.13	10	0.84	736	1	0.06	9	500	18	1.60	<2	1
1131066220		2.64	<10	1	0.11	30	0.89	671	1	0.01	23	840	19	2.38	<2	1
1128037020		1.91	<10	1	0.16	10	0.57	1320	1	0.01	10	380	333	1.87	<2	<1
1128037021		1.86	<10	1	0.16	10	0.61	1400	1	0.01	10	410	241	1.86	<2	<1
1131067102		1.53	<10	<1	0.11	10	0.07	148	1	0.01	12	190	15	1.56	<2	<1
1128037001		1.87	<10	1	0.23	10	0.75	1480	<1	0.02	11	460	323	1.47	<2	1
1128037093		1.99	<10	1	0.15	10	0.42	1245	1	0.01	12	420	249	2.07	<2	<1
1131067052		2.75	<10	1	0.15	10	0.12	1155	1	0.01	16	420	29	2.85	8	<1
1131066290		2.08	<10	1	0.13	20	0.90	936	1	0.04	9	680	32	1.28	<2	1
1131066377		2.64	<10	1	0.09	20	0.77	403	2	0.02	13	910	22	2.67	<2	1
1128037050		1.87	<10	1	0.16	10	0.76	1290	1	0.01	9	430	731	1.64	<2	<1
1131067010		2.98	<10	1	0.12	10	0.09	64	2	0.01	16	60	101	3.19	<2	<1
1131067013		2.90	<10	<1	0.17	10	0.78	532	5	0.05	19	370	19	1.20	<2	2
1128037098		2.10	<10	1	0.14	10	0.74	1210	1	0.01	10	390	78	2.24	<2	<1
V829038		1.65	<10	1	0.17	10	0.36	179	15	0.13	9	560	8	0.06	<2	2
1128037128		2.07	<10	<1	0.16	10	0.30	813	1	0.02	12	440	54	2.05	<2	<1
1128037112		2.01	<10	1	0.17	10	0.16	1245	1	0.01	12	360	77	2.09	<2	<1
1131066386		1.93	<10	1	0.11	10	0.87	607	1	0.04	14	520	51	1.46	<2	1
1131066325		1.68	<10	1	0.09	10	0.68	354	1	0.02	9	500	40	1.42	<2	<1
1131066263		1.77	<10	1	0.08	10	0.45	93	1	0.02	9	220	447	1.84	<2	<1
1131066347		1.72	<10	<1	0.15	10	0.63	295	1	0.03	11	120	26	1.04	<2	1
1131066416		1.87	<10	1	0.09	20	0.83	336	1	0.01	20	220	33	1.74	<2	1
1131066239		2.27	<10	1	0.13	20	0.64	333	1	0.05	11	670	12	2.33	<2	1
1128037194		1.94	<10	1	0.16	10	0.25	530	1	0.01	11	450	51	2.17	<2	<1
1127019502		1.90	<10	1	0.13	10	0.61	416	1	0.04	12	380	<2	0.17	<2	1
1127019535		2.19	<10	1	0.18	10	0.68	283	1	0.04	9	420	4	0.66	<2	1
1128038092		1.97	<10	1	0.13	10	0.42	1200	1	0.03	10	400	207	1.96	<2	<1
1127019024		3.36	<10	1	0.24	10	0.93	386	2	0.03	17	420	2	2.17	<2	1
1127019527		2.11	<10	<1	0.17	10	0.68	284	1	0.05	9	400	2	0.64	<2	1
1127019224		1.91	<10	1	0.13	10	0.63	276	1	0.04	11	380	<2	0.42	<2	1
1128038026		2.00	<10	1	0.17	10	0.83	1440	1	0.01	10	400	250	1.95	<2	<1
1127019166		1.99	10	<1	0.15	10	0.75	348	1	0.05	12	420	<2	0.36	<2	2
1127019025		2.03	10	<1	0.11	10	0.76	294	1	0.05	12	410	2	0.43	<2	1
1127019178		1.58	<10	1	0.13	10	0.78	388	<1	0.05	8	330	8	1.21	2	1
1128038022		1.83	<10	<1	0.18	10	0.64	1195	1	0.01	12	450	71	2.00	<2	<1
1128038109		1.81	<10	<1	0.14	10	0.69	1115	1	0.02	9	420	72	1.58	2	1
V829039		2.44	<10	<1	0.20	10	0.35	246	4	0.14	10	520	23	0.04	2	2

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

***** See Appendix Page for comments regarding this certificate *****

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Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOR	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1128037014		20	<20	<0.01	<10	<10	3	<10	1245	1.26	1.85	98	8.7	40	57.8	1.70
1128036001		75	<20	<0.01	<10	<10	4	<10	105	0.91	0.74	76	9.0	53	23.1	3.29
1128036050		64	<20	<0.01	<10	<10	5	<10	112	0.92	0.81	78	9.1	53	25.3	3.08
1131066312		27	<20	0.01	<10	<10	8	<10	98	0.19	1.63	16	8.3	-35	50.9	0.31
1131066220		15	<20	<0.01	<10	<10	10	<10	146	0.18	2.23	14	7.9	-56	69.7	0.20
1128037020		17	<20	<0.01	<10	<10	3	<10	739	1.02	1.82	84	8.7	27	56.9	1.48
1128037021		17	<20	<0.01	<10	<10	2	<10	466	0.97	1.72	78	8.9	24	53.8	1.45
1131067102		14	<20	<0.01	<10	<10	2	<10	171	0.06	1.38	4	8.2	-39	43.1	0.09
1128037001		26	<20	<0.01	<10	<10	3	<10	434	1.23	1.41	98	8.9	54	44.1	2.22
1128037093		12	<20	<0.01	<10	<10	2	<10	473	0.54	2.09	43	8.7	-22	65.3	0.66
1131067052		15	<20	<0.01	<10	<10	2	<10	2120	0.14	2.74	5	7.6	-81	85.6	0.06
1131066290		21	<20	<0.01	<10	<10	7	<10	112	0.23	1.24	24	8.2	-15	38.8	0.62
1131066377		16	<20	<0.01	<10	<10	7	<10	149	0.08	2.36	11	7.9	-63	73.8	0.15
1128037050		17	<20	<0.01	<10	<10	2	<10	1310	1.14	1.40	88	8.8	44	43.8	2.01
1131067010		12	<20	<0.01	<10	<10	3	<10	1175	0.13	3.10	8	8.1	-89	96.9	0.08
1131067013		37	<20	0.02	<10	<10	35	<10	182	0.80	1.14	68	8.6	32	35.6	1.91
1128037098		18	<20	<0.01	<10	<10	2	<10	1825	0.98	2.26	77	8.7	6	70.6	1.09
V829038		21	<20	0.23	<10	<10	48	<10	34	0.02						
1128037128		15	<20	<0.01	<10	<10	3	<10	407	0.44	1.90	37	8.6	-22	59.4	0.62
1128037112		7	<20	<0.01	<10	<10	2	<10	515	0.14	2.09	11	8.6	-54	65.3	0.17
1131066386		17	<20	<0.01	<10	<10	7	<10	319	0.21	1.28	20	8.8	-20	40.0	0.50
1131066325		12	<20	<0.01	<10	<10	4	<10	172	0.13	1.36	6	8.4	-37	42.5	0.14
1131066263		9	<20	<0.01	<10	<10	3	<10	1820	0.05	1.69	4	8.3	-49	52.8	0.08
1131066347		20	<20	0.01	<10	<10	17	<10	280	0.20	0.90	18	8.5	-10	28.1	0.64
1131066416		10	<20	<0.01	<10	<10	9	<10	1520	0.03	1.80	4	7.8	-52	56.3	0.07
1131066239		27	<20	<0.01	<10	<10	6	<10	246	0.17	2.17	18	8.2	-50	67.8	0.27
1128037194		9	<20	<0.01	<10	<10	2	<10	840	0.26	2.12	23	8.7	-43	66.3	0.35
1127019502		24	<20	0.02	<10	<10	16	<10	69	0.51	0.18	43	9.5	37	5.6	7.64
1127019535		25	<20	0.03	<10	<10	18	<10	45	0.31	0.68	31	9.2	10	21.3	1.46
1128038092		15	<20	<0.01	<10	<10	3	<10	424	0.30	1.94	25	8.6	-36	60.6	0.41
1127019024		37	<20	0.03	<10	<10	17	10	46	0.47	2.02	42	9.1	-21	63.1	0.67
1127019527		22	<20	0.03	<10	<10	17	<10	34	0.23	0.71	26	9.4	4	22.2	1.17
1127019224		27	<20	0.02	<10	<10	15	<10	28	0.44	0.45	38	9.4	24	14.1	2.70
1128038026		16	<20	<0.01	<10	<10	3	<10	563	1.08	1.91	85	9.0	25	59.7	1.42
1127019166		27	<20	0.02	<10	<10	20	<10	36	0.38	0.31	37	9.4	27	9.7	3.82
1127019025		36	<20	0.02	<10	<10	16	<10	34	0.52	0.44	43	9.3	29	13.8	3.13
1127019178		89	<20	<0.01	<10	<10	5	<10	74	0.89	1.18	79	9.3	42	36.9	2.14
1128038022		15	<20	<0.01	<10	<10	2	<10	262	0.73	2.08	59	8.6	-6	65.0	0.91
1128038109		23	<20	<0.01	<10	<10	3	<10	162	1.04	1.62	80	8.5	29	50.6	1.58
V829039		19	<20	0.38	<10	<10	58	<10	59	0.02						

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method Analyte Units LOR	OA-VOL08 FIZZ RAT Unity 1
1128037014		3
1128036001		3
1128036050		3
1131066312		1
1131066220		1
1128037020		3
1128037021		2
1131067102		1
1128037001		3
1128037093		2
1131067052		1
1131066290		2
1131066377		1
1128037050		3
1131067010		1
1131067013		3
1128037098		2
V829038		
1128037128		2
1128037112		1
1131066386		2
1131066325		1
1131066263		1
1131066347		2
1131066416		1
1131066239		1
1128037194		2
1127019502		2
1127019535		2
1128038092		2
1127019024		2
1127019527		2
1127019224		2
1128038026		3
1127019166		2
1127019025		2
1127019178		3
1128038022		2
1128038109		2
V829039		

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CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1128038126		0.51		0.530	2.8	0.79	65	<10	20	<0.5	<2	2.07	2.0	8	77	71
1127019119		0.46		0.093	1.4	1.40	45	<10	40	<0.5	<2	2.17	<0.5	8	64	19
1129098230		0.51		0.236	1.2	0.86	92	<10	30	<0.5	2	0.64	6.4	6	66	29
1129098237		0.54		0.534	2.2	0.86	90	<10	30	<0.5	<2	1.34	9.2	7	66	42
1128038133		0.54		0.275	5.1	0.43	38	<10	30	<0.5	4	1.40	2.8	9	78	78
1129098228		0.43		0.175	1.4	1.33	96	<10	50	<0.5	<2	0.21	10.5	11	111	48
1127022331		0.47		0.095	0.8	0.62	30	<10	30	<0.5	<2	2.39	<0.5	9	121	69
1129098343		0.44		0.238	1.3	1.67	130	<10	40	<0.5	<2	0.24	6.4	7	69	33
1129098310		0.54		1.420	1.4	1.39	74	<10	30	<0.5	<2	0.39	7.4	8	62	75
1127019194		0.48	93.6	0.790	4.1	0.55	147	<10	30	<0.5	<2	2.21	3.9	9	93	55
1131068016		0.47		0.372	0.4	0.63	48	<10	30	<0.5	<2	0.04	0.7	11	50	15
1131068039		0.57		0.009	0.2	0.44	6	<10	10	<0.5	<2	0.10	<0.5	5	104	9
1127022068		0.53		0.030	0.2	1.17	7	<10	40	<0.5	<2	1.30	<0.5	9	95	21
1129098363		0.50		1.910	35.9	1.52	119	<10	20	<0.5	<2	0.28	18.8	7	56	359
1129098370		0.43		0.536	1.6	1.20	105	<10	20	<0.5	2	0.17	8.5	9	95	59
1127022041		0.44		0.059	0.3	1.36	8	<10	60	<0.5	<2	1.36	<0.5	9	91	22
1129098280		0.53		0.729	1.3	1.08	119	<10	60	<0.5	<2	0.18	7.0	10	95	75
V829040		0.06		0.402	4.8	0.81	<2	<10	50	<0.5	<2	0.42	<0.5	6	7	22
1127022007		0.53		0.010	0.3	1.08	5	<10	50	<0.5	<2	1.40	<0.5	8	208	26
1129098334		0.47		0.285	2.2	0.47	194	<10	30	<0.5	<2	0.21	9.9	10	163	79
1129098319		0.53		0.401	1.0	1.08	112	<10	20	<0.5	<2	0.21	5.7	10	85	27
1129098353		0.52		0.220	1.0	0.75	139	<10	70	<0.5	<2	0.52	1.1	14	256	42
1127022100		0.52		0.070	<0.2	1.10	8	<10	50	<0.5	<2	1.67	<0.5	8	118	27
1129098296		0.46		0.637	1.9	1.01	143	<10	20	<0.5	<2	0.15	13.2	10	203	61
1127022037		0.55		0.160	0.8	1.09	19	<10	50	<0.5	<2	1.40	0.7	12	175	27
1129052150		0.53		0.166	1.3	0.91	150	<10	30	<0.5	<2	0.23	23.8	7	160	77
1129052030		0.55		0.178	0.7	0.52	104	<10	20	<0.5	<2	0.37	0.9	10	147	28
1129052070		0.52		0.836	2.9	1.64	173	<10	20	<0.5	<2	0.31	22.8	7	142	279
1129052043		0.42		0.685	5.8	0.57	530	<10	20	<0.5	<2	1.03	13.8	9	225	118
1129052011		0.42		0.401	0.6	2.87	66	<10	210	0.8	<2	0.62	0.9	30	281	74
1129053120		0.48		0.533	0.7	0.40	75	<10	20	<0.5	<2	1.71	4.1	5	179	39
1129052013		0.50		1.075	1.3	1.15	142	<10	20	<0.5	<2	0.12	6.1	9	124	155
1128039004		0.47		0.338	2.8	0.44	36	<10	30	<0.5	<2	0.61	2.2	9	165	54
1128039025		0.46		0.377	3.2	0.44	40	<10	20	<0.5	2	0.57	4.1	8	232	64
V829041		0.06		0.200	1.4	0.75	2	<10	40	<0.5	<2	0.38	<0.5	9	11	50
1129052024		0.56		1.780	1.0	1.14	86	<10	20	<0.5	<2	0.21	4.7	8	131	51
1131069006		0.48		0.098	0.6	1.03	34	<10	40	<0.5	<2	0.51	<0.5	7	115	24
1129053064		0.52		0.623	0.6	0.60	128	<10	30	<0.5	<2	0.76	6.2	6	161	40
1131069105		0.51		0.119	<0.2	1.91	11	<10	30	<0.5	<2	0.92	<0.5	6	67	21
1131069047		0.47		0.013	<0.2	1.49	8	<10	30	<0.5	<2	0.55	<0.5	8	62	28

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOR	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1128038126		1.92	<10	<1	0.13	10	0.68	1070	1	0.02	10	430	233	1.79	2	<1
1127019119		1.72	<10	<1	0.14	10	0.95	622	1	0.04	9	370	16	1.01	<2	1
1129098230		2.19	<10	<1	0.22	10	0.52	605	1	<0.01	9	430	60	1.78	2	<1
1129098237		2.28	<10	<1	0.25	10	0.62	818	1	<0.01	9	460	164	2.01	4	<1
1128038133		2.12	<10	1	0.20	10	0.68	1460	<1	0.01	11	430	321	2.44	7	<1
1129098228		3.17	<10	<1	0.30	20	0.98	507	1	<0.01	23	640	27	2.19	<2	2
1127022331		2.02	<10	<1	0.17	10	0.72	570	1	0.03	10	380	4	1.02	<2	1
1129098343		2.32	<10	<1	0.58	20	1.33	856	1	<0.01	9	390	46	1.48	<2	1
1129098310		2.89	<10	<1	0.35	20	0.92	502	1	<0.01	10	400	30	1.74	2	1
1127019194		2.11	<10	1	0.19	<10	0.90	1975	1	0.01	11	400	599	2.04	3	<1
1131068016		1.82	<10	1	0.16	10	0.25	58	1	0.01	12	70	11	1.84	<2	<1
1131068039		0.46	<10	<1	0.03	<10	0.08	64	1	<0.01	6	290	2	0.19	<2	<1
1127022068		1.93	10	<1	0.30	10	0.68	391	1	0.04	11	390	3	0.30	<2	2
1129098363		2.90	<10	1	0.38	10	1.23	675	<1	<0.01	7	380	191	2.06	7	1
1129098370		2.78	<10	<1	0.33	20	0.78	803	1	0.01	11	430	14	2.02	<2	1
1127022041		2.03	<10	<1	0.35	10	0.72	458	1	0.06	9	390	<2	0.60	2	1
1129098280		2.75	<10	<1	0.33	20	0.71	690	1	0.01	18	580	15	2.04	<2	2
V829040		1.60	<10	<1	0.15	10	0.20	186	16	0.12	9	360	23	0.03	<2	1
1127022007		1.79	<10	<1	0.35	10	0.60	275	1	0.04	9	420	4	0.23	3	1
1129098334		2.52	<10	1	0.20	10	0.20	309	1	0.01	15	480	14	2.54	2	1
1129098319		2.34	<10	1	0.22	10	0.76	528	1	0.01	12	480	15	1.77	2	1
1129098353		2.67	<10	<1	0.30	10	0.60	1010	1	0.02	26	660	13	1.98	<2	2
1127022100		1.74	<10	<1	0.30	10	0.64	390	1	0.04	13	410	3	0.38	<2	1
1129098296		2.97	<10	<1	0.18	10	0.73	545	1	<0.01	11	440	21	2.30	<2	<1
1127022037		2.73	<10	<1	0.24	10	0.66	442	1	0.04	11	390	2	1.82	<2	1
1129052150		2.66	<10	1	0.31	10	0.53	476	1	<0.01	8	430	32	2.46	2	<1
1129052030		2.05	<10	1	0.16	10	0.38	953	1	<0.01	12	440	11	1.78	2	<1
1129052070		3.36	<10	<1	0.41	20	1.36	942	1	<0.01	11	400	34	2.18	5	1
1129052043		2.64	<10	<1	0.18	10	0.50	700	1	<0.01	11	450	53	2.47	<2	<1
1129052011		4.64	10	<1	0.83	30	2.71	3510	<1	0.01	90	2330	35	1.04	2	12
1129053120		1.80	<10	1	0.19	10	0.74	1510	1	<0.01	7	380	126	1.48	<2	<1
1129052013		2.52	<10	<1	0.14	10	0.77	436	1	<0.01	13	360	12	1.80	3	<1
1128039004		2.15	<10	<1	0.12	10	0.33	455	1	0.02	12	390	91	2.24	4	<1
1128039025		2.32	<10	1	0.10	10	0.34	467	1	0.02	14	410	71	2.39	3	<1
V829041		2.36	<10	<1	0.19	10	0.33	237	4	0.12	10	490	19	0.04	2	2
1129052024		2.47	<10	<1	0.18	10	0.73	543	1	<0.01	12	420	46	1.94	<2	<1
1131069006		1.40	<10	<1	0.12	10	0.38	252	1	0.03	8	460	15	0.98	<2	<1
1129053064		2.12	<10	<1	0.24	10	0.50	949	1	<0.01	7	310	28	1.65	<2	<1
1131069105		1.66	<10	<1	0.11	10	0.49	322	<1	0.08	5	420	6	0.49	<2	1
1131069047		1.48	<10	<1	0.10	10	0.38	370	1	0.05	6	440	8	0.29	<2	1

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Finalized Date: 24-APR-2018
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Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOR	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1128038126		20	<20	<0.01	<10	<10	3	<10	488	0.93	1.85	72	8.7	14	57.8	1.25
1127019119		33	<20	<0.01	<10	<10	5	<10	128	0.77	0.93	62	8.9	33	29.1	2.13
1129098230		7	<20	<0.01	<10	<10	4	<10	1560	0.22	1.80	21	8.7	-35	56.3	0.37
1129098237		21	<20	<0.01	<10	<10	4	<10	2240	0.49	1.95	40	8.7	-21	60.9	0.66
1128038133		14	<20	<0.01	<10	<10	2	<10	701	0.79	2.40	61	8.8	-14	75.0	0.81
1129098228		11	<20	0.02	<10	<10	20	<10	2570	0.04	2.18	10	8.4	-58	68.1	0.15
1127022331		38	<20	<0.01	<10	<10	3	<10	66	1.18	0.95	80	8.6	50	29.7	2.69
1129098343		10	<20	0.02	<10	<10	9	<10	1620	0.05	1.45	10	8.7	-35	45.3	0.22
1129098310		9	<20	0.02	<10	<10	8	<10	1820	0.13	1.74	15	8.6	-39	54.4	0.28
1127019194		23	<20	<0.01	<10	<10	3	<10	958	1.15	1.99	83	9.0	21	62.2	1.33
1131068016		14	<20	<0.01	<10	<10	3	<10	255	0.01	1.79	3	8.0	-53	55.9	0.05
1131068039		7	<20	<0.01	<10	<10	3	<10	26	0.02	0.19	3	7.5	-3	5.9	0.51
1127022068		23	<20	0.04	<10	<10	18	<10	112	0.42	0.31	40	9.1	30	9.7	4.13
1129098363		7	<20	0.01	<10	<10	8	<10	4470	0.08	2.13	12	8.6	-55	66.6	0.18
1129098370		6	<20	0.01	<10	<10	6	<10	2030	0.10	2.08	10	8.3	-55	65.0	0.15
1127022041		31	<20	0.04	<10	<10	16	<10	133	0.40	0.58	41	9.3	23	18.1	2.26
1129098280		10	<20	0.02	<10	<10	15	<10	1710	0.10	2.04	9	8.2	-55	63.8	0.14
V829040		20	20	0.28	<10	10	35	<10	45	0.02						
1127022007		19	<20	0.06	<10	<10	18	<10	81	0.43	0.23	42	9.4	35	7.2	5.84
1129098334		9	<20	0.01	<10	<10	6	<10	2340	0.08	2.60	8	8.1	-73	81.3	0.10
1129098319		7	<20	0.01	<10	<10	7	<10	1500	0.08	1.77	10	8.5	-45	55.3	0.18
1129098353		16	<20	0.03	<10	<10	22	<10	367	0.24	2.03	21	8.4	-42	63.4	0.33
1127022100		33	<20	0.04	<10	<10	14	<10	147	0.56	0.35	47	9.1	36	10.9	4.30
1129098296		5	<20	0.01	<10	<10	6	<10	3350	0.05	2.41	6	8.0	-69	75.3	0.08
1127022037		24	<20	0.02	<10	<10	11	<10	208	0.46	1.84	40	8.9	-18	57.5	0.70
1129052150		9	<20	0.01	<10	<10	5	<10	5780	0.10	2.53	10	8.1	-69	79.1	0.13
1129052030		8	<20	<0.01	<10	<10	3	<10	294	0.22	1.84	16	8.5	-42	57.5	0.28
1129052070		9	<20	0.02	<10	<10	9	10	5120	0.12	2.17	14	8.5	-54	67.8	0.21
1129052043		12	<20	<0.01	<10	<10	3	<10	3190	0.45	2.61	36	8.5	-46	81.6	0.44
1129052011		63	<20	0.11	<10	<10	89	<10	591	0.31	1.02	18	8.1	-14	31.9	0.56
1129053120		22	<20	<0.01	<10	<10	2	<10	1040	0.99	1.46	73	9.0	27	45.6	1.60
1129052013		7	<20	<0.01	<10	<10	5	<10	1560	0.02	1.89	5	8.2	-54	59.1	0.08
1128039004		15	<20	<0.01	<10	<10	2	<10	498	0.33	2.13	24	8.3	-43	66.6	0.36
1128039025		12	<20	<0.01	<10	<10	2	<10	1100	0.33	2.50	23	7.9	-55	78.1	0.29
V829041		16	<20	0.35	<10	<10	53	<10	57	0.01						
1129052024		10	<20	<0.01	<10	<10	6	<10	1260	0.02	1.96	6	8.1	-55	61.3	0.10
1131069006		31	<20	<0.01	<10	<10	5	<10	134	0.11	0.90	11	7.9	-17	28.1	0.39
1129053064		29	<20	<0.01	<10	<10	4	<10	1570	0.45	1.92	35	8.4	-25	60.0	0.58
1131069105		67	<20	0.01	<10	<10	6	<10	74	0.16	0.52	12	8.2	-4	16.3	0.74
1131069047		48	<20	0.01	<10	<10	6	<10	75	0.11	0.28	9	8.1	0	8.8	1.03

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method Analyte Units LOR	OA-VOL08 FIZZ RAT Unity 1
1128038126		2
1127019119		2
1129098230		2
1129098237		2
1128038133		2
1129098228		1
1127022331		2
1129098343		1
1129098310		1
1127019194		2
1131068016		1
1131068039		1
1127022068		2
1129098363		1
1129098370		1
1127022041		2
1129098280		1
V829040		
1127022007		2
1129098334		1
1129098319		1
1129098353		2
1127022100		2
1129098296		1
1127022037		2
1129052150		1
1129052030		1
1129052070		1
1129052043		2
1129052011		1
1129053120		2
1129052013		1
1128039004		2
1128039025		2
V829041		
1129052024		1
1131069006		1
1129053064		2
1131069105		1
1131069047		1

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1131069087		0.49		0.008	<0.2	1.20	8	<10	20	<0.5	<2	0.41	<0.5	8	160	21
1128039007		0.46		0.179	1.0	0.45	34	<10	20	<0.5	<2	1.74	1.3	8	176	28
1129098288		0.54		0.448	1.1	1.41	105	<10	20	<0.5	<2	0.29	11.6	8	95	73
1129098339		0.48		0.763	1.8	1.06	81	<10	20	<0.5	2	0.18	9.9	7	174	56
1129053069		0.43		8.37	11.9	0.42	174	<10	30	<0.5	<2	1.86	6.5	6	192	48
1131069001		0.51		0.106	2.0	0.96	49	<10	30	<0.5	2	0.73	4.2	11	199	77
1129053179		0.52		0.178	0.6	2.04	31	<10	40	<0.5	<2	1.71	0.6	10	196	32
1129053008		0.52		1.115	2.7	0.54	320	<10	20	<0.5	2	0.28	25.5	7	156	126
1129053043		0.53		0.380	3.2	0.72	104	<10	50	<0.5	<2	0.71	15.7	6	105	75
1129053100		0.50		0.287	0.6	0.58	51	<10	60	<0.5	<2	2.45	1.9	9	167	33
1128039094		0.47		0.512	2.1	1.21	23	<10	30	<0.5	3	0.48	1.8	16	159	83
V829042		0.06		6.61	4.7	0.85	<2	<10	50	<0.5	<2	0.52	<0.5	7	10	38
1128039061		0.53		0.112	0.7	0.78	34	<10	30	<0.5	<2	2.10	0.8	8	196	36
1127021125		0.57		0.023	0.2	1.07	6	<10	30	<0.5	<2	1.42	<0.5	6	239	26
1129053111		0.53		0.229	0.9	1.01	73	<10	20	<0.5	2	0.17	16.1	6	200	53
1127021080		0.55		0.043	0.2	1.12	5	<10	50	<0.5	2	1.40	<0.5	7	226	39
1128039050		0.57		1.480	2.2	0.54	55	<10	10	<0.5	<2	1.96	3.4	9	165	87
1129053010		0.60		0.539	1.4	0.49	381	<10	20	<0.5	<2	0.79	18.0	6	121	95
1129053037		0.59		1.210	4.8	0.53	264	<10	20	<0.5	<2	0.19	25.0	6	152	146
1128039084		0.50	94.5	1.070	5.2	0.29	93	<10	20	<0.5	<2	2.09	2.5	8	143	106
1129053009		0.57		0.287	0.9	0.47	236	<10	20	<0.5	<2	0.48	13.4	7	169	55
1127021110		0.56		0.045	<0.2	1.03	6	<10	40	<0.5	<2	1.25	<0.5	7	233	25
1127021074		0.57		0.006	<0.2	1.08	4	<10	40	<0.5	<2	1.87	<0.5	6	69	29
1127021044		0.57		0.202	1.7	1.33	18	<10	90	<0.5	4	1.45	<0.5	14	92	103
1128039017		0.56		0.430	1.8	0.49	65	<10	20	<0.5	<2	2.05	0.9	8	50	50
1128039139		0.53		0.464	3.5	0.41	31	<10	30	<0.5	2	2.44	1.5	9	89	37
1127021039		0.50		0.027	0.3	0.97	6	<10	40	<0.5	<2	1.69	<0.5	7	99	38
V829043		0.06		0.418	4.5	0.73	<2	<10	50	<0.5	<2	0.36	<0.5	5	6	22
1128039044		0.44		0.125	2.3	0.39	24	<10	20	<0.5	<2	2.66	2.1	9	93	51
1127021136		0.57		0.023	<0.2	1.04	3	<10	30	<0.5	<2	1.47	<0.5	8	98	23
1128040002		0.45		0.048	0.5	1.14	39	<10	40	<0.5	<2	1.15	<0.5	7	65	17
1128040065		0.45		0.285	1.5	0.98	31	<10	30	<0.5	<2	1.46	0.5	7	44	31
1128040136		0.38		0.807	6.4	0.51	76	<10	20	<0.5	<2	1.37	3.1	8	81	152
1128040134		0.49		0.619	3.9	0.62	33	<10	20	<0.5	<2	1.24	0.5	10	71	29
1128040120		0.50		0.433	1.7	0.64	27	<10	20	<0.5	<2	0.73	<0.5	9	76	26
1128040154		0.63		0.620	14.7	0.49	61	<10	20	<0.5	6	1.86	6.1	9	92	138
1129057019		0.51		0.191	1.1	0.82	76	<10	20	<0.5	<2	1.96	2.3	7	63	38
1127021010		0.51		0.145	0.6	1.15	10	<10	70	<0.5	<2	1.16	<0.5	14	90	45
1128040017		0.46		0.447	4.5	0.50	77	<10	30	<0.5	<2	1.15	2.2	9	55	147
1127021009		0.47		0.015	0.2	1.15	6	<10	60	<0.5	<2	1.33	<0.5	9	115	27

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOR	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1131069087		1.61	<10	<1	0.07	10	0.30	251	1	0.04	7	420	3	0.42	<2	<1
1128039007		2.02	<10	<1	0.13	10	0.94	969	1	0.01	11	380	70	1.98	<2	<1
1129098288		3.25	<10	<1	0.21	10	0.93	615	1	<0.01	10	430	20	2.25	<2	<1
1129098339		2.49	<10	1	0.29	20	0.72	512	1	<0.01	11	400	16	1.77	<2	<1
1129053069		1.86	<10	<1	0.20	10	0.68	1610	<1	<0.01	7	370	56	1.26	<2	<1
1131069001		4.93	<10	<1	0.10	10	0.62	366	3	0.03	23	530	21	4.15	<2	2
1129053179		2.37	<10	<1	0.19	20	1.00	688	1	0.11	17	630	31	1.17	<2	2
1129053008		3.99	<10	1	0.20	10	0.28	438	1	<0.01	9	390	211	4.14	2	<1
1129053043		1.96	<10	<1	0.32	10	0.37	528	1	<0.01	5	370	265	1.69	<2	<1
1129053100		1.80	<10	1	0.25	10	0.68	1270	1	<0.01	12	820	38	1.10	<2	2
1128039094		3.34	<10	<1	0.10	20	0.87	247	2	0.01	28	1700	52	3.01	3	2
V829042		1.67	<10	<1	0.17	10	0.35	180	20	0.13	10	560	10	0.08	<2	2
1128039061		2.02	<10	<1	0.12	10	0.72	413	1	0.03	10	380	37	1.80	<2	<1
1127021125		1.99	<10	<1	0.09	10	0.62	385	1	0.04	10	380	<2	0.35	<2	1
1129053111		2.38	<10	1	0.22	10	0.74	508	1	<0.01	9	300	30	1.60	<2	<1
1127021080		2.19	<10	<1	0.22	10	0.79	543	<1	0.03	8	390	<2	0.37	<2	1
1128039050		2.46	<10	<1	0.10	10	0.94	1160	1	0.01	13	380	496	2.23	3	<1
1129053010		3.17	<10	<1	0.17	10	0.40	1010	1	<0.01	8	370	80	3.18	<2	<1
1129053037		2.33	<10	<1	0.23	10	0.21	251	1	<0.01	7	390	611	2.47	<2	<1
1128039084		2.33	<10	<1	0.13	10	0.97	1330	1	0.01	12	410	419	2.43	10	<1
1129053009		2.63	<10	<1	0.19	10	0.31	659	1	<0.01	8	380	36	2.61	<2	<1
1127021110		2.05	<10	<1	0.11	10	0.58	302	1	0.04	10	380	<2	0.41	<2	1
1127021074		1.69	<10	<1	0.12	10	0.55	310	<1	0.05	8	390	<2	0.14	<2	1
1127021044		2.76	<10	<1	0.24	20	0.85	494	1	0.04	10	560	2	1.21	<2	2
1128039017		2.06	<10	<1	0.17	10	0.95	1510	1	0.01	11	430	94	1.95	<2	<1
1128039139		2.41	<10	<1	0.16	10	0.87	1530	1	0.01	13	410	94	2.50	3	<1
1127021039		1.74	<10	<1	0.13	10	0.54	324	1	0.05	10	380	2	0.22	<2	1
V829043		1.49	<10	<1	0.14	10	0.18	170	14	0.11	8	340	20	0.03	<2	1
1128039044		1.93	<10	<1	0.15	<10	1.17	1725	1	0.01	10	410	163	2.14	4	<1
1127021136		1.76	10	<1	0.10	10	0.57	230	1	0.05	9	380	<2	0.26	<2	1
1128040002		1.73	<10	<1	0.15	10	0.68	226	1	0.05	10	420	8	1.37	<2	<1
1128040065		1.74	<10	<1	0.14	10	0.79	719	1	0.04	10	410	32	1.77	<2	1
1128040136		1.97	<10	<1	0.17	10	0.69	857	1	0.02	11	430	371	2.21	12	<1
1128040134		1.97	<10	<1	0.12	10	0.70	710	1	0.02	12	460	18	2.12	2	<1
1128040120		1.78	<10	<1	0.13	10	0.44	604	1	0.03	12	410	13	1.93	<2	<1
1128040154		1.97	<10	1	0.16	<10	0.94	2240	2	0.01	11	400	500	2.32	13	<1
1129057019		1.83	<10	1	0.20	10	0.58	648	1	0.01	6	380	69	1.91	<2	<1
1127021010		2.13	10	<1	0.41	10	0.67	402	1	0.06	9	390	<2	0.74	<2	2
1128040017		2.26	<10	<1	0.18	10	0.54	805	1	0.02	13	470	190	2.55	4	<1
1127021009		1.81	10	<1	0.27	10	0.62	335	1	0.06	15	430	3	0.28	<2	2

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Finalized Date: 24-APR-2018
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Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOR	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1131069087		40	<20	0.01	<10	<10	5	<10	59	0.09	0.43	7	8.1	-6	13.4	0.52
1128039007		22	<20	<0.01	<10	<10	3	<10	339	1.05	2.12	81	8.6	15	66.3	1.22
1129098288		7	<20	0.01	<10	<10	8	<10	2920	0.10	2.36	8	8.2	-66	73.8	0.11
1129098339		7	<20	0.01	<10	<10	5	<10	2410	0.04	1.94	7	8.3	-54	60.6	0.12
1129053069		64	<20	<0.01	<10	<10	2	<10	1630	0.98	1.28	71	8.7	31	40.0	1.78
1131069001		21	<20	0.04	<10	<10	22	<10	1380	0.23	4.45	22	7.9	-117	139.1	0.16
1129053179		64	<20	0.05	<10	<10	20	<10	194	0.33	1.31	36	8.5	-5	40.9	0.88
1129053008		9	<20	<0.01	<10	<10	3	<10	6240	0.13	4.52	13	7.8	-128	141.3	0.09
1129053043		57	<20	0.01	<10	<10	4	<10	3770	0.25	1.75	25	8.7	-30	54.7	0.46
1129053100		88	<20	0.01	<10	<10	10	<10	531	1.04	1.13	81	8.6	46	35.3	2.29
1128039094		15	<20	<0.01	<10	<10	15	<10	507	0.12	3.15	14	7.7	-84	98.4	0.14
V829042		21	<20	0.23	<10	<10	48	<10	34	0.02						
1128039061		45	<20	<0.01	<10	<10	3	<10	176	0.79	1.94	63	8.9	2	60.6	1.04
1127021125		25	<20	0.01	<10	<10	12	<10	44	0.46	0.35	42	9.2	31	10.9	3.84
1129053111		13	<20	0.01	<10	<10	5	<10	3750	0.06	1.60	8	8.3	-42	50.0	0.16
1127021080		31	<20	0.03	<10	<10	17	<10	56	0.53	0.34	46	9.1	35	10.6	4.33
1128039050		18	<20	<0.01	<10	<10	3	<10	862	1.09	2.38	81	8.8	7	74.4	1.09
1129053010		13	<20	<0.01	<10	<10	2	<10	4260	0.40	3.58	33	8.5	-79	111.9	0.29
1129053037		16	<20	<0.01	<10	<10	2	<10	6170	0.06	2.61	7	8.3	-75	81.6	0.09
1128039084		17	<20	<0.01	<10	<10	2	<10	647	1.22	2.62	100	8.9	18	81.9	1.22
1129053009		9	<20	<0.01	<10	<10	2	<10	3170	0.24	3.02	21	8.3	-73	94.4	0.22
1127021110		21	<20	0.02	<10	<10	19	<10	33	0.39	0.41	37	9.2	24	12.8	2.89
1127021074		38	<20	0.01	<10	<10	11	<10	35	0.63	0.13	51	9.3	47	4.1	12.55
1127021044		45	<20	0.03	<10	<10	17	<10	60	0.46	1.19	43	8.9	6	37.2	1.16
1128039017		21	<20	<0.01	<10	<10	2	<10	255	1.16	2.03	85	8.9	22	63.4	1.34
1128039139		23	<20	<0.01	<10	<10	2	<10	427	1.30	2.54	100	8.9	21	79.4	1.26
1127021039		28	<20	0.01	<10	<10	14	<10	33	0.60	0.22	51	9.2	44	6.9	7.42
V829043		19	<20	0.26	<10	<10	33	<10	39	0.01						
1128039044		26	<20	<0.01	<10	<10	2	<10	579	1.51	2.19	122	9.0	54	68.4	1.78
1127021136		24	<20	0.01	<10	<10	15	<10	32	0.46	0.27	42	9.4	34	8.4	4.98
1128040002		44	<20	<0.01	<10	<10	4	<10	98	0.36	1.37	32	8.9	-11	42.8	0.75
1128040065		29	<20	<0.01	<10	<10	4	<10	139	0.72	1.83	59	8.9	2	57.2	1.03
1128040136		19	<20	<0.01	<10	<10	3	<10	801	0.78	2.35	62	9.0	-11	73.4	0.84
1128040134		22	<20	<0.01	<10	<10	3	<10	124	0.66	2.23	52	8.6	-18	69.7	0.75
1128040120		16	<20	<0.01	<10	<10	3	<10	98	0.37	2.06	31	8.4	-33	64.4	0.48
1128040154		21	<20	<0.01	<10	<10	2	<10	1485	1.07	2.57	90	8.6	10	80.3	1.12
1129057019		13	<20	<0.01	<10	<10	4	<10	921	0.61	1.98	54	8.5	-8	61.9	0.87
1127021010		23	<20	0.06	<10	<10	20	10	57	0.35	0.77	36	9.3	12	24.1	1.50
1128040017		15	<20	<0.01	<10	<10	3	<10	530	0.62	2.61	50	8.6	-32	81.6	0.61
1127021009		32	<20	0.04	<10	<10	19	10	52	0.41	0.29	40	9.4	31	9.1	4.41

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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ALS Canada Ltd.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method Analyte Units LOR	OA-VOL08 FIZZ RAT Unity 1
1131069087		1
1128039007		2
1129098288		1
1129098339		1
1129053069		2
1131069001		2
1129053179		2
1129053008		1
1129053043		2
1129053100		2
1128039094		1
V829042		
1128039061		2
1127021125		2
1129053111		1
1127021080		2
1128039050		2
1129053010		2
1129053037		1
1128039084		3
1129053009		2
1127021110		2
1127021074		2
1127021044		2
1128039017		2
1128039139		3
1127021039		2
V829043		
1128039044		3
1127021136		2
1128040002		2
1128040065		2
1128040136		2
1128040134		2
1128040120		2
1128040154		3
1129057019		2
1127021010		2
1128040017		2
1127021009		2

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1128040052		0.50		0.428	4.8	0.68	67	<10	20	<0.5	<2	1.41	3.4	7	65	142
1128040077		0.50		0.311	1.5	0.69	27	<10	20	<0.5	<2	0.69	0.5	9	77	29
1128040032		0.67		0.212	4.8	0.82	49	<10	30	<0.5	<2	1.46	0.5	8	101	84
V829044		0.06		6.64	4.9	0.81	2	<10	50	<0.5	<2	0.50	<0.5	6	9	39
1129057051		0.41		0.330	0.3	1.03	21	<10	80	<0.5	<2	0.23	1.0	10	38	29
1127023119		0.54		0.014	0.5	1.15	21	<10	40	<0.5	<2	2.50	<0.5	8	78	13
1129057088		0.54		0.230	1.0	0.93	47	<10	20	<0.5	<2	2.07	0.9	6	71	31
1128040401		0.48		0.337	8.4	0.38	30	<10	30	<0.5	2	2.36	2.0	10	89	62
1129057120		0.53		0.038	0.4	1.16	11	<10	40	<0.5	<2	1.92	0.7	10	104	18
1128040089		0.49		0.441	6.2	0.42	66	<10	30	<0.5	<2	2.08	4.7	8	99	148
1129057060		0.52		0.167	0.4	0.55	53	<10	90	<0.5	<2	0.94	1.8	10	119	20
1128040090		0.57		0.437	5.8	0.41	63	<10	30	<0.5	<2	1.52	4.3	9	104	163
1129057103		0.56		0.911	1.2	0.47	80	<10	50	<0.5	<2	0.64	9.3	7	80	84
1129057169		0.47		0.246	1.4	0.94	50	<10	20	<0.5	2	2.02	1.3	8	79	47
1127024096		0.56		0.521	0.5	0.81	107	<10	30	<0.5	<2	1.43	<0.5	8	65	27
1127023041		0.49		0.060	0.5	1.45	25	<10	40	<0.5	<2	1.69	<0.5	9	102	15
1127021025		0.50		0.049	0.3	1.12	9	<10	60	<0.5	<2	1.36	<0.5	10	85	29
1127021101		0.46		0.019	<0.2	1.06	3	<10	40	<0.5	<2	1.57	<0.5	11	83	23
1127023068		0.57		0.009	0.4	1.19	22	<10	40	<0.5	<2	2.46	<0.5	6	66	8
1129057130		0.52		0.135	1.3	0.89	44	<10	20	<0.5	<2	1.52	1.1	7	75	25
1129057108		0.56		0.138	1.3	0.39	56	<10	30	<0.5	<2	1.85	1.4	8	92	28
1127024083		0.57		1.045	1.4	0.57	61	<10	30	<0.5	<2	0.99	2.4	12	64	84
V829045		0.06		0.200	1.4	0.81	2	<10	40	<0.5	<2	0.43	<0.5	10	11	54

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOR	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1128040052		1.67	<10	<1	0.14	10	0.69	1460	2	0.01	8	410	393	1.64	4	<1
1128040077		1.90	<10	<1	0.15	10	0.42	495	1	0.03	12	420	17	2.10	<2	<1
1128040032		1.83	<10	<1	0.13	10	0.84	1250	7	0.01	8	400	42	1.58	<2	<1
V829044		1.60	<10	<1	0.17	10	0.35	177	17	0.13	9	580	9	0.08	<2	2
1129057051		1.90	<10	<1	0.28	20	0.48	480	<1	0.01	11	590	7	1.29	<2	1
1127023119		1.65	<10	<1	0.16	10	0.80	395	1	0.04	14	470	11	1.16	<2	1
1129057088		1.68	<10	<1	0.19	10	0.66	885	1	0.01	6	370	173	1.51	2	<1
1128040401		2.33	<10	<1	0.18	<10	0.73	2060	1	0.01	10	410	241	2.76	9	<1
1129057120		2.18	<10	<1	0.16	10	0.55	476	1	0.04	10	470	10	0.59	<2	1
1128040089		2.05	<10	1	0.21	<10	0.60	1920	1	0.02	11	420	524	2.42	5	<1
1129057060		2.37	<10	<1	0.33	10	0.53	1725	1	<0.01	12	750	78	2.14	<2	1
1128040090		2.25	<10	1	0.19	<10	0.69	2210	1	0.01	10	420	507	2.64	5	<1
1129057103		2.04	<10	<1	0.26	10	0.30	1160	<1	<0.01	7	460	106	2.09	4	<1
1129057169		1.53	<10	<1	0.20	10	0.67	834	1	0.01	7	390	101	1.30	<2	<1
1127024096		2.46	<10	<1	0.17	10	0.66	961	<1	0.02	9	530	20	2.02	<2	1
1127023041		1.72	<10	<1	0.18	10	0.64	424	1	0.12	15	370	10	1.13	2	1
1127021025		1.98	10	<1	0.30	10	0.70	510	1	0.05	9	400	<2	0.53	<2	1
1127021101		1.66	10	<1	0.13	20	0.53	254	1	0.06	9	380	<2	0.18	<2	1
1127023068		1.50	<10	<1	0.16	10	0.74	349	1	0.07	8	360	12	1.11	<2	1
1129057130		1.66	<10	<1	0.20	20	0.60	664	1	0.01	7	400	36	1.43	<2	<1
1129057108		2.11	<10	<1	0.20	10	0.47	1185	1	0.01	8	420	167	2.21	<2	<1
1127024083		2.39	<10	<1	0.23	10	0.35	585	1	0.02	17	490	323	2.76	<2	<1
V829045		2.39	<10	<1	0.20	10	0.35	241	3	0.13	11	500	23	0.04	<2	2

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOR	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1128040052		20	<20	<0.01	<10	<10	3	<10	850	0.73	1.70	59	8.8	6	53.1	1.11
1128040077		18	<20	<0.01	<10	<10	3	<10	132	0.34	2.19	27	8.7	-41	68.4	0.39
1128040032		25	<20	<0.01	<10	<10	3	<10	157	0.77	1.54	61	8.8	13	48.1	1.27
V829044		20	<20	0.23	<10	<10	48	<10	32	0.02						
1129057051		11	<20	0.01	<10	<10	8	<10	428	0.06	1.26	9	8.6	-30	39.4	0.23
1127023119		57	<20	<0.01	<10	<10	10	<10	52	0.78	1.12	67	8.7	32	35.0	1.91
1129057088		19	<20	<0.01	<10	<10	4	<10	279	0.69	1.50	56	8.8	9	46.9	1.19
1128040401		20	<20	<0.01	<10	<10	2	<10	520	1.20	2.75	98	9.0	12	85.9	1.14
1129057120		28	<20	0.03	<10	<10	21	<10	219	0.62	0.62	53	9.0	34	19.4	2.74
1128040089		22	<20	<0.01	<10	<10	2	<10	1225	1.03	2.51	81	9.0	3	78.4	1.03
1129057060		26	<20	0.02	<10	<10	9	<10	550	0.55	2.22	42	8.7	-27	69.4	0.61
1128040090		17	<20	<0.01	<10	<10	2	<10	1045	0.90	2.76	71	8.9	-15	86.3	0.82
1129057103		58	<20	<0.01	<10	<10	3	<10	2430	0.36	2.22	28	8.7	-41	69.4	0.40
1129057169		17	<20	<0.01	<10	<10	5	10	367	0.68	1.29	57	8.7	17	40.3	1.41
1127024096		16	<20	<0.01	<10	<10	4	<10	121	0.72	2.15	56	8.6	-11	67.2	0.83
1127023041		64	<20	0.01	<10	<10	9	10	76	0.45	1.14	42	8.7	6	35.6	1.18
1127021025		29	<20	0.04	<10	<10	16	<10	42	0.50	0.51	45	9.2	29	15.9	2.82
1127021101		30	<20	0.01	<10	<10	16	10	24	0.49	0.15	45	9.4	40	4.7	9.60
1127023068		67	<20	<0.01	<10	<10	6	<10	55	0.75	1.08	65	9.0	31	33.8	1.93
1129057130		17	<20	<0.01	<10	<10	5	<10	369	0.51	1.40	41	8.5	-3	43.8	0.94
1129057108		18	<20	<0.01	<10	<10	2	<10	493	0.84	2.20	66	8.8	-3	68.8	0.96
1127024083		13	<20	<0.01	<10	<10	3	<10	562	0.44	2.72	37	8.6	-48	85.0	0.44
V829045		19	<20	0.38	<10	<10	57	<10	59	0.02						

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method Analyte Units LOR	OA-VOL08 FIZZ RAT Unity 1
1128040052		2
1128040077		1
1128040032		2
V829044		
1129057051		1
1127023119		2
1129057088		2
1128040401		3
1129057120		2
1128040089		2
1129057060		2
1128040090		2
1129057103		2
1129057169		2
1127024096		2
1127023041		2
1127021025		2
1127021101		2
1127023068		2
1129057130		2
1129057108		2
1127024083		2
V829045		

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Finalized Date: 24-APR-2018
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Project: Mine Site Lab Pulps February

CERTIFICATE OF ANALYSIS TB18073654

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

CERTIFICATE TB18098363

Project: Mine Site Lab Pulps March

P.O. No.: 4500009909

This report is for 143 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 27-APR-2018.

The following have access to data associated with this certificate:

JOHN BLIGH	JASON PATTISON	TIM SCHWARTZ

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
ATTN: JASON PATTISON
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
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Finalized Date: 18-MAY-2018
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Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr
	Units	kg	%	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1
1127026174		0.50	85.3	0.032		0.4	1.43	14	<10	50	<0.5	<2	2.26	<0.5	6	95
1127025302		0.41		0.084		0.2	1.15	7	<10	40	<0.5	<2	0.98	<0.5	7	123
1128044051		0.50		1.680		1.0	0.56	107	<10	70	<0.5	<2	0.37	10.6	6	97
1127025301		0.41		0.117		0.3	1.15	9	<10	50	<0.5	2	1.63	<0.5	8	114
1127025342		0.55		0.141		0.2	1.08	7	<10	40	<0.5	<2	1.23	<0.5	10	109
1127025367		0.48		0.040		<0.2	1.16	5	<10	40	<0.5	2	1.63	<0.5	8	131
1126003068		0.46		0.108		1.1	3.68	17	<10	100	<0.5	3	3.27	1.2	42	98
1127024368		0.50		0.025		<0.2	1.08	3	<10	40	<0.5	<2	1.56	<0.5	6	112
1128045063		0.44		0.042		<0.2	1.01	5	<10	40	<0.5	<2	1.02	<0.5	6	161
1128045003		0.42		0.034		0.6	1.19	16	<10	50	<0.5	<2	1.78	1.0	6	107
1128045089		0.52		0.109		0.7	0.44	91	<10	60	<0.5	<2	1.38	1.6	11	88
1127025345		0.43		0.046		0.2	1.14	8	<10	60	<0.5	<2	1.60	<0.5	9	157
1128045020		0.50		0.047		0.9	0.60	62	<10	30	<0.5	<2	2.35	<0.5	6	100
1127026090		0.62		0.106		<0.2	1.06	9	<10	30	<0.5	<2	1.85	<0.5	11	107
1128045145		0.43		0.086		0.6	1.01	57	<10	30	<0.5	<2	1.78	<0.5	5	46
1130094001		0.48		0.163		1.1	0.90	41	<10	30	<0.5	<2	0.14	1.6	10	118
1128045010		0.62		0.082		0.3	1.90	7	10	40	<0.5	<2	1.55	0.7	16	119
1126003048		0.58		0.061		0.5	1.18	7	<10	60	<0.5	<2	1.47	<0.5	8	113
1130094016		0.38		0.202		0.4	1.58	35	<10	40	<0.5	<2	0.13	0.5	9	76
1128045071		0.53		0.306		0.2	1.01	43	10	30	<0.5	<2	1.36	<0.5	7	56
1126003026		0.50		0.012		<0.2	1.05	8	<10	50	<0.5	<2	1.47	<0.5	6	115
1128045096		0.53		1.440		1.9	0.94	48	<10	20	<0.5	<2	1.69	1.0	6	90
1128046120		0.55		0.220		2.7	1.15	24	<10	30	<0.5	<2	1.26	1.3	8	74
1128045017		0.48		0.225		2.3	0.85	77	<10	30	<0.5	<2	1.66	1.0	6	82
V829046		0.06		2.07		6.3	0.76	398	<10	40	<0.5	2	1.20	1.0	7	13
1127026053		0.50		0.025		0.2	1.72	23	<10	40	<0.5	<2	1.44	<0.5	6	128
1127026005		0.53		0.033		0.2	1.44	40	<10	40	<0.5	<2	1.36	<0.5	7	144
1127026004		0.48		0.067		<0.2	1.11	8	<10	50	<0.5	<2	1.04	<0.5	5	155
1127026068		0.45		0.198		0.8	0.92	31	<10	30	<0.5	<2	2.45	1.2	7	53
1127026021		0.48		0.314		0.5	0.72	34	<10	20	<0.5	<2	2.29	<0.5	7	203
1128042058		0.58		0.189		2.3	0.70	122	<10	20	<0.5	2	0.57	4.5	6	79
1128043410		0.50		0.358		0.9	0.93	437	<10	40	<0.5	<2	0.70	10.3	6	49
1128044002		0.47		1.270		2.5	0.79	147	<10	30	<0.5	<2	0.29	10.4	6	65
1128043317		0.56		0.506		1.2	0.88	75	<10	20	<0.5	<2	0.95	8.7	7	64
1127026006		0.49		0.018		0.2	1.60	27	<10	50	<0.5	<2	2.02	<0.5	6	71
1128043373		0.53		1.065		2.5	0.77	101	<10	30	<0.5	<2	1.65	19.7	6	67
1128043350		0.46		0.585		1.6	1.08	135	<10	40	<0.5	<2	0.92	17.2	6	53
1128041137		0.44		0.093		1.4	0.84	38	<10	40	<0.5	<2	0.54	0.5	7	103
1127026012		0.48		0.079		<0.2	1.84	32	<10	60	<0.5	<2	2.15	<0.5	11	121
1127026001		0.54		0.078		<0.2	1.11	6	<10	50	<0.5	<2	1.77	<0.5	8	134

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
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5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOR	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1127026174		18	1.72	<10	<1	0.17	20	0.68	380	<1	0.09	10	430	7	0.59	<2
1127025302		39	2.19	<10	<1	0.12	10	0.60	251	1	0.05	8	390	3	0.81	<2
1128044051		55	2.30	<10	<1	0.33	10	0.16	220	1	0.01	7	350	42	2.37	<2
1127025301		39	2.19	10	<1	0.14	10	0.58	248	1	0.06	9	360	4	0.77	<2
1127025342		21	2.19	<10	<1	0.12	10	0.60	242	1	0.05	10	350	2	0.72	<2
1127025367		29	2.19	10	<1	0.13	10	0.67	312	1	0.05	11	360	2	0.46	<2
1126003068		145	9.65	10	1	0.55	<10	1.38	1650	1	0.25	67	780	12	2.18	<2
1127024368		31	1.86	<10	<1	0.12	10	0.57	256	1	0.05	8	390	<2	0.27	<2
1128045063		21	1.62	<10	<1	0.18	20	0.50	321	1	0.05	5	460	14	0.15	<2
1128045003		55	1.95	<10	<1	0.21	10	0.70	488	2	0.05	9	390	20	0.66	<2
1128045089		17	1.56	<10	<1	0.28	10	0.45	1370	2	0.01	13	480	217	1.43	2
1127025345		24	2.20	10	<1	0.23	10	0.57	296	1	0.06	10	380	2	0.42	<2
1128045020		13	1.76	<10	<1	0.18	10	0.54	1345	<1	0.01	7	370	40	1.57	2
1127026090		13	2.17	<10	<1	0.08	10	0.70	269	1	0.05	10	390	2	1.05	<2
1128045145		14	1.53	<10	<1	0.28	10	0.54	881	<1	0.02	6	360	25	1.30	<2
1130094001		47	2.13	<10	<1	0.14	10	0.43	853	1	0.04	11	190	127	1.89	<2
1128045010		47	3.22	10	<1	0.16	10	0.83	562	2	0.09	25	540	10	0.49	<2
1126003048		36	1.84	<10	<1	0.20	10	0.66	411	1	0.07	12	440	4	0.52	<2
1130094016		33	2.05	<10	<1	0.14	20	1.03	398	1	0.04	10	220	34	1.46	<2
1128045071		14	1.66	<10	<1	0.21	20	0.65	655	<1	0.02	8	390	44	1.40	<2
1126003026		25	1.54	<10	<1	0.22	10	0.66	320	1	0.05	12	400	3	0.22	3
1128045096		46	1.64	<10	<1	0.21	10	0.66	861	1	0.02	8	380	255	1.40	<2
1128046120		42	2.00	<10	<1	0.18	10	0.49	521	1	0.04	11	430	23	2.06	<2
1128045017		44	1.86	<10	<1	0.21	10	0.52	955	1	0.02	7	370	282	1.74	2
V829046		283	4.15	<10	1	0.24	10	0.28	452	3	0.02	8	150	20	3.24	4
1127026053		24	1.50	10	<1	0.20	10	0.72	355	1	0.15	9	360	8	0.42	<2
1127026005		13	1.56	<10	<1	0.18	10	0.65	419	1	0.11	10	330	9	0.42	<2
1127026004		15	1.76	<10	<1	0.24	20	0.55	345	3	0.05	16	470	9	0.20	<2
1127026068		36	1.89	<10	1	0.24	10	1.01	1005	1	0.03	10	380	93	1.88	<2
1127026021		20	2.33	<10	<1	0.14	10	0.86	1030	2	0.02	13	360	38	2.27	<2
1128042058		58	2.62	<10	<1	0.21	20	0.36	324	<1	0.01	8	420	14	2.49	<2
1128043410		58	1.94	<10	<1	0.29	10	0.57	659	<1	0.01	7	340	58	1.57	3
1128044002		63	2.64	<10	<1	0.28	10	0.38	533	1	0.01	7	350	131	2.49	<2
1128043317		64	1.94	<10	<1	0.25	10	0.58	518	1	0.01	9	390	40	1.76	<2
1127026006		15	1.62	<10	<1	0.20	10	0.76	438	1	0.11	10	360	9	0.50	<2
1128043373		179	2.30	<10	<1	0.27	10	0.77	1330	<1	0.01	7	350	99	2.15	3
1128043350		74	2.78	<10	<1	0.35	20	0.57	491	1	0.01	8	370	41	2.38	2
1128041137		18	2.41	<10	<1	0.19	10	0.37	357	1	0.04	9	420	63	2.63	<2
1127026012		55	2.11	10	<1	0.16	20	1.25	724	1	0.07	32	620	11	0.94	<2
1127026001		30	1.98	<10	<1	0.12	10	0.62	285	<1	0.07	9	410	2	0.50	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOR	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1127026174		1	64	<20	<0.01	<10	<10	9	<10	53	0.66	0.58	59	9.0	41	18.1
1127025302		1	23	<20	<0.01	<10	<10	12	<10	34	0.31	0.82	31	9.1	5	25.6
1128044051		<1	44	<20	0.01	<10	<10	3	10	2510	0.11	2.55	13	8.6	-67	79.7
1127025301		1	26	<20	0.01	<10	<10	12	<10	31	0.49	0.75	47	9.3	24	23.4
1127025342		1	22	<20	0.01	<10	<10	15	<10	25	0.40	0.72	37	9.4	15	22.5
1127025367		1	27	<20	0.02	<10	<10	17	<10	36	0.52	0.46	48	9.4	34	14.4
1126003068		13	133	<20	0.17	<10	<10	262	<10	370	1.01	2.45	83	8.9	6	76.6
1127024368		1	26	<20	0.01	<10	<10	13	<10	28	0.49	0.27	44	9.5	36	8.4
1128045063		1	21	<20	0.03	<10	<10	13	<10	134	0.33	0.16	32	9.4	27	5.0
1128045003		1	25	<20	0.03	<10	<10	14	<10	277	0.54	0.66	50	9.2	29	20.6
1128045089		1	82	<20	0.01	<10	<10	4	<10	488	0.64	1.41	54	9.1	10	44.1
1127025345		1	34	<20	0.03	<10	<10	18	<10	28	0.52	0.44	47	9.3	33	13.8
1128045020		<1	26	<20	<0.01	<10	<10	2	<10	101	0.91	1.53	75	8.8	27	47.8
1127026090		1	40	<20	<0.01	<10	<10	12	<10	22	0.61	1.04	53	9.1	21	32.5
1128045145		<1	19	<20	<0.01	<10	<10	4	<10	71	0.55	1.26	52	9.1	13	39.4
1130094001		<1	14	<20	<0.01	<10	<10	4	<10	504	0.15	1.90	6	8.4	-53	59.4
1128045010		4	63	<20	0.08	<10	<10	62	<10	277	0.37	0.50	37	9.2	21	15.6
1126003048		1	37	<20	0.02	<10	<10	17	10	110	0.45	0.53	44	9.2	27	16.6
1130094016		<1	16	<20	<0.01	<10	<10	6	<10	237	0.08	1.43	6	8.6	-39	44.7
1128045071		<1	21	<20	<0.01	<10	<10	5	<10	100	0.38	1.39	38	8.8	-5	43.4
1126003026		1	31	<20	0.02	<10	<10	15	<10	53	0.46	0.24	44	9.5	37	7.5
1128045096		<1	16	<20	<0.01	<10	<10	4	<10	401	0.48	1.31	46	9.1	5	40.9
1128046120		<1	25	<20	<0.01	<10	<10	3	<10	317	0.29	2.08	32	8.6	-33	65.0
1128045017		<1	14	<20	<0.01	<10	<10	4	<10	335	0.51	1.74	36	9.0	-18	54.4
V829046		1	18	<20	0.01	<10	<10	6	<10	229	0.33					
1127026053		1	58	<20	0.02	<10	<10	12	<10	67	0.35	0.42	32	9.2	19	13.1
1127026005		1	46	<20	0.03	<10	<10	12	<10	67	0.40	0.44	33	9.2	19	13.8
1127026004		1	25	<20	0.05	<10	<10	14	<10	66	0.33	0.21	30	9.4	23	6.6
1127026068		1	32	<20	<0.01	<10	<10	4	<10	306	1.11	1.83	95	9.1	38	57.2
1127026021		<1	29	<20	<0.01	<10	<10	3	<10	95	1.10	2.34	81	8.8	8	73.1
1128042058		<1	8	<20	<0.01	<10	<10	3	<10	1110	0.17	2.34	17	8.6	-56	73.1
1128043410		<1	16	<20	<0.01	<10	<10	4	<10	2430	0.23	1.57	24	9.0	-25	49.1
1128044002		<1	11	<20	<0.01	<10	<10	3	<10	2480	0.12	2.44	14	8.6	-62	76.3
1128043317		<1	16	<20	<0.01	<10	<10	4	<10	2140	0.26	1.68	28	9.0	-25	52.5
1127026006		1	61	<20	0.01	<10	<10	10	<10	67	0.53	0.47	51	9.3	36	14.7
1128043373		<1	52	<20	<0.01	<10	<10	4	10	4980	0.72	2.16	62	8.9	-6	67.5
1128043350		<1	11	<20	0.01	<10	<10	5	10	4160	0.30	2.46	29	8.9	-48	76.9
1128041137		<1	24	<20	<0.01	<10	<10	4	<10	130	0.22	2.50	18	8.4	-60	78.1
1127026012		2	73	<20	0.06	<10	<10	24	<10	159	0.56	0.84	50	8.4	24	26.3
1127026001		1	49	<20	<0.01	<10	<10	12	<10	26	0.63	0.46	53	9.1	39	14.4

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EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
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Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method Analyte Units LOR	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1127026174		3.26	2
1127025302		1.21	2
1128044051		0.16	1
1127025301		2.01	2
1127025342		1.64	2
1127025367		3.34	2
1126003068		1.08	2
1127024368		5.21	2
1128045063		6.40	2
1128045003		2.42	2
1128045089		1.23	2
1127025345		3.42	2
1128045020		1.57	2
1127026090		1.63	2
1128045145		1.32	2
1130094001		0.10	1
1128045010		2.37	2
1126003048		2.66	2
1130094016		0.13	1
1128045071		0.87	2
1126003026		5.87	2
1128045096		1.12	2
1128046120		0.49	2
1128045017		0.66	2
V829046			
1127026053		2.44	2
1127026005		2.40	2
1127026004		4.57	2
1127026068		1.66	3
1127026021		1.11	2
1128042058		0.23	1
1128043410		0.49	2
1128044002		0.18	1
1128043317		0.53	2
1127026006		3.47	2
1128043373		0.92	2
1128043350		0.38	2
1128041137		0.23	1
1127026012		1.90	2
1127026001		3.69	2

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method Analyte Units LOR	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1128043354		0.54		0.343		1.1	1.20	115	<10	40	<0.5	<2	0.35	6.1	8	53
1127026106		0.44		0.353		0.2	1.43	38	<10	40	<0.5	<2	2.10	0.6	8	95
1128044001		0.53		0.407		1.2	0.62	305	<10	30	<0.5	<2	0.42	19.6	9	79
V829047		0.06		0.182		1.1	0.80	3	<10	40	<0.5	<2	0.40	<0.5	10	11
1127023037		0.55		0.010		<0.2	1.24	46	<10	50	<0.5	<2	1.70	<0.5	8	55
1127023023		0.54		0.180		<0.2	1.25	20	<10	40	<0.5	<2	1.28	<0.5	9	120
1127024027		0.53		0.268		<0.2	2.02	52	<10	40	<0.5	<2	1.10	<0.5	8	72
1129057140		0.53		1.050		1.5	0.36	86	<10	50	<0.5	2	0.50	15.8	7	152
1129056006		0.48		0.357		<0.2	1.44	100	<10	60	<0.5	<2	0.25	0.8	11	52
1127023004		0.52	86.1	0.082		<0.2	1.15	13	<10	40	<0.5	<2	1.67	<0.5	10	131
1129056030		0.51		0.538		<0.2	0.58	135	<10	60	<0.5	<2	0.15	22.6	10	77
1129056034		0.50		0.544		11.5	0.68	51	<10	40	<0.5	<2	1.12	17.3	10	57
1127024001		0.52		0.300		0.9	1.52	73	<10	60	<0.5	<2	2.13	0.7	8	39
1127024038		0.64		0.604		0.8	0.95	37	<10	30	<0.5	<2	1.95	3.3	7	51
1127035110		0.54		0.247		2.7	3.04	25	<10	10	<0.5	3	5.97	<0.5	46	430
1126002174		0.54		0.186		1.1	3.14	16	<10	90	<0.5	<2	2.52	1.3	42	99
1127035405		0.55		0.016		<0.2	1.06	11	<10	50	<0.5	<2	1.87	<0.5	6	89
1126002186		0.50		0.009		<0.2	2.86	17	<10	80	<0.5	<2	2.11	<0.5	22	93
1129055021		0.53		0.194		0.9	0.49	120	<10	20	<0.5	<2	1.19	9.0	7	79
1128043348		0.55		0.439		0.3	0.91	97	<10	20	<0.5	<2	0.65	1.5	8	69
1128042144		0.56		2.21		1.2	1.28	141	<10	30	<0.5	<2	0.87	3.8	8	71
1128042134		0.57		0.859		0.6	1.19	95	<10	20	<0.5	<2	0.40	2.1	8	88
V829048		0.06		6.73		4.9	0.84	<2	<10	50	<0.5	<2	0.55	<0.5	7	10
1128045023		0.53		0.093		0.3	0.46	59	<10	40	<0.5	<2	2.35	0.8	8	111
1128046168		0.58		0.478		1.4	0.88	45	<10	30	<0.5	<2	1.03	1.2	9	78
1127025350		0.48		0.122		0.5	1.07	6	<10	50	<0.5	<2	1.46	<0.5	9	154
1127025311		0.48		0.145		<0.2	1.00	3	<10	50	<0.5	<2	1.30	<0.5	8	161
1127025421		0.52		0.021		<0.2	0.97	5	<10	40	<0.5	<2	2.01	<0.5	7	99
1127025405		0.54		0.023		<0.2	1.09	3	<10	70	<0.5	<2	1.66	<0.5	9	131
1128046140		0.54		0.343		1.4	1.34	48	<10	40	<0.5	<2	2.04	2.5	8	49
1126003005		0.51		0.132		0.8	1.77	12	<10	50	<0.5	<2	2.21	<0.5	11	115
1126003032		0.54		0.008		<0.2	1.65	4	<10	40	<0.5	<2	1.71	<0.5	7	91
1127025304		0.50		0.137		0.5	1.10	7	<10	70	<0.5	<2	1.20	<0.5	7	134
1128048087		0.61		0.411		0.9	1.05	157	<10	20	<0.5	<2	0.46	2.6	9	111
1128048088		0.45		1.190		2.9	1.48	171	<10	30	<0.5	<2	0.39	0.6	10	88
1128048121		0.50		0.263		1.7	0.51	856	<10	30	<0.5	<2	0.86	16.3	6	87
1128046133		0.55		0.106		0.8	1.21	41	<10	30	<0.5	<2	2.09	0.6	8	153
1126003045		0.64		0.081		1.1	3.08	14	<10	30	<0.5	<2	3.48	0.9	34	90
1128048137		0.55		0.606		2.2	0.55	499	<10	20	<0.5	2	0.45	25.1	11	121
1126003079		0.56		0.227		1.2	3.13	5	<10	110	<0.5	2	2.94	1.1	41	91

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOR	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1128043354		57	2.20	<10	<1	0.31	10	0.67	366	1	0.01	10	480	27	1.79	<2
1127026106		38	1.87	<10	<1	0.16	10	0.75	528	1	0.07	8	460	30	1.65	<2
1128044001		78	3.08	<10	1	0.25	10	0.33	636	1	0.01	10	400	50	3.34	<2
V829047		53	2.40	<10	<1	0.19	10	0.34	245	4	0.13	10	530	21	0.04	<2
1127023037		12	1.53	<10	<1	0.18	10	0.70	276	<1	0.07	10	380	8	1.17	<2
1127023023		20	1.99	<10	<1	0.12	20	0.69	319	1	0.05	10	470	16	0.66	2
1127024027		27	2.17	<10	<1	0.18	20	0.68	521	1	0.09	9	580	27	1.54	<2
1129057140		149	2.16	<10	1	0.23	10	0.17	863	1	0.01	7	370	247	2.48	3
1129056006		34	2.10	<10	<1	0.21	20	0.70	511	<1	0.01	11	720	4	1.28	<2
1127023004		29	1.99	<10	<1	0.10	20	0.66	325	1	0.06	20	400	3	0.65	<2
1129056030		57	2.10	<10	<1	0.18	10	0.06	39	1	0.02	13	420	7	2.63	<2
1129056034		39	2.50	<10	1	0.24	10	0.19	546	1	0.02	14	370	24	3.08	<2
1127024001		39	2.05	<10	<1	0.22	20	0.74	616	<1	0.08	10	430	16	1.37	2
1127024038		32	2.04	<10	<1	0.18	10	0.59	669	<1	0.03	11	380	243	2.12	<2
1127035110		147	7.15	10	<1	0.06	<10	3.31	1340	1	0.01	179	170	5	1.79	4
1126002174		102	8.68	10	<1	0.32	<10	1.31	1095	1	0.14	58	770	9	2.07	2
1127035405		21	1.83	<10	<1	0.14	20	0.62	389	2	0.05	11	440	3	0.72	<2
1126002186		42	5.60	10	<1	0.27	10	1.11	698	<1	0.17	34	620	7	1.18	<2
1129055021		39	1.81	<10	<1	0.21	10	0.58	1210	1	0.01	8	410	65	1.77	2
1128043348		24	2.16	<10	<1	0.21	10	0.76	1730	1	0.02	10	460	18	1.58	<2
1128042144		35	2.44	<10	<1	0.21	10	0.77	477	1	0.02	11	440	45	1.95	<2
1128042134		28	2.43	<10	<1	0.20	10	0.81	428	1	0.01	11	440	24	1.80	<2
V829048		40	1.71	<10	<1	0.17	10	0.36	183	42	0.14	10	580	9	0.06	<2
1128045023		17	2.06	<10	<1	0.24	10	0.35	1100	1	0.01	8	390	24	2.05	2
1128046168		29	2.08	<10	<1	0.19	10	0.45	1090	1	0.03	13	460	59	1.93	<2
1127025350		59	2.21	<10	<1	0.11	10	0.60	268	1	0.06	9	380	2	0.83	<2
1127025311		29	1.92	10	<1	0.10	10	0.54	237	1	0.05	8	380	2	0.35	<2
1127025421		47	1.79	<10	<1	0.13	20	0.63	323	3	0.06	10	370	<2	0.28	<2
1127025405		31	2.07	10	<1	0.24	10	0.60	267	1	0.06	11	380	4	0.27	2
1128046140		59	1.85	<10	<1	0.20	10	1.00	1030	1	0.04	8	480	143	1.51	<2
1126003005		51	1.90	10	<1	0.19	10	0.65	585	1	0.14	12	410	6	0.59	<2
1126003032		13	1.74	<10	<1	0.16	20	0.69	384	1	0.11	10	540	6	0.07	<2
1127025304		24	2.21	10	<1	0.24	10	0.62	247	2	0.06	15	410	3	0.70	<2
1128048087		47	2.84	<10	<1	0.19	10	0.73	506	1	0.01	10	430	73	2.26	3
1128048088		193	3.34	<10	<1	0.27	10	1.01	522	<1	<0.01	12	400	23	2.38	3
1128048121		61	2.46	<10	<1	0.27	10	0.25	644	<1	0.01	8	410	59	2.57	<2
1128046133		31	1.82	<10	<1	0.14	10	1.03	1025	1	0.05	9	440	40	1.29	<2
1126003045		100	8.33	10	<1	0.17	10	1.46	1465	1	0.08	50	740	8	1.72	3
1128048137		120	4.64	<10	<1	0.22	10	0.26	423	1	0.01	12	390	106	4.97	<2
1126003079		156	8.37	10	<1	0.51	10	1.45	1260	1	0.14	60	800	3	1.36	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOR	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1128043354		<1	10	<20	<0.01	<10	<10	7	<10	1385	0.08	1.64	11	8.8	-40	51.3
1127026106		1	46	<20	<0.01	<10	<10	5	<10	159	0.60	1.57	55	8.8	6	49.1
1128044001		<1	10	<20	<0.01	<10	<10	3	10	4290	0.20	3.33	18	8.2	-86	104.1
V829047		2	18	<20	0.38	<10	<10	58	<10	61	0.02					
1127023037		1	52	<20	<0.01	<10	<10	6	<10	53	0.49	1.08	46	9.2	12	33.8
1127023023		1	26	<20	0.01	<10	<10	17	<10	70	0.37	0.59	36	9.1	18	18.4
1127024027		1	36	<20	0.01	<10	<10	7	<10	123	0.12	1.46	18	8.8	-28	45.6
1129057140		<1	39	<20	<0.01	<10	<10	2	<10	3960	0.26	2.37	21	8.8	-53	74.1
1129056006		1	26	<20	<0.01	<10	<10	8	<10	368	0.03	1.14	7	8.5	-29	35.6
1127023004		1	38	<20	<0.01	<10	<10	13	10	35	0.53	0.60	47	9.2	28	18.8
1129056030		<1	18	<20	<0.01	<10	<10	2	10	5100	0.03	2.48	4	7.4	-74	77.5
1129056034		<1	35	<20	<0.01	<10	<10	3	10	4100	0.37	2.96	32	8.6	-61	92.5
1127024001		1	47	<20	<0.01	<10	<10	7	<10	195	0.58	1.29	54	9.1	14	40.3
1127024038		<1	21	<20	<0.01	<10	<10	4	<10	743	0.57	2.09	53	9.0	-12	65.3
1127035110		13	90	<20	0.01	<10	<10	87	<10	128	2.64	1.71	237	8.4	184	53.4
1126002174		11	44	<20	0.15	<10	<10	216	10	445	0.55	2.13	56	8.7	-11	66.6
1127035405		1	37	<20	<0.01	<10	<10	13	10	31	0.57	0.72	51	9.2	29	22.5
1126002186		5	69	<20	0.09	<10	<10	120	<10	144	0.48	1.13	49	8.9	14	35.3
1129055021		<1	16	<20	<0.01	<10	<10	3	<10	2260	0.63	1.62	50	9.0	-1	50.6
1128043348		<1	13	<20	<0.01	<10	<10	4	<10	452	0.37	1.51	31	9.0	-16	47.2
1128042144		<1	14	<20	0.01	<10	<10	5	<10	853	0.20	1.91	23	8.8	-37	59.7
1128042134		<1	7	<20	<0.01	<10	<10	5	<10	491	0.09	1.72	12	8.8	-42	53.8
V829048		2	21	<20	0.25	<10	<10	50	<10	34	0.02					
1128045023		<1	19	<20	<0.01	<10	<10	2	<10	200	0.87	1.89	71	8.9	12	59.1
1128046168		<1	17	<20	<0.01	<10	<10	3	<10	302	0.31	1.75	29	8.7	-26	54.7
1127025350		1	30	<20	<0.01	<10	<10	12	<10	23	0.45	0.83	42	9.1	16	25.9
1127025311		1	29	<20	0.01	<10	<10	14	<10	27	0.42	0.38	38	9.4	26	11.9
1127025421		1	45	<20	<0.01	<10	<10	8	<10	28	0.78	0.29	62	9.3	53	9.1
1127025405		1	37	<20	0.04	<10	<10	19	<10	29	0.51	0.29	47	9.4	38	9.1
1128046140		<1	31	<20	<0.01	<10	<10	6	<10	631	0.65	1.38	60	9.1	17	43.1
1126003005		1	88	<20	0.02	<10	<10	14	10	160	0.53	0.51	52	9.2	36	15.9
1126003032		1	64	<20	0.01	<10	<10	12	10	75	0.44	0.09	42	9.3	39	2.8
1127025304		2	25	<20	0.04	<10	<10	20	<10	29	0.34	0.68	35	9.2	14	21.3
1128048087		<1	8	<20	0.01	<10	<10	5	<10	703	0.14	2.24	14	8.6	-56	70.0
1128048088		1	11	<20	0.01	<10	<10	6	<10	204	0.12	2.44	13	8.7	-63	76.3
1128048121		<1	16	<20	<0.01	<10	<10	2	<10	3950	0.37	2.42	29	8.3	-47	75.6
1128046133		1	42	<20	<0.01	<10	<10	5	10	179	0.70	1.25	60	8.5	21	39.1
1126003045		7	89	<20	0.09	<10	<10	146	<10	425	1.13	1.62	137	8.3	86	50.6
1128048137		<1	8	<20	<0.01	<10	<10	3	<10	5910	0.21	5.38	15	8.0	-153	168.1
1126003079		11	70	<20	0.17	<10	<10	174	10	314	0.68	1.34	63	8.6	21	41.9

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method Analyte Units LOR	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1128043354		0.21	1
1127026106		1.12	2
1128044001		0.17	1
V829047			
1127023037		1.36	2
1127023023		1.95	2
1127024027		0.39	1
1129057140		0.28	1
1129056006		0.20	1
1127023004		2.51	2
1129056030		0.05	1
1129056034		0.35	2
1127024001		1.34	2
1127024038		0.81	2
1127035110		4.44	3
1126002174		0.84	2
1127035405		2.27	2
1126002186		1.39	2
1129055021		0.99	2
1128043348		0.66	2
1128042144		0.39	2
1128042134		0.22	1
V829048			
1128045023		1.20	2
1128046168		0.53	2
1127025350		1.62	2
1127025311		3.20	2
1127025421		6.84	2
1127025405		5.19	2
1128046140		1.39	2
1126003005		3.26	2
1126003032		14.93	2
1127025304		1.65	2
1128048087		0.20	1
1128048088		0.17	1
1128048121		0.38	2
1128046133		1.54	2
1126003045		2.71	3
1128048137		0.09	1
1126003079		1.50	2

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr
	Units	kg	%	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOR	0.02	0.01	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1
V829049		0.06		0.189		1.4	0.82	2	<10	40	<0.5	<2	0.44	<0.5	9	11
1128042101		0.44		2.15		0.8	1.11	106	<10	30	<0.5	<2	0.92	<0.5	7	104
1128042205		0.51		0.751		1.3	1.02	48	<10	30	<0.5	<2	1.29	3.2	9	67
1128042175		0.41		0.597		1.4	1.47	72	<10	30	<0.5	<2	2.49	2.5	8	64
1128042084		0.49		0.587		2.0	0.55	73	<10	30	<0.5	<2	2.52	1.6	8	90
1128042075		0.52		0.515		1.5	0.63	54	<10	30	<0.5	<2	2.68	2.2	8	112
1128043494		0.49		0.245		1.2	0.92	147	<10	20	<0.5	<2	0.67	4.1	8	113
1128042220		0.52		1.405		1.4	0.62	67	<10	30	<0.5	<2	2.27	2.3	8	105
1128043433		0.54		0.274		1.2	0.75	147	<10	30	<0.5	<2	0.41	3.5	9	81
1128042035		0.50		0.400		1.2	1.33	111	<10	30	<0.5	<2	0.55	<0.5	9	122
1128044057		0.49		2.88		4.1	0.56	193	<10	70	<0.5	2	0.41	16.3	20	87
1128042065		0.61		0.544		1.7	1.39	80	<10	30	<0.5	<2	0.30	<0.5	9	59
1128043485		0.52		0.523		1.3	1.11	76	<10	30	<0.5	<2	1.00	10.5	5	43
1128043465		0.46		1.225		2.7	0.92	119	<10	20	<0.5	<2	0.86	11.4	7	79
1128043429		0.47		0.283		1.3	0.67	152	<10	30	<0.5	<2	2.16	4.7	9	74
1128042050		0.49		0.802		1.0	1.52	87	<10	40	<0.5	<2	0.46	0.6	8	65
1128044119		0.45		0.497		0.9	0.87	120	<10	60	<0.5	<2	0.99	7.5	6	84
1128043454		0.57		0.181		0.5	0.77	67	<10	30	<0.5	<2	1.09	3.8	7	41
1128043416		0.45		0.290		0.9	1.31	53	<10	40	<0.5	<2	1.40	15.8	6	63
1128042057		0.52	86.2	0.931		2.2	0.88	145	<10	30	<0.5	<2	0.34	11.6	8	68
1128043423		0.52		0.364		1.3	1.19	135	<10	40	<0.5	<2	0.25	8.8	6	67
V829050		0.06		1.850		7.0	0.83	423	<10	50	<0.5	3	1.28	1.2	7	14
1126003120		0.54		0.135		0.6	2.47	47	<10	50	<0.5	<2	1.64	<0.5	10	86
1126003139		0.62		0.005		<0.2	1.73	5	<10	150	<0.5	<2	2.28	<0.5	13	92
1128047085		0.49		1.255		0.6	1.70	125	<10	30	<0.5	<2	0.14	2.5	10	84
1128047069		0.61		0.657		1.3	1.19	59	<10	20	<0.5	<2	0.73	6.7	8	71
1128047088		0.50		>10.0	20.8	5.9	1.56	82	<10	40	<0.5	2	0.16	2.1	11	90
1127031151		0.59		0.951		2.7	0.58	84	<10	30	<0.5	<2	1.79	4.1	7	110
1128047120		0.57		0.251		0.9	0.72	58	<10	30	<0.5	<2	1.86	2.5	8	76
1128047167		0.53		0.288		0.7	0.73	99	<10	30	<0.5	<2	1.54	2.7	8	84
1127031118		0.56		0.740		2.6	0.59	229	<10	30	<0.5	<2	0.26	0.9	9	111
1128046101		0.51		0.180		2.4	0.87	53	<10	40	<0.5	<2	1.39	1.0	8	87
1128048080		0.49		0.755		1.2	0.89	97	<10	20	<0.5	2	1.42	13.0	7	105
1128048042		0.42		0.553		0.7	0.79	200	<10	20	<0.5	<2	0.95	16.0	8	147
1127033007		0.34		1.840		1.3	0.79	54	<10	30	<0.5	<2	2.93	1.6	8	103
1128047044		0.44		0.310		1.1	1.17	71	<10	20	<0.5	<2	0.33	3.7	10	97
1128048052		0.55		0.115		1.3	0.47	91	<10	20	<0.5	<2	0.54	5.6	8	136
1127031133		0.49		0.466		1.0	1.45	51	<10	20	<0.5	<2	0.81	13.3	7	108
1128048112		0.55		0.404		1.3	0.36	150	<10	60	<0.5	<2	1.38	10.2	7	103
1127030089		0.55		1.300		1.5	0.91	47	<10	30	<0.5	2	2.44	8.2	8	128

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOR	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
V829049		50	2.51	<10	<1	0.20	10	0.36	238	4	0.14	11	510	18	0.04	<2
1128042101		12	2.10	<10	1	0.22	10	0.77	572	<1	0.02	10	410	26	1.41	<2
1128042205		61	2.15	<10	<1	0.23	10	0.67	863	1	0.04	12	440	57	1.99	2
1128042175		40	2.01	<10	<1	0.28	10	1.00	1170	1	0.02	11	430	61	1.29	<2
1128042084		54	1.95	<10	<1	0.22	10	0.95	1470	<1	0.02	11	450	125	1.51	2
1128042075		51	2.06	<10	<1	0.25	10	0.82	1415	1	0.02	11	440	136	1.73	<2
1128043494		42	2.60	<10	<1	0.25	10	0.57	426	1	0.01	12	420	42	2.28	<2
1128042220		42	2.33	<10	<1	0.23	10	0.94	1505	1	0.02	12	450	170	2.02	<2
1128043433		33	2.38	<10	<1	0.29	10	0.35	457	1	0.02	13	510	12	2.38	<2
1128042035		33	2.63	<10	<1	0.22	10	0.94	541	1	0.01	11	450	42	1.62	<2
1128044057		53	4.62	<10	1	0.36	10	0.13	363	2	0.01	10	330	89	5.13	<2
1128042065		43	2.70	<10	<1	0.26	10	0.91	446	1	0.01	12	430	23	1.67	<2
1128043485		45	2.10	<10	1	0.39	10	0.87	719	1	0.01	7	380	41	1.67	<2
1128043465		94	2.48	<10	1	0.31	20	0.65	846	1	0.01	11	450	22	2.24	<2
1128043429		63	2.24	<10	<1	0.29	10	0.74	1070	<1	0.01	13	420	21	1.85	<2
1128042050		43	2.55	<10	<1	0.30	10	0.93	517	<1	0.02	11	420	25	1.46	<2
1128044119		34	2.05	<10	<1	0.40	10	0.55	971	1	0.01	8	310	64	1.58	<2
1128043454		19	1.91	<10	<1	0.30	10	0.68	1210	1	0.01	8	390	45	1.47	<2
1128043416		72	2.09	<10	<1	0.37	10	0.99	1125	<1	0.01	8	390	60	1.11	<2
1128042057		92	2.84	<10	<1	0.25	10	0.47	277	1	0.01	12	500	27	2.69	<2
1128043423		35	2.17	<10	<1	0.40	10	0.76	527	<1	<0.01	7	400	32	1.57	<2
V829050		299	4.48	<10	1	0.27	20	0.31	483	3	0.01	10	170	22	3.49	<2
1126003120		29	2.23	<10	<1	0.21	20	0.91	665	1	0.10	12	580	43	0.94	3
1126003139		9	2.60	10	1	0.48	20	1.14	517	1	0.09	25	730	7	0.17	3
1128047085		52	2.90	<10	<1	0.20	10	1.29	604	1	0.01	15	390	14	1.63	<2
1128047069		141	2.06	<10	1	0.16	10	0.59	425	1	0.03	11	420	70	2.03	3
1128047088		391	2.70	<10	<1	0.21	10	1.14	698	<1	0.01	20	450	14	1.58	<2
1127031151		56	2.41	<10	<1	0.22	10	0.58	1485	1	0.01	8	400	76	2.27	<2
1128047120		55	2.01	<10	<1	0.24	10	0.88	1425	<1	0.02	10	410	50	1.66	2
1128047167		33	2.02	<10	<1	0.25	10	0.69	1385	1	0.02	10	430	26	1.71	2
1127031118		93	3.94	<10	<1	0.23	10	0.20	166	1	0.01	12	400	57	4.09	3
1128046101		30	2.14	<10	<1	0.21	10	0.58	956	<1	0.05	10	410	59	2.09	<2
1128048080		90	2.61	<10	1	0.24	10	0.71	1245	1	0.01	9	380	114	2.32	<2
1128048042		71	2.70	<10	1	0.23	10	0.50	662	1	0.01	8	400	8	2.45	<2
1127033007		55	1.90	<10	1	0.22	10	1.01	1745	<1	0.02	12	410	205	1.32	<2
1128047044		64	2.29	<10	<1	0.18	10	0.76	633	<1	0.01	13	430	65	1.86	<2
1128048052		48	1.83	<10	<1	0.20	10	0.29	656	<1	0.01	10	400	48	1.78	2
1127031133		39	2.42	<10	<1	0.23	10	0.75	449	<1	0.04	8	400	23	1.90	<2
1128048112		54	2.10	<10	<1	0.22	10	0.20	652	<1	0.01	8	390	785	2.26	3
1127030089		86	2.13	<10	<1	0.22	10	0.70	1395	<1	0.02	11	410	33	1.90	<2

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOR	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
V829049		2	19	<20	0.38	<10	<10	56	<10	61	0.04					
1128042101		<1	9	<20	<0.01	<10	<10	5	<10	164	0.29	1.34	28	8.7	-14	41.9
1128042205		<1	23	<20	<0.01	<10	<10	4	<10	701	0.50	2.02	42	8.7	-21	63.1
1128042175		1	22	<20	<0.01	<10	<10	6	<10	576	0.78	1.18	67	8.8	30	36.9
1128042084		<1	23	<20	<0.01	<10	<10	2	<10	355	1.25	1.44	96	9.0	51	45.0
1128042075		1	27	<20	<0.01	<10	<10	3	<10	502	1.24	1.65	98	9.0	46	51.6
1128043494		<1	12	<20	<0.01	<10	<10	5	<10	964	0.21	2.23	20	8.6	-50	69.7
1128042220		1	31	<20	<0.01	<10	<10	3	<10	588	1.15	1.93	84	9.0	24	60.3
1128043433		<1	12	<20	<0.01	<10	<10	4	<10	934	0.13	2.25	14	8.7	-56	70.3
1128042035		1	10	<20	0.02	<10	<10	6	<10	105	0.14	1.50	14	8.6	-33	46.9
1128044057		<1	44	<20	<0.01	<10	<10	3	110	3900	0.16	5.13	14	8.2	-146	160.3
1128042065		1	7	<20	<0.01	<10	<10	5	<10	104	0.09	1.65	11	8.8	-41	51.6
1128043485		<1	26	<20	0.01	<10	<10	5	<10	2760	0.36	1.66	35	9.0	-17	51.9
1128043465		<1	16	<20	<0.01	<10	<10	4	<10	2610	0.38	2.18	33	8.5	-35	68.1
1128043429		1	22	<20	<0.01	<10	<10	4	<10	1145	0.99	1.76	75	9.0	20	55.0
1128042050		1	8	<20	<0.01	<10	<10	6	<10	187	0.20	1.32	16	9.0	-25	41.3
1128044119		<1	88	<20	0.01	<10	<10	4	<10	1825	0.43	1.56	36	9.1	-13	48.8
1128043454		<1	45	<20	<0.01	<10	<10	4	<10	985	0.56	1.40	43	9.1	-1	43.8
1128043416		1	41	<20	0.01	<10	<10	6	<10	3530	0.54	1.06	48	9.1	15	33.1
1128042057		<1	7	<20	<0.01	<10	<10	4	<10	2470	0.10	2.68	11	8.3	-73	83.8
1128043423		<1	8	<20	0.01	<10	<10	6	<10	2120	0.06	1.50	11	8.9	-36	46.9
V829050		2	19	<20	0.01	<10	<10	7	<10	244	0.38					
1126003120		1	59	<20	0.04	10	<10	15	10	119	0.23	0.84	30	8.8	4	26.3
1126003139		3	114	<20	0.08	<10	<10	51	<10	95	0.69	0.14	63	9.4	59	4.4
1128047085		1	8	<20	<0.01	<10	<10	7	<10	638	0.05	1.61	8	8.6	-42	50.3
1128047069		<1	18	<20	<0.01	<10	<10	5	<10	1395	0.18	2.00	17	8.2	-46	62.5
1128047088		1	13	<20	<0.01	<10	<10	10	<10	534	0.06	1.60	9	8.5	-41	50.0
1127031151		<1	17	<20	<0.01	<10	<10	3	<10	1095	0.80	2.20	65	8.8	-4	68.8
1128047120		1	26	<20	<0.01	<10	<10	3	<10	645	0.95	1.54	72	8.9	24	48.1
1128047167		1	20	<20	<0.01	<10	<10	3	<10	752	0.74	1.58	58	8.8	9	49.4
1127031118		<1	6	<20	<0.01	<10	<10	3	<10	216	0.05	4.05	8	7.9	-119	126.6
1128046101		<1	47	<20	<0.01	<10	<10	4	<10	253	0.50	2.06	45	8.9	-19	64.4
1128048080		<1	14	<20	<0.01	<10	<10	4	<10	3070	0.55	2.28	47	8.5	-24	71.3
1128048042		<1	10	<20	<0.01	<10	<10	4	<10	4170	0.39	2.37	31	8.3	-43	74.1
1127033007		1	22	<20	<0.01	<10	<10	3	<10	425	1.29	1.27	107	8.9	67	39.7
1128047044		<1	23	<20	0.01	<10	<10	5	<10	907	0.05	1.78	6	7.8	-50	55.6
1128048052		<1	7	<20	<0.01	<10	<10	2	<10	1460	0.26	1.75	20	8.6	-35	54.7
1127031133		<1	26	<20	0.01	<10	<10	5	<10	3380	0.13	1.83	19	8.5	-38	57.2
1128048112		<1	28	<20	<0.01	<10	<10	2	<10	2640	0.50	2.09	41	8.6	-24	65.3
1127030089		<1	24	<20	<0.01	<10	<10	3	<10	1920	0.78	1.89	69	8.6	10	59.1

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CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method Analyte Units LOR	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
V829049			
1128042101		0.67	2
1128042205		0.67	2
1128042175		1.82	2
1128042084		2.13	3
1128042075		1.90	3
1128043494		0.29	2
1128042220		1.39	2
1128043433		0.20	1
1128042035		0.30	1
1128044057		0.09	1
1128042065		0.21	1
1128043485		0.67	2
1128043465		0.48	2
1128043429		1.36	2
1128042050		0.39	1
1128044119		0.74	2
1128043454		0.98	2
1128043416		1.45	2
1128042057		0.13	1
1128043423		0.23	1
V829050			
1126003120		1.14	2
1126003139		14.40	2
1128047085		0.16	1
1128047069		0.27	1
1128047088		0.18	1
1127031151		0.95	2
1128047120		1.50	2
1128047167		1.17	2
1127031118		0.06	1
1128046101		0.70	2
1128048080		0.66	2
1128048042		0.42	2
1127033007		2.70	3
1128047044		0.11	1
1128048052		0.37	1
1127031133		0.33	1
1128048112		0.63	2
1127030089		1.17	2

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Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method / Analyte / Units / LOR	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1128047015		0.43		0.120		0.9	1.04	62	<10	20	<0.5	<2	0.24	9.2	9	135
V829051		0.06		6.60		5.0	0.82	<2	<10	50	<0.5	<2	0.54	<0.5	7	10
1127031178		0.39		0.479		1.4	1.04	62	<10	30	<0.5	<2	1.50	4.7	7	104
1127033011		0.53		0.587		0.7	0.89	46	<10	30	<0.5	<2	2.41	0.8	8	103
1128048069		0.53		1.370		0.9	0.53	100	<10	30	<0.5	<2	1.62	5.5	7	125
1127031088		0.40		0.579		0.9	1.15	82	<10	30	<0.5	2	0.42	<0.5	8	134
1128041031		0.53		0.388		9.7	0.69	29	<10	30	<0.5	<2	1.43	9.0	9	102
1128041016		0.52		0.169		3.6	0.88	29	<10	40	<0.5	<2	1.42	3.8	6	61
1128041036		0.51		0.289		2.3	1.08	35	<10	20	<0.5	<2	1.19	<0.5	9	67
1130101131		0.51		0.007		0.2	1.32	7	<10	60	<0.5	<2	2.54	<0.5	9	101
1127030010		0.43		0.737		1.4	0.68	62	<10	30	<0.5	<2	2.47	6.2	9	135
1128048058		0.43		1.075		1.8	0.42	123	<10	40	<0.5	<2	0.49	7.8	7	181
1127031097		0.57		0.334		2.1	0.75	111	<10	40	<0.5	2	0.32	0.7	7	134
1128047030		0.51		0.304		1.1	1.60	53	<10	30	<0.5	2	0.26	2.2	10	130
1127030042		0.47		0.951		1.4	1.26	99	<10	30	<0.5	2	1.35	2.9	8	165
V829052		0.06		6.63		5.2	0.83	<2	<10	50	<0.5	<2	0.54	<0.5	7	10
1127021025		Not Recvd														
1127021101		Not Recvd														
1127023068		Not Recvd														
1129057130		Not Recvd														
1129057108		Not Recvd														
1127024083		Not Recvd														
V829045		Not Recvd														

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOR	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1128047015		76	2.33	<10	1	0.17	10	0.69	510	<1	0.01	12	470	67	2.07	<2
V829051		40	1.76	<10	<1	0.18	10	0.37	190	14	0.13	11	580	9	0.07	<2
1127031178		48	1.72	<10	<1	0.26	10	0.76	789	1	0.01	9	390	107	1.27	4
1127033011		29	1.84	<10	<1	0.19	10	0.79	1260	<1	0.02	11	410	85	1.38	2
1128048069		41	2.04	<10	<1	0.20	10	0.26	551	<1	0.01	7	420	60	1.96	<2
1127031088		21	2.27	<10	<1	0.27	10	0.73	411	<1	0.01	11	420	21	1.40	<2
1128041031		120	2.51	<10	1	0.21	10	0.72	1035	1	0.03	12	410	181	2.68	3
1128041016		45	1.58	<10	<1	0.25	10	0.84	1240	1	0.03	10	420	110	1.57	2
1128041036		35	2.54	<10	<1	0.16	<10	0.66	1075	<1	0.03	10	380	14	2.60	2
1130101131		8	2.07	<10	<1	0.21	20	0.88	499	<1	0.05	18	470	3	0.41	2
1127030010		47	2.52	<10	1	0.24	10	0.95	1955	1	0.01	13	390	97	2.06	2
1128048058		83	2.36	<10	1	0.21	10	0.11	237	<1	0.01	10	360	42	2.52	3
1127031097		39	2.67	<10	<1	0.24	10	0.39	292	<1	0.01	11	430	26	2.34	<2
1128047030		28	2.75	<10	<1	0.18	10	1.30	651	1	0.01	13	450	56	1.92	<2
1127030042		84	3.19	<10	<1	0.23	10	0.72	945	<1	0.02	12	410	31	2.58	2
V829052		40	1.76	<10	<1	0.17	10	0.37	188	21	0.14	11	570	8	0.07	<2
1127021025																
1127021101																
1127023068																
1129057130																
1129057108																
1127024083																
V829045																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOR	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1128047015		<1	26	<20	<0.01	<10	<10	4	<10	2130	0.03	2.02	8	7.7	-55	63.1
V829051		2	21	<20	0.24	<10	<10	49	<10	36	0.02					
1127031178		<1	23	<20	<0.01	<10	<10	4	<10	1250	0.44	1.18	45	8.8	8	36.9
1127033011		<1	22	<20	<0.01	<10	<10	3	<10	231	0.89	1.29	75	9.0	35	40.3
1128048069		<1	14	<20	<0.01	<10	<10	3	<10	1465	0.47	1.78	43	8.6	-13	55.6
1127031088		<1	8	<20	0.01	<10	<10	5	<10	102	0.09	1.30	15	8.7	-26	40.6
1128041031		<1	22	<20	<0.01	<10	<10	3	<10	2430	0.70	2.60	60	9.0	-21	81.3
1128041016		<1	22	<20	<0.01	<10	<10	4	<10	1065	0.69	1.43	59	9.2	14	44.7
1128041036		<1	22	<20	<0.01	<10	<10	4	<10	114	0.48	2.47	43	8.9	-34	77.2
1130101131		1	43	<20	0.01	<10	<10	12	<10	72	0.88	0.39	72	9.1	60	12.2
1127030010		<1	19	<20	<0.01	<10	<10	3	<10	1615	1.17	2.07	95	8.8	30	64.7
1128048058		<1	9	<20	<0.01	<10	<10	2	<10	2100	0.16	2.40	14	8.3	-61	75.0
1127031097		<1	6	<20	<0.01	<10	<10	4	<10	179	0.07	2.25	12	8.3	-58	70.3
1128047030		1	18	<20	0.02	<10	<10	7	<10	659	0.03	1.85	11	8.2	-47	57.8
1127030042		<1	18	<20	<0.01	<10	<10	5	<10	752	0.37	2.56	38	8.6	-42	80.0
V829052		2	21	<20	0.24	<10	<10	49	<10	35	0.03					
1127021025																
1127021101																
1127023068																
1129057130																
1129057108																
1127024083																
V829045																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method Analyte Units LOR	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1128047015		0.13	1
V829051			
1127031178		1.22	2
1127033011		1.86	2
1128048069		0.77	2
1127031088		0.37	1
1128041031		0.74	2
1128041016		1.32	2
1128041036		0.56	2
1130101131		5.91	2
1127030010		1.47	3
1128048058		0.19	1
1127031097		0.17	1
1128047030		0.19	1
1127030042		0.48	2
V829052			
1127021025			
1127021101			
1127023068			
1129057130			
1129057108			
1127024083			
V829045			

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

CERTIFICATE OF ANALYSIS TB18098363

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

CERTIFICATE TB18114640

Project: Mine Site Lab Pulps April 2018

P.O. No.: 4500009909

This report is for 219 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 17-MAY-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1
1126001124		0.54	91.3	0.026	0.2	1.28	6	<10	110	<0.5	<2	1.73	<0.5	10	149	17
1126001005		0.43		0.242	2.4	4.49	41	<10	100	<0.5	<2	3.33	1.7	50	97	101
1131072075		0.47		0.095	0.7	1.17	106	<10	20	<0.5	<2	0.25	<0.5	10	135	36
1127027014		0.39		0.253	1.1	0.64	37	<10	20	<0.5	<2	1.03	0.9	9	115	45
1128041006		0.46		0.133	2.4	1.00	18	<10	30	<0.5	<2	0.73	<0.5	10	71	27
1127027015		0.40		0.323	1.9	0.70	26	<10	20	<0.5	<2	1.42	0.7	8	110	25
1127030071		0.49		0.814	1.1	0.44	38	<10	20	<0.5	2	2.19	4.7	7	160	87
1128041108		0.49		0.258	2.4	0.84	29	<10	30	<0.5	2	1.80	2.4	7	83	41
1128047058		0.52		0.183	1.9	2.12	18	<10	30	<0.5	<2	1.48	0.7	7	95	25
1131072046		0.46		0.075	1.3	0.87	30	<10	30	<0.5	<2	0.56	<0.5	10	135	29
1128046038		0.44		0.060	1.1	0.86	20	<10	50	<0.5	2	2.31	0.8	9	121	21
1127030050		0.49		0.523	0.8	0.83	126	<10	30	<0.5	<2	1.35	2.9	9	162	32
1127030016		0.39		0.795	1.5	1.29	63	<10	30	<0.5	<2	1.63	6.0	8	127	61
1130101009		0.52		0.016	<0.2	1.75	9	<10	70	<0.5	<2	2.43	<0.5	14	136	24
1127027205		0.42		0.058	0.8	1.01	24	<10	40	<0.5	4	1.73	<0.5	7	134	41
1127030101		0.51		0.628	1.0	1.21	68	<10	30	<0.5	<2	0.34	<0.5	8	141	46
1127030134		0.40		0.633	1.7	1.11	39	<10	30	<0.5	<2	2.30	12.3	8	118	102
1127030129		0.45		0.826	1.7	0.66	40	<10	30	<0.5	2	1.98	2.9	7	139	119
1130101067		0.46		0.025	0.5	1.83	8	<10	70	<0.5	<2	2.76	0.6	16	131	188
1127027187		0.38		0.061	0.4	1.24	28	<10	40	<0.5	<2	1.91	<0.5	7	149	24
1127027010		0.37		0.134	0.5	1.06	32	<10	40	<0.5	2	1.97	<0.5	7	141	23
V829061		0.06		1.875	6.7	0.82	406	<10	50	<0.5	3	1.24	1.0	7	13	295
1131072036		0.49		0.040	0.8	0.40	20	<10	20	<0.5	<2	0.05	0.6	6	109	14
1128046021		0.48		0.053	1.0	0.59	20	<10	30	<0.5	<2	1.75	<0.5	9	136	17
1127032052		0.46		0.161	0.6	1.96	23	<10	30	<0.5	<2	1.20	<0.5	7	133	16
1127027138		0.47		0.053	0.9	1.15	80	<10	20	<0.5	<2	2.17	<0.5	6	134	11
1128047001		0.55		0.665	5.4	1.66	21	<10	30	<0.5	<2	1.45	<0.5	10	92	27
1127027186		0.50		0.062	1.1	0.89	34	<10	30	<0.5	2	1.24	<0.5	7	138	38
1127027127		0.46		0.281	1.1	0.72	49	<10	20	<0.5	<2	1.08	1.3	10	157	49
1127027194		0.49		0.769	1.5	0.54	63	<10	20	<0.5	<2	1.69	1.1	8	123	54
1131072124		0.48		0.083	0.7	0.74	59	<10	50	<0.5	<2	0.69	0.5	9	164	27
1127036094		0.50		0.112	1.0	2.57	11	<10	80	<0.5	<2	1.75	0.5	17	147	60
1127032053		0.51		0.077	0.4	2.18	33	<10	30	<0.5	<2	1.58	<0.5	7	115	20
1127032152		0.48		0.084	0.4	0.50	62	<10	30	<0.5	<2	2.42	1.6	6	122	19
1127032073		0.48		0.140	0.5	1.12	46	<10	20	<0.5	2	1.32	5.0	6	120	36
1127032002		0.51		0.168	0.9	1.47	51	<10	20	<0.5	<2	1.61	0.9	8	110	32
1127032065		0.50		0.208	1.5	1.10	56	<10	20	<0.5	<2	1.57	6.9	7	104	48
1127036083		0.53		0.222	1.1	0.90	46	<10	20	<0.5	<2	0.89	0.8	7	93	25
1127029104		0.50		0.104	1.9	0.52	23	<10	30	<0.5	<2	2.37	1.2	7	117	38
V829062		0.06		6.51	4.9	0.83	<2	<10	50	<0.5	<2	0.53	<0.5	7	10	38

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1126001124		2.01	10	<1	0.36	10	0.70	447	1	0.07	10	550	<2	0.35	<2	2
1126001005		12.25	20	<1	0.57	<10	1.76	1770	1	0.30	73	800	4	4.35	<2	17
1131072075		1.98	<10	<1	0.12	10	0.83	227	<1	0.03	10	500	12	1.40	<2	<1
1127027014		1.85	<10	<1	0.13	10	0.54	682	2	0.03	11	420	28	1.87	<2	<1
1128041006		2.37	<10	<1	0.16	10	0.48	809	<1	0.03	9	390	26	2.57	<2	<1
1127027015		1.93	<10	<1	0.14	10	0.80	663	1	0.04	11	410	19	1.94	<2	<1
1127030071		1.94	<10	1	0.17	10	0.61	1210	1	0.02	12	390	173	1.85	<2	<1
1128041108		1.89	<10	<1	0.21	<10	0.94	1660	2	0.03	12	420	104	1.90	<2	<1
1128047058		1.74	<10	1	0.18	10	0.66	443	1	0.09	11	410	32	1.71	<2	1
1131072046		2.11	<10	1	0.14	10	0.54	302	3	0.03	12	260	36	1.65	<2	1
1128046038		1.80	<10	<1	0.19	10	0.26	620	1	0.07	13	400	17	1.95	<2	<1
1127030050		2.22	<10	<1	0.21	10	0.57	862	1	0.01	12	420	25	1.77	<2	<1
1127030016		3.05	<10	1	0.22	10	0.81	1135	<1	0.02	10	430	27	2.49	<2	1
1130101009		2.83	10	1	0.24	10	1.02	635	<1	0.08	24	530	2	0.50	<2	3
1127027205		1.77	<10	1	0.17	10	0.64	346	1	0.06	9	330	17	1.72	<2	1
1127030101		2.34	<10	<1	0.20	10	0.75	454	1	0.01	12	410	32	1.53	<2	<1
1127030134		2.36	<10	1	0.26	10	0.80	1200	<1	0.02	11	410	58	2.26	<2	<1
1127030129		1.85	<10	<1	0.24	10	0.67	1290	1	0.02	10	420	326	1.67	<2	<1
1130101067		3.25	10	<1	0.26	10	1.03	635	1	0.07	27	450	4	0.70	<2	3
1127027187		1.67	<10	<1	0.18	10	0.75	368	1	0.06	11	360	12	0.92	<2	1
1127027010		1.68	<10	<1	0.16	10	0.66	373	1	0.07	9	360	14	1.38	<2	1
V829061		4.34	<10	<1	0.26	10	0.29	476	3	0.02	14	170	18	3.40	3	2
1131072036		1.17	<10	<1	0.13	10	0.07	36	1	0.02	7	20	7	1.28	<2	<1
1128046021		2.18	<10	<1	0.15	10	0.25	501	1	0.03	11	460	12	2.39	<2	<1
1127032052		1.46	<10	1	0.18	10	0.75	489	1	0.10	6	400	26	0.52	<2	1
1127027138		1.43	<10	<1	0.13	10	0.76	486	<1	0.04	11	410	7	0.45	<2	1
1128047001		2.27	<10	<1	0.20	10	0.51	408	<1	0.10	12	500	28	2.49	2	1
1127027186		1.67	<10	<1	0.14	10	0.57	341	1	0.05	10	370	17	1.23	<2	1
1127027127		2.09	<10	<1	0.13	10	0.54	496	1	0.03	13	470	55	2.06	2	<1
1127027194		2.11	<10	1	0.17	10	0.60	1145	<1	0.03	12	450	108	2.21	2	<1
1131072124		2.41	<10	1	0.18	10	0.45	1010	1	0.02	14	510	12	1.50	<2	1
1127036094		4.59	10	<1	0.35	10	0.85	702	<1	0.15	24	590	9	1.11	<2	4
1127032053		1.66	10	1	0.21	10	0.86	546	1	0.09	7	390	35	0.83	<2	1
1127032152		1.54	<10	<1	0.21	10	1.05	1680	1	0.01	6	520	37	0.75	<2	<1
1127032073		1.72	<10	1	0.25	10	0.90	899	1	0.01	7	420	28	1.00	<2	<1
1127032002		1.61	<10	<1	0.19	10	0.78	630	<1	0.04	8	380	59	1.25	2	<1
1127032065		1.85	<10	<1	0.26	10	0.88	840	<1	0.01	7	380	79	1.47	2	<1
1127036083		2.04	<10	<1	0.19	20	0.47	418	<1	0.04	8	410	103	2.06	<2	<1
1127029104		1.94	<10	<1	0.20	10	1.02	1580	<1	0.02	10	420	88	2.12	4	<1
V829062		1.64	<10	<1	0.17	10	0.35	182	19	0.13	10	570	8	0.07	<2	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1126001124		58	<20	0.04	<10	<10	18	<10	101	0.55	0.31	54	9.2	44	9.7	5.57
1126001005		117	<20	0.16	<10	<10	288	<10	374	1.00	4.46	168	8.5	29	139.4	1.21
1131072075		22	<20	<0.01	<10	<10	8	<10	128	0.06	1.37	6	7.9	-37	42.8	0.14
1127027014		16	<20	<0.01	<10	<10	3	<10	209	0.51	1.86	40	8.5	-18	58.1	0.69
1128041006		20	<20	<0.01	<10	<10	3	<10	68	0.32	2.50	25	8.4	-53	78.1	0.32
1127027015		19	<20	<0.01	<10	<10	3	<10	141	0.74	1.84	59	8.6	2	57.5	1.03
1127030071		16	<20	<0.01	<10	<10	2	<10	1180	0.98	1.82	78	8.7	21	56.9	1.37
1128041108		23	<20	<0.01	<10	<10	4	<10	601	0.95	1.90	75	8.9	16	59.4	1.26
1128047058		52	<20	<0.01	<10	<10	5	<10	207	0.23	1.72	28	8.4	-26	53.8	0.52
1131072046		21	<20	0.01	<10	<10	13	<10	153	0.23	1.64	15	8.3	-36	51.3	0.29
1128046038		59	<20	<0.01	<10	<10	3	<10	178	0.70	1.79	58	8.5	2	55.9	1.04
1127030050		12	<20	<0.01	<10	<10	4	<10	739	0.50	1.80	44	8.4	-12	56.3	0.78
1127030016		19	<20	<0.01	<10	<10	5	<10	1380	0.54	2.27	47	8.4	-24	70.9	0.66
1130101009		51	<20	0.04	<10	<10	46	<10	100	0.81	0.46	69	8.9	55	14.4	4.80
1127027205		43	<20	<0.01	<10	<10	5	<10	75	0.56	1.73	50	8.9	-4	54.1	0.92
1127030101		8	<20	<0.01	<10	<10	5	<10	113	0.09	1.58	11	8.5	-38	49.4	0.22
1127030134		26	<20	<0.01	<10	<10	4	<10	2530	0.77	2.31	67	8.7	-5	72.2	0.93
1127030129		19	<20	<0.01	<10	<10	3	<10	798	0.89	1.68	73	9.0	21	52.5	1.39
1130101067		49	<20	0.05	<10	<10	52	<10	203	1.05	0.79	109	8.6	84	24.7	4.42
1127027187		44	<20	<0.01	<10	<10	5	<10	92	0.58	0.95	52	8.9	22	29.7	1.75
1127027010		55	<20	<0.01	<10	<10	5	<10	65	0.64	1.43	53	8.6	8	44.7	1.19
V829061		18	<20	0.01	<10	<10	7	<10	244	0.38						
1131072036		16	<20	<0.01	<10	<10	2	<10	168	0.04	1.28	1	7.6	-39	40.0	0.03
1128046021		23	<20	<0.01	<10	<10	3	<10	57	0.56	2.46	46	8.4	-31	76.9	0.60
1127032052		43	<20	0.02	<10	<10	8	<10	87	0.16	0.51	24	8.7	8	15.9	1.51
1127027138		32	<20	<0.01	<10	<10	5	<10	75	0.78	0.50	66	9.0	50	15.6	4.22
1128047001		47	<20	0.01	<10	<10	4	<10	122	0.25	2.38	28	8.6	-46	74.4	0.38
1127027186		31	<20	<0.01	<10	<10	7	<10	159	0.40	1.17	36	8.7	-1	36.6	0.98
1127027127		17	<20	<0.01	<10	<10	3	<10	323	0.47	2.10	40	8.6	-26	65.6	0.61
1127027194		21	<20	<0.01	<10	<10	2	<10	285	0.79	2.23	65	8.5	-5	69.7	0.93
1131072124		23	<20	0.01	<10	<10	10	<10	119	0.37	1.46	25	8.5	-21	45.6	0.55
1127036094		117	<20	0.11	<10	<10	103	<10	264	0.35	1.15	39	8.7	3	35.9	1.09
1127032053		44	<20	0.02	<10	<10	9	<10	115	0.23	0.77	31	8.8	7	24.1	1.29
1127032152		84	<20	<0.01	<10	<10	3	<10	447	1.38	0.71	107	8.9	85	22.2	4.82
1127032073		18	<20	0.01	<10	<10	6	<10	1320	0.40	1.00	39	8.6	8	31.3	1.25
1127032002		38	<20	<0.01	<10	<10	5	<10	251	0.40	1.28	42	8.7	2	40.0	1.05
1127032065		21	<20	<0.01	<10	<10	6	<10	1760	0.48	1.48	44	8.6	-2	46.3	0.95
1127036083		18	<20	<0.01	<10	<10	5	<10	271	0.24	2.07	22	8.3	-43	64.7	0.34
1127029104		26	<20	<0.01	<10	<10	2	<10	323	1.27	2.14	105	8.9	38	66.9	1.57
V829062		21	<20	0.24	<10	<10	48	<10	35	0.04						

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1126001124		2
1126001005		3
1131072075		1
1127027014		2
1128041006		2
1127027015		2
1127030071		2
1128041108		2
1128047058		2
1131072046		1
1128046038		2
1127030050		2
1127030016		2
1130101009		2
1127027205		2
1127030101		1
1127030134		2
1127030129		2
1130101067		3
1127027187		2
1127027010		2
V829061		
1131072036		1
1128046021		2
1127032052		2
1127027138		2
1128047001		2
1127027186		2
1127027127		2
1127027194		2
1131072124		2
1127036094		2
1127032053		2
1127032152		3
1127032073		2
1127032002		2
1127032065		2
1127036083		2
1127029104		3
V829062		

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CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1127034031		0.47		0.402	1.0	0.83	89	<10	50	<0.5	<2	1.30	9.3	6	48	44
1127041124		0.52		0.510	1.2	0.67	21	<10	30	<0.5	3	1.74	1.1	8	109	20
1230001209		0.51		0.462	0.3	1.54	30	<10	40	<0.5	<2	0.28	2.1	10	51	32
1231001051		0.45		0.233	1.6	1.29	25	<10	20	<0.5	2	0.24	2.7	20	155	153
1126004046		0.50		0.170	0.7	1.90	19	<10	140	<0.5	<2	3.25	<0.5	16	195	45
1230001167		0.51		0.547	0.3	1.57	28	<10	50	<0.5	<2	0.21	3.0	11	45	48
1127038030		0.43		2.97	2.0	0.99	94	<10	30	<0.5	<2	2.07	4.3	7	109	29
1127038013		0.55		2.34	2.7	0.71	55	<10	30	<0.5	<2	3.04	2.5	8	105	59
1127041170		0.49		0.594	2.4	0.65	38	<10	30	<0.5	3	1.11	2.1	10	99	52
1127034075		0.63	77.3	0.880	8.0	0.92	141	<10	20	<0.5	2	1.19	19.4	7	58	156
1127041136		0.47		0.593	2.7	0.60	27	<10	40	<0.5	<2	0.68	3.6	7	168	60
1127041214		0.46		0.403	4.3	0.52	52	<10	20	<0.5	<2	1.20	3.8	8	30	84
1127041181		0.39		0.609	1.1	0.57	68	<10	20	<0.5	3	1.37	3.0	8	31	50
1127034094		0.51		1.060	2.7	0.82	634	<10	40	<0.5	<2	0.26	18.6	6	75	152
1127038031		0.49		0.918	1.4	0.91	68	<10	30	<0.5	2	2.72	5.8	8	106	42
1230002127		0.35		3.83	2.0	0.77	44	<10	30	<0.5	<2	0.20	3.0	12	146	49
1230001052		0.48		0.818	1.4	0.74	100	<10	70	<0.5	<2	0.43	4.3	11	53	39
1230001163		0.40		0.642	0.7	0.49	58	<10	90	<0.5	<2	0.18	1.9	6	70	21
1127038060		0.59		0.722	1.5	0.61	43	<10	20	<0.5	2	3.07	3.1	8	21	80
V829063		0.06		0.205	1.5	0.82	<2	<10	40	<0.5	<2	0.43	<0.5	10	11	55
1127029114		0.48		0.529	2.3	0.64	62	<10	30	<0.5	<2	1.90	1.9	8	82	97
1127036033		0.51		0.073	1.5	2.60	8	<10	90	<0.5	<2	2.41	3.1	25	104	96
1230001153		0.51		0.243	0.8	0.40	36	<10	30	<0.5	<2	0.07	3.6	6	136	30
1230001066		0.46		2.76	2.0	0.94	65	<10	50	<0.5	<2	0.15	23.5	10	72	323
1230001133		0.55		0.176	0.9	0.47	48	<10	30	<0.5	<2	0.09	4.4	9	86	35
1127034053		0.48		0.502	1.1	1.22	110	<10	30	<0.5	2	0.32	0.5	10	22	70
1127034152		0.49		3.20	3.4	0.77	265	<10	40	<0.5	3	0.47	30.8	7	89	247
1230001061		0.50		0.885	1.6	0.84	92	<10	120	<0.5	2	0.55	5.1	10	193	68
1127034070		0.45		0.319	3.5	0.75	141	<10	30	<0.5	<2	1.37	8.4	25	127	54
1230001156		0.38		0.296	0.6	1.14	55	<10	40	<0.5	<2	0.18	2.2	8	85	18
1230002222		0.44		0.077	1.4	0.45	43	<10	30	<0.5	<2	0.13	1.2	8	116	32
1127034057		0.50		0.673	0.9	1.23	87	<10	20	<0.5	<2	0.36	<0.5	8	21	44
1127034134		0.49		0.418	3.0	1.39	121	<10	20	<0.5	<2	1.16	17.2	6	89	196
1230001041		0.53		0.099	1.4	0.53	107	<10	40	<0.5	<2	0.49	6.8	9	114	36
1230001077		0.44		0.188	0.4	1.02	39	<10	50	<0.5	<2	1.08	1.1	10	39	21
1230001017		0.40		0.125	0.4	1.93	22	<10	70	<0.5	2	1.51	0.8	14	165	47
1127034125		0.43		0.252	0.8	0.91	117	<10	30	<0.5	<2	1.85	1.7	8	84	27
1127034182		0.51		0.731	0.9	1.12	116	<10	20	<0.5	<2	2.15	6.2	7	16	29
1230001204		0.62		0.465	0.3	0.78	23	<10	50	<0.5	<2	0.14	0.8	11	45	37
1127034039		0.54		0.441	1.3	1.14	96	<10	30	<0.5	<2	0.84	9.4	6	47	48

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1127034031		1.83	<10	1	0.29	10	0.68	1240	<1	0.01	7	340	77	1.23	<2	<1
1127041124		1.88	<10	<1	0.19	<10	0.73	1170	1	0.02	10	400	66	1.94	<2	<1
1230001209		2.16	<10	<1	0.14	20	0.80	439	<1	0.02	11	550	12	1.27	<2	1
1231001051		2.61	<10	<1	0.07	30	1.12	246	1	0.02	41	610	16	2.19	<2	3
1126004046		3.18	10	<1	0.39	20	1.57	713	<1	0.06	40	850	16	1.23	<2	5
1230001167		2.27	<10	<1	0.15	20	0.68	317	<1	0.02	12	170	5	1.63	4	1
1127038030		2.16	<10	<1	0.24	10	0.66	1125	1	0.01	10	420	27	1.86	<2	<1
1127038013		2.10	<10	<1	0.22	10	0.56	1245	3	0.02	12	420	594	2.03	<2	1
1127041170		2.01	<10	1	0.24	10	0.43	938	3	0.02	12	430	219	2.19	2	<1
1127034075		2.25	<10	<1	0.31	10	0.62	716	<1	0.01	8	390	124	2.26	2	<1
1127041136		2.10	<10	1	0.22	<10	0.35	1010	1	0.02	12	420	100	2.23	<2	<1
1127041214		1.89	<10	1	0.16	10	0.52	1050	1	0.02	10	410	70	2.09	<2	<1
1127041181		1.35	<10	1	0.16	10	0.52	1435	<1	0.02	9	410	42	1.27	<2	<1
1127034094		3.00	<10	1	0.32	10	0.39	330	<1	0.01	7	400	46	3.17	<2	<1
1127038031		2.17	<10	<1	0.24	10	0.85	1510	<1	0.02	11	440	51	1.75	<2	1
1230002127		2.91	<10	<1	0.17	10	0.39	134	1	0.03	15	150	12	2.97	8	1
1230001052		2.06	<10	1	0.28	10	0.48	587	<1	0.01	18	1060	394	1.45	2	2
1230001163		1.62	<10	2	0.28	10	0.09	964	<1	0.01	10	420	51	1.56	<2	<1
1127038060		1.86	<10	<1	0.16	10	0.89	1760	2	0.03	10	430	189	1.51	<2	<1
V829063		2.53	<10	<1	0.20	10	0.35	254	4	0.14	11	540	23	0.04	<2	2
1127029114		1.92	<10	1	0.21	10	0.79	1445	1	0.03	10	430	320	1.85	<2	1
1127036033		6.71	10	<1	0.43	10	1.01	972	<1	0.10	42	620	8	1.40	2	7
1230001153		1.58	<10	1	0.19	10	0.04	219	<1	0.01	7	210	104	1.22	<2	<1
1230001066		3.04	<10	2	0.23	20	0.54	289	<1	0.01	12	640	9	3.15	4	<1
1230001133		1.62	<10	<1	0.21	10	0.11	31	1	0.02	14	130	8	1.75	<2	1
1127034053		2.56	<10	<1	0.19	10	0.81	438	1	0.01	11	440	22	1.75	<2	<1
1127034152		3.31	<10	1	0.33	10	0.31	428	1	0.01	8	410	533	3.62	2	<1
1230001061		2.22	<10	<1	0.45	20	0.65	1240	<1	0.01	18	940	567	1.41	<2	2
1127034070		2.31	<10	<1	0.25	10	0.41	616	2	0.01	13	430	169	2.15	4	<1
1230001156		1.95	<10	<1	0.26	20	0.59	355	<1	0.02	11	450	211	1.72	<2	1
1230002222		1.35	<10	<1	0.18	10	0.05	30	<1	0.02	10	70	32	1.48	5	<1
1127034057		2.33	<10	2	0.17	10	0.83	462	<1	0.01	10	420	19	1.54	<2	<1
1127034134		2.34	<10	<1	0.38	10	1.10	772	<1	0.01	7	400	30	1.65	6	1
1230001041		1.97	<10	<1	0.21	10	0.17	280	1	0.02	11	160	150	2.05	<2	<1
1230001077		2.02	<10	1	0.29	10	0.55	380	1	0.04	15	430	39	0.90	<2	2
1230001017		2.56	10	<1	0.22	10	0.97	565	<1	0.11	32	490	13	0.63	<2	4
1127034125		1.89	<10	1	0.28	10	0.64	733	<1	0.01	11	430	11	1.50	<2	1
1127034182		2.14	<10	1	0.18	10	0.86	1005	<1	0.01	9	410	23	1.56	2	1
1230001204		1.88	<10	<1	0.19	20	0.22	452	2	0.01	12	260	47	0.88	<2	1
1127034039		2.44	<10	<1	0.40	10	0.63	566	1	0.01	7	390	30	1.98	3	<1

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1127034031		102	<20	0.01	<10	<10	4	<10	2290	0.57	1.25	47	8.8	8	39.1	1.20
1127041124		18	<20	<0.01	<10	<10	3	<10	275	0.92	2.09	73	8.9	8	65.3	1.12
1230001209		23	<20	<0.01	<10	<10	10	<10	611	0.03	1.33	8	8.1	-34	41.6	0.19
1231001051		13	<20	<0.01	<10	<10	21	<10	801	0.10	2.12	8	7.8	-58	66.3	0.12
1126004046		133	<20	0.06	<10	<10	46	<10	136	1.00	1.21	114	8.7	76	37.8	3.01
1230001167		25	<20	<0.01	<10	<10	9	<10	764	0.02	1.61	5	7.9	-45	50.3	0.10
1127038030		17	<20	<0.01	<10	<10	4	<10	1010	0.67	1.83	58	8.7	1	57.2	1.01
1127038013		21	<20	<0.01	<10	<10	3	<10	657	1.17	1.96	95	8.8	34	61.3	1.55
1127041170		14	<20	<0.01	<10	<10	3	<10	521	0.51	2.13	43	8.8	-24	66.6	0.65
1127034075		18	<20	<0.01	<10	<10	4	<10	4640	0.37	2.20	35	8.7	-34	68.8	0.51
1127041136		10	<20	<0.01	<10	<10	3	<10	906	0.31	1.97	27	8.5	-35	61.6	0.44
1127041214		14	<20	<0.01	<10	<10	2	<10	1000	0.57	2.02	47	8.6	-16	63.1	0.74
1127041181		12	<20	<0.01	<10	<10	3	<10	790	0.60	1.22	48	8.9	10	38.1	1.26
1127034094		10	<20	<0.01	<10	<10	4	<10	4590	0.06	3.01	9	8.3	-85	94.1	0.10
1127038031		25	<20	<0.01	<10	<10	4	<10	1300	1.08	1.61	92	8.8	42	50.3	1.83
1230002127		17	<20	<0.01	<10	<10	7	<10	672	0.07	2.94	7	8.3	-85	91.9	0.08
1230001052		36	<20	0.02	<10	<10	16	<10	1620	0.16	1.35	14	8.4	-28	42.2	0.33
1230001163		18	<20	<0.01	<10	<10	3	<10	724	0.16	1.55	11	8.3	-37	48.4	0.23
1127038060		26	<20	<0.01	<10	<10	3	<10	738	1.39	1.38	111	8.7	68	43.1	2.57
V829063		19	<20	0.38	<10	<10	58	<10	64	0.03						
1127029114		20	<20	<0.01	<10	<10	3	<10	538	1.01	1.78	76	8.7	20	55.6	1.37
1127036033		72	<20	0.16	<10	<10	154	<10	888	0.76	1.46	59	8.7	13	45.6	1.29
1230001153		11	<20	<0.01	<10	<10	3	<10	719	0.07	1.19	7	7.7	-30	37.2	0.19
1230001066		15	<20	<0.01	<10	<10	6	<10	6300	0.04	3.16	7	7.6	-92	98.8	0.07
1230001133		13	<20	<0.01	<10	<10	6	<10	1020	0.03	1.72	3	8.5	-51	53.8	0.06
1127034053		7	<20	<0.01	<10	<10	5	<10	136	0.08	1.62	10	8.3	-41	50.6	0.20
1127034152		16	<20	<0.01	<10	<10	4	<10	7480	0.17	3.47	18	8.4	-90	108.4	0.17
1230001061		35	<20	0.04	<10	<10	17	<10	1540	0.27	1.31	26	8.7	-15	40.9	0.64
1127034070		18	<20	<0.01	<10	<10	4	120	1740	0.46	1.96	40	8.3	-21	61.3	0.65
1230001156		15	<20	<0.01	<10	<10	7	<10	695	0.04	1.58	7	8.2	-42	49.4	0.14
1230002222		19	<20	<0.01	<10	<10	3	<10	316	0.06	1.54	5	8.4	-43	48.1	0.10
1127034057		7	<20	0.01	<10	<10	4	<10	146	0.08	1.58	13	8.3	-36	49.4	0.26
1127034134		17	<20	0.01	<10	<10	7	<10	3660	0.41	1.60	39	8.7	-11	50.0	0.78
1230001041		15	<20	<0.01	<10	<10	4	<10	1620	0.21	2.09	17	8.6	-48	65.3	0.26
1230001077		26	<20	0.04	<10	<10	24	<10	260	0.38	0.87	35	8.5	8	27.2	1.29
1230001017		53	<20	0.07	<10	<10	45	<10	210	0.35	0.60	34	8.5	15	18.8	1.81
1127034125		26	<20	<0.01	<10	<10	6	<10	446	0.66	1.49	57	8.9	10	46.6	1.22
1127034182		25	<20	0.01	<10	<10	6	<10	1560	0.71	1.55	60	8.4	12	48.4	1.24
1230001204		13	<20	<0.01	<10	<10	7	<10	207	0.13	0.88	5	7.8	-23	27.5	0.18
1127034039		15	<20	0.01	<10	<10	5	<10	2280	0.25	1.99	27	8.6	-35	62.2	0.43

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1127034031		2
1127041124		2
1230001209		1
1231001051		1
1126004046		3
1230001167		1
1127038030		2
1127038013		3
1127041170		2
1127034075		2
1127041136		2
1127041214		2
1127041181		2
1127034094		1
1127038031		3
1230002127		1
1230001052		1
1230001163		1
1127038060		3
V829063		
1127029114		2
1127036033		2
1230001153		1
1230001066		1
1230001133		1
1127034053		1
1127034152		1
1230001061		2
1127034070		2
1230001156		1
1230002222		1
1127034057		1
1127034134		2
1230001041		1
1230001077		2
1230001017		2
1127034125		2
1127034182		2
1230001204		1
1127034039		2

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CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method / Analyte / Units / LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1
V829064		0.06		6.56	4.8	0.75	<2	<10	50	<0.5	<2	0.49	<0.5	6	9	39
1230003193		0.53		0.060	0.6	1.29	37	<10	30	<0.5	<2	0.76	<0.5	9	84	23
1126010225		0.57		0.024	0.5	1.16	44	10	40	<0.5	<2	2.07	0.5	7	36	11
1230003996		0.49		1.400	3.2	1.06	39	<10	50	<0.5	<2	2.08	0.5	11	74	32
1230004131		0.53		0.184	1.2	1.54	40	<10	60	<0.5	<2	1.13	0.5	11	58	21
1230004104		0.53		0.123	1.0	0.88	25	<10	40	<0.5	<2	2.15	<0.5	8	110	22
1230004119		0.51		0.230	1.3	1.25	34	<10	50	<0.5	<2	1.77	0.6	10	73	30
1230004142		0.47		0.163	2.9	0.78	26	<10	50	<0.5	<2	1.76	3.7	9	122	81
1230003066		0.54		0.206	4.1	1.02	32	10	40	<0.5	<2	0.92	0.6	12	69	33
1230003232		0.51		0.043	0.4	1.17	9	<10	30	<0.5	<2	1.41	0.6	11	106	30
1127042183		0.54		0.293	0.7	1.12	102	<10	30	<0.5	<2	0.52	7.6	8	82	34
1127042113		0.49		0.272	2.1	1.91	22	<10	30	<0.5	<2	1.89	1.6	9	60	42
1230004105		0.39		0.328	2.1	1.17	32	<10	50	<0.5	<2	1.47	1.2	9	120	48
1127042162		0.54		0.327	2.4	0.74	27	<10	30	<0.5	<2	2.32	1.8	8	156	53
1230003012		0.48		0.317	4.3	0.67	36	<10	30	<0.5	<2	0.17	2.3	9	110	24
1126011231		0.55		0.041	0.3	1.10	<2	<10	60	<0.5	<2	1.65	<0.5	8	168	16
1126011011		0.59		0.078	0.3	0.92	6	<10	40	<0.5	<2	2.01	<0.5	9	198	55
1126011219		0.55		0.135	0.3	0.91	5	<10	30	<0.5	<2	1.86	<0.5	9	170	22
V829065		0.06		6.55	4.9	0.77	<2	<10	50	<0.5	<2	0.51	<0.5	7	10	38
1230003220		0.58	87.9	0.099	1.2	1.39	13	<10	40	<0.5	<2	2.05	4.1	12	136	55
1127042024		0.49		0.189	0.8	2.00	37	10	30	<0.5	<2	1.72	1.8	9	76	49
1127041043		0.51		0.148	1.8	1.06	46	<10	50	<0.5	<2	2.89	2.0	10	43	34
1127042150		0.50		0.084	0.5	2.11	32	10	40	<0.5	<2	1.66	1.6	7	72	27
1230003126		0.53		0.119	2.0	0.95	20	<10	30	<0.5	<2	0.50	0.5	10	100	24
1230003124		0.43		0.407	5.3	0.91	33	<10	40	<0.5	<2	0.55	0.9	8	56	24
1127042235		0.45		0.220	0.9	1.23	76	<10	30	<0.5	<2	2.66	1.4	7	73	33
1126004113		0.52		0.083	0.8	1.48	24	<10	40	<0.5	<2	1.05	<0.5	6	104	21
1127042233		0.40		0.352	0.6	0.93	117	<10	30	<0.5	<2	1.86	1.8	8	66	24
1230003150		0.38		0.045	0.6	1.21	25	<10	50	<0.5	<2	0.74	<0.5	8	68	19
1127042184		0.47		8.39	3.4	0.74	266	<10	30	<0.5	<2	0.16	17.6	8	76	200
1126010214		0.50		0.022	0.7	1.08	31	<10	50	<0.5	<2	1.97	<0.5	7	95	11
1127042042		0.52		0.467	0.8	1.32	48	<10	20	<0.5	<2	1.05	7.0	8	193	65
1127042208		0.51		0.189	1.2	1.12	45	<10	30	<0.5	<2	0.63	0.7	8	102	33
1230003213		0.50		0.163	1.2	1.20	31	<10	40	<0.5	<2	0.92	0.9	9	68	22
1126004134		0.41		0.484	0.9	1.90	86	10	30	<0.5	<2	1.37	0.8	9	131	27
1126004139		0.51		0.024	0.6	1.60	22	<10	50	<0.5	<2	1.24	<0.5	7	66	16
V829066		0.06		1.940	6.5	0.78	386	<10	40	<0.5	2	1.18	1.0	6	13	281
1127041045		0.48		0.371	1.3	1.26	71	<10	50	<0.5	<2	2.68	1.8	12	48	39
1126004082		0.47		0.347	0.8	1.50	43	<10	50	<0.5	<2	1.33	0.5	9	60	23
1126005030		0.46		0.046	0.7	1.40	36	<10	40	<0.5	<2	1.65	<0.5	7	71	19

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
V829064		1.64	<10	<1	0.16	10	0.35	177	19	0.12	11	570	9	0.07	<2	1
1230003193		2.04	<10	<1	0.14	10	0.57	307	1	0.05	11	420	23	1.83	<2	1
1126010225		1.62	<10	<1	0.17	10	0.66	428	<1	0.06	9	350	28	0.88	2	1
1230003996		2.59	<10	<1	0.22	20	0.72	747	1	0.04	12	610	29	2.44	<2	1
1230004131		2.56	<10	<1	0.21	20	0.90	501	1	0.09	18	590	25	1.95	<2	1
1230004104		1.99	<10	<1	0.16	10	0.62	708	1	0.05	11	460	22	1.94	<2	1
1230004119		2.41	<10	<1	0.21	20	0.75	671	1	0.07	15	550	25	2.07	<2	1
1230004142		2.23	<10	<1	0.21	20	0.47	661	1	0.04	10	480	45	2.38	2	<1
1230003066		2.29	<10	<1	0.18	20	0.34	708	1	0.05	15	530	50	2.35	<2	<1
1230003232		2.01	<10	<1	0.09	10	0.90	576	1	0.04	21	580	5	1.49	2	2
1127042183		2.51	<10	<1	0.24	10	0.63	403	<1	0.02	11	360	18	2.15	<2	<1
1127042113		2.00	<10	<1	0.19	10	0.59	432	1	0.11	10	440	31	1.98	<2	<1
1230004105		2.27	<10	<1	0.19	20	0.71	714	1	0.06	11	560	61	2.09	<2	1
1127042162		1.97	<10	<1	0.19	10	0.40	760	1	0.03	12	420	143	1.90	<2	<1
1230003012		2.06	<10	<1	0.17	10	0.26	312	1	0.02	13	390	103	2.15	<2	<1
1126011231		1.91	<10	<1	0.12	10	0.52	256	1	0.07	9	380	3	0.20	<2	1
1126011011		2.04	<10	<1	0.10	10	0.59	315	1	0.06	10	380	<2	0.31	<2	1
1126011219		1.94	<10	<1	0.07	10	0.62	263	1	0.08	8	360	2	0.71	<2	1
V829065		1.64	<10	<1	0.16	10	0.35	177	15	0.12	10	570	9	0.07	<2	2
1230003220		2.70	<10	<1	0.15	20	0.88	618	1	0.08	21	550	21	2.67	<2	2
1127042024		2.04	<10	<1	0.21	10	0.77	496	1	0.10	11	380	70	1.80	<2	1
1127041043		2.38	<10	<1	0.20	20	0.77	1355	<1	0.06	15	530	62	2.21	<2	1
1127042150		1.75	<10	<1	0.20	10	0.75	490	<1	0.16	10	380	39	1.34	<2	1
1230003126		2.05	<10	1	0.13	10	0.31	380	1	0.05	12	480	31	2.05	<2	<1
1230003124		2.00	<10	<1	0.26	10	0.45	1510	<1	0.04	12	460	64	2.01	<2	1
1127042235		1.77	<10	<1	0.28	10	0.81	1260	1	0.03	9	380	38	1.21	2	1
1126004113		1.56	<10	<1	0.19	10	0.62	397	1	0.11	10	360	13	0.62	<2	1
1127042233		1.89	<10	1	0.32	10	0.56	967	1	0.02	11	430	20	1.63	<2	1
1230003150		1.69	<10	<1	0.15	10	0.17	162	1	0.11	7	410	14	1.58	<2	1
1127042184		2.58	<10	<1	0.26	10	0.24	153	1	0.02	13	310	36	2.74	2	<1
1126010214		1.76	<10	<1	0.19	10	0.64	323	2	0.07	10	360	9	1.44	<2	1
1127042042		2.21	<10	1	0.17	10	0.66	519	3	0.04	12	370	65	1.84	<2	<1
1127042208		2.03	<10	<1	0.21	10	0.54	826	1	0.03	11	450	64	1.80	<2	<1
1230003213		2.62	<10	<1	0.18	10	0.57	568	2	0.06	11	560	52	2.62	2	<1
1126004134		2.17	<10	<1	0.17	20	0.84	596	1	0.06	9	500	48	1.36	2	1
1126004139		1.46	<10	<1	0.22	10	0.67	416	1	0.09	8	370	11	0.53	<2	1
V829066		4.21	<10	1	0.24	10	0.28	454	3	0.02	8	160	18	3.27	3	2
1127041045		2.61	<10	<1	0.19	20	0.91	1495	1	0.07	16	530	42	2.22	<2	1
1126004082		2.22	<10	<1	0.20	20	0.64	585	1	0.04	10	560	23	1.83	<2	1
1126005030		1.73	<10	<1	0.18	10	0.65	430	1	0.08	9	430	12	0.81	<2	1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
V829064		19	<20	0.22	<10	<10	47	<10	34	0.03						
1230003193		28	<20	<0.01	<10	<10	6	<10	111	0.18	1.86	18	8.5	-40	58.1	0.31
1126010225		39	<20	<0.01	<10	<10	6	<10	159	0.61	0.89	55	9.2	27	27.8	1.98
1230003996		32	<20	<0.01	<10	<10	5	<10	119	0.70	2.51	59	8.5	-19	78.4	0.75
1230004131		56	<20	0.01	<10	<10	12	<10	155	0.27	2.07	30	8.5	-35	64.7	0.46
1230004104		33	<20	<0.01	<10	<10	5	<10	102	0.74	1.95	64	8.8	3	60.9	1.05
1230004119		39	<20	<0.01	<10	<10	8	<10	147	0.55	2.15	49	8.6	-18	67.2	0.73
1230004142		33	<20	<0.01	<10	<10	4	10	976	0.60	2.43	53	8.4	-23	75.9	0.70
1230003066		35	<20	<0.01	<10	<10	4	<10	155	0.26	2.40	26	8.2	-49	75.0	0.35
1230003232		29	<20	<0.01	<10	<10	12	<10	181	0.53	1.46	45	8.5	-1	45.6	0.99
1127042183		13	<20	<0.01	<10	<10	5	<10	1815	0.14	2.16	17	8.5	-51	67.5	0.25
1127042113		51	<20	0.02	<10	<10	5	<10	409	0.30	1.97	37	8.5	-25	61.6	0.60
1230004105		31	<20	<0.01	<10	<10	7	<10	301	0.46	2.08	44	8.6	-21	65.0	0.68
1127042162		20	<20	<0.01	<10	<10	3	<10	463	0.74	1.93	63	8.4	3	60.3	1.04
1230003012		17	<20	<0.01	<10	<10	4	<10	585	0.04	2.20	7	8.1	-62	68.8	0.10
1126011231		42	<20	<0.01	<10	<10	11	<10	24	0.50	0.18	46	9.5	40	5.6	8.18
1126011011		51	<20	<0.01	<10	<10	8	10	28	0.85	0.30	65	9.2	56	9.4	6.93
1126011219		45	<20	<0.01	<10	<10	11	<10	19	0.67	0.69	57	9.3	35	21.6	2.64
V829065		20	<20	0.23	<10	<10	48	<10	33	0.02						
1230003220		44	<20	<0.01	<10	<10	11	<10	948	0.58	2.73	53	9.0	-32	85.3	0.62
1127042024		43	<20	0.01	<10	<10	6	<10	447	0.32	1.83	37	8.6	-20	57.2	0.65
1127041043		62	<20	<0.01	<10	<10	6	<10	511	1.04	2.22	89	8.8	20	69.4	1.28
1127042150		49	<20	<0.01	<10	<10	6	<10	390	0.28	1.32	36	8.7	-5	41.3	0.87
1230003126		42	<20	<0.01	<10	<10	4	<10	154	0.09	2.12	11	8.0	-55	66.3	0.17
1230003124		25	<20	<0.01	<10	<10	4	<10	255	0.29	1.97	25	8.8	-37	61.6	0.41
1127042235		25	<20	<0.01	<10	<10	5	<10	376	0.91	1.20	77	9.0	40	37.5	2.05
1126004113		47	<20	0.01	<10	<10	9	<10	80	0.24	0.60	29	9.1	10	18.8	1.55
1127042233		24	<20	<0.01	<10	<10	4	<10	503	0.70	1.63	59	8.8	8	50.9	1.16
1230003150		97	<20	0.01	<10	<10	5	<10	74	0.10	1.55	14	8.8	-34	48.4	0.29
1127042184		10	<20	<0.01	<10	<10	4	10	4070	0.03	2.85	7	8.3	-82	89.1	0.08
1126010214		40	<20	<0.01	<10	<10	5	<10	75	0.59	1.44	54	9.2	9	45.0	1.20
1127042042		25	<20	<0.01	<10	<10	5	<10	1510	0.24	1.79	26	8.1	-30	55.9	0.46
1127042208		17	<20	<0.01	<10	<10	4	<10	176	0.16	1.80	17	8.6	-39	56.3	0.30
1230003213		28	<20	<0.01	<10	<10	4	<10	243	0.21	2.58	24	8.4	-57	80.6	0.30
1126004134		41	<20	<0.01	<10	<10	8	<10	206	0.31	1.43	36	8.5	-9	44.7	0.81
1126004139		43	<20	<0.01	<10	<10	7	<10	86	0.33	0.49	34	9.0	19	15.3	2.22
V829066		18	<20	0.01	<10	<10	7	<10	229	0.36						
1127041045		58	<20	<0.01	<10	<10	9	<10	441	1.06	2.25	81	8.5	11	70.3	1.15
1126004082		29	<20	<0.01	<10	<10	8	<10	127	0.37	1.74	37	8.5	-17	54.4	0.68
1126005030		42	<20	<0.01	<10	<10	10	<10	81	0.50	0.80	48	9.2	23	25.0	1.92

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
V829064		
1230003193		1
1126010225		2
1230003996		2
1230004131		2
1230004104		2
1230004119		2
1230004142		2
1230003066		2
1230003232		2
1127042183		1
1127042113		2
1230004105		2
1127042162		2
1230003012		1
1126011231		2
1126011011		2
1126011219		2
V829065		
1230003220		2
1127042024		2
1127041043		3
1127042150		2
1230003126		1
1230003124		2
1127042235		2
1126004113		2
1127042233		2
1230003150		1
1127042184		1
1126010214		2
1127042042		2
1127042208		1
1230003213		2
1126004134		2
1126004139		2
V829066		
1127041045		2
1126004082		2
1126005030		2

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CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1127042149		0.42		0.828	0.8	1.66	56	10	40	<0.5	<2	1.15	1.6	7	74	77
1230003195		0.60		0.105	0.9	1.69	20	<10	40	<0.5	<2	1.15	1.1	10	92	34
1127042025		0.54		0.076	0.4	1.82	35	<10	30	<0.5	<2	1.43	1.2	9	84	31
1126004165		0.49		0.108	0.6	1.63	40	<10	50	<0.5	<2	1.96	1.5	6	59	13
1126005018		0.59		0.018	<0.2	1.04	3	<10	40	<0.5	<2	2.05	<0.5	6	125	13
1126004099		0.46		0.055	0.4	2.73	23	<10	50	<0.5	<2	1.93	<0.5	6	71	14
1230003120		0.58		0.038	0.5	1.72	14	<10	40	<0.5	<2	0.96	<0.5	8	75	17
1126010188		0.48		0.050	0.6	1.38	35	<10	50	<0.5	<2	2.27	<0.5	7	70	16
1126010143		0.47		0.144	2.4	1.16	99	<10	40	<0.5	<2	2.10	<0.5	7	93	21
1230003198		0.59		0.124	0.9	1.51	14	<10	50	<0.5	<2	1.77	3.1	13	129	85
1126010140		0.43		0.207	1.7	1.27	99	<10	50	<0.5	<2	2.44	<0.5	6	58	21
1230003170		0.53		0.067	0.2	1.56	13	<10	40	<0.5	<2	0.97	<0.5	9	43	24
1127042001		0.56		0.030	0.6	0.91	21	<10	50	<0.5	<2	1.70	<0.5	10	73	20
1126010161		0.48		0.062	0.4	1.02	24	<10	30	<0.5	<2	1.59	<0.5	7	63	12
V829067		0.06		0.197	1.5	0.79	2	<10	40	<0.5	<2	0.40	<0.5	9	11	55
1126004060		0.38		0.063	1.2	1.52	21	<10	40	<0.5	<2	1.35	<0.5	8	45	22
1230002037		0.38		0.187	3.3	0.61	64	<10	20	<0.5	<2	0.11	2.1	8	20	29
1127041001		0.50		0.242	3.1	1.01	23	<10	30	<0.5	<2	1.46	0.5	8	101	33
1230002076		0.42		1.260	0.9	0.81	63	<10	20	<0.5	<2	0.03	1.7	8	15	40
1127041069		0.46		0.096	1.2	0.64	25	<10	30	<0.5	<2	1.84	0.5	7	26	20
1230002057		0.32		0.264	2.2	0.92	41	10	30	<0.5	<2	0.09	3.9	10	66	127
1126004054		0.51		0.266	0.6	1.53	75	<10	40	<0.5	<2	2.37	0.6	9	90	22
1230002002		0.42		0.901	3.8	1.12	71	<10	30	<0.5	<2	0.80	9.3	9	49	92
1127041295		0.52		0.185	0.9	1.17	58	<10	40	<0.5	<2	2.34	0.6	8	22	36
1230002003		0.46		0.219	0.8	0.70	59	<10	20	<0.5	<2	0.10	3.6	9	22	31
1127041019		0.52		0.074	1.3	1.02	30	<10	40	<0.5	<2	1.96	0.5	7	87	30
1126005010		0.62		0.097	0.5	1.45	42	<10	60	<0.5	<2	1.53	<0.5	9	118	16
1126004067		0.51		0.023	<0.2	1.07	5	<10	50	<0.5	<2	1.64	0.6	6	65	20
1126004150		0.54		0.087	1.0	1.76	32	<10	50	<0.5	<2	1.15	<0.5	8	111	17
1126010001		0.53	85.6	0.041	1.1	1.50	37	<10	40	<0.5	<2	1.33	<0.5	7	92	21
1230003097		0.44		0.268	2.2	1.77	40	10	50	<0.5	<2	0.70	0.5	10	81	30
1127041193		0.49		0.505	4.7	1.11	33	<10	40	<0.5	3	1.23	0.9	10	97	78
1127041050		0.49		1.650	2.1	1.32	70	<10	40	<0.5	<2	2.57	1.1	13	54	38
V829068		0.06		6.75	5.3	0.88	<2	<10	50	<0.5	<2	0.55	<0.5	7	10	42
1126007035		0.51		0.071	0.5	0.79	38	<10	30	<0.5	<2	2.25	0.5	7	32	14
1126013064		0.45		0.031	0.2	1.20	7	<10	80	<0.5	<2	1.84	0.5	8	181	35
1126007040		0.50		0.028	0.8	0.93	50	<10	30	<0.5	<2	2.57	1.6	6	20	14
1126013063		0.49		0.030	<0.2	1.21	7	<10	130	<0.5	<2	2.39	<0.5	7	60	14
1126007092		0.47		0.070	0.5	1.26	38	<10	50	<0.5	<2	2.33	0.6	7	71	19
1126014113		0.49		0.444	0.9	1.18	51	<10	30	<0.5	<2	1.63	1.3	7	111	18

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Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1127042149		1.90	<10	<1	0.24	10	0.51	366	1	0.14	10	370	45	1.79	<2	1
1230003195		2.27	<10	<1	0.17	10	0.67	397	1	0.10	10	630	20	2.44	<2	1
1127042025		1.99	<10	<1	0.19	10	0.63	404	1	0.10	11	400	47	1.90	<2	1
1126004165		1.59	<10	<1	0.23	10	0.75	519	<1	0.06	7	370	14	0.85	<2	1
1126005018		1.67	<10	<1	0.11	10	0.55	316	1	0.06	10	410	2	0.12	<2	1
1126004099		1.43	10	<1	0.22	10	0.80	417	<1	0.16	7	350	17	0.57	<2	1
1230003120		1.78	<10	<1	0.17	10	0.39	397	<1	0.14	8	420	14	1.12	<2	1
1126010188		1.76	<10	<1	0.20	10	0.74	549	1	0.07	9	360	10	1.13	<2	1
1126010143		1.62	<10	<1	0.22	10	0.60	543	1	0.05	9	400	19	1.35	<2	1
1230003198		2.61	<10	1	0.17	20	0.90	659	1	0.10	24	640	8	2.60	<2	3
1126010140		1.60	<10	<1	0.22	10	0.74	650	1	0.07	7	350	35	1.11	<2	1
1230003170		1.39	<10	<1	0.12	10	0.29	259	1	0.13	6	460	6	0.98	<2	1
1127042001		1.30	<10	<1	0.19	10	0.28	493	1	0.08	13	330	17	1.35	<2	<1
1126010161		1.53	<10	<1	0.12	20	0.51	322	1	0.04	6	450	8	0.44	<2	1
V829067		2.41	<10	<1	0.20	10	0.35	244	4	0.13	10	520	24	0.03	2	2
1126004060		1.91	<10	<1	0.14	10	0.71	393	1	0.09	10	400	10	0.88	<2	1
1230002037		1.60	<10	<1	0.16	10	0.25	274	<1	0.02	10	250	33	1.79	2	<1
1127041001		3.22	<10	<1	0.15	<10	0.84	1395	<1	0.03	9	380	15	3.25	<2	<1
1230002076		1.67	<10	<1	0.13	10	0.55	252	1	0.01	10	40	19	1.54	<2	<1
1127041069		1.84	<10	<1	0.12	<10	1.00	981	<1	0.02	6	400	22	1.94	<2	<1
1230002057		2.32	<10	<1	0.22	10	0.43	244	1	0.02	12	80	12	2.51	8	<1
1126004054		2.22	<10	<1	0.19	20	0.92	798	1	0.04	7	560	21	1.21	<2	1
1230002002		2.10	<10	<1	0.22	10	0.61	325	1	0.02	11	110	993	2.00	2	1
1127041295		1.85	<10	<1	0.17	10	0.82	1060	1	0.05	10	480	39	1.55	<2	1
1230002003		1.98	<10	<1	0.14	10	0.43	243	1	0.01	12	80	59	1.96	<2	<1
1127041019		2.09	<10	<1	0.18	10	1.08	1185	1	0.04	8	440	34	1.93	<2	1
1126005010		1.67	<10	<1	0.25	10	0.75	465	1	0.08	13	460	7	0.76	<2	1
1126004067		1.75	<10	<1	0.17	10	0.64	418	<1	0.04	9	410	5	0.29	<2	1
1126004150		1.63	<10	1	0.20	10	0.68	420	<1	0.13	9	380	9	0.62	<2	1
1126010001		1.38	<10	<1	0.19	10	0.72	448	<1	0.09	8	420	13	0.51	<2	1
1230003097		2.26	<10	<1	0.19	20	0.62	464	1	0.08	15	530	31	1.85	<2	1
1127041193		2.14	<10	<1	0.26	10	0.54	777	1	0.03	11	480	76	2.11	<2	1
1127041050		2.83	<10	<1	0.19	20	0.98	1140	1	0.06	16	540	54	2.54	<2	1
V829068		1.73	<10	<1	0.18	10	0.38	191	25	0.14	10	620	9	0.06	<2	2
1126007035		1.55	<10	<1	0.13	10	0.74	529	1	0.03	8	380	16	1.05	<2	1
1126013064		1.85	<10	<1	0.21	10	0.67	375	<1	0.06	8	540	<2	0.31	<2	1
1126007040		1.67	<10	<1	0.14	10	0.81	590	<1	0.04	7	370	18	1.33	<2	1
1126013063		1.76	<10	<1	0.22	20	0.85	460	1	0.05	11	680	<2	0.25	<2	2
1126007092		1.70	<10	<1	0.20	10	0.90	568	1	0.05	7	350	19	1.24	<2	1
1126014113		1.66	<10	<1	0.25	10	0.86	824	1	0.02	6	420	174	1.51	<2	1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1127042149		35	<20	<0.01	<10	<10	5	<10	411	0.23	1.89	29	8.7	-30	59.1	0.49
1230003195		53	<20	<0.01	<10	<10	5	<10	221	0.21	2.64	26	8.5	-57	82.5	0.32
1127042025		40	<20	0.01	<10	<10	5	<10	292	0.28	2.00	30	8.6	-33	62.5	0.48
1126004165		36	<20	<0.01	<10	<10	6	<10	355	0.57	0.92	54	9.1	25	28.8	1.88
1126005018		59	<20	<0.01	<10	<10	13	<10	47	0.71	0.14	60	9.4	56	4.4	13.71
1126004099		77	<20	<0.01	<10	<10	7	<10	58	0.31	0.61	36	9.2	17	19.1	1.89
1230003120		102	<20	<0.01	<10	<10	6	<10	78	0.15	1.14	16	8.8	-20	35.6	0.45
1126010188		54	<20	<0.01	<10	<10	6	<10	90	0.71	1.16	62	9.2	26	36.3	1.71
1126010143		43	<20	<0.01	<10	<10	5	<10	96	0.75	1.45	65	9.2	20	45.3	1.43
1230003198		66	<20	<0.01	<10	<10	14	<10	726	0.56	2.78	50	8.7	-37	86.9	0.58
1126010140		68	<20	<0.01	<10	<10	5	<10	118	0.89	1.15	75	9.3	39	35.9	2.09
1230003170		113	<20	<0.01	<10	<10	4	<10	139	0.16	1.06	16	8.8	-17	33.1	0.48
1127042001		58	<20	<0.01	<10	<10	3	<10	48	0.54	1.33	44	8.8	2	41.6	1.06
1126010161		31	<20	0.01	<10	<10	7	<10	57	0.48	0.45	42	9.3	28	14.1	2.99
V829067		18	<20	0.37	<10	<10	58	<10	60	0.03						
1126004060		59	<20	0.02	<10	<10	14	<10	59	0.31	0.84	33	8.7	7	26.3	1.26
1230002037		12	<20	<0.01	<10	<10	3	<10	484	0.03	1.80	4	7.7	-52	56.3	0.07
1127041001		27	<20	<0.01	<10	<10	4	<10	128	0.73	3.41	59	8.8	-48	106.6	0.55
1230002076		10	<20	<0.01	<10	<10	4	<10	412	0.03	1.50	3	7.8	-44	46.9	0.06
1127041069		28	<20	<0.01	<10	<10	3	<10	133	1.03	2.05	78	9.1	14	64.1	1.22
1230002057		21	<20	<0.01	<10	<10	4	<10	937	0.13	2.52	5	7.9	-74	78.8	0.06
1126004054		36	<20	<0.01	<10	<10	10	<10	164	0.70	1.17	61	8.7	24	36.6	1.67
1230002002		24	<20	<0.01	<10	<10	7	<10	2250	0.31	2.11	25	8.5	-41	65.9	0.38
1127041295		32	<20	<0.01	<10	<10	6	<10	195	0.74	1.61	65	9.0	15	50.3	1.29
1230002003		14	<20	<0.01	<10	<10	5	<10	830	0.07	1.89	5	8.0	-54	59.1	0.08
1127041019		46	<20	<0.01	<10	<10	5	<10	160	0.99	1.81	78	9.0	21	56.6	1.38
1126005010		46	<20	0.02	<10	<10	13	10	43	0.41	0.77	39	9.0	15	24.1	1.62
1126004067		32	<20	0.02	<10	<10	16	<10	165	0.54	0.32	46	9.2	36	10.0	4.60
1126004150		57	<20	<0.01	<10	<10	10	<10	73	0.24	0.64	30	9.0	10	20.0	1.50
1126010001		30	<20	<0.01	<10	<10	7	<10	107	0.36	0.52	34	9.2	18	16.3	2.09
1230003097		66	<20	<0.01	<10	<10	8	<10	182	0.10	1.83	13	8.4	-44	57.2	0.23
1127041193		20	<20	<0.01	<10	<10	5	<10	242	0.40	2.05	35	8.8	-29	64.1	0.55
1127041050		40	<20	<0.01	<10	<10	8	<10	326	0.86	2.48	72	9.1	-6	77.5	0.93
V829068		23	<20	0.25	<10	<10	53	<10	35	0.03						
1126007035		46	<20	<0.01	<10	<10	4	<10	158	1.03	1.05	70	9.0	37	32.8	2.13
1126013064		50	<20	0.01	<10	<10	16	<10	172	0.56	0.31	51	9.5	41	9.7	5.26
1126007040		51	<20	<0.01	<10	<10	4	<10	365	0.94	1.27	73	9.0	33	39.7	1.84
1126013063		82	<20	0.02	<10	<10	16	<10	62	0.78	0.23	65	9.4	58	7.2	9.04
1126007092		79	<20	<0.01	<10	<10	5	<10	165	0.92	1.17	73	9.2	36	36.6	2.00
1126014113		33	<20	<0.01	<10	<10	6	<10	363	0.48	1.40	45	9.0	1	43.8	1.03

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1127042149		2
1230003195		2
1127042025		2
1126004165		2
1126005018		2
1126004099		2
1230003120		1
1126010188		2
1126010143		2
1230003198		2
1126010140		2
1230003170		1
1127042001		2
1126010161		2
V829067		
1126004060		2
1230002037		1
1127041001		2
1230002076		1
1127041069		2
1230002057		1
1126004054		2
1230002002		2
1127041295		2
1230002003		1
1127041019		2
1126005010		2
1126004067		2
1126004150		2
1126010001		2
1230003097		1
1127041193		2
1127041050		2
V829068		
1126007035		2
1126013064		2
1126007040		2
1126013063		2
1126007092		2
1126014113		2

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Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1
1126014050		0.56		1.620	2.2	1.35	88	<10	30	<0.5	<2	1.44	11.4	10	135	210
1126007088		0.52		0.193	1.1	1.39	73	<10	30	<0.5	<2	1.42	2.3	10	114	46
1126007125		0.57		1.125	1.9	0.93	129	<10	30	<0.5	<2	1.32	2.8	9	96	54
1126007145		0.46		0.114	0.7	1.60	222	<10	40	<0.5	<2	1.23	<0.5	8	110	37
1126014073		0.37		0.363	1.3	0.94	50	<10	20	<0.5	<2	1.74	3.7	6	181	58
1126007003		0.48		0.029	0.5	1.94	23	<10	40	<0.5	<2	1.48	<0.5	8	176	13
1126015147		0.53		3.92	8.1	0.95	97	<10	20	<0.5	<2	1.46	23.1	9	165	185
1126007321		0.49		0.454	1.8	1.16	110	<10	40	<0.5	<2	2.70	1.0	9	93	31
1126013015		0.47		0.064	0.3	1.38	5	<10	60	<0.5	<2	2.16	<0.5	11	192	33
1126007010		0.54		0.029	0.6	1.59	35	10	40	<0.5	<2	1.99	<0.5	7	88	14
1126007062		0.46		0.087	0.8	1.14	140	<10	40	<0.5	<2	1.87	<0.5	6	97	10
1126013040		0.57		0.032	0.4	1.28	6	<10	60	<0.5	<2	1.79	<0.5	6	155	102
1126007030		0.57		0.107	0.5	1.78	41	<10	40	<0.5	<2	1.27	<0.5	8	113	15
1126007082		0.48		0.028	0.4	1.48	39	<10	40	<0.5	<2	3.02	<0.5	6	83	8
1126007346		0.52		1.010	1.8	0.58	144	<10	40	<0.5	<2	1.17	1.8	9	115	36
1126007362		0.58		1.390	3.8	0.49	117	<10	30	<0.5	<2	2.68	2.6	24	133	57
V829069		0.06		6.81	5.3	0.86	<2	<10	50	<0.5	<2	0.54	<0.5	6	10	40
1126015002		0.49		1.620	1.7	1.11	98	<10	20	<0.5	<2	1.07	7.6	7	23	83
1126011104		0.48		0.085	0.3	1.07	7	<10	40	<0.5	<2	1.41	<0.5	7	35	32
1126015003		0.52		1.225	3.2	1.49	37	<10	30	<0.5	<2	1.77	9.8	7	72	175
1130101103		0.44		0.019	0.3	3.99	8	<10	60	<0.5	<2	6.01	0.7	40	113	111
1126015080		0.47		2.88	4.0	1.49	107	<10	30	<0.5	<2	0.31	5.1	7	140	119
1126012051		0.50		0.016	<0.2	1.26	4	<10	70	<0.5	<2	1.78	<0.5	8	165	16
1126012094		0.47		0.034	0.2	1.42	10	<10	60	<0.5	<2	1.56	<0.5	9	127	21
1126012077		0.45		0.090	0.4	1.39	9	<10	60	<0.5	<2	1.58	<0.5	9	161	48
1126015108		0.50		1.810	1.4	1.61	110	<10	30	<0.5	<2	1.10	4.2	10	104	61
1130101110		0.49		0.359	1.6	3.38	36	<10	50	<0.5	3	4.24	1.4	42	112	187
1126012106		0.50		0.057	0.2	1.40	4	<10	100	<0.5	<2	1.53	<0.5	9	129	31
1126012081		0.51		0.039	<0.2	1.55	4	<10	100	<0.5	<2	1.19	<0.5	7	160	24
1130101034		0.50		0.026	0.5	3.94	13	<10	90	<0.5	3	6.09	1.4	37	110	101
1126015011		0.48		0.583	1.0	1.48	39	<10	50	<0.5	<2	1.22	9.4	7	93	50
1126012059		0.53		0.133	0.3	1.41	8	<10	50	<0.5	<2	1.18	<0.5	9	142	43
1130101038		0.48		2.64	23.6	3.84	73	<10	90	<0.5	<2	4.46	0.6	41	123	94
1126012066		0.48		0.254	0.7	1.29	12	<10	50	<0.5	<2	0.80	<0.5	12	160	54
1126012133		0.50		0.029	0.2	1.32	33	<10	30	<0.5	<2	2.15	<0.5	10	46	24
1126012086		0.50		0.023	<0.2	1.63	4	<10	120	<0.5	<2	1.85	<0.5	12	103	20
1130101047		0.50		0.078	0.8	4.02	25	<10	50	<0.5	2	4.68	1.3	48	84	129
1126012085		0.51		0.041	<0.2	1.38	3	<10	90	<0.5	<2	0.98	<0.5	10	121	23
1126013065		0.48		0.017	0.2	1.14	5	<10	50	<0.5	<2	1.84	<0.5	8	54	18
1126012006		0.60	88.7	0.036	0.2	1.25	5	<10	50	<0.5	<2	1.54	<0.5	9	155	23

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CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1126014050		2.56	<10	1	0.19	10	0.77	719	1	0.03	10	490	79	2.13	<2	1
1126007088		1.99	<10	<1	0.12	10	0.78	572	1	0.03	10	420	58	1.34	<2	1
1126007125		2.74	<10	<1	0.18	10	0.65	978	<1	0.03	10	590	224	2.40	<2	1
1126007145		2.21	<10	<1	0.18	10	0.75	570	1	0.04	9	500	20	1.14	<2	1
1126014073		1.77	<10	<1	0.20	10	0.74	869	1	0.02	6	370	109	1.40	<2	1
1126007003		1.83	<10	<1	0.18	10	0.78	481	<1	0.13	10	380	9	0.53	<2	1
1126015147		2.91	<10	1	0.17	10	0.73	944	1	0.02	13	460	491	2.84	3	1
1126007321		2.46	<10	<1	0.21	20	0.93	1005	<1	0.03	8	650	166	2.01	<2	1
1126013015		2.31	<10	<1	0.16	20	0.93	471	1	0.05	21	540	2	0.53	<2	2
1126007010		1.65	<10	<1	0.22	10	0.81	517	<1	0.08	9	390	9	0.73	<2	1
1126007062		1.47	<10	<1	0.21	10	0.57	527	<1	0.05	8	370	11	0.80	<2	1
1126013040		2.08	<10	<1	0.21	10	0.74	406	2	0.06	12	420	4	0.27	<2	2
1126007030		1.57	<10	<1	0.21	10	0.66	436	<1	0.14	11	370	14	0.56	<2	1
1126007082		1.42	<10	<1	0.17	10	0.91	488	1	0.07	7	360	11	0.45	<2	1
1126007346		2.42	<10	<1	0.21	10	0.46	842	1	0.02	9	560	118	2.48	<2	1
1126007362		2.54	<10	<1	0.21	10	1.05	2490	1	0.02	24	430	235	2.39	<2	1
V829069		1.67	<10	<1	0.17	10	0.37	188	15	0.14	10	600	10	0.06	<2	2
1126015002		2.10	<10	<1	0.14	20	0.61	566	1	0.03	8	460	196	1.87	<2	<1
1126011104		2.06	<10	<1	0.11	10	0.58	267	1	0.05	7	400	<2	0.70	<2	1
1126015003		1.84	<10	1	0.27	20	1.02	1010	1	0.02	5	380	494	1.26	<2	1
1130101103		8.44	10	<1	0.35	10	2.05	1435	<1	0.12	67	600	2	0.66	3	16
1126015080		4.09	<10	<1	0.23	10	0.95	544	<1	0.02	10	350	161	3.57	2	<1
1126012051		1.99	10	<1	0.19	10	0.68	352	1	0.07	11	440	2	0.23	<2	1
1126012094		2.17	<10	<1	0.22	10	0.77	379	1	0.06	9	410	2	0.44	<2	1
1126012077		2.45	10	<1	0.18	10	0.74	391	2	0.07	11	390	2	0.69	<2	1
1126015108		2.32	<10	<1	0.20	20	0.82	567	1	0.03	9	560	215	1.89	<2	1
1130101110		7.65	10	1	0.28	<10	1.67	1395	1	0.17	62	540	11	2.08	<2	9
1126012106		2.22	10	<1	0.38	10	0.78	348	<1	0.07	13	390	3	0.47	<2	2
1126012081		2.38	10	<1	0.39	10	0.84	440	<1	0.07	12	420	4	0.35	<2	2
1130101034		7.79	10	<1	0.43	<10	1.79	1465	<1	0.12	63	610	9	0.82	4	13
1126015011		2.44	<10	<1	0.33	10	1.11	623	<1	0.01	13	480	29	1.63	2	1
1126012059		2.56	10	<1	0.15	10	0.74	397	1	0.06	10	410	2	0.85	<2	1
1130101038		8.64	10	<1	0.62	<10	2.02	1460	<1	0.10	71	590	9	1.72	3	16
1126012066		2.82	<10	<1	0.18	10	0.63	313	1	0.06	11	410	4	1.34	<2	1
1126012133		2.20	10	1	0.13	10	0.72	386	1	0.05	13	460	12	0.53	<2	1
1126012086		2.67	10	1	0.39	20	0.93	373	1	0.08	15	680	2	0.24	<2	2
1130101047		8.97	10	<1	0.35	<10	2.08	1715	1	0.24	71	590	10	2.02	3	14
1126012085		2.08	10	1	0.34	10	0.72	326	1	0.09	12	420	2	0.38	<2	2
1126013065		1.81	<10	1	0.16	10	0.67	396	1	0.05	10	600	3	0.21	<2	2
1126012006		2.34	10	<1	0.18	30	0.73	394	1	0.07	12	410	4	0.39	<2	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1126014050		26	<20	<0.01	<10	<10	8	<10	3220	0.40	2.08	39	8.8	-26	65.0	0.60
1126007088		23	<20	<0.01	<10	<10	5	<10	593	0.48	1.26	42	8.8	3	39.4	1.07
1126007125		19	<20	<0.01	<10	<10	5	<10	683	0.59	2.30	49	8.8	-23	71.9	0.68
1126007145		25	<20	<0.01	<10	<10	8	<10	167	0.45	1.07	39	9.0	6	33.4	1.17
1126014073		32	<20	<0.01	<10	<10	5	<10	973	0.60	1.33	52	8.9	10	41.6	1.25
1126007003		58	<20	0.01	<10	<10	9	<10	64	0.37	0.47	35	9.2	20	14.7	2.38
1126015147		23	<20	<0.01	<10	<10	5	<10	5670	0.61	2.79	50	8.8	-37	87.2	0.57
1126007321		34	<20	<0.01	<10	<10	7	<10	262	1.09	1.97	92	8.9	30	61.6	1.49
1126013015		49	<20	0.01	<10	<10	18	<10	60	0.68	0.49	60	9.2	45	15.3	3.92
1126007010		42	<20	<0.01	<10	<10	6	<10	63	0.56	0.67	49	9.2	28	20.9	2.34
1126007062		35	<20	<0.01	<10	<10	4	<10	73	0.62	0.74	50	9.2	27	23.1	2.16
1126013040		29	<20	0.03	<10	<10	19	<10	79	0.54	0.24	50	9.6	43	7.5	6.67
1126007030		54	<20	0.01	<10	<10	9	<10	72	0.28	0.52	28	9.4	12	16.3	1.72
1126007082		83	<20	<0.01	<10	<10	6	<10	53	0.96	0.43	80	9.3	67	13.4	5.95
1126007346		17	<20	<0.01	<10	<10	4	<10	376	0.59	2.40	48	8.9	-27	75.0	0.64
1126007362		22	<20	<0.01	<10	<10	3	<10	673	1.50	2.34	117	9.1	44	73.1	1.60
V829069		22	<20	0.24	<10	<10	51	<10	35	0.03						
1126015002		26	<20	<0.01	<10	<10	5	<10	2140	0.30	1.90	28	8.6	-31	59.4	0.47
1126011104		26	<20	0.01	<10	<10	13	<10	28	0.45	0.67	41	9.4	20	20.9	1.96
1126015003		39	<20	0.01	<10	<10	7	<10	2540	0.53	1.22	50	9.1	12	38.1	1.31
1130101103		81	<20	0.12	<10	<10	211	<10	202	2.21	0.61	220	8.8	201	19.1	11.54
1126015080		12	<20	<0.01	<10	<10	6	<10	1335	0.09	3.45	11	8.4	-97	107.8	0.10
1126012051		36	<20	0.02	<10	<10	18	<10	54	0.51	0.21	48	9.6	41	6.6	7.31
1126012094		30	<20	0.02	<10	<10	18	<10	55	0.45	0.42	43	9.5	30	13.1	3.28
1126012077		31	<20	0.02	<10	<10	17	<10	57	0.47	0.67	46	9.2	25	20.9	2.20
1126015108		28	<20	<0.01	<10	<10	7	<10	1045	0.27	1.88	28	8.7	-31	58.8	0.48
1130101110		85	<20	0.08	<10	<10	155	<10	345	1.67	2.17	171	8.5	103	67.8	2.52
1126012106		31	<20	0.06	<10	<10	22	<10	47	0.44	0.46	47	9.6	33	14.4	3.27
1126012081		28	<20	0.07	<10	<10	22	<10	61	0.32	0.34	36	9.6	25	10.6	3.39
1130101034		80	<20	0.11	<10	<10	187	<10	315	2.08	0.78	206	8.6	182	24.4	8.45
1126015011		39	<20	0.02	<10	<10	12	<10	2410	0.35	1.50	36	9.0	-11	46.9	0.77
1126012059		26	<20	0.01	<10	<10	16	<10	59	0.35	0.77	34	9.0	10	24.1	1.41
1130101038		57	<20	0.13	<10	<10	204	<10	252	1.66	1.69	183	8.7	130	52.8	3.47
1126012066		23	<20	0.02	<10	<10	16	<10	38	0.22	1.30	24	8.8	-17	40.6	0.59
1126012133		33	<20	0.01	<10	<10	16	<10	77	0.61	0.48	53	9.2	38	15.0	3.53
1126012086		56	<20	0.08	<10	<10	43	<10	52	0.46	0.21	49	9.5	42	6.6	7.47
1130101047		95	<20	0.09	<10	<10	213	<10	300	1.83	2.05	204	8.4	140	64.1	3.18
1126012085		32	<20	0.06	<10	<10	25	<10	38	0.23	0.35	29	9.5	18	10.9	2.65
1126013065		60	<20	0.02	<10	<10	19	<10	92	0.52	0.20	49	9.6	43	6.3	7.84
1126012006		32	<20	0.03	<10	<10	21	<10	42	0.47	0.34	46	9.3	35	10.6	4.33

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1126014050		2
1126007088		2
1126007125		2
1126007145		2
1126014073		2
1126007003		2
1126015147		2
1126007321		3
1126013015		2
1126007010		2
1126007062		2
1126013040		2
1126007030		2
1126007082		2
1126007346		2
1126007362		3
V829069		
1126015002		2
1126011104		2
1126015003		2
1130101103		3
1126015080		1
1126012051		2
1126012094		2
1126012077		2
1126015108		2
1130101110		3
1126012106		2
1126012081		2
1130101034		3
1126015011		2
1126012059		2
1130101038		3
1126012066		2
1126012133		2
1126012086		2
1130101047		3
1126012085		2
1126013065		2
1126012006		2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
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Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
V829070		0.06		0.195	1.4	0.86	2	<10	40	<0.5	<2	0.45	<0.5	10	12	54
1230004076		0.55		0.176	1.8	1.47	23	<10	40	<0.5	<2	1.12	0.6	10	168	94
1230003062		0.50		0.443	5.0	1.58	40	<10	40	<0.5	<2	1.27	1.7	9	96	48
1230003024		0.53		0.061	1.4	1.21	30	<10	30	<0.5	<2	0.77	0.7	11	120	38
1126011032		0.43		0.179	0.4	1.12	4	<10	60	<0.5	<2	2.37	<0.5	10	221	82
1126011001		0.53		0.108	0.3	1.12	8	<10	30	<0.5	<2	1.64	<0.5	12	119	17
1230004064		0.54		0.339	5.0	0.85	34	<10	40	<0.5	2	2.14	5.1	9	99	106
1230004058		0.54		0.110	1.1	1.30	48	<10	40	<0.5	<2	2.09	0.7	9	90	29
1126011131		0.49		0.119	0.7	1.12	6	<10	30	<0.5	<2	1.71	<0.5	8	41	45
1230004050		0.57		0.288	5.2	0.96	41	<10	40	<0.5	<2	2.27	1.9	8	102	98
1230003702		0.55		0.106	2.1	2.05	26	<10	40	<0.5	<2	1.35	<0.5	8	103	23
1126011149		0.54		0.243	0.5	1.24	8	<10	50	<0.5	2	0.75	<0.5	11	181	40
1230004037		0.54		0.099	1.0	1.02	38	<10	40	<0.5	<2	2.23	<0.5	7	87	28
1230003305		0.43		0.057	0.6	1.26	17	<10	30	<0.5	<2	1.08	1.1	7	123	35
1126011118		0.46		0.020	0.2	1.16	2	<10	40	<0.5	<2	1.18	<0.5	8	42	27
1126011119		0.50		0.066	0.2	1.28	7	<10	50	<0.5	<2	0.97	<0.5	9	152	42
1126015053		0.53		1.280	0.7	1.97	52	<10	30	<0.5	<2	0.67	3.0	9	45	48
1126015109		0.52		0.694	1.2	1.74	56	<10	30	<0.5	<2	1.52	1.5	8	75	50
V829071		0.06		6.71	5.0	0.84	<2	<10	50	<0.5	<2	0.54	<0.5	7	10	41

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
V829070		2.57	<10	<1	0.20	10	0.36	259	4	0.15	11	540	20	0.05	<2	2
1230004076		2.14	<10	<1	0.15	20	0.85	607	4	0.11	12	490	19	1.91	<2	1
1230003062		2.54	<10	<1	0.21	10	0.61	549	1	0.04	14	490	43	2.73	<2	1
1230003024		1.59	<10	1	0.18	10	0.29	736	1	0.08	13	570	75	1.54	<2	1
1126011032		2.49	<10	<1	0.14	10	0.72	360	1	0.07	13	410	<2	0.61	<2	1
1126011001		2.32	<10	<1	0.08	10	0.75	309	<1	0.05	16	410	2	0.77	<2	2
1230004064		2.26	<10	<1	0.20	20	0.86	1370	<1	0.05	10	540	57	2.44	<2	1
1230004058		1.94	<10	1	0.17	20	0.89	970	<1	0.07	9	590	22	1.52	<2	1
1126011131		2.17	<10	1	0.11	10	0.64	341	1	0.05	8	420	2	0.79	<2	1
1230004050		1.99	<10	<1	0.18	10	0.87	1430	1	0.05	10	500	89	2.04	2	1
1230003702		2.10	10	<1	0.17	20	0.61	558	1	0.08	9	510	24	1.58	<2	1
1126011149		2.86	10	1	0.19	10	0.73	279	1	0.06	15	380	3	1.33	<2	2
1230004037		1.89	<10	<1	0.18	20	0.83	1130	<1	0.06	10	480	26	1.73	<2	1
1230003305		2.09	<10	1	0.13	20	0.52	470	1	0.09	9	480	15	2.25	2	1
1126011118		1.86	10	1	0.14	10	0.64	325	<1	0.06	10	410	3	0.28	<2	2
1126011119		2.35	10	<1	0.19	10	0.69	303	1	0.07	9	410	<2	0.72	<2	2
1126015053		2.30	10	<1	0.17	20	0.80	612	<1	0.04	9	620	73	1.22	<2	1
1126015109		1.97	<10	<1	0.19	10	0.88	717	<1	0.04	10	440	158	1.11	<2	1
V829071		1.73	<10	<1	0.18	10	0.37	185	16	0.13	10	590	9	0.07	<2	2

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
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Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
V829070		19	<20	0.39	<10	<10	59	<10	62	0.02						
1230004076		43	<20	0.01	<10	<10	8	<10	159	0.28	1.77	27	8.6	-28	55.3	0.49
1230003062		30	<20	0.01	<10	<10	6	<10	450	0.23	2.48	26	8.2	-52	77.5	0.34
1230003024		51	<20	<0.01	<10	<10	5	<10	255	0.15	1.39	13	8.5	-30	43.4	0.30
1126011032		62	<20	<0.01	<10	<10	11	10	29	0.91	0.56	69	9.1	52	17.5	3.94
1126011001		33	<20	0.01	<10	<10	22	<10	33	0.55	0.75	48	9.2	25	23.4	2.05
1230004064		35	<20	<0.01	<10	<10	4	<10	1330	0.87	2.37	74	8.7	0	74.1	1.00
1230004058		41	<20	<0.01	<10	<10	6	<10	182	0.66	1.43	59	9.0	14	44.7	1.32
1126011131		28	<20	<0.01	<10	<10	11	<10	38	0.49	0.78	44	9.2	20	24.4	1.81
1230004050		35	<20	<0.01	<10	<10	5	<10	496	0.87	1.94	74	8.8	13	60.6	1.22
1230003702		78	<20	<0.01	<10	<10	7	<10	136	0.19	1.40	24	8.7	-20	43.8	0.55
1126011149		20	<20	0.03	<10	<10	19	10	43	0.21	1.35	26	8.8	-16	42.2	0.62
1230004037		37	<20	<0.01	<10	<10	6	<10	127	0.86	1.73	72	8.9	18	54.1	1.33
1230003305		50	<20	<0.01	<10	<10	6	<10	263	0.27	2.28	26	8.7	-45	71.3	0.36
1126011118		28	<20	0.04	<10	<10	22	<10	38	0.31	0.27	33	9.5	25	8.4	3.91
1126011119		23	<20	0.03	<10	<10	21	<10	32	0.25	0.68	30	9.4	9	21.3	1.41
1126015053		30	<20	<0.01	<10	<10	9	<10	846	0.11	1.14	16	8.9	-20	35.6	0.45
1126015109		31	<20	<0.01	<10	<10	8	<10	384	0.33	1.05	34	8.9	1	32.8	1.04
V829071		22	<20	0.24	<10	<10	49	<10	35	0.03						

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.

2103 Dollarton Hwy
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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
V829070		
1230004076		2
1230003062		2
1230003024		1
1126011032		2
1126011001		2
1230004064		2
1230004058		2
1126011131		2
1230004050		2
1230003702		2
1126011149		2
1230004037		2
1230003305		2
1126011118		2
1126011119		2
1126015053		1
1126015109		2
V829071		

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps April 2018

CERTIFICATE OF ANALYSIS TB18114640

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

CERTIFICATE TB18114668

Project: Mine Site Lab Pulps 2017 Backl

P.O. No.: 4500009909

This report is for 154 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 17-MAY-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

<Original signed by>

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1
1131051010		0.54	90.0	0.076	0.3	2.11	13	<10	50	<0.5	<2	2.13	<0.5	25	312	57
2138012365		0.52		0.007	<0.2	1.53	5	<10	140	<0.5	<2	1.67	<0.5	11	220	19
1131052111		0.54		0.218	3.1	0.91	23	<10	30	<0.5	<2	0.75	0.6	8	240	31
1131052281		0.43		0.463	2.4	0.91	42	<10	50	<0.5	<2	0.09	1.6	9	236	28
1131052609		0.55		0.280	2.6	0.82	49	<10	40	<0.5	<2	0.15	1.0	9	253	37
1131051508		0.50		0.083	0.4	2.07	13	<10	20	<0.5	<2	3.12	<0.5	25	316	74
1129024037		0.88		8.70	2.1	1.22	64	<10	30	<0.5	<2	0.67	31.7	6	172	135
1131052319		0.48		0.197	5.0	0.86	40	<10	40	<0.5	<2	0.93	1.8	9	204	118
1128007246		0.47		0.038	0.4	1.41	13	<10	60	<0.5	<2	1.40	1.4	9	174	26
1128007202		0.54		0.051	0.3	1.29	8	<10	60	<0.5	<2	0.84	<0.5	9	212	35
1131052156		0.51		0.064	1.6	0.71	23	<10	30	<0.5	<2	0.62	0.7	6	190	34
1128017018		Not Recvd														
1128017029		0.57		0.184	2.1	3.49	25	<10	90	<0.5	2	3.34	0.8	49	128	110
1128015026		Not Recvd														
1128170172		Not Recvd														
1128015184		0.52		1.900	3.9	1.41	86	<10	50	<0.5	<2	0.55	4.0	7	101	26
1130056034		0.48		0.244	1.2	0.63	55	<10	40	<0.5	<2	1.48	0.9	8	187	29
V829054		0.06		NSS	6.7	0.78	411	<10	40	<0.5	2	1.18	1.1	7	13	284
1129025108		0.61		0.064	0.5	3.64	8	<10	170	<0.5	<2	2.76	1.5	36	204	99
1128015310		0.51		1.460	6.2	1.55	57	<10	20	<0.5	<2	1.49	11.2	6	171	172
1131063119		0.49		0.117	0.7	1.46	32	10	40	<0.5	<2	0.97	0.6	7	176	23
1129027235		0.48		0.009	<0.2	1.08	3	<10	50	<0.5	<2	1.53	<0.5	6	226	9
1130056210		0.46		0.246	1.7	0.82	31	<10	40	<0.5	4	0.14	<0.5	10	402	27
1128012248		0.65		0.052	0.4	1.07	5	<10	60	<0.5	<2	1.68	<0.5	8	187	19
1128015094		0.48		1.060	1.6	1.17	63	<10	30	<0.5	<2	2.25	3.1	7	155	82
1128015100		0.46		0.944	1.3	1.77	38	<10	120	<0.5	<2	2.58	4.6	14	136	58
1129029001		0.51		1.205	2.0	0.91	90	<10	30	<0.5	<2	0.18	7.8	7	193	52
1128015122		0.50		0.090	0.4	1.67	46	<10	50	<0.5	<2	1.76	1.5	7	149	12
1128012136		0.59		0.224	2.7	3.18	39	<10	70	<0.5	<2	3.06	5.5	38	140	177
1128017058		0.40		1.080	2.0	1.21	67	<10	40	<0.5	<2	1.40	0.6	9	133	25
1128015312		0.37		0.151	0.7	1.56	38	<10	50	<0.5	<2	1.69	0.9	7	87	30
1128009374		0.63		0.174	1.3	3.06	18	<10	100	<0.5	2	2.71	3.0	42	146	137
1129029073		0.44		0.663	0.9	1.46	82	<10	40	<0.5	2	0.30	<0.5	9	132	43
1129026040		0.56		0.008	0.2	0.98	3	<10	40	<0.5	<2	1.39	<0.5	5	260	23
1128011076		0.61		0.027	0.2	1.11	10	<10	60	<0.5	<2	1.24	<0.5	9	260	27
1128012223		0.57		<0.005	<0.2	1.70	2	<10	100	<0.5	<2	2.04	<0.5	13	172	6
1129029032		0.48		0.557	0.9	1.01	128	<10	40	<0.5	<2	0.35	<0.5	8	228	29
1131063103		0.52		0.113	0.8	0.82	63	<10	40	<0.5	<2	0.28	<0.5	7	143	21
1129029043		0.46		0.256	0.8	1.14	98	<10	40	<0.5	<2	0.38	<0.5	7	191	15
V829055		0.06		0.192	1.5	0.79	<2	<10	40	<0.5	<2	0.41	<0.5	10	11	53

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1131051010		3.94	10	<1	0.23	20	1.87	723	1	0.04	77	460	9	0.72	<2	9
2138012365		2.14	10	<1	0.59	20	0.79	389	1	0.08	30	710	5	0.22	2	3
1131052111		1.91	<10	<1	0.21	10	0.49	1105	1	0.02	13	450	22	1.78	<2	1
1131052281		2.20	<10	<1	0.23	10	0.29	61	1	0.05	12	80	74	2.30	2	<1
1131052609		1.89	<10	<1	0.17	10	0.38	69	1	0.04	12	40	22	1.70	<2	<1
1131051508		3.56	10	<1	0.11	10	1.76	627	1	0.03	71	390	4	0.79	<2	6
1129024037		2.33	<10	1	0.22	10	0.84	725	1	0.02	9	380	154	2.05	<2	<1
1131052319		2.03	<10	<1	0.18	10	0.68	1175	1	0.05	19	450	135	1.93	<2	1
1128007246		1.88	<10	<1	0.38	10	0.68	402	1	0.09	12	400	<2	0.57	<2	1
1128007202		2.00	10	<1	0.41	10	0.66	393	1	0.07	10	390	3	0.37	<2	1
1131052156		1.54	<10	<1	0.15	10	0.43	1115	2	0.03	12	280	84	1.33	<2	<1
1128017018																
1128017029		11.10	10	<1	0.44	<10	1.35	1555	1	0.17	69	700	6	3.45	<2	11
1128015026																
1128170172																
1128015184		2.49	<10	<1	0.30	10	0.77	504	1	0.03	11	370	72	2.23	<2	1
1130056034		2.23	<10	1	0.27	10	0.71	1200	1	0.03	12	470	52	2.37	2	1
V829054		4.24	<10	<1	0.25	10	0.28	475	3	0.02	9	160	18	3.36	3	2
1129025108		6.34	10	<1	0.59	<10	1.14	835	1	0.22	54	750	6	1.04	<2	8
1128015310		2.12	<10	<1	0.24	10	1.00	676	1	0.03	8	380	257	1.64	3	1
1131063119		1.77	<10	<1	0.24	10	0.67	471	1	0.09	8	380	98	1.46	<2	1
1129027235		1.73	<10	<1	0.19	20	0.45	305	1	0.07	7	460	3	0.08	<2	1
1130056210		2.36	<10	<1	0.18	10	0.27	112	2	0.05	17	350	134	2.34	<2	<1
1128012248		1.59	<10	<1	0.22	20	0.58	466	1	0.05	12	410	2	0.26	<2	1
1128015094		1.72	<10	<1	0.29	10	0.80	1230	<1	0.02	8	360	283	1.18	4	1
1128015100		2.38	<10	<1	0.51	20	1.48	1010	1	0.02	32	730	343	1.11	2	3
1129029001		2.31	<10	1	0.25	10	0.50	814	1	0.01	9	420	18	1.89	<2	<1
1128015122		1.73	<10	<1	0.25	10	0.84	516	<1	0.05	9	360	31	0.88	<2	1
1128012136		8.98	10	<1	0.33	10	1.49	1585	1	0.11	62	780	6	2.48	<2	12
1128017058		2.58	<10	<1	0.31	10	0.62	656	1	0.05	13	470	68	2.55	3	1
1128015312		1.57	<10	1	0.45	10	0.80	845	1	0.03	8	380	43	1.07	<2	1
1128009374		10.30	10	<1	0.31	10	1.30	1440	1	0.16	65	770	5	2.83	<2	12
1129029073		2.39	<10	<1	0.31	10	0.87	483	1	0.01	13	430	21	1.48	<2	1
1129026040		1.64	<10	<1	0.13	20	0.44	410	1	0.06	7	480	8	0.16	<2	1
1128011076		1.98	<10	<1	0.30	10	0.62	398	2	0.06	12	420	2	0.50	<2	1
1128012223		2.22	10	<1	0.32	10	1.00	483	<1	0.08	30	430	5	0.02	<2	3
1129029032		2.80	<10	<1	0.27	20	0.52	337	2	0.01	13	420	28	2.31	<2	1
1131063103		1.87	<10	<1	0.26	20	0.37	742	1	0.02	11	520	47	1.83	<2	<1
1129029043		2.49	<10	<1	0.28	10	0.63	404	1	0.01	12	420	26	1.82	<2	1
V829055		2.45	<10	<1	0.19	10	0.35	249	4	0.14	11	520	22	0.04	2	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1131051010		72	<20	0.06	<10	<10	69	<10	108	0.66	0.69	58	9.0	36	21.6	2.69
2138012365		90	<20	0.08	<10	<10	29	<10	49	0.40	0.19	41	9.7	35	5.9	6.91
1131052111		20	<20	<0.01	<10	<10	5	<10	140	0.36	1.66	29	8.9	-23	51.9	0.56
1131052281		21	<20	<0.01	<10	<10	5	<10	496	0.02	2.12	4	7.5	-62	66.3	0.06
1131052609		20	<20	<0.01	<10	<10	5	<10	270	0.06	1.68	6	8.6	-47	52.5	0.11
1131051508		49	<20	0.02	<10	<10	55	<10	54	0.97	0.73	83	9.3	60	22.8	3.64
1129024037		18	<20	0.01	<10	<10	6	<10	7650	0.18	2.06	23	8.6	-41	64.4	0.36
1131052319		21	<20	<0.01	<10	<10	4	10	457	0.45	1.85	38	8.9	-20	57.8	0.66
1128007246		34	<20	0.04	<10	<10	14	<10	397	0.39	0.55	41	9.5	24	17.2	2.39
1128007202		25	<20	0.05	<10	<10	18	<10	194	0.23	0.30	28	9.7	19	9.4	2.99
1131052156		20	<20	<0.01	<10	<10	4	<10	209	0.35	1.23	29	9.0	-9	38.4	0.75
1128017018																
1128017029		108	<20	0.15	<10	<10	259	20	276	0.97	3.42	160	8.8	53	106.9	1.50
1128015026																
1128170172																
1128015184		19	<20	<0.01	<10	<10	6	<10	1030	0.15	2.14	20	8.8	-47	66.9	0.30
1130056034		18	<20	<0.01	<10	<10	4	<10	232	0.85	2.24	67	9.0	-3	70.0	0.96
V829054		18	<20	0.01	<10	<10	7	<10	239	0.38						
1129025108		98	<20	0.19	<10	<10	159	10	487	0.58	1.03	105	8.8	73	32.2	3.26
1128015310		33	<20	0.01	<10	<10	7	<10	2740	0.39	1.67	44	9.0	-8	52.2	0.84
1131063119		26	<20	<0.01	<10	<10	7	<10	199	0.25	1.39	30	8.7	-13	43.4	0.69
1129027235		32	<20	0.03	<10	<10	14	<10	98	0.48	0.07	44	9.6	42	2.2	20.11
1130056210		21	<20	<0.01	<10	<10	5	<10	109	0.16	2.34	5	7.9	-68	73.1	0.07
1128012248		28	<20	0.03	<10	<10	14	<10	115	0.51	0.27	50	9.6	42	8.4	5.93
1128015094		36	<20	<0.01	<10	<10	5	<10	845	0.88	1.16	71	9.0	35	36.3	1.96
1128015100		128	<20	0.04	<10	<10	32	<10	1215	0.93	1.17	78	9.2	41	36.6	2.13
1129029001		7	<20	<0.01	<10	<10	5	<10	1960	0.08	1.96	10	8.6	-51	61.3	0.16
1128015122		33	<20	<0.01	<10	<10	6	<10	386	0.53	0.82	48	8.9	22	25.6	1.87
1128012136		104	<20	0.11	<10	<10	203	<10	1190	1.03	2.45	129	8.6	52	76.6	1.68
1128017058		30	<20	<0.01	<10	<10	7	<10	184	0.43	2.64	41	8.8	-42	82.5	0.50
1128015312		26	<20	0.01	<10	<10	7	<10	237	0.54	1.00	51	9.2	20	31.3	1.63
1128009374		69	<20	0.13	<10	<10	242	<10	861	0.84	2.97	129	8.8	36	92.8	1.39
1129029073		9	<20	<0.01	<10	<10	7	<10	90	0.10	1.49	13	9.1	-34	46.6	0.28
1129026040		34	<20	0.01	<10	<10	11	<10	133	0.49	0.17	42	9.6	37	5.3	7.91
1128011076		24	<20	0.04	<10	<10	18	<10	175	0.39	0.50	38	9.6	22	15.6	2.43
1128012223		75	<20	0.09	<10	<10	39	10	93	0.61	0.03	58	9.7	57	0.9	61.87
1129029032		7	<20	0.01	<10	<10	6	<10	62	0.09	2.37	13	8.6	-61	74.1	0.18
1131063103		10	<20	<0.01	<10	<10	4	<10	115	0.08	1.81	11	8.8	-46	56.6	0.19
1129029043		8	<20	0.01	<10	<10	7	<10	101	0.12	1.84	14	8.6	-44	57.5	0.24
V829055		18	<20	0.37	<10	<10	57	<10	59	0.02						

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1131051010		2
2138012365		2
1131052111		2
1131052281		1
1131052609		1
1131051508		2
1129024037		2
1131052319		2
1128007246		2
1128007202		2
1131052156		2
1128017018		
1128017029		3
1128015026		
1128170172		
1128015184		2
1130056034		2
V829054		
1129025108		3
1128015310		2
1131063119		2
1129027235		2
1130056210		1
1128012248		2
1128015094		2
1128015100		2
1129029001		1
1128015122		2
1128012136		3
1128017058		2
1128015312		2
1128009374		3
1129029073		1
1129026040		2
1128011076		2
1128012223		2
1129029032		1
1131063103		1
1129029043		1
V829055		

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CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1
1131063084		0.49		0.070	0.5	1.49	30	<10	40	<0.5	<2	1.85	<0.5	6	88	24
1128012116		0.46		0.747	0.7	2.32	58	<10	40	<0.5	<2	1.04	0.8	8	163	30
1129029084		0.48		1.695	1.0	1.26	72	<10	40	<0.5	<2	0.46	0.7	10	124	11
1131052195		0.43		0.079	2.5	0.91	26	<10	30	<0.5	<2	0.16	0.7	9	328	45
1128013162		0.46		0.019	0.2	1.39	9	<10	70	<0.5	<2	1.53	<0.5	11	239	28
1130052221		0.44		0.204	0.9	1.04	50	<10	40	<0.5	<2	0.18	0.8	10	191	73
1130051019		0.49		0.085	1.5	0.59	171	<10	30	<0.5	<2	1.84	<0.5	8	181	23
1130052227		0.54		0.331	1.7	0.82	52	<10	30	<0.5	<2	0.32	2.2	10	246	58
1130051068		0.33		0.108	1.2	0.93	77	<10	40	<0.5	<2	2.21	0.8	7	152	18
1128015177		0.38	92.8	0.340	0.8	1.32	66	<10	40	<0.5	<2	1.81	2.3	6	101	28
1128006004		0.38		0.026	<0.2	1.37	3	<10	100	<0.5	<2	1.02	<0.5	7	184	18
1130050161		0.43		0.166	1.3	1.15	29	<10	30	<0.5	<2	0.25	0.9	9	149	37
1130050157		0.66		0.456	3.5	0.80	28	<10	30	<0.5	<2	0.08	0.5	8	162	25
1130052077		0.47		0.195	0.6	0.89	32	<10	30	<0.5	<2	0.90	0.9	10	305	37
1128016119		0.46		0.016	<0.2	1.12	3	<10	60	<0.5	<2	1.11	<0.5	8	305	16
1130050174		0.53		0.384	4.5	0.80	37	<10	40	<0.5	<2	0.07	2.0	10	159	87
1128013169		0.57		0.010	<0.2	1.15	3	<10	70	<0.5	<2	1.07	<0.5	9	202	16
1130052248		0.50		0.399	0.7	0.71	47	<10	30	<0.5	<2	1.40	1.3	7	182	38
1130048235		0.48		0.070	0.7	1.14	41	<10	40	<0.5	<2	2.19	<0.5	7	148	19
1128007101		0.52		0.128	0.5	1.29	16	<10	90	<0.5	<2	1.51	1.0	9	227	25
V829056		0.06		6.87	4.5	0.76	<2	<10	50	<0.5	<2	0.50	<0.5	7	10	38
1128015143		0.36		2.70	2.7	1.73	100	<10	50	<0.5	<2	1.58	8.7	7	92	93
1128015148		0.35		0.883	0.8	2.16	46	10	40	<0.5	<2	1.28	3.9	9	128	56
1128017061		0.60		0.080	0.7	3.34	8	<10	120	<0.5	<2	3.44	0.8	27	97	70
1128015156		0.48		0.111	0.4	1.61	39	<10	60	<0.5	<2	2.12	0.5	7	115	16
1128013194		0.48		0.011	<0.2	1.45	3	<10	70	<0.5	<2	1.36	<0.5	8	223	22
1128007215		0.51		0.136	0.8	1.41	15	<10	70	<0.5	<2	1.08	0.6	10	237	93
1128016080		0.57		0.028	<0.2	1.11	<2	<10	80	<0.5	<2	0.98	<0.5	9	402	31
1130050048		0.37		0.588	1.1	0.75	62	<10	30	<0.5	<2	0.20	3.5	10	207	68
1128016045		0.52		0.018	<0.2	1.09	5	<10	60	<0.5	<2	1.25	<0.5	8	305	14
1128013115		0.66		0.046	0.2	1.34	14	<10	160	<0.5	2	3.06	<0.5	14	216	41
1130050138		0.40		0.397	3.5	0.69	26	<10	40	<0.5	<2	0.22	1.7	9	267	78
1128016034		0.48		0.027	<0.2	1.23	5	<10	50	<0.5	<2	1.44	<0.5	7	257	13
1128008571		0.46		0.058	0.3	1.15	9	<10	60	<0.5	<2	2.22	1.8	6	175	46
1128015166		0.43		0.399	0.8	1.75	74	<10	60	<0.5	<2	2.01	0.9	9	73	34
1131063066		0.50		0.073	0.4	1.80	36	<10	40	<0.5	<2	1.47	0.7	9	163	38
1128017135		0.49		0.035	0.3	1.17	9	<10	70	<0.5	<2	1.94	1.7	8	223	22
1128016562		0.51		0.052	0.2	1.27	6	<10	40	<0.5	<2	1.44	<0.5	7	331	22
1130050105		0.55		0.221	1.9	0.82	41	<10	40	<0.5	<2	0.35	2.2	10	173	36
1128009101		0.43		0.044	0.6	3.82	10	<10	50	<0.5	3	4.77	3.8	35	155	112

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1131063084		1.58	<10	<1	0.28	10	0.97	1000	<1	0.06	7	380	34	1.03	<2	1
1128012116		2.25	10	1	0.20	20	0.77	567	1	0.12	11	570	27	1.26	<2	1
1129029084		2.40	<10	<1	0.24	10	0.72	489	<1	0.02	15	440	23	1.71	<2	<1
1131052195		2.16	<10	<1	0.14	10	0.30	78	3	0.03	13	50	30	2.07	<2	<1
1128013162		2.01	10	<1	0.23	10	0.68	353	1	0.09	20	420	11	0.53	<2	2
1130052221		2.17	<10	<1	0.18	10	0.53	278	1	0.02	17	420	37	1.94	<2	<1
1130051019		1.87	<10	<1	0.18	10	0.79	832	1	0.06	12	370	7	1.47	<2	1
1130052227		2.20	<10	<1	0.19	10	0.34	702	2	0.03	14	430	117	1.77	<2	1
1130051068		1.66	<10	<1	0.19	10	0.45	578	1	0.07	12	360	13	1.31	<2	1
1128015177		1.58	<10	<1	0.39	10	0.79	886	1	0.02	6	350	73	1.15	<2	1
1128006004		1.89	10	<1	0.35	10	0.65	325	<1	0.10	13	380	3	0.21	<2	2
1130050161		2.03	<10	<1	0.20	10	0.58	633	1	0.02	13	460	74	1.79	<2	1
1130050157		1.66	<10	<1	0.18	10	0.39	120	1	0.02	11	60	18	1.53	<2	<1
1130052077		2.08	<10	<1	0.17	10	0.58	908	1	0.05	20	450	52	0.87	<2	2
1128016119		2.02	<10	<1	0.23	10	0.61	272	1	0.07	12	370	<2	0.43	<2	2
1130050174		1.99	<10	<1	0.19	10	0.33	112	1	0.03	11	60	80	1.94	<2	<1
1128013169		2.04	<10	<1	0.27	10	0.59	306	1	0.07	11	380	2	0.37	<2	2
1130052248		1.75	<10	<1	0.21	10	0.62	1475	1	0.03	11	400	74	0.98	<2	1
1130048235		1.66	<10	<1	0.21	10	0.77	611	1	0.06	9	340	13	0.90	<2	1
1128007101		2.15	<10	<1	0.38	10	0.77	467	1	0.06	14	400	<2	0.67	<2	1
V829056		1.61	<10	<1	0.16	10	0.34	173	14	0.13	9	560	8	0.07	<2	2
1128015143		3.64	<10	<1	0.39	10	1.09	1140	1	0.03	7	370	157	3.06	<2	1
1128015148		2.48	10	<1	0.22	20	0.87	637	1	0.04	10	500	44	1.35	2	1
1128017061		6.63	10	<1	0.47	10	1.43	1230	<1	0.16	38	680	9	1.20	<2	10
1128015156		1.72	<10	<1	0.26	10	0.99	607	1	0.04	9	340	36	1.02	<2	1
1128013194		1.85	10	<1	0.21	10	0.69	297	1	0.11	14	390	5	0.24	<2	1
1128007215		2.40	10	<1	0.40	10	0.66	351	1	0.09	11	390	2	1.17	<2	1
1128016080		2.19	10	<1	0.34	10	0.62	270	1	0.06	12	370	<2	0.45	<2	2
1130050048		1.99	<10	<1	0.23	10	0.27	145	1	0.02	13	250	63	1.85	<2	1
1128016045		2.02	<10	<1	0.24	10	0.59	265	1	0.06	11	380	2	0.34	<2	2
1128013115		2.66	<10	<1	0.48	20	1.26	800	1	0.04	23	680	3	0.59	<2	3
1130050138		2.06	<10	<1	0.23	10	0.11	249	1	0.03	13	280	212	1.85	<2	1
1128016034		2.03	<10	<1	0.14	10	0.65	335	3	0.06	10	380	2	0.34	<2	1
1128008571		1.68	<10	<1	0.25	10	0.64	525	<1	0.06	9	390	<2	0.47	<2	1
1128015166		2.33	<10	<1	0.32	20	0.88	789	<1	0.06	8	520	102	1.44	<2	1
1131063066		2.24	10	<1	0.26	20	0.79	628	1	0.12	15	470	29	1.36	2	1
1128017135		2.08	<10	<1	0.23	20	0.58	618	2	0.06	12	510	8	0.50	<2	1
1128016562		2.23	10	<1	0.11	10	0.66	386	1	0.08	12	380	<2	0.44	<2	1
1130050105		2.01	<10	<1	0.18	10	0.32	155	2	0.03	15	180	190	1.61	<2	1
1128009101		9.20	10	<1	0.18	10	1.92	1480	1	0.11	50	760	5	1.35	<2	16

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EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
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Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1131063084		25	<20	0.01	<10	<10	7	<10	115	0.59	1.07	54	9.1	21	33.4	1.61
1128012116		55	<20	<0.01	<10	<10	12	<10	205	0.11	1.29	21	8.7	-19	40.3	0.52
1129029084		8	<20	<0.01	<10	<10	5	<10	186	0.14	1.76	15	8.7	-40	55.0	0.27
1131052195		20	<20	<0.01	<10	<10	5	<10	175	0.02	2.18	5	7.9	-63	68.1	0.07
1128013162		52	<20	0.03	<10	<10	19	20	98	0.43	0.53	42	9.2	25	16.6	2.54
1130052221		15	<20	<0.01	<10	<10	5	<10	264	0.03	2.04	7	7.7	-57	63.8	0.11
1130051019		19	<20	<0.01	<10	<10	4	<10	112	1.09	1.55	79	9.2	31	48.4	1.63
1130052227		16	<20	0.01	<10	<10	9	<10	539	0.11	1.87	11	8.3	-47	58.4	0.19
1130051068		39	<20	<0.01	<10	<10	5	<10	214	0.81	1.36	64	9.1	22	42.5	1.51
1128015177		32	<20	<0.01	<10	<10	6	<10	570	0.61	1.21	56	9.2	18	37.8	1.48
1128006004		30	<20	0.06	<10	<10	23	<10	42	0.28	0.20	33	9.7	27	6.3	5.28
1130050161		12	<20	<0.01	<10	<10	6	<10	304	0.05	1.85	9	7.8	-49	57.8	0.16
1130050157		11	<20	<0.01	<10	<10	4	<10	131	0.04	1.54	5	8.4	-43	48.1	0.10
1130052077		26	<20	0.04	<10	<10	20	<10	236	0.36	0.84	31	8.8	5	26.3	1.18
1128016119		26	<20	0.04	<10	<10	21	<10	30	0.35	0.44	35	9.3	21	13.8	2.55
1130050174		14	<20	<0.01	<10	<10	4	<10	268	0.03	2.00	4	8.2	-59	62.5	0.06
1128013169		24	<20	0.04	<10	<10	18	<10	48	0.32	0.38	33	9.5	21	11.9	2.78
1130052248		19	<20	0.01	<10	<10	8	<10	316	0.76	0.95	54	8.5	24	29.7	1.82
1130048235		34	<20	<0.01	<10	<10	6	<10	62	0.89	0.89	68	9.0	40	27.8	2.44
1128007101		31	<20	0.04	<10	<10	16	<10	301	0.46	0.62	46	9.4	27	19.4	2.37
V829056		19	<20	0.22	<10	<10	47	<10	32	0.03						
1128015143		33	<20	<0.01	<10	<10	8	<10	2240	0.55	3.24	50	8.7	-51	101.3	0.49
1128015148		42	<20	<0.01	<10	<10	11	<10	1050	0.31	1.38	33	8.6	-10	43.1	0.77
1128017061		121	<20	0.15	<10	<10	192	<10	267	0.95	1.15	129	9.1	93	35.9	3.59
1128015156		27	<20	<0.01	<10	<10	7	<10	167	0.64	1.02	58	9.0	26	31.9	1.82
1128013194		58	<20	0.05	<10	<10	20	10	59	0.35	0.23	37	9.5	30	7.2	5.15
1128007215		34	<20	0.05	<10	<10	15	<10	171	0.27	1.17	31	9.1	-6	36.6	0.85
1128016080		22	<20	0.06	<10	<10	22	<10	30	0.33	0.43	32	9.5	19	13.4	2.38
1130050048		9	<20	<0.01	<10	<10	5	<10	879	0.09	1.76	9	8.3	-46	55.0	0.16
1128016045		25	<20	0.03	<10	<10	19	<10	44	0.41	0.31	38	9.5	28	9.7	3.92
1128013115		106	<20	0.05	<10	<10	30	<10	75	1.14	0.55	119	9.3	102	17.2	6.92
1130050138		20	<20	<0.01	<10	<10	6	<10	220	0.12	1.86	8	8.2	-50	58.1	0.14
1128016034		26	<20	0.01	<10	<10	14	<10	41	0.46	0.31	42	9.4	32	9.7	4.34
1128008571		35	<20	<0.01	<10	<10	8	<10	465	0.79	0.47	64	9.3	49	14.7	4.36
1128015166		36	<20	<0.01	<10	<10	12	<10	259	0.61	1.39	55	8.9	12	43.4	1.27
1131063066		49	<20	0.02	<10	<10	14	<10	186	0.33	1.31	34	9.1	-7	40.9	0.83
1128017135		40	<20	0.03	<10	<10	14	<10	453	0.60	0.49	56	9.4	41	15.3	3.66
1128016562		29	<20	0.01	<10	<10	14	<10	39	0.45	0.41	43	9.3	30	12.8	3.36
1130050105		18	<20	0.01	<10	<10	12	<10	422	0.13	1.62	11	8.2	-40	50.6	0.22
1128009101		108	<20	0.09	<10	<10	193	<10	976	1.65	1.36	183	8.6	141	42.5	4.31

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1131063084		2
1128012116		2
1129029084		1
1131052195		1
1128013162		2
1130052221		1
1130051019		2
1130052227		1
1130051068		2
1128015177		2
1128006004		2
1130050161		1
1130050157		1
1130052077		2
1128016119		2
1130050174		1
1128013169		2
1130052248		2
1130048235		2
1128007101		2
V829056		
1128015143		2
1128015148		2
1128017061		3
1128015156		2
1128013194		2
1128007215		2
1128016080		2
1130050048		1
1128016045		2
1128013115		3
1130050138		1
1128016034		2
1128008571		2
1128015166		2
1131063066		2
1128017135		2
1128016562		2
1130050105		1
1128009101		3

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Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method / Analyte / Units / LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1
V829057		0.06		1.875	7.0	0.76	386	<10	40	<0.5	3	1.22	1.0	6	13	286
1130055528		0.38		1.315	2.7	1.07	31	<10	50	<0.5	<2	0.69	2.3	10	238	50
1130055507		0.59		0.623	1.7	0.92	38	<10	40	<0.5	<2	0.97	2.2	9	185	58
1130055500		0.49		0.816	1.7	0.98	35	<10	50	<0.5	<2	0.28	1.7	9	192	36
1130051137		0.36		0.106	0.6	1.74	102	<10	60	<0.5	<2	2.06	<0.5	9	205	32
1130055133		0.43		0.639	1.7	1.35	90	<10	40	<0.5	<2	0.48	0.8	10	284	41
1130055063		0.53		1.570	1.0	1.29	23	<10	40	<0.5	2	0.21	0.8	8	188	47
1129027259		0.48		0.006	<0.2	1.20	3	<10	50	<0.5	<2	1.68	<0.5	6	264	18
1128015022		0.42		1.245	2.7	0.96	99	<10	50	<0.5	2	1.14	11.0	8	203	72
1130055532		0.30		0.768	1.6	1.77	35	<10	60	<0.5	<2	0.92	2.1	9	191	55
1130052061		0.40		0.096	0.4	1.64	24	<10	40	<0.5	2	0.87	0.9	11	222	45
1127029195		0.43		0.738	2.0	1.03	73	<10	30	<0.5	<2	2.09	1.9	9	100	59
1127029166		0.46		1.825	9.0	0.98	51	<10	30	<0.5	2	2.60	1.4	8	82	51
1127029018		0.46		0.173	3.6	0.53	55	<10	40	<0.5	2	2.14	4.2	8	141	113
1128009095		0.50		0.079	1.2	4.39	21	<10	100	<0.5	2	5.02	6.7	42	152	142
1127029057		0.54		0.523	2.4	0.58	48	<10	20	<0.5	2	1.60	3.4	9	149	41
1130049037		0.38		0.261	0.4	1.29	29	<10	40	<0.5	2	0.43	0.5	9	196	20
1127029119		0.41		0.240	15.7	0.60	42	<10	40	<0.5	3	2.45	2.4	10	115	117
1127029199		0.55		8.12	1.8	1.09	70	<10	30	<0.5	2	3.55	1.0	7	104	51
1127029128		0.60	83.3	0.192	6.0	0.52	49	<10	30	<0.5	3	1.52	4.6	9	114	127
1130055132		0.49		1.175	1.1	1.14	74	<10	40	<0.5	<2	1.54	2.0	9	223	43
V829058		0.06		0.202	1.5	0.91	<2	<10	40	<0.5	3	0.50	<0.5	10	13	55
1130050109		Not Recvd														
1130052265		0.41		1.260	2.1	1.15	56	<10	60	<0.5	2	0.74	3.0	9	155	83
1130050061		0.41		1.310	1.3	1.14	42	<10	50	<0.5	2	0.63	1.8	10	251	64
1130052019		0.43		0.059	2.1	1.58	13	<10	40	<0.5	<2	0.97	3.1	14	207	64
1130048011		0.42		0.236	27.6	1.42	137	<10	40	<0.5	<2	2.32	0.5	9	271	37
1128015072		0.52		0.048	0.8	2.24	35	<10	60	<0.5	<2	1.61	<0.5	7	224	14
1130055080		0.41		0.441	3.3	1.07	31	<10	50	<0.5	7	0.17	0.7	9	176	30
1131063063		0.46		0.040	0.2	2.02	6	<10	60	<0.5	<2	2.28	<0.5	12	206	25
1128015118		0.57		0.119	0.5	1.12	29	<10	40	<0.5	2	0.48	0.5	8	201	41
1130052042		0.44		0.200	0.5	1.35	44	<10	40	<0.5	2	0.55	2.9	11	262	45
1128015035		0.54		0.051	0.9	1.45	33	<10	50	<0.5	<2	1.44	<0.5	7	202	17
1130056015		0.40		0.776	1.3	1.00	57	<10	40	<0.5	2	1.14	0.8	8	292	43
1130055026		0.50		0.355	0.2	1.40	29	<10	50	<0.5	<2	1.02	<0.5	9	269	27
1128016092		0.51		0.019	<0.2	1.22	3	<10	50	<0.5	<2	1.74	<0.5	7	458	29
1130052515		0.45		0.054	0.2	1.68	8	<10	50	<0.5	<2	1.07	<0.5	14	291	54
1130055054		0.48		0.074	0.3	2.33	35	<10	50	<0.5	<2	2.58	0.5	8	207	13
1130049117		0.38		0.407	2.8	0.68	40	<10	40	<0.5	<2	0.08	2.8	9	149	37
1130048369		0.45		0.338	0.4	1.61	30	<10	40	<0.5	<2	0.78	<0.5	10	133	31

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
V829057		4.33	<10	<1	0.24	10	0.28	455	3	0.02	8	150	19	3.31	2	2
1130055528		2.70	<10	<1	0.28	10	0.35	1895	1	0.04	16	490	292	2.58	2	1
1130055507		2.13	<10	<1	0.27	10	0.46	1435	1	0.03	12	480	222	1.88	<2	1
1130055500		2.00	<10	<1	0.31	10	0.23	585	1	0.03	12	430	91	1.91	<2	1
1130051137		2.11	<10	<1	0.24	10	0.86	457	1	0.12	13	390	18	1.21	<2	1
1130055133		2.30	<10	<1	0.24	10	0.44	683	1	0.05	16	500	91	1.82	<2	1
1130055063		2.29	<10	<1	0.18	10	0.79	556	1	0.04	11	580	37	2.17	<2	<1
1129027259		1.82	<10	<1	0.20	20	0.50	306	1	0.07	4	520	<2	0.08	<2	1
1128015022		2.70	<10	<1	0.34	20	0.36	574	1	0.03	9	430	172	2.92	3	1
1130055532		2.29	<10	<1	0.34	10	0.74	996	1	0.05	12	450	180	1.87	<2	1
1130052061		2.37	<10	<1	0.21	10	0.87	486	1	0.05	20	500	39	1.27	<2	2
1127029195		2.24	<10	<1	0.18	10	0.71	1000	1	0.04	11	460	330	2.11	<2	1
1127029166		2.32	<10	<1	0.20	10	1.20	1450	1	0.03	11	470	222	2.00	<2	1
1127029018		2.30	<10	1	0.20	10	0.81	2560	1	0.03	12	460	226	2.54	2	<1
1128009095		10.40	10	1	0.41	<10	2.44	2150	2	0.20	57	910	14	2.41	<2	17
1127029057		2.22	<10	<1	0.19	10	0.71	1290	1	0.03	12	480	177	2.26	<2	1
1130049037		2.16	<10	<1	0.21	10	0.72	699	1	0.04	12	520	43	1.97	<2	1
1127029119		2.46	<10	<1	0.27	10	0.70	1860	1	0.03	13	480	303	2.78	19	1
1127029199		1.97	<10	<1	0.19	10	0.82	1315	1	0.03	9	480	60	1.39	<2	1
1127029128		1.91	<10	<1	0.20	10	0.41	992	1	0.02	9	480	463	2.15	3	<1
1130055132		2.26	<10	<1	0.24	10	0.69	1940	1	0.04	12	470	195	1.63	<2	1
V829058		2.71	<10	<1	0.21	10	0.39	263	4	0.16	10	560	26	0.05	<2	2
1130050109																
1130052265		2.34	<10	<1	0.35	10	0.48	1780	1	0.04	12	530	173	1.98	3	1
1130050061		2.41	<10	<1	0.29	10	0.61	1180	1	0.03	15	510	144	1.99	<2	1
1130052019		2.54	<10	<1	0.17	10	0.89	432	1	0.08	29	510	218	0.89	<2	3
1130048011		2.46	<10	<1	0.18	10	0.85	874	2	0.10	17	460	34	1.51	4	1
1128015072		1.91	10	<1	0.26	10	0.84	523	1	0.18	10	400	19	0.70	<2	1
1130055080		2.63	<10	<1	0.30	10	0.28	82	1	0.06	13	420	111	2.86	2	1
1131063063		2.90	10	<1	0.26	10	1.15	595	1	0.09	32	410	6	0.40	<2	3
1128015118		2.08	<10	<1	0.17	10	0.60	165	1	0.06	13	380	14	1.96	2	1
1130052042		2.47	<10	<1	0.22	10	0.76	360	1	0.05	19	530	19	1.39	<2	2
1128015035		1.96	<10	<1	0.23	10	0.63	461	1	0.10	10	400	13	1.27	<2	1
1130056015		2.06	<10	<1	0.27	10	0.47	912	1	0.05	13	430	84	1.97	<2	1
1130055026		2.17	<10	<1	0.21	10	0.79	329	1	0.08	12	410	14	1.78	<2	1
1128016092		2.21	<10	<1	0.16	10	0.67	359	1	0.06	15	440	3	0.27	<2	1
1130052515		2.80	<10	<1	0.18	10	0.97	424	1	0.08	28	510	8	0.53	<2	4
1130055054		1.93	<10	<1	0.26	10	0.96	656	2	0.11	9	390	17	0.67	<2	1
1130049117		2.03	<10	<1	0.24	10	0.10	27	1	0.02	13	80	90	2.27	<2	<1
1130048369		2.20	<10	<1	0.15	20	0.71	558	1	0.05	12	550	16	1.00	<2	1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
V829057		18	<20	0.01	<10	<10	7	<10	227	0.37						
1130055528		22	<20	<0.01	<10	<10	5	<10	599	0.34	2.39	26	8.5	-49	74.7	0.35
1130055507		17	<20	<0.01	<10	<10	4	<10	572	0.45	1.65	36	8.7	-16	51.6	0.70
1130055500		14	<20	<0.01	<10	<10	5	<10	429	0.10	1.72	11	8.2	-43	53.8	0.20
1130051137		62	<20	<0.01	<10	<10	8	<10	136	0.61	1.05	51	9.1	18	32.8	1.55
1130055133		20	<20	<0.01	<10	<10	8	<10	235	0.17	1.59	15	8.5	-35	49.7	0.30
1130055063		15	<20	<0.01	<10	<10	5	<10	240	0.07	1.97	9	8.0	-53	61.6	0.15
1129027259		30	<20	0.03	<10	<10	13	<10	76	0.50	0.06	42	9.5	40	1.9	22.40
1128015022		21	<20	<0.01	<10	<10	5	<10	2970	0.33	2.71	32	8.5	-53	84.7	0.38
1130055532		28	<20	<0.01	<10	<10	9	<10	544	0.36	1.64	32	8.8	-19	51.3	0.62
1130052061		22	<20	0.05	<10	<10	24	<10	258	0.16	1.06	16	8.5	-17	33.1	0.48
1127029195		26	<20	<0.01	<10	<10	4	<10	450	0.85	1.94	66	8.9	5	60.6	1.09
1127029166		28	<20	<0.01	<10	<10	4	<10	397	1.24	1.74	93	8.9	39	54.4	1.71
1127029018		26	<20	<0.01	<10	<10	2	<10	1020	1.05	2.28	79	8.8	8	71.3	1.11
1128009095		101	<20	0.14	<10	<10	239	<10	1690	1.81	2.26	200	8.7	129	70.6	2.83
1127029057		18	<20	<0.01	<10	<10	3	<10	866	0.89	2.00	60	8.8	-3	62.5	0.96
1130049037		15	<20	<0.01	<10	<10	6	<10	148	0.14	1.84	15	8.4	-43	57.5	0.26
1127029119		23	<20	<0.01	<10	<10	3	<10	583	1.03	2.57	81	9.1	1	80.3	1.01
1127029199		29	<20	<0.01	<10	<10	4	<10	235	1.23	1.18	100	9.0	63	36.9	2.71
1127029128		15	<20	<0.01	<10	<10	2	<10	1135	0.60	2.02	48	9.1	-15	63.1	0.76
1130055132		22	<20	<0.01	<10	<10	5	<10	554	0.79	1.52	57	8.9	10	47.5	1.20
V829058		21	<20	0.40	<10	<10	63	<10	61	0.02						
1130050109																
1130052265		25	<20	<0.01	<10	<10	6	<10	743	0.37	1.75	28	8.7	-27	54.7	0.51
1130050061		18	<20	<0.01	<10	<10	7	<10	501	0.31	1.75	25	8.5	-30	54.7	0.46
1130052019		38	<20	0.09	<10	<10	36	<10	709	0.16	0.76	18	8.9	-6	23.8	0.76
1130048011		56	<20	<0.01	<10	<10	10	<10	139	0.81	1.34	61	9.2	19	41.9	1.46
1128015072		72	<20	0.01	<10	<10	11	<10	107	0.29	0.57	33	9.2	15	17.8	1.85
1130055080		18	<20	<0.01	<10	<10	5	<10	185	0.05	2.59	7	7.8	-74	80.9	0.09
1131063063		57	<20	0.03	<10	<10	38	<10	114	0.61	0.35	54	9.1	43	10.9	4.94
1128015118		27	<20	<0.01	<10	<10	5	<10	146	0.15	1.89	15	8.6	-44	59.1	0.25
1130052042		27	<20	0.03	<10	<10	22	<10	737	0.09	1.27	14	8.6	-26	39.7	0.35
1128015035		40	<20	<0.01	<10	<10	7	<10	71	0.37	1.14	37	9.0	1	35.6	1.04
1130056015		21	<20	<0.01	<10	<10	5	<10	213	0.55	1.83	40	8.9	-17	57.2	0.70
1130055026		37	<20	<0.01	<10	<10	7	<10	96	0.40	1.59	27	8.8	-23	49.7	0.54
1128016092		28	<20	0.03	<10	<10	17	<10	57	0.54	0.24	46	9.5	39	7.5	6.13
1130052515		42	<20	0.10	<10	<10	43	<10	112	0.22	0.47	24	8.9	9	14.7	1.63
1130055054		56	<20	<0.01	<10	<10	7	<10	120	0.60	0.58	56	8.8	38	18.1	3.09
1130049117		12	<20	<0.01	<10	<10	3	<10	627	0.04	2.35	4	7.4	-69	73.4	0.05
1130048369		21	<20	0.01	<10	<10	10	<10	116	0.21	0.97	23	8.3	-7	30.3	0.76

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CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
V829057		
1130055528		2
1130055507		2
1130055500		1
1130051137		2
1130055133		1
1130055063		1
1129027259		2
1128015022		2
1130055532		2
1130052061		1
1127029195		2
1127029166		3
1127029018		2
1128009095		3
1127029057		2
1130049037		1
1127029119		2
1127029199		3
1127029128		2
1130055132		2
V829058		
1130050109		
1130052265		2
1130050061		2
1130052019		1
1130048011		2
1128015072		2
1130055080		1
1131063063		2
1128015118		1
1130052042		1
1128015035		2
1130056015		2
1130055026		2
1128016092		2
1130052515		2
1130055054		2
1130049117		1
1130048369		2

***** See Appendix Page for comments regarding this certificate *****

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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1128013149		0.48		0.014	<0.2	1.22	3	<10	80	<0.5	<2	1.91	<0.5	9	185	46
1128013092		0.50		0.025	<0.2	1.15	6	<10	80	<0.5	<2	1.35	<0.5	8	194	23
1130049050		0.42		1.250	0.8	1.03	56	<10	30	<0.5	<2	0.68	1.1	8	128	30
V829059		0.06		6.76	4.9	0.83	<2	<10	50	<0.5	<2	0.51	<0.5	6	10	38
1128013108		0.48		0.050	0.2	1.22	7	<10	90	<0.5	<2	1.13	<0.5	8	202	23
1130048159		0.45		0.060	0.3	1.37	15	<10	50	<0.5	<2	1.37	<0.5	8	200	12
1128009141		0.49		0.030	0.3	2.12	4	<10	110	<0.5	2	2.43	0.6	21	209	51
1130048512		0.56		0.088	0.3	2.57	11	<10	10	<0.5	4	4.70	0.6	43	378	94
1127029069		0.42		0.280	1.1	0.84	64	<10	20	<0.5	<2	1.98	0.5	8	113	30
1130050022		0.55		0.454	0.7	0.85	36	<10	30	<0.5	<2	0.44	1.2	10	232	41
1130048136		0.45		0.132	0.5	2.38	72	<10	30	<0.5	2	2.00	0.5	31	176	89
1128013012		0.46		0.127	1.0	1.62	11	<10	70	<0.5	<2	1.76	1.2	9	258	38
1128013037		0.49		0.221	1.1	1.69	15	<10	60	<0.5	<2	1.74	<0.5	9	207	29
1127033054		0.47		0.569	0.8	0.76	35	<10	30	<0.5	<2	2.63	1.1	7	106	44
1127033039		0.45		0.529	1.5	0.56	41	<10	30	<0.5	<2	2.12	2.4	7	124	38
1130049095		0.42		0.384	1.4	0.72	56	<10	30	<0.5	<2	1.11	1.7	9	139	34
1130049055		0.45		0.297	0.6	1.11	64	<10	30	<0.5	<2	1.21	0.5	9	179	18
1130049088		0.46		1.560	1.1	0.72	49	<10	30	<0.5	<2	0.15	5.6	10	170	81
1130048087		0.53		0.131	0.8	3.14	11	<10	10	<0.5	2	4.14	0.5	42	497	144
1131063046		0.45		0.099	0.5	1.44	47	<10	40	<0.5	<2	2.12	<0.5	7	144	23
1130055147		0.36		1.015	1.8	1.30	111	<10	40	<0.5	<2	1.66	1.3	8	198	43
1130052259		0.40		0.398	2.8	1.25	40	<10	50	<0.5	3	0.91	3.3	9	198	61
1130049058		0.43		2.78	3.1	0.91	57	<10	40	<0.5	<2	1.64	2.0	8	174	68
1131063055		0.45		0.162	0.3	1.48	48	<10	40	<0.5	<2	2.15	<0.5	7	185	24
1128013041		0.51		0.053	0.4	1.51	6	<10	130	<0.5	<2	2.71	<0.5	12	295	133
1127029040		0.48		0.178	3.8	0.46	30	<10	30	<0.5	2	1.05	3.7	8	127	72
1127029077		0.36		0.395	10.5	0.48	107	<10	30	<0.5	2	2.08	4.6	7	100	249
1130055062		0.40		0.178	0.7	1.22	21	<10	40	<0.5	<2	0.20	<0.5	8	226	42
1130052314		0.39		0.108	1.1	1.40	35	<10	40	<0.5	<2	0.26	1.3	10	163	61
V829060		0.06	94.7	1.840	6.3	0.79	436	<10	40	<0.5	2	1.15	1.1	7	13	283
1130050190		0.39	93.2	3.74	4.1	0.65	48	<10	40	<0.5	<2	0.08	4.6	9	289	74
1128017072		0.42		3.43	3.0	0.80	113	<10	40	<0.5	<2	0.73	6.3	6	179	83
1128015206		0.39		5.86	1.8	1.62	139	<10	50	<0.5	<2	0.43	16.0	8	128	73
1128017112		0.43		0.102	0.7	1.38	68	<10	50	<0.5	<2	1.07	1.0	8	66	10

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1128013149		1.94	<10	<1	0.23	10	0.75	476	2	0.07	17	470	2	0.11	<2	2
1128013092		1.97	10	<1	0.36	10	0.58	393	2	0.07	11	370	2	0.40	2	1
1130049050		1.82	<10	<1	0.25	10	0.57	839	<1	0.03	11	430	145	1.65	2	1
V829059		1.65	<10	<1	0.17	10	0.35	183	16	0.14	10	570	9	0.07	<2	2
1128013108		1.99	10	<1	0.40	10	0.59	384	1	0.08	11	380	<2	0.33	<2	2
1130048159		2.14	10	<1	0.11	20	0.74	266	1	0.09	15	460	5	0.76	<2	2
1128009141		4.61	10	<1	0.40	10	1.21	746	1	0.10	43	540	2	0.64	<2	6
1130048512		6.57	10	<1	0.02	<10	2.58	953	1	0.03	119	280	<2	1.42	<2	9
1127029069		1.89	<10	<1	0.16	10	0.91	1120	1	0.03	10	400	28	1.56	<2	1
1130050022		1.91	<10	<1	0.20	10	0.39	131	1	0.03	15	280	116	1.34	<2	1
1130048136		6.34	10	<1	0.15	10	1.58	573	3	0.05	30	490	<2	2.05	2	13
1128013012		2.00	10	<1	0.25	10	0.70	540	1	0.11	13	400	5	0.68	<2	1
1128013037		2.06	<10	<1	0.22	20	0.71	521	2	0.12	14	480	11	0.74	<2	1
1127033054		1.76	<10	<1	0.22	10	1.09	1515	1	0.02	10	390	100	1.27	<2	1
1127033039		1.90	<10	<1	0.20	10	0.80	1400	1	0.02	12	420	316	1.84	3	<1
1130049095		2.21	<10	<1	0.28	10	0.56	1690	1	0.03	14	410	183	2.10	2	1
1130049055		2.10	<10	<1	0.23	10	0.70	1220	1	0.04	12	460	43	1.89	<2	1
1130049088		2.17	<10	<1	0.22	10	0.20	1770	1	0.02	16	260	76	1.87	2	<1
1130048087		5.85	10	<1	0.02	<10	3.16	924	2	0.05	163	240	<2	0.69	<2	6
1131063046		1.77	<10	<1	0.29	10	0.91	1300	1	0.03	9	370	48	1.27	2	1
1130055147		2.04	<10	<1	0.26	10	0.60	1105	1	0.05	13	440	94	1.72	3	1
1130052259		2.27	<10	<1	0.28	10	0.67	1505	1	0.03	13	490	383	1.99	<2	1
1130049058		1.87	<10	<1	0.25	10	0.64	1245	1	0.03	14	420	276	1.45	<2	1
1131063055		1.83	<10	<1	0.29	10	0.94	1340	1	0.03	8	380	51	1.30	<2	1
1128013041		2.46	10	<1	0.33	20	1.11	516	1	0.07	30	680	3	0.33	<2	3
1127029040		2.14	<10	1	0.18	10	0.48	1615	1	0.02	12	390	111	2.37	4	<1
1127029077		2.07	<10	1	0.21	<10	0.88	2240	1	0.02	10	380	549	2.40	15	<1
1130055062		2.15	<10	<1	0.20	10	0.65	1075	1	0.04	11	380	21	1.96	<2	<1
1130052314		1.98	<10	<1	0.22	10	0.75	449	1	0.02	13	480	110	1.57	<2	1
V829060		4.19	<10	1	0.25	20	0.28	467	3	0.02	8	160	19	3.26	3	2
1130050190		2.22	<10	1	0.25	10	0.09	90	1	0.02	15	180	205	2.37	<2	<1
1128017072		1.86	<10	<1	0.30	10	0.33	259	1	0.02	11	570	426	1.88	4	1
1128015206		3.72	<10	<1	0.25	20	0.65	449	1	0.03	11	480	111	3.46	<2	1
1128017112		1.46	<10	<1	0.38	10	0.71	504	1	0.04	8	430	58	1.43	<2	1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1128013149		58	<20	0.03	<10	<10	19	<10	68	0.63	0.10	55	9.4	52	3.1	17.60
1128013092		28	<20	0.05	<10	<10	18	<10	67	0.42	0.39	42	9.3	30	12.2	3.45
1130049050		16	<20	<0.01	<10	<10	5	<10	261	0.31	1.67	28	8.8	-24	52.2	0.54
V829059		21	<20	0.23	<10	<10	49	<10	33	0.02						
1128013108		27	<20	0.05	<10	<10	20	10	52	0.37	0.30	39	9.5	30	9.4	4.16
1130048159		38	<20	<0.01	<10	<10	15	<10	27	0.46	0.79	42	9.0	17	24.7	1.70
1128009141		57	<20	0.09	<10	<10	104	<10	189	0.78	0.63	100	9.1	80	19.7	5.08
1130048512		91	<20	0.08	<10	<10	122	<10	62	1.70	1.49	163	8.8	116	46.6	3.50
1127029069		27	<20	<0.01	<10	<10	3	<10	136	1.11	1.62	80	8.5	29	50.6	1.58
1130050022		16	<20	0.02	<10	<10	14	<10	333	0.18	1.37	14	8.3	-29	42.8	0.33
1130048136		53	<20	0.01	<10	<10	130	<10	50	0.85	2.10	92	8.3	26	65.6	1.40
1128013012		60	<20	0.03	<10	<10	15	10	332	0.47	0.66	46	8.9	25	20.6	2.23
1128013037		73	<20	0.01	<10	<10	15	10	108	0.48	0.73	46	8.8	23	22.8	2.02
1127033054		27	<20	<0.01	<10	<10	4	<10	327	1.43	1.23	113	9.0	75	38.4	2.94
1127033039		19	<20	<0.01	<10	<10	3	<10	620	1.10	1.82	83	8.7	26	56.9	1.46
1130049095		15	<20	<0.01	<10	<10	4	<10	447	0.66	2.08	52	8.8	-13	65.0	0.80
1130049055		19	<20	<0.01	<10	<10	5	<10	129	0.59	1.93	49	8.7	-11	60.3	0.81
1130049088		12	<20	<0.01	<10	<10	5	<10	1570	0.16	1.81	9	7.7	-48	56.6	0.16
1130048087		49	<20	0.10	<10	<10	97	<10	70	1.27	0.63	137	9.0	117	19.7	6.96
1131063046		20	<20	0.01	<10	<10	7	<10	132	0.67	1.15	59	8.6	23	35.9	1.64
1130055147		26	<20	<0.01	<10	<10	6	<10	317	0.76	1.76	60	8.5	5	55.0	1.09
1130052259		22	<20	<0.01	<10	<10	6	<10	894	0.42	1.91	33	8.3	-27	59.7	0.55
1130049058		22	<20	<0.01	<10	<10	7	<10	480	0.79	1.44	62	9.0	17	45.0	1.38
1131063055		21	<20	0.01	<10	<10	7	<10	143	0.66	1.21	58	8.9	20	37.8	1.53
1128013041		92	<20	0.04	<10	<10	34	<10	69	0.88	0.31	98	9.3	88	9.7	10.12
1127029040		16	<20	<0.01	<10	<10	2	<10	922	0.63	2.42	50	8.9	-26	75.6	0.66
1127029077		23	<20	<0.01	<10	<10	2	<10	1175	1.25	2.44	100	9.0	24	76.3	1.31
1130055062		16	<20	<0.01	<10	<10	5	<10	137	0.22	2.13	10	8.0	-57	66.6	0.15
1130052314		18	<20	0.01	<10	<10	8	<10	437	0.06	1.50	8	7.8	-39	46.9	0.17
V829060		18	<20	0.01	<10	<10	7	<10	236	0.37						
1130050190		15	<20	<0.01	<10	<10	4	<10	1025	0.05	2.29	4	7.1	-68	71.6	0.06
1128017072		24	<20	<0.01	<10	<10	8	<10	1730	0.23	1.83	23	8.8	-34	57.2	0.40
1128015206		21	<20	<0.01	<10	<10	8	<10	3960	0.09	3.67	12	7.8	-103	114.7	0.10
1128017112		30	<20	<0.01	<10	<10	6	<10	288	0.30	1.36	34	9.0	-9	42.5	0.80

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1128013149		2
1128013092		2
1130049050		2
V829059		
1128013108		2
1130048159		2
1128009141		3
1130048512		3
1127029069		2
1130050022		1
1130048136		3
1128013012		2
1128013037		2
1127033054		3
1127033039		2
1130049095		2
1130049055		2
1130049088		1
1130048087		3
1131063046		2
1130055147		2
1130052259		2
1130049058		2
1131063055		2
1128013041		3
1127029040		2
1127029077		3
1130055062		1
1130052314		1
V829060		
1130050190		1
1128017072		2
1128015206		1
1128017112		2

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EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

CERTIFICATE OF ANALYSIS TB18114668

CERTIFICATE COMMENTS

ANALYTICAL COMMENTS

NSS is non-sufficient sample.
Applies to Method: ALL METHODS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

CERTIFICATE TB18165552

Project: Mine Site Lab Pulps June 2018

P.O. No.: 4500009909

This report is for 153 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 10-JUL-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1126030064		0.50	86.3	0.823	2.0	1.19	85	<10	70	<0.5	<2	0.90	14.1	6	156	64
1125022166		0.57		0.019	0.2	1.12	6	<10	40	<0.5	<2	1.84	<0.5	7	346	20
1126030109		0.52		0.851	1.9	0.96	268	<10	40	<0.5	<2	1.06	14.6	7	172	65
1125021011		0.56		0.021	0.3	1.07	8	<10	30	<0.5	<2	1.87	<0.5	9	185	35
1126030129		0.47		0.482	2.2	0.86	174	<10	20	<0.5	<2	0.93	10.2	8	178	80
1126030060		0.50		2.25	1.8	0.70	71	<10	40	<0.5	<2	1.39	17.3	9	232	124
1125008148		0.52		0.371	1.6	1.27	12	<10	60	<0.5	<2	1.81	<0.5	13	168	353
1126031022		0.52		0.218	1.0	0.62	83	<10	40	<0.5	<2	1.92	1.2	7	111	21
1125021118		0.49		0.008	0.2	1.13	7	<10	50	<0.5	<2	1.81	<0.5	7	307	20
1125021156		0.49		0.058	0.3	1.32	12	20	50	<0.5	<2	1.73	4.7	5	234	43
1125021001		0.56		0.067	0.2	1.10	4	10	30	<0.5	<2	1.17	<0.5	5	153	15
1125021189		0.45		0.017	<0.2	1.21	4	10	80	<0.5	<2	2.29	<0.5	9	278	37
1125021005		0.54		0.173	1.0	0.95	10	10	50	<0.5	<2	2.00	<0.5	10	208	143
1125008113		0.43		0.324	0.8	1.10	33	10	40	<0.5	<2	1.62	3.4	9	206	49
1125021143		0.51		0.031	<0.2	1.13	5	10	40	<0.5	<2	1.63	<0.5	6	284	30
1126031198		0.47		0.375	0.9	1.68	100	10	30	<0.5	<2	0.72	3.0	9	81	51
1126031245		0.50		0.700	1.6	0.95	684	10	30	<0.5	<2	0.20	22.3	6	62	83
V829081		0.06		6.68	4.7	0.81	<2	10	50	<0.5	<2	0.52	<0.5	6	10	37
1126027217		0.54		0.219	1.1	0.64	27	10	30	<0.5	<2	2.25	2.4	7	73	47
1125007012		0.57		0.036	0.7	3.99	20	10	60	<0.5	<2	3.54	<0.5	48	127	84
1126027004		0.47		0.031	0.8	1.06	28	10	30	<0.5	<2	2.68	<0.5	7	206	16
1126027009		0.50		0.109	0.3	1.02	28	10	40	<0.5	<2	2.20	<0.5	7	95	15
1126026121		0.55		1.550	2.5	0.33	154	10	60	<0.5	<2	1.27	8.6	6	252	90
1126026119		0.47		0.680	1.4	0.54	100	10	80	<0.5	<2	1.93	11.7	7	168	67
1126030042		0.50		0.238	1.5	0.73	152	<10	30	<0.5	<2	1.06	3.7	9	192	50
1125022167		0.52		0.022	0.2	1.56	8	<10	40	<0.5	<2	1.94	<0.5	7	294	61
1126030027		0.44		0.064	0.6	1.00	52	<10	30	<0.5	<2	1.89	7.5	5	127	28
1126030007		0.45		0.827	10.0	0.82	192	<10	30	<0.5	<2	0.59	21.4	7	172	105
1126030053		0.50		0.532	0.9	1.32	50	<10	30	<0.5	<2	1.10	8.6	6	208	39
1125022009		0.53		<0.005	<0.2	1.74	4	<10	40	<0.5	<2	1.80	<0.5	6	316	6
1125022027		0.51		0.017	<0.2	1.51	12	<10	50	<0.5	<2	2.32	<0.5	10	218	12
1125022108		0.51		0.023	<0.2	1.88	10	<10	60	<0.5	<2	2.99	<0.5	9	310	19
1126030119		0.50		0.149	0.8	1.01	104	<10	30	<0.5	<2	1.35	1.4	8	200	20
V829082		0.06		0.200	1.5	0.81	3	<10	40	<0.5	<2	0.44	<0.5	9	11	51
1126029057		0.49		0.466	2.6	0.96	35	<10	40	<0.5	<2	2.04	3.3	7	284	57
1126029504		0.45		0.111	1.0	1.17	37	<10	30	<0.5	<2	1.77	<0.5	7	143	22
1126031023		0.52		1.150	2.2	0.56	98	<10	40	<0.5	<2	1.57	4.3	5	125	33
1126029517		0.49		0.119	1.6	0.90	45	<10	40	<0.5	<2	1.35	0.9	8	164	31
1126031101		0.44		0.472	0.7	1.42	116	<10	20	<0.5	<2	0.59	0.9	10	167	25
1125008021		0.52		0.054	0.3	1.04	5	<10	30	<0.5	<2	1.15	<0.5	6	307	36

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1126030064		2.28	<10	1	0.41	10	0.89	1100	1	<0.01	8	360	104	1.55	<2	<1
1125022166		1.89	<10	<1	0.15	10	0.61	403	2	0.06	14	400	3	0.29	<2	1
1126030109		2.40	<10	<1	0.35	10	0.73	1015	1	<0.01	8	370	176	1.96	<2	<1
1125021011		1.98	<10	1	0.12	10	0.65	432	1	0.04	10	390	3	0.35	<2	1
1126030129		2.55	<10	<1	0.23	20	0.61	557	1	<0.01	10	410	44	2.20	5	<1
1126030060		2.34	<10	1	0.25	10	0.75	1180	1	<0.01	8	370	193	2.11	<2	<1
1125008148		2.99	10	<1	0.18	10	0.70	332	1	0.05	12	380	3	1.44	<2	1
1126031022		1.96	<10	<1	0.26	10	0.78	1445	1	0.01	9	420	93	1.62	2	1
1125021118		1.94	<10	<1	0.26	10	0.73	452	1	0.04	10	400	2	0.25	<2	1
1125021156		2.27	<10	<1	0.19	10	0.91	600	1	0.04	10	380	2	0.43	<2	1
1125021001		1.99	<10	<1	0.14	10	0.69	418	1	0.04	9	380	<2	0.35	<2	1
1125021189		2.24	<10	<1	0.25	10	0.88	461	2	0.05	25	500	<2	0.21	<2	3
1125021005		2.44	<10	<1	0.20	10	0.75	631	1	0.05	10	350	4	0.68	<2	1
1125008113		2.35	<10	<1	0.16	10	0.61	514	1	0.05	10	420	75	0.97	<2	1
1125021143		2.01	<10	<1	0.15	10	0.73	393	1	0.04	9	390	<2	0.24	<2	1
1126031198		2.47	<10	<1	0.26	10	1.19	599	<1	0.01	13	380	20	1.36	<2	1
1126031245		3.34	<10	<1	0.26	10	0.47	401	<1	<0.01	7	330	47	2.89	3	<1
V829081		1.63	<10	<1	0.17	10	0.35	177	16	0.13	9	560	7	0.07	<2	2
1126027217		1.99	<10	<1	0.14	10	0.71	472	1	0.04	9	350	45	2.10	<2	1
1125007012		11.70	10	<1	0.25	<10	1.41	1730	<1	0.29	74	690	7	2.38	2	17
1126027004		1.44	<10	<1	0.12	10	0.61	415	1	0.06	10	360	3	0.80	<2	1
1126027009		1.71	<10	<1	0.14	10	0.69	346	1	0.05	9	210	13	1.23	<2	<1
1126026121		2.47	<10	<1	0.23	10	0.06	339	1	<0.01	8	370	619	2.77	2	<1
1126026119		2.12	<10	<1	0.34	10	0.54	1985	1	<0.01	7	380	313	2.03	<2	<1
1126030042		2.26	<10	<1	0.22	10	0.43	462	1	0.01	38	420	21	2.01	2	<1
1125022167		1.93	<10	<1	0.13	10	0.72	446	1	0.11	13	400	3	0.37	<2	1
1126030027		1.76	<10	<1	0.28	10	0.89	1315	<1	<0.01	7	350	51	1.10	<2	<1
1126030007		2.66	<10	<1	0.32	10	0.32	339	1	0.01	8	370	75	2.78	10	<1
1126030053		2.00	<10	<1	0.42	10	1.02	969	1	<0.01	6	360	63	1.13	<2	1
1125022009		1.72	<10	<1	0.12	10	0.62	301	1	0.14	12	330	2	0.05	<2	1
1125022027		2.05	<10	<1	0.14	10	0.91	449	1	0.07	25	410	2	0.43	<2	1
1125022108		2.14	10	<1	0.17	10	1.05	496	1	0.12	23	420	<2	0.38	<2	2
1126030119		2.25	<10	<1	0.24	10	0.81	715	<1	<0.01	11	410	17	1.73	2	1
V829082		2.44	<10	<1	0.20	10	0.35	242	4	0.14	11	490	17	0.04	<2	2
1126029057		2.22	<10	<1	0.22	10	0.87	1575	1	0.03	11	530	317	2.18	<2	1
1126029504		1.78	<10	<1	0.15	10	0.98	751	1	0.03	8	400	19	1.47	<2	<1
1126031023		1.72	<10	<1	0.28	10	0.57	1155	<1	0.01	8	420	479	1.66	2	<1
1126029517		2.51	<10	<1	0.23	10	0.46	638	1	0.05	12	420	71	2.60	<2	1
1126031101		2.91	<10	<1	0.18	10	1.09	522	1	0.01	12	350	16	1.86	2	1
1125008021		2.06	<10	<1	0.15	10	0.68	381	1	0.05	10	380	<2	0.41	<2	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1126030064		70	<20	0.01	<10	<10	6	<10	3230	0.34	1.44	32	9.0	-13	45.0	0.71
1125022166		45	<20	0.01	<10	<10	14	<10	110	0.68	0.28	51	9.5	42	8.8	5.83
1126030109		29	<20	0.01	<10	<10	5	<10	3490	0.46	1.79	38	8.9	-18	55.9	0.68
1125021011		32	<20	0.01	<10	<10	14	<10	67	0.59	0.31	48	9.5	38	9.7	4.95
1126030129		11	<20	<0.01	<10	<10	5	<10	2340	0.27	2.15	26	8.6	-41	67.2	0.39
1126030060		69	<20	<0.01	<10	<10	3	<10	4150	0.63	2.09	51	8.9	-14	65.3	0.78
1125008148		29	<20	0.03	<10	<10	17	<10	36	0.52	1.37	50	9.0	7	42.8	1.17
1126031022		30	<20	<0.01	<10	<10	4	<10	322	0.96	1.52	73	9.2	26	47.5	1.54
1125021118		39	<20	0.03	<10	<10	15	<10	75	0.64	0.23	52	9.7	45	7.2	7.23
1125021156		49	<20	0.02	<10	<10	13	<10	1200	0.63	0.38	54	9.5	42	11.9	4.55
1125021001		21	<20	0.02	<10	<10	18	<10	46	0.40	0.31	36	9.5	26	9.7	3.72
1125021189		53	<20	0.03	<10	<10	25	<10	95	0.81	0.17	68	9.6	63	5.3	12.80
1125021005		46	<20	0.02	<10	<10	13	<10	50	0.91	0.66	67	9.3	46	20.6	3.25
1125008113		39	<20	0.01	<10	<10	12	<10	849	0.54	1.00	49	9.2	18	31.3	1.57
1125021143		31	<20	0.02	<10	<10	16	<10	41	0.60	0.23	49	9.6	42	7.2	6.82
1126031198		15	<20	0.01	<10	<10	8	<10	714	0.20	1.34	24	9.0	-18	41.9	0.57
1126031245		9	<20	0.01	<10	<10	4	<10	5120	0.06	2.84	8	8.5	-81	88.8	0.09
V829081		20	<20	0.23	<10	<10	48	<10	33	0.01						
1126027217		59	<20	<0.01	<10	<10	3	<10	607	0.94	2.05	73	9.0	9	64.1	1.14
1125007012		152	<20	0.12	<10	<10	297	<10	217	1.14	2.62	150	8.5	68	81.9	1.83
1126027004		61	<20	<0.01	<10	<10	6	<10	60	0.86	0.82	71	9.3	45	25.6	2.77
1126027009		44	<20	<0.01	<10	<10	4	<10	65	0.69	1.23	58	9.0	20	38.4	1.51
1126026121		67	<20	<0.01	<10	<10	2	<10	2680	0.62	2.72	34	8.7	-51	85.0	0.40
1126026119		217	<20	<0.01	<10	<10	4	<10	3050	1.00	2.04	73	9.2	9	63.8	1.15
1126030042		13	<20	<0.01	<10	<10	4	10	900	0.34	2.03	30	8.8	-33	63.4	0.47
1125022167		69	<20	0.01	<10	<10	14	<10	147	0.65	0.37	50	9.5	38	11.6	4.32
1126030027		39	<20	<0.01	<10	<10	5	<10	1800	0.85	1.10	61	9.3	27	34.4	1.77
1126030007		11	<20	<0.01	<10	<10	4	<10	5110	0.17	2.98	17	8.0	-76	93.1	0.18
1126030053		24	<20	0.02	<10	<10	7	<10	2110	0.35	1.12	36	9.1	1	35.0	1.03
1125022009		99	<20	0.01	<10	<10	15	<10	64	0.46	0.05	43	9.6	41	1.6	27.52
1125022027		80	<20	<0.01	<10	<10	14	<10	78	0.77	0.43	65	9.5	52	13.4	4.84
1125022108		97	<20	0.01	<10	<10	19	<10	110	1.10	0.40	77	9.5	65	12.5	6.16
1126030119		18	<20	0.01	<10	<10	6	<10	372	0.47	1.68	42	8.8	-11	52.5	0.80
V829082		18	<20	0.37	<10	<10	57	<10	56	0.01						
1126029057		26	<20	<0.01	<10	<10	5	<10	817	1.33	2.19	76	9.0	8	68.4	1.11
1126029504		32	<20	<0.01	<10	<10	4	<10	76	0.78	1.39	62	8.9	19	43.4	1.43
1126031023		23	<20	<0.01	<10	<10	3	<10	1060	0.78	1.64	62	9.2	11	51.3	1.21
1126029517		29	<20	<0.01	<10	<10	4	<10	223	0.46	2.72	42	9.0	-43	85.0	0.49
1126031101		12	<20	0.01	<10	<10	8	<10	267	0.16	1.85	18	8.5	-40	57.8	0.31
1125008021		22	<20	0.03	<10	<10	20	<10	35	0.43	0.42	38	9.5	25	13.1	2.90

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1126030064		2
1125022166		2
1126030109		2
1125021011		2
1126030129		2
1126030060		2
1125008148		2
1126031022		2
1125021118		2
1125021156		2
1125021001		2
1125021189		2
1125021005		2
1125008113		2
1125021143		2
1126031198		2
1126031245		1
V829081		
1126027217		2
1125007012		3
1126027004		2
1126027009		2
1126026121		2
1126026119		2
1126030042		2
1125022167		2
1126030027		2
1126030007		1
1126030053		2
1125022009		2
1125022027		2
1125022108		2
1126030119		2
V829082		
1126029057		2
1126029504		2
1126031023		2
1126029517		2
1126031101		1
1125008021		2

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Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1
1125008171		0.53		0.060	0.2	1.30	13	<10	70	<0.5	<2	1.45	<0.5	124	275	23
1126029083		0.40		0.566	2.4	1.18	27	<10	40	<0.5	<2	1.66	1.4	7	201	36
1126029030		0.46		0.072	1.1	1.06	31	<10	40	<0.5	<2	2.08	0.6	6	138	26
1126029029		0.46		0.107	1.3	0.96	38	<10	40	<0.5	<2	1.86	<0.5	8	142	31
1126029012		0.49		0.184	3.4	0.88	63	<10	40	<0.5	<2	1.72	2.9	8	118	89
1125008124		0.68		0.100	0.2	1.14	3	<10	50	<0.5	<2	1.71	<0.5	9	286	37
1125008203		0.46		0.009	<0.2	1.85	8	<10	130	<0.5	<2	2.03	<0.5	12	195	9
1232001010		0.35		0.169	0.8	0.91	27	<10	30	<0.5	<2	0.84	0.8	10	170	22
1232001040		0.56		0.039	1.0	1.90	7	<10	60	<0.5	2	2.43	0.5	10	155	13
1232001018		0.51	85.9	0.070	1.0	2.04	21	<10	80	<0.5	<2	1.96	<0.5	11	165	26
1125008173		0.45		0.050	0.2	1.03	3	<10	40	<0.5	<2	1.65	<0.5	9	216	22
1232001152		0.68		0.206	0.7	1.22	36	<10	30	<0.5	<2	1.67	0.8	9	141	24
V829083		0.06		6.79	5.1	0.78	<2	<10	50	<0.5	<2	0.51	<0.5	6	10	39
1126031238		0.51		1.805	1.5	0.83	187	<10	40	<0.5	<2	0.28	21.5	6	165	108
1126031265		0.51		1.705	2.7	1.07	126	<10	170	<0.5	<2	1.45	17.0	10	159	76
1126031050		0.47		0.597	1.2	0.70	373	<10	30	<0.5	<2	1.18	4.5	7	217	39
1126031258		0.55		0.983	2.4	0.68	153	<10	60	<0.5	2	0.48	16.7	6	231	101
1126031257		0.51		0.430	1.4	0.59	111	<10	70	<0.5	2	0.43	11.6	7	182	60
1126031001		0.44		0.476	0.6	1.37	80	<10	30	<0.5	2	1.20	3.7	9	167	31
1126031059		0.47		0.606	1.8	0.73	264	<10	20	<0.5	<2	1.15	15.2	8	182	57
1126031196		0.52		0.449	1.1	1.05	400	<10	20	<0.5	<2	0.17	11.0	7	98	101
1126031277		0.58		1.065	1.5	1.04	81	<10	90	<0.5	<2	0.73	15.8	6	153	69
1126031036		0.44		0.425	0.2	1.17	47	<10	210	0.5	<2	2.43	2.6	12	130	36
1126031148		0.41		0.921	0.7	1.74	94	<10	30	<0.5	<2	0.45	1.9	10	212	27
1126029101		0.56		0.747	9.1	0.51	155	<10	30	<0.5	<2	1.48	29.5	8	314	364
1126029624		0.48		1.620	1.9	0.87	32	<10	30	<0.5	<2	1.89	2.5	8	230	63
1126029606		0.52		0.298	3.2	0.60	44	<10	20	<0.5	<2	1.86	2.9	8	170	95
1126031173		0.51		0.188	1.2	0.61	224	<10	40	<0.5	<2	0.74	4.9	7	125	46
1126029503		0.37		0.093	1.4	0.93	38	<10	30	<0.5	2	2.04	<0.5	8	160	24
1126031141		0.53		0.502	1.3	0.73	209	<10	20	<0.5	<2	1.09	13.2	7	214	65
1126029064		0.39		0.550	6.0	0.78	36	<10	40	<0.5	<2	0.64	1.8	9	288	49
1126029061		0.54		0.327	3.5	0.84	37	<10	30	<0.5	<2	2.48	2.8	8	194	69
1126029118		0.61		0.353	3.0	0.59	22	<10	20	<0.5	<2	2.18	1.9	7	175	43
V829084		0.06		0.202	1.3	0.77	<2	<10	40	<0.5	<2	0.41	<0.5	9	11	49
1125003227		0.57		0.048	0.3	1.11	11	<10	110	<0.5	<2	2.04	0.7	9	118	39
1126027142		0.55		0.049	0.7	0.84	42	<10	30	<0.5	<2	0.84	0.9	8	120	17
1126027030		0.69		0.173	2.0	0.36	27	<10	30	<0.5	<2	2.88	1.3	8	190	55
1125003010		0.45		0.154	0.4	1.33	6	<10	60	<0.5	<2	1.39	<0.5	10	205	40
1126026145		0.50		0.809	1.5	0.87	49	<10	20	<0.5	<2	1.66	1.3	7	285	39
1125003026		0.47		0.018	<0.2	1.09	6	<10	60	<0.5	<2	1.11	<0.5	12	225	15

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1125008171		2.32	10	<1	0.30	10	0.76	373	4	0.05	52	410	7	0.41	<2	2
1126029083		1.89	<10	<1	0.24	10	0.50	768	1	0.04	10	410	95	1.79	<2	1
1126029030		1.96	<10	<1	0.24	10	1.01	1230	<1	0.03	8	450	41	1.99	<2	1
1126029029		2.19	<10	<1	0.19	10	0.85	1050	1	0.03	8	410	29	2.20	<2	1
1126029012		2.35	<10	<1	0.23	10	0.69	1205	1	0.05	11	460	411	2.44	4	1
1125008124		2.25	<10	1	0.15	10	0.71	360	2	0.05	14	490	4	0.34	<2	2
1125008203		2.35	10	<1	0.46	20	0.86	331	1	0.11	14	610	6	0.23	<2	2
1232001010		1.76	<10	1	0.21	20	0.56	528	1	0.01	12	550	116	0.86	<2	1
1232001040		2.39	10	<1	0.25	30	0.80	765	1	0.12	14	620	12	0.85	<2	2
1232001018		2.42	10	1	0.42	30	0.91	618	1	0.13	18	690	13	0.72	<2	2
1125008173		1.87	<10	<1	0.15	10	0.55	350	1	0.04	10	370	3	0.31	<2	1
1232001152		1.90	<10	1	0.18	10	0.70	619	1	0.06	12	450	37	1.10	<2	1
V829083		1.64	<10	<1	0.17	10	0.35	182	16	0.12	10	590	9	0.08	<2	2
1126031238		2.75	<10	<1	0.35	10	0.25	268	1	<0.01	7	480	120	2.68	<2	<1
1126031265		2.52	<10	<1	0.76	10	0.81	862	1	<0.01	16	960	146	1.98	<2	3
1126031050		2.21	<10	<1	0.24	10	0.41	694	1	<0.01	9	410	81	2.04	<2	<1
1126031258		2.70	<10	<1	0.35	10	0.34	719	1	<0.01	9	350	185	2.79	<2	<1
1126031257		2.33	<10	1	0.33	10	0.37	895	1	<0.01	8	340	255	2.30	<2	<1
1126031001		3.20	<10	<1	0.30	10	0.89	633	1	0.01	11	360	17	2.68	<2	1
1126031059		2.61	<10	<1	0.20	10	0.44	559	1	<0.01	10	390	10	2.50	<2	<1
1126031196		2.89	<10	1	0.25	10	0.45	369	1	<0.01	8	410	22	1.92	<2	<1
1126031277		2.53	<10	1	0.54	10	0.66	932	1	<0.01	9	430	168	2.10	<2	1
1126031036		2.41	<10	<1	0.69	20	1.06	1070	<1	<0.01	17	1390	22	1.31	<2	3
1126031148		2.40	<10	1	0.27	10	1.18	529	1	0.01	14	360	39	1.23	<2	1
1126029101		2.32	<10	2	0.21	10	0.55	1090	1	0.01	12	420	401	2.67	18	<1
1126029624		1.94	<10	1	0.23	10	0.74	1050	1	0.02	10	420	30	1.90	<2	1
1126029606		2.00	<10	1	0.16	10	0.86	1630	1	0.01	10	410	75	1.97	<2	<1
1126031173		1.98	<10	<1	0.33	10	0.24	668	1	<0.01	8	390	480	2.10	2	<1
1126029503		1.92	<10	<1	0.14	10	0.91	856	1	0.02	8	400	13	1.66	<2	1
1126031141		2.48	<10	1	0.19	10	0.44	523	1	<0.01	8	390	18	2.29	<2	<1
1126029064		2.20	<10	1	0.27	10	0.24	546	1	0.02	13	570	101	2.31	2	<1
1126029061		2.37	<10	<1	0.20	10	0.93	1920	1	0.02	8	480	77	2.43	<2	1
1126029118		1.89	<10	1	0.14	10	0.37	1025	1	0.01	9	420	307	2.03	<2	<1
V829084		2.32	<10	<1	0.20	10	0.33	234	3	0.13	11	500	19	0.04	<2	2
1125003227		2.01	<10	<1	0.24	10	0.72	412	2	0.03	11	590	7	0.59	<2	1
1126027142		1.54	<10	<1	0.12	10	0.44	271	1	0.06	9	380	14	1.35	<2	1
1126027030		2.14	<10	1	0.18	10	0.66	1870	1	0.01	12	410	155	2.34	<2	<1
1125003010		2.46	<10	<1	0.20	10	0.75	391	1	0.05	11	390	2	0.67	<2	2
1126026145		1.91	<10	1	0.20	10	0.56	931	1	0.01	9	390	274	1.58	<2	<1
1125003026		2.04	<10	1	0.25	10	0.62	283	1	0.05	9	380	3	0.31	<2	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1125008171		26	<20	0.05	<10	<10	21	320	94	0.42	0.39	41	9.5	29	12.2	3.36
1126029083		23	<20	<0.01	<10	<10	5	<10	348	0.61	1.71	47	8.8	-6	53.4	0.88
1126029030		40	<20	<0.01	<10	<10	5	<10	147	1.02	1.97	81	9.2	19	61.6	1.32
1126029029		31	<20	<0.01	<10	<10	4	<10	131	0.80	2.25	66	9.0	-4	70.3	0.94
1126029012		40	<20	<0.01	<10	<10	4	<10	733	0.73	2.51	60	9.2	-18	78.4	0.76
1125008124		38	<20	0.02	<10	<10	20	<10	46	0.58	0.32	52	9.7	42	10.0	5.20
1125008203		90	<20	0.08	<10	<10	35	<10	66	0.51	0.21	53	9.6	46	6.6	8.08
1232001010		15	<20	0.01	<10	<10	8	<10	248	0.33	0.75	29	8.9	6	23.4	1.24
1232001040		96	<20	0.07	<10	<10	25	<10	151	0.59	0.84	54	9.2	28	26.3	2.06
1232001018		97	<20	0.09	<10	<10	29	<10	131	0.44	0.74	50	9.3	27	23.1	2.16
1125008173		28	<20	0.02	<10	<10	15	<10	50	0.49	0.30	46	9.5	37	9.4	4.91
1232001152		36	<20	0.01	<10	<10	12	<10	247	0.54	1.06	45	8.8	12	33.1	1.36
V829083		20	<20	0.23	<10	<10	49	<10	33	0.02						
1126031238		19	<20	0.01	<10	<10	4	<10	4980	0.07	2.56	11	8.8	-69	80.0	0.14
1126031265		138	<20	0.06	<10	<10	19	<10	3990	0.47	1.84	49	9.1	-9	57.5	0.85
1126031050		13	<20	<0.01	<10	<10	3	<10	1050	0.44	2.01	35	8.8	-28	62.8	0.56
1126031258		53	<20	0.01	<10	<10	4	<10	4090	0.21	2.91	20	8.6	-71	90.9	0.22
1126031257		86	<20	0.01	<10	<10	4	<10	2780	0.23	2.32	21	8.7	-52	72.5	0.29
1126031001		18	<20	0.02	<10	<10	6	<10	948	0.39	2.69	35	8.6	-49	84.1	0.42
1126031059		11	<20	<0.01	<10	<10	3	<10	3860	0.41	2.52	35	8.8	-44	78.8	0.44
1126031196		8	<20	0.01	<10	<10	4	<10	2500	0.04	1.85	9	8.5	-49	57.8	0.16
1126031277		85	<20	0.02	<10	<10	9	<10	3620	0.32	2.03	32	9.1	-31	63.4	0.50
1126031036		181	<20	0.04	<10	<10	20	<10	664	1.00	1.29	79	9.3	39	40.3	1.96
1126031148		13	<20	<0.01	<10	<10	8	<10	494	0.12	1.23	18	8.9	-20	38.4	0.47
1126029101		13	<20	<0.01	<10	<10	3	<10	7010	0.78	2.65	58	8.9	-25	82.8	0.70
1126029624		23	<20	<0.01	<10	<10	4	<10	622	0.88	1.87	70	9.0	12	58.4	1.20
1126029606		20	<20	<0.01	<10	<10	3	<10	696	1.09	1.94	76	9.1	15	60.6	1.25
1126031173		15	<20	<0.01	<10	<10	3	<10	1130	0.31	2.01	27	9.1	-36	62.8	0.43
1126029503		30	<20	<0.01	<10	<10	4	<10	81	0.97	1.55	75	8.8	27	48.4	1.55
1126031141		11	<20	<0.01	<10	<10	4	<10	3270	0.34	2.08	31	8.6	-34	65.0	0.48
1126029064		15	<20	<0.01	<10	<10	4	<10	417	0.28	2.24	22	8.5	-48	70.0	0.31
1126029061		26	<20	<0.01	<10	<10	4	<10	694	1.18	2.47	90	8.8	13	77.2	1.17
1126029118		18	<20	<0.01	<10	<10	2	<10	459	0.79	2.01	61	8.9	-2	62.8	0.97
V829084		18	<20	0.36	<10	<10	55	<10	54	0.01						
1125003227		75	<20	0.02	<10	<10	14	<10	199	0.65	0.60	59	9.5	40	18.8	3.15
1126027142		33	<20	<0.01	<10	<10	5	<10	300	0.24	1.35	22	9.0	-20	42.2	0.52
1126027030		25	<20	<0.01	<10	<10	2	<10	330	1.41	2.42	105	8.8	29	75.6	1.39
1125003010		27	<20	0.03	<10	<10	18	<10	56	0.44	0.67	44	9.3	23	20.9	2.10
1126026145		16	<20	<0.01	<10	<10	4	<10	544	0.63	1.60	46	8.8	-4	50.0	0.92
1125003026		22	<20	0.04	<10	<10	21	10	38	0.33	0.28	34	9.5	25	8.8	3.89

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1125008171		2
1126029083		2
1126029030		2
1126029029		2
1126029012		2
1125008124		2
1125008203		2
1232001010		2
1232001040		2
1232001018		2
1125008173		2
1232001152		2
V829083		
1126031238		1
1126031265		2
1126031050		2
1126031258		2
1126031257		2
1126031001		2
1126031059		2
1126031196		1
1126031277		2
1126031036		2
1126031148		2
1126029101		2
1126029624		2
1126029606		2
1126031173		2
1126029503		2
1126031141		2
1126029064		2
1126029061		2
1126029118		2
V829084		
1125003227		2
1126027142		2
1126027030		3
1125003010		2
1126026145		2
1125003026		2

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CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1125003030		0.56		0.012	<0.2	1.12	2	<10	50	<0.5	<2	1.70	<0.5	9	299	32
1125007089		0.52		0.196	0.6	1.19	18	<10	50	<0.5	<2	2.14	<0.5	9	129	17
1126026150		0.58		0.065	1.0	0.53	38	<10	40	<0.5	<2	2.16	<0.5	6	118	19
1126027047		0.36		0.242	6.0	0.55	41	<10	40	<0.5	<2	2.19	2.5	8	282	100
1126027161		0.51		1.045	11.1	0.77	72	<10	40	<0.5	<2	1.36	8.2	9	125	293
1126026210		0.44		0.388	1.2	0.39	49	<10	20	<0.5	<2	1.98	0.6	6	102	19
1125003091		0.53		0.025	0.2	1.12	4	<10	50	<0.5	<2	1.58	<0.5	7	177	16
1125007033		0.45		0.030	<0.2	1.35	2	<10	150	<0.5	<2	2.48	<0.5	12	130	18
1126027164		0.53		0.189	2.8	0.40	24	<10	20	<0.5	<2	2.60	1.1	8	99	46
1126027201		0.60		0.148	1.9	0.48	34	<10	20	<0.5	<2	2.47	1.1	12	92	46
1126026241		0.50		0.708	1.4	0.38	60	<10	20	<0.5	<2	1.92	3.5	5	93	34
1125007004		0.53		0.392	0.7	2.10	16	<10	60	<0.5	<2	2.19	<0.5	11	207	31
1125007029		0.52		0.037	0.4	2.10	9	<10	80	<0.5	<2	2.48	<0.5	14	181	28
1125007036		0.58		0.113	1.1	2.70	31	<10	70	<0.5	<2	3.08	<0.5	34	94	66
V829085		0.06		6.70	4.8	0.85	<2	<10	50	<0.5	<2	0.56	<0.5	6	10	38
1125004028		0.54		0.028	0.2	1.64	6	<10	120	<0.5	<2	1.65	<0.5	8	206	11
1127040453		0.62		0.132	0.6	0.39	62	<10	30	<0.5	<2	1.06	2.1	3	82	19
1125004031		0.52		0.095	0.6	1.04	6	<10	50	<0.5	<2	1.49	<0.5	7	267	8
1125004013		0.48		0.013	<0.2	1.60	3	<10	170	<0.5	<2	1.79	<0.5	10	210	9
1127040465		0.43	92.1	0.719	0.6	1.18	413	<10	30	<0.5	<2	0.87	6.2	5	111	21
1127040480		0.50		0.427	0.6	1.56	85	<10	30	<0.5	<2	0.42	5.7	9	124	44
1126028103		0.52		0.581	1.7	0.58	20	<10	30	<0.5	<2	2.18	1.3	7	243	29
1127040405		0.40		0.535	0.5	2.36	51	<10	120	<0.5	<2	0.59	1.3	15	204	43
1125003161		0.48		0.024	0.5	1.33	9	<10	80	<0.5	<2	1.61	<0.5	23	250	59
1126028044		0.62		0.961	68.1	0.31	86	<10	20	<0.5	<2	1.55	5.3	8	144	251
1126028116		0.45		0.778	3.0	0.90	30	<10	40	<0.5	<2	2.31	2.1	8	184	30
1126028050		0.46		0.260	6.0	0.39	40	<10	20	<0.5	2	1.40	3.9	8	107	91
1125004034		0.59		0.057	2.8	3.95	29	<10	110	<0.5	<2	3.05	3.4	42	109	184
1126028015		0.51		0.174	2.0	1.22	23	<10	30	<0.5	<2	1.28	0.5	7	143	21
1125003126		0.48		0.031	0.2	1.22	8	<10	60	<0.5	<2	1.62	<0.5	7	220	17
1126028449		0.51		0.154	4.1	0.35	45	<10	20	<0.5	<2	2.26	3.1	7	137	98
1125003208		0.56		0.110	0.6	1.09	12	<10	50	<0.5	<2	1.66	1.2	8	268	84
1126027130		0.52		0.139	0.8	1.09	24	<10	50	<0.5	<2	2.27	<0.5	6	130	29
1126028092		0.56		1.485	4.2	0.62	47	<10	20	<0.5	<2	2.20	5.2	6	77	77
V829086		0.06		0.192	1.5	0.79	2	<10	40	<0.5	<2	0.42	<0.5	9	11	50
1126026165		0.43		0.172	0.9	1.00	41	<10	30	<0.5	<2	0.98	0.5	7	160	20
1125003005		0.48		0.015	<0.2	1.09	4	<10	70	<0.5	<2	1.13	<0.5	8	127	15
1126026273		0.53		0.134	0.6	1.60	29	<10	20	<0.5	3	1.52	1.2	5	82	19
1125003002		0.59		0.015	<0.2	1.30	5	<10	60	<0.5	<2	1.42	<0.5	6	170	13
1127040081		0.47		1.615	2.7	0.49	444	<10	20	<0.5	<2	0.40	27.0	6	83	229

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1125003030		1.99	<10	<1	0.17	10	0.65	381	1	0.05	12	430	2	0.19	<2	1
1125007089		2.24	<10	<1	0.19	10	0.59	742	1	0.05	12	460	13	1.13	<2	1
1126026150		1.79	<10	<1	0.25	10	0.64	1265	<1	0.01	7	380	36	1.62	2	<1
1126027047		2.53	<10	<1	0.24	10	0.60	1735	2	0.02	12	420	282	2.69	6	<1
1126027161		2.36	<10	1	0.23	10	0.55	1460	1	0.02	14	390	361	2.60	3	<1
1126026210		1.70	<10	<1	0.20	10	0.66	1440	<1	<0.01	7	370	78	1.49	2	<1
1125003091		1.99	<10	<1	0.17	10	0.70	363	<1	0.04	11	430	<2	0.32	<2	2
1125007033		2.62	10	<1	0.36	10	1.09	508	<1	0.06	29	500	<2	0.12	<2	3
1126027164		2.28	<10	<1	0.17	10	0.89	1570	1	0.01	11	400	86	2.52	5	<1
1126027201		2.23	<10	<1	0.16	10	1.03	1440	1	0.02	12	430	77	2.35	3	<1
1126026241		1.67	<10	<1	0.21	10	0.75	1645	<1	<0.01	6	400	171	1.37	<2	<1
1125007004		2.29	10	<1	0.23	20	0.96	679	1	0.11	22	530	17	0.59	<2	2
1125007029		3.32	10	<1	0.27	20	1.09	664	1	0.09	27	540	8	0.90	<2	4
1125007036		8.98	10	<1	0.25	10	1.37	1345	<1	0.10	57	670	4	2.58	2	11
V829085		1.68	<10	<1	0.18	10	0.37	185	19	0.14	10	580	7	0.07	<2	2
1125004028		2.09	10	<1	0.48	20	0.79	533	1	0.11	14	500	<2	0.31	<2	2
1127040453		1.15	<10	<1	0.23	10	0.30	564	1	<0.01	7	470	86	1.12	3	<1
1125004031		1.83	<10	<1	0.18	10	0.67	506	2	0.06	13	430	<2	0.68	<2	1
1125004013		2.40	10	<1	0.63	20	0.98	522	1	0.08	21	540	2	0.18	2	4
1127040465		2.89	<10	<1	0.32	10	0.62	644	1	0.01	9	390	23	2.27	<2	1
1127040480		2.65	<10	<1	0.19	10	1.17	571	1	0.01	13	360	13	1.79	2	1
1126028103		2.10	<10	<1	0.19	10	0.79	1415	1	0.01	11	420	48	2.13	<2	<1
1127040405		3.47	<10	<1	0.49	20	1.90	951	1	0.01	38	930	31	1.60	2	4
1125003161		2.02	<10	<1	0.32	10	0.77	391	5	0.06	17	430	3	0.48	<2	2
1126028044		2.28	<10	1	0.15	10	0.70	1730	<1	0.01	11	430	569	2.63	54	<1
1126028116		2.22	<10	<1	0.22	10	0.71	1250	1	0.02	12	410	293	2.28	<2	1
1126028050		1.57	<10	<1	0.16	10	0.15	599	1	0.01	11	410	173	1.83	3	<1
1125004034		10.65	10	<1	0.66	<10	1.63	1555	1	0.21	67	800	9	3.39	3	14
1126028015		1.94	<10	<1	0.18	10	0.67	1205	<1	0.03	8	380	29	1.94	2	<1
1125003126		2.06	<10	<1	0.18	10	0.62	406	7	0.06	14	390	2	0.37	<2	1
1126028449		1.98	<10	<1	0.14	<10	0.61	1885	1	0.01	10	390	284	2.21	5	<1
1125003208		2.24	<10	<1	0.16	10	0.70	595	1	0.05	11	430	<2	0.58	<2	1
1126027130		2.00	<10	<1	0.28	10	0.85	505	1	0.07	10	370	24	2.08	2	1
1126028092		1.92	<10	<1	0.17	10	0.73	1255	<1	0.01	9	410	251	2.10	3	<1
V829086		2.43	<10	<1	0.20	10	0.35	240	4	0.13	10	510	19	0.04	<2	2
1126026165		2.07	<10	<1	0.25	10	0.50	427	1	0.04	9	400	86	2.09	<2	<1
1125003005		1.95	<10	<1	0.30	10	0.65	291	1	0.05	12	390	3	0.52	<2	2
1126026273		1.61	<10	<1	0.19	10	1.30	813	1	0.02	8	360	82	0.98	<2	1
1125003002		1.88	10	<1	0.22	10	0.69	279	1	0.08	12	390	4	0.35	<2	2
1127040081		3.79	<10	<1	0.22	10	0.22	443	1	<0.01	7	350	241	4.09	<2	<1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1125003030		35	<20	0.02	<10	<10	16	<10	69	0.56	0.17	49	9.6	44	5.3	9.22
1125007089		49	<20	0.03	<10	<10	11	<10	150	0.60	1.14	54	8.9	18	35.6	1.52
1126026150		25	<20	<0.01	<10	<10	2	<10	132	1.01	1.57	78	9.1	29	49.1	1.59
1126027047		25	<20	<0.01	<10	<10	3	<10	624	1.19	2.56	77	8.8	-3	80.0	0.96
1126027161		20	<20	<0.01	<10	<10	3	<10	1985	0.64	2.49	52	8.9	-26	77.8	0.67
1126026210		23	<20	<0.01	<10	<10	2	<10	201	0.99	1.44	77	8.9	32	45.0	1.71
1125003091		27	<20	0.02	<10	<10	19	<10	45	0.50	0.31	44	9.5	34	9.7	4.54
1125007033		97	<20	0.04	<10	<10	43	<10	70	0.85	0.10	71	9.5	68	3.1	22.72
1126027164		24	<20	<0.01	<10	<10	2	<10	287	1.27	2.47	106	9.0	29	77.2	1.37
1126027201		27	<20	<0.01	<10	<10	2	10	293	1.26	2.09	101	9.1	36	65.3	1.55
1126026241		36	<20	<0.01	<10	<10	2	<10	920	1.06	1.32	80	9.1	39	41.3	1.94
1125007004		87	<20	0.06	<10	<10	23	<10	153	0.48	0.56	46	9.3	29	17.5	2.63
1125007029		93	<20	0.10	<10	<10	56	<10	108	0.60	0.83	57	9.2	31	25.9	2.20
1125007036		85	<20	0.10	<10	<10	209	<10	212	0.97	2.72	135	8.6	50	85.0	1.59
V829085		21	<20	0.24	<10	<10	50	<10	32	0.01						
1125004028		66	<20	0.07	<10	<10	27	<10	83	0.42	0.28	43	9.6	34	8.8	4.91
1127040453		16	<20	<0.01	<10	<10	2	<10	495	0.47	1.11	38	9.0	3	34.7	1.10
1125004031		25	<20	0.02	<10	<10	20	<10	73	0.44	0.66	40	9.5	19	20.6	1.94
1125004013		63	<20	0.09	<10	<10	43	<10	98	0.51	0.17	49	9.7	44	5.3	9.22
1127040465		13	<20	<0.01	<10	<10	6	<10	1630	0.29	2.27	29	8.9	-42	70.9	0.41
1127040480		11	<20	<0.01	<10	<10	6	<10	1415	0.13	1.70	14	8.5	-39	53.1	0.26
1126028103		19	<20	<0.01	<10	<10	3	<10	342	1.03	2.05	80	9.0	16	64.1	1.25
1127040405		34	<20	0.04	<10	<10	40	<10	468	0.16	1.55	20	8.6	-28	48.4	0.41
1125003161		42	<20	0.03	<10	<10	17	70	120	0.49	0.43	45	9.3	32	13.4	3.35
1126028044		16	<20	<0.01	<10	<10	2	<10	1280	0.85	2.57	66	9.0	-14	80.3	0.82
1126028116		32	<20	<0.01	<10	<10	4	<10	543	0.99	2.22	80	9.0	11	69.4	1.15
1126028050		11	<20	<0.01	<10	<10	2	<10	969	0.47	1.85	39	8.9	-19	57.8	0.67
1125004034		87	<20	0.16	<10	<10	257	<10	789	0.90	3.48	71	8.4	-38	108.8	0.65
1126028015		25	<20	<0.01	<10	<10	4	<10	127	0.57	1.71	46	8.9	-7	53.4	0.86
1125003126		31	<20	0.01	<10	<10	16	<10	54	0.47	0.35	44	9.6	33	10.9	4.02
1126028449		21	<20	<0.01	<10	<10	2	<10	795	1.04	2.16	82	8.9	15	67.5	1.21
1125003208		43	<20	0.01	<10	<10	15	<10	363	0.64	0.54	52	9.5	35	16.9	3.08
1126027130		56	<20	<0.01	<10	<10	5	<10	77	0.95	2.00	77	9.2	15	62.5	1.23
1126028092		22	<20	<0.01	<10	<10	3	<10	1375	0.94	1.94	75	8.8	14	60.6	1.24
V829086		18	<20	0.37	<10	<10	57	<10	56	0.01						
1126026165		18	<20	<0.01	<10	<10	4	<10	175	0.25	2.05	26	8.8	-38	64.1	0.41
1125003005		26	<20	0.06	<10	<10	22	<10	44	0.32	0.46	34	9.5	20	14.4	2.37
1126026273		23	<20	0.04	<10	<10	8	<10	341	0.37	0.97	36	9.1	6	30.3	1.19
1125003002		51	<20	0.04	<10	<10	19	<10	43	0.39	0.33	38	9.5	28	10.3	3.68
1127040081		9	<20	<0.01	<10	<10	2	<10	6640	0.18	4.98	16	8.1	-140	155.6	0.10

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1125003030		2
1125007089		2
1126026150		2
1126027047		2
1126027161		2
1126026210		2
1125003091		2
1125007033		2
1126027164		3
1126027201		3
1126026241		2
1125007004		2
1125007029		2
1125007036		3
V829085		
1125004028		2
1127040453		2
1125004031		2
1125004013		2
1127040465		2
1127040480		1
1126028103		2
1127040405		1
1125003161		2
1126028044		2
1126028116		2
1126028050		2
1125004034		2
1126028015		2
1125003126		2
1126028449		2
1125003208		2
1126027130		2
1126028092		2
V829086		
1126026165		2
1125003005		2
1126026273		2
1125003002		2
1127040081		1

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CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1127040101		0.47		1.810	3.1	0.89	344	<10	30	<0.5	2	0.30	11.8	5	229	67
1127040044		0.48		0.327	1.0	0.58	329	<10	20	<0.5	<2	0.95	12.2	7	80	62
1126026108		0.49		0.406	0.9	1.51	47	<10	40	<0.5	2	1.68	0.9	8	101	33
1125003016		0.53		0.060	0.2	1.19	4	<10	60	<0.5	<2	0.92	<0.5	7	172	62
1127040040		0.46		0.343	1.7	0.50	1210	<10	30	<0.5	<2	1.29	7.4	7	115	34
1127040039		0.45		1.090	1.2	0.45	177	<10	30	<0.5	<2	1.05	4.6	6	138	37
1127040017		0.41		3.96	1.3	0.65	360	<10	20	<0.5	<2	0.42	11.7	6	157	129
1127040028		0.51		0.515	3.1	0.48	618	<10	40	<0.5	<2	0.81	33.2	6	139	266
1125005046		0.37		0.121	0.7	2.29	35	<10	90	0.5	<2	2.25	<0.5	9	95	27
1125005037		0.51		0.008	<0.2	1.57	5	<10	120	<0.5	<2	2.10	<0.5	11	106	3
1127040415		0.46		2.26	1.1	1.03	186	<10	30	<0.5	<2	0.75	2.4	8	128	50
1127040421		0.46		0.352	0.2	0.77	178	<10	20	<0.5	<2	1.72	8.1	5	199	20
V829087		0.06		6.69	5.0	0.90	<2	<10	50	<0.5	3	0.59	<0.5	7	10	40
1125006023		0.46		0.315	1.0	2.20	33	10	60	<0.5	<2	1.96	<0.5	14	60	37
1126020122		0.47		0.262	0.7	0.76	122	<10	30	<0.5	<2	1.60	1.9	6	165	25
1126020003		0.58		0.118	1.1	1.26	59	<10	20	<0.5	<2	0.78	11.3	6	115	27
1126020246		0.50		0.381	1.2	1.20	134	<10	30	<0.5	<2	0.63	8.2	8	166	38
1125003036		0.36		0.052	0.2	1.16	4	<10	50	<0.5	<2	1.28	<0.5	7	104	23
1125004085		0.53		0.031	0.3	1.37	6	<10	40	<0.5	<2	1.80	<0.5	5	195	18
1126026002		0.54		0.007	<0.2	1.13	3	<10	50	<0.5	<2	1.30	<0.5	6	170	12
1126026135		0.55		0.298	1.5	2.63	8	<10	50	<0.5	2	2.68	<0.5	22	132	66
1126020210		0.55		1.065	1.1	0.97	27	<10	30	<0.5	2	2.10	2.1	5	103	27
1126026168		0.45		0.106	0.5	2.50	29	<10	50	<0.5	<2	2.12	0.8	11	90	43
1125006014		0.52		0.322	0.9	2.80	9	<10	60	<0.5	<2	3.69	0.6	21	109	83
1126020191		0.51		0.387	2.3	0.91	118	<10	30	<0.5	3	0.93	17.9	6	192	67
1125005070		0.50		0.201	0.5	1.44	48	10	30	<0.5	<2	1.41	3.0	9	40	30
1126020123		0.50		0.190	0.6	0.99	106	<10	30	<0.5	<2	1.79	1.4	6	152	37
1125005083		0.49		0.360	0.8	1.70	61	<10	40	<0.5	<2	1.42	2.7	10	115	36
1126026133		0.52		0.205	0.6	1.97	36	<10	50	<0.5	<2	1.59	0.6	9	64	35
1125003039		0.48	86.1	0.010	<0.2	1.09	3	<10	50	<0.5	<2	1.60	<0.5	7	108	11
1127040082		0.48		0.418	3.1	0.45	259	<10	20	<0.5	3	0.38	9.6	6	81	42
1126026106		0.53		0.102	0.5	1.79	36	<10	40	<0.5	<2	1.44	1.0	8	102	32
V829088		0.06		0.188	1.4	0.85	2	<10	40	<0.5	3	0.46	<0.5	9	11	52

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1127040101		3.13	<10	1	0.26	10	0.51	737	1	<0.01	7	370	299	2.55	2	<1
1127040044		2.74	<10	<1	0.20	10	0.31	517	1	<0.01	8	400	63	2.88	<2	<1
1126026108		2.16	<10	<1	0.27	10	0.77	709	1	0.07	8	400	181	1.70	<2	1
1125003016		2.00	10	<1	0.23	10	0.61	262	1	0.06	9	380	3	0.32	<2	2
1127040040		2.95	<10	<1	0.32	10	0.34	954	1	<0.01	9	350	250	3.13	<2	<1
1127040039		1.94	<10	<1	0.27	10	0.37	1270	<1	<0.01	7	350	318	1.95	<2	<1
1127040017		2.28	<10	<1	0.21	10	0.40	477	1	<0.01	8	490	194	2.21	4	<1
1127040028		2.27	<10	1	0.26	10	0.25	571	1	0.01	8	390	1040	2.67	9	<1
1125005046		2.26	10	<1	0.28	20	1.09	631	1	0.07	12	840	22	1.13	<2	2
1125005037		2.52	10	<1	0.43	20	1.04	561	<1	0.08	18	680	6	0.16	<2	3
1127040415		2.83	<10	<1	0.32	10	0.51	385	1	0.01	7	350	133	2.61	<2	1
1127040421		2.32	<10	<1	0.27	10	0.64	1120	1	0.01	8	380	10	1.77	<2	<1
V829087		1.70	<10	<1	0.18	10	0.37	186	17	0.15	10	570	8	0.07	<2	2
1125006023		2.61	10	<1	0.18	20	1.21	534	1	0.04	25	870	7	0.79	<2	2
1126020122		2.05	<10	<1	0.24	10	0.56	788	1	0.01	7	380	17	1.53	<2	<1
1126020003		2.14	<10	<1	0.32	10	0.69	500	1	0.02	7	370	26	1.73	<2	1
1126020246		2.35	<10	1	0.29	10	0.73	432	1	0.01	11	410	25	1.81	<2	1
1125003036		1.96	10	<1	0.17	10	0.68	298	<1	0.05	11	400	2	0.41	<2	2
1125004085		1.72	10	1	0.16	10	0.77	506	2	0.09	16	390	3	0.51	<2	1
1126026002		1.80	<10	<1	0.20	20	0.52	279	1	0.06	5	450	3	0.11	<2	1
1126026135		4.69	10	<1	0.20	10	1.01	797	2	0.15	29	650	8	0.44	<2	8
1126020210		1.60	<10	<1	0.32	10	0.83	1170	2	0.01	5	380	173	1.36	<2	1
1126026168		2.36	10	<1	0.32	20	1.04	691	1	0.17	16	650	32	0.95	<2	2
1125006014		5.54	10	<1	0.30	10	1.43	1360	1	0.13	29	570	8	0.92	<2	8
1126020191		2.96	<10	<1	0.27	10	0.49	476	1	0.01	8	340	89	2.76	<2	<1
1125005070		2.33	<10	<1	0.17	20	0.88	683	<1	0.03	8	520	23	1.30	<2	1
1126020123		2.11	<10	<1	0.29	10	0.60	747	1	0.01	7	360	20	1.55	<2	1
1125005083		2.81	<10	<1	0.22	20	0.92	694	1	0.04	10	540	32	1.73	<2	1
1126026133		2.03	10	<1	0.29	20	0.90	552	1	0.14	12	500	23	1.27	<2	2
1125003039		1.73	<10	<1	0.14	10	0.60	301	<1	0.05	11	410	<2	0.20	<2	1
1127040082		3.71	<10	<1	0.21	10	0.22	484	1	<0.01	7	380	393	3.86	<2	<1
1126026106		2.02	10	<1	0.24	20	0.89	565	1	0.10	11	520	36	1.20	<2	1
V829088		2.47	<10	<1	0.20	10	0.35	243	4	0.15	10	500	22	0.04	<2	2

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1127040101		12	<20	<0.01	<10	<10	4	<10	2920	0.23	2.53	15	8.1	-64	79.1	0.19
1127040044		10	<20	<0.01	<10	<10	3	<10	3000	0.31	2.72	27	8.4	-58	85.0	0.32
1126026108		34	<20	0.01	<10	<10	10	<10	325	0.44	1.52	42	9.0	-6	47.5	0.88
1125003016		24	<20	0.04	<10	<10	20	<10	40	0.25	0.29	27	9.6	18	9.1	2.98
1127040040		26	<20	<0.01	<10	<10	3	<10	1910	0.66	3.11	47	8.6	-50	97.2	0.48
1127040039		29	<20	<0.01	<10	<10	2	<10	1170	0.58	1.89	42	8.8	-17	59.1	0.71
1127040017		10	<20	<0.01	<10	<10	3	<10	2760	0.50	1.96	13	8.6	-48	61.3	0.21
1127040028		19	<20	<0.01	<10	<10	3	<10	8460	0.35	2.41	29	8.8	-46	75.3	0.39
1125005046		79	<20	0.06	<10	<10	20	<10	103	0.42	1.05	45	9.1	12	32.8	1.37
1125005037		172	<20	0.05	<10	<10	45	<10	108	0.61	0.15	56	9.4	51	4.7	11.95
1127040415		13	<20	0.01	<10	<10	5	<10	574	0.22	2.60	23	8.7	-58	81.3	0.28
1127040421		16	<20	<0.01	<10	<10	4	<10	2150	0.76	1.72	58	8.6	4	53.8	1.08
V829087		24	<20	0.24	<10	<10	50	<10	35	0.01						
1125006023		101	<20	0.04	<10	<10	29	<10	122	0.48	0.70	47	9.0	25	21.9	2.15
1126020122		18	<20	<0.01	<10	<10	4	<10	476	0.66	1.49	51	8.8	4	46.6	1.10
1126020003		23	<20	0.02	<10	<10	6	<10	2930	0.19	1.71	21	8.9	-32	53.4	0.39
1126020246		13	<20	0.01	<10	<10	7	<10	2150	0.18	1.77	18	8.7	-37	55.3	0.33
1125003036		26	<20	0.04	<10	<10	20	<10	48	0.36	0.41	35	9.6	22	12.8	2.73
1125004085		39	<20	0.01	<10	<10	16	<10	88	0.55	0.49	48	9.3	33	15.3	3.13
1126026002		29	<20	0.03	<10	<10	14	<10	81	0.44	0.12	37	9.6	33	3.8	9.87
1126026135		150	<20	0.13	<10	<10	101	10	241	0.56	0.46	52	9.0	38	14.4	3.62
1126020210		32	<20	<0.01	<10	<10	5	<10	568	0.87	1.16	66	9.1	30	36.3	1.82
1126026168		99	<20	0.06	<10	<10	26	<10	289	0.41	0.84	40	9.0	14	26.3	1.52
1125006014		106	<20	0.10	<10	<10	113	10	322	1.25	0.86	145	8.9	118	26.9	5.40
1126020191		12	<20	<0.01	<10	<10	4	<10	4530	0.37	2.79	27	8.5	-60	87.2	0.31
1125005070		25	<20	<0.01	<10	<10	9	<10	896	0.44	1.42	40	9.0	-4	44.4	0.90
1126020123		21	<20	<0.01	<10	<10	5	<10	309	0.68	1.54	50	9.0	2	48.1	1.04
1125005083		32	<20	<0.01	<10	<10	11	<10	873	0.39	1.65	38	8.9	-14	51.6	0.74
1126026133		76	<20	0.03	<10	<10	17	<10	205	0.35	1.28	34	9.0	-6	40.0	0.85
1125003039		41	<20	0.02	<10	<10	16	<10	52	0.47	0.19	42	9.5	36	5.9	7.07
1127040082		10	<20	<0.01	<10	<10	2	<10	2320	0.17	4.37	15	8.1	-122	136.6	0.11
1126026106		54	<20	0.02	<10	<10	14	<10	346	0.35	1.17	33	8.9	-4	36.6	0.90
V829088		20	<20	0.36	<10	<10	56	<10	58	0.01						

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1127040101		1
1127040044		2
1126026108		2
1125003016		2
1127040040		2
1127040039		2
1127040017		1
1127040028		2
1125005046		2
1125005037		2
1127040415		2
1127040421		2
V829087		
1125006023		2
1126020122		2
1126020003		2
1126020246		1
1125003036		2
1125004085		2
1126026002		2
1126026135		2
1126020210		2
1126026168		2
1125006014		3
1126020191		2
1125005070		2
1126020123		2
1125005083		2
1126026133		2
1125003039		2
1127040082		1
1126026106		2
V829088		

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18165552

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

CERTIFICATE TB18165553

Project: Mine Site Lab Pulps May 2018

P.O. No.: 4500009909

This report is for 160 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 10-JUL-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1126020084		0.52	88.7	0.271	0.7	1.78	65	<10	30	<0.5	<2	1.72	3.8	7	203	45
1126025119		0.55		0.008	<0.2	1.40	6	<10	70	<0.5	<2	2.60	<0.5	11	79	9
1125006056		0.50		0.068	0.5	2.76	36	<10	30	<0.5	<2	2.18	<0.5	8	213	18
1125005003		0.54		0.245	0.5	2.31	21	<10	70	<0.5	<2	2.53	<0.5	14	92	28
1126020066		0.42		0.239	1.1	1.26	56	<10	20	<0.5	<2	0.69	10.7	7	76	37
1125006047		0.46		0.214	0.8	2.67	52	10	60	<0.5	<2	1.48	<0.5	10	111	25
1126020040		0.39		0.351	0.4	1.91	28	<10	100	<0.5	<2	2.09	0.6	8	174	45
1126020012		0.56		0.475	2.5	1.73	49	<10	30	<0.5	<2	1.39	4.8	7	140	51
1125005004		0.54		6.70	2.0	2.81	34	<10	60	<0.5	<2	1.67	<0.5	10	134	30
1126020080		0.48		0.445	0.6	1.72	38	<10	60	<0.5	<2	1.63	1.7	7	124	24
1126020135		0.54		0.215	1.8	1.37	62	<10	20	<0.5	<2	1.88	8.2	7	95	52
1126020164		0.46		0.657	6.9	1.65	110	<10	30	<0.5	<2	1.14	18.2	7	134	108
1126020138		0.61		0.811	1.1	1.46	47	<10	20	<0.5	<2	1.48	7.6	7	65	50
1125005035		0.58		0.019	0.4	2.98	11	<10	90	<0.5	<2	2.73	<0.5	19	134	39
1125006018		0.47		0.618	2.0	2.13	63	10	30	<0.5	<2	0.72	<0.5	11	59	23
1126020027		0.52		1.320	0.7	1.66	40	<10	20	<0.5	<2	1.30	0.6	6	83	32
1126020060		0.45		0.086	1.4	0.50	118	<10	20	<0.5	<2	1.77	5.6	8	105	48
V829072		0.05		2.07	7.2	0.89	417	<10	50	<0.5	3	1.38	0.9	8	14	302
1229002149		0.42		0.382	4.8	1.21	53	<10	40	<0.5	<2	1.77	3.3	9	79	68
1126021023		0.49		0.009	<0.2	1.84	6	<10	40	<0.5	<2	1.98	<0.5	7	86	15
1229002152		0.48		0.272	3.7	1.51	29	<10	40	<0.5	<2	1.56	0.7	8	97	32
1229002176		0.62		0.061	0.4	1.93	12	<10	40	<0.5	<2	1.14	<0.5	9	124	24
1126022104		0.49		0.031	<0.2	1.36	22	<10	40	<0.5	<2	1.56	<0.5	9	173	19
1229002087		0.56		1.060	4.3	0.75	60	<10	20	<0.5	<2	0.78	4.0	10	133	47
1126022073		0.49		0.029	<0.2	1.42	5	<10	110	<0.5	<2	2.19	<0.5	11	90	20
1126022076		0.56		0.039	0.3	1.31	15	<10	60	<0.5	<2	1.96	<0.5	8	178	23
1126022109		0.55		0.043	<0.2	1.09	13	<10	40	<0.5	<2	1.88	<0.5	9	58	20
1229002109		0.44		0.394	4.8	0.96	47	<10	30	<0.5	<2	0.21	2.3	9	105	36
1229003029		0.55		0.044	0.3	1.84	19	<10	50	<0.5	<2	1.61	<0.5	10	103	27
1229003030		0.45		0.208	1.6	0.98	36	<10	50	<0.5	<2	0.57	<0.5	8	109	40
1229003032		0.48		0.054	1.1	1.72	20	<10	40	<0.5	2	1.59	0.8	9	99	30
1229003034		0.39		0.174	1.0	1.20	20	<10	40	<0.5	<2	1.62	0.8	9	73	23
1126022145		0.58		0.036	<0.2	1.10	4	<10	160	<0.5	<2	2.53	<0.5	9	170	52
1229001115		0.54		0.299	1.6	0.85	58	<10	30	<0.5	<2	0.64	14.3	12	98	64
1229001006		0.51		0.424	<0.2	1.90	31	<10	50	<0.5	<2	0.38	<0.5	11	43	22
V829073		0.05		6.78	5.1	0.85	2	<10	50	<0.5	<2	0.58	<0.5	7	10	39
1126024019		0.47		0.686	1.7	1.08	96	<10	30	<0.5	<2	0.46	0.9	9	121	35
1126024156		0.49		0.671	0.9	1.46	52	<10	30	<0.5	<2	1.74	3.7	7	61	37
1229002058		0.52		0.412	1.2	0.92	45	<10	20	<0.5	<2	0.31	2.6	9	32	31
1229002081		0.50		0.644	0.8	1.17	90	<10	30	<0.5	<2	0.31	19.2	9	96	85

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1126020084		2.27	<10	<1	0.22	10	1.39	853	1	0.02	9	410	95	1.32	2	1
1126025119		2.60	<10	<1	0.24	20	0.98	722	<1	0.04	17	760	3	0.62	<2	2
1125006056		1.83	10	<1	0.17	10	0.78	407	<1	0.17	10	390	22	0.93	<2	1
1125005003		2.52	10	<1	0.25	20	1.09	669	1	0.13	26	540	19	0.69	<2	2
1126020066		2.22	<10	<1	0.24	20	0.74	410	<1	0.01	8	420	34	1.70	<2	1
1125006047		2.26	10	<1	0.25	20	0.99	520	<1	0.10	10	540	31	1.33	<2	1
1126020040		1.96	10	<1	0.42	20	1.29	821	2	0.05	10	660	63	1.32	<2	1
1126020012		1.94	<10	1	0.26	20	1.12	648	<1	0.02	7	400	85	1.12	<2	1
1125005004		2.48	10	<1	0.25	20	0.91	673	1	0.17	11	590	38	1.12	<2	1
1126020080		1.92	10	<1	0.33	20	1.05	654	1	0.03	8	480	106	1.41	<2	1
1126020135		2.21	<10	<1	0.27	20	1.31	921	1	0.01	7	450	143	1.74	<2	1
1126020164		2.85	<10	<1	0.37	10	1.28	761	<1	0.01	8	400	157	2.24	5	1
1126020138		2.10	<10	<1	0.27	20	1.22	809	<1	0.01	7	420	108	1.36	2	1
1125005035		4.21	10	1	0.32	10	1.08	731	<1	0.17	26	610	11	0.45	<2	5
1125006018		2.69	10	<1	0.11	20	0.82	455	1	0.05	12	650	14	1.22	<2	1
1126020027		1.74	<10	1	0.22	10	0.89	507	<1	0.05	6	400	95	1.19	2	1
1126020060		1.84	<10	<1	0.22	10	0.48	915	2	0.01	14	420	18	1.67	<2	1
V829072		4.75	<10	1	0.30	20	0.32	500	3	0.02	9	170	19	3.59	3	2
1229002149		2.24	<10	<1	0.27	20	0.56	900	1	0.04	12	490	164	2.46	3	1
1126021023		1.86	10	<1	0.15	10	0.71	398	1	0.15	10	400	2	0.16	<2	2
1229002152		2.19	<10	<1	0.20	10	0.55	759	1	0.09	12	460	55	2.22	<2	1
1229002176		1.95	10	<1	0.16	10	0.44	395	1	0.16	8	440	14	0.92	<2	1
1126022104		2.34	10	<1	0.29	10	0.82	488	5	0.04	29	400	2	0.36	<2	1
1229002087		2.65	<10	<1	0.18	10	0.26	488	<1	0.03	12	460	183	2.85	<2	<1
1126022073		2.05	10	<1	0.38	20	1.15	488	2	0.04	20	550	3	0.28	<2	2
1126022076		2.30	<10	<1	0.26	10	0.84	510	2	0.04	11	420	5	0.50	<2	1
1126022109		1.79	<10	<1	0.18	10	0.76	470	1	0.03	11	400	<2	0.28	<2	1
1229002109		2.18	<10	<1	0.20	10	0.58	317	2	0.02	11	460	50	2.21	<2	<1
1229003029		1.19	<10	<1	0.14	10	0.23	226	1	0.22	9	510	8	0.75	<2	1
1229003030		1.73	<10	<1	0.24	10	0.18	154	1	0.06	8	450	16	1.78	<2	1
1229003032		2.12	<10	<1	0.20	10	0.77	443	1	0.10	9	430	45	2.26	<2	1
1229003034		2.11	<10	<1	0.19	10	0.58	486	1	0.04	9	500	21	2.17	2	1
1126022145		2.26	<10	<1	0.28	20	0.94	470	1	0.05	12	740	2	0.21	<2	2
1229001115		3.07	<10	<1	0.21	10	0.10	222	1	0.03	19	380	50	3.49	5	<1
1229001006		2.41	<10	<1	0.17	20	0.92	482	<1	0.02	12	560	4	1.47	4	1
V829073		1.78	<10	<1	0.18	10	0.37	187	18	0.14	10	600	9	0.07	<2	2
1126024019		2.58	<10	<1	0.24	10	0.67	429	1	0.01	13	440	29	1.82	<2	1
1126024156		1.96	<10	<1	0.29	10	0.96	907	1	0.02	8	420	24	1.31	2	1
1229002058		1.96	<10	<1	0.13	10	0.64	321	1	0.01	12	270	87	1.79	<2	1
1229002081		2.58	<10	1	0.20	10	0.74	415	1	0.01	16	510	20	2.42	<2	1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1126020084		29	<20	0.01	<10	<10	11	<10	1010	0.47	1.19	41	8.6	4	37.2	1.10
1126025119		56	<20	0.03	<10	<10	26	<10	85	0.71	0.56	61	9.3	44	17.5	3.49
1125006056		82	<20	<0.01	<10	<10	6	<10	58	0.29	0.87	32	8.9	5	27.2	1.18
1125005003		108	<20	0.08	<10	<10	32	<10	150	0.51	0.61	49	9.1	30	19.1	2.57
1126020066		16	<20	0.01	<10	<10	6	<10	2660	0.14	1.73	14	8.6	-40	54.1	0.26
1125006047		64	<20	<0.01	<10	<10	10	<10	111	0.18	1.23	25	9.0	-13	38.4	0.65
1126020040		80	<20	0.03	<10	<10	14	<10	187	0.52	1.26	49	9.0	10	39.4	1.24
1126020012		27	<20	0.02	<10	<10	8	<10	1235	0.30	1.08	29	8.8	-5	33.8	0.86
1125005004		97	<20	0.04	<10	<10	15	10	141	0.17	1.03	25	8.9	-7	32.2	0.78
1126020080		46	<20	0.02	<10	<10	10	<10	447	0.34	1.28	34	8.7	-6	40.0	0.85
1126020135		29	<20	0.02	<10	<10	7	<10	2040	0.57	1.58	43	8.5	-6	49.4	0.87
1126020164		19	<20	0.02	<10	<10	8	<10	4290	0.30	2.08	29	8.5	-36	65.0	0.45
1126020138		23	<20	0.04	<10	<10	8	<10	1890	0.34	1.26	34	8.6	-5	39.4	0.86
1125005035		124	<20	0.09	<10	<10	82	<10	223	0.61	0.42	53	8.9	40	13.1	4.04
1125006018		37	<20	<0.01	<10	<10	14	<10	153	0.09	1.13	13	8.6	-22	35.3	0.37
1126020027		33	<20	0.03	<10	<10	7	<10	211	0.27	1.19	25	8.9	-12	37.2	0.67
1126020060		21	<20	<0.01	<10	<10	4	<10	1180	0.74	1.65	55	8.7	3	51.6	1.07
V829072		20	<20	0.01	<10	<10	8	<10	251	0.36						
1229002149		29	<20	<0.01	<10	<10	4	<10	787	0.44	2.24	43	8.1	-27	70.0	0.61
1126021023		94	<20	0.03	<10	<10	21	<10	79	0.44	0.14	41	9.4	37	4.4	9.37
1229002152		63	<20	<0.01	<10	<10	5	<10	202	0.34	2.11	35	8.5	-31	65.9	0.53
1229002176		118	<20	0.01	<10	<10	8	<10	120	0.11	0.85	14	8.8	-13	26.6	0.53
1126022104		28	<20	0.03	<10	<10	16	<10	133	0.49	0.35	45	9.4	34	10.9	4.11
1229002087		22	<20	<0.01	<10	<10	3	<10	940	0.19	2.86	18	8.3	-71	89.4	0.20
1126022073		53	<20	0.06	<10	<10	25	<10	71	0.66	0.26	59	9.5	51	8.1	7.26
1126022076		29	<20	0.03	<10	<10	15	<10	138	0.61	0.48	51	9.2	36	15.0	3.40
1126022109		34	<20	0.02	<10	<10	14	<10	63	0.61	0.25	49	9.4	41	7.8	6.27
1229002109		21	<20	<0.01	<10	<10	4	<10	540	0.01	2.04	5	8.0	-59	63.8	0.08
1229003029		195	<20	<0.01	<10	<10	6	<10	83	0.22	0.73	28	9.1	5	22.8	1.23
1229003030		56	<20	<0.01	<10	<10	4	<10	111	0.10	1.72	13	8.1	-41	53.8	0.24
1229003032		54	<20	<0.01	<10	<10	5	<10	196	0.29	2.10	33	8.8	-33	65.6	0.50
1229003034		28	<20	<0.01	<10	<10	6	<10	189	0.43	2.04	38	8.6	-26	63.8	0.60
1126022145		125	<20	0.03	<10	<10	24	<10	47	0.90	0.19	69	9.5	63	5.9	11.62
1229001115		43	<20	<0.01	<10	<10	3	<10	3510	0.13	3.49	13	8.4	-96	109.1	0.12
1229001006		33	<20	<0.01	<10	<10	12	<10	152	<0.01	1.40	7	7.9	-37	43.8	0.16
V829073		22	<20	0.24	<10	<10	51	<10	34	0.03						
1126024019		7	<20	0.01	<10	<10	5	<10	240	0.10	1.72	13	8.6	-41	53.8	0.24
1126024156		19	<20	0.01	<10	<10	6	<10	820	0.51	1.29	48	8.9	8	40.3	1.19
1229002058		22	<20	<0.01	<10	<10	5	<10	628	0.04	1.70	6	7.9	-47	53.1	0.11
1229002081		19	<20	<0.01	<10	<10	6	<10	4440	0.03	2.26	8	7.9	-63	70.6	0.11

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1126020084		2
1126025119		2
1125006056		2
1125005003		2
1126020066		1
1125006047		2
1126020040		2
1126020012		2
1125005004		2
1126020080		2
1126020135		2
1126020164		2
1126020138		2
1125005035		2
1125006018		1
1126020027		2
1126020060		2
V829072		
1229002149		2
1126021023		2
1229002152		2
1229002176		1
1126022104		2
1229002087		1
1126022073		2
1126022076		2
1126022109		2
1229002109		1
1229003029		2
1229003030		1
1229003032		2
1229003034		2
1126022145		2
1229001115		1
1229001006		1
V829073		
1126024019		1
1126024156		2
1229002058		1
1229002081		1

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CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1229002091		0.49		0.235	0.8	0.97	57	<10	20	<0.5	<2	0.17	2.6	10	33	41
1229002125		0.51		0.127	2.0	1.47	26	<10	30	<0.5	<2	1.05	1.3	8	56	19
1229002086		0.45		0.215	3.7	0.78	45	<10	30	<0.5	<2	0.09	2.5	8	93	31
1229002025		0.50		0.736	0.8	0.50	212	<10	50	<0.5	3	0.13	10.8	10	195	89
1126024004		0.47		0.264	2.1	0.66	31	<10	30	<0.5	<2	2.75	4.0	8	50	50
1126021148		0.62		0.067	1.0	3.70	21	<10	130	<0.5	<2	3.44	0.7	34	125	116
1229002010		0.49		0.304	0.2	1.11	28	<10	150	<0.5	<2	0.14	<0.5	10	86	47
1229002060		0.51		1.635	2.2	0.84	79	<10	30	<0.5	<2	0.05	1.6	10	68	51
1229002022		0.59		0.118	0.2	0.91	16	<10	40	<0.5	<2	0.15	0.8	9	116	22
1229002144		0.48	90.9	0.156	2.8	1.70	32	10	40	<0.5	<2	1.42	0.9	9	62	26
1126024043		0.57		3.47	2.5	0.92	69	<10	30	<0.5	<2	2.27	13.4	8	89	118
1126024060		0.54		0.445	1.3	0.78	69	<10	20	<0.5	<2	2.73	8.1	7	60	92
V829074		0.05		0.185	1.5	0.81	2	<10	40	<0.5	<2	0.46	<0.5	9	11	51
1126021028		0.50		0.075	0.2	2.06	19	<10	40	<0.5	<2	4.25	<0.5	18	112	47
1229001011		0.50		0.454	0.5	1.74	31	<10	40	<0.5	<2	0.32	1.5	10	70	42
1126022001		0.50		0.072	0.3	1.16	9	<10	40	<0.5	<2	1.54	0.6	8	105	25
1229001007		0.47		0.266	0.5	1.58	36	<10	50	<0.5	<2	0.31	1.1	10	92	23
1229001048		0.47		0.516	0.6	0.40	134	<10	30	<0.5	<2	0.08	7.7	17	162	27
1126022006		0.53		0.012	<0.2	1.33	9	<10	50	<0.5	<2	1.92	<0.5	7	162	14
1229001050		0.49		0.525	1.2	0.70	106	<10	30	<0.5	<2	0.12	8.5	21	207	51
1229001043		0.41		0.336	2.0	0.78	58	<10	30	<0.5	<2	0.29	10.2	12	126	80
1229001073		0.49		0.252	1.4	0.55	63	<10	20	<0.5	<2	0.15	4.6	11	181	45
1126022016		0.47		0.036	0.3	1.06	8	<10	40	<0.5	<2	1.68	<0.5	8	239	32
1229003018		0.54		0.070	0.3	1.69	22	<10	40	<0.5	<2	1.24	<0.5	8	188	32
1229003008		0.49		0.223	2.9	1.01	39	<10	40	<0.5	<2	2.14	5.7	12	142	100
1229003609		0.48		0.114	0.2	1.86	9	<10	40	<0.5	<2	1.09	1.4	8	131	39
1129003042		0.49		0.137	2.4	0.93	23	<10	40	<0.5	<2	1.47	0.6	10	107	36
1126022142		0.47		0.100	0.2	0.93	8	<10	50	<0.5	<2	1.81	<0.5	10	163	20
1126022036		0.53		0.031	<0.2	0.95	7	<10	40	<0.5	<2	1.71	<0.5	8	169	36
1126022049		0.57		0.011	<0.2	0.93	5	<10	40	<0.5	<2	1.81	<0.5	7	221	32
1229003047		0.55		0.138	0.9	1.07	24	<10	40	<0.5	<2	1.83	<0.5	9	148	25
V829075		0.06		2.13	7.2	0.81	401	<10	50	<0.5	3	1.33	1.0	7	13	287
1126022045		0.54		0.037	<0.2	0.99	3	<10	30	<0.5	2	1.87	<0.5	6	216	29
1126022043		0.58		0.014	0.2	0.99	3	<10	30	<0.5	<2	2.11	<0.5	6	80	36
1229003646		0.54		0.105	1.2	1.35	18	<10	40	<0.5	2	1.54	3.2	10	174	67
1229003006		0.52		0.134	2.1	1.18	23	<10	40	<0.5	2	1.64	5.3	10	169	108
1229003003		0.50		0.169	0.8	1.21	26	<10	30	<0.5	<2	1.36	0.6	9	50	32
1126025102		0.51		0.053	0.7	4.20	21	<10	90	<0.5	3	3.81	1.2	35	155	77
1126025170		0.44		0.091	0.5	1.76	19	<10	60	<0.5	<2	2.04	0.5	9	150	22
1126025200		0.51		0.098	0.4	2.08	35	<10	30	<0.5	<2	1.88	<0.5	6	114	20

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1229002091		1.92	<10	<1	0.10	10	0.54	330	1	0.01	14	280	92	1.67	<2	<1
1229002125		2.12	<10	<1	0.16	10	0.58	452	<1	0.04	11	460	19	2.24	<2	1
1229002086		2.00	<10	<1	0.21	10	0.34	205	<1	0.01	12	210	52	2.14	<2	<1
1229002025		2.76	<10	<1	0.19	10	0.12	59	1	0.02	12	400	9	2.93	<2	<1
1126024004		2.09	<10	<1	0.17	10	0.58	1220	2	0.01	11	430	216	2.14	<2	<1
1126021148		8.35	10	<1	0.55	10	1.79	1160	2	0.21	45	730	5	2.12	3	10
1229002010		2.18	<10	<1	0.22	10	0.49	109	1	0.02	13	420	9	1.80	<2	<1
1229002060		2.42	<10	<1	0.23	10	0.34	217	<1	0.01	14	100	77	2.56	<2	<1
1229002022		1.18	<10	<1	0.08	10	0.31	120	1	0.01	10	300	10	0.68	<2	1
1229002144		2.20	<10	<1	0.21	10	0.61	580	1	0.05	12	460	53	2.36	<2	1
1126024043		2.50	<10	<1	0.24	10	0.86	1225	1	0.01	10	420	35	2.30	<2	1
1126024060		2.38	<10	<1	0.17	10	0.78	1295	3	0.01	9	400	53	2.14	<2	<1
V829074		2.51	<10	<1	0.20	10	0.36	244	4	0.14	11	520	20	0.04	<2	2
1126021028		2.88	10	<1	0.19	20	1.53	727	2	0.08	62	660	2	0.68	<2	3
1229001011		2.47	<10	<1	0.15	20	0.96	412	<1	0.02	11	680	3	1.55	5	1
1126022001		2.05	<10	<1	0.26	10	0.70	492	2	0.04	9	400	<2	0.57	<2	1
1229001007		2.36	<10	<1	0.18	20	0.74	409	1	0.02	10	570	5	1.61	<2	1
1229001048		2.32	<10	<1	0.21	10	0.10	1160	1	0.01	24	260	29	2.00	<2	<1
1126022006		1.93	10	<1	0.22	10	0.89	415	1	0.03	10	410	2	0.22	<2	1
1229001050		2.31	<10	<1	0.21	10	0.39	42	3	0.01	37	260	50	2.26	<2	2
1229001043		1.97	<10	<1	0.21	10	0.14	58	1	0.05	15	80	7	1.93	2	1
1229001073		3.30	<10	<1	0.16	10	0.08	60	13	0.02	15	240	22	3.55	4	<1
1126022016		2.00	10	<1	0.20	10	0.58	333	2	0.05	10	390	2	0.29	<2	1
1229003018		1.50	<10	<1	0.13	10	0.21	262	1	0.18	8	450	10	1.03	<2	1
1229003008		3.97	<10	<1	0.18	20	0.56	667	3	0.08	13	660	45	4.32	3	1
1229003609		1.78	<10	<1	0.15	10	0.35	304	1	0.16	8	430	8	0.85	<2	1
1129003042		2.36	<10	<1	0.19	20	0.42	519	1	0.08	12	510	43	2.53	<2	<1
1126022142		2.19	<10	<1	0.11	10	0.65	393	5	0.04	26	480	2	0.68	<2	1
1126022036		2.01	<10	<1	0.14	10	0.55	311	1	0.04	9	370	<2	0.40	<2	1
1126022049		1.83	10	<1	0.14	10	0.55	292	1	0.05	9	390	<2	0.18	<2	1
1229003047		2.15	<10	<1	0.17	10	0.63	637	1	0.08	11	460	13	2.10	<2	1
V829075		4.53	<10	<1	0.27	20	0.30	479	3	0.02	8	170	20	3.44	4	2
1126022045		1.76	<10	<1	0.09	10	0.54	288	2	0.05	9	390	<2	0.27	<2	1
1126022043		1.72	<10	<1	0.08	10	0.56	319	1	0.04	10	380	2	0.29	<2	1
1229003646		2.66	<10	<1	0.16	10	0.70	485	4	0.09	13	490	21	2.55	<2	1
1229003006		2.54	<10	1	0.18	20	0.63	535	1	0.09	9	580	27	2.58	<2	1
1229003003		1.94	<10	<1	0.13	20	0.73	554	1	0.08	9	500	16	1.72	<2	1
1126025102		10.75	10	<1	0.38	10	1.94	1590	1	0.17	51	740	10	2.64	<2	13
1126025170		2.39	10	<1	0.25	20	0.77	788	1	0.10	14	500	19	0.91	<2	1
1126025200		1.81	10	<1	0.21	10	0.98	586	<1	0.11	6	420	36	0.98	<2	1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1229002091		16	<20	<0.01	<10	<10	5	<10	783	0.01	1.58	3	6.7	-46	49.4	0.06
1229002125		28	<20	<0.01	<10	<10	5	<10	328	0.18	2.18	19	8.4	-49	68.1	0.28
1229002086		13	<20	<0.01	<10	<10	3	<10	564	<0.01	1.76	3	7.4	-52	55.0	0.05
1229002025		12	<20	<0.01	<10	<10	2	<10	2800	0.01	2.70	4	6.4	-80	84.4	0.05
1126024004		18	<20	<0.01	<10	<10	3	<10	1030	0.91	2.01	73	8.5	10	62.8	1.16
1126021148		89	<20	0.12	<10	<10	202	10	278	1.09	1.98	77	8.4	15	61.9	1.24
1229002010		23	<20	<0.01	<10	<10	5	<10	97	<0.01	1.60	4	7.0	-46	50.0	0.08
1229002060		15	<20	<0.01	<10	<10	4	<10	446	0.01	2.59	3	7.0	-78	80.9	0.04
1229002022		17	<20	<0.01	<10	<10	6	10	205	0.02	0.65	4	7.6	-16	20.3	0.20
1229002144		37	<20	<0.01	<10	<10	5	<10	242	0.22	2.16	25	8.3	-43	67.5	0.37
1126024043		34	<20	<0.01	<10	<10	4	<10	2710	0.89	2.38	71	8.4	-3	74.4	0.95
1126024060		30	<20	<0.01	<10	<10	3	<10	1700	0.96	2.28	76	8.7	5	71.3	1.07
V829074		19	<20	0.38	<10	<10	57	<10	60	0.04						
1126021028		92	<20	0.01	<10	<10	25	<10	105	1.43	0.61	121	9.0	102	19.1	6.35
1229001011		35	<20	<0.01	<10	<10	11	<10	471	0.01	1.60	6	7.6	-44	50.0	0.12
1126022001		26	<20	0.02	<10	<10	12	<10	199	0.48	0.55	41	9.1	24	17.2	2.39
1229001007		26	<20	<0.01	<10	<10	9	<10	320	<0.01	1.62	6	7.3	-45	50.6	0.12
1229001048		10	<20	<0.01	<10	<10	3	<10	2220	0.16	1.94	4	7.2	-57	60.6	0.07
1126022006		27	<20	0.02	<10	<10	12	<10	132	0.55	0.20	49	9.2	43	6.3	7.84
1229001050		11	<20	<0.01	<10	<10	13	<10	2070	0.03	2.24	5	8.5	-65	70.0	0.07
1229001043		21	<20	0.01	<10	<10	13	<10	1860	0.04	1.95	4	8.0	-57	60.9	0.07
1229001073		21	<20	<0.01	<10	<10	3	<10	1000	0.12	3.48	3	6.0	-106	108.8	0.03
1126022016		30	<20	0.02	<10	<10	13	<10	72	0.50	0.29	45	9.6	36	9.1	4.97
1229003018		154	<20	<0.01	<10	<10	5	<10	88	0.13	1.00	15	8.6	-16	31.3	0.48
1229003008		41	<20	<0.01	<10	<10	6	<10	1520	0.58	4.30	51	8.1	-83	134.4	0.38
1229003609		131	<20	0.01	<10	<10	6	<10	437	0.10	0.84	13	8.9	-13	26.3	0.50
1129003042		41	<20	<0.01	<10	<10	4	<10	137	0.37	2.75	35	8.6	-51	85.9	0.41
1126022142		33	<20	0.01	<10	<10	15	<10	33	0.70	0.72	50	9.1	28	22.5	2.22
1126022036		25	<20	0.01	<10	<10	14	<10	28	0.55	0.40	46	9.4	34	12.5	3.68
1126022049		32	<20	0.02	<10	<10	14	<10	29	0.59	0.18	48	9.5	42	5.6	8.53
1229003047		38	<20	<0.01	<10	<10	5	<10	99	0.49	2.22	46	8.4	-23	69.4	0.66
V829075		18	<20	0.01	<10	<10	7	<10	237	0.37						
1126022045		37	<20	<0.01	<10	<10	11	<10	24	0.57	0.25	48	9.4	40	7.8	6.14
1126022043		36	<20	<0.01	<10	<10	10	<10	27	0.64	0.24	51	9.6	44	7.5	6.80
1229003646		45	<20	<0.01	<10	<10	7	<10	810	0.40	2.61	36	8.4	-46	81.6	0.44
1229003006		43	<20	<0.01	<10	<10	6	<10	1505	0.40	2.74	39	7.4	-47	85.6	0.46
1229003003		42	<20	<0.01	<10	<10	6	<10	153	0.34	1.80	33	8.4	-23	56.3	0.59
1126025102		105	<20	0.12	<10	<10	193	<10	438	1.26	2.85	85	8.3	-4	89.1	0.95
1126025170		56	<20	0.06	<10	<10	16	<10	199	0.46	0.87	43	9.1	16	27.2	1.58
1126025200		42	<20	0.02	<10	<10	8	<10	132	0.34	0.94	36	9.1	7	29.4	1.23

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EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
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Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1229002091		1
1229002125		1
1229002086		1
1229002025		1
1126024004		2
1126021148		2
1229002010		1
1229002060		1
1229002022		1
1229002144		2
1126024043		2
1126024060		2
V829074		
1126021028		3
1229001011		1
1126022001		2
1229001007		1
1229001048		1
1126022006		2
1229001050		1
1229001043		1
1229001073		1
1126022016		2
1229003018		1
1229003008		2
1229003609		1
1129003042		2
1126022142		2
1126022036		2
1126022049		2
1229003047		2
V829075		
1126022045		2
1126022043		2
1229003646		2
1229003006		2
1229003003		2
1126025102		2
1126025170		2
1126025200		2

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CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1
1229003620		0.48		0.052	0.4	1.73	9	<10	50	<0.5	<2	3.38	1.9	17	323	52
1126025152		0.49		0.039	0.4	1.06	8	<10	40	<0.5	<2	1.79	0.8	7	83	9
1126025117		0.52		0.010	0.2	1.96	7	<10	100	<0.5	<2	3.17	<0.5	21	128	35
1126025185		0.49		0.044	0.4	1.95	10	<10	70	<0.5	<2	2.18	<0.5	9	141	22
1126025130		0.50		0.071	0.7	2.58	27	<10	80	<0.5	<2	3.08	2.3	21	151	37
1125006073		0.46		3.69	1.1	2.00	33	10	50	<0.5	<2	2.03	0.6	7	125	16
1126025121		0.52		0.008	<0.2	1.50	3	<10	70	<0.5	<2	2.78	<0.5	13	196	4
1125006077		0.53		0.044	0.5	1.45	21	<10	40	<0.5	<2	1.24	<0.5	7	112	12
1125006067		0.58		0.093	0.7	1.58	25	<10	40	<0.5	<2	1.43	<0.5	8	144	22
V829076		0.05		6.66	4.9	0.80	<2	<10	50	<0.5	<2	0.55	<0.5	7	10	38
1230005194		0.69		0.115	0.9	1.03	38	<10	30	<0.5	<2	1.83	<0.5	8	130	21
1126018034		0.59		0.366	0.8	1.77	55	<10	30	<0.5	<2	1.01	0.6	9	38	43
1230005137		0.70		1.535	18.5	1.05	56	<10	30	<0.5	<2	2.01	1.7	10	130	64
1230005203		0.49		0.240	2.0	0.81	39	<10	20	<0.5	<2	0.15	1.7	7	22	49
1230005192		0.47		0.174	0.9	1.16	47	<10	30	<0.5	<2	1.17	0.5	8	134	32
1126019243		0.42		0.694	2.1	0.77	40	<10	30	<0.5	<2	2.61	1.0	8	162	48
1230005125		0.47		0.136	2.1	0.54	34	<10	30	<0.5	<2	0.09	0.7	11	121	31
1126018073		0.51		0.653	1.1	0.79	42	<10	30	<0.5	<2	2.85	1.1	8	127	28
1126016103		0.57		0.419	0.7	0.46	36	<10	20	<0.5	<2	3.18	1.0	9	171	56
1126018058		0.60	91.5	0.355	0.7	0.97	34	<10	30	<0.5	<2	2.83	1.3	8	131	31
1230005142		0.60		0.299	2.2	0.63	46	<10	30	<0.5	<2	0.19	0.9	8	154	33
1230005133		0.64		0.616	7.7	0.96	43	<10	20	<0.5	<2	0.34	3.7	8	209	130
1126019221		0.54		0.116	0.3	1.29	20	<10	30	<0.5	<2	2.32	<0.5	7	190	31
1126018054		0.51		0.534	0.5	0.62	35	<10	30	<0.5	<2	3.02	0.8	7	180	31
1126018041		0.47		0.158	1.3	1.20	28	<10	30	<0.5	<2	2.20	0.9	8	121	43
1126016035		0.44		0.208	1.5	0.65	43	<10	30	<0.5	<2	2.53	3.3	8	255	24
1126018050		0.40		1.260	5.9	0.66	44	<10	50	<0.5	4	2.69	3.9	8	160	46
V829077		0.05		0.191	1.3	0.77	2	<10	40	<0.5	<2	0.43	<0.5	10	11	50
1126007399		0.55		2.04	1.4	0.59	49	<10	20	<0.5	<2	2.78	2.6	8	142	36
1126007378		0.59		1.385	3.4	0.41	134	<10	30	<0.5	<2	1.30	2.7	10	141	68
1126007155		0.56		0.022	0.3	1.17	39	<10	30	<0.5	<2	2.30	<0.5	7	112	8
1126014053		0.51		0.273	0.8	1.92	65	<10	30	<0.5	<2	1.79	<0.5	8	140	22
1126007390		0.54		0.634	0.8	0.67	52	<10	30	<0.5	<2	2.49	1.4	10	83	22
1126014055		0.49		0.203	1.2	1.70	58	<10	30	<0.5	<2	1.14	0.5	9	117	19
1126016061		0.51		0.407	0.9	0.69	39	<10	30	<0.5	<2	2.72	4.6	9	116	66
1126016009		0.58		0.384	0.6	0.57	38	<10	20	<0.5	<2	2.98	2.6	7	37	34
1126014154		0.59		0.426	0.6	1.55	64	<10	30	<0.5	<2	1.38	0.8	7	90	31
1126016080		0.46		3.27	3.2	1.18	67	<10	30	<0.5	<2	1.56	27.9	9	167	209
1126014171		0.58		0.342	0.8	1.58	49	<10	30	<0.5	<2	1.36	0.8	8	72	41
1126014103		0.52		2.20	2.8	0.99	115	<10	30	<0.5	<2	2.01	1.3	7	73	55

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1229003620		3.04	<10	<1	0.14	20	1.77	750	6	0.05	54	850	7	2.06	<2	5
1126025152		1.84	<10	<1	0.18	10	0.70	561	1	0.04	9	410	15	0.50	<2	1
1126025117		4.85	10	<1	0.32	20	1.37	872	1	0.08	31	820	4	0.95	<2	6
1126025185		2.57	10	<1	0.26	20	0.70	636	1	0.15	14	620	9	0.86	<2	1
1126025130		5.93	10	<1	0.41	10	1.16	1260	1	0.18	30	640	5	1.88	<2	7
1125006073		1.72	<10	<1	0.21	10	1.08	605	1	0.10	9	370	27	1.03	<2	1
1126025121		2.92	10	<1	0.19	20	1.08	604	1	0.05	20	740	<2	0.66	<2	2
1125006077		1.50	<10	<1	0.18	10	0.67	393	<1	0.09	7	380	8	0.47	<2	1
1125006067		1.96	<10	<1	0.16	10	0.73	422	2	0.10	17	400	7	0.72	<2	1
V829076		1.74	<10	<1	0.18	10	0.37	183	14	0.13	10	600	9	0.07	<2	2
1230005194		1.93	<10	<1	0.14	10	0.75	874	1	0.06	9	420	28	1.71	<2	1
1126018034		2.24	<10	<1	0.14	20	0.67	566	1	0.09	9	560	22	1.34	<2	1
1230005137		2.27	<10	<1	0.14	10	0.85	979	1	0.04	11	410	35	2.17	<2	1
1230005203		1.85	<10	<1	0.08	10	0.62	176	1	0.01	8	430	151	1.83	<2	<1
1230005192		2.08	<10	<1	0.16	10	0.74	864	1	0.05	10	440	51	1.92	<2	1
1126019243		2.06	<10	<1	0.22	10	1.17	1060	1	0.03	10	420	188	2.08	3	1
1230005125		2.09	<10	<1	0.14	10	0.13	342	1	0.03	10	90	16	2.12	<2	<1
1126018073		2.03	<10	<1	0.24	10	0.85	1355	1	0.02	11	410	112	1.73	<2	1
1126016103		1.79	<10	<1	0.19	10	0.68	1750	1	0.01	9	450	126	1.13	<2	<1
1126018058		1.79	<10	<1	0.19	10	0.71	1090	1	0.02	10	400	169	1.64	<2	1
1230005142		1.94	<10	<1	0.13	10	0.31	122	1	0.03	9	380	75	2.01	<2	<1
1230005133		2.04	<10	<1	0.10	10	0.74	566	1	0.03	10	810	59	1.96	2	<1
1126019221		1.80	<10	<1	0.16	10	0.79	580	1	0.08	8	620	21	1.45	<2	1
1126018054		1.90	<10	<1	0.21	10	0.94	1550	1	0.01	9	390	126	1.49	<2	1
1126018041		1.85	<10	<1	0.21	10	0.85	1020	1	0.04	11	420	131	1.73	<2	1
1126016035		2.62	<10	<1	0.21	10	1.04	2380	1	0.01	11	400	440	2.52	<2	1
1126018050		2.16	<10	<1	0.25	10	0.78	1430	1	0.02	10	420	261	2.25	2	1
V829077		2.48	<10	<1	0.20	10	0.35	241	4	0.13	10	520	20	0.04	<2	2
1126007399		2.25	<10	<1	0.19	10	1.14	2200	<1	0.01	11	410	324	2.31	2	1
1126007378		2.11	<10	<1	0.20	10	0.48	1100	1	0.01	13	430	303	2.23	3	<1
1126007155		1.55	<10	<1	0.15	10	0.72	335	<1	0.06	8	380	9	0.75	<2	1
1126014053		2.09	10	<1	0.23	10	0.96	793	1	0.07	8	430	35	1.32	<2	1
1126007390		2.66	<10	<1	0.23	10	1.09	1910	1	0.02	13	410	213	2.75	<2	1
1126014055		2.43	<10	<1	0.23	10	0.74	490	1	0.12	9	510	81	2.22	<2	1
1126016061		2.29	<10	<1	0.24	10	0.95	1340	1	0.02	11	450	121	2.14	<2	1
1126016009		2.12	<10	<1	0.17	10	0.77	1480	<1	0.01	9	410	142	2.04	<2	<1
1126014154		1.63	<10	<1	0.25	10	0.91	549	1	0.03	6	400	50	1.09	<2	1
1126016080		3.70	<10	2	0.24	10	0.82	901	1	0.01	11	400	53	3.61	<2	1
1126014171		1.59	<10	<1	0.26	20	0.84	500	1	0.03	7	410	65	1.13	<2	1
1126014103		1.99	<10	<1	0.28	10	0.60	802	1	0.02	8	400	143	1.84	<2	1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1229003620		59	<20	<0.01	<10	<10	33	<10	466	1.15	2.05	88	8.8	24	64.1	1.37
1126025152		23	<20	0.04	<10	<10	15	<10	228	0.52	0.49	46	9.3	31	15.3	3.00
1126025117		95	<20	0.06	<10	<10	91	<10	146	0.98	0.87	79	9.1	52	27.2	2.91
1126025185		111	<20	0.07	<10	<10	23	<10	189	0.48	0.82	45	9.1	19	25.6	1.76
1126025130		121	<20	0.08	<10	<10	116	<10	558	0.89	1.85	71	8.8	13	57.8	1.23
1125006073		52	<20	0.01	<10	<10	7	<10	167	0.46	1.00	47	9.0	16	31.3	1.50
1126025121		77	<20	0.01	<10	<10	33	<10	76	0.86	0.62	71	9.1	52	19.4	3.66
1125006077		39	<20	<0.01	<10	<10	8	<10	74	0.29	0.43	31	9.1	18	13.4	2.31
1125006067		49	<20	0.01	<10	<10	12	<10	84	0.34	0.63	35	9.1	15	19.7	1.78
V829076		20	<20	0.23	<10	<10	49	<10	34	0.03						
1230005194		30	<20	<0.01	<10	<10	5	<10	100	0.57	1.63	50	9.2	-1	50.9	0.98
1126018034		34	<20	<0.01	<10	<10	7	<10	231	0.16	1.26	21	8.6	-18	39.4	0.53
1230005137		24	<20	<0.01	<10	<10	4	<10	403	0.63	1.95	55	9.1	-6	60.9	0.90
1230005203		8	<20	<0.01	<10	<10	3	<10	447	0.03	1.78	4	7.0	-52	55.6	0.07
1230005192		25	<20	<0.01	<10	<10	5	<10	167	0.38	1.74	34	8.8	-20	54.4	0.63
1126019243		36	<20	<0.01	<10	<10	4	<10	272	1.31	1.92	108	8.7	48	60.0	1.80
1230005125		17	<20	<0.01	<10	<10	3	<10	138	0.08	1.93	3	7.5	-57	60.3	0.05
1126018073		25	<20	<0.01	<10	<10	3	<10	275	1.20	1.59	90	9.0	40	49.7	1.81
1126016103		21	<20	<0.01	<10	<10	2	<10	262	1.40	1.03	109	8.7	77	32.2	3.39
1126018058		22	<20	<0.01	<10	<10	4	<10	330	0.89	1.56	73	8.8	24	48.8	1.50
1230005142		13	<20	<0.01	<10	<10	3	<10	284	0.04	1.93	5	7.8	-55	60.3	0.08
1230005133		13	<20	<0.01	<10	<10	4	<10	930	0.06	1.84	10	8.1	-48	57.5	0.17
1126019221		47	<20	<0.01	<10	<10	5	<10	94	0.65	1.38	56	8.9	13	43.1	1.30
1126018054		24	<20	<0.01	<10	<10	3	<10	218	1.38	1.41	110	8.9	66	44.1	2.50
1126018041		20	<20	<0.01	<10	<10	5	<10	276	0.64	1.62	56	8.9	5	50.6	1.11
1126016035		29	<20	<0.01	<10	<10	3	<10	835	1.25	2.36	89	8.6	15	73.8	1.21
1126018050		22	<20	<0.01	<10	<10	3	<10	978	1.14	2.12	87	8.9	21	66.3	1.31
V829077		18	<20	0.37	<10	<10	56	<10	57	0.02						
1126007399		32	<20	<0.01	<10	<10	3	<10	703	1.32	2.17	106	8.9	38	67.8	1.56
1126007378		14	<20	<0.01	<10	<10	2	<10	636	0.66	2.08	50	8.6	-15	65.0	0.77
1126007155		47	<20	<0.01	<10	<10	6	<10	59	0.65	0.68	56	9.1	35	21.3	2.64
1126014053		46	<20	<0.01	<10	<10	8	<10	110	0.38	1.22	42	9.0	4	38.1	1.10
1126007390		27	<20	<0.01	<10	<10	3	<10	339	1.24	2.79	103	9.0	16	87.2	1.18
1126014055		49	<20	<0.01	<10	<10	8	<10	152	0.17	2.14	24	7.1	-43	66.9	0.36
1126016061		28	<20	<0.01	<10	<10	3	<10	1030	1.20	1.97	89	8.9	27	61.6	1.45
1126016009		23	<20	<0.01	<10	<10	2	<10	635	1.19	2.02	88	8.9	25	63.1	1.39
1126014154		30	<20	0.01	<10	<10	6	<10	218	0.31	1.02	30	8.9	-2	31.9	0.94
1126016080		16	<20	<0.01	<10	<10	5	10	6160	0.49	3.72	43	8.5	-73	116.3	0.37
1126014171		31	<20	0.01	<10	<10	7	<10	238	0.24	1.03	26	8.9	-6	32.2	0.81
1126014103		26	<20	<0.01	<10	<10	4	<10	441	0.58	1.71	49	8.6	-4	53.4	0.92

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1229003620		2
1126025152		2
1126025117		2
1126025185		2
1126025130		2
1125006073		2
1126025121		2
1125006077		2
1125006067		2
V829076		
1230005194		2
1126018034		2
1230005137		2
1230005203		1
1230005192		2
1126019243		3
1230005125		1
1126018073		2
1126016103		3
1126018058		2
1230005142		1
1230005133		1
1126019221		2
1126018054		3
1126018041		2
1126016035		2
1126018050		2
V829077		
1126007399		3
1126007378		2
1126007155		2
1126014053		2
1126007390		3
1126014055		2
1126016061		2
1126016009		2
1126014154		2
1126016080		2
1126014171		2
1126014103		2

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CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu
	Units	kg	%	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1
1126014002		0.57		1.030	2.1	1.00	87	<10	30	<0.5	<2	1.57	18.3	6	68	102
1126016005		0.52		0.672	4.2	0.57	48	<10	30	<0.5	<2	2.49	1.8	9	41	167
1126014159		0.49		0.374	1.3	1.55	43	<10	20	<0.5	<2	0.87	11.8	7	107	58
V829078		0.06		0.187	1.4	0.76	3	<10	40	<0.5	<2	0.42	<0.5	9	11	51
1126016036		0.50		0.213	2.5	0.93	52	<10	30	<0.5	<2	2.30	5.5	8	106	40
1126015120		0.60		1.365	0.9	1.33	62	<10	40	<0.5	<2	0.88	0.6	9	97	55
1126016046		0.54		0.113	1.2	0.81	57	<10	30	<0.5	<2	2.54	2.1	8	118	30
1126016023		0.57		0.492	5.1	0.74	44	<10	40	<0.5	2	2.57	3.9	9	109	314
1126016147		0.62		1.425	1.2	1.30	103	<10	20	<0.5	<2	0.92	3.3	8	45	93
1126018136		0.63		0.579	2.1	0.64	36	<10	40	<0.5	<2	2.16	2.2	8	113	41
1126019214		0.58		0.990	0.7	0.82	61	<10	30	<0.5	<2	2.63	0.7	8	121	28
1126018115		0.51		0.447	1.3	0.72	53	<10	20	<0.5	<2	2.65	0.7	28	38	31
1126019253		0.54		0.724	0.9	1.31	92	10	30	<0.5	<2	1.67	<0.5	10	26	53
1126019035		0.51		0.053	0.4	0.96	19	<10	50	<0.5	<2	2.09	<0.5	8	155	22
1126016156		0.56		1.220	6.5	0.48	105	<10	40	<0.5	<2	3.73	3.7	9	137	85
1126018108		0.57		0.603	2.7	0.53	49	<10	20	<0.5	<2	2.74	2.7	9	54	61
1230005227		0.69		0.197	1.7	1.37	44	<10	30	<0.5	<2	0.19	0.5	8	114	28
1126018114		0.59		0.329	0.8	0.83	33	<10	20	<0.5	<2	2.62	0.7	8	108	22
1126016139		0.48		1.315	4.2	0.34	57	<10	30	<0.5	<2	2.59	4.2	12	54	131
V829079		0.05		6.61	5.1	0.82	<2	<10	50	<0.5	<2	0.54	<0.5	7	10	38
1126018048		0.50		0.744	4.1	0.71	38	<10	40	<0.5	<2	2.68	1.8	8	164	33
1126019162		0.49		0.262	0.8	1.32	39	<10	40	<0.5	<2	1.91	<0.5	8	216	26
1126019132		0.47		0.117	1.0	1.20	81	<10	40	<0.5	<2	2.35	0.5	7	137	19
1126019156		0.50		0.256	2.2	1.06	30	<10	30	<0.5	3	1.76	0.5	8	117	87
1126019233		0.49		0.799	1.6	0.70	77	<10	30	<0.5	<2	2.25	1.5	12	163	36
1126019136		0.52		0.035	0.3	1.46	31	10	60	<0.5	<2	2.44	<0.5	6	102	15
1126024097		0.36		0.637	5.0	1.32	26	10	40	<0.5	2	2.28	1.1	8	99	128
1126019022		0.46		4.05	2.8	0.78	49	<10	40	<0.5	<2	2.54	5.6	8	102	68
1126024147		0.45		0.161	0.8	1.79	34	10	40	<0.5	3	1.89	0.5	8	104	30
1127039112		0.51	89.1	0.078	1.1	0.99	77	<10	30	<0.5	<2	2.16	0.5	7	123	22
1127039003		0.49		1.850	5.4	0.38	118	<10	40	<0.5	<2	1.12	21.6	7	154	171
1126024151		0.48		0.376	1.0	0.70	59	<10	30	<0.5	<2	2.93	4.2	8	152	67
1127039007		0.42		1.355	1.5	0.65	190	<10	110	<0.5	<2	1.94	8.9	11	166	83
1126024027		0.49		0.408	1.8	1.14	100	<10	100	<0.5	<2	2.72	8.1	13	171	129
1127039013		0.43		0.047	0.8	0.58	61	<10	40	<0.5	<2	2.69	<0.5	7	118	18
1127039037		0.54		0.319	1.0	0.43	76	<10	30	<0.5	<2	2.44	0.7	9	183	21
1126019150		0.49		1.985	3.6	0.57	55	<10	20	<0.5	<2	2.35	7.7	10	174	78
1126016057		0.50		0.371	2.3	0.79	45	<10	30	<0.5	<2	2.50	2.4	12	141	53
1126024083		0.49		1.165	1.1	1.38	114	<10	30	<0.5	<2	0.52	0.7	10	104	26
V829080		0.05		1.805	6.6	0.81	409	<10	50	<0.5	3	1.30	1.0	7	13	282

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc
	Units	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm
	LOD	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1
1126014002		2.71	<10	1	0.25	10	0.61	720	2	0.01	8	380	89	2.81	<2	<1
1126016005		2.19	<10	<1	0.14	10	0.41	1235	1	0.01	10	460	190	2.41	2	<1
1126014159		2.17	<10	<1	0.26	10	0.92	512	<1	0.03	7	400	28	1.38	<2	<1
V829078		2.45	<10	<1	0.19	10	0.35	237	4	0.13	10	510	21	0.04	<2	2
1126016036		2.31	<10	<1	0.25	10	0.88	1550	1	0.02	12	430	537	2.38	4	1
1126015120		3.05	<10	1	0.25	10	0.82	681	<1	0.01	14	460	32	2.07	<2	1
1126016046		2.00	<10	<1	0.25	10	0.83	1395	1	0.01	10	450	183	1.87	<2	1
1126016023		2.34	<10	<1	0.23	10	0.75	1375	2	0.02	14	420	498	2.42	3	1
1126016147		3.25	<10	<1	0.16	10	0.82	678	<1	0.02	10	440	31	2.51	<2	<1
1126018136		2.01	<10	<1	0.22	10	0.79	1385	1	0.02	9	420	129	1.97	2	1
1126019214		1.89	<10	<1	0.18	10	0.75	1255	1	0.02	9	440	52	1.46	<2	1
1126018115		2.28	<10	<1	0.14	<10	0.95	1075	1	0.02	16	420	72	2.23	2	1
1126019253		2.30	<10	<1	0.15	20	0.67	711	1	0.05	10	550	19	1.71	2	1
1126019035		1.91	<10	<1	0.18	10	0.58	402	4	0.06	10	410	25	1.81	2	1
1126016156		2.15	<10	<1	0.24	10	0.72	2520	1	0.01	10	420	687	2.13	5	<1
1126018108		2.26	<10	<1	0.14	<10	1.07	1760	1	0.01	11	420	305	2.22	3	<1
1230005227		1.81	<10	<1	0.12	10	1.01	463	1	0.03	9	420	36	1.37	<2	<1
1126018114		2.08	<10	<1	0.20	10	1.07	1020	1	0.02	10	400	77	2.13	3	1
1126016139		2.06	<10	<1	0.17	10	0.42	1355	1	0.01	14	430	672	2.22	3	<1
V829079		1.69	<10	<1	0.17	10	0.36	183	15	0.13	10	590	8	0.08	<2	2
1126018048		2.04	<10	<1	0.23	10	0.89	1750	1	0.02	9	410	198	2.02	3	1
1126019162		1.84	<10	<1	0.16	10	0.71	544	1	0.08	10	370	12	1.05	2	1
1126019132		1.80	<10	<1	0.20	10	0.68	682	1	0.06	9	400	12	1.19	2	1
1126019156		2.11	<10	<1	0.19	10	0.69	482	1	0.04	10	380	26	2.19	2	1
1126019233		2.90	<10	<1	0.21	10	0.94	1135	1	0.03	16	440	187	2.98	<2	1
1126019136		1.58	<10	<1	0.21	10	0.85	437	1	0.07	8	370	15	0.55	<2	1
1126024097		2.05	<10	<1	0.24	10	0.71	959	1	0.03	10	440	72	1.90	<2	1
1126019022		2.13	<10	1	0.24	10	1.07	1430	1	0.02	10	380	69	1.93	<2	1
1126024147		1.86	<10	<1	0.20	10	0.78	572	1	0.08	9	410	36	1.59	<2	1
1127039112		1.94	<10	<1	0.21	10	0.59	1180	1	0.01	6	380	38	1.68	<2	<1
1127039003		2.46	<10	1	0.24	10	0.34	934	1	<0.01	9	440	639	2.57	<2	<1
1126024151		2.10	<10	<1	0.21	10	0.91	1515	1	0.02	10	420	75	1.65	2	1
1127039007		2.77	<10	<1	0.46	10	0.70	2170	1	<0.01	13	750	389	2.47	3	1
1126024027		3.37	<10	1	0.48	10	0.86	623	1	0.01	28	670	16	2.80	<2	3
1127039013		2.04	<10	<1	0.25	10	0.67	1335	1	0.01	7	390	28	1.88	<2	1
1127039037		2.42	<10	<1	0.21	10	0.61	1245	1	0.01	9	400	50	2.39	<2	<1
1126019150		2.46	<10	1	0.16	10	0.85	1245	1	0.02	13	420	728	2.42	4	1
1126016057		2.03	<10	<1	0.24	10	0.88	1460	1	0.01	10	430	124	1.77	2	1
1126024083		2.67	<10	<1	0.27	10	0.81	458	1	0.01	11	440	21	1.93	<2	1
V829080		4.38	<10	<1	0.26	20	0.29	474	3	0.01	9	160	19	3.37	2	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity
	LOD	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01
1126014002		22	<20	<0.01	<10	<10	4	<10	5140	0.46	2.81	40	8.5	-48	87.8	0.46
1126016005		18	<20	<0.01	<10	<10	2	<10	485	0.82	2.44	65	8.5	-11	76.3	0.85
1126014159		25	<20	0.01	<10	<10	6	<10	2950	0.17	1.30	22	8.7	-19	40.6	0.54
V829078		17	<20	0.36	<10	<10	56	<10	58	0.02						
1126016036		31	<20	<0.01	<10	<10	4	<10	1490	0.90	2.26	66	8.6	-5	70.6	0.93
1126015120		10	<20	<0.01	<10	<10	6	<10	203	0.27	1.90	25	8.8	-34	59.4	0.42
1126016046		24	<20	<0.01	<10	<10	3	<10	491	1.00	1.73	77	8.6	23	54.1	1.42
1126016023		20	<20	<0.01	<10	<10	3	<10	1090	1.03	2.40	78	9.0	3	75.0	1.04
1126016147		15	<20	<0.01	<10	<10	5	<10	762	0.24	2.36	24	8.2	-50	73.8	0.33
1126018136		21	<20	<0.01	<10	<10	3	<10	596	1.00	1.90	77	9.0	18	59.4	1.30
1126019214		22	<20	<0.01	<10	<10	3	<10	176	1.05	1.38	78	8.6	35	43.1	1.81
1126018115		24	<20	<0.01	<10	<10	3	40	201	1.12	2.01	80	8.8	17	62.8	1.27
1126019253		28	<20	<0.01	<10	<10	6	<10	151	0.44	1.62	40	8.5	-11	50.6	0.79
1126019035		46	<20	<0.01	<10	<10	5	<10	69	0.63	1.70	53	8.6	0	53.1	1.00
1126016156		30	<20	<0.01	<10	<10	2	<10	1010	1.56	2.04	120	8.7	56	63.8	1.88
1126018108		23	<20	<0.01	<10	<10	3	<10	737	1.33	2.18	101	8.8	33	68.1	1.48
1230005227		14	<20	<0.01	<10	<10	5	<10	203	0.04	1.34	6	8.5	-36	41.9	0.14
1126018114		33	<20	<0.01	<10	<10	4	<10	169	1.18	2.02	89	8.7	26	63.1	1.41
1126016139		18	<20	<0.01	<10	<10	2	<10	1130	0.98	2.26	73	8.5	2	70.6	1.03
V829079		21	<20	0.23	<10	<10	50	<10	34	0.04						
1126018048		23	<20	<0.01	<10	<10	3	<10	492	1.18	1.89	90	9.1	31	59.1	1.52
1126019162		51	<20	<0.01	<10	<10	7	<10	84	0.60	0.95	47	9.0	17	29.7	1.58
1126019132		41	<20	<0.01	<10	<10	5	<10	172	0.75	1.14	60	9.0	24	35.6	1.68
1126019156		36	<20	<0.01	<10	<10	4	<10	138	0.62	2.11	50	8.6	-16	65.9	0.76
1126019233		29	<20	<0.01	<10	<10	4	<10	417	1.05	2.82	81	8.8	-7	88.1	0.92
1126019136		53	<20	<0.01	<10	<10	7	<10	68	0.70	0.49	59	9.3	44	15.3	3.85
1126024097		21	<20	<0.01	<10	<10	4	<10	311	0.62	1.73	54	8.6	0	54.1	1.00
1126019022		26	<20	<0.01	<10	<10	4	<10	1540	1.35	1.88	88	9.2	29	58.8	1.50
1126024147		32	<20	0.01	<10	<10	7	<10	165	0.41	1.51	40	8.7	-7	47.2	0.85
1127039112		20	<20	<0.01	<10	<10	4	<10	156	0.65	1.60	54	8.7	4	50.0	1.08
1127039003		62	<20	<0.01	<10	<10	2	10	5260	0.59	2.43	40	8.3	-36	75.9	0.53
1126024151		28	<20	<0.01	<10	<10	3	<10	909	1.24	1.50	89	8.7	42	46.9	1.90
1127039007		292	<20	0.02	<10	<10	10	<10	2460	0.89	2.28	68	8.8	-3	71.3	0.95
1126024027		61	<20	0.03	<10	<10	25	<10	1795	0.82	2.67	69	8.8	-14	83.4	0.83
1127039013		36	<20	<0.01	<10	<10	4	<10	99	1.15	1.78	83	9.0	27	55.6	1.49
1127039037		28	<20	<0.01	<10	<10	2	<10	185	1.04	2.19	78	9.0	10	68.4	1.14
1126019150		20	<20	<0.01	<10	<10	3	<10	1910	1.09	2.31	83	9.0	11	72.2	1.15
1126016057		23	<20	<0.01	<10	<10	3	20	556	1.03	1.67	80	9.0	28	52.2	1.53
1126024083		10	<20	0.01	<10	<10	6	<10	214	0.10	1.87	14	8.6	-44	58.4	0.24
V829080		19	<20	0.01	<10	<10	7	<10	240	0.35						

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method Analyte Units LOD	OA-VOL08 FIZZ RAT Unity 1
1126014002		2
1126016005		2
1126014159		2
V829078		
1126016036		2
1126015120		2
1126016046		2
1126016023		2
1126016147		2
1126018136		2
1126019214		2
1126018115		2
1126019253		2
1126019035		2
1126016156		3
1126018108		3
1230005227		1
1126018114		2
1126016139		2
V829079		
1126018048		2
1126019162		2
1126019132		2
1126019156		2
1126019233		2
1126019136		2
1126024097		2
1126019022		2
1126024147		2
1127039112		2
1127039003		2
1126024151		2
1127039007		2
1126024027		2
1127039013		2
1127039037		2
1126019150		2
1126016057		2
1126024083		1
V829080		

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

CERTIFICATE OF ANALYSIS TB18165553

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

CERTIFICATE TB18214709

Project: Mine Site Lab Pulps June 2018

P.O. No.: 4500009909

This report is for 207 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 30-AUG-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

<Original signed by>

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1126033026		0.48	86.8	0.124		0.7	2.36	29	10	30	<0.5	<2	1.71	1.5	8	162
1232002009		0.53		0.475		1.0	1.60	16	<10	50	<0.5	3	0.97	<0.5	12	244
1126032447		0.50		0.240		2.0	1.99	26	<10	40	<0.5	<2	1.65	0.5	10	233
1126032401		0.37		0.190		0.8	2.44	35	<10	40	<0.5	<2	1.92	1.3	10	275
1232001120		0.52		0.109		0.9	1.21	56	<10	60	<0.5	<2	0.94	2.0	15	287
1232001069		0.54		0.049		1.2	1.41	8	<10	70	<0.5	<2	1.65	1.3	8	268
1232001068		0.44		0.041		1.4	1.45	12	<10	80	<0.5	<2	1.87	0.8	9	289
1126032415		0.42		0.069		2.0	0.78	24	<10	30	<0.5	<2	0.73	0.6	14	116
1126032080		0.49		0.249		1.1	0.85	36	<10	30	<0.5	2	1.74	0.5	9	216
1125019411		0.52		0.140		0.5	1.06	8	<10	40	<0.5	<2	1.69	<0.5	13	245
1126033528		0.53		4.26		0.6	0.93	111	<10	40	<0.5	<2	0.58	6.8	11	191
1126032024		0.72		0.205		1.5	0.67	28	<10	30	<0.5	<2	2.29	1.1	9	133
1126033505		0.61		0.144		1.1	1.68	62	<10	20	<0.5	<2	1.72	3.4	11	209
1126033101		0.44		0.154		0.8	0.85	44	<10	30	<0.5	<2	2.79	1.0	9	164
1232002001		0.50		0.384		1.3	1.57	11	<10	40	<0.5	4	0.52	<0.5	10	217
1232001048		0.53		0.072		1.0	1.89	13	<10	50	<0.5	<2	2.69	0.6	22	277
V829089		0.06		0.956		2.5	1.09	2	<10	80	<0.5	<2	0.68	<0.5	14	8
1125023013		0.45		0.091		0.2	2.24	6	<10	70	<0.5	<2	2.26	<0.5	9	263
1125023147		0.55		0.074		1.1	2.97	30	<10	80	<0.5	5	1.71	1.0	42	259
1232002111		0.54		0.671		0.8	1.01	14	<10	40	<0.5	<2	0.86	<0.5	11	194
1126033046		0.55		0.435		0.9	0.87	134	<10	20	<0.5	<2	2.51	1.3	9	94
1126033088		0.47		0.308		3.6	1.48	114	<10	70	<0.5	<2	2.84	2.7	11	164
1125023005		0.54		0.070		0.5	3.27	12	<10	50	<0.5	2	2.28	<0.5	39	145
1125019098		0.58		0.035		0.5	1.33	49	<10	40	<0.5	<2	2.83	<0.5	6	112
1126033030		0.50		1.150		2.2	0.98	73	<10	30	<0.5	<2	2.14	7.5	8	171
1125019056		0.41		0.104		0.5	1.03	6	<10	40	<0.5	<2	1.55	<0.5	10	335
1126032004		0.47		0.400		3.5	1.77	25	<10	30	<0.5	2	1.77	1.7	8	254
1125009001		0.43		0.314		0.9	1.31	58	<10	30	<0.5	<2	2.47	0.6	11	127
1125023167		0.49		0.040		0.3	1.65	6	<10	110	<0.5	2	2.60	<0.5	19	283
1125020187		0.57		2.84		2.0	0.87	89	<10	20	<0.5	<2	1.43	1.7	13	161
1125019018		0.49		0.158		0.5	1.09	9	<10	50	<0.5	<2	1.70	<0.5	13	559
1125019163		0.53		0.168		0.8	0.91	9	<10	50	<0.5	<2	1.16	<0.5	11	382
1125020165		0.44		0.191		0.7	1.49	35	<10	60	<0.5	<2	2.21	<0.5	8	182
1125020136		0.50		0.100		0.6	1.38	33	<10	40	<0.5	<2	2.12	<0.5	8	244
1126033062		0.53		0.848		1.4	0.94	123	<10	50	<0.5	<2	1.69	3.6	11	182
V829090		0.06		6.68		5.3	0.85	<2	<10	50	<0.5	<2	0.55	<0.5	7	10
1125018335		0.48		0.521		4.0	0.72	36	<10	30	<0.5	<2	2.73	8.9	8	264
1232002125		0.56		0.284		0.5	0.89	12	<10	30	<0.5	<2	0.86	<0.5	10	146
1125026078		0.45		0.601		1.8	1.30	128	<10	30	<0.5	2	0.33	15.7	6	125
1125018231		0.59		0.258		3.0	0.70	31	<10	20	<0.5	3	2.39	1.6	8	203

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1126033026		35	2.18	<10	<1	0.17	10	0.77	475	<1	0.15	12	380	37	1.86	<2
1232002009		136	3.29	<10	<1	0.14	10	0.72	462	3	0.13	13	410	4	2.71	<2
1126032447		31	2.27	<10	1	0.21	10	0.53	505	1	0.15	14	520	48	2.07	<2
1126032401		41	2.19	10	<1	0.23	10	0.83	538	1	0.13	16	410	49	1.82	<2
1232001120		61	2.67	<10	<1	0.21	10	0.76	362	1	0.06	23	650	24	0.90	<2
1232001069		20	2.05	10	<1	0.38	10	0.81	567	1	0.07	15	460	2	0.50	<2
1232001068		88	2.24	10	1	0.51	20	0.86	583	1	0.06	16	520	4	0.49	<2
1126032415		27	2.94	<10	<1	0.15	10	0.28	525	1	0.03	17	490	12	3.12	<2
1126032080		31	2.01	<10	<1	0.16	10	0.48	768	1	0.02	13	470	41	1.84	<2
1125019411		42	2.38	<10	<1	0.11	10	0.63	302	2	0.06	13	420	2	0.70	<2
1126033528		45	2.69	<10	<1	0.20	10	0.67	432	1	0.01	19	480	17	2.14	<2
1126032024		34	1.99	<10	<1	0.15	10	0.39	809	<1	0.02	12	480	19	2.06	<2
1126033505		52	2.50	<10	1	0.16	10	0.72	532	1	0.10	16	430	147	2.23	<2
1126033101		35	1.99	<10	1	0.23	10	0.98	1520	2	0.02	11	460	19	1.42	<2
1232002001		297	3.24	<10	1	0.15	10	0.82	304	3	0.08	11	430	4	2.59	<2
1232001048		44	4.38	10	<1	0.25	10	1.54	985	1	0.05	41	530	6	2.07	<2
V829089		58	3.13	10	1	0.27	10	0.53	297	11	0.10	18	730	9	0.07	<2
1125023013		22	2.62	10	1	0.29	20	1.13	460	1	0.15	18	530	3	0.19	<2
1125023147		99	10.90	10	1	0.36	<10	1.61	1285	1	0.11	64	780	4	3.23	<2
1232002111		186	2.59	<10	1	0.10	10	0.62	396	3	0.07	12	400	2	2.04	<2
1126033046		31	1.82	<10	1	0.18	10	0.68	1430	<1	0.01	10	440	20	1.42	<2
1126033088		33	2.54	<10	2	0.37	10	1.36	1090	1	0.01	22	570	25	1.45	<2
1125023005		80	8.63	10	1	0.18	<10	1.56	1370	1	0.07	54	700	4	0.86	2
1125019098		13	1.52	<10	1	0.19	10	0.80	653	1	0.06	10	350	15	0.65	<2
1126033030		82	2.02	<10	1	0.23	10	0.72	1150	1	0.02	12	420	88	1.75	<2
1125019056		46	2.11	10	1	0.09	10	0.59	285	1	0.05	10	410	3	0.56	<2
1126032004		38	2.09	<10	<1	0.18	10	0.62	440	<1	0.11	12	440	27	1.99	<2
1125009001		217	2.24	<10	<1	0.17	20	0.83	718	1	0.02	10	550	36	1.34	2
1125023167		35	3.70	10	1	0.37	10	1.09	554	1	0.05	36	570	2	0.29	<2
1125020187		65	2.79	<10	1	0.10	10	0.55	456	1	0.02	13	530	113	2.64	<2
1125019018		51	2.89	10	1	0.11	10	0.60	291	2	0.07	13	370	3	1.33	<2
1125019163		29	2.46	<10	1	0.12	10	0.55	225	1	0.04	13	360	3	1.04	<2
1125020165		32	1.90	<10	<1	0.23	10	0.86	526	1	0.07	10	420	16	1.28	<2
1125020136		26	1.82	<10	<1	0.15	10	0.86	496	2	0.07	11	360	14	0.87	<2
1126033062		53	2.54	<10	2	0.29	10	0.77	589	1	0.01	23	570	21	2.02	2
V829090		40	1.72	<10	1	0.17	10	0.37	185	15	0.13	10	600	10	0.07	<2
1125018335		156	2.03	<10	2	0.19	10	0.65	1485	1	0.01	12	410	975	1.86	3
1232002125		156	2.37	<10	1	0.09	10	0.62	386	3	0.04	14	450	3	1.63	<2
1125026078		86	2.59	<10	2	0.36	10	0.76	539	<1	<0.01	8	380	34	1.88	3
1125018231		64	1.98	<10	<1	0.14	10	0.45	1085	1	0.01	11	440	173	1.97	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1126033026		1	55	<20	0.01	<10	<10	7	<10	412	0.21	1.53	28	8.4	-20	47.8
1232002009		1	53	<20	0.01	<10	<10	11	<10	67	0.17	2.48	21	8.7	-57	77.5
1126032447		1	87	<20	<0.01	<10	<10	6	<10	156	0.30	1.87	29	8.7	-29	58.4
1126032401		1	50	<20	0.01	<10	<10	7	<10	336	0.30	1.65	34	8.5	-18	51.6
1232001120		2	38	<20	0.09	<10	<10	35	10	514	0.24	0.82	23	8.7	-3	25.6
1232001069		2	31	<20	0.08	<10	<10	22	<10	367	0.41	0.44	44	9.4	30	13.8
1232001068		2	33	<20	0.07	<10	<10	21	<10	254	0.56	0.44	51	9.5	37	13.8
1126032415		<1	25	<20	<0.01	<10	<10	4	<10	214	0.23	3.07	20	8.5	-76	95.9
1126032080		<1	19	<20	<0.01	<10	<10	4	<10	157	0.49	1.75	43	8.8	-12	54.7
1125019411		1	42	<20	<0.01	<10	<10	10	20	21	0.57	0.68	50	9.0	29	21.3
1126033528		1	26	<20	0.01	<10	<10	11	<10	1655	0.17	2.14	20	8.6	-47	66.9
1126032024		<1	25	<20	<0.01	<10	<10	3	<10	281	0.66	1.95	58	8.8	-3	60.9
1126033505		1	33	<20	0.01	<10	<10	6	<10	863	0.33	2.16	32	8.6	-36	67.5
1126033101		1	27	<20	<0.01	<10	<10	4	<10	235	1.16	1.33	97	9.2	55	41.6
1232002001		1	39	<20	0.01	<10	<10	11	10	41	0.13	2.25	13	8.3	-57	70.3
1232001048		3	37	<20	0.04	<10	<10	50	<10	199	0.98	1.89	78	8.7	19	59.1
V829089		2	16	<20	0.36	<10	<10	77	<10	51	0.05					
1125023013		2	57	<20	0.05	<10	<10	37	10	113	0.62	0.19	57	9.5	51	5.9
1125023147		12	40	<20	0.11	<10	<10	244	10	403	0.71	3.41	99	8.4	-8	106.6
1232002111		1	30	<20	0.01	<10	<10	13	10	55	0.23	2.00	26	8.5	-37	62.5
1126033046		1	20	<20	<0.01	<10	<10	4	<10	331	0.86	1.21	73	8.8	35	37.8
1126033088		2	73	<20	0.02	<10	<10	20	<10	694	0.92	1.51	82	8.9	35	47.2
1125023005		13	48	<20	0.12	<10	<10	172	10	251	0.93	0.91	75	8.9	47	28.4
1125019098		1	66	<20	<0.01	<10	<10	6	<10	71	0.92	0.66	77	9.5	56	20.6
1126033030		1	29	<20	<0.01	<10	<10	4	<10	1755	0.75	1.77	65	8.9	10	55.3
1125019056		1	29	<20	0.01	<10	<10	14	<10	34	0.50	0.57	42	9.5	24	17.8
1126032004		1	42	<20	0.02	<10	<10	6	<10	396	0.31	1.99	37	8.7	-25	62.2
1125009001		1	33	<20	<0.01	<10	<10	7	<10	186	0.76	1.34	69	8.9	27	41.9
1125023167		5	55	<20	0.08	<10	<10	79	<10	94	0.91	0.29	70	9.4	61	9.1
1125020187		<1	18	<20	<0.01	<10	<10	4	<10	412	0.42	2.70	40	8.9	-44	84.4
1125019018		1	36	<20	<0.01	<10	<10	13	<10	19	0.62	1.34	52	8.9	10	41.9
1125019163		1	28	<20	0.02	<10	<10	16	<10	23	0.41	1.02	35	9.3	3	31.9
1125020165		1	45	<20	<0.01	<10	<10	6	<10	127	0.66	1.23	62	9.3	24	38.4
1125020136		1	53	<20	<0.01	<10	<10	7	<10	84	0.60	0.81	55	9.4	30	25.3
1126033062		2	50	<20	0.01	<10	<10	16	<10	880	0.53	1.89	51	8.9	-8	59.1
V829090		2	22	<20	0.25	<10	<10	51	<10	34	0.02					
1125018335		<1	22	<20	<0.01	<10	<10	3	<10	2060	1.03	1.74	80	9.0	26	54.4
1232002125		1	21	<20	0.02	<10	<10	16	<10	61	0.25	1.56	23	8.4	-26	48.8
1125026078		<1	11	<20	0.01	<10	<10	7	<10	3670	0.07	1.79	12	8.6	-44	55.9
1125018231		<1	19	<20	<0.01	<10	<10	3	<10	431	0.74	1.95	61	8.8	0	60.9

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1126033026		0.59	2
1232002009		0.27	2
1126032447		0.50	2
1126032401		0.66	2
1232001120		0.90	2
1232001069		3.20	2
1232001068		3.71	2
1126032415		0.21	2
1126032080		0.79	2
1125019411		2.35	2
1126033528		0.30	2
1126032024		0.95	2
1126033505		0.47	2
1126033101		2.33	3
1232002001		0.18	1
1232001048		1.32	2
V829089			
1125023013		9.60	2
1125023147		0.93	3
1232002111		0.42	2
1126033046		1.93	2
1126033088		1.74	2
1125023005		2.64	2
1125019098		3.73	2
1126033030		1.18	2
1125019056		2.36	2
1126032004		0.59	2
1125009001		1.65	2
1125023167		7.72	2
1125020187		0.47	2
1125019018		1.24	2
1125019163		1.10	2
1125020165		1.61	2
1125020136		2.17	2
1126033062		0.86	2
V829090			
1125018335		1.47	2
1232002125		0.47	2
1125026078		0.21	1
1125018231		1.00	2

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Finalized Date: 28-SEP-2018
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CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1232002150		0.54		0.328		0.7	1.17	12	<10	40	<0.5	2	0.74	<0.5	10	322
1125027052		0.50		0.054		2.3	2.23	22	<10	30	<0.5	2	1.77	4.0	7	221
1125027010		0.46		0.313		0.6	1.03	55	<10	30	<0.5	<2	3.01	2.6	8	220
1125027008		0.52		0.568		1.1	1.04	70	<10	20	<0.5	<2	2.27	5.9	8	229
1125018240		0.41		0.598		3.6	0.61	84	<10	40	<0.5	<2	2.38	7.3	10	238
1125017207		0.48		0.861		1.4	0.93	17	<10	30	<0.5	<2	2.38	1.5	7	262
1125018246		0.47		0.424		1.4	0.68	44	<10	30	<0.5	<2	2.62	3.5	9	185
1125017007		0.51		0.188		4.0	0.88	37	<10	40	<0.5	2	0.88	2.1	9	245
1125017136		0.53		0.258		5.2	0.80	31	<10	30	<0.5	4	0.65	1.6	13	271
1125011126		0.48	93.4	0.080		2.0	1.20	47	<10	20	<0.5	<2	2.22	1.0	9	193
1125018309		0.54		0.209		0.4	1.19	40	<10	20	<0.5	<2	2.05	<0.5	8	258
1232002130		0.50		0.568		0.7	0.95	11	<10	30	<0.5	2	0.75	<0.5	9	130
V829091		0.06		1.920		3.6	0.99	3	<10	70	<0.5	<2	0.47	<0.5	10	14
1125011089		0.52		1.575		3.6	0.93	160	<10	50	<0.5	<2	0.96	4.2	8	141
1125017146		0.51		0.196		5.9	0.77	31	<10	40	<0.5	2	2.51	1.6	9	470
1125011040		0.46		1.210		2.6	0.95	129	<10	50	<0.5	<2	1.44	3.1	15	146
1125011163		0.46		1.830		1.4	1.07	103	<10	30	<0.5	<2	1.17	3.3	26	161
1125017157		0.51		0.294		6.8	1.05	50	<10	40	<0.5	5	0.92	2.9	9	213
1125011073		0.54		1.020		1.2	1.05	108	<10	50	<0.5	<2	1.05	2.7	8	160
1125017016		0.57		0.384		4.9	0.92	39	<10	20	<0.5	<2	1.30	1.6	10	199
1125017104		0.52		0.154		3.3	0.62	36	<10	40	<0.5	2	2.54	2.9	8	322
1125011091		0.48		1.540		1.5	0.91	104	<10	40	<0.5	2	1.56	1.5	13	129
1125024049		0.46		0.333		1.1	1.53	117	<10	90	<0.5	<2	3.16	2.7	12	263
1125017229		0.58		1.095		1.6	0.99	45	<10	40	<0.5	<2	2.27	1.4	8	322
1125017216		0.53		0.619		3.3	1.08	40	<10	40	<0.5	<2	1.98	2.8	9	331
1125024009		0.54		0.414		1.0	1.54	114	<10	30	<0.5	<2	0.58	5.2	9	343
1125011007		0.52		0.917		1.4	0.71	58	<10	60	<0.5	<2	2.68	1.9	9	222
1125011005		0.27		0.593		2.1	0.99	58	<10	70	<0.5	<2	1.86	6.3	9	296
1125011056		0.51		0.033		0.6	1.28	33	<10	60	<0.5	<2	2.57	<0.5	8	182
1125011012		0.51		0.481		1.2	1.10	122	<10	50	<0.5	<2	0.64	1.7	16	242
1125011118		0.51		0.399		0.6	1.10	82	<10	40	<0.5	<2	1.64	<0.5	7	105
V829092		0.06		0.192		1.4	0.91	2	<10	40	<0.5	<2	0.50	<0.5	10	12
1232002162		0.57		0.290		1.2	1.35	11	<10	40	<0.5	2	0.76	<0.5	12	365
1125027188		0.56		0.177		2.0	0.94	26	<10	20	<0.5	<2	1.20	1.0	10	341
1125027174		0.47		0.382		2.2	1.17	29	<10	40	<0.5	<2	1.95	1.0	8	228
1125027115		0.45		1.635		1.0	1.64	107	<10	20	<0.5	<2	1.21	3.5	9	234
1125027130		0.47		0.168		0.7	1.22	101	<10	40	<0.5	<2	2.27	0.7	9	232
1125026033		0.38		1.535		1.6	1.36	89	<10	180	0.5	<2	1.38	11.1	10	267
1125025407		0.48		0.513		22.3	1.11	39	<10	50	<0.5	<2	2.39	1.0	8	256
1125025099		0.47		0.544		2.6	0.99	29	<10	30	<0.5	<2	1.61	1.6	10	209

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1232002150		129	2.75	<10	1	0.11	10	0.67	356	3	0.09	13	430	3	2.07	<2
1125027052		38	1.80	10	1	0.17	10	0.68	514	1	0.20	11	390	428	1.33	2
1125027010		35	1.89	<10	<1	0.22	10	0.83	1415	1	0.01	11	420	29	1.32	<2
1125027008		44	2.09	<10	1	0.18	10	0.80	1160	1	0.01	11	420	30	1.57	<2
1125018240		73	2.49	<10	1	0.26	10	0.80	1935	1	0.01	14	410	1010	2.36	3
1125017207		32	1.77	<10	1	0.23	10	1.00	1355	1	0.02	10	410	18	1.61	<2
1125018246		41	2.08	<10	1	0.26	10	0.88	1355	1	0.01	11	400	296	1.88	4
1125017007		75	2.23	<10	2	0.24	10	0.35	655	1	0.03	13	440	162	2.21	3
1125017136		51	2.22	<10	1	0.17	10	0.30	584	1	0.02	15	400	112	2.31	<2
1125011126		27	1.97	<10	<1	0.17	10	0.84	1350	1	0.02	12	420	122	1.80	<2
1125018309		16	1.83	<10	1	0.16	10	0.85	1105	1	0.02	10	410	51	1.57	<2
1232002130		242	2.37	<10	1	0.09	10	0.63	363	3	0.05	13	430	2	1.74	<2
V829091		262	2.04	<10	1	0.24	10	0.39	234	14	0.12	12	380	19	0.06	<2
1125011089		67	2.75	<10	<1	0.31	10	0.35	629	1	0.03	9	520	324	2.76	3
1125017146		58	2.69	<10	1	0.26	10	0.94	2220	1	0.02	15	400	248	2.24	4
1125011040		60	2.57	<10	1	0.36	10	0.58	1260	1	0.02	16	550	313	2.53	2
1125011163		91	2.87	<10	1	0.18	10	0.49	598	1	0.02	40	440	321	2.81	2
1125017157		100	2.11	<10	2	0.29	10	0.42	1090	1	0.02	11	420	291	2.25	2
1125011073		33	2.61	<10	1	0.28	10	0.47	650	<1	0.03	10	570	115	2.38	<2
1125017016		42	2.52	<10	1	0.14	10	0.82	1275	1	0.02	12	360	16	2.37	<2
1125017104		81	2.21	<10	1	0.25	10	0.63	1740	1	0.02	12	410	275	2.30	3
1125011091		66	2.61	<10	<1	0.27	10	0.69	1205	<1	0.02	12	540	93	2.23	2
1125024049		40	2.78	<10	<1	0.52	20	1.22	1145	1	0.02	25	620	21	1.78	<2
1125017229		22	2.09	<10	1	0.23	10	0.90	1420	1	0.02	11	410	137	1.76	<2
1125017216		56	2.20	<10	1	0.26	10	0.84	1250	2	0.02	12	420	163	1.79	<2
1125024009		58	2.65	<10	1	0.30	10	0.98	579	2	0.01	12	420	30	1.64	<2
1125011007		78	2.18	<10	1	0.34	10	0.63	1780	1	0.01	13	420	218	2.16	2
1125011005		44	2.18	<10	<1	0.44	10	0.76	1870	1	0.02	13	410	470	2.08	3
1125011056		12	1.77	<10	<1	0.23	10	0.78	503	<1	0.06	9	380	20	1.36	<2
1125011012		23	2.87	<10	<1	0.22	10	0.30	232	1	0.03	17	460	25	2.80	<2
1125011118		20	2.42	<10	<1	0.22	10	0.68	871	1	0.03	8	550	23	1.79	<2
V829092		53	2.58	<10	<1	0.21	10	0.37	255	4	0.15	11	510	20	0.03	<2
1232002162		178	2.98	<10	1	0.14	10	0.80	382	2	0.07	17	470	4	1.70	<2
1125027188		54	2.04	<10	1	0.14	10	0.43	543	1	0.02	14	450	23	1.66	<2
1125027174		23	2.07	<10	<1	0.22	10	0.59	833	1	0.03	12	450	11	1.90	<2
1125027115		33	2.65	<10	<1	0.18	10	0.84	669	1	0.07	12	410	78	2.19	2
1125027130		41	2.11	<10	1	0.20	10	0.57	896	1	0.03	12	420	23	1.84	<2
1125026033		87	2.69	<10	<1	0.85	10	1.11	1245	1	<0.01	15	930	128	1.73	<2
1125025407		62	2.20	<10	1	0.23	10	0.80	1165	2	0.05	11	430	91	2.03	<2
1125025099		54	2.26	<10	<1	0.19	10	0.58	866	1	0.03	13	420	168	2.21	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1232002150		1	41	<20	0.01	<10	<10	17	<10	81	0.17	2.07	21	8.6	-44	64.7
1125027052		1	48	<20	0.02	<10	<10	7	<10	1110	0.23	1.29	31	9.0	-9	40.3
1125027010		1	29	<20	<0.01	<10	<10	4	<10	567	1.07	1.24	91	9.0	52	38.8
1125027008		<1	21	<20	<0.01	<10	<10	4	<10	1280	0.73	1.61	59	9.0	9	50.3
1125018240		1	22	<20	<0.01	<10	<10	4	<10	1855	1.28	2.35	87	8.9	14	73.4
1125017207		1	28	<20	<0.01	<10	<10	5	<10	399	1.13	1.68	86	9.1	34	52.5
1125018246		1	25	<20	<0.01	<10	<10	4	<10	812	1.31	1.85	101	9.1	43	57.8
1125017007		1	22	<20	<0.01	<10	<10	6	<10	534	0.36	2.29	29	8.7	-43	71.6
1125017136		<1	14	<20	<0.01	<10	<10	4	<10	406	0.47	2.37	20	8.6	-54	74.1
1125011126		1	18	<20	<0.01	<10	<10	5	<10	269	0.73	1.86	60	8.9	2	58.1
1125018309		<1	15	<20	<0.01	<10	<10	5	<10	96	0.67	1.55	53	8.9	5	48.4
1232002130		1	26	<20	0.01	<10	<10	15	<10	55	0.21	1.78	43	8.8	-13	55.6
V829091		2	21	<20	0.30	<10	<10	45	<10	54	0.02					
1125011089		1	19	<20	<0.01	<10	<10	5	<10	922	0.43	2.95	35	8.7	-57	92.2
1125017146		1	31	<20	<0.01	<10	<10	12	<10	390	1.31	2.27	102	9.0	31	70.9
1125011040		1	19	<20	<0.01	<10	<10	6	<10	749	0.71	2.61	56	9.0	-26	81.6
1125011163		1	17	<20	<0.01	<10	<10	5	<10	802	0.41	2.80	34	8.6	-54	87.5
1125017157		1	20	<20	<0.01	<10	<10	4	<10	741	0.47	2.25	33	8.9	-37	70.3
1125011073		1	19	<20	<0.01	<10	<10	6	<10	686	0.44	2.37	36	8.9	-38	74.1
1125017016		<1	25	<20	<0.01	<10	<10	4	<10	403	0.68	2.36	52	8.7	-22	73.8
1125017104		<1	26	<20	<0.01	<10	<10	3	<10	706	1.17	2.38	89	9.0	15	74.4
1125011091		1	18	<20	<0.01	<10	<10	5	<10	378	0.81	2.23	59	8.8	-11	69.7
1125024049		3	83	<20	0.03	<10	<10	23	<10	671	1.18	1.76	87	9.0	32	55.0
1125017229		1	26	<20	<0.01	<10	<10	6	<10	347	1.17	1.71	80	9.1	27	53.4
1125017216		1	28	<20	<0.01	<10	<10	5	<10	737	1.02	1.75	71	9.0	16	54.7
1125024009		1	13	<20	0.02	<10	<10	8	<10	1190	0.23	1.61	20	8.9	-30	50.3
1125011007		1	23	<20	<0.01	<10	<10	4	<10	560	1.20	2.14	88	9.1	21	66.9
1125011005		1	20	<20	<0.01	<10	<10	5	<10	1500	1.02	2.09	77	9.1	12	65.3
1125011056		1	68	<20	<0.01	<10	<10	5	<10	92	0.97	1.35	75	9.2	33	42.2
1125011012		1	20	<20	<0.01	<10	<10	6	<10	425	0.17	2.87	19	8.4	-71	89.7
1125011118		1	22	<20	<0.01	<10	<10	6	<10	129	0.75	1.78	57	8.9	1	55.6
V829092		2	21	<20	0.40	<10	<10	60	<10	60	0.02					
1232002162		2	37	<20	0.04	<10	<10	24	<10	93	0.21	1.67	19	8.6	-33	52.2
1125027188		1	18	<20	<0.01	<10	<10	5	10	235	0.36	1.65	30	8.7	-22	51.6
1125027174		1	25	<20	<0.01	<10	<10	5	<10	246	0.59	1.87	49	8.9	-9	58.4
1125027115		1	27	<20	0.01	<10	<10	6	<10	809	0.25	2.12	25	8.6	-41	66.3
1125027130		1	26	<20	<0.01	<10	<10	5	<10	182	0.71	1.85	59	8.7	1	57.8
1125026033		3	157	<20	0.06	<10	<10	20	<10	2630	0.60	1.76	53	9.1	-2	55.0
1125025407		1	53	<20	<0.01	<10	<10	5	<10	244	1.10	2.03	75	8.8	12	63.4
1125025099		1	19	<20	<0.01	<10	<10	4	<10	394	0.56	2.14	45	9.0	-22	66.9

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EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
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Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1232002150		0.32	2
1125027052		0.77	2
1125027010		2.35	3
1125027008		1.17	2
1125018240		1.18	2
1125017207		1.64	2
1125018246		1.75	3
1125017007		0.41	2
1125017136		0.27	2
1125011126		1.03	2
1125018309		1.09	2
1232002130		0.77	2
V829091			
1125011089		0.38	2
1125017146		1.44	3
1125011040		0.69	2
1125011163		0.39	2
1125017157		0.47	2
1125011073		0.49	2
1125017016		0.71	2
1125017104		1.20	2
1125011091		0.85	2
1125024049		1.58	2
1125017229		1.50	2
1125017216		1.30	2
1125024009		0.40	2
1125011007		1.32	2
1125011005		1.18	2
1125011056		1.78	2
1125011012		0.21	2
1125011118		1.02	2
V829092			
1232002162		0.36	2
1125027188		0.58	2
1125027174		0.84	2
1125027115		0.38	2
1125027130		1.02	2
1125026033		0.96	2
1125025407		1.18	2
1125025099		0.67	2

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CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1125027042		0.56		0.589		0.8	0.86	54	<10	30	<0.5	<2	2.48	3.0	8	145
1125025095		0.48		0.421		2.3	0.92	32	<10	40	<0.5	<2	2.38	1.1	8	255
1232002465		0.63		0.050		0.4	1.03	10	<10	40	<0.5	2	0.82	<0.5	9	313
1125025144		0.57		0.088		1.4	1.49	33	<10	50	<0.5	<2	1.63	1.0	8	124
1125027072		0.52		2.81		1.0	0.88	79	<10	20	<0.5	<2	2.13	2.2	8	169
1125025159		0.61		0.218		3.4	0.91	58	<10	40	<0.5	<2	1.75	1.9	8	186
V829093		0.06		0.961		2.5	1.25	<2	<10	90	<0.5	<2	0.83	<0.5	15	9
1125016163		0.53		0.764		1.6	1.86	40	<10	30	<0.5	<2	1.12	7.0	7	249
1125016184		0.44		1.955		0.9	1.71	55	<10	20	<0.5	<2	1.10	5.3	7	210
1125015070		0.40		1.530		0.8	1.32	61	<10	30	<0.5	<2	0.96	10.2	8	232
1125015109		0.48		0.454		2.0	0.53	73	<10	30	<0.5	<2	2.70	3.2	9	201
1125016203		0.48		0.217		1.3	1.57	52	<10	30	<0.5	<2	1.24	17.1	7	178
1125016200		0.52		0.529		1.2	1.39	45	<10	50	<0.5	<2	1.30	9.0	7	169
1125012020		0.38		0.142		0.5	2.18	52	<10	40	<0.5	<2	1.57	<0.5	8	281
1125012054		0.47		0.086		1.6	3.06	18	<10	120	<0.5	<2	4.66	1.3	25	225
1125016122		0.46		2.03		1.0	1.58	46	<10	20	<0.5	<2	1.12	0.9	8	312
1125010201		0.52		1.060		3.7	0.77	36	<10	40	<0.5	<2	2.37	10.2	8	219
1125015001		0.47		0.893		1.8	0.59	79	<10	40	<0.5	<2	3.06	2.5	7	266
1125016150		0.46		0.882		2.1	1.77	32	<10	40	<0.5	<2	1.68	3.9	8	304
1125016088		0.50	88.5	1.485		1.5	1.19	41	<10	30	<0.5	<2	2.01	5.3	7	218
1125016153		0.50		0.416		0.4	1.33	22	<10	30	<0.5	<2	1.43	0.8	6	385
1125010141		0.48		2.59		4.0	0.67	34	<10	40	<0.5	<2	1.86	13.0	9	452
1125010034		0.47		2.32		3.0	0.59	39	<10	30	<0.5	<2	1.47	0.9	10	230
V829094		0.06		1.790		6.7	0.84	416	<10	50	<0.5	3	1.25	1.0	7	14
1125026116		0.47		2.04		2.7	0.87	268	<10	40	<0.5	3	0.19	15.6	6	154
1125027111		0.55		0.164		0.8	2.00	55	10	30	<0.5	<2	1.65	2.1	8	148
1124001284		0.49		0.085		0.5	1.44	37	<10	50	<0.5	<2	2.51	<0.5	8	168
1125027244		0.49		0.100		1.5	0.93	33	<10	50	<0.5	<2	2.24	0.6	9	214
1125027076		0.59		7.70		5.6	1.17	133	<10	30	<0.5	2	0.98	33.2	9	179
1124001281		0.42		0.051		0.5	1.35	27	<10	50	<0.5	<2	2.23	<0.5	7	309
1125027220		0.54		0.131		2.4	0.81	34	<10	20	<0.5	2	2.18	2.2	8	116
1125028033		0.53		0.312		0.4	1.95	68	<10	30	<0.5	<2	0.46	1.0	9	119
1125027226		0.55		0.358		1.2	1.10	39	<10	40	<0.5	<2	2.42	1.6	9	178
1125028097		0.39		0.961		3.1	1.58	95	<10	30	<0.5	<2	0.39	3.1	9	255
1125028087		0.47		0.451		1.4	1.11	238	<10	30	<0.5	<2	1.08	1.5	8	377
1232002169		0.60		0.846		1.2	1.22	12	<10	40	<0.5	<2	0.66	<0.5	11	320
1125025411		0.51		0.118		1.6	0.91	55	<10	40	<0.5	<2	1.77	1.4	8	275
1125026086		0.54		0.792		1.3	0.89	70	<10	110	<0.5	<2	0.24	11.1	6	157
1125028526		0.45		0.382		1.1	0.65	220	<10	30	<0.5	<2	1.55	16.2	8	234
1124001265		0.53		0.678		1.1	1.44	58	<10	30	<0.5	<2	2.21	2.3	9	275

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1125027042		43	1.89	<10	1	0.26	10	0.84	1350	1	0.01	11	400	34	1.47	2
1125025095		40	2.06	<10	1	0.24	10	0.56	1100	1	0.03	10	410	124	1.90	<2
1232002465		84	2.62	<10	<1	0.08	10	0.66	439	3	0.06	10	370	2	1.87	<2
1125025144		18	1.99	<10	1	0.19	10	1.14	870	<1	0.04	8	420	132	1.87	<2
1125027072		44	2.00	<10	1	0.20	10	0.65	1165	1	0.02	10	420	88	1.76	<2
1125025159		68	1.99	<10	1	0.21	10	0.73	1135	1	0.04	12	440	267	1.92	<2
V829093		57	3.37	10	1	0.28	10	0.57	325	11	0.12	17	740	7	0.07	<2
1125016163		62	1.94	10	<1	0.31	10	1.19	699	<1	0.02	8	390	131	1.19	3
1125016184		32	2.63	<10	<1	0.22	10	0.89	539	1	0.05	8	410	21	1.82	<2
1125015070		87	3.69	<10	1	0.21	10	0.85	789	1	0.01	13	420	29	2.82	<2
1125015109		60	2.33	<10	1	0.25	10	0.88	2070	1	0.01	11	430	134	2.04	<2
1125016203		83	2.34	<10	1	0.35	10	1.07	807	1	0.01	8	360	76	1.66	<2
1125016200		59	2.08	<10	<1	0.38	10	0.97	872	1	0.01	8	450	50	1.30	<2
1125012020		17	1.73	10	<1	0.26	10	0.89	632	<1	0.11	8	390	40	0.75	2
1125012054		97	5.77	10	<1	0.63	10	1.60	1500	1	0.12	34	730	14	1.53	<2
1125016122		34	1.75	<10	<1	0.23	10	0.79	522	1	0.07	7	390	57	1.28	<2
1125010201		93	2.16	<10	1	0.22	10	0.99	1385	1	0.02	11	410	1050	1.96	2
1125015001		31	2.14	<10	1	0.27	10	1.25	2840	1	0.01	11	390	320	1.65	<2
1125016150		63	1.86	<10	1	0.30	10	0.91	670	1	0.05	8	410	592	1.48	2
1125016088		63	1.87	<10	<1	0.24	10	0.95	1130	1	0.01	7	390	276	1.23	3
1125016153		17	1.70	<10	1	0.27	10	0.58	560	2	0.04	7	400	65	1.43	<2
1125010141		139	2.54	<10	1	0.23	10	0.68	1030	1	0.02	14	430	245	2.42	2
1125010034		60	2.60	<10	1	0.18	10	0.53	762	1	0.03	14	410	59	2.65	<2
V829094		294	4.45	<10	1	0.28	20	0.30	477	3	0.01	9	160	19	3.42	3
1125026116		205	3.82	<10	<1	0.37	10	0.29	385	<1	<0.01	7	330	136	3.80	<2
1125027111		33	1.93	10	1	0.22	10	0.73	534	1	0.11	11	400	88	1.63	<2
1124001284		15	1.70	<10	1	0.22	10	0.85	579	1	0.05	9	370	15	1.07	<2
1125027244		21	2.23	<10	<1	0.23	10	0.43	764	1	0.04	14	410	20	2.25	<2
1125027076		186	3.45	<10	1	0.23	10	0.59	448	1	0.02	12	380	56	3.64	<2
1124001281		11	1.78	<10	<1	0.19	10	0.76	442	1	0.07	10	370	10	1.14	<2
1125027220		103	2.00	<10	<1	0.13	10	0.51	956	<1	0.02	10	440	165	1.97	<2
1125028033		35	2.35	<10	<1	0.23	10	1.24	609	1	0.01	13	380	14	0.79	<2
1125027226		46	2.04	<10	<1	0.20	10	0.61	931	1	0.02	11	420	79	1.85	<2
1125028097		131	2.47	<10	<1	0.24	10	1.08	522	1	0.01	17	370	17	1.54	<2
1125028087		75	3.20	<10	<1	0.30	20	0.58	518	1	0.01	10	410	42	2.59	2
1232002169		107	2.64	<10	1	0.10	10	0.67	376	3	0.07	14	410	10	1.65	<2
1125025411		38	2.19	<10	<1	0.20	10	0.57	805	2	0.04	10	440	65	2.07	<2
1125026086		83	2.48	<10	<1	0.43	10	0.33	745	1	<0.01	7	340	67	2.06	<2
1125028526		56	3.40	<10	<1	0.28	10	0.55	1055	1	0.01	9	400	24	3.49	<2
1124001265		39	2.51	<10	1	0.15	10	0.99	665	1	0.04	12	440	37	1.76	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1125027042		1	30	<20	<0.01	<10	<10	4	<10	711	1.11	1.41	84	9.1	40	44.1
1125025095		1	24	<20	<0.01	<10	<10	4	<10	289	0.90	1.84	68	9.0	11	57.5
1232002465		1	25	<20	0.01	<10	<10	13	<10	54	0.22	1.84	22	8.9	-36	57.5
1125025144		1	35	<20	<0.01	<10	<10	6	<10	297	0.62	1.82	50	9.0	-7	56.9
1125027072		<1	29	<20	<0.01	<10	<10	4	<10	546	0.79	1.61	65	9.1	15	50.3
1125025159		1	35	<20	<0.01	<10	<10	4	<10	491	0.76	1.83	57	9.1	0	57.2
V829093		3	20	<20	0.41	<10	<10	88	<10	53	0.05					
1125016163		1	28	<20	0.03	<10	<10	9	<10	1805	0.20	1.11	24	9.1	-11	34.7
1125016184		<1	34	<20	<0.01	<10	<10	6	<10	1400	0.29	1.77	27	8.7	-28	55.3
1125015070		1	11	<20	<0.01	<10	<10	5	<10	2240	0.30	2.83	30	8.7	-58	88.4
1125015109		1	21	<20	<0.01	<10	<10	3	<10	879	1.33	1.88	104	9.1	45	58.8
1125016203		1	27	<20	0.04	<10	<10	9	<10	3970	0.32	1.61	35	8.9	-15	50.3
1125016200		1	30	<20	0.01	<10	<10	9	<10	2140	0.40	1.26	39	9.2	0	39.4
1125012020		1	55	<20	0.01	<10	<10	7	<10	118	0.36	0.72	34	9.2	12	22.5
1125012054		7	155	<20	0.19	<10	<10	138	<10	474	1.36	1.51	159	8.9	112	47.2
1125016122		1	38	<20	<0.01	<10	<10	6	<10	267	0.24	1.27	28	8.9	-12	39.7
1125010201		1	25	<20	<0.01	<10	<10	5	<10	2500	1.21	1.94	88	9.0	27	60.6
1125015001		1	27	<20	<0.01	<10	<10	4	<10	666	1.67	1.62	133	9.2	82	50.6
1125016150		1	48	<20	0.01	<10	<10	7	<10	1055	0.42	1.36	39	9.0	-4	42.5
1125016088		1	30	<20	0.01	<10	<10	6	<10	1455	0.73	1.14	53	9.0	17	35.6
1125016153		1	40	<20	0.01	<10	<10	5	<10	253	0.38	1.38	33	8.9	-10	43.1
1125010141		1	22	<20	<0.01	<10	<10	6	<10	3080	0.87	2.37	67	8.8	-7	74.1
1125010034		<1	18	<20	<0.01	<10	<10	3	<10	196	0.70	2.58	53	8.6	-28	80.6
V829094		2	19	<20	0.01	<10	<10	7	<10	244	0.37					
1125026116		<1	13	<20	<0.01	<10	<10	4	<10	3500	0.06	3.24	8	8.1	-93	101.3
1125027111		1	39	<20	<0.01	<10	<10	7	<10	527	0.28	1.54	34	8.9	-14	48.1
1124001284		1	57	<20	<0.01	<10	<10	6	<10	141	0.83	0.97	67	9.5	37	30.3
1125027244		1	37	<20	<0.01	<10	<10	4	<10	148	0.73	2.17	57	8.9	-11	67.8
1125027076		<1	18	<20	<0.01	<10	<10	5	<10	7710	0.22	3.36	24	8.5	-81	105.0
1124001281		1	55	<20	<0.01	<10	<10	6	<10	108	0.72	1.07	59	9.4	26	33.4
1125027220		<1	18	<20	<0.01	<10	<10	3	<10	554	0.67	1.92	55	9.0	-5	60.0
1125028033		1	13	<20	<0.01	<10	<10	8	<10	299	0.10	0.74	14	9.3	-9	23.1
1125027226		1	22	<20	<0.01	<10	<10	5	<10	403	0.77	1.82	61	9.0	4	56.9
1125028097		1	16	<20	<0.01	<10	<10	7	<10	704	0.13	1.43	15	8.8	-30	44.7
1125028087		1	15	<20	0.01	<10	<10	5	<10	400	0.51	2.57	29	8.2	-51	80.3
1232002169		1	38	<20	0.03	<10	<10	17	10	101	0.15	1.61	16	8.4	-34	50.3
1125025411		1	31	<20	<0.01	<10	<10	5	<10	364	0.73	2.03	49	8.7	-14	63.4
1125026086		<1	73	<20	0.01	<10	<10	4	<10	2610	0.11	2.03	11	8.3	-52	63.4
1125028526		<1	18	<20	<0.01	<10	<10	3	<10	4080	0.72	3.41	57	8.4	-50	106.6
1124001265		1	42	<20	<0.01	<10	<10	8	<10	698	0.71	1.77	62	8.5	7	55.3

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EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
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Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1125027042		1.91	2
1125025095		1.18	2
1232002465		0.38	2
1125025144		0.88	2
1125027072		1.29	2
1125025159		1.00	2
V829093			
1125016163		0.69	2
1125016184		0.49	2
1125015070		0.34	2
1125015109		1.77	3
1125016203		0.70	2
1125016200		0.99	2
1125012020		1.51	2
1125012054		3.37	3
1125016122		0.71	2
1125010201		1.45	2
1125015001		2.63	3
1125016150		0.92	2
1125016088		1.49	2
1125016153		0.77	2
1125010141		0.90	2
1125010034		0.66	2
V829094			
1125026116		0.08	1
1125027111		0.71	2
1124001284		2.21	2
1125027244		0.84	2
1125027076		0.23	2
1124001281		1.76	2
1125027220		0.92	2
1125028033		0.61	1
1125027226		1.07	2
1125028097		0.34	1
1125028087		0.36	2
1232002169		0.32	2
1125025411		0.77	2
1125026086		0.17	1
1125028526		0.53	2
1124001265		1.12	2

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CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1232002157		0.63		0.747		1.0	1.29	10	<10	40	<0.5	2	0.65	<0.5	11	368
1125028504		0.44		4.67		6.0	1.45	154	<10	50	<0.5	2	1.28	10.7	12	240
1124001210		0.44		0.521		1.3	0.88	47	<10	40	<0.5	<2	1.62	2.6	9	162
V829095		0.06		0.200		1.5	0.85	3	<10	40	<0.5	<2	0.46	<0.5	9	12
1125023107		0.49		0.075		1.0	2.56	12	<10	80	<0.5	<2	1.72	0.5	44	177
1125009223		0.50		1.210		4.0	1.31	67	<10	20	<0.5	<2	1.20	3.2	8	184
1125009270		0.54		1.700		1.7	1.37	86	<10	20	<0.5	<2	0.66	10.5	9	187
1125009331		0.45		0.691		1.8	0.47	58	<10	30	<0.5	<2	2.20	1.7	15	184
1125009366		0.58		1.455		2.7	0.52	91	<10	30	<0.5	<2	2.74	3.1	12	159
1125020001		0.55		0.079		2.1	1.08	68	<10	30	<0.5	<2	2.02	0.8	8	125
1125020200		0.53		0.019		0.4	1.06	29	<10	30	<0.5	<2	1.85	<0.5	7	131
1125009288		0.45		1.285		3.3	0.50	102	<10	30	<0.5	<2	2.48	3.3	14	147
1125023187		0.49		0.127		1.9	4.14	23	<10	100	<0.5	<2	3.27	1.1	49	232
1125020157		0.47		0.062		0.9	1.34	45	<10	40	<0.5	<2	1.89	<0.5	7	230
1125020181		0.50		0.023		0.3	1.27	31	<10	40	<0.5	<2	2.06	0.5	7	163
V829096		0.06		0.949		2.3	1.10	<2	<10	80	<0.5	<2	0.69	<0.5	13	8
1125012102		0.56		0.378		1.7	1.16	49	<10	140	<0.5	<2	1.34	9.2	7	307
1125024041		0.46		0.159		1.8	0.50	101	<10	30	<0.5	<2	2.44	4.6	8	250
1125024156		0.55		0.614		1.3	0.98	111	<10	30	<0.5	<2	0.61	5.5	6	225
1125024035		0.54		1.055		2.5	1.27	112	<10	30	<0.5	<2	0.39	9.7	9	203
1125024144		0.51		0.739		3.0	1.04	104	<10	30	<0.5	<2	0.75	6.1	6	195
1125024021		0.56		0.397		2.9	0.50	107	<10	30	<0.5	<2	1.67	10.6	8	255
1125024073		0.51		0.249		1.0	1.81	79	<10	30	<0.5	<2	1.13	10.4	7	187
1125024115		0.48		0.476		1.6	1.03	229	<10	30	<0.5	<2	0.76	3.1	13	288
1125015416		0.49		1.425		1.3	1.27	34	<10	30	<0.5	<2	2.73	2.4	8	108
1125015046		0.46		1.465		1.5	0.61	57	<10	20	<0.5	2	2.64	14.0	8	326
1125024059		0.46		0.104		1.9	0.45	110	<10	20	<0.5	<2	2.22	6.0	8	175
1125024158		0.53		0.216		2.3	0.90	89	<10	20	<0.5	<2	1.50	15.0	6	287
1125011137		0.63		0.037		0.5	0.99	45	<10	30	<0.5	<2	2.43	<0.5	8	126
1125024150		0.47	90.1	0.445		1.1	1.18	106	<10	30	<0.5	<2	0.85	3.2	8	223
1125024001		0.61		0.301		1.7	0.74	135	<10	60	<0.5	<2	1.39	4.6	10	323
V829097		0.06		2.02		3.2	0.90	3	<10	70	<0.5	<2	0.41	<0.5	9	13
1125012174		0.43		0.106		0.4	1.13	40	<10	30	<0.5	<2	1.58	<0.5	8	240
1125015154		0.54		0.752		1.1	1.33	84	<10	30	<0.5	<2	0.56	4.0	8	253
1125015176		0.54		0.476		1.2	1.18	97	<10	40	<0.5	2	0.88	3.4	9	279
1125015401		0.36		7.04		2.1	1.29	63	<10	30	<0.5	2	1.52	19.3	9	282
1125012156		0.53		0.217		1.4	0.79	56	<10	20	<0.5	<2	1.57	0.5	6	246
1125012186		0.52		0.345		0.7	0.50	68	<10	60	<0.5	<2	1.79	2.8	7	331
1125012201		0.48		0.103		0.8	0.75	60	<10	20	<0.5	<2	2.01	<0.5	6	213
1125015148		0.51		1.335		1.7	0.98	109	<10	30	<0.5	<2	0.36	0.7	9	199

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1232002157		226	2.93	<10	1	0.11	10	0.75	325	3	0.09	15	450	3	1.90	<2
1125028504		137	3.26	<10	1	0.29	10	1.12	689	1	0.01	25	570	46	2.21	3
1124001210		54	1.84	<10	<1	0.26	10	0.64	875	<1	0.02	13	390	249	1.84	2
V829095		51	2.51	<10	<1	0.20	10	0.36	246	4	0.14	10	510	23	0.04	<2
1125023107		141	7.81	10	<1	0.26	<10	1.04	751	2	0.12	60	800	6	1.91	<2
1125009223		49	2.17	<10	1	0.16	20	0.75	675	<1	0.01	9	460	305	1.45	4
1125009270		119	3.48	<10	<1	0.13	20	0.85	595	1	0.01	10	480	186	2.79	<2
1125009331		32	1.95	<10	<1	0.21	<10	0.84	1795	1	0.01	20	390	265	1.76	3
1125009366		65	2.44	<10	1	0.18	10	0.76	1735	1	0.01	14	400	232	2.29	<2
1125020001		27	1.81	<10	<1	0.16	10	0.77	586	<1	0.04	10	420	28	1.08	<2
1125020200		16	1.70	<10	<1	0.10	10	0.66	344	1	0.05	8	350	7	0.93	<2
1125009288		48	2.59	<10	<1	0.20	<10	0.99	2220	1	0.01	15	420	403	2.35	2
1125023187		117	11.65	10	1	0.53	<10	1.57	1650	1	0.25	71	770	7	3.34	<2
1125020157		15	1.76	<10	<1	0.18	10	0.69	486	1	0.07	10	340	15	0.93	<2
1125020181		9	1.51	<10	1	0.15	10	0.71	355	1	0.06	9	340	6	0.63	<2
V829096		57	3.09	10	<1	0.26	10	0.53	297	11	0.10	15	710	8	0.07	<2
1125012102		63	2.26	<10	<1	0.54	10	1.03	1190	1	<0.01	9	530	121	1.33	<2
1125024041		34	2.10	<10	<1	0.24	10	0.36	1080	1	<0.01	10	400	24	2.00	2
1125024156		39	3.11	<10	1	0.21	20	0.54	447	<1	<0.01	7	370	59	2.31	2
1125024035		113	3.03	<10	<1	0.23	10	0.86	461	1	<0.01	12	430	20	2.08	<2
1125024144		82	2.80	<10	<1	0.23	10	0.60	411	1	<0.01	6	390	69	2.11	<2
1125024021		130	3.19	<10	1	0.23	10	0.32	833	1	0.01	10	390	19	3.24	<2
1125024073		33	2.73	<10	1	0.27	10	1.22	690	1	0.01	10	420	20	1.58	<2
1125024115		49	3.23	<10	<1	0.27	10	0.59	411	1	<0.01	14	430	23	2.78	<2
1125015416		64	1.98	<10	<1	0.21	10	0.69	1035	<1	0.05	10	420	142	1.85	<2
1125015046		79	2.44	<10	1	0.17	10	0.77	1315	1	0.01	12	420	64	2.22	<2
1125024059		45	2.08	<10	<1	0.20	10	0.25	1050	1	0.01	9	390	17	2.12	<2
1125024158		72	2.45	<10	1	0.24	10	0.57	645	1	<0.01	8	390	60	2.17	<2
1125011137		13	1.75	<10	<1	0.13	10	0.62	405	1	0.05	10	380	16	1.33	<2
1125024150		25	2.06	<10	1	0.22	10	0.83	478	1	<0.01	12	410	17	1.30	2
1125024001		91	4.04	<10	<1	0.27	10	0.56	456	1	<0.01	22	530	20	3.71	3
V829097		257	1.97	<10	<1	0.23	10	0.37	226	14	0.11	11	380	19	0.06	<2
1125012174		18	2.10	<10	<1	0.18	10	0.68	548	1	0.03	9	490	19	1.15	<2
1125015154		40	2.33	<10	1	0.26	10	0.83	478	1	0.01	12	420	16	1.57	<2
1125015176		38	2.40	<10	<1	0.27	10	0.71	579	1	0.01	12	450	45	1.68	<2
1125015401		154	3.81	<10	1	0.30	10	0.82	943	1	0.01	12	440	58	3.55	<2
1125012156		21	1.90	<10	<1	0.19	10	0.62	825	<1	0.01	7	350	97	1.69	<2
1125012186		32	1.91	<10	<1	0.29	10	0.75	1565	1	<0.01	8	440	183	1.45	2
1125012201		14	1.64	<10	1	0.20	10	0.82	1235	<1	0.01	7	390	64	1.33	<2
1125015148		25	2.74	<10	1	0.21	10	0.57	363	1	0.01	12	410	33	2.21	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1232002157		1	40	<20	0.03	<10	<10	21	<10	73	0.10	1.92	15	8.1	-45	60.0
1125028504		2	45	<20	0.01	<10	<10	19	<10	2610	0.41	2.26	40	8.3	-31	70.6
1124001210		1	18	<20	<0.01	<10	<10	4	<10	602	0.65	1.70	54	8.6	1	53.1
V829095		2	20	<20	0.39	<10	<10	58	<10	59	0.03					
1125023107		10	32	<20	0.13	<10	<10	172	<10	209	0.35	2.08	35	8.3	-30	65.0
1125009223		1	24	<20	<0.01	<10	<10	7	<10	853	0.32	1.44	32	8.5	-13	45.0
1125009270		1	17	<20	<0.01	<10	<10	7	<10	2760	0.16	3.04	19	8.0	-76	95.0
1125009331		1	19	<20	<0.01	<10	<10	3	<10	488	1.13	1.80	86	8.6	30	56.3
1125009366		<1	25	<20	<0.01	<10	<10	3	<10	864	1.24	2.35	101	8.7	28	73.4
1125020001		1	35	<20	<0.01	<10	<10	7	<10	185	0.80	1.10	62	8.8	28	34.4
1125020200		1	38	<20	<0.01	<10	<10	6	<10	65	0.65	0.94	50	8.8	21	29.4
1125009288		1	21	<20	<0.01	<10	<10	3	<10	906	1.29	2.32	103	8.6	31	72.5
1125023187		10	104	<20	0.14	<10	<10	273	<10	347	1.02	3.59	72	8.3	-40	112.2
1125020157		1	40	<20	<0.01	<10	<10	6	<10	103	0.57	0.95	52	8.9	22	29.7
1125020181		1	48	<20	<0.01	<10	<10	7	<10	151	0.60	0.66	55	9.3	34	20.6
V829096		3	16	<20	0.37	<10	<10	77	<10	50	0.05					
1125012102		1	112	<20	0.03	<10	<10	11	<10	2280	0.59	1.38	51	8.8	8	43.1
1125024041		<1	21	<20	<0.01	<10	<10	3	<10	981	0.97	2.10	74	8.6	8	65.6
1125024156		<1	10	<20	<0.01	<10	<10	5	<10	1285	0.29	2.49	18	8.2	-60	77.8
1125024035		1	10	<20	0.01	<10	<10	6	<10	2230	0.10	2.12	15	8.2	-51	66.3
1125024144		<1	11	<20	<0.01	<10	<10	4	<10	1415	0.28	2.10	23	8.3	-43	65.6
1125024021		1	20	<20	<0.01	<10	<10	4	<10	2230	0.64	3.49	52	8.3	-57	109.1
1125024073		1	26	<20	0.03	<10	<10	10	<10	2550	0.26	1.62	31	8.7	-20	50.6
1125024115		1	14	<20	0.01	<10	<10	6	<10	730	0.21	2.92	24	8.3	-67	91.3
1125015416		1	26	<20	<0.01	<10	<10	4	<10	621	0.82	1.88	69	8.8	10	58.8
1125015046		<1	30	<20	<0.01	<10	<10	3	<10	2820	1.14	2.32	88	8.4	16	72.5
1125024059		<1	21	<20	<0.01	<10	<10	2	<10	1295	0.78	2.25	64	8.3	-6	70.3
1125024158		<1	19	<20	0.01	<10	<10	4	<10	3570	0.53	2.27	42	8.5	-29	70.9
1125011137		1	55	<20	<0.01	<10	<10	7	<10	101	0.71	1.33	63	8.9	21	41.6
1125024150		1	15	<20	<0.01	<10	<10	6	<10	779	0.27	1.22	27	8.5	-11	38.1
1125024001		2	34	<20	0.02	<10	<10	14	<10	998	0.42	3.92	42	8.4	-81	122.5
V829097		1	18	<20	0.28	<10	<10	42	<10	53	0.02					
1125012174		1	29	<20	0.01	<10	<10	9	<10	66	0.46	1.14	44	9.0	8	35.6
1125015154		1	10	<20	0.01	<10	<10	6	<10	908	0.12	1.60	21	8.4	-29	50.0
1125015176		1	14	<20	0.02	<10	<10	6	<10	757	0.23	1.70	25	8.5	-28	53.1
1125015401		1	20	<20	<0.01	<10	<10	6	<10	4020	0.65	3.68	45	8.1	-70	115.0
1125012156		<1	25	<20	<0.01	<10	<10	4	<10	141	0.54	1.63	45	8.6	-6	50.9
1125012186		<1	96	<20	<0.01	<10	<10	3	<10	683	1.04	1.42	76	8.9	32	44.4
1125012201		<1	29	<20	<0.01	<10	<10	3	<10	136	0.88	1.26	67	8.4	28	39.4
1125015148		<1	7	<20	0.01	<10	<10	4	<10	214	0.08	2.24	12	8.5	-58	70.0

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1232002157		0.25	2
1125028504		0.57	2
1124001210		1.02	2
V829095			
1125023107		0.54	2
1125009223		0.71	2
1125009270		0.20	2
1125009331		1.53	2
1125009366		1.38	3
1125020001		1.80	2
1125020200		1.70	2
1125009288		1.42	3
1125023187		0.64	2
1125020157		1.75	2
1125020181		2.67	2
V829096			
1125012102		1.18	2
1125024041		1.13	2
1125024156		0.23	2
1125024035		0.23	2
1125024144		0.35	2
1125024021		0.48	2
1125024073		0.61	2
1125024115		0.26	2
1125015416		1.17	2
1125015046		1.21	2
1125024059		0.91	2
1125024158		0.59	2
1125011137		1.52	2
1125024150		0.71	2
1125024001		0.34	2
V829097			
1125012174		1.24	2
1125015154		0.42	2
1125015176		0.47	2
1125015401		0.39	2
1125012156		0.88	2
1125012186		1.71	2
1125012201		1.70	2
1125015148		0.17	1

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CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr
	Units	kg	%	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1
1125012152		0.52		0.028		0.4	1.82	27	<10	30	<0.5	<2	1.11	<0.5	7	232
1125012113		0.49		0.075		0.6	1.68	18	<10	50	<0.5	<2	1.54	0.8	8	274
1125012115		0.53		0.042		0.4	1.71	10	<10	50	<0.5	<2	1.32	<0.5	7	181
1125015197		0.59		0.464		1.9	0.46	117	<10	20	<0.5	2	0.49	4.3	7	153
1125012014		0.43		0.134		1.5	1.44	54	<10	30	<0.5	<2	1.35	0.9	7	111
1125012041		0.53		0.531		2.8	1.37	69	<10	30	<0.5	2	1.01	24.2	6	329
1125012095		0.54		0.117		0.8	1.79	36	<10	30	<0.5	<2	1.61	0.5	7	244
1125012065		0.48		0.210		0.5	1.48	41	<10	20	<0.5	<2	1.26	0.7	7	393
1125015084		0.53		0.810		2.0	1.45	59	<10	30	<0.5	<2	1.01	6.6	8	203
V829098		0.06		0.198		1.5	0.79	2	<10	40	<0.5	<2	0.42	<0.5	9	11
1125010179		0.48		1.270		2.1	0.60	36	<10	30	<0.5	<2	2.30	1.8	13	272
1125009357		0.48		>10.0	10.05	4.2	0.73	142	<10	30	<0.5	<2	1.22	10.0	8	136
1125010146		0.45		0.301		3.0	0.82	42	<10	20	<0.5	<2	2.17	0.9	8	168
1125016037		0.48		0.596		1.8	0.93	88	<10	30	<0.5	<2	1.83	3.0	8	81
1125010101		0.42		0.135		0.4	0.97	26	<10	30	<0.5	<2	2.40	<0.5	8	86
1125010120		0.49		0.495		0.7	0.90	39	<10	30	<0.5	<2	2.91	1.2	8	143
1125010159		0.46		0.884		1.8	0.65	35	<10	30	<0.5	<2	2.47	3.9	8	177
1125016080		0.50		1.620		0.8	1.21	49	<10	20	<0.5	<2	2.10	0.8	7	122
1125009342		0.43		0.863		3.2	0.58	67	<10	40	<0.5	<2	2.48	3.7	9	242
1125023019		0.53		0.067		0.9	3.39	23	<10	60	<0.5	3	4.34	2.3	36	183
1125023119		Not Recvd														
1125009379		0.47		1.655		4.1	0.57	45	<10	40	<0.5	<2	2.58	2.8	11	221
1125023208		0.63		0.157		1.2	1.06	7	<10	50	<0.5	<2	1.91	0.8	10	246
1125016031		0.54		2.96		1.1	1.18	78	<10	30	<0.5	<2	1.71	2.5	6	179
1125016015		0.46		1.085		2.7	0.61	86	<10	20	<0.5	<2	0.99	4.8	7	271
1125016030		0.54		2.14		1.4	1.39	73	<10	30	<0.5	<2	1.75	5.4	6	123
1125016107		0.49		0.070		0.4	1.72	32	<10	30	<0.5	<2	0.88	<0.5	6	367
V829099		0.06		1.800		6.7	0.82	411	<10	50	<0.5	3	1.24	1.0	7	13
1125028141		Not Recvd														
1125029004		0.53		0.229		1.7	1.08	83	<10	30	<0.5	<2	2.61	0.6	8	184
1125014012		0.38		0.046		0.6	2.31	15	<10	80	<0.5	2	2.70	0.7	19	320
1124001171		0.48		0.279		0.6	0.84	40	<10	30	<0.5	<2	2.58	1.0	8	249
1124001155		0.44		0.483		0.8	0.79	38	<10	30	<0.5	<2	2.79	1.5	8	284
1232002185		0.55		0.330		0.8	1.33	10	<10	30	<0.5	3	0.64	<0.5	10	300
1125029101		0.46		0.149		1.3	0.56	86	<10	30	<0.5	<2	2.17	0.5	8	78
1125028020		0.43		1.720		2.1	0.54	295	<10	10	<0.5	<2	0.46	17.8	6	204
1125028108		0.50		0.643		0.8	1.08	135	<10	30	<0.5	<2	0.30	5.6	8	244
1124001195		0.57		0.366		1.3	0.48	39	<10	30	<0.5	<2	2.06	2.2	9	303
1125028077		0.53		0.560		2.0	0.73	311	<10	30	<0.5	<2	0.56	31.1	7	310
1125028106		0.47	91.7	0.717		1.2	1.56	58	<10	40	<0.5	<2	1.27	4.1	10	243

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1125012152		21	1.55	10	1	0.18	10	0.71	370	1	0.13	9	390	21	0.80	<2
1125012113		27	2.00	<10	<1	0.23	10	0.65	645	<1	0.11	9	490	22	0.60	<2
1125012115		28	1.80	<10	1	0.19	20	0.61	498	<1	0.11	9	540	11	0.44	<2
1125015197		131	2.84	<10	1	0.20	10	0.14	222	1	0.01	9	380	18	3.01	<2
1125012014		17	1.82	<10	1	0.27	10	1.08	685	1	0.02	7	380	178	1.45	<2
1125012041		102	2.72	<10	1	0.47	10	1.03	993	<1	0.01	8	380	79	1.76	<2
1125012095		17	1.84	10	<1	0.25	10	1.31	919	1	0.02	8	400	76	1.12	<2
1125012065		18	1.82	<10	<1	0.22	10	0.77	517	1	0.04	9	400	64	1.17	<2
1125015084		49	2.56	<10	1	0.19	10	0.89	688	<1	0.02	10	410	71	1.84	<2
V829098		53	2.44	<10	1	0.20	10	0.35	241	3	0.13	11	510	24	0.04	<2
1125010179		55	2.04	<10	<1	0.20	10	0.84	956	1	0.02	14	410	184	1.99	2
1125009357		50	2.28	<10	1	0.22	10	0.43	801	1	0.01	10	420	57	2.24	<2
1125010146		37	1.90	<10	1	0.18	10	0.71	999	<1	0.02	11	420	118	1.76	<2
1125016037		34	1.68	<10	1	0.24	10	0.55	978	1	0.01	8	390	107	1.53	<2
1125010101		12	2.04	<10	1	0.23	10	0.67	828	1	0.03	11	430	30	2.20	<2
1125010120		31	1.76	<10	<1	0.22	10	0.60	1220	<1	0.02	10	410	88	1.45	<2
1125010159		42	2.06	<10	1	0.20	10	0.95	1460	1	0.01	11	410	294	1.80	<2
1125016080		30	1.59	<10	<1	0.24	10	0.99	1115	1	0.01	7	370	126	1.02	<2
1125009342		52	2.33	<10	1	0.28	10	0.73	1775	1	0.01	12	420	454	2.27	4
1125023019		75	8.99	10	1	0.20	<10	1.76	1515	1	0.09	52	800	7	2.00	3
1125023119																
1125009379		84	1.95	<10	1	0.28	10	0.73	1710	1	0.01	14	390	555	1.81	<2
1125023208		23	2.36	<10	1	0.22	10	0.71	703	1	0.04	15	430	5	1.17	<2
1125016031		34	1.91	<10	1	0.27	10	0.95	870	1	0.01	9	430	58	1.55	2
1125016015		76	1.97	<10	1	0.19	10	0.38	418	1	0.01	9	370	221	1.97	2
1125016030		37	1.67	<10	1	0.23	10	1.09	870	<1	0.02	7	390	60	1.40	<2
1125016107		9	1.58	<10	<1	0.19	10	0.59	354	1	0.09	8	390	23	0.95	<2
V829099		293	4.44	<10	1	0.26	10	0.30	469	3	0.01	9	170	19	3.42	<2
1125028141																
1125029004		28	2.34	<10	1	0.23	10	0.83	1610	1	0.01	9	390	72	1.89	<2
1125014012		42	4.96	10	1	0.35	10	0.92	1160	1	0.14	28	630	5	1.44	<2
1124001171		28	1.97	<10	1	0.20	10	0.85	1380	1	0.01	11	410	73	1.57	<2
1124001155		20	2.21	<10	1	0.26	10	0.80	1325	1	0.02	12	440	100	2.02	<2
1232002185		202	2.95	<10	<1	0.12	10	0.78	320	2	0.07	14	540	3	1.80	<2
1125029101		23	2.79	<10	1	0.18	10	0.58	1170	1	0.01	9	390	50	2.75	<2
1125028020		139	2.99	<10	1	0.15	10	0.32	323	1	<0.01	8	380	85	2.97	3
1125028108		48	2.41	<10	1	0.24	10	0.59	368	1	0.01	14	350	16	1.91	2
1124001195		23	2.23	<10	1	0.19	10	0.82	1690	<1	0.01	13	440	394	2.24	<2
1125028077		162	3.92	<10	2	0.24	10	0.32	434	<1	<0.01	9	370	67	3.92	2
1125028106		55	2.54	<10	1	0.26	10	1.08	701	1	0.01	17	500	11	1.43	<2

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1125012152		1	33	<20	0.01	<10	<10	6	<10	64	0.21	0.78	25	8.9	1	24.4
1125012113		1	72	<20	0.04	<10	<10	13	<10	264	0.41	0.57	36	9.0	18	17.8
1125012115		1	92	<20	0.05	<10	<10	13	<10	212	0.22	0.38	28	9.3	16	11.9
1125015197		<1	7	<20	<0.01	<10	<10	2	<10	980	0.15	3.09	14	8.3	-83	96.6
1125012014		1	22	<20	0.02	<10	<10	6	<10	286	0.36	1.43	36	8.9	-9	44.7
1125012041		1	29	<20	0.02	<10	<10	8	<10	5420	0.44	1.74	38	8.7	-16	54.4
1125012095		1	34	<20	0.03	<10	<10	9	<10	160	0.38	1.08	41	8.9	7	33.8
1125012065		1	26	<20	0.02	<10	<10	7	<10	202	0.34	1.15	28	8.6	-8	35.9
1125015084		<1	17	<20	0.01	<10	<10	5	<10	1480	0.25	1.86	29	8.3	-29	58.1
V829098		2	18	<20	0.37	<10	<10	56	<10	58	0.02					
1125010179		1	24	<20	<0.01	<10	<10	3	30	436	1.09	1.96	85	8.6	24	61.3
1125009357		<1	15	<20	<0.01	<10	<10	4	<10	2220	0.41	2.26	36	8.7	-35	70.6
1125010146		1	22	<20	<0.01	<10	<10	4	<10	220	0.84	1.62	69	8.6	18	50.6
1125016037		<1	28	<20	<0.01	<10	<10	4	<10	880	0.65	1.47	50	8.7	4	45.9
1125010101		1	24	<20	<0.01	<10	<10	4	<10	136	0.78	2.15	67	8.8	0	67.2
1125010120		1	27	<20	<0.01	<10	<10	4	<10	272	1.02	1.39	82	8.9	39	43.4
1125010159		1	25	<20	<0.01	<10	<10	4	<10	1085	1.22	1.77	94	8.5	39	55.3
1125016080		1	34	<20	0.01	<10	<10	6	<10	243	0.68	0.95	57	8.9	27	29.7
1125009342		<1	25	<20	<0.01	<10	<10	4	<10	1000	1.17	2.27	87	8.7	16	70.9
1125023019		11	78	<20	0.11	<10	<10	173	<10	710	1.50	2.13	171	8.3	104	66.6
1125023119																
1125009379		1	22	<20	<0.01	<10	<10	4	<10	763	1.21	1.80	88	9.0	32	56.3
1125023208		1	37	<20	0.03	<10	<10	17	<10	230	0.70	1.09	52	8.9	18	34.1
1125016031		1	27	<20	<0.01	<10	<10	6	<10	686	0.55	1.50	47	8.7	0	46.9
1125016015		<1	16	<20	<0.01	<10	<10	3	<10	1220	0.32	1.98	28	8.4	-34	61.9
1125016030		1	33	<20	0.01	<10	<10	6	<10	1455	0.54	1.41	47	8.8	3	44.1
1125016107		1	41	<20	<0.01	<10	<10	5	<10	59	0.16	0.94	18	8.6	-11	29.4
V829099		2	19	<20	0.01	<10	<10	7	<10	242	0.37					
1125028141																
1125029004		1	28	<20	<0.01	<10	<10	5	<10	184	0.99	1.96	76	8.8	15	61.3
1125014012		5	91	<20	0.07	<10	<10	87	<10	237	0.83	1.42	66	8.8	22	44.4
1124001171		1	24	<20	<0.01	<10	<10	4	<10	259	1.13	1.59	83	8.8	33	49.7
1124001155		1	26	<20	<0.01	<10	<10	4	<10	358	1.22	2.02	101	8.8	38	63.1
1232002185		1	40	<20	0.03	<10	<10	21	<10	71	0.12	1.79	13	8.0	-43	55.9
1125029101		1	32	<20	<0.01	<10	<10	4	<10	155	1.02	2.87	73	8.2	-17	89.7
1125028020		<1	7	<20	<0.01	<10	<10	3	<10	3920	0.42	3.06	13	7.9	-83	95.6
1125028108		<1	12	<20	<0.01	<10	<10	5	<10	1375	0.09	1.80	11	8.6	-45	56.3
1124001195		<1	18	<20	<0.01	<10	<10	3	<10	560	0.97	2.20	78	8.6	9	68.8
1125028077		<1	8	<20	<0.01	<10	<10	4	<10	7380	0.26	3.87	17	7.9	-104	120.9
1125028106		2	28	<20	0.01	<10	<10	15	<10	1070	0.37	1.40	37	8.6	-7	43.8

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5967 HWY 11/71
EMO ON P0W 1E0

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CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1125012152		1.03	2
1125012113		2.02	2
1125012115		2.36	2
1125015197		0.14	1
1125012014		0.81	2
1125012041		0.70	2
1125012095		1.21	2
1125012065		0.78	2
1125015084		0.50	2
V829098			
1125010179		1.39	2
1125009357		0.51	2
1125010146		1.36	2
1125016037		1.09	2
1125010101		1.00	2
1125010120		1.89	2
1125010159		1.70	3
1125016080		1.92	2
1125009342		1.23	2
1125023019		2.57	3
1125023119			
1125009379		1.56	2
1125023208		1.53	2
1125016031		1.00	2
1125016015		0.45	2
1125016030		1.07	2
1125016107		0.61	2
V829099			
1125028141			
1125029004		1.24	2
1125014012		1.49	2
1124001171		1.67	2
1124001155		1.60	3
1232002185		0.23	1
1125029101		0.81	2
1125028020		0.14	1
1125028108		0.20	1
1124001195		1.13	2
1125028077		0.14	2
1125028106		0.85	2

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CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr
	Units	kg	%	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1
1125028126		0.48		1.190		1.9	0.54	196	<10	20	<0.5	<2	1.14	13.8	8	346
1124001177		0.49		0.104		0.5	0.82	39	<10	20	<0.5	<2	2.11	<0.5	9	103
1125014014		0.63		0.093		1.6	2.88	36	<10	70	<0.5	3	2.90	1.6	39	174
V829100		0.06		0.939		2.4	1.12	<2	<10	80	<0.5	2	0.69	<0.5	13	8
1125024056		0.56		0.333		1.0	0.83	147	<10	40	<0.5	<2	0.56	0.6	8	256
1125018256		0.50		0.215		1.5	0.54	40	10	20	<0.5	<2	2.72	1.7	9	46
1125024201		0.53		1.335		9.5	1.19	117	<10	30	<0.5	2	0.95	13.9	7	255

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	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1125028126		68	2.87	<10	<1	0.21	10	0.38	759	1	<0.01	10	400	145	2.85	2
1124001177		20	2.02	<10	1	0.11	10	0.62	1145	1	0.01	12	420	49	2.07	<2
1125014014		124	10.45	10	1	0.36	10	1.23	1360	1	0.12	55	640	6	5.03	<2
V829100		58	3.19	10	<1	0.27	10	0.54	302	11	0.10	16	740	9	0.08	<2
1125024056		12	1.78	<10	1	0.29	10	0.36	284	1	0.01	12	440	18	1.47	2
1125018256		31	2.04	<10	1	0.16	<10	0.98	1585	1	0.01	11	450	202	2.04	2
1125024201		117	2.19	<10	1	0.38	10	0.80	605	1	0.01	9	380	750	1.86	7

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Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1125028126		<1	12	<20	<0.01	<10	<10	3	<10	3240	0.46	2.91	37	8.2	-54	90.9
1124001177		<1	19	<20	<0.01	<10	<10	3	<10	103	0.68	2.07	61	8.7	-4	64.7
1125014014		9	90	<20	0.11	<10	<10	182	<10	468	0.88	5.34	123	8.3	-44	166.9
V829100		3	17	<20	0.37	<10	<10	79	<10	51	0.05					
1125024056		1	11	<20	<0.01	<10	<10	5	<10	124	0.15	1.42	18	8.6	-26	44.4
1125018256		<1	26	<20	<0.01	<10	<10	2	<10	407	1.26	2.06	100	8.6	36	64.4
1125024201		1	18	<20	0.01	<10	<10	6	<10	3190	0.25	1.73	30	8.5	-24	54.1

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.

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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1125028126		0.41	2
1124001177		0.94	2
1125014014		0.74	3
V829100			
1125024056		0.41	2
1125018256		1.55	3
1125024201		0.55	2

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Finalized Date: 28-SEP-2018
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CERTIFICATE OF ANALYSIS TB18214709

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

CERTIFICATE TB18235181

Project: Mine Site Lab Pulps Aug

P.O. No.: 4500009909

This report is for 148 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 20-SEP-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

<Original signed by>

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1124002054		0.74	93.2	0.179		0.5	1.21	63	<10	30	<0.5	<2	0.87	0.5	10	84
1125014116		0.48		0.035		0.5	2.84	11	<10	60	<0.5	<2	2.09	<0.5	19	232
1125014101		0.49		0.048		0.7	3.24	18	<10	120	<0.5	<2	2.65	0.6	32	274
1124002069		0.50		0.573		2.7	0.79	90	<10	20	<0.5	<2	2.05	2.8	11	86
1125029133		0.50		0.373		1.9	0.76	78	<10	20	<0.5	<2	2.05	0.5	8	112
1124002043		0.42		0.043		0.6	1.17	31	<10	30	<0.5	<2	2.17	<0.5	9	183
1125014122		0.45		0.253		1.0	0.89	34	<10	40	<0.5	<2	1.21	1.5	7	216
1124001123		0.46		0.786		1.5	0.41	42	<10	30	<0.5	<2	2.55	3.1	8	103
1124001126		0.45		0.607		1.6	0.64	40	<10	40	<0.5	<2	2.67	4.9	7	152
1125029121		0.52		0.931		1.5	0.39	84	<10	40	<0.5	<2	0.80	13.1	5	118
1125029001		0.44		0.749		1.6	1.05	50	<10	30	<0.5	<2	1.77	1.1	7	166
1124002090		0.53		0.061		1.0	1.09	33	<10	30	<0.5	<2	1.41	<0.5	7	101
1125014127		0.52		0.080		1.1	3.54	18	<10	90	<0.5	<2	3.31	1.4	33	91
1124002006		0.53		0.012		0.3	0.72	13	<10	30	<0.5	<2	1.70	<0.5	7	80
1125014158		0.45		0.008		<0.2	1.28	2	<10	60	<0.5	<2	2.32	<0.5	12	113
1125014159		0.54		0.007		<0.2	1.22	2	<10	80	<0.5	<2	2.48	<0.5	11	106
1124002028		0.56		0.043		0.4	1.09	39	<10	30	<0.5	<2	1.56	<0.5	7	95
1124001016		0.40		0.285		3.1	0.44	24	<10	30	<0.5	2	2.50	2.5	7	95
V835501		0.06		1.955		3.2	0.90	<2	<10	70	<0.5	<2	0.42	<0.5	9	13
1124016092		0.42		0.227		0.9	1.65	64	10	30	<0.5	<2	1.66	1.5	8	111
1124005087		Not Recvd														
1124005105		0.46		0.104		1.0	0.52	34	<10	20	<0.5	<2	1.97	<0.5	7	48
1124005122		0.48		1.825		3.9	0.73	24	<10	20	<0.5	<2	2.12	2.6	7	70
1124005123		0.45		0.308		2.1	0.76	24	<10	20	<0.5	2	2.07	1.5	8	77
1124005140		0.46		0.172		2.1	0.56	42	<10	20	<0.5	<2	1.99	0.7	8	93
1124005160		0.49		0.711		3.1	0.56	39	<10	20	<0.5	<2	2.18	1.9	8	57
1124016016		0.44		0.070		0.5	1.62	36	10	30	<0.5	<2	1.65	<0.5	7	131
1124016032		0.51		1.025		3.1	0.30	78	<10	20	<0.5	<2	2.85	2.3	11	83
1124016065		0.52		0.077		0.6	1.09	28	<10	30	<0.5	<2	2.05	0.5	6	112
1124016010		0.51		1.205		0.8	0.90	47	<10	20	<0.5	<2	2.96	0.6	8	52
1232002846		0.54		0.053		0.5	0.83	8	<10	30	<0.5	2	0.62	0.7	10	91
12320021153		0.47		0.096		1.1	0.84	17	<10	20	<0.5	2	0.68	1.7	9	94
1124016072		0.50		1.545		3.3	0.35	127	<10	20	<0.5	<2	1.49	29.2	7	110
1124016087		0.48		0.752		1.0	0.92	159	<10	20	<0.5	<2	1.99	1.0	9	93
1124016114		0.41		0.153		0.5	1.66	58	10	30	<0.5	<2	1.75	<0.5	10	74
V835502		0.06		0.767		3.2	0.79	3	<10	60	<0.5	2	1.62	<0.5	8	8
1124014027		0.49		0.206		0.8	2.11	26	<10	30	<0.5	<2	1.56	<0.5	9	109
1124014029		0.57		0.102		0.7	1.90	7	<10	50	<0.5	<2	1.72	<0.5	12	106
12320021138		0.52		0.058		0.4	1.05	6	<10	40	<0.5	3	0.63	<0.5	9	104
1124010068		0.49		0.011		0.2	1.05	5	<10	50	<0.5	<2	1.34	<0.5	8	110

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1124002054		41	1.98	<10	<1	0.16	10	0.64	499	1	0.02	13	530	19	1.20	<2
1125014116		58	4.10	10	<1	0.28	20	1.10	679	1	0.17	27	750	14	0.65	<2
1125014101		60	6.40	10	<1	0.49	10	1.48	917	1	0.16	51	730	15	1.49	<2
1124002069		52	2.33	<10	<1	0.12	10	0.62	778	1	0.01	10	560	215	2.08	2
1125029133		27	1.94	<10	<1	0.15	10	0.61	1210	1	0.01	7	390	73	1.62	<2
1124002043		20	1.54	<10	<1	0.12	10	0.70	531	1	0.07	10	360	13	0.70	<2
1125014122		36	1.92	<10	<1	0.15	10	0.51	494	2	0.03	8	480	98	0.70	2
1124001123		53	1.93	<10	<1	0.16	<10	0.85	1545	1	0.02	10	390	157	1.80	<2
1124001126		73	1.99	<10	<1	0.22	10	0.84	1440	1	0.02	11	400	125	1.94	2
1125029121		104	1.70	<10	<1	0.19	10	0.44	1365	<1	0.01	7	260	126	1.60	<2
1125029001		47	1.93	<10	<1	0.25	10	0.61	959	1	0.02	9	380	529	1.54	2
1124002090		12	1.44	<10	<1	0.12	10	0.55	411	1	0.06	10	380	11	0.60	<2
1125014127		120	9.02	10	<1	0.44	10	1.47	1555	1	0.19	52	690	11	2.15	<2
1124002006		9	1.51	<10	<1	0.11	10	0.39	271	1	0.07	8	340	7	1.51	<2
1125014158		4	2.50	10	<1	0.20	20	0.99	562	<1	0.04	18	690	3	0.69	<2
1125014159		2	2.44	10	<1	0.28	20	0.98	614	1	0.04	19	680	<2	0.67	<2
1124002028		13	1.75	<10	<1	0.11	10	0.59	384	<1	0.09	8	320	8	1.32	<2
1124001016		33	2.06	<10	<1	0.16	10	0.79	1280	1	0.02	10	390	54	2.16	<2
V835501		258	1.98	<10	<1	0.24	10	0.37	225	15	0.12	12	370	18	0.07	<2
1124016092		48	2.02	<10	<1	0.14	10	0.94	549	1	0.07	9	430	27	1.36	<2
1124005087																
1124005105		26	1.67	<10	1	0.09	10	0.44	975	<1	0.02	6	410	13	1.80	<2
1124005122		43	1.73	<10	<1	0.14	10	0.46	1020	1	0.03	9	400	54	1.73	<2
1124005123		29	1.82	<10	<1	0.14	10	0.44	937	1	0.03	10	420	28	1.81	<2
1124005140		43	2.29	<10	<1	0.12	10	0.45	1210	1	0.02	11	450	42	2.49	<2
1124005160		56	1.79	<10	<1	0.12	10	0.42	1025	1	0.02	10	420	197	1.87	<2
1124016016		14	1.67	<10	<1	0.13	10	1.07	519	<1	0.05	8	370	31	1.05	<2
1124016032		72	1.74	<10	<1	0.15	<10	0.51	1530	1	0.01	15	400	311	1.76	3
1124016065		16	1.39	<10	<1	0.12	10	0.79	496	<1	0.03	7	330	20	0.80	<2
1124016010		31	1.97	<10	<1	0.12	20	0.76	884	1	0.02	7	520	23	1.48	<2
1232002846		54	2.44	<10	<1	0.11	10	0.48	205	1	0.06	12	490	4	2.36	<2
12320021153		83	2.55	<10	<1	0.08	20	0.54	334	1	0.06	10	530	5	2.73	2
1124016072		230	2.89	<10	1	0.14	<10	0.54	936	1	0.01	10	360	235	3.36	3
1124016087		33	2.12	<10	<1	0.14	20	0.55	695	<1	0.02	9	510	79	1.78	<2
1124016114		25	2.25	<10	<1	0.15	20	1.01	708	<1	0.04	9	570	25	1.12	<2
V835502		35	2.73	<10	<1	0.21	10	0.36	214	14	0.10	12	480	17	0.05	<2
1124014027		34	2.07	<10	<1	0.17	10	0.70	570	1	0.13	10	510	23	1.07	<2
1124014029		28	2.62	10	1	0.20	10	0.69	588	2	0.12	22	520	12	0.51	<2
12320021138		34	2.71	<10	<1	0.10	20	0.58	202	1	0.08	9	540	5	2.97	<2
1124010068		43	1.89	<10	<1	0.24	10	0.64	327	1	0.05	9	390	4	0.32	<2

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EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1124002054		1	17	<20	<0.01	<10	<10	6	<10	135	0.30	1.32	29	9.0	-12	41.3
1125014116		5	112	<20	0.10	<10	<10	74	<10	216	0.38	0.66	38	9.1	17	20.6
1125014101		7	69	<20	0.17	<10	<10	132	<10	276	0.60	1.36	54	8.8	12	42.5
1124002069		1	22	<20	<0.01	<10	<10	4	<10	676	0.73	2.12	56	8.8	-10	66.3
1125029133		<1	22	<20	<0.01	<10	<10	5	<10	154	0.77	1.58	58	8.8	9	49.4
1124002043		1	44	<20	<0.01	<10	<10	6	10	65	0.63	0.68	50	9.3	29	21.3
1125014122		1	34	<20	0.02	<10	<10	12	<10	469	0.46	0.71	37	9.3	15	22.2
1124001123		<1	19	<20	<0.01	<10	<10	2	<10	791	1.35	1.93	100	9.1	40	60.3
1124001126		<1	23	<20	<0.01	<10	<10	3	<10	1305	1.27	1.74	100	9.1	46	54.4
1125029121		<1	135	<20	<0.01	<10	<10	2	<10	3130	0.51	1.53	34	9.1	-14	47.8
1125029001		1	19	<20	<0.01	<10	<10	6	<10	470	0.61	1.55	48	9.1	0	48.4
1124002090		1	28	<20	<0.01	<10	<10	5	<10	63	0.39	0.61	35	9.3	16	19.1
1125014127		13	127	<20	0.11	<10	<10	216	<10	359	0.99	2.33	75	8.7	2	72.8
1124002006		<1	39	<20	<0.01	<10	<10	3	<10	64	0.49	1.46	43	9.3	-3	45.6
1125014158		2	58	<20	0.03	<10	<10	33	<10	68	0.71	0.66	61	9.5	40	20.6
1125014159		2	63	<20	0.04	<10	<10	33	<10	70	0.78	0.65	66	9.4	46	20.3
1124002028		<1	52	<20	<0.01	<10	<10	6	<10	83	0.42	1.29	38	9.1	-2	40.3
1124001016		<1	20	<20	<0.01	<10	<10	2	<10	626	1.18	2.10	94	9.2	28	65.6
V835501		1	19	<20	0.29	<10	<10	43	<10	52	0.02					
1124016092		1	38	<20	<0.01	<10	<10	6	<10	386	0.51	1.29	41	8.9	1	40.3
1124005087																
1124005105		<1	20	<20	<0.01	<10	<10	2	<10	72	0.70	1.84	55	9.2	-3	57.5
1124005122		<1	20	<20	<0.01	<10	<10	3	<10	682	0.68	1.74	57	9.1	3	54.4
1124005123		<1	22	<20	<0.01	<10	<10	3	<10	382	0.68	1.79	54	9.0	-2	55.9
1124005140		<1	20	<20	<0.01	<10	<10	2	<10	151	0.76	2.36	56	8.8	-18	73.8
1124005160		<1	17	<20	<0.01	<10	<10	2	<10	456	0.80	1.74	58	9.0	4	54.4
1124016016		<1	34	<20	<0.01	<10	<10	5	<10	110	0.62	1.00	43	9.0	12	31.3
1124016032		<1	19	<20	<0.01	<10	<10	2	<10	621	1.18	1.71	93	9.1	40	53.4
1124016065		<1	21	<20	<0.01	<10	<10	4	<10	123	0.71	0.74	55	9.2	32	23.1
1124016010		1	26	<20	<0.01	<10	<10	4	<10	159	1.05	1.49	82	9.1	35	46.6
1232002846		1	24	<20	0.01	<10	<10	10	<10	174	0.13	2.19	15	8.8	-53	68.4
12320021153		<1	22	<20	<0.01	<10	<10	5	<10	389	0.18	2.89	17	8.5	-73	90.3
1124016072		<1	16	<20	<0.01	<10	<10	2	<10	7140	0.87	3.22	57	8.6	-44	100.6
1124016087		1	22	<20	<0.01	<10	<10	5	<10	251	0.67	1.71	52	8.6	-1	53.4
1124016114		1	29	<20	<0.01	<10	<10	10	<10	121	0.53	1.04	44	9.1	12	32.5
V835502		2	36	<20	0.25	<10	<10	43	<10	40	0.43					
1124014027		1	71	<20	0.02	<10	<10	11	<10	155	0.39	1.01	30	9.0	-2	31.6
1124014029		2	66	<20	0.05	<10	<10	33	<10	127	0.45	0.47	36	9.2	21	14.7
12320021138		1	33	<20	<0.01	<10	<10	6	<10	44	0.10	3.05	14	8.8	-81	95.3
1124010068		2	27	<20	0.04	<10	<10	17	<10	63	0.43	0.30	39	9.3	30	9.4

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1124002054		0.70	2
1125014116		1.84	2
1125014101		1.27	2
1124002069		0.85	2
1125029133		1.17	2
1124002043		2.35	2
1125014122		1.67	2
1124001123		1.66	3
1124001126		1.84	3
1125029121		0.71	2
1125029001		0.99	2
1124002090		1.84	2
1125014127		1.03	2
1124002006		0.94	2
1125014158		2.96	2
1125014159		3.25	2
1124002028		0.94	2
1124001016		1.43	3
V835501			
1124016092		1.02	2
1124005087			
1124005105		0.96	2
1124005122		1.05	2
1124005123		0.97	2
1124005140		0.76	2
1124005160		1.07	2
1124016016		1.38	2
1124016032		1.74	3
1124016065		2.38	2
1124016010		1.76	2
1232002846		0.22	1
12320021153		0.19	1
1124016072		0.57	2
1124016087		0.97	2
1124016114		1.35	2
V835502			
1124014027		0.95	2
1124014029		2.45	2
12320021138		0.15	1
1124010068		4.16	2

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1232002520		0.49		0.173		0.4	1.17	7	<10	40	<0.5	<2	0.94	0.5	12	128
1124016127		0.41		1.095		2.1	0.29	42	<10	20	<0.5	<2	2.62	4.8	9	170
1232002518		0.43		0.219		0.4	0.75	11	<10	40	<0.5	<2	0.73	<0.5	12	142
1124010027		0.47		0.045		0.3	1.11	6	<10	50	<0.5	<2	1.89	<0.5	7	118
1124010058		0.47		0.227		1.0	1.53	53	10	30	<0.5	<2	0.99	<0.5	9	73
1124014066		0.50		0.195		0.7	2.58	42	<10	60	<0.5	<2	2.06	0.5	9	141
1124014090		0.53		0.136		1.4	3.04	19	<10	60	<0.5	2	3.22	5.6	38	89
1124010005		0.50		0.026		0.3	1.10	8	<10	40	<0.5	<2	2.18	<0.5	8	89
1124010008		0.50		0.067		0.6	1.42	33	<10	40	<0.5	<2	1.54	<0.5	8	180
1124010082		0.48	85.7	0.171		25.6	2.43	17	<10	30	<0.5	<2	1.36	<0.5	9	93
1124014020		0.46		0.044		0.4	1.13	7	<10	50	<0.5	<2	1.84	<0.5	8	112
1124014067		0.57		0.129		1.0	2.48	17	<10	360	0.9	2	3.09	<0.5	15	143
V835503		0.06		0.964		2.5	1.14	<2	<10	90	<0.5	<2	0.74	<0.5	14	9
1124014032		0.48		0.009		<0.2	1.17	4	<10	70	<0.5	<2	2.41	<0.5	12	137
1124017001		0.49		0.490		1.8	2.00	36	<10	30	<0.5	<2	1.39	0.6	11	100
1232002971		0.57		0.544		1.2	1.49	15	<10	30	<0.5	3	0.86	<0.5	10	119
1232002007		0.53		2.17		1.5	1.19	17	<10	30	<0.5	5	0.55	<0.5	11	175
1124020037		0.47		>10.0	9.62	2.0	0.99	65	<10	20	<0.5	2	1.72	8.3	8	133
1232002768		0.54		0.072		0.7	0.94	7	<10	20	<0.5	3	0.69	0.7	9	138
1124017045		0.55		0.226		0.6	3.16	36	<10	40	<0.5	<2	1.86	<0.5	10	84
1124017070		0.49		0.743		0.8	1.65	35	10	40	<0.5	<2	2.23	3.9	10	75
1124020002		0.47		0.478		0.5	0.69	57	<10	20	<0.5	<2	2.44	1.6	9	97
1232002720		0.46		0.029		0.5	0.89	4	<10	20	<0.5	3	0.28	0.5	8	109
1124014008		0.51		0.046		0.5	1.92	14	<10	60	<0.5	<2	1.40	<0.5	8	100
1124014003		0.52		0.065		0.3	1.35	7	<10	70	<0.5	<2	1.71	<0.5	9	190
1124014001		0.52		0.064		0.5	1.08	11	<10	60	<0.5	<2	2.38	<0.5	10	82
1124017076		0.51		1.830		4.7	0.56	84	<10	20	<0.5	<2	1.92	14.4	8	121
1124014014		0.51		0.012		0.2	1.61	5	<10	130	<0.5	<2	2.53	<0.5	13	88
1124017071		0.47		0.414		0.5	2.22	25	10	30	<0.5	<2	1.30	0.8	10	93
1124017100		0.52		1.665		3.4	0.30	106	<10	20	<0.5	<2	2.25	6.9	7	117
1124014016		0.54		0.044		0.3	1.28	6	<10	60	<0.5	<2	1.67	<0.5	8	172
V835504		0.06		2.01		3.4	0.93	<2	<10	70	<0.5	<2	0.44	<0.5	10	14
1124017037		0.49		3.47		2.8	1.04	114	<10	20	<0.5	<2	0.41	8.1	8	114
1232002743		0.54		0.019		0.3	1.05	2	<10	30	<0.5	2	0.43	<0.5	8	116
1124020054		0.52		1.015		1.2	1.29	52	<10	20	<0.5	2	1.75	4.5	8	103
1124017016		0.48		2.35		1.5	1.06	44	<10	30	<0.5	<2	1.43	3.9	6	81
1124020015		0.49		0.529		1.8	0.71	64	<10	30	<0.5	2	2.55	7.9	8	94
1124020075		0.45		1.680		1.5	1.72	66	<10	20	<0.5	3	0.34	<0.5	8	120
1124015007		Not Recvd														
1124015201		0.49		0.097		0.5	1.02	10	<10	30	<0.5	<2	2.44	<0.5	9	112

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1232002520		91	2.48	<10	<1	0.14	10	0.72	345	1	0.08	17	500	3	1.26	<2
1124016127		83	2.24	<10	<1	0.15	<10	0.63	1545	1	0.01	12	400	149	2.27	<2
1232002518		111	2.24	<10	<1	0.09	10	0.55	383	3	0.05	11	400	4	1.90	<2
1124010027		20	1.89	<10	<1	0.13	10	0.63	398	<1	0.03	10	430	4	0.37	<2
1124010058		21	1.96	<10	<1	0.11	20	0.70	375	1	0.03	11	570	8	1.01	2
1124014066		41	2.25	10	<1	0.19	20	0.96	558	1	0.09	11	620	21	0.98	<2
1124014090		117	7.80	10	<1	0.37	10	1.45	1365	2	0.12	55	720	21	1.59	2
1124010005		39	1.90	<10	<1	0.13	10	0.68	493	1	0.04	11	450	5	0.35	<2
1124010008		28	1.81	<10	<1	0.14	10	0.81	488	1	0.06	13	410	9	0.68	<2
1124010082		31	2.12	10	1	0.14	20	0.77	409	1	0.15	11	590	18	0.45	2
1124014020		12	1.97	<10	<1	0.18	10	0.67	609	1	0.06	14	440	4	0.54	<2
1124014067		50	2.86	10	<1	0.73	30	1.65	637	2	0.08	23	1640	22	0.80	<2
V835503		57	3.24	10	<1	0.27	10	0.56	307	11	0.10	16	750	7	0.09	<2
1124014032		11	2.55	10	<1	0.25	20	0.98	600	<1	0.04	18	680	3	0.18	<2
1124017001		33	2.41	<10	<1	0.13	20	0.87	570	1	0.12	11	560	33	1.43	<2
1232002971		417	2.84	<10	<1	0.10	10	0.61	400	3	0.13	11	400	3	2.31	<2
1232002007		361	3.52	<10	<1	0.10	10	0.59	363	4	0.07	11	400	4	3.02	<2
1124020037		110	2.82	<10	1	0.14	10	0.76	1030	<1	0.01	12	430	56	2.30	<2
1232002768		54	2.33	<10	<1	0.09	20	0.69	272	1	0.05	11	540	3	2.18	<2
1124017045		18	2.43	10	<1	0.16	20	1.02	648	1	0.15	11	580	25	0.98	<2
1124017070		52	2.70	<10	<1	0.17	20	1.17	792	<1	0.02	16	630	52	1.37	<2
1124020002		26	1.96	<10	<1	0.21	10	0.78	1350	<1	0.01	13	430	45	1.70	<2
1232002720		20	2.04	<10	<1	0.09	20	0.70	136	1	0.04	8	460	3	2.13	<2
1124014008		27	1.71	10	<1	0.22	20	0.65	369	1	0.15	11	520	17	0.56	<2
1124014003		15	2.18	10	<1	0.33	10	0.76	578	2	0.07	15	480	5	0.52	<2
1124014001		31	2.25	<10	<1	0.18	10	0.65	668	2	0.04	13	430	4	1.01	<2
1124017076		114	3.02	<10	<1	0.18	10	0.78	1410	1	0.01	10	400	432	2.81	2
1124014014		4	2.66	10	<1	0.49	20	1.14	592	<1	0.06	20	700	5	0.17	<2
1124017071		40	2.37	10	<1	0.15	20	1.00	753	1	0.05	11	590	77	0.97	2
1124017100		93	2.24	<10	<1	0.15	10	0.63	1405	1	<0.01	11	420	253	2.22	<2
1124014016		15	1.99	10	<1	0.23	20	0.74	523	1	0.06	15	480	5	0.43	<2
V835504		264	2.04	<10	<1	0.24	10	0.39	232	13	0.12	12	380	18	0.06	<2
1124017037		117	3.89	<10	1	0.16	10	0.81	487	1	<0.01	10	360	570	3.50	2
1232002743		19	1.95	<10	<1	0.11	20	0.80	191	1	0.05	10	520	3	1.77	<2
1124020054		53	2.49	<10	<1	0.15	10	0.82	906	<1	0.03	10	410	48	2.02	<2
1124017016		49	1.79	<10	<1	0.18	10	0.85	701	<1	<0.01	7	370	99	1.27	<2
1124020015		63	2.19	<10	1	0.23	10	0.83	1340	1	0.01	10	410	140	2.03	<2
1124020075		93	4.95	<10	<1	0.19	10	1.10	753	<1	<0.01	10	410	28	3.31	<2
1124015007																
1124015201		42	2.18	<10	<1	0.12	10	0.77	556	2	0.05	14	420	3	0.84	<2

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1232002520		2	36	<20	0.06	<10	<10	30	10	152	0.18	1.21	20	8.9	-18	37.8
1124016127		<1	20	<20	<0.01	<10	<10	2	<10	1305	1.27	2.17	90	8.8	22	67.8
1232002518		1	18	<20	0.01	<10	<10	10	40	47	0.24	1.88	18	8.6	-41	58.8
1124010027		1	36	<20	0.01	<10	<10	12	<10	47	0.59	0.36	51	9.4	40	11.3
1124010058		1	28	<20	<0.01	<10	<10	8	<10	107	0.29	0.94	25	8.9	-4	29.4
1124014066		1	69	<20	0.04	<10	<10	15	<10	158	0.46	0.91	37	8.9	9	28.4
1124014090		9	94	<20	0.10	<10	<10	174	<10	984	1.11	1.52	134	8.6	87	47.5
1124010005		1	43	<20	0.01	<10	<10	14	<10	71	0.73	0.33	57	9.4	47	10.3
1124010008		1	40	<20	0.01	<10	<10	11	<10	96	0.60	0.64	38	9.1	18	20.0
1124010082		1	101	<20	0.02	<10	<10	14	10	108	0.35	0.42	25	9.1	12	13.1
1124014020		2	30	<20	0.03	<10	<10	25	<10	101	0.54	0.52	49	9.4	33	16.3
1124014067		5	194	<20	0.12	<10	<10	40	<10	133	0.92	0.76	69	9.0	45	23.8
V835503		3	17	<20	0.37	<10	<10	81	<10	51	0.05					
1124014032		3	161	<20	0.03	<10	<10	39	<10	99	0.92	0.16	69	9.1	64	5.0
1124017001		1	46	<20	0.02	<10	<10	9	<10	220	0.26	1.42	28	8.7	-16	44.4
1232002971		1	57	<20	0.01	<10	<10	10	10	56	0.14	2.22	14	8.2	-55	69.4
1232002007		1	34	<20	<0.01	<10	<10	7	<10	90	0.09	2.88	11	7.9	-79	90.0
1124020037		<1	17	<20	<0.01	<10	<10	4	<10	1825	0.54	2.20	48	8.5	-21	68.8
1232002768		1	24	<20	0.01	<10	<10	11	<10	103	0.20	2.16	18	8.2	-50	67.5
1124017045		1	79	<20	0.01	<10	<10	12	<10	138	0.19	0.94	30	9.0	1	29.4
1124017070		1	48	<20	0.01	<10	<10	15	<10	966	0.65	1.32	57	8.9	16	41.3
1124020002		<1	21	<20	<0.01	<10	<10	3	<10	361	1.00	1.67	80	9.0	28	52.2
1232002720		<1	15	<20	<0.01	<10	<10	5	<10	82	0.07	2.18	8	8.3	-60	68.1
1124014008		1	109	<20	0.04	<10	<10	13	<10	99	0.22	0.52	27	9.1	11	16.3
1124014003		2	47	<20	0.06	<10	<10	29	<10	118	0.65	0.49	46	8.9	31	15.3
1124014001		1	40	<20	0.01	<10	<10	14	<10	107	0.77	0.94	62	9.0	33	29.4
1124017076		<1	20	<20	<0.01	<10	<10	3	<10	3600	1.04	2.83	71	8.7	-17	88.4
1124014014		4	78	<20	0.07	<10	<10	46	<10	106	0.82	0.14	69	9.5	65	4.4
1124017071		1	56	<20	0.01	<10	<10	9	<10	328	0.21	0.88	27	9.0	-1	27.5
1124017100		<1	18	<20	<0.01	<10	<10	2	<10	1805	1.10	2.21	78	8.8	9	69.1
1124014016		2	43	<20	0.04	<10	<10	23	<10	84	0.62	0.39	42	9.3	30	12.2
V835504		1	20	<20	0.29	<10	<10	44	<10	53	0.02					
1124017037		<1	9	<20	<0.01	<10	<10	4	<10	2060	0.12	3.32	12	8.4	-92	103.8
1232002743		1	20	<20	0.01	<10	<10	11	<10	61	0.09	1.83	12	8.6	-45	57.2
1124020054		<1	22	<20	<0.01	<10	<10	4	<10	964	0.48	1.98	44	8.6	-18	61.9
1124017016		<1	19	<20	<0.01	<10	<10	4	<10	1055	0.44	1.28	39	8.9	-1	40.0
1124020015		<1	24	<20	<0.01	<10	<10	3	<10	1725	1.05	1.97	82	8.9	20	61.6
1124020075		1	7	<20	<0.01	<10	<10	6	<10	135	0.06	3.25	12	8.2	-90	101.6
1124015007																
1124015201		2	38	<20	0.01	<10	<10	18	<10	82	0.90	0.89	69	9.2	41	27.8

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1232002520		0.53	1
1124016127		1.33	3
1232002518		0.31	1
1124010027		4.53	2
1124010058		0.85	2
1124014066		1.30	2
1124014090		2.82	3
1124010005		5.53	2
1124010008		1.90	2
1124010082		1.90	2
1124014020		3.02	2
1124014067		2.91	2
V835503			
1124014032		13.80	2
1124017001		0.63	2
1232002971		0.20	1
1232002007		0.12	1
1124020037		0.70	2
1232002768		0.27	1
1124017045		1.02	2
1124017070		1.38	2
1124020002		1.53	2
1232002720		0.12	1
1124014008		1.66	2
1124014003		3.00	2
1124014001		2.11	2
1124017076		0.80	2
1124014014		15.77	2
1124017071		0.98	2
1124017100		1.13	2
1124014016		3.45	2
V835504			
1124017037		0.12	1
1232002743		0.21	1
1124020054		0.71	2
1124017016		0.98	2
1124020015		1.33	2
1124020075		0.12	1
1124015007			
1124015201		2.48	2

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5967 HWY 11/71
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Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
2137010010		0.49		<0.005		<0.2	1.94	3	<10	90	<0.5	<2	1.87	<0.5	9	131
1124018131		0.47		1.440		1.3	0.97	51	<10	20	<0.5	<2	1.55	2.8	6	69
1124018123		0.48		0.220		0.4	1.52	52	<10	20	<0.5	<2	0.90	1.9	9	93
1124015152		0.46		0.038		0.3	1.07	8	<10	40	<0.5	<2	1.62	2.0	8	70
1124015013		0.47		0.044		<0.2	1.02	4	<10	50	<0.5	<2	1.69	<0.5	7	107
1124020087		0.34		0.830		1.4	2.01	21	<10	30	<0.5	<2	1.64	1.7	8	87
1124020089		0.46		0.446		1.0	2.26	37	<10	30	<0.5	<2	1.80	2.8	8	78
1124020049		0.46		0.080		0.6	2.35	32	<10	30	<0.5	<2	1.92	0.9	8	95
1124018044		0.46		0.256		1.6	1.94	47	<10	130	0.6	<2	2.04	4.0	11	80
1124018091		0.46		0.438		1.3	1.19	61	<10	30	<0.5	<2	1.73	2.0	11	47
1124025102		Not Recvd														
1124018042		0.50		>10.0	33.6	8.2	2.08	43	<10	30	<0.5	<2	1.78	0.5	10	63
1124018017		0.48		0.453		1.1	0.73	63	<10	20	<0.5	<2	1.68	3.0	7	88
V835505		0.06		0.755		3.6	0.78	2	<10	60	<0.5	<2	1.59	<0.5	12	8
1124003061		0.51		0.653		1.2	0.55	137	<10	20	<0.5	<2	1.34	1.1	11	81
1124003135		0.53		0.550		1.9	0.27	49	<10	20	<0.5	<2	2.94	2.2	8	129
1124003092		0.51		5.02		5.5	0.32	72	<10	20	<0.5	<2	1.64	4.2	14	141
1124007068		0.54		0.035		0.3	1.74	8	<10	50	<0.5	<2	1.92	<0.5	11	262
1124003015		0.55		1.790		5.7	0.53	47	<10	30	<0.5	<2	2.13	5.9	8	75
1124003001		0.41	94.3	0.249		0.6	0.88	89	<10	40	<0.5	<2	1.94	<0.5	9	205
1124003329		0.49		0.651		4.7	0.42	35	<10	20	<0.5	2	2.49	2.8	8	108
1124003315		Not Recvd														
1124003131		0.55		1.175		1.3	0.62	59	<10	20	<0.5	<2	1.80	0.7	9	72
1124007053		0.50		0.058		0.4	1.20	46	<10	40	<0.5	<2	2.54	<0.5	6	160
1124003147		0.51		0.472		1.6	0.52	53	<10	20	<0.5	<2	2.40	2.1	9	114
1124003304		0.53		0.973		3.4	0.59	26	<10	30	<0.5	<2	2.31	3.1	8	250
1124007064		0.57		0.067		0.2	0.97	6	<10	30	<0.5	<2	1.62	<0.5	8	138
1124006013		0.53		0.033		0.2	1.05	4	<10	50	<0.5	<2	1.26	<0.5	7	152
1124003049		0.47		0.645		1.7	0.49	48	<10	30	<0.5	<2	2.51	2.5	8	63
1124003017		0.48		0.808		3.3	0.42	40	<10	30	<0.5	<2	2.28	1.7	8	109
1124007001		0.56		0.020		0.2	1.04	10	<10	90	<0.5	<2	2.08	0.6	11	72
V835506		0.06		0.944		2.4	1.09	<2	<10	80	<0.5	<2	0.68	<0.5	13	8
1124001131		0.45		0.913		2.0	0.67	37	<10	40	<0.5	<2	2.46	2.2	8	169
1124004104		0.40		0.351		1.8	0.77	33	<10	30	<0.5	<2	2.07	1.1	7	184
1124004127		0.37		0.249		1.9	0.75	35	<10	20	<0.5	<2	1.68	1.2	8	126
1124004010		0.43		0.266		10.5	0.75	18	<10	20	<0.5	<2	1.28	1.0	7	75
1124004070		0.41		0.229		4.0	0.63	35	<10	20	<0.5	<2	1.04	7.7	8	180
1124001107		0.52		0.649		2.6	0.45	39	<10	20	<0.5	<2	2.12	4.6	9	119
1124003084		0.41		0.569		0.9	0.58	35	<10	30	<0.5	2	2.43	4.5	9	109
1124004001		0.47		0.659		2.0	0.73	21	<10	30	<0.5	<2	1.74	3.7	10	89

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
2137010010		9	1.88	10	<1	0.40	10	0.54	258	<1	0.14	11	430	4	0.06	<2
1124018131		65	1.74	<10	1	0.19	10	0.77	815	<1	0.01	7	370	166	1.29	<2
1124018123		31	2.38	<10	<1	0.10	20	0.81	637	<1	0.03	10	570	19	1.17	<2
1124015152		33	1.96	<10	<1	0.18	10	0.63	484	1	0.04	11	410	<2	0.56	<2
1124015013		21	1.79	<10	<1	0.21	10	0.65	415	1	0.05	9	390	<2	0.28	<2
1124020087		34	1.79	<10	<1	0.17	10	0.55	413	1	0.22	10	390	147	1.60	2
1124020089		39	1.81	<10	<1	0.16	10	0.65	498	1	0.24	11	380	92	1.56	4
1124020049		35	1.76	<10	1	0.18	10	0.72	587	1	0.16	11	380	58	1.34	<2
1124018044		64	2.81	<10	1	0.33	20	1.12	622	1	0.06	16	1040	76	1.83	<2
1124018091		53	1.81	<10	1	0.24	10	0.83	886	9	0.02	11	380	62	1.32	<2
1124025102																
1124018042		28	2.17	<10	<1	0.15	20	0.88	581	1	0.08	9	560	43	1.26	<2
1124018017		32	1.70	<10	<1	0.18	10	0.54	786	<1	0.01	7	360	60	1.51	2
V835505		32	2.68	<10	<1	0.21	10	0.35	215	14	0.10	11	490	16	0.04	<2
1124003061		32	2.45	<10	<1	0.13	10	0.49	888	1	0.02	10	530	56	2.27	<2
1124003135		40	2.00	<10	<1	0.13	10	0.63	1810	1	0.01	13	390	343	2.02	<2
1124003092		71	2.33	<10	1	0.14	10	0.66	1545	1	0.02	15	480	713	2.35	4
1124007068		32	1.98	10	<1	0.13	20	1.03	373	1	0.09	26	570	8	0.39	<2
1124003015		193	2.11	<10	<1	0.20	10	0.81	1435	1	0.02	11	430	653	2.20	2
1124003001		20	2.18	<10	<1	0.19	10	0.65	970	<1	0.03	11	530	21	1.77	2
1124003329		70	1.98	<10	<1	0.14	<10	0.55	1270	1	0.02	12	430	339	2.09	2
1124003315																
1124003131		38	1.96	<10	<1	0.16	10	0.68	2010	<1	0.02	10	460	31	1.38	<2
1124007053		12	1.54	<10	1	0.17	10	0.65	568	<1	0.03	9	350	6	0.71	<2
1124003147		47	2.11	<10	<1	0.14	10	0.59	1295	1	0.02	11	430	150	2.11	<2
1124003304		80	2.06	<10	<1	0.20	10	0.58	1240	1	0.02	12	420	194	2.06	<2
1124007064		26	1.92	<10	<1	0.10	10	0.59	368	1	0.04	10	380	11	0.48	<2
1124006013		10	1.96	10	<1	0.18	10	0.65	293	1	0.05	10	390	6	0.41	<2
1124003049		34	1.94	<10	<1	0.18	10	0.81	1570	1	0.02	10	410	230	1.97	2
1124003017		51	1.96	<10	<1	0.14	10	0.77	1420	1	0.02	11	430	122	1.96	<2
1124007001		15	1.97	<10	<1	0.19	20	0.68	451	1	0.04	13	600	3	0.42	<2
V835506		58	3.10	<10	<1	0.26	10	0.52	303	10	0.11	16	730	6	0.07	<2
1124001131		63	1.97	<10	1	0.23	10	0.92	1545	1	0.02	11	410	400	1.78	<2
1124004104		29	1.89	<10	<1	0.13	10	0.86	1035	1	0.03	9	420	70	1.76	<2
1124004127		23	1.73	<10	1	0.10	<10	0.67	843	1	0.02	8	380	192	1.68	<2
1124004010		21	1.74	<10	1	0.11	10	0.64	941	3	0.03	9	430	49	1.78	<2
1124004070		74	1.80	<10	1	0.17	10	0.55	953	1	0.02	10	370	345	1.88	<2
1124001107		72	2.35	<10	<1	0.15	<10	0.70	1165	1	0.02	13	420	52	2.53	<2
1124003084		63	2.18	<10	1	0.21	<10	0.86	1270	1	0.01	11	440	103	2.10	<2
1124004001		58	2.49	<10	<1	0.19	10	0.74	1115	1	0.02	14	450	67	2.23	<2

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5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
2137010010		1	223	<20	0.08	<10	<10	23	<10	53	0.36	0.05	38	9.7	36	1.6
1124018131		<1	23	<20	<0.01	<10	<10	4	<10	775	0.49	1.27	42	9.2	2	39.7
1124018123		1	21	<20	<0.01	<10	<10	9	<10	561	0.22	1.18	23	9.0	-14	36.9
1124015152		1	33	<20	0.02	<10	<10	15	<10	550	0.57	0.56	47	9.6	30	17.5
1124015013		1	37	<20	0.03	<10	<10	17	<10	118	0.66	0.27	53	9.7	45	8.4
1124020087		1	47	<20	0.01	<10	<10	6	<10	450	0.25	1.62	31	9.2	-20	50.6
1124020089		1	50	<20	0.01	<10	<10	6	<10	720	0.26	1.51	33	9.2	-14	47.2
1124020049		1	51	<20	0.02	<10	<10	7	<10	296	0.29	1.21	30	9.2	-8	37.8
1124018044		3	80	<20	0.04	<10	<10	21	<10	1195	0.49	1.80	49	9.1	-7	56.3
1124018091		1	28	<20	<0.01	<10	<10	5	10	571	0.58	1.27	48	9.1	8	39.7
1124025102																
1124018042		1	46	<20	0.03	<10	<10	12	<10	190	0.31	1.20	34	9.0	-4	37.5
1124018017		<1	32	<20	<0.01	<10	<10	3	<10	921	0.54	1.43	45	9.1	0	44.7
V835505		2	36	<20	0.24	<10	<10	44	<10	41	0.42					
1124003061		<1	14	<20	<0.01	<10	<10	3	<10	312	0.57	2.25	46	8.8	-24	70.3
1124003135		<1	20	<20	<0.01	<10	<10	2	<10	569	1.26	2.12	100	9.0	34	66.3
1124003092		<1	14	<20	<0.01	<10	<10	2	<10	1135	0.88	2.32	69	9.1	-4	72.5
1124007068		2	87	<20	0.05	<10	<10	23	10	64	0.50	0.37	46	9.4	34	11.6
1124003015		<1	19	<20	<0.01	<10	<10	3	<10	1565	1.03	1.97	80	9.3	18	61.6
1124003001		1	24	<20	<0.01	<10	<10	5	<10	115	0.76	1.72	64	8.2	10	53.8
1124003329		<1	20	<20	<0.01	<10	<10	2	<10	733	1.08	1.95	80	8.9	19	60.9
1124003315																
1124003131		<1	13	<20	<0.01	<10	<10	3	<10	222	0.83	1.34	66	8.9	24	41.9
1124007053		1	29	<20	<0.01	<10	<10	5	<10	105	0.82	0.70	70	9.3	48	21.9
1124003147		<1	21	<20	<0.01	<10	<10	3	<10	536	0.98	1.97	78	9.0	16	61.6
1124003304		<1	21	<20	<0.01	<10	<10	3	<10	775	0.98	2.02	77	8.9	14	63.1
1124007064		1	26	<20	0.01	<10	<10	14	<10	73	0.51	0.48	46	9.5	31	15.0
1124006013		2	26	<20	0.05	<10	<10	21	<10	48	0.36	0.41	36	9.5	23	12.8
1124003049		<1	21	<20	<0.01	<10	<10	2	<10	652	1.20	1.94	96	9.2	35	60.6
1124003017		<1	19	<20	<0.01	<10	<10	2	<10	443	1.15	1.99	85	9.1	23	62.2
1124007001		2	79	<20	0.02	<10	<10	14	<10	192	0.71	0.40	63	9.5	51	12.5
V835506		3	16	<20	0.34	<10	<10	77	<10	50	0.05					
1124001131		1	23	<20	<0.01	<10	<10	4	<10	622	1.19	1.80	99	9.3	43	56.3
1124004104		<1	31	<20	<0.01	<10	<10	4	<10	280	0.94	1.64	75	9.1	24	51.3
1124004127		<1	23	<20	<0.01	<10	<10	3	<10	276	0.71	1.70	56	9.0	3	53.1
1124004010		<1	29	<20	<0.01	<10	<10	3	<10	256	0.64	1.83	49	9.0	-8	57.2
1124004070		<1	18	<20	<0.01	<10	<10	3	<10	1790	0.59	1.83	42	9.0	-15	57.2
1124001107		<1	20	<20	<0.01	<10	<10	2	<10	1160	0.97	2.47	76	9.0	-1	77.2
1124003084		<1	22	<20	<0.01	<10	<10	3	<10	1030	1.10	2.01	86	8.8	23	62.8
1124004001		1	20	<20	0.01	<10	<10	17	<10	964	0.84	2.18	66	8.6	-2	68.1

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
2137010010		24.32	2
1124018131		1.06	2
1124018123		0.62	2
1124015152		2.69	2
1124015013		6.28	2
1124020087		0.61	2
1124020089		0.70	2
1124020049		0.79	2
1124018044		0.87	2
1124018091		1.21	2
1124025102			
1124018042		0.91	2
1124018017		1.01	2
V835505			
1124003061		0.65	2
1124003135		1.51	3
1124003092		0.95	2
1124007068		3.98	2
1124003015		1.30	2
1124003001		1.19	2
1124003329		1.31	2
1124003315			
1124003131		1.58	2
1124007053		3.20	2
1124003147		1.27	2
1124003304		1.22	2
1124007064		3.07	2
1124006013		2.81	2
1124003049		1.58	3
1124003017		1.37	2
1124007001		5.04	2
V835506			
1124001131		1.76	3
1124004104		1.46	2
1124004127		1.05	2
1124004010		0.86	2
1124004070		0.73	2
1124001107		0.98	2
1124003084		1.37	2
1124004001		0.97	2

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
2138017070		0.63		0.013		0.2	2.73	11	<10	90	<0.5	<2	1.79	<0.5	7	260
1124003009		0.44		1.430		5.4	0.60	82	<10	30	<0.5	<2	2.34	10.3	8	96
1124004002		0.46		0.959		2.0	0.60	20	30	30	<0.5	<2	2.01	1.6	8	88
1124004030		0.50		0.297		4.1	0.61	20	<10	20	<0.5	<2	0.97	1.4	8	141
1124004054		0.46		1.095		1.9	0.62	18	<10	20	<0.5	2	2.14	2.5	8	102
1124003005		0.52		4.98		4.3	0.59	111	<10	30	<0.5	<2	1.02	4.6	11	224
1124004100		0.48		0.380		3.0	0.44	26	<10	20	<0.5	<2	1.37	3.0	8	149
1124003125		0.49		2.81		2.7	0.50	141	<10	20	<0.5	<2	1.15	4.3	9	72
2138017062		0.46		0.014		0.4	2.13	6	<10	70	<0.5	<2	1.52	<0.5	9	195
V835507		0.05		1.890		3.2	0.93	<2	<10	70	<0.5	<2	0.44	<0.5	9	13
1124005001		0.55		0.131		3.0	0.56	31	<10	20	<0.5	<2	1.93	2.4	7	97
1124005016		0.53		0.167		7.2	0.55	42	<10	30	<0.5	<2	1.75	7.9	8	87
1124005225		0.53		0.650		5.7	0.58	29	<10	30	<0.5	4	1.80	3.8	9	154
1124007006		0.53		0.076		0.6	1.50	21	<10	30	<0.5	<2	1.37	<0.5	9	156
1124005065		0.42		0.106		1.1	0.82	31	<10	30	<0.5	<2	1.88	<0.5	8	130
1124006024		0.55		0.037		0.3	1.18	8	<10	30	<0.5	<2	1.53	<0.5	8	117
1124005035		0.43		0.297		2.8	0.78	60	<10	30	<0.5	<2	2.47	<0.5	9	80
1124005043		0.49		0.244		1.8	0.73	35	<10	30	<0.5	<2	2.46	<0.5	8	83
1124005041		0.59		0.207		0.7	0.89	67	<10	30	<0.5	<2	2.88	0.6	9	76
1124007028		0.43		0.026		0.5	1.06	20	<10	30	<0.5	<2	1.19	<0.5	7	40
1124007011		0.62		0.033		0.7	1.92	33	<10	30	<0.5	<2	1.64	<0.5	8	59
1124005919		0.47		0.106		1.1	2.48	23	<10	30	<0.5	3	1.96	<0.5	8	117
V835508		0.06		0.931		2.5	1.13	<2	<10	80	<0.5	<2	0.73	<0.5	13	8
1124003317		0.45		0.265		2.2	1.41	24	<10	30	<0.5	4	2.05	1.3	8	101
1124005187		0.45		0.514		4.1	0.50	32	<10	20	<0.5	<2	1.82	2.6	8	79
1124015027		0.47		0.016		0.2	1.26	5	<10	50	<0.5	<2	2.11	<0.5	6	79
1124015102		0.50		0.020		0.3	1.07	4	<10	40	<0.5	<2	1.80	<0.5	7	92
V835267		0.58		0.147		0.9	1.02	57	<10	40	<0.5	<2	2.36	0.9	9	117

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
2138017070		7	1.72	10	<1	0.69	20	0.67	276	1	0.20	11	370	3	0.19	<2
1124003009		107	2.28	<10	1	0.20	10	0.99	2090	1	0.01	12	400	1680	2.47	7
1124004002		55	2.02	<10	1	0.21	10	0.82	1190	1	0.01	11	410	47	2.08	<2
1124004030		34	2.08	<10	1	0.12	10	0.53	1075	1	0.01	10	370	37	2.13	<2
1124004054		52	1.95	<10	1	0.18	10	0.82	1375	1	0.01	10	420	55	2.03	<2
1124003005		141	2.33	<10	<1	0.19	10	0.39	632	1	0.01	11	500	578	2.17	3
1124004100		81	1.82	<10	1	0.12	<10	0.52	1385	1	0.01	11	420	39	1.87	<2
1124003125		56	2.18	<10	1	0.17	10	0.39	985	1	0.01	9	440	505	2.17	2
2138017062		14	1.98	10	<1	0.35	10	0.68	275	1	0.11	12	400	7	0.13	<2
V835507		255	1.95	<10	<1	0.23	10	0.37	226	13	0.11	12	360	18	0.06	<2
1124005001		39	1.92	<10	<1	0.12	10	0.83	995	1	0.02	8	410	216	2.02	<2
1124005016		238	1.87	<10	1	0.13	10	0.59	1140	1	0.02	10	430	1390	2.03	5
1124005225		54	2.10	<10	<1	0.14	10	0.50	950	1	0.01	11	420	50	2.20	<2
1124007006		16	1.79	10	<1	0.13	10	0.72	431	<1	0.07	11	410	11	0.68	<2
1124005065		39	2.12	<10	<1	0.13	10	0.71	942	1	0.02	8	440	24	2.11	<2
1124006024		12	2.01	10	<1	0.09	10	0.69	308	1	0.04	10	420	4	0.53	<2
1124005035		26	1.98	<10	<1	0.15	10	0.51	976	<1	0.03	10	460	41	1.96	<2
1124005043		17	1.86	<10	<1	0.13	10	0.51	888	1	0.03	10	440	21	1.84	<2
1124005041		35	2.12	<10	<1	0.12	10	0.70	1105	1	0.03	13	440	68	1.89	<2
1124007028		12	1.36	<10	<1	0.09	10	0.57	396	<1	0.04	9	370	13	0.49	<2
1124007011		27	1.70	10	1	0.12	10	1.00	375	1	0.07	8	340	20	0.91	2
1124005919		31	1.92	10	<1	0.15	10	0.56	415	1	0.23	10	420	50	1.80	<2
V835508		59	3.16	<10	<1	0.27	10	0.54	304	10	0.10	16	720	7	0.06	<2
1124003317		53	1.89	<10	<1	0.14	10	0.59	801	2	0.12	10	420	88	1.74	2
1124005187		48	1.65	<10	1	0.12	10	0.44	909	1	0.01	9	420	138	1.75	2
1124015027		14	1.76	10	<1	0.16	10	0.77	419	1	0.04	11	420	<2	0.09	<2
1124015102		20	1.68	<10	1	0.11	10	0.59	377	1	0.03	8	400	<2	0.12	<2
V835267		37	1.99	<10	<1	0.13	10	0.69	1065	1	0.05	11	480	48	1.76	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
2138017070		1	141	<20	0.09	<10	<10	23	<10	38	0.20	0.18	28	9.4	22	5.6
1124003009		<1	26	<20	<0.01	<10	<10	3	<10	2710	1.14	2.49	97	8.9	19	77.8
1124004002		1	21	<20	<0.01	<10	<10	3	<10	411	1.01	2.03	78	9.0	15	63.4
1124004030		<1	16	<20	<0.01	<10	<10	2	<10	342	0.53	2.10	37	8.7	-29	65.6
1124004054		<1	22	<20	<0.01	<10	<10	3	<10	650	0.98	2.01	79	8.9	16	62.8
1124003005		<1	13	<20	<0.01	<10	<10	4	<10	1110	0.45	2.06	36	8.8	-28	64.4
1124004100		<1	15	<20	<0.01	<10	<10	2	<10	785	0.64	1.89	52	8.9	-7	59.1
1124003125		<1	12	<20	<0.01	<10	<10	3	<10	1160	0.51	2.13	40	8.8	-27	66.6
2138017062		1	93	<20	0.08	<10	<10	24	<10	100	0.29	0.14	27	8.4	23	4.4
V835507		1	19	<20	0.28	<10	<10	42	<10	52	0.02					
1124005001		<1	28	<20	<0.01	<10	<10	2	<10	571	0.91	1.90	71	9.0	12	59.4
1124005016		<1	29	<20	<0.01	<10	<10	2	<10	1990	0.77	2.12	56	8.9	-10	66.3
1124005225		<1	14	<20	<0.01	<10	<10	2	<10	922	0.72	2.28	53	9.0	-18	71.3
1124007006		1	50	<20	0.01	<10	<10	13	<10	79	0.30	0.75	32	9.0	9	23.4
1124005065		<1	29	<20	<0.01	<10	<10	3	<10	88	0.76	2.13	56	8.7	-11	66.6
1124006024		1	32	<20	0.01	<10	<10	15	<10	41	0.43	0.56	39	8.7	22	17.5
1124005035		<1	35	<20	<0.01	<10	<10	3	<10	110	0.79	2.11	63	8.8	-3	65.9
1124005043		<1	33	<20	<0.01	<10	<10	3	<10	98	0.89	2.05	69	9.0	5	64.1
1124005041		<1	44	<20	<0.01	<10	<10	4	<10	163	0.95	2.07	75	9.0	10	64.7
1124007028		1	25	<20	<0.01	<10	<10	7	<10	73	0.33	0.53	29	9.4	12	16.6
1124007011		1	39	<20	<0.01	<10	<10	6	<10	199	0.35	0.88	35	9.4	8	27.5
1124005919		<1	66	<20	0.02	<10	<10	5	<10	128	0.27	1.81	29	9.1	-28	56.6
V835508		3	18	<20	0.36	<10	<10	79	<10	51	0.06					
1124003317		<1	30	<20	<0.01	<10	<10	3	<10	330	0.60	1.82	46	8.9	-11	56.9
1124005187		<1	16	<20	<0.01	<10	<10	2	<10	640	0.75	1.83	55	9.0	-2	57.2
1124015027		1	43	<20	0.01	<10	<10	13	<10	72	0.69	0.10	55	9.6	52	3.1
1124015102		1	29	<20	0.01	<10	<10	10	<10	83	0.58	0.14	47	9.7	43	4.4
V835267		1	42	<20	<0.01	<10	<10	5	<10	283	0.77					

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
2138017070		4.98	2
1124003009		1.25	3
1124004002		1.23	2
1124004030		0.56	2
1124004054		1.26	2
1124003005		0.56	2
1124004100		0.88	2
1124003125		0.60	2
2138017062		6.17	2
V835507			
1124005001		1.20	2
1124005016		0.85	2
1124005225		0.74	2
1124007006		1.37	2
1124005065		0.84	2
1124006024		2.23	2
1124005035		0.96	2
1124005043		1.08	2
1124005041		1.16	2
1124007028		1.75	2
1124007011		1.27	2
1124005919		0.51	2
V835508			
1124003317		0.81	2
1124005187		0.96	2
1124015027		17.60	2
1124015102		10.74	2
V835267			

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

CERTIFICATE OF ANALYSIS TB18235181

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

CERTIFICATE TB18315376

Project: Mine Site Lab Pulps Nov 2018

P.O. No.: 4500023138

This report is for 236 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 10-DEC-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

<Original signed by>

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1124029433		0.56	87.5	9.02		2.1	1.58	46	<10	150	0.6	4	1.73	5.7	11	181
1124029389		0.51		1.675		3.9	0.86	66	<10	80	<0.5	2	0.53	8.2	7	140
1124029716		0.55		0.293		1.1	0.61	163	<10	30	<0.5	<2	0.65	12.1	7	92
1124029733		0.50		0.558		1.4	0.48	164	<10	60	<0.5	2	1.35	12.6	7	115
1124029382		0.49		2.63		5.2	1.06	109	<10	50	0.5	2	1.45	9.7	10	179
1123015079		0.49		0.374		0.5	1.26	43	<10	30	<0.5	<2	1.77	2.0	7	70
1123015062		0.49		0.761		1.0	1.27	62	<10	40	<0.5	<2	1.93	3.5	7	87
1124029301		0.51		0.308		1.9	1.05	129	<10	20	<0.5	<2	0.20	4.3	7	83
1124029741		0.38		2.74		2.1	0.73	216	<10	30	<0.5	2	0.45	18.5	8	147
1124029330		0.54		1.070		1.6	0.72	399	<10	30	<0.5	<2	0.32	29.7	7	116
1124028243		0.47		1.085		0.9	1.26	85	<10	30	<0.5	2	0.64	8.6	8	83
1124028205		0.50		0.292		0.9	1.54	83	<10	30	<0.5	2	2.72	1.4	9	111
1123018079		0.52		0.006		<0.2	1.29	3	<10	90	<0.5	<2	2.37	<0.5	14	143
1123018107		0.47		0.008		<0.2	1.31	4	<10	110	<0.5	<2	2.39	<0.5	13	148
1124028224		0.48		0.316		1.0	1.34	135	<10	30	<0.5	<2	0.59	<0.5	7	92
V835516		0.06		1.630		9.6	0.99	<2	<10	80	<0.5	<2	0.60	<0.5	12	9
1123017145		0.67		0.190		0.6	1.52	32	<10	40	<0.5	<2	1.80	1.4	9	110
1123018998		0.52		0.293		<0.2	2.13	24	<10	30	<0.5	2	1.32	<0.5	6	77
1123016195		0.50		0.306		1.2	2.05	26	<10	30	<0.5	3	2.29	1.0	11	121
1123016221		0.46		0.176		1.1	2.22	22	<10	30	<0.5	3	2.14	0.7	9	143
1122003012		0.48		0.708		0.3	1.24	42	<10	60	<0.5	<2	2.35	1.0	10	108
1122003029		0.44		4.67		2.3	1.15	76	<10	30	<0.5	<2	2.10	4.1	11	95
1232007390		0.55		0.031		0.5	1.02	7	<10	30	<0.5	5	0.37	<0.5	10	125
1123016001		0.55		0.136		0.9	2.01	33	<10	40	<0.5	<2	2.77	2.3	8	127
1123020101		0.46		0.181		0.5	2.47	32	<10	40	<0.5	<2	1.78	<0.5	6	128
1123016053		0.45		0.150		0.5	2.30	42	<10	30	<0.5	<2	2.33	2.0	8	101
1123016020		0.50		0.267		1.8	2.27	23	<10	30	<0.5	<2	2.06	1.5	9	96
1123016136		0.46		0.220		1.0	2.47	65	10	40	<0.5	<2	1.77	6.6	8	144
1123016122		0.47		0.344		2.0	0.94	39	<10	30	<0.5	<2	2.22	0.9	7	122
1123016033		0.45		0.112		1.2	1.23	33	<10	40	<0.5	<2	2.39	0.6	8	124
1123016169		0.47		0.090		0.5	2.65	34	<10	30	<0.5	<2	2.16	1.6	8	121
1122003045		0.50		2.23		0.9	0.56	33	<10	30	<0.5	<2	2.32	1.1	8	128
1123016704		0.45		0.440		0.9	1.15	59	<10	30	<0.5	<2	2.43	1.6	6	101
1123020082		0.61		2.51		1.5	0.86	91	<10	60	<0.5	<2	0.35	19.5	6	129
1122003064		0.46		0.258		0.6	0.70	28	<10	20	<0.5	<2	2.26	0.6	7	164
1122003063		0.49		0.354		1.2	0.79	37	<10	30	<0.5	<2	2.35	2.0	9	193
V835517		0.06		6.61		5.2	0.95	<2	<10	50	<0.5	<2	0.61	<0.5	6	11
1123014107		0.69		0.859		2.0	0.88	68	<10	20	<0.5	<2	2.29	4.1	8	192
1123014114		0.65		1.440		1.5	1.14	55	<10	20	<0.5	<2	1.75	10.8	7	172
1123014165		0.67		3.47		1.8	1.22	98	<10	20	<0.5	<2	0.70	5.2	9	140

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1124029433		68	2.95	<10	<1	1.07	10	1.54	1630	<1	<0.01	16	1090	209	1.46	<2
1124029389		162	2.89	<10	<1	0.41	10	0.42	573	<1	<0.01	6	330	174	2.56	<2
1124029716		51	2.01	<10	<1	0.27	10	0.28	524	1	<0.01	7	370	129	1.93	<2
1124029733		94	2.51	<10	<1	0.31	10	0.51	1120	1	<0.01	7	370	255	2.45	2
1124029382		132	3.32	<10	<1	0.71	10	0.96	932	1	<0.01	17	980	104	2.67	2
1123015079		15	1.74	<10	<1	0.30	20	1.00	942	<1	0.01	6	410	41	1.37	<2
1123015062		44	1.76	<10	<1	0.34	20	0.88	997	<1	0.01	7	380	125	1.36	<2
1124029301		210	2.72	<10	<1	0.27	10	0.44	306	<1	0.01	7	420	12	1.84	<2
1124029741		88	4.03	<10	1	0.25	10	0.34	386	1	<0.01	8	370	93	4.00	2
1124029330		147	2.77	<10	<1	0.27	10	0.27	348	1	<0.01	6	910	98	2.67	<2
1124028243		85	2.49	<10	<1	0.26	10	0.73	377	<1	0.02	10	420	27	2.21	<2
1124028205		33	1.87	<10	<1	0.30	10	0.96	1090	1	0.02	9	450	19	1.12	<2
1123018079		9	2.74	10	<1	0.24	20	1.07	585	<1	0.07	18	690	2	0.23	<2
1123018107		12	2.73	10	<1	0.23	20	1.05	630	1	0.06	21	720	3	0.34	2
1124028224		84	2.96	<10	<1	0.33	10	0.59	414	<1	0.01	8	430	11	2.03	2
V835516		49	2.93	<10	<1	0.20	10	0.42	268	20	0.14	12	620	7	0.06	<2
1123017145		19	1.51	<10	<1	0.20	10	0.77	600	<1	0.04	6	410	58	1.03	<2
1123018998		17	1.39	<10	<1	0.19	10	0.67	361	<1	0.18	6	390	30	0.93	<2
1123016195		47	2.36	<10	<1	0.19	10	0.57	711	1	0.11	13	450	44	1.70	<2
1123016221		46	1.81	<10	<1	0.17	10	0.51	538	1	0.16	10	420	71	1.52	<2
1122003012		36	2.28	<10	<1	0.22	20	0.88	983	<1	0.02	14	650	88	1.43	<2
1122003029		127	2.41	<10	1	0.22	20	0.76	1015	<1	0.02	11	610	551	1.96	<2
1232007390		61	2.62	<10	<1	0.12	20	0.82	229	1	0.04	11	520	4	2.81	<2
1123016001		32	2.02	<10	<1	0.24	10	0.98	1050	1	0.05	11	370	211	1.44	<2
1123020101		22	1.71	10	<1	0.28	10	1.00	658	1	0.11	7	390	40	0.79	5
1123016053		30	1.90	<10	<1	0.22	10	0.81	764	1	0.11	12	370	55	1.47	5
1123016020		25	2.05	<10	<1	0.17	10	0.66	444	2	0.11	12	440	22	1.96	7
1123016136		62	2.20	10	<1	0.25	10	0.80	619	1	0.14	12	390	107	1.86	3
1123016122		29	1.85	<10	<1	0.20	10	0.52	908	1	0.02	10	410	15	1.71	5
1123016033		34	2.00	<10	<1	0.19	10	0.61	977	1	0.06	12	460	42	1.81	3
1123016169		46	1.86	10	<1	0.20	10	0.74	582	1	0.17	11	420	45	1.53	5
1122003045		28	2.03	<10	<1	0.20	10	0.88	1095	1	0.02	11	390	86	2.15	5
1123016704		31	1.72	<10	<1	0.25	10	0.79	1125	<1	0.01	9	400	21	1.26	5
1123020082		193	2.19	<10	<1	0.46	10	0.56	784	1	<0.01	7	320	118	1.79	5
1122003064		26	1.93	<10	<1	0.18	10	0.74	1035	1	0.02	11	420	53	1.95	4
1122003063		36	2.27	<10	<1	0.26	10	0.94	1380	<1	0.02	13	400	184	2.36	4
V835517		40	1.75	<10	<1	0.18	10	0.38	188	23	0.15	10	600	8	0.08	3
1123014107		69	2.02	<10	<1	0.15	10	0.68	1030	1	0.01	10	420	108	1.67	4
1123014114		69	2.08	<10	<1	0.14	10	0.89	951	1	0.01	10	430	45	1.61	4
1123014165		92	3.58	<10	1	0.17	10	0.81	617	<1	0.01	12	410	35	2.60	4

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1124029433		4	236	<20	0.09	<10	<10	26	<10	1445	0.71	1.38	64	9.3	21	43.1
1124029389		<1	64	<20	0.01	<10	<10	5	<10	2090	0.23	2.61	21	8.7	-61	81.6
1124029716		<1	14	<20	<0.01	<10	<10	3	<10	2880	0.28	1.93	23	8.6	-37	60.3
1124029733		<1	91	<20	<0.01	<10	<10	3	<10	3190	0.76	2.53	57	8.7	-22	79.1
1124029382		3	274	<20	0.06	<10	<10	20	<10	2420	0.56	2.68	48	8.8	-36	83.8
1123015079		1	31	<20	0.01	<10	<10	5	<10	560	0.47	1.22	45	9.2	7	38.1
1123015062		1	35	<20	<0.01	<10	<10	6	<10	950	0.56	1.25	54	9.2	15	39.1
1124029301		<1	9	<20	0.01	<10	<10	4	<10	1000	0.07	1.65	7	8.6	-45	51.6
1124029741		<1	12	<20	<0.01	<10	<10	4	<10	4300	0.18	4.02	14	8.1	-112	125.6
1124029330		<1	21	<20	<0.01	<10	<10	3	<10	6770	0.09	2.62	11	8.3	-71	81.9
1124028243		1	21	<20	<0.01	<10	<10	7	<10	2090	0.15	2.09	16	8.7	-49	65.3
1124028205		1	33	<20	0.01	<10	<10	7	<10	354	0.75	1.00	67	8.9	36	31.3
1123018079		4	81	<20	0.03	<10	<10	48	<10	82	0.78	0.22	67	9.5	60	6.9
1123018107		4	121	<20	0.03	<10	<10	46	<10	86	0.83	0.33	71	9.4	61	10.3
1124028224		1	14	<20	0.01	<10	<10	6	<10	81	0.16	1.92	15	8.8	-45	60.0
V835516		2	21	<20	0.42	<10	<10	72	<10	50	0.03					
1123017145		1	49	<20	0.01	<10	<10	7	<10	377	0.42	0.93	41	9.0	12	29.1
1123018998		1	54	<20	0.01	<10	<10	6	<10	92	0.18	0.88	19	9.2	-9	27.5
1123016195		1	66	<20	0.01	<10	<10	21	<10	253	0.46	1.65	45	9.0	-7	51.6
1123016221		1	68	<20	0.01	<10	<10	7	<10	192	0.36	1.37	38	9.0	-5	42.8
1122003012		1	40	<20	<0.01	<10	<10	11	<10	295	0.66	1.30	59	8.9	18	40.6
1122003029		1	29	<20	<0.01	<10	<10	6	<10	968	0.58	1.79	53	9.0	-3	55.9
1232007390		1	16	<20	<0.01	<10	<10	6	<10	83	0.09	2.65	11	8.9	-72	82.8
1123016001		1	45	<20	<0.01	<10	<10	8	<10	616	0.64	1.33	60	8.9	18	41.6
1123020101		1	58	<20	0.02	<10	<10	9	<10	152	0.31	0.74	36	9.2	13	23.1
1123016053		1	51	<20	<0.01	<10	<10	8	<10	548	0.46	1.31	45	8.8	4	40.9
1123016020		1	62	<20	0.02	<10	<10	6	<10	391	0.28	1.84	34	8.6	-24	57.5
1123016136		1	48	<20	<0.01	<10	<10	8	<10	1520	0.30	1.82	35	8.8	-22	56.9
1123016122		<1	22	<20	<0.01	<10	<10	5	<10	215	0.68	1.62	58	9.0	7	50.6
1123016033		1	53	<20	<0.01	<10	<10	5	<10	160	0.69	1.73	59	8.8	5	54.1
1123016169		1	72	<20	0.01	<10	<10	8	<10	391	0.32	1.46	34	9.1	-12	45.6
1122003045		<1	24	<20	<0.01	<10	<10	3	<10	257	1.07	2.12	87	9.1	21	66.3
1123016704		<1	24	<20	<0.01	<10	<10	4	<10	366	0.74	1.21	64	8.9	26	37.8
1123020082		<1	48	<20	0.02	<10	<10	5	<10	4300	0.20	1.75	16	9.0	-39	54.7
1122003064		<1	25	<20	<0.01	<10	<10	3	<10	141	0.86	1.83	74	9.0	17	57.2
1122003063		1	29	<20	<0.01	<10	<10	4	<10	520	1.02	2.27	85	9.1	14	70.9
V835517		2	24	<20	0.25	<10	<10	53	<10	34	0.03					
1123014107		<1	16	<20	<0.01	<10	<10	3	<10	848	0.73	1.61	58	8.7	8	50.3
1123014114		<1	16	<20	0.01	<10	<10	4	<10	2130	0.56	1.58	45	8.8	-4	49.4
1123014165		1	10	<20	0.01	<10	<10	6	<10	1045	0.21	2.61	20	8.4	-62	81.6

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
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Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1124029433		1.48	2
1124029389		0.26	2
1124029716		0.38	2
1124029733		0.72	2
1124029382		0.57	2
1123015079		1.18	2
1123015062		1.38	2
1124029301		0.14	1
1124029741		0.11	1
1124029330		0.13	1
1124028243		0.24	1
1124028205		2.14	2
1123018079		9.75	2
1123018107		6.88	2
1124028224		0.25	1
V835516			
1123017145		1.41	2
1123018998		0.69	1
1123016195		0.87	2
1123016221		0.89	2
1122003012		1.45	2
1122003029		0.95	2
1232007390		0.13	1
1123016001		1.44	2
1123020101		1.56	2
1123016053		1.10	2
1123016020		0.59	2
1123016136		0.62	2
1123016122		1.15	2
1123016033		1.09	2
1123016169		0.75	2
1122003045		1.31	2
1123016704		1.69	2
1123020082		0.29	1
1122003064		1.29	2
1122003063		1.20	2
V835517			
1123014107		1.15	2
1123014114		0.91	2
1123014165		0.25	2

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CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1123014146		0.67		4.61		0.8	1.57	73	<10	20	<0.5	<2	0.48	1.7	8	192
1123014219		0.69		0.440		1.2	0.88	94	<10	30	<0.5	<2	0.98	0.9	8	155
1123006079		0.68		0.086		1.0	3.07	13	<10	90	<0.5	<2	2.85	1.8	21	141
1123006017		0.68		0.045		0.4	1.08	10	<10	60	<0.5	<2	2.13	<0.5	8	190
1123006055		0.67		0.010		0.2	1.30	3	<10	80	<0.5	<2	1.65	<0.5	8	116
1123006072		0.67		0.082		0.7	1.37	8	<10	70	<0.5	<2	1.70	<0.5	7	153
1123014232		0.67		0.564		1.0	1.35	91	<10	20	<0.5	<2	0.40	<0.5	9	158
1123014173		0.68		0.366		0.7	1.21	34	<10	20	<0.5	<2	1.96	1.5	8	160
1123014275		0.66		0.233		2.0	0.57	197	<10	20	<0.5	<2	1.09	9.7	7	173
1123014186		0.68	90.1	0.824		1.4	1.22	79	<10	20	<0.5	<2	0.44	4.0	7	184
1124028163		0.65		0.266		0.8	1.30	170	<10	30	<0.5	<2	2.63	1.0	7	82
V835518		0.06		1.540		9.7	1.04	2	<10	80	<0.5	2	0.62	<0.5	11	9
1123005025		0.48		0.094		0.9	1.88	31	<10	40	<0.5	<2	1.60	<0.5	7	62
1123005102		0.59		0.271		1.8	1.41	13	<10	50	<0.5	<2	2.07	0.5	7	145
1123005100		0.50		0.075		0.7	1.83	25	<10	140	0.6	<2	2.72	0.6	12	170
1123005090		0.66		0.060		0.6	1.34	35	<10	40	<0.5	<2	1.76	<0.5	8	110
1123013017		0.50		3.32		2.9	1.05	205	<10	20	<0.5	<2	0.77	17.3	9	90
1123013034		0.50		0.875		1.9	0.53	62	<10	30	<0.5	<2	2.25	3.3	7	122
1123013004		0.50		1.245		1.3	1.33	156	<10	40	<0.5	<2	1.62	1.7	10	93
1123013057		0.44		1.370		2.7	0.56	78	<10	30	<0.5	<2	2.10	10.9	8	90
1231002096		0.45		0.291		3.0	0.38	105	<10	30	<0.5	2	1.68	2.9	8	104
1123004008		0.48		0.024		<0.2	1.11	4	<10	50	<0.5	<2	1.73	<0.5	7	191
1123004024		0.47		0.026		0.2	1.17	5	<10	80	<0.5	2	1.65	<0.5	9	184
1123013068		0.47		1.015		1.1	1.63	45	<10	40	<0.5	<2	1.06	5.6	10	72
1123004153		0.47		0.041		<0.2	1.07	3	<10	70	<0.5	<2	1.28	<0.5	7	297
1123013023		0.48		0.201		0.6	2.21	41	10	40	<0.5	<2	1.77	<0.5	9	68
1123013093		0.46		0.244		1.5	0.89	80	<10	20	<0.5	<2	1.22	16.4	8	110
1123004001		0.69		0.069		0.4	0.93	5	<10	40	<0.5	<2	1.18	<0.5	9	198
1123004119		0.69		0.036		0.3	1.20	10	<10	30	<0.5	<2	2.01	<0.5	9	167
1231002049		0.69		0.081		2.9	1.20	15	<10	40	<0.5	<2	1.84	1.4	9	150
V835519		0.06		1.905		3.2	0.95	<2	<10	70	<0.5	2	0.45	<0.5	10	14
1124028211		0.52		1.130		3.9	1.66	77	<10	30	<0.5	<2	0.23	0.5	11	51
1124028113		0.48		0.135		1.1	1.38	50	<10	30	<0.5	<2	1.15	11.0	6	85
1124028150		0.47		1.250		2.3	1.50	201	<10	40	<0.5	2	1.08	7.0	7	132
1124028109		0.45		0.488		1.5	1.51	72	<10	30	<0.5	<2	0.95	28.6	7	96
1124028001		0.50		0.238		0.6	1.34	168	<10	20	<0.5	<2	0.42	3.2	9	133
1124029436		0.55		1.650		4.1	1.73	85	<10	40	<0.5	2	0.54	7.1	6	95
1124028108		0.52		0.280		1.1	1.19	54	<10	20	<0.5	<2	1.54	14.4	7	115
1123015053		0.48		0.853		0.7	1.45	52	<10	40	<0.5	<2	2.08	1.7	7	79
1123015005		0.48		0.122		0.4	2.55	43	10	40	<0.5	<2	1.15	0.6	10	63

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1123014146		58	4.01	<10	<1	0.13	10	1.10	766	<1	<0.01	10	400	21	2.51	3
1123014219		55	2.72	<10	<1	0.16	10	0.55	511	1	0.01	12	450	28	2.09	4
1123006079		84	5.31	10	<1	0.49	10	1.33	1000	1	0.19	35	590	5	1.17	5
1123006017		18	2.12	<10	<1	0.22	10	0.73	667	1	0.04	13	410	4	0.99	4
1123006055		18	1.76	<10	<1	0.20	20	0.76	316	1	0.07	11	510	<2	0.16	5
1123006072		30	1.82	<10	<1	0.30	10	0.78	498	1	0.06	11	420	2	0.42	5
1123014232		52	2.80	<10	<1	0.17	10	0.91	566	<1	0.01	12	430	15	1.66	4
1123014173		38	1.83	<10	<1	0.14	10	0.58	700	1	0.07	11	420	36	1.49	4
1123014275		131	2.99	<10	<1	0.17	10	0.35	546	1	0.01	9	390	18	3.01	5
1123014186		74	3.62	<10	<1	0.16	10	0.77	534	<1	<0.01	10	410	34	2.47	3
1124028163		30	2.17	<10	<1	0.27	10	1.11	1350	<1	0.01	11	430	15	1.38	4
V835518		48	2.95	<10	<1	0.20	10	0.42	268	19	0.15	13	620	7	0.06	4
1123005025		34	1.60	<10	<1	0.16	10	1.00	372	1	0.06	8	340	32	0.99	4
1123005102		49	2.01	<10	<1	0.14	10	0.57	562	1	0.10	12	400	7	0.87	4
1123005100		45	2.62	10	<1	0.32	20	1.22	811	1	0.08	21	1100	21	0.96	3
1123005090		20	1.66	<10	<1	0.17	10	0.53	697	1	0.10	10	420	16	0.95	3
1123013017		98	4.11	<10	<1	0.16	10	0.63	597	1	0.01	14	370	185	3.91	5
1123013034		42	2.20	<10	<1	0.26	10	0.61	1455	1	0.01	10	440	76	2.18	5
1123013004		40	2.40	<10	<1	0.22	20	0.66	642	<1	0.03	10	520	83	2.03	5
1123013057		75	2.61	<10	<1	0.23	10	0.60	1625	<1	0.01	11	390	183	2.54	6
1231002096		31	1.41	<10	<1	0.23	10	0.27	811	1	0.01	8	380	493	1.48	3
1123004008		24	2.15	<10	<1	0.12	10	0.62	391	3	0.04	10	430	2	0.24	<2
1123004024		23	2.27	<10	<1	0.27	10	0.80	406	1	0.04	12	460	3	0.45	<2
1123013068		61	2.91	<10	<1	0.18	20	0.98	741	1	0.02	10	550	47	1.84	<2
1123004153		19	2.13	10	<1	0.28	10	0.62	373	1	0.04	9	410	<2	0.19	<2
1123013023		24	2.05	<10	<1	0.17	20	0.97	613	<1	0.07	8	550	27	1.06	<2
1123013093		49	3.16	<10	<1	0.19	10	0.56	729	<1	0.01	9	420	99	2.88	<2
1123004001		62	1.94	<10	<1	0.17	10	0.56	254	2	0.03	10	380	3	0.50	<2
1123004119		55	2.32	<10	<1	0.10	10	0.76	488	<1	0.02	9	410	2	0.45	<2
1231002049		125	1.90	<10	<1	0.23	20	0.71	485	1	0.05	17	470	2	0.60	<2
V835519		267	2.05	<10	<1	0.25	10	0.38	235	13	0.11	12	390	19	0.06	<2
1124028211		39	2.58	<10	<1	0.22	10	1.01	528	<1	0.01	14	360	8	1.22	2
1124028113		66	1.87	<10	<1	0.33	10	0.96	739	<1	0.01	5	390	94	1.09	<2
1124028150		70	4.04	<10	<1	0.45	20	0.85	825	<1	0.01	8	380	59	3.35	3
1124028109		112	2.62	<10	1	0.32	20	1.16	682	<1	0.01	7	450	46	2.22	<2
1124028001		40	3.53	<10	<1	0.24	20	0.74	446	1	0.01	10	420	28	2.26	<2
1124029436		71	2.50	<10	<1	0.71	10	1.41	791	<1	0.01	6	350	695	1.38	3
1124028108		90	1.98	<10	<1	0.25	20	0.95	708	<1	<0.01	6	380	30	1.44	<2
1123015053		27	1.79	<10	1	0.33	10	1.11	1135	<1	0.02	7	420	60	1.26	<2
1123015005		21	2.48	10	<1	0.20	20	0.98	640	<1	0.07	10	590	22	1.02	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1123014146		<1	7	<20	<0.01	<10	<10	6	<10	468	0.15	2.53	13	8.2	-66	79.1
1123014219		1	13	<20	<0.01	<10	<10	5	<10	252	0.32	2.08	26	8.6	-39	65.0
1123006079		6	101	<20	0.10	<10	<10	116	<10	429	0.78	1.16	67	8.9	31	36.3
1123006017		1	32	<20	0.02	<10	<10	14	<10	85	0.64	0.92	57	9.2	28	28.8
1123006055		1	135	<20	0.02	<10	<10	16	<10	76	0.48	0.13	44	9.3	40	4.1
1123006072		1	37	<20	0.04	<10	<10	17	<10	134	0.46	0.41	45	9.5	32	12.8
1123014232		1	8	<20	<0.01	<10	<10	5	<10	108	0.11	1.51	12	8.8	-35	47.2
1123014173		<1	23	<20	<0.01	<10	<10	4	<10	318	0.57	1.33	47	8.9	5	41.6
1123014275		<1	12	<20	<0.01	<10	<10	3	<10	2160	0.39	3.01	31	8.6	-63	94.1
1123014186		1	7	<20	0.01	<10	<10	5	<10	853	0.14	2.44	13	7.9	-63	76.3
1124028163		1	36	<20	<0.01	<10	<10	6	<10	313	0.90	1.30	75	9.2	34	40.6
V835518		2	22	<20	0.42	<10	<10	73	<10	48	0.03					
1123005025		1	40	<20	<0.01	<10	<10	6	<10	139	0.40	0.98	37	8.3	6	30.6
1123005102		1	80	<20	0.01	<10	<10	10	<10	158	0.70	0.81	49	8.3	24	25.3
1123005100		4	165	<20	0.07	<10	<10	32	<10	232	0.73	0.90	67	9.0	39	28.1
1123005090		1	53	<20	0.01	<10	<10	9	<10	90	0.48	0.92	41	8.7	12	28.8
1123013017		<1	10	<20	<0.01	<10	<10	4	<10	4130	0.22	3.88	21	7.7	-100	121.3
1123013034		<1	20	<20	<0.01	<10	<10	3	<10	842	0.95	2.11	76	9.0	10	65.9
1123013004		1	33	<20	0.01	<10	<10	7	<10	437	0.42	1.91	40	8.7	-20	59.7
1123013057		<1	23	<20	<0.01	<10	<10	3	<10	2800	0.91	2.40	74	8.9	-1	75.0
1231002096		<1	28	<20	<0.01	<10	<10	2	<10	866	0.58	1.31	47	8.7	6	40.9
1123004008		1	30	<20	0.01	<10	<10	12	<10	37	0.57	0.21	48	9.2	41	6.6
1123004024		2	35	<20	0.03	<10	<10	20	<10	54	0.58	0.41	50	9.2	37	12.8
1123013068		1	23	<20	<0.01	<10	<10	10	<10	1375	0.27	1.70	29	8.1	-24	53.1
1123004153		2	23	<20	0.04	<10	<10	22	<10	49	0.43	0.17	37	9.0	32	5.3
1123013023		1	51	<20	<0.01	<10	<10	9	<10	144	0.32	0.98	37	8.9	6	30.6
1123013093		1	13	<20	<0.01	<10	<10	6	<10	4090	0.37	2.91	35	8.0	-56	90.9
1123004001		1	21	<20	0.03	<10	<10	16	<10	27	0.38	0.48	34	8.6	19	15.0
1123004119		1	35	<20	0.01	<10	<10	11	<10	57	0.70	0.42	55	9.2	42	13.1
1231002049		1	35	<20	0.03	<10	<10	16	<10	385	0.52	0.61	46	8.7	27	19.1
V835519		1	20	<20	0.28	<10	<10	44	<10	55	0.02					
1124028211		1	12	<20	<0.01	<10	<10	7	<10	218	0.09	1.09	9	8.8	-25	34.1
1124028113		1	26	<20	0.03	<10	<10	8	<10	2610	0.30	1.07	30	9.1	-3	33.4
1124028150		1	20	<20	0.01	<10	<10	8	<10	1695	0.32	3.30	32	8.6	-71	103.1
1124028109		1	20	<20	0.03	<10	<10	8	<10	6840	0.29	2.13	24	8.8	-43	66.6
1124028001		<1	10	<20	0.01	<10	<10	6	<10	823	0.12	2.09	12	8.1	-53	65.3
1124029436		1	15	<20	0.04	<10	<10	9	<10	1865	0.17	1.30	18	8.9	-23	40.6
1124028108		<1	22	<20	0.01	<10	<10	6	<10	3550	0.48	1.44	41	8.8	-4	45.0
1123015053		1	54	<20	0.01	<10	<10	8	<10	467	0.61	1.18	57	9.0	20	36.9
1123015005		1	42	<20	0.01	<10	<10	13	<10	240	0.17	0.95	26	8.6	-4	29.7

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1123014146		0.16	1
1123014219		0.40	2
1123006079		1.85	2
1123006017		1.98	2
1123006055		10.83	2
1123006072		3.51	2
1123014232		0.25	1
1123014173		1.13	2
1123014275		0.33	2
1123014186		0.17	1
1124028163		1.85	2
V835518			
1123005025		1.21	2
1123005102		1.94	2
1123005100		2.38	2
1123005090		1.43	2
1123013017		0.17	2
1123013034		1.15	2
1123013004		0.67	2
1123013057		0.99	2
1231002096		1.15	2
1123004008		7.31	2
1123004024		3.90	2
1123013068		0.55	2
1123004153		6.96	2
1123013023		1.21	2
1123013093		0.38	2
1123004001		2.27	2
1123004119		4.19	2
1231002049		2.41	2
V835519			
1124028211		0.26	1
1124028113		0.90	2
1124028150		0.31	2
1124028109		0.36	2
1124028001		0.18	1
1124029436		0.44	1
1124028108		0.91	2
1123015053		1.55	2
1123015005		0.88	2

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CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1123015043		0.49		0.604		0.8	1.28	56	<10	40	<0.5	<2	1.34	4.3	7	138
1123015030		0.49		1.020		3.0	1.18	85	<10	30	<0.5	<2	1.90	7.3	7	110
1124028032		0.47		>10.0	14.05	5.4	1.25	134	<10	20	<0.5	2	0.34	23.5	10	107
1123015001		0.53		0.176		0.7	2.08	47	<10	70	<0.5	<2	1.76	0.8	12	115
1124029405		0.55		0.919		3.0	1.01	88	<10	40	<0.5	2	0.66	19.6	7	85
V835520		0.06		6.44		5.0	0.91	<2	<10	50	<0.5	<2	0.60	<0.5	7	11
1122003080		0.48		0.639		4.0	0.78	53	<10	40	<0.5	<2	2.31	9.6	8	126
1123020150		0.44		2.73		1.8	1.14	123	<10	60	<0.5	<2	0.80	17.0	7	204
1123020109		0.46		4.47		1.9	1.04	40	<10	40	<0.5	2	1.63	8.2	6	145
1123020126		0.45		0.201		0.8	1.28	30	<10	30	<0.5	2	1.25	6.2	6	188
1123020185		0.46		0.245		1.6	1.92	54	<10	190	0.5	<2	1.71	19.6	10	169
1123020044		0.45		0.279		3.2	1.37	57	<10	30	<0.5	<2	1.88	2.9	7	139
1123020061		0.45		1.010		2.4	1.40	58	<10	30	<0.5	<2	0.93	11.0	7	116
1122004129		0.45		0.016		<0.2	1.35	4	<10	60	<0.5	<2	2.14	<0.5	8	233
1123016143		0.46		1.615		3.3	2.05	57	<10	100	<0.5	<2	3.24	7.4	12	166
1123020012		0.50		1.545		1.7	0.78	113	<10	60	<0.5	2	1.03	12.4	6	183
1123020029		0.51		5.96		4.4	0.61	167	<10	70	<0.5	<2	0.35	6.1	5	432
1122002019		0.45		0.526		4.5	0.68	34	<10	40	<0.5	3	1.50	3.7	8	127
1232007457		0.46		0.083		0.9	1.12	9	<10	40	<0.5	2	0.86	2.1	9	178
1232007393		0.46	90.4	0.036		0.6	1.22	9	<10	30	<0.5	3	0.42	1.7	7	158
1232007501		0.44		0.526		0.7	0.99	8	<10	40	<0.5	2	1.27	<0.5	8	132
1123020165		0.44		0.200		1.8	1.43	62	<10	20	<0.5	<2	1.50	3.1	6	124
1123016056		0.46		1.020		1.5	1.67	92	<10	40	<0.5	3	0.85	17.7	8	104
1123020197		0.47		0.130		1.1	2.01	50	<10	150	1.0	2	3.53	8.4	14	184
1122005040		0.48		0.035		0.5	2.22	20	<10	60	<0.5	<2	1.59	<0.5	9	140
1122005092		0.46		0.333		0.6	1.78	19	<10	50	<0.5	<2	1.80	<0.5	8	143
1122002175		0.43		0.267		0.7	0.79	29	<10	40	<0.5	<2	2.75	1.8	7	71
V835521		0.06		1.520		9.3	0.95	<2	<10	80	<0.5	<2	0.56	<0.5	11	8
1124028106		0.49		0.320		1.7	1.12	69	<10	20	<0.5	<2	1.05	19.9	6	50
1123014284		0.60		0.303		0.7	1.80	63	<10	30	<0.5	<2	0.95	1.4	10	48
1123014301		0.46		0.328		0.8	2.01	63	10	40	<0.5	<2	1.54	1.2	8	95
1123014001		0.44		0.346		0.8	1.29	75	<10	30	<0.5	<2	1.76	5.1	7	91
1123014020		0.48		0.105		1.5	2.44	20	<10	40	<0.5	4	1.52	0.6	8	83
1123014177		0.63		1.270		0.7	1.24	99	<10	20	<0.5	2	0.68	2.1	8	168
1124028173		0.48		1.375		0.7	1.40	95	<10	30	<0.5	<2	0.52	2.2	8	65
1123018114		0.46		0.022		0.3	2.27	8	<10	130	<0.5	<2	2.83	<0.5	12	149
1123014010		0.52		0.110		0.6	2.41	34	<10	30	<0.5	<2	1.94	5.2	8	84
1123006001		0.67		0.029		0.3	1.04	10	<10	50	<0.5	<2	2.26	<0.5	9	122
1123006052		0.49		0.051		0.4	1.35	6	<10	80	<0.5	<2	1.69	<0.5	7	106
1123006027		0.48		0.155		0.6	2.48	37	<10	50	<0.5	<2	1.86	<0.5	11	80

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1123015043		77	2.83	<10	<1	0.30	20	0.79	785	1	0.01	7	430	50	2.12	<2
1123015030		51	2.24	<10	<1	0.25	20	0.82	953	<1	0.01	7	420	145	1.76	<2
1124028032		231	2.85	<10	<1	0.19	10	0.84	407	1	0.01	20	400	17	2.42	<2
1123015001		25	2.70	10	<1	0.23	30	1.06	611	1	0.07	13	920	27	1.66	<2
1124029405		120	2.46	<10	1	0.35	20	0.59	567	<1	0.01	7	390	59	2.27	<2
V835520		39	1.77	<10	<1	0.18	10	0.38	189	18	0.14	10	600	9	0.07	<2
1122003080		60	2.58	<10	1	0.26	10	1.07	2100	1	0.02	11	390	1630	2.73	4
1123020150		135	2.28	<10	<1	0.49	10	0.62	698	<1	0.01	8	400	191	1.86	<2
1123020109		121	1.79	<10	<1	0.36	10	0.74	1220	1	0.01	8	370	100	1.29	<2
1123020126		57	1.81	<10	<1	0.34	10	0.80	720	1	0.01	6	380	94	1.47	<2
1123020185		79	2.87	10	1	0.60	20	1.55	1120	1	0.01	10	790	96	1.47	<2
1123020044		70	1.86	<10	<1	0.35	10	0.94	961	1	0.01	7	410	545	1.50	2
1123020061		85	2.46	<10	<1	0.36	10	1.14	886	<1	<0.01	6	440	141	1.83	<2
1122004129		13	2.08	10	<1	0.15	20	0.73	384	1	0.08	12	410	2	0.36	<2
1123016143		72	2.64	10	1	0.59	20	1.50	1100	1	0.04	26	700	27	1.50	<2
1123020012		94	2.47	<10	<1	0.38	10	0.56	1160	<1	<0.01	7	380	157	2.28	<2
1123020029		163	2.77	<10	<1	0.38	<10	0.32	658	1	0.01	8	240	143	2.43	<2
1122002019		55	2.18	<10	<1	0.19	10	0.48	781	1	0.02	11	410	33	2.24	<2
1232007457		105	2.39	<10	1	0.11	10	0.63	381	4	0.11	11	380	3	2.21	<2
1232007393		28	1.79	<10	<1	0.14	20	0.83	207	1	0.07	10	510	3	1.83	<2
1232007501		222	2.02	<10	<1	0.11	10	0.61	454	3	0.08	9	380	3	1.55	<2
1123020165		27	2.09	<10	<1	0.21	10	0.95	682	1	0.03	8	390	110	1.71	2
1123016056		145	2.78	<10	1	0.33	10	0.76	448	1	0.03	11	370	18	2.32	<2
1123020197		53	3.03	10	<1	0.88	20	2.05	1210	<1	0.02	30	1830	67	1.15	<2
1122005040		26	1.66	<10	<1	0.26	10	0.91	409	1	0.16	16	450	13	0.54	<2
1122005092		18	2.03	10	<1	0.16	10	0.75	415	1	0.13	12	420	8	0.63	<2
1122002175		21	2.03	<10	<1	0.28	10	0.95	1390	1	0.03	9	400	179	1.83	<2
V835521		48	2.86	<10	<1	0.19	10	0.40	262	20	0.14	12	600	8	0.06	<2
1124028106		91	2.45	<10	1	0.28	10	0.68	574	1	0.01	7	350	70	2.08	2
1123014284		31	2.29	<10	<1	0.18	20	0.90	514	1	0.04	9	550	66	1.45	<2
1123014301		23	2.34	<10	<1	0.20	20	0.79	579	<1	0.09	9	530	34	1.49	<2
1123014001		32	2.28	<10	<1	0.27	10	0.94	894	1	0.02	10	400	60	1.56	<2
1123014020		35	2.05	<10	<1	0.22	10	0.57	298	1	0.24	12	430	56	1.84	<2
1123014177		38	2.62	<10	<1	0.14	10	0.85	603	1	0.02	10	420	22	1.71	<2
1124028173		30	2.04	<10	<1	0.22	10	0.96	454	1	0.01	11	390	14	1.08	3
1123018114		23	2.51	10	<1	0.47	10	1.09	638	2	0.15	34	460	6	0.15	<2
1123014010		52	2.00	<10	<1	0.17	10	0.69	559	1	0.21	12	380	28	1.61	3
1123006001		10	2.24	<10	<1	0.21	10	0.77	736	2	0.04	12	400	3	0.92	<2
1123006052		20	1.88	<10	<1	0.34	10	0.68	602	1	0.07	13	410	5	0.36	<2
1123006027		25	2.51	10	<1	0.21	20	0.90	585	<1	0.11	11	530	24	1.43	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1123015043		1	33	<20	<0.01	<10	<10	6	<10	1195	0.40	2.01	39	8.5	-24	62.8
1123015030		1	33	<20	<0.01	<10	<10	5	<10	2170	0.51	1.50	46	8.8	-1	46.9
1124028032		1	13	<20	<0.01	<10	<10	6	<10	5650	0.11	2.39	11	8.1	-64	74.7
1123015001		2	99	<20	0.05	<10	<10	17	<10	263	0.30	1.54	34	8.6	-14	48.1
1124029405		<1	18	<20	0.01	<10	<10	5	<10	4800	0.24	2.28	21	8.8	-50	71.3
V835520		2	24	<20	0.25	<10	<10	52	<10	38	0.02					
1122003080		1	27	<20	<0.01	<10	<10	4	<10	2520	1.09	2.86	85	9.0	-4	89.4
1123020150		1	39	<20	0.01	<10	<10	6	<10	4050	0.27	1.77	26	8.8	-29	55.3
1123020109		1	30	<20	<0.01	<10	<10	5	<10	2060	0.68	1.20	57	9.0	20	37.5
1123020126		1	23	<20	0.01	<10	<10	6	<10	1625	0.35	1.35	33	8.7	-9	42.2
1123020185		2	109	<20	0.04	<10	<10	19	<10	4690	0.50	1.48	49	8.9	3	46.3
1123020044		1	29	<20	0.01	<10	<10	6	<10	921	0.54	1.45	50	9.1	5	45.3
1123020061		1	17	<20	0.01	<10	<10	7	<10	2740	0.27	1.77	27	8.7	-28	55.3
1122004129		1	56	<20	<0.01	<10	<10	15	<10	40	0.65	0.36	57	9.1	46	11.3
1123016143		3	94	<20	0.03	<10	<10	28	<10	1855	0.94	1.48	81	9.1	35	46.3
1123020012		<1	42	<20	<0.01	<10	<10	4	<10	3010	0.56	2.46	44	8.6	-33	76.9
1123020029		<1	87	<20	0.01	<10	<10	4	<10	1500	0.18	2.55	17	8.4	-63	79.7
1122002019		<1	14	<20	<0.01	<10	<10	3	<10	886	0.65	2.13	49	8.6	-18	66.6
1232007457		1	37	<20	<0.01	<10	<10	12	10	542	0.21	2.45	25	8.6	-52	76.6
1232007393		1	21	<20	<0.01	<10	<10	8	<10	313	0.09	1.84	14	8.8	-44	57.5
1232007501		1	28	<20	<0.01	<10	<10	9	<10	56	0.36	1.63	34	8.9	-17	50.9
1123020165		1	25	<20	0.02	<10	<10	6	<10	932	0.37	1.68	36	8.6	-17	52.5
1123016056		1	24	<20	0.01	<10	<10	7	<10	4140	0.16	2.36	20	8.3	-54	73.8
1123020197		6	437	<20	0.09	<10	<10	39	<10	2130	1.06	1.20	88	9.0	51	37.5
1122005040		1	78	<20	0.03	<10	<10	14	<10	74	0.25	0.57	29	9.0	11	17.8
1122005092		1	79	<20	0.01	<10	<10	15	<10	81	0.45	0.62	42	9.0	23	19.4
1122002175		1	28	<20	<0.01	<10	<10	4	<10	401	1.28	1.86	104	9.1	46	58.1
V835521		2	18	<20	0.40	<10	<10	67	<10	48	0.03					
1124028106		<1	18	<20	0.02	<10	<10	5	<10	4930	0.30	2.15	28	9.0	-39	67.2
1123014284		1	33	<20	<0.01	<10	<10	7	<10	407	0.20	1.45	19	8.7	-26	45.3
1123014301		1	49	<20	0.02	<10	<10	9	<10	357	0.29	1.53	31	8.5	-17	47.8
1123014001		1	15	<20	0.01	<10	<10	6	<10	1160	0.53	1.54	47	8.8	-1	48.1
1123014020		1	56	<20	0.02	<10	<10	7	<10	117	0.14	1.69	17	8.8	-36	52.8
1123014177		<1	10	<20	0.01	<10	<10	4	<10	447	0.22	1.70	19	8.5	-34	53.1
1124028173		1	13	<20	0.01	<10	<10	7	<10	546	0.19	1.11	14	8.7	-21	34.7
1123018114		3	151	<20	0.07	<10	<10	39	<10	113	0.75	0.13	68	9.5	64	4.1
1123014010		1	44	<20	0.01	<10	<10	6	<10	1100	0.35	1.67	35	8.6	-17	52.2
1123006001		1	34	<20	0.02	<10	<10	10	<10	66	0.77	0.91	64	8.9	36	28.4
1123006052		2	42	<20	0.04	<10	<10	18	<10	93	0.48	0.33	48	9.4	38	10.3
1123006027		1	58	<20	0.01	<10	<10	13	<10	114	0.30	1.36	36	8.8	-7	42.5

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EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
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Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1123015043		0.62	2
1123015030		0.98	2
1124028032		0.15	1
1123015001		0.71	2
1124029405		0.29	2
V835520			
1122003080		0.95	2
1123020150		0.47	2
1123020109		1.52	2
1123020126		0.78	2
1123020185		1.06	2
1123020044		1.10	2
1123020061		0.49	2
1122004129		5.07	2
1123016143		1.75	2
1123020012		0.57	2
1123020029		0.21	1
1122002019		0.74	2
1232007457		0.33	2
1232007393		0.24	1
1232007501		0.67	2
1123020165		0.69	2
1123016056		0.27	1
1123020197		2.35	2
1122005040		1.63	2
1122005092		2.17	2
1122002175		1.79	3
V835521			
1124028106		0.42	2
1123014284		0.42	1
1123014301		0.65	2
1123014001		0.98	2
1123014020		0.32	1
1123014177		0.36	1
1124028173		0.40	1
1123018114		16.74	2
1123014010		0.67	2
1123006001		2.25	2
1123006052		4.65	2
1123006027		0.85	2

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CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1124028144		0.49		0.206		1.7	0.93	117	<10	20	<0.5	<2	1.73	13.1	6	85
V835522		0.06		0.185		1.5	0.83	3	<10	40	<0.5	<2	0.44	<0.5	9	11
1231002100		0.64		0.212		0.7	0.80	40	<10	30	<0.5	<2	2.19	0.6	7	118
1123013002		0.68		1.935		1.0	1.59	87	10	30	<0.5	<2	1.69	0.8	9	79
1123013021		0.69		0.188		0.5	2.22	52	10	30	<0.5	<2	1.62	<0.5	9	51
1123013106		0.67		0.681		2.0	3.02	32	<10	30	<0.5	<2	1.62	<0.5	10	90
1123004157		0.67		0.034		0.3	1.38	8	<10	80	<0.5	<2	2.85	<0.5	12	266
1123011194		0.68		0.029		0.3	0.98	29	<10	40	<0.5	<2	0.95	<0.5	7	198
1123011017		0.67		0.015		0.4	1.37	22	<10	30	<0.5	<2	1.48	<0.5	7	142
1123011025		0.66		0.068		0.3	1.01	7	<10	30	<0.5	<2	1.30	<0.5	8	215
1231002042		0.69		0.142		0.6	1.87	30	10	40	<0.5	<2	1.92	0.8	9	86
1123011010		0.71		1.925		1.5	0.69	35	<10	20	<0.5	2	2.45	2.1	7	120
1123011163		0.69		0.015		0.6	1.22	39	<10	30	<0.5	<2	1.62	<0.5	7	169
1123006117		0.68		0.147		1.1	1.16	10	<10	40	<0.5	<2	2.12	0.6	8	111
1123006132		0.67		0.091		1.0	0.89	8	<10	40	<0.5	<2	2.11	0.5	8	148
1123011005		0.68		0.279		0.9	0.47	30	<10	20	<0.5	<2	1.84	0.7	9	153
1123011119		0.67		0.217		1.0	0.78	34	<10	30	<0.5	<2	2.37	0.5	7	117
1123006098		0.69		0.089		0.7	1.79	7	<10	40	<0.5	<2	1.57	0.5	7	124
1123011149		0.68		0.065		0.4	1.06	6	<10	20	<0.5	<2	1.40	<0.5	7	184
1123011109		0.66		0.014		0.6	0.81	25	<10	30	<0.5	<2	1.37	<0.5	7	136
V835523		0.06		1.875		3.6	0.89	2	<10	70	<0.5	3	0.41	<0.5	9	13
1123009025		0.45		1.450		0.7	0.54	154	<10	40	<0.5	<2	1.65	1.0	9	105
1123009171		0.46		2.59		0.8	1.42	54	<10	30	<0.5	<2	1.05	1.2	9	41
1123009211		0.45		0.566		1.1	1.69	39	<10	40	<0.5	<2	1.68	0.8	9	61
1123009005		0.49		1.565		3.3	0.64	140	<10	30	<0.5	<2	1.75	3.1	8	145
1123009004		0.57		1.365		2.4	0.84	138	<10	40	<0.5	<2	1.02	2.5	9	81
1123009035		0.45		0.279		0.8	0.82	79	<10	40	<0.5	<2	2.26	0.6	9	74
1123005086		0.46		0.018		0.2	1.19	8	<10	50	<0.5	<2	2.18	<0.5	8	203
1123005059		0.50		0.010		0.2	1.14	9	<10	40	<0.5	<2	3.11	<0.5	7	105
1123005032		0.45	79.1	0.027		0.3	1.11	5	<10	70	<0.5	<2	2.30	<0.5	8	161
1231002001		0.52	87.6	0.168		1.8	0.71	50	<10	30	<0.5	<2	1.28	0.8	10	73
1123005207		0.44	86.1	0.045		0.6	1.19	25	<10	30	<0.5	<2	1.68	<0.5	8	115
1231002047		0.46		0.072		1.6	1.45	21	<10	40	<0.5	<2	1.83	0.6	10	109
1123005061		0.49		0.019		0.3	1.19	18	<10	40	<0.5	<2	2.25	2.0	8	161
1231002004		0.53		1.305		2.0	1.16	49	<10	40	<0.5	<2	1.90	1.3	8	95
1231002008		0.48		0.129		0.8	1.94	36	<10	40	<0.5	<2	1.68	0.8	12	101
V835524		0.06		0.196		1.6	0.82	2	<10	40	<0.5	3	0.44	<0.5	9	11
1122004024		0.67		0.195		0.9	1.32	108	<10	30	<0.5	<2	1.70	<0.5	9	93
1123008138		0.67		0.077		1.0	3.49	12	<10	50	<0.5	3	3.29	<0.5	38	101
1123008178		0.67		0.020		0.3	1.50	4	<10	40	<0.5	<2	1.88	<0.5	8	150

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1124028144		70	2.29	<10	<1	0.25	10	0.74	805	<1	0.01	7	360	152	2.09	2
V835522		54	2.52	<10	<1	0.20	10	0.35	248	4	0.14	11	500	27	0.04	<2
1231002100		19	1.65	<10	<1	0.18	10	0.57	1120	<1	0.02	8	420	67	1.29	<2
1123013002		32	2.20	<10	<1	0.15	20	0.75	678	1	0.06	9	550	86	1.51	2
1123013021		21	2.11	<10	1	0.16	20	0.93	656	<1	0.08	9	540	30	0.99	<2
1123013106		22	2.25	10	<1	0.13	20	0.88	544	1	0.18	10	570	20	0.88	2
1123004157		53	2.51	<10	<1	0.22	20	1.15	519	2	0.03	25	620	2	0.46	<2
1123011194		15	1.66	<10	<1	0.18	10	0.62	319	<1	0.07	10	360	9	1.04	<2
1123011017		16	1.61	<10	<1	0.12	10	0.70	391	2	0.10	11	360	12	0.60	<2
1123011025		26	2.02	<10	<1	0.10	10	0.62	271	2	0.04	13	430	2	0.52	<2
1231002042		18	2.08	<10	<1	0.26	20	0.79	621	<1	0.12	12	490	22	0.94	2
1123011010		41	1.85	<10	1	0.11	10	0.66	727	1	0.03	10	390	85	1.60	<2
1123011163		14	1.92	<10	<1	0.11	10	0.63	404	1	0.10	12	360	14	1.16	<2
1123006117		36	1.88	<10	<1	0.12	10	0.64	637	1	0.05	14	440	5	0.54	<2
1123006132		23	1.74	<10	<1	0.11	10	0.53	577	1	0.04	16	370	3	0.62	<2
1123011005		51	2.34	<10	1	0.14	<10	0.38	579	1	0.02	13	410	67	2.42	2
1123011119		18	1.88	<10	<1	0.11	10	0.67	572	<1	0.04	9	360	32	1.74	<2
1123006098		55	1.73	10	<1	0.18	20	0.78	425	1	0.13	11	470	4	0.25	<2
1123011149		24	1.99	10	1	0.08	10	0.68	313	<1	0.04	11	400	4	0.36	<2
1123011109		15	1.60	<10	<1	0.15	10	0.53	379	1	0.06	9	360	9	1.23	<2
V835523		271	1.99	<10	<1	0.23	10	0.37	227	13	0.12	13	370	19	0.07	<2
1123009025		57	1.81	<10	<1	0.24	10	0.66	1370	1	0.02	15	380	106	1.64	<2
1123009171		67	2.35	<10	<1	0.17	10	0.57	432	<1	0.04	10	570	67	1.79	<2
1123009211		39	2.37	<10	<1	0.17	20	0.77	653	1	0.06	10	570	32	1.42	2
1123009005		68	2.61	<10	<1	0.21	10	0.66	1560	1	0.02	9	540	397	2.41	2
1123009004		158	2.53	<10	<1	0.28	10	0.38	842	2	0.03	10	550	320	2.42	<2
1123009035		19	2.39	<10	<1	0.22	10	0.64	1000	<1	0.03	10	550	42	2.07	<2
1123005086		22	2.04	<10	<1	0.14	10	0.62	414	1	0.07	13	420	5	0.23	<2
1123005059		24	1.75	<10	<1	0.13	10	0.48	530	1	0.06	9	380	2	0.22	<2
1123005032		10	2.00	<10	<1	0.17	10	0.76	454	1	0.08	12	520	3	0.39	<2
1231002001		19	2.33	<10	<1	0.17	10	0.40	657	1	0.02	12	510	92	2.03	2
1123005207		14	1.48	<10	<1	0.14	10	0.62	445	<1	0.06	11	390	9	0.50	<2
1231002047		41	2.39	10	<1	0.23	10	0.92	549	1	0.06	17	470	11	0.86	<2
1123005061		38	2.06	<10	<1	0.16	10	0.65	524	1	0.06	11	390	3	0.54	<2
1231002004		35	2.25	<10	<1	0.24	10	0.70	830	3	0.04	11	430	113	1.92	<2
1231002008		31	2.84	10	<1	0.25	10	0.86	689	1	0.11	19	540	35	1.22	<2
V835524		50	2.51	<10	<1	0.20	10	0.35	249	4	0.15	11	500	21	0.04	<2
1122004024		28	2.43	<10	<1	0.15	10	0.68	576	1	0.06	13	510	16	1.89	2
1123008138		123	9.39	10	<1	0.20	<10	2.17	1390	1	0.12	54	820	3	1.67	<2
1123008178		22	1.80	10	<1	0.11	20	0.84	376	1	0.09	12	500	<2	0.19	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1124028144		<1	22	<20	<0.01	<10	<10	4	<10	3130	0.55	2.01	47	8.5	-16	62.8
V835522		2	18	<20	0.37	<10	<10	56	<10	61	0.02					
1231002100		<1	23	<20	<0.01	<10	<10	4	<10	171	0.67	1.26	56	8.5	17	39.4
1123013002		1	34	<20	<0.01	<10	<10	7	<10	215	0.39	1.56	39	8.6	-10	48.8
1123013021		1	46	<20	0.01	<10	<10	10	<10	112	0.30	0.93	34	8.9	5	29.1
1123013106		1	73	<20	0.01	<10	<10	11	10	137	0.14	0.93	20	8.8	-9	29.1
1123004157		3	64	<20	0.02	<10	<10	29	<10	65	0.96	0.44	72	7.6	58	13.8
1123011194		1	25	<20	0.01	<10	<10	10	<10	105	0.33	1.02	25	9.0	-7	31.9
1123011017		1	45	<20	<0.01	<10	<10	8	<10	96	0.44	0.57	35	9.1	17	17.8
1123011025		1	24	<20	0.02	<10	<10	16	10	33	0.48	0.48	38	8.9	23	15.0
1231002042		1	75	<20	0.04	<10	<10	17	<10	249	0.42	0.97	41	8.8	11	30.3
1123011010		1	35	<20	<0.01	<10	<10	3	<10	515	0.91	1.68	71	9.1	19	52.5
1123011163		1	50	<20	<0.01	<10	<10	8	<10	74	0.50	1.14	39	8.9	3	35.6
1123006117		1	44	<20	0.01	<10	<10	9	<10	203	0.72	0.51	60	8.8	44	15.9
1123006132		1	30	<20	0.01	<10	<10	9	<10	139	0.67	0.57	57	9.1	39	17.8
1123011005		<1	17	<20	<0.01	<10	<10	2	<10	180	0.67	2.62	53	8.7	-29	81.9
1123011119		1	45	<20	<0.01	<10	<10	3	<10	138	0.90	1.71	68	9.1	15	53.4
1123006098		1	71	<20	0.03	<10	<10	13	<10	180	0.34	0.21	34	8.8	27	6.6
1123011149		2	22	<20	0.01	<10	<10	17	<10	31	0.48	0.33	39	9.2	29	10.3
1123011109		1	25	<20	0.01	<10	<10	6	<10	84	0.46	1.19	36	8.3	-1	37.2
V835523		1	19	<20	0.28	<10	<10	42	<10	52	0.03					
1123009025		1	19	<20	<0.01	<10	<10	3	<10	254	0.89	1.57	69	9.0	20	49.1
1123009171		1	21	<20	<0.01	<10	<10	6	<10	305	0.28	1.69	27	8.8	-26	52.8
1123009211		1	28	<20	<0.01	<10	<10	7	<10	220	0.47	1.43	43	9.0	-2	44.7
1123009005		<1	15	<20	<0.01	<10	<10	4	<10	782	0.83	2.35	60	8.5	-13	73.4
1123009004		1	15	<20	<0.01	<10	<10	5	<10	610	0.47	2.48	31	8.6	-47	77.5
1123009035		1	26	<20	<0.01	<10	<10	5	<10	134	0.97	1.99	72	8.5	10	62.2
1123005086		1	47	<20	<0.01	<10	<10	11	<10	69	0.75	0.22	58	9.3	51	6.9
1123005059		1	68	<20	<0.01	<10	<10	6	<10	97	0.96	0.20	78	9.2	72	6.3
1123005032		1	78	<20	0.01	<10	<10	13	<10	57	0.88	0.38	67	9.2	55	11.9
1231002001		<1	16	<20	<0.01	<10	<10	4	<10	216	0.41	1.94	34	8.5	-27	60.6
1123005207		1	29	<20	<0.01	<10	<10	6	<10	75	0.50	0.44	42	9.2	28	13.8
1231002047		1	32	<20	0.05	<10	<10	20	<10	171	0.49	0.76	46	9.1	22	23.8
1123005061		1	65	<20	<0.01	<10	<10	8	<10	528	0.74	0.50	63	9.1	47	15.6
1231002004		1	29	<20	<0.01	<10	<10	7	<10	393	0.56	1.75	48	9.0	-7	54.7
1231002008		2	52	<20	0.03	<10	<10	32	<10	283	0.38	1.15	38	8.8	2	35.9
V835524		2	20	<20	0.38	<10	<10	57	<10	58	0.03					
1122004024		1	32	<20	<0.01	<10	<10	6	<10	108	0.46	1.74	42	8.8	-12	54.4
1123008138		15	101	<20	0.11	<10	<10	242	10	237	1.42	1.59	151	8.4	101	49.7
1123008178		1	48	<20	0.02	<10	<10	17	<10	57	0.55	0.16	50	9.2	45	5.0

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1124028144		0.75	2
V835522			
1231002100		1.42	2
1123013002		0.80	2
1123013021		1.17	2
1123013106		0.69	1
1123004157		5.24	2
1123011194		0.78	2
1123011017		1.96	2
1123011025		2.53	2
1231002042		1.35	2
1123011010		1.35	2
1123011163		1.09	2
1123006117		3.76	2
1123006132		3.20	2
1123011005		0.65	2
1123011119		1.27	2
1123006098		5.18	2
1123011149		3.78	2
1123011109		0.97	2
V835523			
1123009025		1.41	2
1123009171		0.51	2
1123009211		0.96	2
1123009005		0.82	2
1123009004		0.40	2
1123009035		1.16	2
1123005086		8.44	2
1123005059		12.48	2
1123005032		5.64	2
1231002001		0.56	2
1123005207		3.05	2
1231002047		1.94	2
1123005061		4.03	2
1231002004		0.88	2
1231002008		1.06	2
V835524			
1122004024		0.77	2
1123008138		3.04	3
1123008178		10.00	2

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CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1231005162		0.66		0.021		<0.2	1.77	11	<10	20	<0.5	<2	0.70	<0.5	7	50
1231005202		0.68		0.022		<0.2	2.24	12	<10	30	<0.5	<2	1.49	<0.5	8	68
1123008129		0.67		0.093		1.7	3.70	13	<10	40	<0.5	3	3.55	0.5	42	128
1123018314		0.70		0.468		0.9	0.95	78	<10	20	<0.5	<2	1.42	0.9	7	149
1231005050		0.68		0.046		0.4	2.35	7	10	60	<0.5	<2	1.31	<0.5	13	84
1231005088		0.68		0.021		0.2	1.92	6	10	30	<0.5	<2	0.78	<0.5	10	87
1231005123		0.67		0.094		0.2	2.15	7	<10	40	<0.5	<2	0.98	<0.5	8	63
1231005169		0.68		0.020		0.2	1.96	9	10	30	<0.5	<2	0.73	<0.5	7	33
1231005233		0.67		0.723		1.5	1.65	27	<10	50	<0.5	2	1.18	14.0	8	187
1231005052		0.67		0.015		0.2	1.73	5	10	50	<0.5	<2	0.59	<0.5	9	41
1122004075		0.68		0.142		1.3	1.09	64	<10	30	<0.5	<2	2.84	0.5	7	79
1122004063		0.67		0.008		0.3	1.39	48	<10	30	<0.5	<2	1.59	<0.5	6	252
1123018370		0.67		0.465		1.2	0.90	71	<10	20	<0.5	<2	2.09	0.6	7	198
1123008224		0.67		0.061		0.3	1.14	4	<10	40	<0.5	<2	2.23	<0.5	14	326
1231005041		0.68		0.016		0.2	4.23	5	<10	20	<0.5	<2	2.84	<0.5	24	158
1123008246		0.68		0.102		1.3	3.12	23	<10	60	<0.5	2	4.23	0.6	35	114
1123017029		0.66		0.314		1.2	0.57	49	<10	30	<0.5	<2	2.04	3.9	6	175
V835525		0.06		1.555		9.8	0.93	3	<10	80	<0.5	3	0.56	<0.5	11	9
1123018074		0.52		0.192		1.2	1.68	27	<10	60	<0.5	<2	1.92	<0.5	9	83
1124029701		0.42		0.444		0.9	1.02	205	<10	20	<0.5	<2	0.78	3.8	8	108
1123012131		0.48		0.541		1.8	0.51	29	<10	40	<0.5	<2	2.36	1.8	8	106
1123018048		0.52		0.030		0.5	1.39	8	<10	70	<0.5	2	2.16	<0.5	9	171
1123018056		0.44		0.609		1.0	2.18	38	<10	40	<0.5	<2	1.60	<0.5	9	121
1122004035		0.68		0.039		0.5	0.95	20	<10	40	<0.5	<2	2.33	<0.5	6	61
1123012148		0.51		0.309		1.8	0.62	36	<10	40	<0.5	<2	2.48	1.5	7	106
1123018125		0.68		0.075		0.7	0.85	11	<10	40	<0.5	<2	2.22	0.6	8	182
1123012140		0.46		0.384		2.4	0.56	54	<10	40	<0.5	<2	2.40	1.8	8	117
1123012173		0.50		0.855		2.0	0.56	38	<10	30	<0.5	<2	2.22	3.7	7	105
1123012045		0.49		0.869		2.2	0.57	60	<10	30	<0.5	<2	1.90	3.4	11	87
1123012001		0.67		0.874		3.2	0.61	22	<10	30	<0.5	2	2.67	2.1	8	148
1123012063		0.55		0.361		4.0	0.49	30	<10	30	<0.5	2	2.59	3.3	9	143
1123018087		0.51		0.493		0.6	1.45	69	<10	30	<0.5	<2	1.35	0.5	8	70
1123008120		0.66		0.054		0.9	3.15	13	<10	50	<0.5	2	4.44	0.5	33	132
1123012144		0.69		1.370		4.5	0.41	36	<10	20	<0.5	<2	2.15	1.2	8	225
1123008166		0.69		0.161		0.7	0.77	30	<10	30	<0.5	<2	1.36	1.4	8	204
1123018021		0.68		0.126		1.0	1.34	17	<10	40	<0.5	<2	2.18	0.5	8	155
1123008199		0.68		0.030		0.3	0.88	24	<10	30	<0.5	<2	1.95	1.4	8	134
1123008032		0.67		0.296		1.6	2.53	30	<10	60	<0.5	3	2.74	2.6	28	123
1123008148		0.68		0.108		0.8	1.06	17	<10	40	<0.5	<2	1.74	1.0	9	130
1123008200		0.70	73.8	0.191		0.8	0.96	19	<10	40	<0.5	<2	1.75	3.6	8	115

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1231005162		19	1.72	<10	<1	0.09	10	0.59	264	1	0.04	7	480	24	0.33	<2
1231005202		16	1.71	10	<1	0.13	10	0.62	342	<1	0.07	7	440	12	0.49	<2
1123008129		141	10.15	10	<1	0.15	<10	1.48	1110	2	0.19	63	780	5	2.73	<2
1123018314		25	1.92	<10	<1	0.18	10	0.70	729	1	0.02	9	380	56	1.40	<2
1231005050		30	3.22	10	<1	0.24	10	1.22	1370	<1	0.06	16	1220	4	0.43	<2
1231005088		24	2.18	10	<1	0.13	20	0.88	574	<1	0.03	10	680	9	0.38	<2
1231005123		22	1.80	10	<1	0.13	10	0.73	350	<1	0.05	7	470	12	0.32	<2
1231005169		13	1.91	10	<1	0.14	10	1.09	749	<1	0.02	6	580	10	0.26	<2
1231005233		238	2.24	<10	<1	0.11	10	0.38	311	1	0.15	8	400	13	2.07	<2
1231005052		26	2.11	10	1	0.21	20	0.83	587	<1	0.03	10	530	3	0.31	<2
1122004075		23	1.45	<10	<1	0.13	10	0.70	611	1	0.05	9	360	17	0.69	<2
1122004063		18	1.52	<10	<1	0.13	10	0.66	315	1	0.11	10	370	8	0.40	<2
1123018370		27	1.97	<10	<1	0.20	10	0.64	1090	1	0.02	8	420	90	1.66	<2
1123008224		26	3.12	10	<1	0.09	10	0.88	593	1	0.06	24	470	4	0.61	<2
1231005041		103	4.05	10	<1	0.04	<10	1.85	560	1	0.37	48	240	<2	0.24	3
1123008246		75	8.83	10	<1	0.23	<10	1.61	1650	1	0.14	50	930	5	2.41	<2
1123017029		62	2.18	<10	<1	0.24	10	0.40	983	1	0.02	9	370	13	1.77	3
V835525		49	2.85	<10	1	0.19	10	0.41	266	20	0.14	13	610	8	0.06	<2
1123018074		20	2.38	<10	<1	0.29	10	0.64	664	1	0.16	14	450	45	1.77	<2
1124029701		58	3.00	<10	<1	0.22	10	0.62	439	1	0.01	10	380	33	2.33	<2
1123012131		35	2.03	<10	<1	0.20	<10	0.82	1380	1	0.02	12	400	36	1.97	<2
1123018048		15	2.19	10	<1	0.26	20	0.71	595	1	0.07	15	500	5	0.59	<2
1123018056		27	2.17	10	<1	0.21	10	0.70	571	1	0.14	14	500	32	1.33	<2
1122004035		10	1.48	<10	<1	0.16	10	0.63	433	<1	0.06	14	350	12	1.20	<2
1123012148		23	1.92	<10	<1	0.23	<10	0.83	1650	1	0.02	11	380	135	1.93	<2
1123018125		40	1.97	<10	<1	0.13	10	0.58	684	1	0.03	13	400	3	0.77	<2
1123012140		68	2.02	<10	<1	0.23	<10	0.76	1450	1	0.02	12	410	129	2.06	<2
1123012173		49	1.98	<10	<1	0.24	<10	0.95	1740	1	0.02	11	380	351	1.85	2
1123012045		48	2.12	<10	<1	0.18	<10	0.77	1170	1	0.02	13	410	30	2.13	<2
1123012001		30	2.12	<10	<1	0.15	10	0.37	720	1	0.02	12	420	37	2.14	<2
1123012063		59	2.27	<10	<1	0.17	<10	0.53	1090	1	0.02	13	420	206	2.36	2
1123018087		22	2.00	<10	<1	0.21	10	0.74	807	1	0.03	9	480	31	1.22	<2
1123008120		115	8.98	10	<1	0.23	<10	1.97	1570	1	0.14	55	780	5	1.81	<2
1123012144		42	1.91	<10	<1	0.13	<10	0.72	1420	<1	0.02	12	390	118	1.72	2
1123008166		40	2.21	<10	<1	0.11	10	0.46	429	1	0.03	10	360	3	1.18	<2
1123018021		23	1.94	<10	<1	0.15	10	0.56	639	1	0.10	12	390	27	0.81	2
1123008199		23	2.07	<10	<1	0.13	10	0.54	517	1	0.04	10	390	3	0.78	2
1123008032		101	6.32	10	<1	0.27	10	1.44	1140	2	0.13	38	610	32	1.83	<2
1123008148		49	2.25	<10	<1	0.12	10	0.64	488	1	0.04	9	390	3	0.89	2
1123008200		53	2.19	<10	1	0.16	10	0.51	523	1	0.04	10	370	2	1.02	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1231005162		1	54	<20	<0.01	<10	<10	8	<10	102	0.10	0.32	11	8.4	1	10.0
1231005202		1	93	<20	0.01	<10	<10	7	<10	80	0.22	0.43	26	8.3	13	13.4
1123008129		11	103	<20	0.09	<10	<10	236	<10	279	1.08	2.83	82	8.3	-6	88.4
1123018314		<1	24	<20	<0.01	<10	<10	4	<10	277	0.44	1.38	37	8.2	-6	43.1
1231005050		3	31	<20	0.01	<10	<10	27	<10	72	0.40	0.40	28	8.0	16	12.5
1231005088		1	39	<20	0.01	<10	<10	11	<10	92	0.18	0.36	15	8.1	4	11.3
1231005123		1	73	<20	0.01	<10	<10	9	<10	117	0.08	0.28	11	8.5	2	8.8
1231005169		1	24	<20	<0.01	<10	<10	10	<10	119	0.20	0.22	14	8.0	7	6.9
1231005233		<1	131	<20	<0.01	<10	<10	5	<10	3460	0.19	2.07	18	8.4	-47	64.7
1231005052		1	27	<20	0.01	<10	<10	11	<10	86	0.17	0.29	13	8.2	4	9.1
1122004075		1	40	<20	<0.01	<10	<10	4	<10	116	0.93	0.65	76	9.2	56	20.3
1122004063		1	62	<20	<0.01	<10	<10	8	<10	51	0.68	0.36	37	9.1	26	11.3
1123018370		1	30	<20	<0.01	<10	<10	4	<10	200	0.66	1.49	57	8.6	10	46.6
1123008224		2	78	<20	0.02	<10	<10	43	<10	102	0.92	0.57	74	9.1	56	17.8
1231005041		6	58	<20	0.17	<10	<10	115	<10	72	0.26	0.21	37	8.5	30	6.6
1123008246		11	113	<20	0.08	<10	<10	192	<10	244	1.54	2.34	173	8.2	100	73.1
1123017029		<1	19	<20	<0.01	<10	<10	3	<10	844	0.82	1.64	65	8.7	14	51.3
V835525		2	20	<20	0.42	<10	<10	69	<10	48	0.04					
1123018074		1	109	<20	0.02	<10	<10	16	<10	137	0.45	1.68	46	8.5	-7	52.5
1124029701		<1	12	<20	0.01	<10	<10	5	<10	947	0.26	2.24	23	7.8	-47	70.0
1123012131		<1	22	<20	<0.01	<10	<10	3	<10	448	1.16	1.98	94	8.9	32	61.9
1123018048		1	49	<20	0.03	<10	<10	18	10	76	0.62	0.53	60	9.1	43	16.6
1123018056		1	85	<20	0.02	<10	<10	11	10	107	0.27	1.21	31	8.5	-7	37.8
1122004035		<1	51	<20	<0.01	<10	<10	4	<10	78	0.74	1.15	64	9.1	28	35.9
1123012148		<1	23	<20	<0.01	<10	<10	3	<10	407	1.16	1.78	94	8.7	38	55.6
1123018125		1	39	<20	0.01	<10	<10	13	<10	158	0.77	0.70	64	8.9	42	21.9
1123012140		<1	21	<20	<0.01	<10	<10	3	<10	449	1.15	2.17	93	8.7	25	67.8
1123012173		<1	21	<20	<0.01	<10	<10	3	<10	933	1.19	1.91	88	8.6	28	59.7
1123012045		<1	21	<20	<0.01	<10	<10	3	20	852	0.98	2.22	77	8.4	8	69.4
1123012001		<1	18	<20	<0.01	<10	<10	4	<10	553	0.92	2.04	75	8.5	11	63.8
1123012063		<1	19	<20	<0.01	<10	<10	2	<10	807	1.02	2.32	83	8.0	11	72.5
1123018087		1	27	<20	<0.01	<10	<10	7	<10	144	0.38	1.21	37	8.5	-1	37.8
1123008120		13	101	<20	0.10	<10	<10	225	10	205	1.95	1.93	204	8.5	144	60.3
1123012144		<1	19	<20	<0.01	<10	<10	2	<10	317	1.03	1.68	79	8.3	27	52.5
1123008166		1	29	<20	<0.01	<10	<10	7	<10	348	0.49	1.21	42	8.7	4	37.8
1123018021		1	112	<20	0.03	<10	<10	12	<10	166	0.58	0.79	51	8.8	26	24.7
1123008199		1	42	<20	<0.01	<10	<10	7	<10	376	0.71	0.73	56	9.0	33	22.8
1123008032		7	64	<20	0.07	<10	<10	125	10	654	1.11	1.71	86	8.4	33	53.4
1123008148		1	31	<20	<0.01	<10	<10	10	<10	261	0.58	0.88	48	9.0	21	27.5
1123008200		1	37	<20	<0.01	<10	<10	7	<10	925	0.62	1.04	50	9.0	18	32.5

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EMO ON P0W 1E0

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Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1231005162		1.10	1
1231005202		1.93	2
1123008129		0.93	2
1123018314		0.86	2
1231005050		2.24	2
1231005088		1.33	1
1231005123		1.26	1
1231005169		2.04	1
1231005233		0.28	1
1231005052		1.43	1
1122004075		3.74	2
1122004063		3.29	2
1123018370		1.22	2
1123008224		4.15	2
1231005041		5.64	2
1123008246		2.37	3
1123017029		1.27	2
V835525			
1123018074		0.88	2
1124029701		0.33	2
1123012131		1.52	3
1123018048		3.62	2
1123018056		0.82	2
1122004035		1.78	2
1123012148		1.69	3
1123018125		2.93	2
1123012140		1.37	3
1123012173		1.47	2
1123012045		1.11	2
1123012001		1.18	2
1123012063		1.14	2
1123018087		0.98	2
1123008120		3.38	3
1123012144		1.50	2
1123008166		1.11	2
1123018021		2.07	2
1123008199		2.45	2
1123008032		1.61	2
1123008148		1.75	2
1123008200		1.54	2

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CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method / Analyte / Units / LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
V835526		0.06		0.196		1.5	0.80	2	<10	40	<0.5	3	0.43	<0.5	9	11
1123017051		0.67	86.1	1.100		2.2	1.23	51	<10	20	<0.5	<2	1.02	15.2	8	125
1122004097		0.67	85.9	0.087		0.8	1.13	65	<10	40	<0.5	<2	1.94	<0.5	7	146
1122004103		0.67		0.273		0.8	1.13	65	<10	40	<0.5	<2	2.51	<0.5	7	176
1123008250		0.69		0.096		1.3	2.82	16	<10	80	<0.5	2	2.94	9.8	44	219
1122004125		0.68		0.029		0.3	1.45	6	<10	40	<0.5	<2	1.70	<0.5	9	209
1123017044		0.68		0.475		2.0	1.01	101	<10	40	<0.5	<2	0.55	1.1	8	147
1123017100		0.67		0.173		1.0	1.46	33	<10	20	<0.5	<2	1.16	2.5	8	132
1123017125		0.68		0.221		0.7	1.50	39	<10	20	<0.5	<2	0.84	8.2	7	124
1123017164		0.68		1.635		0.9	1.67	34	<10	90	<0.5	<2	1.73	7.0	8	139
1123017086		0.67		0.769		3.0	1.42	115	<10	30	<0.5	<2	0.50	7.8	9	171
1123017189		0.68		0.152		1.2	1.34	45	<10	40	<0.5	<2	0.79	10.3	7	142
1123017219		0.67		0.425		1.3	1.20	89	<10	20	<0.5	<2	1.03	8.1	5	158
1123017241		0.49		0.249		1.3	1.42	49	<10	110	<0.5	<2	1.57	11.8	7	190
1123017069		0.49		0.475		1.8	0.94	120	<10	40	<0.5	<2	0.92	5.3	8	226
1123017062		0.68		0.387		1.0	1.39	106	<10	20	<0.5	<2	1.80	9.4	8	137
1123017172		0.68		0.287		2.9	0.78	149	<10	20	<0.5	2	0.73	14.5	8	127
V835527		0.06		1.920		3.2	0.96	3	<10	70	<0.5	3	0.45	<0.5	9	13
1123002082		0.51		0.034		0.4	1.07	7	<10	40	<0.5	<2	1.19	<0.5	8	167
1123003046		0.49		0.041		0.5	1.50	22	<10	30	<0.5	<2	1.94	<0.5	9	153
1123003041		0.50		0.026		0.2	1.01	3	<10	30	<0.5	<2	1.51	<0.5	7	206
1123009173		0.50		0.349		1.9	0.42	52	<10	20	<0.5	<2	2.07	1.9	8	196
1123002106		0.46		0.015		0.2	1.03	2	<10	70	<0.5	<2	1.71	<0.5	9	220
1123009024		0.48		1.175		3.1	0.44	71	<10	30	<0.5	<2	2.11	5.3	10	143
1123003001		0.48		0.051		0.7	1.10	33	<10	30	<0.5	<2	2.94	<0.5	7	69
1123009015		0.47		0.505		1.6	0.62	31	<10	30	<0.5	<2	2.46	5.2	7	95
1123003016		0.46		0.069		0.4	1.23	7	<10	50	<0.5	<2	1.25	<0.5	8	194
1123009135		0.49		0.432		2.8	0.74	54	<10	30	<0.5	<2	2.12	5.3	8	104
1123009013		0.45		0.805		1.0	0.70	45	<10	20	<0.5	<2	2.52	1.4	7	168
1123009124		0.50		0.416		0.7	0.43	46	<10	20	<0.5	<2	1.59	1.4	9	98
1123003032		0.47		0.043		0.7	1.88	39	<10	40	<0.5	<2	2.16	<0.5	7	132
1123009130		0.45		0.359		1.4	0.60	29	<10	30	<0.5	<2	2.29	1.8	8	85
1123009012		0.52		5.20		1.4	0.88	48	<10	30	<0.5	<2	2.31	6.2	7	100
1123009043		0.52		0.297		1.5	0.80	41	<10	30	<0.5	<2	2.53	6.0	8	105
1123009159		0.48		0.349		2.2	1.13	42	<10	20	<0.5	<2	2.39	1.0	9	120
V835528		0.06		1.565		9.9	1.10	2	<10	80	<0.5	3	0.68	<0.5	12	10

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
V835526		50	2.48	<10	<1	0.20	10	0.35	245	4	0.14	11	510	21	0.05	<2
1123017051		70	2.51	<10	1	0.18	10	0.92	583	1	0.02	10	400	29	1.86	<2
1122004097		9	1.48	<10	<1	0.18	10	0.59	496	1	0.06	10	360	17	0.69	<2
1122004103		15	1.60	<10	<1	0.17	10	0.69	529	1	0.06	11	370	33	0.81	<2
1123008250		144	9.16	10	1	0.26	10	1.29	1450	1	0.08	69	750	6	2.21	<2
1122004125		12	2.24	10	1	0.12	10	0.77	350	1	0.08	15	410	4	0.39	<2
1123017044		92	2.41	<10	<1	0.25	10	0.55	373	1	0.02	11	420	21	1.86	2
1123017100		65	1.68	<10	1	0.17	10	0.75	513	1	0.10	9	460	58	1.14	<2
1123017125		42	1.95	<10	1	0.18	10	0.77	436	<1	0.06	8	390	21	1.31	<2
1123017164		40	1.92	<10	<1	0.31	20	1.16	705	1	0.03	11	620	48	1.10	<2
1123017086		245	3.03	<10	1	0.23	20	0.97	507	1	0.01	13	390	18	2.11	<2
1123017189		69	1.98	<10	<1	0.24	10	1.02	523	<1	0.02	8	410	61	1.32	<2
1123017219		51	2.52	<10	<1	0.21	10	1.02	772	1	0.01	8	360	41	1.77	<2
1123017241		71	2.25	<10	1	0.39	20	1.06	792	1	0.02	11	650	64	1.30	<2
1123017069		75	2.21	<10	<1	0.29	10	0.42	408	1	0.02	12	410	14	1.85	<2
1123017062		61	2.43	<10	<1	0.21	10	1.07	896	1	0.01	11	400	16	1.39	<2
1123017172		87	3.03	<10	<1	0.23	10	0.43	403	1	0.01	10	370	57	2.98	<2
V835527		253	2.01	<10	<1	0.24	10	0.37	228	14	0.13	12	360	20	0.07	<2
1123002082		32	2.02	10	<1	0.13	10	0.68	318	<1	0.05	12	400	7	0.42	<2
1123003046		14	2.21	10	<1	0.10	10	0.79	404	<1	0.08	13	440	8	0.60	<2
1123003041		26	1.99	10	<1	0.08	10	0.63	369	1	0.05	13	390	2	0.18	<2
1123009173		53	1.99	<10	<1	0.16	<10	0.67	963	1	0.02	11	380	293	2.05	4
1123002106		42	1.98	10	1	0.19	10	0.67	361	1	0.05	13	490	2	0.20	<2
1123009024		186	2.07	<10	1	0.17	10	0.55	1390	1	0.02	14	420	925	2.05	9
1123003001		15	1.60	<10	<1	0.15	10	0.74	564	<1	0.04	9	360	14	1.25	<2
1123009015		74	2.12	<10	1	0.22	10	0.87	1270	1	0.02	11	400	355	2.00	<2
1123003016		31	2.15	10	<1	0.15	10	0.75	354	1	0.05	12	400	2	0.45	<2
1123009135		47	2.46	<10	<1	0.25	<10	0.80	1360	1	0.03	14	410	549	2.68	2
1123009013		39	2.00	<10	<1	0.14	10	1.12	2170	<1	0.02	11	440	50	1.43	<2
1123009124		35	2.22	<10	<1	0.14	10	0.55	861	1	0.02	12	420	202	2.37	2
1123003032		25	1.75	10	<1	0.19	10	0.92	621	1	0.14	9	350	18	0.61	<2
1123009130		45	2.06	<10	1	0.21	10	0.85	1290	1	0.02	12	420	258	1.83	<2
1123009012		118	2.01	<10	<1	0.21	10	1.11	2150	1	0.02	11	410	151	1.53	<2
1123009043		43	2.46	<10	1	0.19	10	1.16	2330	1	0.02	12	400	281	2.33	<2
1123009159		64	2.25	<10	<1	0.18	10	0.78	951	<1	0.04	13	410	110	2.24	2
V835528		51	3.09	<10	<1	0.21	10	0.44	286	20	0.17	14	620	8	0.06	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
V835526		2	20	<20	0.37	<10	<10	56	<10	56	0.02					
1123017051		1	22	<20	0.02	<10	<10	7	<10	3690	0.30	1.81	27	8.7	-30	56.6
1122004097		1	31	<20	<0.01	<10	<10	5	<10	77	0.59	0.69	53	8.4	31	21.6
1122004103		1	45	<20	<0.01	<10	<10	6	<10	136	0.79	0.82	67	9.1	41	25.6
1123008250		13	73	<20	0.13	<10	<10	226	<10	2370	0.95	2.05	81	8.3	17	64.1
1122004125		2	50	<20	0.01	<10	<10	21	<10	43	0.50	0.36	45	9.1	34	11.3
1123017044		1	10	<20	<0.01	<10	<10	5	<10	261	0.18	1.95	17	8.7	-44	60.9
1123017100		1	32	<20	0.02	<10	<10	6	<10	639	0.26	1.13	26	8.3	-9	35.3
1123017125		<1	29	<20	0.02	<10	<10	6	<10	2050	0.13	1.21	16	8.6	-22	37.8
1123017164		2	81	<20	0.04	<10	<10	13	<10	1735	0.41	1.04	41	8.3	9	32.5
1123017086		1	12	<20	0.01	<10	<10	7	<10	1890	0.14	2.03	16	8.5	-47	63.4
1123017189		1	28	<20	0.04	<10	<10	8	<10	2580	0.17	1.27	17	8.7	-23	39.7
1123017219		<1	18	<20	0.01	<10	<10	5	<10	1950	0.31	1.75	31	8.4	-24	54.7
1123017241		2	86	<20	0.05	<10	<10	14	<10	2750	0.44	1.23	44	8.8	6	38.4
1123017069		<1	13	<20	<0.01	<10	<10	5	<10	1250	0.30	1.89	26	8.5	-33	59.1
1123017062		1	24	<20	0.02	<10	<10	7	<10	2280	0.57	1.32	49	8.6	8	41.3
1123017172		<1	13	<20	<0.01	<10	<10	3	<10	3480	0.25	3.14	22	8.2	-76	98.1
V835527		2	21	<20	0.29	<10	<10	43	<10	53	0.02					
1123002082		2	23	<20	0.02	<10	<10	20	<10	71	0.39	0.42	35	8.8	22	13.1
1123003046		1	63	<20	0.01	<10	<10	18	<10	75	0.58	0.59	50	8.6	32	18.4
1123003041		2	29	<20	0.01	<10	<10	18	<10	33	0.52	0.16	46	9.1	41	5.0
1123009173		<1	21	<20	<0.01	<10	<10	2	<10	459	1.01	1.98	77	8.2	15	61.9
1123002106		2	37	<20	0.03	<10	<10	19	<10	44	0.58	0.20	49	8.9	43	6.3
1123009024		<1	21	<20	<0.01	<10	<10	4	<10	1440	0.98	2.05	73	8.3	9	64.1
1123003001		1	79	<20	<0.01	<10	<10	4	<10	86	0.96	1.12	78	8.7	43	35.0
1123009015		<1	25	<20	<0.01	<10	<10	3	<10	1175	1.22	2.05	89	8.5	25	64.1
1123003016		2	23	<20	0.02	<10	<10	19	<10	30	0.39	0.42	37	9.3	24	13.1
1123009135		1	25	<20	<0.01	<10	<10	4	<10	1470	0.97	2.73	77	9.0	-8	85.3
1123009013		1	32	<20	<0.01	<10	<10	5	<10	373	1.23	1.38	86	8.5	43	43.1
1123009124		<1	15	<20	<0.01	<10	<10	2	<10	342	0.73	2.32	58	8.2	-15	72.5
1123003032		1	66	<20	0.02	<10	<10	10	<10	84	0.54	0.60	46	9.0	27	18.8
1123009130		<1	20	<20	<0.01	<10	<10	3	<10	460	1.10	1.73	81	8.8	27	54.1
1123009012		1	34	<20	<0.01	<10	<10	5	<10	1540	1.17	1.44	81	8.6	36	45.0
1123009043		<1	36	<20	<0.01	<10	<10	4	<10	1545	1.24	2.26	86	8.3	15	70.6
1123009159		1	27	<20	<0.01	<10	<10	5	<10	296	0.80	2.17	69	8.7	1	67.8
V835528		2	24	<20	0.46	<10	<10	76	<10	50	0.03					

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
V835526			
1123017051		0.48	2
1122004097		2.46	2
1122004103		2.61	2
1123008250		1.26	2
1122004125		4.00	2
1123017044		0.28	1
1123017100		0.74	2
1123017125		0.42	1
1123017164		1.26	2
1123017086		0.25	1
1123017189		0.43	1
1123017219		0.57	2
1123017241		1.14	2
1123017069		0.44	2
1123017062		1.19	2
1123017172		0.22	2
V835527			
1123002082		2.67	2
1123003046		2.71	2
1123003041		9.20	2
1123009173		1.24	2
1123002106		7.84	2
1123009024		1.14	2
1123003001		2.23	2
1123009015		1.39	2
1123003016		2.82	2
1123009135		0.90	2
1123009013		1.99	2
1123009124		0.80	2
1123003032		2.45	2
1123009130		1.50	2
1123009012		1.80	2
1123009043		1.22	2
1123009159		1.02	2
V835528			

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CERTIFICATE OF ANALYSIS TB18315376

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

CERTIFICATE TB18315377

Project: Mine Site Lab Pulps Nov 2018

P.O. No.: 4500023138

This report is for 132 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 10-DEC-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

<Original signed by>

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1124025001		0.46	86.7	0.373		1.0	1.44	45	<10	30	<0.5	<2	1.36	2.1	8	125
1124025119		0.46		0.158		0.5	1.03	42	<10	20	<0.5	<2	1.65	<0.5	5	85
1123002091		0.50		0.032		<0.2	1.10	5	<10	60	<0.5	<2	1.45	<0.5	8	189
1123002001		0.47		0.017		0.4	0.96	19	10	30	<0.5	<2	2.88	<0.5	6	64
1123002014		0.49		0.026		0.3	1.18	35	<10	40	<0.5	<2	2.70	0.5	6	70
1123002032		0.49		0.056		0.9	1.21	42	<10	40	<0.5	<2	1.53	<0.5	6	91
1123003100		0.52		0.024		0.5	1.28	38	<10	50	<0.5	<2	1.56	<0.5	6	140
1123002040		0.49		0.141		1.1	1.30	35	<10	30	<0.5	<2	1.01	<0.5	7	101
1123009007		0.47		2.73		2.1	0.61	57	<10	30	<0.5	<2	1.94	1.8	10	167
1123002067		0.46		0.049		0.2	1.14	5	<10	40	<0.5	<2	1.75	<0.5	9	238
1123002039		0.50		0.061		1.1	1.47	33	10	30	<0.5	<2	1.54	<0.5	7	168
1123003130		0.52		0.256		1.0	1.05	135	<10	30	<0.5	2	1.88	<0.5	9	117
1123003080		0.50		0.046		0.5	0.94	26	<10	30	<0.5	2	2.94	<0.5	6	112
1123009008		0.36		0.652		1.1	0.59	31	<10	40	<0.5	<2	2.26	1.6	9	164
1123002037		0.44		0.070		0.7	1.02	51	<10	30	<0.5	<2	2.66	<0.5	6	100
1123003119		0.50		0.055		0.3	1.09	4	<10	40	<0.5	2	1.51	<0.5	7	106
V835509		0.06		0.176		1.3	0.76	2	<10	40	<0.5	<2	0.40	<0.5	9	10
1124012122		0.47		0.018		0.2	1.10	30	<10	30	<0.5	<2	1.54	<0.5	7	125
1124019165		0.43		0.017		0.2	1.74	4	<10	130	<0.5	<2	1.65	<0.5	11	136
1124019104		0.42		0.797		0.8	2.52	23	<10	130	<0.5	<2	2.48	<0.5	16	97
1124021043		0.55		0.923		1.3	0.95	100	<10	30	<0.5	2	0.82	2.7	7	68
1124019141		0.48		0.751		1.0	1.21	53	<10	30	<0.5	<2	1.70	2.7	6	72
1124021017		0.40		0.960		1.3	1.34	70	<10	30	<0.5	<2	0.99	9.2	8	92
1124013001		0.53		0.147		0.4	1.15	7	<10	40	<0.5	<2	1.90	<0.5	8	114
1124019103		0.50		0.058		0.5	1.68	13	<10	110	<0.5	<2	2.06	<0.5	12	154
1124021001		0.55		0.662		1.3	1.26	79	<10	20	<0.5	<2	0.91	10.7	9	111
1124012064		0.61		0.144		0.6	1.02	5	<10	30	<0.5	3	1.57	<0.5	7	92
1124019060		0.53		0.491		0.7	1.32	37	<10	30	<0.5	<2	1.20	6.0	7	77
1124012094		0.44		0.049		0.3	1.15	13	<10	50	<0.5	<2	1.18	<0.5	8	157
1124012085		0.51		0.175		0.8	1.16	44	<10	30	<0.5	2	2.14	<0.5	7	75
1124013174		0.66		0.010		0.2	1.22	2	<10	100	<0.5	<2	2.40	<0.5	9	101
1124021024		0.51		1.025		1.1	0.84	115	<10	20	<0.5	<2	0.60	0.5	8	108
1124012104		0.51		0.143		0.5	1.16	12	<10	40	<0.5	3	1.56	<0.5	9	104
1124021002		0.54		0.876		1.1	1.41	90	<10	20	<0.5	<2	0.56	2.0	8	75
1124019110		0.45		0.429		1.0	1.34	62	<10	30	<0.5	<2	1.42	2.0	6	78
1124012111		0.48		0.009		0.4	1.10	22	<10	40	<0.5	<2	1.59	<0.5	6	112
1124012029		0.49		0.026		<0.2	1.15	6	<10	30	<0.5	<2	1.37	<0.5	8	162
V835510		0.06		0.209		1.4	0.80	2	<10	40	<0.5	<2	0.42	<0.5	9	12
1124015176		0.49		0.070		0.3	2.10	9	<10	50	<0.5	<2	4.12	<0.5	18	82
1124018094		0.48		0.711		2.1	1.06	60	<10	20	<0.5	2	1.24	13.0	8	95

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1124025001		78	1.98	<10	<1	0.21	10	0.65	549	1	0.11	12	470	67	1.50	<2
1124025119		16	1.60	<10	<1	0.19	10	0.71	685	<1	0.02	7	390	51	1.42	<2
1123002091		24	2.06	<10	<1	0.16	10	0.65	353	2	0.05	14	400	3	0.27	<2
1123002001		17	1.52	<10	<1	0.14	10	0.65	418	1	0.04	8	340	13	1.23	<2
1123002014		10	1.39	<10	<1	0.20	10	0.70	510	<1	0.04	8	350	5	0.65	<2
1123002032		12	1.44	<10	<1	0.17	10	0.57	426	1	0.07	10	390	13	0.59	<2
1123003100		14	1.49	<10	<1	0.17	10	0.65	380	1	0.10	9	350	14	0.92	<2
1123002040		11	1.49	<10	<1	0.16	10	0.56	371	<1	0.09	10	360	8	0.64	<2
1123009007		40	2.45	<10	<1	0.16	10	0.78	1410	1	0.02	15	450	199	1.78	<2
1123002067		22	2.21	<10	<1	0.10	20	0.69	379	1	0.05	13	410	2	0.52	<2
1123002039		13	1.59	<10	<1	0.15	10	0.61	496	1	0.10	10	350	14	0.50	<2
1123003130		24	2.38	<10	<1	0.15	20	0.63	587	1	0.03	10	440	20	1.95	<2
1123003080		12	1.59	<10	<1	0.12	10	0.72	671	<1	0.03	7	340	20	1.14	<2
1123009008		47	2.09	<10	<1	0.16	10	0.65	1340	1	0.02	12	440	224	1.56	3
1123002037		10	1.40	<10	<1	0.16	10	0.59	601	<1	0.04	8	360	14	0.60	<2
1123003119		16	1.94	<10	<1	0.09	20	0.66	282	<1	0.04	10	410	2	0.52	<2
V835509		50	2.39	<10	<1	0.19	10	0.33	236	4	0.13	10	490	21	0.04	<2
1124012122		13	1.54	<10	<1	0.13	10	0.60	288	1	0.08	9	330	8	0.95	<2
1124019165		13	2.23	10	<1	0.48	20	0.91	533	1	0.11	18	560	3	0.29	<2
1124019104		27	3.65	10	<1	0.51	20	0.96	724	1	0.18	25	600	18	1.51	<2
1124021043		55	2.67	<10	<1	0.20	10	0.58	554	1	0.01	10	410	22	2.04	2
1124019141		22	1.85	<10	<1	0.23	20	0.92	837	<1	0.02	7	370	56	1.59	2
1124021017		56	2.41	<10	<1	0.25	10	0.86	617	1	0.03	11	420	73	1.77	<2
1124013001		95	2.23	<10	<1	0.10	10	0.61	364	1	0.04	10	410	3	0.41	<2
1124019103		25	3.63	10	<1	0.51	10	0.93	787	1	0.10	25	540	9	1.25	<2
1124021001		77	2.61	<10	<1	0.18	10	0.92	629	1	0.01	11	430	38	1.82	<2
1124012064		35	1.90	<10	<1	0.09	10	0.52	284	1	0.04	8	380	4	0.59	<2
1124019060		33	1.70	<10	<1	0.22	20	0.86	597	<1	0.02	8	370	49	1.17	<2
1124012094		12	1.97	<10	<1	0.20	10	0.70	289	1	0.05	13	410	4	0.59	<2
1124012085		33	1.68	<10	<1	0.13	10	0.81	531	1	0.04	8	370	12	1.02	2
1124013174		22	2.00	<10	<1	0.18	20	0.84	424	1	0.03	20	530	2	0.21	<2
1124021024		36	2.71	<10	<1	0.17	10	0.49	415	1	0.01	11	430	24	2.09	3
1124012104		26	2.46	<10	<1	0.12	20	0.71	304	<1	0.04	12	400	<2	1.03	<2
1124021002		65	2.79	<10	<1	0.20	10	0.97	589	1	0.01	11	420	38	1.61	<2
1124019110		22	1.70	<10	<1	0.21	20	0.87	731	1	0.03	7	360	57	1.46	2
1124012111		13	1.56	<10	<1	0.15	10	0.59	293	<1	0.08	9	350	7	1.09	<2
1124012029		42	2.05	<10	<1	0.10	10	0.54	307	1	0.04	9	390	2	0.28	<2
V835510		52	2.48	<10	1	0.20	10	0.34	244	4	0.14	12	500	27	0.04	<2
1124015176		51	5.32	10	<1	0.13	10	1.92	863	1	0.09	29	560	5	0.71	<2
1124018094		89	2.51	<10	<1	0.20	20	0.80	564	<1	0.01	8	390	45	2.09	3

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1124025001		1	55	<20	0.01	<10	<10	10	<10	626	0.38	1.49	32	9.0	-15	46.6
1124025119		<1	23	<20	<0.01	<10	<10	4	<10	78	0.48	1.37	42	9.0	-1	42.8
1123002091		2	29	<20	0.02	<10	<10	19	<10	43	0.46	0.27	43	9.5	35	8.4
1123002001		1	86	<20	<0.01	<10	<10	4	<10	62	0.87	1.21	76	9.2	38	37.8
1123002014		1	48	<20	<0.01	<10	<10	4	<10	83	0.84	0.66	74	9.4	53	20.6
1123002032		1	38	<20	<0.01	<10	<10	6	<10	68	0.43	0.59	40	9.3	22	18.4
1123003100		1	54	<20	<0.01	<10	<10	7	<10	87	0.46	0.89	39	9.1	11	27.8
1123002040		1	35	<20	<0.01	<10	<10	7	<10	54	0.24	0.60	26	9.3	7	18.8
1123009007		1	24	<20	0.01	<10	<10	8	<10	479	0.87	1.66	71	9.1	19	51.9
1123002067		1	30	<20	0.01	<10	<10	17	<10	52	0.53	0.48	49	9.2	34	15.0
1123002039		1	43	<20	<0.01	<10	<10	7	<10	70	0.38	0.47	38	9.3	23	14.7
1123003130		1	28	<20	<0.01	<10	<10	5	<10	112	0.64	1.95	54	8.7	-7	60.9
1123003080		1	68	<20	<0.01	<10	<10	4	<10	133	1.02	1.15	83	9.2	47	35.9
1123009008		1	27	<20	<0.01	<10	<10	6	<10	476	0.89	1.45	74	9.1	29	45.3
1123002037		1	52	<20	<0.01	<10	<10	4	<10	62	0.82	0.59	71	9.3	53	18.4
1123003119		1	27	<20	0.01	<10	<10	15	<10	29	0.47	0.46	43	9.2	29	14.4
V835509		2	18	<20	0.36	<10	<10	55	<10	56	0.02					
1124012122		1	42	<20	<0.01	<10	<10	6	<10	46	0.47	0.85	40	9.1	13	26.6
1124019165		2	82	<20	0.07	<10	<10	36	<10	97	0.43	0.27	45	9.7	37	8.4
1124019104		4	186	<20	0.09	<10	<10	70	<10	160	0.54	1.46	56	9.0	10	45.6
1124021043		<1	10	<20	<0.01	<10	<10	4	<10	666	0.24	2.10	24	8.8	-42	65.6
1124019141		1	32	<20	0.01	<10	<10	6	<10	750	0.51	1.55	45	8.9	-3	48.4
1124021017		1	15	<20	0.01	<10	<10	5	10	2000	0.27	1.80	30	8.9	-26	56.3
1124013001		1	31	<20	0.01	<10	<10	13	<10	38	0.65	0.39	52	9.3	40	12.2
1124019103		4	148	<20	0.09	<10	<10	80	<10	147	0.66	1.23	58	9.0	20	38.4
1124021001		1	15	<20	0.02	<10	<10	7	10	2420	0.25	1.84	27	8.8	-31	57.5
1124012064		1	26	<20	<0.01	<10	<10	9	<10	32	0.54	0.58	44	9.5	26	18.1
1124019060		1	28	<20	0.02	<10	<10	7	<10	1520	0.27	1.15	30	9.1	-6	35.9
1124012094		2	27	<20	0.03	<10	<10	20	<10	39	0.39	0.55	38	9.4	21	17.2
1124012085		1	40	<20	<0.01	<10	<10	5	<10	74	0.78	1.00	63	9.1	32	31.3
1124013174		2	62	<20	0.02	<10	<10	19	<10	74	0.78	0.20	64	9.4	58	6.3
1124021024		<1	9	<20	<0.01	<10	<10	4	<10	142	0.17	2.08	22	8.6	-43	65.0
1124012104		1	26	<20	0.01	<10	<10	15	<10	32	0.51	1.00	48	9.0	17	31.3
1124021002		1	11	<20	0.02	<10	<10	6	<10	575	0.14	1.58	23	8.8	-26	49.4
1124019110		1	35	<20	0.01	<10	<10	5	<10	586	0.37	1.45	39	9.0	-6	45.3
1124012111		1	43	<20	<0.01	<10	<10	5	<10	36	0.49	1.08	45	9.0	11	33.8
1124012029		1	23	<20	0.01	<10	<10	13	<10	27	0.46	0.29	41	9.5	32	9.1
V835510		2	19	<20	0.37	<10	<10	57	<10	59	0.01					
1124015176		8	97	<20	0.05	<10	<10	104	20	108	2.06	0.70	182	9.0	160	21.9
1124018094		<1	17	<20	0.01	<10	<10	5	20	3090	0.36	2.13	40	8.7	-27	66.6

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EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
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Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1124025001		0.69	2
1124025119		0.98	2
1123002091		5.10	2
1123002001		2.01	2
1123002014		3.59	2
1123002032		2.17	2
1123003100		1.40	2
1123002040		1.39	2
1123009007		1.37	2
1123002067		3.27	2
1123002039		2.59	2
1123003130		0.89	2
1123003080		2.31	2
1123009008		1.63	2
1123002037		3.85	2
1123003119		2.99	2
V835509			
1124012122		1.51	2
1124019165		5.33	2
1124019104		1.23	2
1124021043		0.37	2
1124019141		0.93	2
1124021017		0.53	2
1124013001		4.27	2
1124019103		1.51	2
1124021001		0.47	2
1124012064		2.43	2
1124019060		0.83	2
1124012094		2.21	2
1124012085		2.02	2
1124013174		10.24	2
1124021024		0.34	2
1124012104		1.54	2
1124021002		0.47	2
1124019110		0.86	2
1124012111		1.33	2
1124012029		4.52	2
V835510			
1124015176		8.32	3
1124018094		0.60	2

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CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1124018077		0.48		0.320		2.5	1.44	44	<10	20	<0.5	<2	1.18	4.3	10	80
1124018075		0.50		0.142		0.9	1.12	49	<10	20	<0.5	2	0.66	8.5	5	83
1124018028		0.47		1.715		4.3	1.22	70	<10	20	<0.5	2	1.92	10.5	8	63
1124018007		0.48		1.800		1.4	1.37	39	<10	120	0.8	<2	2.57	4.5	10	88
1124013169		0.51		0.205		0.2	1.14	6	<10	60	<0.5	<2	1.19	0.6	9	159
1124013192		0.51		0.023		0.2	1.28	7	<10	50	<0.5	<2	2.32	<0.5	9	138
1124021052		0.50		1.115		1.0	1.13	81	<10	30	<0.5	<2	0.41	<0.5	8	97
1124021054		0.48		0.704		1.3	1.18	116	<10	30	<0.5	3	0.53	1.3	9	70
1124013163		0.49		0.052		0.2	1.21	4	<10	40	<0.5	<2	1.55	<0.5	8	96
1124013172		0.47	67.6	0.027		<0.2	1.19	3	<10	50	<0.5	2	1.85	<0.5	8	104
1124013101		0.48	78.8	0.012		<0.2	1.07	4	<10	40	<0.5	<2	1.60	<0.5	6	207
1124021118		0.52	85.6	1.405		1.7	0.51	92	<10	20	<0.5	2	2.38	5.5	8	91
1124013024		0.73		0.019		0.2	1.00	3	<10	30	<0.5	<2	1.51	<0.5	8	144
1124021115		0.54		1.225		1.5	1.06	68	<10	20	<0.5	2	0.77	9.5	8	97
1124013120		0.60		0.084		0.4	1.06	9	<10	30	<0.5	<2	1.35	<0.5	10	109
1124021127		0.56		0.306		1.2	1.47	55	<10	30	<0.5	2	1.97	18.7	9	69
V835511		0.06		0.943		2.3	1.14	<2	<10	90	<0.5	<2	0.70	<0.5	14	8
1123001234		0.49		0.849		1.3	1.20	97	<10	30	<0.5	<2	2.18	0.7	11	76
1124027032		0.67		0.159		2.6	0.47	82	<10	20	<0.5	2	1.93	12.8	8	144
1124027064		0.51		0.604		1.2	0.67	151	<10	40	<0.5	<2	0.51	3.8	7	124
1124027001		0.49		0.361		1.3	0.55	126	<10	20	<0.5	2	1.34	10.0	7	132
1124025126		0.49		0.264		0.7	0.38	44	<10	30	<0.5	<2	2.51	0.7	8	120
1124027088		0.52		2.67		2.1	0.96	111	<10	30	<0.5	2	0.33	4.6	8	81
1123001117		0.48		1.290		1.1	1.40	54	<10	50	<0.5	<2	1.56	3.8	9	70
1123001180		0.49		1.020		1.5	0.99	47	<10	30	<0.5	<2	2.41	5.1	8	94
1124025107		0.48		0.699		0.6	0.42	58	<10	20	<0.5	<2	2.18	<0.5	6	82
1124026208		0.49		0.140		0.9	1.81	29	<10	40	<0.5	<2	3.10	1.6	12	145
1124026020		0.49		0.098		0.6	2.98	15	<10	100	<0.5	<2	2.78	<0.5	25	148
1124026029		0.50		0.303		3.9	3.18	46	<10	90	<0.5	<2	4.71	2.4	39	89
1123001198		0.44		>10.0	19.30	2.4	0.72	143	<10	30	<0.5	<2	2.33	1.4	11	59
1123001111		0.48		3.46		6.2	0.45	61	<10	40	<0.5	<2	2.35	3.7	12	172
1124026116		0.51		0.013		<0.2	1.69	3	<10	60	<0.5	2	2.89	<0.5	12	128
1124027074		0.52		0.290		1.0	0.72	110	<10	30	<0.5	<2	1.22	2.0	8	131
1124026119		0.55		0.092		0.9	1.97	22	<10	70	<0.5	<2	2.96	0.7	14	123
1123001157		0.53		0.793		7.3	1.36	83	<10	40	<0.5	<2	2.83	0.8	10	88
V835512		0.06		1.135		4.5	0.33	<2	<10	20	<0.5	2	0.37	<0.5	4	5
1124012008		0.53		0.018		0.3	1.12	28	<10	30	<0.5	2	2.36	<0.5	7	126
1124012018		0.35		0.209		0.7	1.27	4	<10	50	<0.5	<2	1.88	<0.5	9	266
1124012051		0.43		0.038		0.4	1.34	37	<10	40	<0.5	<2	2.42	<0.5	7	108
1124012004		0.47		0.091		0.6	1.09	43	<10	30	<0.5	<2	2.26	<0.5	7	139

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1124018077		61	1.77	<10	<1	0.20	20	0.91	659	1	0.02	7	380	128	1.15	3
1124018075		38	2.25	<10	<1	0.20	10	0.76	474	1	0.01	8	380	22	1.58	2
1124018028		185	2.11	<10	<1	0.24	20	0.90	997	1	0.02	8	370	412	1.89	4
1124018007		83	2.56	<10	1	0.72	30	1.34	963	<1	0.01	16	1170	99	1.68	3
1124013169		28	2.19	<10	<1	0.23	10	0.64	349	1	0.04	9	370	<2	0.56	<2
1124013192		22	2.33	<10	<1	0.13	20	0.75	402	1	0.04	12	550	<2	0.14	<2
1124021052		32	2.41	<10	<1	0.19	10	0.71	445	2	0.01	11	410	23	1.60	2
1124021054		39	2.26	<10	<1	0.19	10	0.65	388	<1	0.02	12	430	18	1.74	<2
1124013163		19	2.17	<10	<1	0.15	10	0.75	409	<1	0.04	10	370	3	0.39	<2
1124013172		15	2.03	<10	<1	0.20	10	0.79	471	1	0.04	12	440	2	0.35	<2
1124013101		33	1.94	<10	<1	0.13	10	0.61	378	1	0.04	11	410	2	0.19	<2
1124021118		62	2.16	<10	<1	0.15	10	0.64	1720	1	0.01	11	420	52	1.81	<2
1124013024		13	1.85	<10	<1	0.12	10	0.62	359	1	0.03	13	390	2	0.15	<2
1124021115		103	3.04	<10	<1	0.16	10	0.70	667	<1	0.01	13	440	36	2.19	<2
1124013120		48	2.36	<10	<1	0.08	10	0.60	352	1	0.03	10	390	2	0.76	<2
1124021127		95	2.43	<10	1	0.15	10	0.58	734	1	0.14	12	410	95	2.37	<2
V835511		58	3.20	<10	<1	0.28	10	0.53	304	11	0.10	17	740	7	0.08	<2
1123001234		31	2.24	<10	<1	0.16	10	0.82	572	1	0.02	11	450	43	1.74	<2
1124027032		93	2.36	<10	<1	0.20	10	0.40	980	1	0.01	9	390	16	2.20	2
1124027064		52	1.80	<10	<1	0.27	10	0.22	200	1	0.01	11	440	11	1.73	2
1124027001		73	2.53	<10	<1	0.24	10	0.26	666	1	0.01	8	400	10	2.52	3
1124025126		29	1.48	<10	<1	0.25	10	0.75	1810	1	<0.01	7	410	72	1.03	<2
1124027088		51	2.28	<10	<1	0.23	10	0.53	295	1	0.01	12	450	18	1.68	<2
1123001117		42	2.42	<10	<1	0.26	10	0.73	682	1	0.03	10	560	106	1.80	<2
1123001180		59	2.42	<10	<1	0.28	10	0.89	1420	<1	0.02	12	420	122	2.11	<2
1124025107		24	1.71	<10	<1	0.22	10	0.54	1390	<1	0.01	6	350	41	1.41	<2
1124026208		40	3.12	<10	<1	0.23	10	0.92	916	1	0.08	18	590	27	1.35	<2
1124026020		69	6.14	10	<1	0.44	10	1.47	1160	2	0.12	36	690	7	1.31	<2
1124026029		84	9.21	10	<1	0.39	10	1.79	1530	2	0.10	50	680	8	4.48	<2
1123001198		45	2.44	<10	<1	0.22	10	0.99	1560	1	0.01	11	540	174	2.16	2
1123001111		127	2.61	<10	<1	0.20	10	0.52	1540	1	0.01	16	420	627	2.60	2
1124026116		8	2.76	10	<1	0.20	20	1.17	784	<1	0.05	19	730	5	0.40	<2
1124027074		27	2.00	<10	<1	0.20	20	0.39	432	1	0.01	11	450	13	1.73	3
1124026119		43	4.42	10	<1	0.28	10	1.00	1100	4	0.07	26	500	7	1.76	<2
1123001157		44	2.40	<10	<1	0.20	20	0.88	889	<1	0.03	10	520	108	1.61	2
V835512		25	1.35	<10	<1	0.06	<10	0.08	111	7	0.08	6	300	<2	0.02	<2
1124012008		12	1.46	<10	<1	0.16	10	0.72	344	1	0.06	9	370	10	0.62	<2
1124012018		34	2.52	<10	<1	0.12	20	0.65	314	2	0.05	12	480	4	0.53	<2
1124012051		14	1.76	<10	<1	0.16	10	0.76	556	1	0.06	10	340	9	0.72	<2
1124012004		30	1.81	<10	<1	0.15	10	0.68	527	2	0.05	11	360	10	0.87	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1124018077		1	32	<20	0.02	<10	<10	6	30	1090	0.29	1.15	36	8.9	0	35.9
1124018075		<1	15	<20	0.02	<10	<10	5	<10	2150	0.18	1.70	25	8.9	-28	53.1
1124018028		<1	37	<20	0.01	<10	<10	5	10	2890	0.57	1.91	54	8.9	-6	59.7
1124018007		3	237	<20	0.07	<10	<10	24	<10	1270	0.85	1.67	78	9.2	26	52.2
1124013169		1	22	<20	0.03	<10	<10	17	<10	207	0.39	0.57	40	9.6	22	17.8
1124013192		2	46	<20	0.01	<10	<10	25	<10	38	0.72	0.12	63	9.6	59	3.8
1124021052		1	8	<20	<0.01	<10	<10	5	<10	171	0.11	1.66	12	8.8	-40	51.9
1124021054		<1	15	<20	0.01	<10	<10	4	<10	348	0.10	1.69	13	8.7	-40	52.8
1124013163		2	29	<20	0.02	<10	<10	19	<10	51	0.53	0.37	48	9.6	36	11.6
1124013172		2	36	<20	0.01	<10	<10	17	<10	64	0.63	0.34	57	9.6	46	10.6
1124013101		1	31	<20	0.02	<10	<10	16	<10	62	0.58	0.17	51	9.6	46	5.3
1124021118		<1	23	<20	<0.01	<10	<10	3	<10	1410	1.04	1.83	79	9.0	22	57.2
1124013024		1	25	<20	0.02	<10	<10	17	<10	81	0.53	0.13	45	9.6	41	4.1
1124021115		1	10	<20	0.01	<10	<10	4	10	2230	0.25	2.24	25	8.6	-45	70.0
1124013120		1	23	<20	0.01	<10	<10	11	<10	41	0.49	0.76	42	9.1	18	23.8
1124021127		<1	34	<20	<0.01	<10	<10	4	10	3920	0.52	2.44	51	8.6	-25	76.3
V835511		3	17	<20	0.36	<10	<10	79	<10	53	0.05					
1123001234		1	24	<20	<0.01	<10	<10	5	<10	217	0.70	1.75	59	8.9	4	54.7
1124027032		<1	17	<20	<0.01	<10	<10	2	10	2750	0.83	2.13	63	8.9	-4	66.6
1124027064		<1	10	<20	<0.01	<10	<10	3	<10	791	0.15	1.68	14	8.7	-39	52.5
1124027001		<1	14	<20	<0.01	<10	<10	3	<10	2230	0.53	2.60	41	8.7	-40	81.3
1124025126		<1	81	<20	<0.01	<10	<10	2	<10	189	1.32	0.96	96	9.1	66	30.0
1124027088		<1	9	<20	<0.01	<10	<10	4	<10	1100	0.10	1.59	10	8.7	-40	49.7
1123001117		1	32	<20	<0.01	<10	<10	7	<10	943	0.52	1.80	47	9.1	-9	56.3
1123001180		1	28	<20	<0.01	<10	<10	4	<10	1190	1.02	2.16	81	9.1	14	67.5
1124025107		<1	23	<20	<0.01	<10	<10	2	<10	69	1.10	1.42	80	9.0	36	44.4
1124026208		2	80	<20	0.08	<10	<10	51	<10	429	0.91	1.30	76	9.0	35	40.6
1124026020		10	85	<20	0.12	<10	<10	166	<10	168	0.87	1.32	71	8.8	30	41.3
1124026029		14	148	<20	0.10	<10	<10	197	<10	696	1.55	4.60	163	8.8	19	143.8
1123001198		1	26	<20	<0.01	<10	<10	4	<10	346	1.12	2.08	87	9.1	22	65.0
1123001111		<1	20	<20	<0.01	<10	<10	3	<10	1020	0.99	2.49	75	8.9	-3	77.8
1124026116		2	84	<20	0.04	<10	<10	34	<10	93	0.85	0.36	72	9.5	61	11.3
1124027074		<1	13	<20	<0.01	<10	<10	4	<10	477	0.39	1.65	31	8.8	-21	51.6
1124026119		4	78	<20	0.04	<10	<10	71	<10	319	0.92	1.74	74	9.1	20	54.4
1123001157		1	36	<20	<0.01	<10	<10	8	<10	257	0.93	1.55	75	9.1	27	48.4
V835512		1	12	<20	0.24	<10	<10	31	<10	22	0.06					
1124012008		1	50	<20	<0.01	<10	<10	5	<10	53	0.90	0.58	61	9.3	43	18.1
1124012018		1	34	<20	0.01	<10	<10	13	<10	30	0.76	0.50	49	9.3	33	15.6
1124012051		1	46	<20	<0.01	<10	<10	5	<10	75	0.80	0.67	63	9.5	42	20.9
1124012004		1	43	<20	<0.01	<10	<10	5	<10	94	1.02	0.79	65	9.2	40	24.7

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EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
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Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1124018077		1.00	2
1124018075		0.47	2
1124018028		0.90	2
1124018007		1.49	2
1124013169		2.25	2
1124013192		16.80	2
1124021052		0.23	1
1124021054		0.25	1
1124013163		4.15	2
1124013172		5.36	2
1124013101		9.60	2
1124021118		1.38	2
1124013024		11.08	2
1124021115		0.36	2
1124013120		1.77	2
1124021127		0.67	2
V835511			
1123001234		1.08	2
1124027032		0.95	2
1124027064		0.27	1
1124027001		0.50	2
1124025126		3.20	3
1124027088		0.20	1
1123001117		0.84	2
1123001180		1.20	2
1124025107		1.80	2
1124026208		1.87	2
1124026020		1.72	2
1124026029		1.13	3
1123001198		1.34	2
1123001111		0.96	2
1124026116		6.40	2
1124027074		0.60	2
1124026119		1.36	2
1123001157		1.55	2
V835512			
1124012008		3.37	2
1124012018		3.14	2
1124012051		3.01	2
1124012004		2.63	2

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CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1124012044		0.54		0.015		0.5	1.29	26	<10	40	<0.5	<2	1.69	<0.5	7	87
1124012001		0.55		0.111		0.4	1.19	30	<10	30	<0.5	<2	2.22	<0.5	6	177
1124022145		0.46		1.335		1.1	0.52	38	<10	20	<0.5	2	2.52	2.1	8	186
1124019040		0.51		0.210		1.5	1.34	69	<10	30	<0.5	<2	1.60	0.5	7	106
1124019036		0.48		0.365		0.5	1.43	30	<10	190	0.8	<2	2.56	1.4	10	136
1124019050		0.48		0.215		0.8	1.93	53	<10	20	<0.5	2	0.88	<0.5	10	115
1124019002		0.48		0.235		0.7	1.75	64	<10	30	<0.5	<2	1.37	<0.5	7	111
1124019027		0.49		0.384		1.0	0.84	92	<10	20	<0.5	<2	2.31	<0.5	6	96
1124023132		0.47		0.335		1.6	0.99	31	<10	30	<0.5	<2	2.27	1.4	8	92
1124023153		0.49		0.495		0.9	0.96	61	<10	20	<0.5	2	2.12	3.7	8	117
1124022109		0.49		0.916		0.4	0.90	44	<10	20	<0.5	2	2.10	<0.5	8	97
V835513		0.06		1.605		9.4	0.93	<2	<10	80	<0.5	<2	0.54	<0.5	11	8
1124023006		0.51		0.305		3.1	0.68	18	<10	30	<0.5	2	1.59	0.8	9	157
1124023159		0.50		0.116		0.8	2.58	29	<10	30	<0.5	2	1.56	<0.5	9	100
1124023121		0.47		0.127		0.8	1.95	37	<10	30	<0.5	<2	1.87	2.0	8	127
1124022158		0.52		0.818		0.6	0.87	116	<10	30	<0.5	2	1.99	<0.5	12	116
1124022021		0.46		1.670		1.3	0.72	24	<10	20	<0.5	<2	2.26	0.6	8	206
1124022018		0.47		1.110		0.4	0.77	50	<10	20	<0.5	<2	2.43	<0.5	9	173
1124023001		0.47		0.213		2.5	0.76	27	<10	20	<0.5	<2	2.05	1.0	8	165
1124023113		0.52	91.1	0.162		0.5	1.55	35	<10	20	<0.5	<2	1.84	2.3	8	135
1123001101		0.48		0.635		3.3	0.79	33	<10	30	<0.5	2	2.39	1.5	8	115
1124023175		0.47		0.362		0.9	1.03	57	<10	30	<0.5	<2	2.30	3.1	8	129
1124022002		0.47		0.535		1.4	0.49	32	<10	30	<0.5	2	2.34	1.8	8	142
1124022163		0.50		0.304		0.7	1.29	52	<10	30	<0.5	2	1.39	0.5	9	108
1123001179		0.51		0.785		1.5	0.54	60	<10	20	<0.5	2	2.31	6.9	8	169
1123001018		0.49		0.259		2.1	2.10	22	<10	30	<0.5	4	1.53	1.2	9	166
1124022003		0.49		1.395		1.6	0.52	29	<10	20	<0.5	2	2.53	4.7	8	165
1123001255		0.47		0.303		1.0	0.85	52	<10	20	<0.5	2	2.44	9.3	7	181
1124023022		0.50		0.251		0.7	2.53	43	<10	20	<0.5	<2	1.75	1.9	8	167
1124023018		0.49		0.160		1.6	2.03	24	<10	30	<0.5	<2	2.32	1.9	8	118
1124024008		0.48		0.113		0.8	1.57	34	<10	20	<0.5	<2	1.13	<0.5	6	99
V835514		0.06		0.202		1.5	0.80	<2	<10	40	<0.5	<2	0.42	<0.5	9	11
1123001297		0.51		1.900		2.6	1.61	74	<10	20	<0.5	3	1.26	0.9	9	101
1124024053		0.49		0.273		1.0	1.65	33	<10	20	<0.5	<2	1.72	1.9	5	144
1124024087		0.48		4.87		4.0	0.93	77	<10	20	<0.5	2	1.79	10.5	6	93
1124024034		0.48		0.333		0.5	1.77	48	<10	30	<0.5	<2	1.31	<0.5	7	97
1123001011		0.49		0.247		1.5	1.83	31	<10	30	<0.5	4	2.27	0.7	9	182
1124024064		0.47		0.694		1.2	0.86	55	<10	20	<0.5	3	1.64	11.8	7	161
1124026138		0.47		0.035		0.7	2.61	10	<10	70	<0.5	<2	2.94	6.5	35	186
1123001306		0.51		4.58		4.3	1.32	121	<10	20	<0.5	<2	1.43	14.9	14	94

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1124012044		9	1.40	<10	<1	0.14	10	0.65	299	1	0.08	9	370	7	0.50	<2
1124012001		28	1.64	<10	<1	0.13	10	0.76	541	3	0.06	10	340	12	0.72	2
1124022145		78	1.84	<10	<1	0.14	10	0.80	1500	1	0.01	11	420	112	1.45	<2
1124019040		28	1.67	<10	<1	0.24	20	0.84	764	1	0.02	7	400	121	1.29	2
1124019036		19	2.24	<10	1	0.52	30	1.23	870	<1	0.01	17	1190	144	1.31	2
1124019050		53	2.49	<10	<1	0.16	20	0.82	642	1	0.07	13	600	31	1.41	2
1124019002		25	1.59	<10	<1	0.20	20	0.77	582	<1	0.09	10	380	50	0.77	<2
1124019027		24	1.94	<10	<1	0.21	10	0.54	965	1	0.01	7	410	60	1.78	<2
1124023132		42	1.93	<10	<1	0.19	20	0.49	975	1	0.04	11	440	41	1.79	<2
1124023153		56	2.03	<10	<1	0.19	10	0.60	988	1	0.04	12	450	44	1.80	<2
1124022109		24	1.70	<10	<1	0.14	10	0.55	807	<1	0.02	9	440	15	1.55	<2
V835513		50	2.87	<10	<1	0.20	10	0.40	261	19	0.14	13	620	8	0.06	<2
1124023006		36	1.99	<10	<1	0.15	10	0.31	633	2	0.02	12	420	45	1.99	<2
1124023159		40	2.00	<10	<1	0.16	10	0.58	324	<1	0.24	11	450	45	1.72	<2
1124023121		33	1.87	<10	<1	0.17	10	0.65	587	<1	0.10	11	380	112	1.56	<2
1124022158		37	2.88	<10	<1	0.14	20	0.65	652	<1	0.04	12	570	36	2.72	3
1124022021		105	2.20	<10	<1	0.14	10	0.67	585	3	0.03	11	360	35	2.11	<2
1124022018		41	2.08	<10	<1	0.12	10	0.60	933	2	0.02	12	430	20	1.87	<2
1124023001		34	2.12	<10	<1	0.14	20	0.43	729	2	0.03	11	460	30	2.02	<2
1124023113		28	1.83	<10	<1	0.13	10	0.60	639	2	0.08	11	380	43	1.44	<2
1123001101		55	2.07	<10	<1	0.18	10	0.54	1060	<1	0.02	11	430	123	2.04	2
1124023175		39	2.04	<10	<1	0.18	10	0.64	1000	1	0.05	11	430	31	1.75	2
1124022002		73	2.18	<10	<1	0.17	10	0.86	1430	3	0.01	12	430	44	2.05	<2
1124022163		40	2.21	<10	<1	0.14	20	0.71	539	1	0.04	10	580	36	1.45	<2
1123001179		79	2.43	<10	<1	0.16	10	0.70	1160	<1	0.01	13	430	127	2.29	<2
1123001018		42	2.04	<10	<1	0.19	10	0.59	415	2	0.28	13	460	55	1.83	<2
1124022003		61	2.27	<10	<1	0.15	10	0.93	1610	2	0.01	10	410	62	2.16	<2
1123001255		85	2.22	<10	<1	0.15	10	0.71	1130	1	0.01	10	410	45	1.92	<2
1124023022		46	2.02	<10	<1	0.14	10	0.61	447	1	0.25	12	410	69	1.67	<2
1124023018		47	2.11	<10	<1	0.15	10	0.68	528	1	0.13	11	430	31	2.00	<2
1124024008		23	1.68	<10	<1	0.18	10	1.19	701	<1	0.03	6	380	100	1.07	2
V835514		55	2.48	<10	<1	0.21	10	0.35	243	4	0.14	10	500	24	0.05	2
1123001297		243	4.73	<10	<1	0.18	10	1.06	775	<1	0.01	11	410	69	3.40	<2
1124024053		24	1.70	<10	<1	0.18	20	1.24	868	<1	0.02	7	400	247	1.10	<2
1124024087		143	2.49	<10	<1	0.29	10	0.89	1440	<1	0.01	7	380	253	2.10	<2
1124024034		20	1.82	<10	<1	0.20	20	1.08	692	<1	0.05	7	390	31	0.71	<2
1123001011		32	2.16	<10	<1	0.15	10	0.62	695	1	0.22	13	450	65	1.95	<2
1124024064		107	2.18	<10	<1	0.19	10	0.84	1290	<1	<0.01	8	360	71	1.50	<2
1124026138		91	7.88	10	<1	0.30	10	1.31	1350	1	0.13	50	690	6	1.72	<2
1123001306		123	3.70	<10	<1	0.18	10	0.83	742	1	0.02	14	420	313	3.36	4

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1124012044		1	49	<20	<0.01	<10	<10	7	<10	68	0.51	0.46	41	9.4	27	14.4
1124012001		1	47	<20	<0.01	<10	<10	5	<10	80	0.88	0.69	60	9.2	38	21.6
1124022145		<1	22	<20	<0.01	<10	<10	3	<10	558	1.17	1.42	86	9.1	42	44.4
1124019040		1	33	<20	0.01	<10	<10	5	<10	157	0.43	1.24	40	9.1	1	38.8
1124019036		3	152	<20	0.07	<10	<10	30	<10	446	0.74	1.24	67	9.1	28	38.8
1124019050		1	39	<20	0.01	<10	<10	9	<10	156	0.11	1.36	15	8.6	-28	42.5
1124019002		1	45	<20	0.01	<10	<10	6	<10	118	0.29	0.70	30	9.2	8	21.9
1124019027		<1	28	<20	<0.01	<10	<10	3	<10	121	0.70	1.70	58	9.0	5	53.1
1124023132		<1	25	<20	<0.01	<10	<10	4	<10	360	0.68	1.78	58	9.0	2	55.6
1124023153		<1	28	<20	<0.01	<10	<10	4	<10	858	0.72	1.75	59	8.9	4	54.7
1124022109		<1	22	<20	<0.01	<10	<10	3	<10	107	0.69	1.57	55	9.1	6	49.1
V835513		2	19	<20	0.41	<10	<10	70	<10	47	0.03					
1124023006		<1	21	<20	<0.01	<10	<10	3	<10	213	0.60	2.03	39	8.6	-24	63.4
1124023159		1	57	<20	0.02	<10	<10	7	<10	154	0.08	1.72	15	9.1	-39	53.8
1124023121		1	43	<20	0.01	<10	<10	6	<10	577	0.33	1.54	36	8.9	-12	48.1
1124022158		1	33	<20	<0.01	<10	<10	4	<10	141	0.74	2.79	57	9.0	-30	87.2
1124022021		1	27	<20	<0.01	<10	<10	3	<10	150	1.07	2.01	67	8.7	4	62.8
1124022018		<1	23	<20	<0.01	<10	<10	3	<10	100	0.97	1.83	68	8.7	11	57.2
1124023001		<1	26	<20	<0.01	<10	<10	3	<10	267	0.80	2.00	53	8.8	-10	62.5
1124023113		<1	33	<20	<0.01	<10	<10	4	<10	687	0.38	1.41	38	9.0	-6	44.1
1123001101		<1	23	<20	<0.01	<10	<10	3	<10	391	0.86	1.92	70	8.9	10	60.0
1124023175		1	29	<20	<0.01	<10	<10	4	<10	740	0.77	1.62	64	8.7	13	50.6
1124022002		<1	23	<20	<0.01	<10	<10	3	<10	479	1.29	1.96	87	8.9	26	61.3
1124022163		1	25	<20	<0.01	<10	<10	6	<10	195	0.48	1.37	37	8.9	-6	42.8
1123001179		<1	21	<20	<0.01	<10	<10	2	<10	1530	0.99	2.25	77	8.8	7	70.3
1123001018		1	39	<20	0.02	<10	<10	6	<10	363	0.42	1.74	29	8.8	-25	54.4
1124022003		<1	28	<20	<0.01	<10	<10	3	<10	1250	1.37	2.12	91	8.9	25	66.3
1123001255		<1	21	<20	<0.01	<10	<10	3	<10	1960	0.83	1.91	68	8.8	8	59.7
1124023022		1	62	<20	<0.01	<10	<10	6	<10	515	0.23	1.66	27	8.7	-25	51.9
1124023018		1	57	<20	0.01	<10	<10	6	<10	504	0.48	1.99	44	8.8	-18	62.2
1124024008		1	24	<20	0.02	<10	<10	8	<10	145	0.30	0.99	29	9.1	-2	30.9
V835514		2	19	<20	0.37	<10	<10	57	<10	58	0.02					
1123001297		1	10	<20	<0.01	<10	<10	6	<10	335	0.38	3.50	37	8.8	-72	109.4
1124024053		1	31	<20	0.01	<10	<10	7	<10	558	0.46	1.04	42	9.1	10	32.5
1124024087		1	31	<20	<0.01	<10	<10	4	10	2630	0.79	2.05	62	9.1	-2	64.1
1124024034		1	30	<20	0.04	<10	<10	9	<10	95	0.28	0.62	28	9.3	9	19.4
1123001011		1	36	<20	0.01	<10	<10	4	<10	161	0.55	1.84	47	8.9	-11	57.5
1124024064		<1	31	<20	0.01	<10	<10	4	10	2870	0.66	1.43	52	8.7	7	44.7
1124026138		11	76	<20	0.12	<10	<10	192	<10	1510	0.95	1.67	71	8.7	19	52.2
1123001306		1	18	<20	<0.01	<10	<10	6	<10	3740	0.41	3.21	37	8.7	-63	100.3

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
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Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1124012044		2.85	2
1124012001		2.78	2
1124022145		1.94	2
1124019040		1.03	2
1124019036		1.73	2
1124019050		0.35	1
1124019002		1.37	2
1124019027		1.09	2
1124023132		1.04	2
1124023153		1.08	2
1124022109		1.12	2
V835513			
1124023006		0.61	2
1124023159		0.28	1
1124023121		0.75	2
1124022158		0.65	2
1124022021		1.07	2
1124022018		1.19	2
1124023001		0.85	2
1124023113		0.86	2
1123001101		1.17	2
1124023175		1.26	2
1124022002		1.42	2
1124022163		0.86	2
1123001179		1.10	2
1123001018		0.53	2
1124022003		1.37	3
1123001255		1.14	2
1124023022		0.52	2
1124023018		0.71	2
1124024008		0.94	2
V835514			
1123001297		0.34	2
1124024053		1.29	2
1124024087		0.97	2
1124024034		1.45	2
1123001011		0.82	2
1124024064		1.16	2
1124026138		1.36	2
1123001306		0.37	2

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CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	WEI-21	LOG-QC	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Recvd Wt.	Pass75um	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr
	Units	kg	%	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	0.02	0.01	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1
1124026001		0.52		0.021		0.5	3.56	11	<10	40	<0.5	<2	4.22	0.7	39	85
1124026168		0.49		0.118		0.5	1.56	30	<10	30	<0.5	<2	2.00	1.2	7	142
1124026226		0.47		0.070		0.8	1.18	12	<10	70	<0.5	<2	2.74	<0.5	13	193
1124026125		0.50		0.250		0.5	1.93	39	<10	30	<0.5	<2	1.79	<0.5	8	99
1124026151		0.47		0.013		<0.2	1.39	4	<10	90	<0.5	<2	3.01	<0.5	16	86
1124026154		0.49		0.010		<0.2	1.33	2	<10	190	<0.5	<2	2.31	<0.5	13	201
1124026140		0.47		0.023		0.2	1.60	6	<10	150	<0.5	<2	2.43	<0.5	14	178
1124026016		0.46		0.034		0.7	2.62	65	<10	70	<0.5	<2	2.98	0.6	31	149
1124027126		0.49		0.744		1.9	1.65	87	<10	20	<0.5	<2	2.05	12.4	8	144
1123001262		0.48		0.351		2.5	0.55	68	<10	40	<0.5	<2	2.72	7.4	10	108
1124027021		0.79		0.476		2.0	0.49	130	<10	20	<0.5	<2	1.76	7.9	9	145
V835515		0.06		1.040		4.0	0.38	<2	<10	20	<0.5	3	0.41	<0.5	5	6

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CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1124026001		78	9.84	10	<1	0.13	<10	1.93	1570	1	0.10	56	790	4	1.40	<2
1124026168		37	1.91	<10	<1	0.20	10	0.79	639	1	0.09	9	440	30	1.06	<2
1124026226		25	2.98	<10	<1	0.28	20	0.95	893	5	0.04	41	680	4	1.71	<2
1124026125		19	1.86	<10	<1	0.22	10	0.88	619	<1	0.11	7	420	38	0.91	<2
1124026151		12	3.16	10	<1	0.19	20	1.20	963	1	0.07	24	740	5	0.95	<2
1124026154		22	2.64	10	<1	0.49	10	1.08	458	1	0.06	30	480	2	0.06	<2
1124026140		25	3.08	10	<1	0.48	10	1.17	544	1	0.06	32	500	3	0.37	<2
1124026016		78	7.82	10	<1	0.27	10	1.27	1040	1	0.06	50	600	4	2.00	<2
1124027126		99	3.01	<10	<1	0.24	10	1.36	1160	1	0.01	10	420	33	2.00	<2
1123001262		54	2.35	<10	<1	0.26	10	0.71	1870	1	0.01	13	440	274	2.23	3
1124027021		66	2.24	<10	<1	0.21	10	0.28	701	1	0.01	8	410	18	2.11	<2
V835515		22	1.43	<10	<1	0.06	<10	0.09	117	7	0.09	5	300	<2	0.01	<2

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3
1124026001		14	77	<20	0.11	<10	<10	223	<10	201	1.59	1.38	171	8.7	128	43.1
1124026168		1	54	<20	0.01	<10	<10	10	<10	370	0.51	0.99	42	9.1	11	30.9
1124026226		2	47	<20	0.02	<10	<10	24	<10	112	0.94	1.57	71	9.2	22	49.1
1124026125		1	60	<20	<0.01	<10	<10	9	<10	125	0.38	0.80	35	9.1	10	25.0
1124026151		3	107	<20	0.02	<10	<10	40	<10	100	1.21	0.86	85	9.1	58	26.9
1124026154		4	97	<20	0.05	<10	<10	49	<10	68	0.76	0.05	63	9.6	61	1.6
1124026140		4	83	<20	0.07	<10	<10	58	<10	93	0.75	0.34	65	9.6	54	10.6
1124026016		8	64	<20	0.12	10	<10	138	<10	232	0.90	1.93	75	8.6	15	60.3
1124027126		1	26	<20	0.02	<10	<10	9	<10	2900	0.60	1.95	52	8.8	-9	60.9
1123001262		<1	23	<20	<0.01	<10	<10	3	<10	1820	1.14	2.19	86	9.2	18	68.4
1124027021		<1	18	<20	<0.01	10	<10	2	<10	1700	0.63	2.02	47	8.8	-16	63.1
V835515		1	13	<20	0.25	<10	<10	32	<10	24	0.07					

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1124026001		3.97	3
1124026168		1.36	2
1124026226		1.45	2
1124026125		1.40	2
1124026151		3.16	2
1124026154		40.32	2
1124026140		6.12	2
1124026016		1.24	2
1124027126		0.85	2
1123001262		1.26	2
1124027021		0.74	2
V835515			

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5967 HWY 11/71
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Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

CERTIFICATE OF ANALYSIS TB18315377

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

CERTIFICATE TB19005962

Project: Mine Site Lab Pulps Nov2018 V2

P.O. No.: 4500023138

This report is for 214 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 28-DEC-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1122016152		0.50	91.5	0.083		0.3	2.31	24	<10	40	<0.5	<2	1.10	<0.5	6	116
1122014021		0.44		0.771		0.7	1.00	137	<10	50	<0.5	<2	1.32	1.3	10	122
1122014105		0.52		0.571		0.8	1.42	51	<10	30	<0.5	<2	0.96	11.5	6	112
1231003099		0.47		0.199		1.0	0.68	70	<10	50	<0.5	<2	1.88	0.9	9	114
1231003316		0.48		0.997		1.7	0.78	96	<10	60	<0.5	<2	1.54	1.8	8	109
1231003342		0.46		0.323		1.1	0.77	196	<10	50	<0.5	<2	1.48	1.7	7	131
1122016132		0.43		>10.0	32.8	4.7	1.11	106	<10	30	<0.5	<2	1.56	1.6	6	119
1122014157		0.47		1.420		1.4	1.74	104	<10	40	<0.5	2	0.39	1.2	7	117
1122011143		0.49		0.022		0.3	1.32	7	<10	80	<0.5	<2	1.35	<0.5	7	343
1122014181		0.48		0.385		0.7	1.73	65	<10	40	<0.5	2	0.47	<0.5	7	116
1122016176		0.49		0.174		1.2	1.75	36	<10	60	<0.5	<2	1.69	0.6	9	140
1122014101		0.48		0.326		1.0	2.04	37	<10	90	0.5	3	2.05	8.6	10	114
1122016179		0.50		0.097		0.9	1.66	8	<10	120	<0.5	<2	2.69	0.5	9	154
1231003256		0.53		0.078		0.8	0.47	32	<10	50	<0.5	<2	0.29	0.7	9	213
1231003355		0.54		0.272		1.7	0.47	99	<10	50	<0.5	2	1.77	1.0	9	201
1230010168		0.61		0.379		13.6	1.25	43	<10	40	<0.5	<2	0.17	0.6	7	101
1231008211		0.58		0.101		1.4	1.51	16	<10	50	<0.5	4	1.13	1.8	12	134
1122011114		0.47		0.115		0.5	1.18	7	<10	60	<0.5	<2	1.29	<0.5	8	317
1122011118		0.49		0.076		0.3	1.26	6	<10	70	<0.5	<2	1.09	<0.5	7	332
1231009045		0.49		0.320		6.1	1.18	201	<10	50	<0.5	8	0.76	15.0	8	184
V835529		0.06		1.170		4.3	0.38	<2	<10	20	<0.5	5	0.41	<0.5	4	6
1122016165		0.44		0.342		1.0	1.46	39	<10	40	<0.5	<2	1.19	4.6	6	119
1231009095		0.48		0.242		8.9	1.57	270	<10	60	<0.5	4	0.67	6.9	9	108
1122007038		0.49		0.473		1.8	0.78	34	<10	40	<0.5	<2	2.54	2.1	8	105
1122011014		0.49		0.094		0.5	1.37	10	<10	50	<0.5	<2	1.53	<0.5	7	186
1122007092		0.46		0.213		0.7	1.24	38	<10	40	<0.5	<2	2.05	2.2	9	86
1231008238		0.45		0.072		0.6	1.61	7	<10	60	<0.5	2	0.68	0.6	8	134
1122011169		0.49		0.038		0.3	1.35	4	<10	60	<0.5	<2	1.88	<0.5	9	214
1122009016		0.42		0.019		0.3	1.81	5	<10	120	<0.5	<2	2.67	<0.5	13	141
1122009022		0.47		0.006		0.3	1.88	2	<10	90	<0.5	<2	3.03	<0.5	12	146
1122016114		0.50		0.265		1.0	2.00	26	<10	50	<0.5	<2	1.62	1.6	7	96
1122009005		0.56		0.066		0.3	2.35	8	<10	130	<0.5	<2	2.59	<0.5	12	148
1122007051		0.46		1.375		1.9	1.07	134	<10	50	<0.5	<2	1.17	4.3	10	80
1122014107		0.33		1.210		5.2	0.87	95	<10	40	<0.5	<2	1.78	21.2	7	141
1122011187		0.49		0.062		0.5	1.21	5	<10	60	<0.5	<2	1.64	1.0	7	220
1231003004		0.45		0.681		1.1	0.67	24	<10	70	<0.5	<2	0.31	2.8	8	77
1122016147		0.46		0.302		0.7	1.64	77	<10	40	<0.5	<2	2.19	<0.5	6	80
1231003066		0.47		0.746		3.2	0.54	58	<10	50	<0.5	<2	0.30	9.7	7	169
1231003134		0.47		0.344		0.8	0.63	47	<10	80	<0.5	<2	1.65	1.1	7	152
1122016065		0.49		4.37		2.1	0.95	80	<10	30	<0.5	<2	1.55	5.6	6	95

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1122016152		16	1.49	<10	<1	0.27	10	0.70	410	<1	0.13	8	420	17	0.79	2
1122014021		19	1.69	<10	<1	0.38	10	0.34	437	1	0.02	12	420	19	1.56	<2
1122014105		33	2.45	<10	<1	0.31	10	0.85	609	<1	0.01	8	390	28	1.55	<2
1231003099		20	1.75	<10	<1	0.40	10	0.18	770	<1	0.01	11	400	82	1.72	<2
1231003316		55	1.78	<10	<1	0.38	10	0.60	1255	1	0.01	9	390	473	1.38	2
1231003342		24	1.83	<10	<1	0.37	10	0.59	1145	1	0.01	9	380	533	1.54	<2
1122016132		46	1.85	<10	<1	0.33	10	0.63	866	<1	0.02	8	360	201	1.69	2
1122014157		74	3.64	<10	<1	0.36	10	0.99	557	1	0.01	11	420	21	2.15	<2
1122011143		28	2.21	10	<1	0.35	10	0.72	422	1	0.07	12	400	2	0.24	2
1122014181		16	2.42	<10	<1	0.36	10	1.05	570	<1	0.01	12	440	23	1.07	2
1122016176		26	2.06	<10	<1	0.31	10	0.64	705	<1	0.13	12	420	44	1.63	<2
1122014101		47	2.43	10	<1	0.49	20	1.42	793	1	0.02	16	910	36	1.31	2
1122016179		40	2.19	10	<1	0.38	20	0.73	743	<1	0.09	16	480	3	0.53	<2
1231003256		6	2.39	<10	<1	0.30	10	0.03	168	1	<0.01	13	440	22	2.54	<2
1231003355		30	1.74	<10	<1	0.33	10	0.40	1775	<1	<0.01	10	430	50	1.62	<2
1230010168		24	1.90	<10	<1	0.20	10	0.76	265	3	0.03	11	430	24	1.70	4
1231008211		62	3.26	<10	<1	0.16	20	0.82	424	1	0.10	13	560	7	3.51	2
1122011114		34	2.41	10	<1	0.21	10	0.75	399	1	0.06	13	430	2	0.52	2
1122011118		22	2.18	10	<1	0.32	10	0.70	385	1	0.06	12	420	3	0.29	<2
1231009045		697	3.41	<10	<1	0.20	20	0.61	300	1	0.07	11	480	4	3.89	10
V835529		23	1.41	<10	<1	0.06	<10	0.09	115	7	0.09	7	310	<2	0.02	<2
1122016165		42	1.76	<10	1	0.37	10	0.73	545	<1	0.02	9	420	80	1.42	2
1231009095		741	2.94	<10	<1	0.21	20	0.90	332	1	0.09	11	570	6	3.30	20
1122007038		42	2.02	<10	<1	0.30	10	0.99	1275	1	0.02	11	410	255	1.71	<2
1122011014		49	2.30	10	<1	0.15	10	0.76	396	1	0.05	11	390	4	0.54	<2
1122007092		23	2.15	<10	<1	0.34	10	0.77	1000	1	0.02	12	430	48	1.99	<2
1231008238		47	2.43	<10	<1	0.17	20	0.74	451	2	0.11	10	520	7	2.47	<2
1122011169		23	2.26	10	<1	0.14	10	0.76	377	<1	0.07	13	430	<2	0.36	<2
1122009016		7	2.78	10	<1	0.39	20	1.11	717	<1	0.09	22	680	11	0.25	<2
1122009022		4	2.54	10	<1	0.21	20	1.07	549	<1	0.11	20	690	4	0.31	<2
1122016114		25	1.59	<10	<1	0.34	10	0.84	557	<1	0.06	7	410	72	1.15	<2
1122009005		14	2.28	10	<1	0.38	10	1.08	569	<1	0.19	24	480	9	0.32	<2
1122007051		65	2.68	<10	<1	0.30	10	0.46	687	<1	0.04	10	560	120	2.59	2
1122014107		206	2.67	<10	1	0.39	10	0.44	1020	<1	0.02	9	400	245	2.53	3
1122011187		90	1.95	<10	<1	0.22	10	0.72	385	1	0.05	10	380	3	0.42	<2
1231003004		9	2.06	<10	<1	0.46	10	0.05	74	1	0.01	12	380	17	2.32	<2
1122016147		22	2.01	<10	<1	0.36	10	1.02	1025	1	0.03	7	400	37	1.31	<2
1231003066		28	2.13	<10	<1	0.38	10	0.05	131	<1	0.01	10	380	129	2.34	3
1231003134		33	1.68	<10	<1	0.34	10	0.50	1615	4	0.01	10	340	79	1.15	2
1122016065		74	1.81	<10	<1	0.31	10	0.57	888	<1	0.02	8	370	142	1.81	4

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1122016152		1	49	<20	<0.01	<10	<10	7	<10	69	0.11	0.71	17	9.1	-5	22.2
1122014021		1	22	<20	<0.01	<10	<10	5	<10	307	0.38	1.45	34	9.1	-11	45.3
1122014105		1	21	<20	0.03	<10	<10	6	<10	2820	0.31	1.56	25	8.8	-24	48.8
1231003099		<1	54	<20	0.01	<10	<10	5	<10	218	0.59	1.55	49	9.4	1	48.4
1231003316		<1	15	<20	<0.01	<10	<10	4	<10	539	0.77	1.36	58	9.3	16	42.5
1231003342		<1	13	<20	<0.01	<10	<10	4	<10	450	0.72	1.42	56	9.4	12	44.4
1122016132		1	31	<20	<0.01	<10	<10	5	<10	460	0.46	1.57	43	9.1	-6	49.1
1122014157		1	11	<20	0.01	<10	<10	8	<10	319	0.10	2.01	13	8.9	-50	62.8
1122011143		2	28	<20	0.05	<10	<10	22	<10	96	0.39	0.20	39	9.6	33	6.3
1122014181		1	14	<20	0.01	<10	<10	8	<10	134	0.13	0.95	15	9.1	-15	29.7
1122016176		1	67	<20	0.01	<10	<10	8	<10	159	0.36	1.54	38	9.3	-10	48.1
1122014101		3	122	<20	0.08	<10	<10	21	<10	2170	0.44	1.22	48	9.3	10	38.1
1122016179		2	87	<20	0.01	<10	<10	17	<10	160	0.79	0.48	70	9.5	55	15.0
1231003256		<1	26	<20	0.01	<10	<10	3	<10	135	0.17	2.47	9	8.4	-68	77.2
1231003355		<1	94	<20	0.01	<10	<10	4	<10	262	0.78	1.57	59	9.2	10	49.1
1230010168		1	30	<20	<0.01	<10	<10	6	<10	202	0.01	1.60	9	8.5	-41	50.0
1231008211		1	47	<20	<0.01	<10	<10	8	10	451	0.28	3.49	28	8.8	-81	109.1
1122011114		2	26	<20	0.03	<10	<10	21	<10	57	0.43	0.45	40	9.4	26	14.1
1122011118		2	23	<20	0.05	<10	<10	22	<10	66	0.34	0.25	34	9.5	26	7.8
1231009045		1	29	<20	<0.01	<10	<10	6	<10	3510	0.18	4.05	18	8.5	-109	126.6
V835529		1	13	<20	0.26	<10	<10	32	<10	26	0.06					
1122016165		1	24	<20	0.03	<10	<10	7	<10	1150	0.21	1.36	25	9.1	-18	42.5
1231009095		1	36	<20	<0.01	<10	<10	8	<10	1565	0.12	3.33	17	8.8	-87	104.1
1122007038		1	26	<20	<0.01	<10	<10	4	<10	469	1.21	1.60	102	9.2	52	50.0
1122011014		1	25	<20	0.01	<10	<10	14	<10	47	0.51	0.49	43	9.2	28	15.3
1122007092		1	25	<20	<0.01	<10	<10	5	<10	490	0.71	1.83	61	9.1	4	57.2
1231008238		1	48	<20	<0.01	<10	<10	8	<10	155	0.16	2.42	13	8.6	-63	75.6
1122011169		2	38	<20	0.01	<10	<10	16	<10	36	0.59	0.32	54	9.5	44	10.0
1122009016		3	108	<20	0.04	<10	<10	41	<10	117	0.82	0.21	70	9.4	63	6.6
1122009022		2	233	<20	0.01	<10	<10	34	<10	78	0.81	0.25	73	9.0	65	7.8
1122016114		1	48	<20	0.02	<10	<10	9	<10	453	0.24	1.08	31	9.3	-3	33.8
1122009005		2	172	<20	0.04	<10	<10	29	<10	99	0.64	0.28	60	9.4	51	8.8
1122007051		1	24	<20	<0.01	<10	<10	5	<10	906	0.39	2.40	36	8.9	-39	75.0
1122014107		<1	24	<20	<0.01	<10	<10	4	<10	4560	0.80	2.46	57	9.0	-20	76.9
1122011187		1	32	<20	0.02	<10	<10	14	<10	282	0.47	0.39	45	9.5	33	12.2
1231003004		1	17	<20	0.01	<10	<10	5	<10	615	0.06	2.19	10	8.6	-58	68.4
1122016147		1	37	<20	<0.01	<10	<10	7	<10	114	0.60	1.16	58	9.2	22	36.3
1231003066		<1	17	<20	0.01	<10	<10	4	<10	2110	0.07	2.32	10	8.6	-63	72.5
1231003134		1	39	<20	0.01	<10	<10	6	<10	273	0.77	1.09	61	9.1	27	34.1
1122016065		<1	31	<20	<0.01	<10	<10	4	<10	1595	0.47	1.75	45	9.0	-10	54.7

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1122016152		0.77	1
1122014021		0.75	2
1122014105		0.51	2
1231003099		1.01	2
1231003316		1.36	2
1231003342		1.26	2
1122016132		0.88	2
1122014157		0.21	1
1122011143		6.24	2
1122014181		0.51	1
1122016176		0.79	2
1122014101		1.26	2
1122016179		4.67	2
1231003256		0.12	1
1231003355		1.20	2
1230010168		0.18	1
1231008211		0.26	2
1122011114		2.84	2
1122011118		4.35	2
1231009045		0.14	1
V835529			
1122016165		0.59	2
1231009095		0.16	1
1122007038		2.04	3
1122011014		2.81	2
1122007092		1.07	2
1231008238		0.17	1
1122011169		5.40	2
1122009016		10.67	2
1122009022		9.34	2
1122016114		0.92	2
1122009005		6.86	2
1122007051		0.48	2
1122014107		0.74	2
1122011187		3.69	2
1231003004		0.15	1
1122016147		1.60	2
1231003066		0.14	1
1231003134		1.79	2
1122016065		0.82	2

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CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1122016028		0.47		0.285		1.0	1.69	42	<10	210	0.5	<2	1.79	7.5	10	137
V835530		0.06		1.580		9.5	0.99	<2	<10	80	<0.5	4	0.61	<0.5	12	9
1231008234		0.49		0.127		1.4	1.19	10	<10	40	<0.5	2	0.77	5.0	10	174
1122015150		0.48		0.043		0.3	1.14	7	<10	60	<0.5	<2	1.62	1.2	8	278
1230010368		0.47		0.067		0.3	2.54	8	<10	70	<0.5	2	2.18	0.5	16	156
1122018025		0.49		0.337		0.7	1.10	117	<10	30	<0.5	<2	1.15	4.4	8	201
1122018145		0.53		0.356		0.8	1.11	184	<10	30	<0.5	<2	0.42	0.8	8	182
1231009008		0.50		0.186		0.7	1.31	7	<10	40	<0.5	6	0.27	<0.5	8	258
1122018001		0.52		1.085		1.1	1.29	135	<10	20	<0.5	<2	0.51	2.4	8	141
1122015122		0.43	92.6	0.024		0.4	2.55	11	<10	110	<0.5	<2	4.03	0.5	29	160
1231008088		0.46		0.130		0.5	1.91	7	<10	40	<0.5	2	1.11	1.8	10	115
1231008067		0.45		0.380		0.6	2.19	17	<10	50	<0.5	3	1.07	<0.5	9	133
1230010454		0.51		0.141		1.0	0.82	55	<10	30	<0.5	<2	2.06	0.8	8	130
1122018122		0.46		0.325		0.9	1.22	191	<10	30	<0.5	<2	0.55	1.5	9	177
1122018102		0.51		0.981		6.4	1.88	77	<10	30	<0.5	2	0.52	1.7	9	116
1230010382		0.48		0.454		0.7	1.70	18	10	60	<0.5	2	0.97	1.4	9	134
1122018161		0.45		0.438		0.4	2.13	83	<10	40	<0.5	<2	0.49	0.8	11	107
1231008208		0.50		0.174		1.4	1.57	17	<10	40	<0.5	2	0.93	3.2	9	148
1231008162		0.45		0.078		0.6	1.67	11	<10	50	<0.5	4	1.12	0.5	8	120
1230010486		0.48		0.143		2.2	1.11	55	<10	50	<0.5	2	0.22	1.0	9	74
1122015120		0.48		<0.005		1.6	4.18	21	<10	70	<0.5	3	4.12	0.9	41	184
1122015189		0.56		0.073		0.2	1.50	4	<10	70	<0.5	<2	3.08	<0.5	14	235
V835531		0.06		1.220		4.1	0.33	<2	<10	20	<0.5	6	0.38	<0.5	4	5
1231008330		0.48		0.291		2.4	1.25	15	<10	30	<0.5	2	0.64	5.5	9	131
1122014022		0.49		0.140		1.7	0.79	67	<10	40	<0.5	<2	1.08	3.0	7	211
1122015160		0.45		0.015		0.3	1.16	9	<10	50	<0.5	2	1.64	<0.5	9	261
1122015203		0.52		0.026		0.4	1.04	4	<10	50	<0.5	<2	1.64	<0.5	7	262
1230010166		0.50		0.008		0.4	0.51	9	<10	10	<0.5	<2	0.12	<0.5	6	205
1230010237		0.56		0.145		0.6	0.77	36	<10	60	<0.5	<2	0.60	<0.5	7	94
1230010220		0.47		0.141		3.2	0.52	99	<10	30	<0.5	<2	0.30	2.0	9	174
1230010282		0.49		0.111		0.9	1.27	29	<10	70	<0.5	2	3.20	<0.5	17	289
1122014005		0.50		0.376		0.7	1.10	66	<10	20	<0.5	<2	2.69	1.0	9	180
1122015170		0.48		0.007		0.2	1.40	<2	<10	50	<0.5	<2	2.31	<0.5	8	290
1231008150		0.47		0.070		0.7	1.43	13	<10	40	<0.5	3	0.96	1.7	10	159
1122015023		0.47		0.143		1.1	3.14	17	<10	60	<0.5	<2	2.98	1.3	35	172
1231008012		0.48		0.078		0.2	2.44	51	10	40	<0.5	<2	1.04	<0.5	10	125
1230010324		0.51		0.297		0.6	1.52	24	<10	30	<0.5	<2	1.20	1.4	10	150
1230010341		0.49		0.034		0.7	1.75	10	10	40	<0.5	3	1.66	<0.5	17	155
1122016094		0.53		0.296		1.0	2.18	34	<10	50	<0.5	<2	1.63	<0.5	9	131
1122015029		0.49		0.294		0.9	1.09	17	<10	50	<0.5	2	1.74	3.3	9	314

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1122016028		37	2.37	<10	<1	0.67	20	1.32	705	<1	0.02	14	830	42	1.41	<2
V835530		50	2.99	<10	<1	0.20	10	0.43	269	19	0.15	14	610	9	0.05	<2
1231008234		61	2.79	<10	1	0.13	20	0.59	395	1	0.10	13	530	10	2.87	3
1122015150		27	2.18	<10	<1	0.29	10	0.66	363	1	0.05	10	400	3	0.83	<2
1230010368		52	3.14	10	<1	0.23	20	1.33	547	1	0.18	35	640	7	0.36	<2
1122018025		28	2.38	<10	<1	0.24	10	0.74	552	1	0.01	12	390	16	1.81	<2
1122018145		14	2.55	<10	<1	0.27	10	0.65	320	2	0.01	12	430	25	2.02	4
1231009008		119	3.14	<10	<1	0.14	10	0.81	243	3	0.06	11	410	3	2.71	<2
1122018001		62	3.02	<10	<1	0.20	10	0.79	426	2	0.01	13	390	15	2.28	3
1122015122		54	7.03	10	<1	0.21	20	1.78	1160	<1	0.09	50	970	5	1.27	<2
1231008088		74	3.02	<10	<1	0.14	20	0.76	347	<1	0.10	11	570	5	3.13	<2
1231008067		109	3.24	10	<1	0.19	10	0.79	324	2	0.11	9	380	7	3.01	<2
1230010454		23	2.04	<10	<1	0.17	10	0.60	965	1	0.02	11	460	28	1.88	<2
1122018122		30	2.71	<10	<1	0.32	10	0.65	347	1	0.01	12	410	26	2.14	2
1122018102		641	3.41	<10	<1	0.24	10	1.21	615	1	0.02	13	400	12	2.01	<2
1230010382		54	2.17	<10	<1	0.25	10	0.67	519	1	0.05	10	640	20	1.18	<2
1122018161		22	2.59	10	<1	0.27	10	1.22	606	<1	0.02	14	370	9	1.18	<2
1231008208		63	2.69	<10	<1	0.13	10	0.65	387	1	0.10	11	440	7	2.94	<2
1231008162		48	2.49	<10	<1	0.17	10	0.78	303	<1	0.11	9	400	7	2.63	<2
1230010486		53	1.86	<10	<1	0.28	20	0.35	396	2	0.05	13	560	21	1.97	2
1122015120		123	10.70	10	<1	0.36	<10	1.94	1785	1	0.25	67	810	9	2.76	2
1122015189		24	2.86	10	<1	0.19	20	1.22	564	<1	0.05	30	730	2	0.06	<2
V835531		22	1.33	<10	<1	0.06	<10	0.09	109	6	0.08	6	300	<2	<0.01	<2
1231008330		87	2.47	<10	<1	0.12	10	0.72	614	1	0.07	10	620	9	2.58	<2
1122014022		76	1.45	<10	<1	0.33	10	0.25	397	1	0.01	10	410	11	1.23	3
1122015160		25	2.13	10	<1	0.27	10	0.59	341	1	0.06	14	400	4	0.47	<2
1122015203		25	1.82	<10	<1	0.18	10	0.77	397	1	0.07	14	360	4	0.45	<2
1230010166		9	0.56	<10	<1	0.04	<10	0.08	71	1	0.01	7	410	2	0.24	2
1230010237		19	1.71	<10	<1	0.17	10	0.39	715	1	0.02	10	420	13	1.47	<2
1230010220		39	2.40	<10	<1	0.16	10	0.25	2280	<1	0.02	12	450	106	2.07	4
1230010282		29	2.86	<10	<1	0.19	20	2.17	1615	1	0.02	62	800	9	1.46	2
1122014005		38	1.97	<10	<1	0.19	10	0.85	1125	2	0.01	12	400	14	1.35	<2
1122015170		23	2.00	10	<1	0.15	20	0.79	357	1	0.08	12	560	2	0.11	<2
1231008150		45	3.01	<10	<1	0.12	20	0.68	302	1	0.11	11	550	7	3.18	<2
1122015023		130	9.03	10	<1	0.25	10	2.03	1400	2	0.10	53	730	8	2.11	4
1231008012		32	2.04	10	<1	0.14	10	0.95	384	5	0.07	12	460	7	0.89	4
1230010324		39	2.80	10	<1	0.21	20	1.28	971	1	0.03	16	470	73	2.05	<2
1230010341		80	3.30	10	<1	0.26	10	1.39	1220	1	0.03	27	570	8	0.98	<2
1122016094		24	2.09	10	<1	0.25	10	0.67	588	1	0.15	12	460	29	1.39	2
1122015029		55	2.80	<10	<1	0.26	10	0.68	514	3	0.04	13	380	3	1.35	<2

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5967 HWY 11/71
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Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1122016028		2	176	<20	0.07	<10	<10	19	<10	1885	0.43	1.42	49	9.4	5	44.4
V835530		2	20	<20	0.43	<10	<10	71	<10	50	0.05					
1231008234		1	41	<20	<0.01	<10	<10	7	<10	1175	0.17	2.92	16	8.6	-75	91.3
1122015150		1	27	<20	0.03	<10	<10	13	<10	288	0.44	0.78	44	9.4	20	24.4
1230010368		4	72	<20	0.12	<10	<10	67	<10	89	0.46	0.32	44	8.5	34	10.0
1122018025		1	16	<20	0.01	<10	<10	5	<10	1105	0.33	1.65	29	8.8	-23	51.6
1122018145		1	12	<20	<0.01	<10	<10	5	<10	203	0.10	1.82	12	8.8	-45	56.9
1231009008		1	29	<20	<0.01	<10	<10	8	<10	38	0.07	2.63	8	8.4	-74	82.2
1122018001		<1	16	<20	<0.01	<10	<10	5	<10	502	0.17	2.19	15	8.6	-53	68.4
1122015122		9	161	<20	0.06	<10	<10	146	<10	141	1.56	1.25	164	8.8	125	39.1
1231008088		1	73	<20	<0.01	<10	<10	9	<10	481	0.19	3.22	21	8.7	-80	100.6
1231008067		1	91	<20	<0.01	<10	<10	7	<10	45	0.15	3.14	19	8.6	-79	98.1
1230010454		<1	33	<20	<0.01	<10	<10	4	<10	194	0.67	1.90	57	8.7	-2	59.4
1122018122		1	14	<20	0.01	<10	<10	6	<10	361	0.15	2.07	16	8.7	-49	64.7
1122018102		1	17	<20	0.01	<10	<10	7	<10	399	0.13	1.97	16	8.7	-46	61.6
1230010382		1	61	<20	0.01	<10	<10	11	<10	581	0.18	1.15	22	8.6	-14	35.9
1122018161		1	17	<20	<0.01	<10	<10	9	<10	240	0.09	1.12	15	8.8	-20	35.0
1231008208		1	50	<20	<0.01	<10	<10	8	<10	763	0.18	3.02	20	8.7	-74	94.4
1231008162		1	64	<20	<0.01	<10	<10	7	<10	89	0.24	2.73	29	9.0	-56	85.3
1230010486		1	38	<20	<0.01	<10	<10	5	<10	293	0.03	1.88	8	8.5	-51	58.8
1122015120		16	147	<20	0.13	<10	<10	263	<10	272	1.51	2.90	178	8.5	87	90.6
1122015189		3	106	<20	0.02	<10	<10	43	<10	76	1.05	0.06	86	9.2	84	1.9
V835531		1	12	<20	0.25	<10	<10	30	<10	22	0.06					
1231008330		1	31	<20	<0.01	<10	<10	6	<10	1320	0.15	2.61	16	8.6	-66	81.6
1122014022		<1	21	<20	<0.01	<10	<10	4	<10	640	0.39	1.14	28	9.0	-8	35.6
1122015160		1	29	<20	0.03	<10	<10	15	<10	102	0.48	0.44	45	9.4	31	13.8
1122015203		2	32	<20	0.02	<10	<10	21	<10	81	0.56	0.41	50	9.3	37	12.8
1230010166		<1	10	<20	<0.01	<10	<10	3	<10	19	<0.01	0.23	2	7.4	-5	7.2
1230010237		<1	19	<20	<0.01	<10	<10	3	<10	64	0.21	1.61	17	8.7	-33	50.3
1230010220		<1	17	<20	<0.01	<10	<10	3	<10	475	0.24	2.13	15	8.3	-52	66.6
1230010282		5	111	<20	<0.01	<10	<10	32	<10	79	1.78	1.47	145	9.1	99	45.9
1122014005		<1	25	<20	<0.01	<10	<10	5	<10	259	0.90	1.28	70	8.9	30	40.0
1122015170		1	56	<20	0.01	<10	<10	15	<10	63	0.74	0.09	59	9.4	56	2.8
1231008150		1	56	<20	<0.01	<10	<10	7	<10	397	0.20	3.35	20	8.8	-85	104.7
1122015023		13	72	<20	0.12	<10	<10	206	10	319	1.24	2.11	152	8.5	86	65.9
1231008012		1	87	<20	0.01	<10	<10	11	<10	83	0.13	0.86	17	8.8	-10	26.9
1230010324		2	24	<20	0.02	<10	<10	18	<10	454	0.22	2.02	33	8.6	-30	63.1
1230010341		6	29	<20	0.03	<10	<10	45	<10	88	0.50	1.00	48	8.2	17	31.3
1122016094		1	91	<20	0.01	<10	<10	10	<10	96	0.27	1.37	30	8.8	-13	42.8
1122015029		1	33	<20	0.03	<10	<10	15	<10	882	0.64	1.33	51	9.0	9	41.6

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1122016028		1.10	2
V835530			
1231008234		0.18	1
1122015150		1.81	2
1230010368		4.40	2
1122018025		0.56	2
1122018145		0.21	1
1231009008		0.10	1
1122018001		0.22	1
1122015122		4.20	3
1231008088		0.21	1
1231008067		0.19	1
1230010454		0.96	2
1122018122		0.25	1
1122018102		0.26	1
1230010382		0.61	1
1122018161		0.43	1
1231008208		0.21	1
1231008162		0.34	2
1230010486		0.14	1
1122015120		1.96	3
1122015189		45.87	2
V835531			
1231008330		0.20	1
1122014022		0.79	2
1122015160		3.27	2
1122015203		3.90	2
1230010166		0.28	1
1230010237		0.34	1
1230010220		0.23	1
1230010282		3.16	3
1122014005		1.75	2
1122015170		20.98	2
1231008150		0.19	1
1122015023		2.31	3
1231008012		0.63	1
1230010324		0.52	2
1230010341		1.54	2
1122016094		0.70	2
1122015029		1.23	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
V835532		0.06		1.015		2.4	1.12	<2	<10	80	<0.5	2	0.72	<0.5	13	9
1230010449		0.45		0.083		1.3	1.70	16	10	30	<0.5	2	0.56	<0.5	8	94
1230010402		0.49		0.166		0.7	1.70	25	10	60	<0.5	<2	1.07	<0.5	8	76
1231008274		0.52		0.179		0.7	1.60	22	10	60	<0.5	<2	1.02	0.5	8	73
1231009118		0.46		0.026		0.8	1.24	3	<10	50	<0.5	10	0.49	<0.5	9	190
1231009207		0.49		0.125		1.8	1.36	16	<10	30	<0.5	3	0.25	3.0	13	142
1122018206		0.52		1.260		0.4	1.58	57	<10	20	<0.5	<2	0.70	2.4	9	86
1230010496		0.47		0.147		3.5	1.34	61	10	50	<0.5	<2	0.86	1.5	10	155
1230010437		0.47		0.035		0.5	1.82	13	10	30	<0.5	<2	0.77	<0.5	8	109
1122018173		0.46		1.595		1.3	1.71	109	<10	30	<0.5	2	0.48	4.2	11	53
1122001134		0.42		0.502		1.9	1.09	31	<10	50	<0.5	3	2.15	1.8	8	89
1122018215		0.52		0.982		3.9	0.84	139	<10	30	<0.5	2	1.17	9.6	6	123
1230010393		0.55		0.039		0.3	1.93	12	10	40	<0.5	<2	1.39	<0.5	8	85
1122018190		0.43		0.144		0.4	1.37	69	<10	30	<0.5	<2	0.86	0.9	7	147
1231008225		0.50		0.302		1.0	1.47	12	<10	40	<0.5	5	0.49	<0.5	9	122
1231009077		0.43		0.567		0.9	1.43	11	<10	40	<0.5	5	0.52	<0.5	9	139
1231008290		0.44		0.773		1.1	1.61	10	<10	40	<0.5	7	0.60	<0.5	8	152
1230010027		0.43		1.270		1.3	0.70	84	<10	50	<0.5	2	0.48	13.2	8	140
1122019149		0.46		0.150		0.6	2.40	37	<10	40	<0.5	<2	1.92	<0.5	8	112
1122019208		0.41	75.6	1.260		1.5	0.77	81	<10	20	<0.5	<2	1.77	2.3	10	59
1122019010		0.43	93.4	0.244		1.0	1.47	44	<10	40	<0.5	<2	1.27	2.1	6	98
1231008105		0.38	95.3	0.413		2.3	1.80	16	<10	60	<0.5	3	1.54	7.5	7	51
1122019006		0.46		0.433		1.3	1.21	65	<10	40	<0.5	<2	1.29	13.3	7	83
V835533		0.06		1.615		10.1	1.00	<2	<10	80	<0.5	3	0.62	<0.5	11	9
1122008118		0.50		0.782		1.7	0.76	53	<10	40	<0.5	<2	2.19	2.2	7	113
1122008164		0.47		0.057		0.5	1.50	18	<10	50	<0.5	<2	1.38	8.4	7	179
1122009066		0.44		0.280		0.7	2.47	50	<10	50	<0.5	<2	1.16	0.9	10	95
1122009083		0.55		0.311		0.6	2.90	29	<10	50	<0.5	<2	1.77	<0.5	10	107
1122012158		0.48		0.211		0.5	1.66	31	<10	40	<0.5	<2	1.56	0.8	5	84
1122009113		0.48		0.191		0.6	2.24	34	<10	50	<0.5	<2	1.79	<0.5	9	112
1122012022		0.48		2.48		1.1	2.46	59	<10	70	<0.5	<2	2.05	2.0	10	175
1231009018		0.48		0.124		1.9	1.28	27	<10	30	<0.5	2	0.50	4.3	10	107
1231009049		0.52		0.406		3.6	1.27	24	<10	30	<0.5	3	0.65	20.0	12	153
1231009017		0.46		0.142		0.9	1.55	11	<10	30	<0.5	<2	0.43	1.7	14	199
1122009061		0.47		0.127		1.2	3.59	10	<10	80	<0.5	2	2.90	1.0	34	115
1122011196		0.40		0.022		0.2	1.29	6	<10	70	<0.5	<2	1.35	<0.5	8	269
1122011026		0.46		0.044		0.3	1.72	11	<10	200	<0.5	<2	2.90	<0.5	15	253
1122009054		0.48		0.086		0.5	1.43	11	<10	80	<0.5	<2	2.06	<0.5	10	193
1122011217		0.47		0.028		0.2	1.22	3	<10	70	<0.5	<2	1.36	<0.5	7	350
1122009028		0.48		0.285		0.7	1.89	57	<10	50	<0.5	<2	1.43	1.4	9	74

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
V835532		58	3.14	10	<1	0.27	10	0.55	300	11	0.10	17	720	7	0.08	<2
1230010449		15	2.03	<10	<1	0.15	20	0.64	400	1	0.04	8	480	8	1.21	<2
1230010402		38	1.87	<10	<1	0.24	10	0.67	443	1	0.04	9	480	34	1.21	<2
1231008274		37	1.81	<10	<1	0.23	10	0.63	424	1	0.04	9	470	32	1.18	<2
1231009118		15	3.25	<10	<1	0.16	20	0.87	247	1	0.07	10	540	6	3.38	<2
1231009207		139	2.67	<10	<1	0.11	20	0.99	296	1	0.04	22	720	14	2.66	<2
1122018206		30	2.62	<10	<1	0.18	10	1.17	615	1	0.01	12	390	8	1.06	<2
1230010496		40	2.33	<10	<1	0.26	10	0.73	673	1	0.04	19	500	37	2.08	<2
1230010437		22	2.11	<10	<1	0.15	20	0.79	533	1	0.03	9	490	14	1.07	<2
1122018173		67	2.79	<10	<1	0.27	10	1.07	530	1	0.02	15	390	15	1.63	2
1122001134		35	1.92	<10	<1	0.33	10	0.60	1200	1	0.03	11	420	149	1.90	<2
1122018215		140	2.37	<10	<1	0.31	10	0.40	576	<1	0.01	7	380	26	2.39	<2
1230010393		17	1.68	<10	<1	0.19	20	0.82	452	<1	0.04	8	520	13	0.55	<2
1122018190		28	2.07	<10	<1	0.25	10	0.73	412	1	0.02	8	400	17	1.54	2
1231008225		177	3.27	<10	<1	0.15	10	0.68	250	2	0.06	10	440	4	3.13	<2
1231009077		268	2.89	<10	<1	0.13	10	0.73	308	3	0.10	11	390	5	2.17	<2
1231008290		211	3.41	<10	<1	0.14	10	0.87	302	2	0.08	9	390	5	2.89	<2
1230010027		76	2.13	<10	<1	0.28	20	0.31	678	1	0.01	12	470	8	2.02	<2
1122019149		23	1.96	10	<1	0.26	10	1.20	716	<1	0.12	10	410	48	1.06	<2
1122019208		44	2.45	<10	<1	0.25	10	0.70	1315	1	0.01	9	380	77	2.14	2
1122019010		26	1.64	<10	<1	0.31	10	0.68	536	<1	0.03	6	400	217	1.38	2
1231008105		311	1.86	<10	<1	0.23	20	0.78	550	1	0.08	10	580	25	1.96	<2
1122019006		65	2.07	<10	<1	0.34	10	0.78	757	<1	0.01	8	350	71	1.55	3
V835533		51	2.97	<10	<1	0.20	10	0.43	272	20	0.15	14	620	7	0.07	<2
1122008118		95	2.09	<10	1	0.25	10	0.83	911	1	0.03	10	390	244	2.22	3
1122008164		30	1.78	<10	<1	0.19	10	0.68	323	1	0.13	9	370	20	1.11	<2
1122009066		28	2.48	10	<1	0.21	20	0.87	620	1	0.07	11	570	23	1.34	2
1122009083		24	2.29	10	<1	0.27	20	0.88	521	1	0.17	11	550	22	0.92	<2
1122012158		26	1.59	<10	<1	0.41	10	1.11	961	1	0.03	7	370	60	1.09	3
1122009113		31	2.28	10	<1	0.21	20	0.78	502	1	0.15	11	510	12	0.83	3
1122012022		391	2.68	10	1	0.27	20	1.08	684	9	0.11	15	780	36	1.55	<2
1231009018		120	2.66	<10	1	0.13	20	0.77	490	<1	0.08	11	490	9	2.80	<2
1231009049		388	3.08	<10	<1	0.12	20	0.88	306	1	0.07	14	660	12	3.36	2
1231009017		81	2.58	<10	<1	0.11	20	1.16	455	1	0.08	35	680	8	2.32	<2
1122009061		99	8.38	10	1	0.39	10	1.41	1305	1	0.15	53	790	8	0.92	<2
1122011196		34	2.15	10	<1	0.29	10	0.68	411	1	0.06	10	390	4	0.39	<2
1122011026		46	2.96	10	1	0.58	20	1.55	554	1	0.05	38	760	3	0.55	3
1122009054		25	2.31	10	<1	0.32	20	0.67	642	2	0.08	16	450	4	0.64	<2
1122011217		22	2.11	10	<1	0.22	10	0.71	285	1	0.06	14	420	2	0.18	<2
1122009028		24	2.14	<10	<1	0.28	20	0.79	632	<1	0.05	9	520	33	1.43	<2

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Finalized Date: 1-FEB-2019
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Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
V835532		3	17	<20	0.36	<10	<10	78	<10	51	0.04					
1230010449		1	57	<20	<0.01	<10	<10	7	<10	84	0.06	1.19	12	8.5	-25	37.2
1230010402		1	57	<20	0.01	<10	<10	11	<10	242	0.19	1.12	22	8.4	-13	35.0
1231008274		1	54	<20	0.01	<10	<10	10	<10	235	0.19	1.17	23	8.4	-14	36.6
1231009118		1	23	<20	<0.01	<10	<10	7	<10	62	0.13	3.52	16	8.7	-94	110.0
1231009207		1	17	<20	<0.01	<10	<10	11	<10	755	0.04	2.64	10	8.3	-73	82.5
1122018206		1	11	<20	0.01	<10	<10	6	<10	611	0.20	0.96	22	8.9	-8	30.0
1230010496		1	35	<20	<0.01	<10	<10	10	<10	440	0.25	2.05	27	8.6	-37	64.1
1230010437		1	40	<20	<0.01	<10	<10	9	<10	119	0.12	0.99	16	8.3	-15	30.9
1122018173		1	14	<20	<0.01	<10	<10	7	<10	994	0.16	1.58	15	8.9	-34	49.4
1122001134		1	26	<20	<0.01	<10	<10	5	<10	454	0.82	1.87	63	9.0	5	58.4
1122018215		<1	19	<20	<0.01	<10	<10	3	<10	2250	0.34	2.38	32	8.8	-42	74.4
1230010393		1	55	<20	0.01	<10	<10	10	<10	126	0.27	0.49	31	8.6	16	15.3
1122018190		1	26	<20	<0.01	<10	<10	6	<10	229	0.20	1.51	20	8.8	-27	47.2
1231008225		1	41	<20	<0.01	<10	<10	7	<10	53	0.08	3.07	12	8.5	-84	95.9
1231009077		1	43	<20	0.01	<10	<10	12	10	52	0.10	2.15	15	8.6	-52	67.2
1231008290		1	40	<20	0.01	<10	<10	9	<10	43	0.11	2.98	15	8.7	-78	93.1
1230010027		1	14	<20	<0.01	<10	<10	6	<10	3550	0.22	1.98	18	8.7	-44	61.9
1122019149		1	56	<20	0.02	<10	<10	15	<10	156	0.40	1.04	41	9.1	9	32.5
1122019208		<1	29	<20	<0.01	<10	<10	3	<10	577	0.76	2.20	58	8.9	-11	68.8
1122019010		1	34	<20	0.01	<10	<10	6	<10	556	0.28	1.36	30	9.1	-13	42.5
1231008105		1	60	<20	0.01	<10	<10	7	<10	1985	0.45	1.96	38	8.4	-23	61.3
1122019006		1	24	<20	0.02	<10	<10	5	<10	3100	0.43	1.51	35	9.1	-12	47.2
V835533		2	21	<20	0.44	<10	<10	73	<10	53	0.03					
1122008118		1	28	<20	<0.01	<10	<10	4	<10	521	1.09	2.30	81	9.0	9	71.9
1122008164		1	64	<20	<0.01	<10	<10	8	<10	1340	0.39	1.07	32	8.9	-1	33.4
1122009066		1	44	<20	0.01	<10	<10	12	<10	294	0.14	1.32	18	8.9	-23	41.3
1122009083		1	71	<20	0.04	<10	<10	16	10	107	0.17	0.89	27	9.0	-1	27.8
1122012158		1	42	<20	0.02	<10	<10	7	<10	239	0.44	1.09	41	9.1	7	34.1
1122009113		1	69	<20	0.01	<10	<10	15	<10	141	0.36	0.80	37	9.1	12	25.0
1122012022		2	110	<20	0.04	<10	<10	19	<10	504	0.54	1.57	39	9.0	-10	49.1
1231009018		1	32	<20	<0.01	<10	<10	7	<10	960	0.14	3.08	15	8.7	-81	96.3
1231009049		1	29	<20	<0.01	<10	<10	9	<10	4630	0.16	3.76	17	8.6	-101	117.5
1231009017		2	31	<20	<0.01	<10	<10	21	<10	447	0.11	2.43	14	8.8	-62	75.9
1122009061		13	94	<20	0.17	<10	<10	194	<10	353	0.70	0.91	106	8.9	78	28.4
1122011196		2	29	<20	0.05	<10	<10	18	<10	106	0.43	0.36	41	9.3	30	11.3
1122011026		4	94	<20	0.07	<10	<10	43	<10	78	0.92	0.49	78	9.5	63	15.3
1122009054		2	66	<20	0.04	<10	<10	22	<10	97	0.62	0.57	56	9.2	38	17.8
1122011217		2	32	<20	0.04	<10	<10	22	<10	37	0.43	0.16	39	9.6	34	5.0
1122009028		1	36	<20	<0.01	<10	<10	10	<10	354	0.32	1.40	36	8.9	-8	43.8

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
V835532			
1230010449		0.32	1
1230010402		0.63	1
1231008274		0.63	1
1231009118		0.15	1
1231009207		0.12	1
1122018206		0.73	1
1230010496		0.42	2
1230010437		0.52	1
1122018173		0.30	1
1122001134		1.08	2
1122018215		0.43	2
1230010393		2.02	2
1122018190		0.42	1
1231008225		0.13	1
1231009077		0.22	1
1231008290		0.16	1
1230010027		0.29	1
1122019149		1.26	2
1122019208		0.84	2
1122019010		0.71	2
1231008105		0.62	2
1122019006		0.74	2
V835533			
1122008118		1.13	2
1122008164		0.96	2
1122009066		0.44	1
1122009083		0.97	2
1122012158		1.20	2
1122009113		1.48	2
1122012022		0.79	2
1231009018		0.16	1
1231009049		0.14	1
1231009017		0.18	1
1122009061		3.73	3
1122011196		3.64	2
1122011026		5.09	2
1122009054		3.14	2
1122011217		7.80	2
1122009028		0.82	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1122009031		0.46		0.123		0.8	1.61	29	<10	60	<0.5	<2	2.06	<0.5	8	150
1231009055		0.48		0.074		0.8	1.32	16	<10	40	<0.5	<2	0.83	1.6	9	133
1129009304		0.44		0.223		0.9	2.56	92	<10	50	<0.5	<2	1.55	1.1	9	104
1122007124		0.46		0.640		1.3	1.04	50	<10	40	<0.5	<2	2.56	3.8	7	107
V835534		0.06		1.600		10.0	1.03	<2	<10	80	<0.5	<2	0.64	<0.5	12	9
1123019045		0.42		1.845		2.9	1.95	85	<10	30	<0.5	<2	0.28	0.9	8	106
1232007522		0.45		0.105		0.4	1.03	7	<10	30	<0.5	<2	0.61	1.1	8	503
1122005001		0.47		0.026		0.2	1.21	5	<10	50	<0.5	<2	1.76	<0.5	6	188
1122002001		0.45		1.405		2.8	1.01	23	<10	50	<0.5	<2	2.11	2.3	8	110
1122002018		0.49		0.377		3.0	0.89	26	<10	40	<0.5	<2	2.00	2.8	7	125
1122002104		0.48		0.413		2.3	0.65	74	<10	40	<0.5	<2	2.38	4.6	9	129
1122005016		0.41		0.045		0.5	1.92	31	10	40	<0.5	<2	1.67	<0.5	8	122
1232007385		0.69		0.051		0.5	1.20	7	<10	60	<0.5	4	0.31	0.9	10	147
1123023145		0.67		0.791		1.0	0.63	76	<10	20	<0.5	<2	2.10	1.2	7	213
1232007406		0.47		0.453		1.3	1.35	14	<10	60	<0.5	4	0.95	6.5	7	194
1122005014		0.68		0.086		0.5	1.86	37	10	50	<0.5	<2	2.02	1.7	7	164
1122005087		0.69		0.123		0.9	0.91	65	<10	30	<0.5	<2	2.44	1.3	6	87
1123023026		0.68		0.078		1.5	1.12	63	<10	30	<0.5	<2	1.86	1.1	6	98
1123023033		0.69		0.090		0.4	1.77	43	<10	30	<0.5	<2	1.52	<0.5	8	87
1123023109		0.68		0.046		0.4	2.01	8	<10	60	<0.5	<2	1.81	0.5	11	149
1122019050		0.41		0.207		1.0	0.96	40	<10	40	<0.5	<2	1.35	4.8	6	71
V835535		0.06		0.947		2.4	1.08	<2	<10	80	<0.5	4	0.67	<0.5	13	8
1231003024		0.69		0.525		0.9	0.36	124	<10	60	<0.5	<2	1.01	0.6	8	152
1122012128		0.47		0.235		1.1	1.62	35	<10	70	<0.5	<2	1.02	11.6	9	138
1122012010		0.66		1.390		4.0	0.93	101	<10	60	<0.5	<2	0.99	3.7	10	187
1122012038		0.67		0.761		1.2	1.31	44	<10	30	<0.5	<2	1.47	2.0	6	133
1122010025		0.72		0.153		0.4	2.71	25	<10	30	<0.5	<2	1.99	2.5	9	184
1122010006		0.64		1.855		4.2	1.96	44	<10	30	<0.5	9	1.64	1.5	9	290
1231008085		0.69		0.096		0.8	1.35	8	<10	30	<0.5	3	0.82	2.0	9	143
1122012108		0.70	91.6	0.394		1.5	1.07	50	<10	20	<0.5	2	0.84	17.4	7	235
1122012086		0.65		0.917		1.2	1.04	40	<10	60	<0.5	<2	2.10	5.0	7	119
1122012063		0.46		0.499		1.0	1.96	60	<10	40	<0.5	<2	1.41	3.5	9	84
1122012112		0.46		1.095		1.2	1.64	33	<10	60	<0.5	<2	1.95	2.0	7	108
1122009089		0.48		0.165		0.7	3.00	31	<10	50	<0.5	<2	1.79	<0.5	10	137
1122010266		0.46		1.415		1.3	1.63	52	<10	40	<0.5	2	2.28	3.6	8	113
1122010270		0.47		1.380		0.7	2.52	32	<10	40	<0.5	2	1.56	1.1	8	137
1122007026		0.42		0.795		0.9	1.20	68	<10	60	<0.5	<2	1.93	1.2	12	96
1122010143		0.48		0.079		2.4	2.47	23	<10	40	<0.5	6	1.99	0.8	8	97
1122009133		0.46		0.241		1.0	2.28	41	<10	60	<0.5	<2	1.70	<0.5	8	104
1122009159		0.46		0.065		0.5	1.24	12	<10	60	<0.5	<2	1.77	0.6	14	176

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1122009031		24	1.86	<10	<1	0.27	10	0.61	701	1	0.11	9	390	20	1.09	3
1231009055		79	2.61	<10	1	0.16	20	0.76	383	1	0.09	10	510	5	2.76	<2
1129009304		32	2.50	10	<1	0.26	20	0.89	561	1	0.12	10	570	37	1.67	2
1122007124		56	1.97	<10	<1	0.32	10	0.90	1320	1	0.02	10	410	76	1.74	<2
V835534		52	3.02	<10	<1	0.20	10	0.43	273	20	0.16	13	600	7	0.07	<2
1123019045		185	2.85	<10	1	0.21	10	1.42	593	<1	0.01	13	360	11	1.27	5
1232007522		146	2.69	<10	<1	0.10	10	0.83	384	3	0.04	12	390	<2	1.89	<2
1122005001		14	1.97	<10	<1	0.14	10	0.66	405	1	0.05	10	400	4	0.36	<2
1122002001		64	1.94	<10	1	0.34	10	0.94	1315	1	0.03	10	390	36	1.94	<2
1122002018		32	1.99	<10	1	0.24	10	0.69	999	1	0.02	10	410	23	2.01	<2
1122002104		112	2.49	<10	1	0.26	10	0.96	1305	1	0.02	12	420	19	2.56	<2
1122005016		16	1.72	<10	1	0.21	10	0.77	422	1	0.11	11	390	15	0.64	<2
1232007385		23	2.84	<10	<1	0.19	20	0.97	307	2	0.04	10	530	2	2.83	<2
1123023145		33	1.96	<10	<1	0.29	10	0.78	1720	1	0.01	8	390	65	1.50	2
1232007406		131	3.17	<10	1	0.19	10	0.83	524	1	0.11	9	410	9	3.15	2
1122005014		18	1.79	<10	<1	0.22	10	0.95	528	1	0.07	9	360	30	1.02	3
1122005087		17	1.58	<10	1	0.17	10	0.69	585	1	0.04	9	360	21	1.13	2
1123023026		20	1.94	<10	<1	0.28	10	0.62	1035	1	0.02	9	390	135	1.65	3
1123023033		19	1.78	<10	<1	0.22	20	0.82	505	1	0.11	8	410	33	1.06	2
1123023109		54	3.03	10	<1	0.25	20	0.74	555	1	0.14	18	590	7	0.44	<2
1122019050		28	1.61	<10	<1	0.34	10	0.50	654	1	0.01	6	390	142	1.55	2
V835535		57	3.06	<10	<1	0.26	10	0.53	295	11	0.10	16	720	9	0.07	<2
1231003024		21	1.58	<10	<1	0.25	10	0.17	804	1	<0.01	10	380	83	1.58	<2
1122012128		73	2.35	<10	<1	0.32	20	0.96	504	1	0.04	10	520	30	1.63	<2
1122012010		136	3.90	<10	<1	0.27	10	0.63	470	1	<0.01	19	500	93	3.30	<2
1122012038		44	1.63	<10	<1	0.24	10	1.01	885	<1	0.01	7	360	298	0.92	2
1122010025		37	2.02	10	<1	0.15	10	0.66	484	2	0.26	14	370	26	1.48	<2
1122010006		43	2.59	<10	<1	0.15	10	0.51	398	2	0.20	14	440	124	2.34	3
1231008085		49	2.62	<10	<1	0.09	20	0.74	379	1	0.05	10	580	7	2.67	<2
1122012108		42	2.59	<10	<1	0.15	10	0.81	576	1	0.01	9	390	24	1.84	4
1122012086		52	1.79	<10	<1	0.31	10	0.90	1000	1	0.01	8	460	91	1.37	<2
1122012063		43	2.38	<10	<1	0.27	20	0.87	708	1	0.05	10	500	56	1.54	<2
1122012112		37	1.69	<10	<1	0.33	10	0.96	897	1	0.04	9	480	49	1.11	2
1122009089		24	2.29	10	<1	0.22	20	0.89	474	<1	0.14	11	560	21	1.16	<2
1122010266		83	2.04	<10	<1	0.27	10	0.74	1020	2	0.10	12	420	82	1.70	<2
1122010270		82	1.89	10	<1	0.22	10	0.69	453	1	0.28	12	390	30	1.39	<2
1122007026		47	2.40	<10	<1	0.29	20	0.75	784	1	0.03	20	650	93	1.75	<2
1122010143		34	1.87	10	<1	0.22	10	0.55	521	1	0.26	11	420	91	1.71	2
1122009133		25	1.87	10	<1	0.26	10	0.71	505	1	0.10	10	480	28	1.06	2
1122009159		28	1.87	<10	<1	0.20	10	0.67	497	2	0.07	12	420	5	0.61	<2

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3
1122009031		1	67	<20	0.01	<10	<10	9	<10	103	0.55	1.07	50	9.1	17	33.4
1231009055		1	34	<20	<0.01	<10	<10	7	<10	386	0.21	2.88	24	8.6	-66	90.0
1129009304		1	67	<20	0.03	<10	<10	12	<10	302	0.17	1.72	27	9.0	-27	53.8
1122007124		1	28	<20	<0.01	<10	<10	5	<10	783	1.08	1.71	80	9.2	27	53.4
V835534		2	22	<20	0.44	<10	<10	73	<10	50	0.02					
1123019045		1	12	<20	<0.01	<10	<10	8	<10	308	0.11	1.23	11	8.8	-27	38.4
1232007522		1	19	<20	0.01	<10	<10	12	<10	355	0.58	1.97	18	8.8	-44	61.6
1122005001		1	30	<20	0.01	<10	<10	15	<10	89	0.55	0.32	48	9.4	38	10.0
1122002001		1	30	<20	<0.01	<10	<10	5	<10	585	1.11	1.93	81	9.3	21	60.3
1122002018		<1	19	<20	<0.01	<10	<10	4	<10	661	0.84	2.06	64	8.9	0	64.4
1122002104		1	27	<20	<0.01	<10	<10	3	<10	1205	1.21	2.51	87	9.3	9	78.4
1122005016		1	55	<20	0.01	<10	<10	9	<10	95	0.37	0.62	37	9.2	18	19.4
1232007385		1	14	<20	0.01	<10	<10	8	<10	280	0.09	2.90	12	8.9	-79	90.6
1123023145		1	28	<20	<0.01	<10	<10	3	<10	353	1.12	1.42	80	9.0	36	44.4
1232007406		1	41	<20	0.01	<10	<10	12	<10	1725	0.23	3.18	28	9.0	-71	99.4
1122005014		1	45	<20	0.01	<10	<10	6	<10	405	0.47	0.98	46	9.1	15	30.6
1122005087		1	48	<20	<0.01	<10	<10	4	<10	313	0.85	1.15	68	9.2	32	35.9
1123023026		1	26	<20	<0.01	<10	<10	4	<10	360	0.65	1.63	51	8.8	0	50.9
1123023033		1	53	<20	<0.01	<10	<10	8	<10	79	0.36	0.97	33	9.3	3	30.3
1123023109		3	131	<20	0.08	<10	<10	51	<10	219	0.40	0.40	36	9.3	24	12.5
1122019050		<1	21	<20	<0.01	<10	<10	4	<10	1240	0.44	1.57	38	9.3	-11	49.1
V835535		2	16	<20	0.34	<10	<10	75	<10	50	0.05					
1231003024		<1	67	<20	<0.01	<10	<10	2	<10	143	0.43	1.68	33	9.1	-20	52.5
1122012128		1	62	<20	0.02	<10	<10	10	<10	2900	0.23	1.69	28	8.8	-25	52.8
1122012010		1	30	<20	0.01	<10	<10	13	<10	901	0.30	3.49	29	8.6	-80	109.1
1122012038		1	32	<20	0.01	<10	<10	6	<10	574	0.42	0.87	39	9.1	12	27.2
1122010025		1	59	<20	0.01	<10	<10	7	<10	626	0.33	1.50	33	9.0	-14	46.9
1122010006		<1	53	<20	0.02	<10	<10	5	<10	397	0.28	2.24	27	8.6	-43	70.0
1231008085		1	40	<20	<0.01	<10	<10	7	<10	481	0.35	2.75	17	8.7	-69	85.9
1122012108		<1	15	<20	0.02	<10	<10	5	<10	4300	0.23	1.86	23	8.8	-35	58.1
1122012086		1	69	<20	0.01	<10	<10	7	<10	1320	0.74	1.34	60	9.2	18	41.9
1122012063		1	45	<20	0.01	<10	<10	8	<10	1085	0.30	1.48	34	9.1	-12	46.3
1122012112		1	70	<20	0.02	<10	<10	9	<10	533	0.52	1.12	49	9.3	14	35.0
1122009089		1	63	<20	0.03	<10	<10	15	<10	95	0.11	1.10	-4	9.1	-38	34.4
1122010266		1	32	<20	<0.01	<10	<10	5	<10	854	0.63	1.56	54	9.0	5	48.8
1122010270		1	46	<20	0.01	<10	<10	6	<10	309	0.19	1.34	23	9.1	-19	41.9
1122007026		1	45	<20	0.01	<10	<10	14	<10	321	0.67	1.70	56	9.1	3	53.1
1122010143		1	70	<20	0.01	<10	<10	5	<10	223	0.30	1.65	35	9.0	-17	51.6
1122009133		1	60	<20	0.01	<10	<10	11	<10	142	0.27	1.05	34	9.3	1	32.8
1122009159		2	43	<20	0.02	<10	<10	17	40	195	0.54	0.58	49	9.4	31	18.1

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1122009031		1.50	2
1231009055		0.27	2
1129009304		0.50	2
1122007124		1.50	2
V835534			
1123019045		0.29	1
1232007522		0.29	1
1122005001		4.80	2
1122002001		1.34	2
1122002018		0.99	2
1122002104		1.11	2
1122005016		1.91	2
1232007385		0.13	1
1123023145		1.80	2
1232007406		0.28	2
1122005014		1.50	2
1122005087		1.89	2
1123023026		1.00	2
1123023033		1.09	2
1123023109		2.88	2
1122019050		0.77	2
V835535			
1231003024		0.63	2
1122012128		0.53	2
1122012010		0.27	2
1122012038		1.43	2
1122010025		0.70	2
1122010006		0.39	2
1231008085		0.20	1
1122012108		0.40	1
1122012086		1.43	2
1122012063		0.74	2
1122012112		1.40	2
1122009089		-0.12	1
1122010266		1.11	2
1122010270		0.55	1
1122007026		1.05	2
1122010143		0.68	2
1122009133		1.04	2
1122009159		2.70	2

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1122012123		0.48		0.379		1.4	1.61	70	<10	30	<0.5	<2	1.46	2.7	9	156
V835536		0.06		1.140		4.1	0.35	<2	<10	20	<0.5	6	0.40	<0.5	4	6
1122010119		0.68		0.927		1.3	1.35	177	<10	30	<0.5	2	2.12	0.8	12	137
1122010170		0.62		1.420		2.2	0.28	52	<10	20	<0.5	<2	2.63	4.7	10	252
1122010283		0.61		1.335		2.5	0.52	114	<10	20	<0.5	<2	1.65	22.6	6	220
1122006068		0.69		0.256		0.6	2.92	37	<10	40	<0.5	<2	1.83	<0.5	11	168
1122010213		0.64		0.630		2.2	0.46	75	<10	30	<0.5	2	2.29	3.3	8	200
1231003055		0.66		0.569		1.9	0.42	53	<10	50	<0.5	<2	1.58	1.4	7	186
1122010106		0.70		0.984		1.2	1.57	61	<10	30	<0.5	2	1.20	5.8	8	126
1122010155		0.67		0.661		2.0	0.47	45	<10	30	<0.5	2	3.28	3.4	11	126
1122010217		0.65		2.32		3.2	1.60	95	<10	30	<0.5	2	0.87	3.2	9	129
1122010278		0.70		1.050		1.9	1.49	85	<10	30	<0.5	2	0.86	7.7	8	188
1122010345		0.69		0.822		1.7	1.01	101	<10	40	<0.5	<2	0.49	<0.5	9	167
1231003025		0.66		0.382		2.0	0.42	53	<10	40	<0.5	<2	0.91	2.8	10	175
1232007003		0.69		0.089		2.0	1.04	6	<10	30	<0.5	18	0.37	0.7	10	167
1122007095		0.69		0.367		1.1	0.62	48	<10	30	<0.5	2	2.84	2.8	9	186
1122010234		0.67		1.180		1.9	1.32	75	<10	30	<0.5	<2	0.67	3.8	7	200
1232007558		0.71		0.086		0.3	0.66	6	<10	40	<0.5	2	0.79	1.0	8	187
1122010318		0.70		0.808		0.9	1.27	62	<10	30	<0.5	2	0.52	<0.5	7	140
V835537		0.06		0.964		2.6	1.10	<2	<10	80	<0.5	2	0.71	<0.5	13	8
1122005082		0.65		0.050		0.6	1.33	26	<10	50	<0.5	<2	2.34	<0.5	7	117
1123023148		0.68		0.073		1.1	1.03	40	<10	30	<0.5	<2	2.10	0.5	6	89
1123023201		0.69		0.331		1.1	0.46	61	<10	20	<0.5	2	1.92	9.1	5	268
1123019209		0.66		5.04		1.8	0.94	248	<10	40	<0.5	<2	0.31	11.6	7	225
1122006012		0.67		0.546		0.7	1.79	45	<10	40	<0.5	2	1.41	<0.5	9	76
1122006013		0.68		0.093		0.7	1.35	49	10	30	<0.5	<2	1.67	<0.5	8	79
1123023179		0.66		0.206		0.6	1.01	39	<10	20	<0.5	2	1.92	<0.5	6	64
1123023008		0.69		1.275		2.4	0.43	319	<10	30	<0.5	<2	1.19	5.5	8	88
1123023002		0.66		0.530		2.0	0.84	562	<10	120	0.5	<2	2.04	4.0	10	301
1232007533		0.70		0.160		0.4	0.73	6	<10	30	<0.5	2	0.58	2.6	9	291
1122008014		0.70		0.056		0.6	1.42	70	<10	40	<0.5	<2	1.90	<0.5	9	306
1122008031		0.65		1.645		1.8	0.61	22	<10	30	<0.5	2	2.61	3.2	8	309
1122008130		0.68		0.363		1.3	1.17	16	<10	40	<0.5	<2	3.47	1.0	12	117
1122008001		0.66		0.102		0.5	1.18	8	<10	40	<0.5	2	1.13	<0.5	8	342
1122006025		0.67		0.122		1.0	1.66	37	10	50	<0.5	2	2.35	0.5	11	151
1122006066		1.19		0.035		0.2	0.99	12	<10	30	<0.5	<2	2.24	<0.5	7	214
V835538		0.06		1.070		4.3	0.30	<2	<10	20	<0.5	5	0.37	<0.5	4	5
1123019133		0.50		0.822		0.8	1.80	69	<10	30	<0.5	<2	0.44	1.3	10	96
1123019191		0.51		1.040		1.1	1.44	77	<10	20	<0.5	<2	0.67	8.7	9	91
1122005206		0.68	91.3	0.057		0.6	1.16	31	<10	30	<0.5	<2	1.52	<0.5	7	135

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1122012123		51	2.16	<10	<1	0.29	10	0.89	723	1	0.04	9	400	58	1.85	2
V835536		23	1.40	<10	<1	0.06	<10	0.09	116	7	0.08	6	320	<2	0.02	<2
1122010119		42	2.67	<10	<1	0.19	10	0.63	608	1	0.04	12	540	63	2.11	<2
1122010170		47	2.56	<10	<1	0.14	<10	0.99	1825	1	0.01	13	420	175	2.51	2
1122010283		95	3.51	<10	1	0.17	10	0.47	1135	1	0.01	9	380	167	3.57	2
1122006068		24	2.23	10	<1	0.15	10	0.89	504	<1	0.17	11	570	23	0.98	<2
1122010213		44	2.51	<10	<1	0.23	10	0.54	1315	1	0.01	12	430	170	2.51	<2
1231003055		28	1.56	<10	<1	0.29	10	0.40	1605	1	<0.01	8	380	237	1.30	<2
1122010106		53	3.15	<10	<1	0.21	10	0.95	754	1	0.03	11	410	85	2.62	<2
1122010155		70	2.42	<10	<1	0.22	<10	0.68	1690	1	0.01	14	410	223	2.48	<2
1122010217		357	4.53	<10	<1	0.21	10	0.99	903	1	0.01	13	430	53	2.93	<2
1122010278		104	4.12	<10	<1	0.21	10	0.98	803	1	0.01	12	420	55	2.58	2
1122010345		44	2.99	<10	<1	0.23	10	0.60	429	<1	0.01	12	440	57	2.32	2
1231003025		36	1.80	<10	<1	0.30	10	0.13	614	1	<0.01	12	400	438	1.92	3
1232007003		89	2.34	<10	<1	0.12	20	0.83	208	2	0.04	12	580	5	2.34	<2
1122007095		49	2.21	<10	<1	0.20	10	0.99	1445	1	0.01	12	420	141	1.88	<2
1122010234		120	3.62	<10	<1	0.18	10	0.83	676	<1	<0.01	11	410	35	2.25	<2
1232007558		63	2.29	<10	<1	0.08	10	0.48	357	2	0.04	9	340	2	2.08	<2
1122010318		22	2.53	<10	<1	0.21	10	0.82	544	1	0.01	11	410	20	1.57	2
V835537		56	3.10	<10	<1	0.26	10	0.54	299	11	0.10	16	730	7	0.08	<2
1122005082		21	1.64	<10	<1	0.21	10	0.98	471	<1	0.04	9	350	7	1.14	<2
1123023148		25	1.59	<10	<1	0.27	10	0.71	1050	1	0.01	7	370	84	1.36	<2
1123023201		66	2.03	<10	<1	0.21	10	0.78	1770	<1	<0.01	8	380	113	1.51	<2
1123019209		155	3.43	<10	<1	0.30	10	0.44	444	1	<0.01	9	690	96	2.78	<2
1122006012		22	2.11	<10	<1	0.15	20	0.90	550	1	0.04	9	540	16	1.09	<2
1122006013		27	1.73	<10	<1	0.12	10	0.84	437	1	0.03	9	400	13	1.10	2
1123023179		23	1.54	<10	<1	0.23	10	0.79	1000	1	0.01	8	410	42	1.25	<2
1123023008		34	2.15	<10	<1	0.24	10	0.47	980	1	<0.01	9	390	434	2.12	2
1123023002		42	2.66	<10	<1	0.59	20	0.91	1040	1	0.01	18	1040	258	1.98	3
1232007533		104	2.26	<10	<1	0.07	10	0.58	353	2	0.04	11	360	2	1.88	<2
1122008014		36	1.86	<10	<1	0.15	10	0.81	489	1	0.08	12	350	18	0.79	<2
1122008031		87	2.13	<10	<1	0.19	10	0.85	1340	1	0.02	12	420	334	1.82	<2
1122008130		71	2.22	<10	<1	0.16	10	1.34	1265	1	0.01	30	750	94	1.28	<2
1122008001		42	2.50	10	<1	0.12	10	0.72	276	1	0.06	14	390	4	1.05	<2
1122006025		47	2.12	<10	<1	0.18	10	1.19	564	1	0.04	21	530	37	1.28	<2
1122006066		13	1.74	<10	<1	0.08	10	0.56	406	1	0.04	11	400	4	0.40	<2
V835538		21	1.30	<10	<1	0.05	<10	0.08	109	7	0.07	6	310	<2	0.01	<2
1123019133		80	2.38	<10	<1	0.20	10	1.25	528	<1	0.01	16	370	10	1.10	2
1123019191		80	2.29	<10	<1	0.20	10	0.98	531	1	0.01	13	400	12	1.20	2
1122005206		13	1.54	<10	<1	0.16	10	0.54	428	1	0.07	10	360	8	0.67	<2

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1122012123		1	48	<20	0.01	<10	<10	6	<10	660	0.32	1.75	34	8.9	-21	54.7
V835536		1	12	<20	0.26	<10	<10	32	<10	24	0.06					
1122010119		1	33	<20	0.01	<10	<10	8	<10	223	0.57	2.04	49	8.9	-15	63.8
1122010170		<1	24	<20	<0.01	<10	<10	2	<10	1290	1.40	2.55	103	9.0	23	79.7
1122010283		<1	15	<20	<0.01	<10	<10	2	<10	5700	0.70	3.66	52	8.6	-62	114.4
1122006068		1	76	<20	0.03	<10	<10	14	10	113	0.20	0.95	20	9.1	-10	29.7
1122010213		<1	20	<20	<0.01	<10	<10	2	<10	889	0.97	2.44	74	9.1	-2	76.3
1231003055		<1	79	<20	<0.01	<10	<10	3	<10	410	0.87	1.21	55	9.3	17	37.8
1122010106		<1	21	<20	0.01	<10	<10	5	<10	1255	0.38	2.66	31	8.8	-52	83.1
1122010155		<1	27	<20	<0.01	<10	<10	3	<10	887	1.37	2.39	109	9.2	34	74.7
1122010217		1	13	<20	0.01	<10	<10	6	<10	769	0.26	2.89	27	8.8	-63	90.3
1122010278		1	12	<20	0.01	<10	<10	7	<10	1765	0.26	2.52	25	8.8	-54	78.8
1122010345		1	9	<20	0.01	<10	<10	4	<10	126	0.13	2.22	14	8.7	-55	69.4
1231003025		<1	42	<20	<0.01	<10	<10	2	<10	792	0.34	1.71	26	9.2	-27	53.4
1232007003		1	19	<20	<0.01	<10	<10	7	<10	201	0.08	2.28	11	8.9	-60	71.3
1122007095		<1	24	<20	<0.01	<10	<10	3	<10	644	1.32	1.81	102	9.1	45	56.6
1122010234		1	10	<20	0.01	<10	<10	6	<10	867	0.22	2.36	19	8.6	-55	73.8
1232007558		1	16	<20	<0.01	<10	<10	8	<10	266	0.23	2.12	21	9.0	-45	66.3
1122010318		<1	8	<20	<0.01	<10	<10	5	<10	129	0.17	1.57	16	8.9	-33	49.1
V835537		2	17	<20	0.37	<10	<10	78	<10	51	0.05					
1122005082		1	40	<20	<0.01	<10	<10	5	<10	121	0.82	1.17	68	9.1	31	36.6
1123023148		1	32	<20	<0.01	<10	<10	4	<10	179	0.73	1.35	58	9.2	16	42.2
1123023201		<1	28	<20	<0.01	<10	<10	2	<10	2350	1.06	1.46	74	9.0	28	45.6
1123019209		<1	17	<20	0.01	<10	<10	5	<10	2800	0.09	2.94	11	8.1	-81	91.9
1122006012		1	31	<20	<0.01	<10	<10	9	<10	110	0.30	1.09	32	9.0	-2	34.1
1122006013		1	27	<20	<0.01	<10	<10	6	<10	150	0.42	1.15	39	8.9	3	35.9
1123023179		1	28	<20	<0.01	<10	<10	5	<10	99	0.63	1.26	52	9.3	13	39.4
1123023008		<1	39	<20	<0.01	<10	<10	2	<10	1295	0.62	2.08	46	9.1	-19	65.0
1123023002		2	168	<20	0.05	<10	<10	17	<10	969	0.80	2.06	68	9.2	4	64.4
1232007533		1	14	<20	<0.01	<10	<10	10	<10	827	0.25	1.97	16	9.1	-46	61.6
1122008014		1	38	<20	<0.01	<10	<10	7	<10	88	0.58	0.77	49	9.3	25	24.1
1122008031		<1	27	<20	<0.01	<10	<10	4	<10	860	1.17	1.84	89	9.1	32	57.5
1122008130		2	82	<20	<0.01	<10	<10	11	<10	316	1.38	1.37	113	9.1	70	42.8
1122008001		1	24	<20	0.01	<10	<10	17	<10	32	0.35	1.04	34	9.3	2	32.5
1122006025		2	54	<20	0.01	<10	<10	15	<10	158	0.60	1.29	58	8.9	18	40.3
1122006066		1	40	<20	<0.01	<10	<10	8	<10	47	0.69	0.42	57	9.4	44	13.1
V835538		1	11	<20	0.25	<10	<10	30	<10	22	0.06					
1123019133		1	17	<20	<0.01	<10	<10	7	<10	380	0.09	1.11	14	9.1	-21	34.7
1123019191		1	14	<20	<0.01	<10	<10	6	<10	2200	0.24	1.21	20	9.0	-18	37.8
1122005206		1	30	<20	<0.01	<10	<10	5	<10	53	0.40	0.64	37	9.2	17	20.0

***** See Appendix Page for comments regarding this certificate *****

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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1122012123		0.62	2
V835536			
1122010119		0.77	2
1122010170		1.29	3
1122010283		0.45	2
1122006068		0.67	1
1122010213		0.97	2
1231003055		1.45	2
1122010106		0.37	2
1122010155		1.46	3
1122010217		0.30	2
1122010278		0.32	2
1122010345		0.20	1
1231003025		0.49	2
1232007003		0.15	1
1122007095		1.80	3
1122010234		0.26	1
1232007558		0.32	1
1122010318		0.33	1
V835537			
1122005082		1.86	2
1123023148		1.37	2
1123023201		1.62	2
1123019209		0.12	1
1122006012		0.94	2
1122006013		1.09	2
1123023179		1.32	2
1123023008		0.71	2
1123023002		1.06	2
1232007533		0.26	1
1122008014		2.04	2
1122008031		1.55	2
1122008130		2.64	3
1122008001		1.05	2
1122006025		1.44	2
1122006066		4.34	2
V835538			
1123019133		0.40	1
1123019191		0.53	1
1122005206		1.85	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method / Analyte / Units / LOD	WEI-21 Recvd Wt. kg 0.02	LOG-QC Pass75um % 0.01	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1
1123019054		0.43		0.422		0.9	1.31	146	<10	30	<0.5	2	0.26	4.5	7	240
1123019010		0.68		0.742		2.0	0.67	166	<10	20	<0.5	<2	0.95	18.4	7	175
1122002124		0.69		1.485		3.5	0.45	29	<10	30	<0.5	2	2.33	4.9	8	148
1123019140		0.71		0.439		0.9	0.80	245	<10	20	<0.5	<2	0.29	2.0	9	154
1232007274		0.68		0.031		0.7	0.85	6	<10	20	<0.5	4	0.41	1.3	8	83
1123019028		0.58		0.783		1.0	1.50	96	<10	30	<0.5	<2	0.41	2.2	9	144
1123020214		0.45		0.224		1.2	1.52	52	<10	150	<0.5	<2	1.69	13.7	7	148
1232007483		0.47		0.052		0.4	1.01	8	<10	50	<0.5	3	0.73	<0.5	10	260
1123019009		0.69		0.492		2.4	0.55	210	<10	20	<0.5	<2	0.66	16.6	10	177
1123023018		0.65		0.199		1.3	0.50	90	<10	60	<0.5	<2	1.94	2.6	7	188
1123019151		0.68		2.69		1.3	0.99	157	<10	30	<0.5	<2	0.14	20.1	7	176
1123019101		0.63		0.491		1.5	0.45	191	<10	40	<0.5	2	1.11	14.0	7	160
1122005211		0.63		1.540		9.9	1.00	<2	<10	80	<0.5	4	0.62	<0.5	11	9
V835539		0.06		0.074		0.5	0.98	34	<10	30	<0.5	<2	2.76	<0.5	7	158

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Cu	Fe	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb
	Units	ppm	%	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm
	LOD	1	0.01	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2
1123019054		93	3.68	<10	<1	0.30	10	0.57	406	1	0.01	10	390	18	2.50	2
1123019010		114	2.95	<10	<1	0.19	20	0.40	503	1	0.01	9	400	143	3.00	2
1122002124		80	2.34	<10	<1	0.18	<10	0.69	1125	1	0.01	11	410	28	2.47	<2
1123019140		23	2.36	<10	<1	0.19	10	0.46	214	1	0.01	12	400	34	2.00	2
1232007274		77	2.13	<10	<1	0.08	10	0.54	266	1	0.05	8	410	6	2.20	<2
1123019028		193	2.41	<10	<1	0.24	10	1.05	470	1	0.01	16	370	15	1.48	2
1123020214		51	2.35	<10	<1	0.56	20	1.04	904	1	0.01	11	630	41	1.43	2
1232007483		48	2.65	<10	<1	0.12	10	0.74	484	3	0.07	16	380	4	2.23	<2
1123019009		98	2.45	<10	<1	0.20	20	0.27	373	2	0.01	12	370	154	2.52	4
1123023018		44	1.97	<10	<1	0.32	10	0.63	1785	3	0.01	10	420	192	1.66	<2
1123019151		93	3.02	<10	<1	0.25	10	0.53	484	<1	<0.01	8	400	102	1.99	2
1123019101		100	2.23	<10	<1	0.25	10	0.43	893	<1	<0.01	9	480	309	2.19	2
1122005211		51	3.02	<10	<1	0.20	10	0.43	271	20	0.15	14	620	9	0.05	<2
V835539		15	1.56	<10	<1	0.15	10	0.80	626	1	0.04	10	360	14	1.10	<2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08
	Analyte	Sc	Sr	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA
	Units	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt
	LOD	1	1	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3
1123019054		<1	10	<20	0.01	<10	<10	6	<10	1125	0.10	2.48	11	8.3	-67	77.5
1123019010		<1	11	<20	<0.01	<10	<10	3	<10	4240	0.32	3.04	26	8.4	-69	95.0
1122002124		<1	20	<20	<0.01	<10	<10	2	<10	1230	1.05	2.57	81	9.1	1	80.3
1123019140		<1	8	<20	<0.01	<10	<10	4	<10	495	0.08	2.07	10	8.9	-55	64.7
1232007274		<1	18	<20	<0.01	<10	<10	5	<10	260	0.11	2.27	12	8.5	-59	70.9
1123019028		1	14	<20	<0.01	<10	<10	7	<10	574	0.15	1.34	16	8.8	-26	41.9
1123020214		2	107	<20	0.03	<10	<10	14	<10	3260	0.48	1.40	51	9.4	7	43.8
1232007483		1	21	<20	0.01	<10	<10	13	10	67	0.19	2.26	24	9.0	-47	70.6
1123019009		<1	9	<20	<0.01	<10	<10	3	<10	3850	0.23	2.62	18	8.6	-64	81.9
1123023018		<1	242	<20	0.01	<10	<10	4	<10	884	1.00	1.66	74	9.2	22	51.9
1123019151		<1	9	<20	0.02	<10	<10	5	<10	4660	0.05	1.83	8	8.4	-49	57.2
1123019101		1	40	<20	0.01	<10	<10	4	<10	3280	0.51	2.20	41	8.8	-28	68.8
1122005211		2	21	<20	0.43	<10	<10	72	<10	49	0.03	0.06	12	9.4	10	1.9
V835539		1	57	<20	<0.01	<10	<10	4	<10	74	0.90					

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method Analyte Units LOD	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
1123019054		0.14	1
1123019010		0.27	2
1122002124		1.01	2
1123019140		0.15	1
1232007274		0.17	1
1123019028		0.38	1
1123020214		1.17	2
1232007483		0.34	2
1123019009		0.22	1
1123023018		1.43	2
1123019151		0.14	1
1123019101		0.60	2
1122005211		6.40	1
V835539			

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

CERTIFICATE OF ANALYSIS TB19005962

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

ALS Canada Ltd.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

QC CERTIFICATE TB18054441

Project: Mine Site Lab Pulps January

P.O. No.: 4500009909

This report is for 132 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 12-MAR-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JASON PATTISON	STEPHEN SABO

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-24	Pulp Login - Rcd w/o Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
ATTN: JASON PATTISON
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOR	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																

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555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																

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Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.1				
Buffer pH6											6.1				
Target Range - Lower Bound											5.3				
Upper Bound											6.7				
DS-1								3.18							
DS-1								3.06							
Target Range - Lower Bound								3.01							
Upper Bound								3.25							
DS-1								3.12	2.70						
DS-1								3.09	2.67						
DS-1									2.66						
DS-1									2.63						
Target Range - Lower Bound									2.51						
Upper Bound									2.71						
GS310-10								1.08	0.27						
GS310-10								1.10	0.28						
GS310-10									0.27						
Target Range - Lower Bound									0.25						
Upper Bound									0.29						
GS313-8								0.95							
GS313-8								0.94							
Target Range - Lower Bound								0.90							
Upper Bound								0.98							
GS313-8								0.92	1.27						
GS313-8								0.91	1.22						
GS313-8									1.29						
Target Range - Lower Bound									1.19						
Upper Bound									1.29						

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOR	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
JK-17		1.925														
JK-17		1.980														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16		0.510														
LEA-16		0.525														
LEA-16		0.507														
Target Range - Lower Bound		0.466														
Upper Bound		0.536														
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08			4.6	2.59	32	10	440	0.7	2	1.08	2.2	19	90	622	3.60	10
MRGeo08			4.6	2.64	33	10	440	0.8	<2	1.09	2.4	19	91	635	3.57	10
Target Range - Lower Bound			3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22	<10
Upper Bound			5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96	30
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08			19.9	2.22	122	20	70	0.7	13	0.95	18.6	97	82	8560	5.02	10
OGGeo08			18.8	2.08	114	10	60	0.6	12	0.84	17.7	93	76	8170	4.82	10
OGGeo08			20.8	2.26	121	<10	50	0.7	12	0.92	19.6	98	83	8680	5.24	10
Target Range - Lower Bound			18.0	2.05	105	<10	60	<0.5	6	0.82	16.2	86	75	7800	4.51	<10
Upper Bound			22.4	2.53	133	30	110	1.8	15	1.02	21.0	108	93	8980	5.53	30
OREAS 602			>100	0.65	690	<10	30	<0.5	61	0.53	26.0	10	33	5280	2.10	<10
OREAS 602			>100	0.64	694	<10	30	<0.5	64	0.54	26.2	10	33	5310	2.06	<10
Target Range - Lower Bound			106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94	<10
Upper Bound			100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40	30
OREAS 925			2.5	2.92	11	20	50	0.5	36	0.33	0.5	25	39	6470	6.47	10

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16																
LEA-16																
LEA-16																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		<1	1.27	30	1.16	406	13	0.34	703	990	1075	0.29	2	7	81	20
MRGeo08		1	1.30	30	1.13	409	13	0.33	718	1020	1085	0.31	3	7	81	20
Target Range - Lower Bound		<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71	<20
Upper Bound		2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89	60
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08		<1	1.10	30	0.93	388	876	0.30	8990	810	7220	2.70	18	6	66	<20
OGGeo08		1	1.05	20	0.88	358	824	0.27	8620	770	6870	2.58	20	5	60	<20
OGGeo08		<1	1.09	30	0.99	389	897	0.32	9030	810	7460	2.70	19	6	68	<20
Target Range - Lower Bound		<1	0.94	<10	0.84	350	810	0.26	7760	700	6510	2.51	15	4	59	<20
Upper Bound		3	1.18	50	1.05	438	992	0.34	9480	880	7970	3.09	27	9	74	60
OREAS 602		1	0.09	10	0.11	211	4	0.03	63	240	861	2.00	63	1	50	<20
OREAS 602		1	0.09	10	0.10	218	4	0.03	64	240	872	2.03	65	1	49	<20
Target Range - Lower Bound		<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	46	<1	44	<20
Upper Bound		3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	68	3	56	40
OREAS 925		<1	0.30	30	1.48	874	1	0.01	35	610	113	1.03	<2	3	13	<20

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555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
JK-17															
JK-17															
Target Range - Lower Bound															
Upper Bound															
KZK-1										59		34	25.0	2.36	2
KZK-1										59		34	25.0	2.36	2
KZK-1										57		32	25.0	2.28	2
KZK-1										60		35	25.0	2.40	2
Target Range - Lower Bound										54		30	22.9	2.18	
Upper Bound										64		38	27.1	2.54	
LEA-16															
LEA-16															
LEA-16															
Target Range - Lower Bound															
Upper Bound															
MA-1b								2.39	1.17						
MA-1b								2.44	1.20						
Target Range - Lower Bound								2.34	1.12						
Upper Bound								2.54	1.22						
MRGeo08		0.37	<10	<10	100	<10	770								
MRGeo08		0.37	<10	<10	100	<10	784								
Target Range - Lower Bound		0.33	<10	<10	90	<10	708								
Upper Bound		0.43	20	30	112	20	870								
NBM-1										51		42	8.8	5.83	2
NBM-1										49		40	8.8	5.60	2
NBM-1										52		43	8.8	5.94	2
NBM-1										50		41	8.8	5.71	2
Target Range - Lower Bound										45		37	7.8	5.26	
Upper Bound										54		47	9.7	6.08	
OGGeo08		0.31	<10	<10	80	<10	6950								
OGGeo08		0.28	<10	<10	75	<10	6590								
OGGeo08		0.31	<10	<10	81	<10	7150								
Target Range - Lower Bound		0.27	<10	<10	70	<10	6500								
Upper Bound		0.36	20	30	88	20	7950								
OREAS 602		0.01	<10	<10	11	<10	4200								
OREAS 602		0.01	<10	<10	10	<10	4120								
Target Range - Lower Bound		<0.01	<10	<10	8	<10	3680								
Upper Bound		0.03	20	20	14	20	4500								
OREAS 925		0.10	<10	<10	29	<10	429								

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VANCOUVER BC V7X 1M9

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Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOR	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
OREAS 925			2.3	2.76	9	10	40	0.5	34	0.29	<0.5	24	36	6250	6.20	10
OREAS 925			2.8	2.95	7	<10	50	0.5	38	0.33	<0.5	24	40	6610	6.70	10
Target Range - Lower Bound			1.9	2.56	5	<10	30	<0.5	27	0.27	<0.5	20	34	5850	5.74	<10
Upper Bound			2.9	3.15	13	20	80	1.6	38	0.36	1.6	27	43	6730	7.04	30
OxN117		7.64														
Target Range - Lower Bound		7.21														
Upper Bound		8.14														
BLANKS																
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Target Range - Lower Bound			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Upper Bound			0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02	20
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
OREAS 925		<1	0.26	20	1.41	828	1	0.01	34	580	109	0.98	<2	3	12	<20
OREAS 925		<1	0.30	30	1.59	896	<1	0.02	36	620	117	1.02	<2	3	14	<20
Target Range - Lower Bound		<1	0.27	<10	1.37	805	<1	<0.01	28	540	98	0.88	<2	<1	10	<20
Upper Bound		2	0.35	50	1.69	995	3	0.02	36	680	124	1.09	5	5	15	50
OxN117																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	0.01	1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Target Range - Lower Bound		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Upper Bound		2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2	40
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
OREAS 925		0.07	<10	<10	27	<10	407								
OREAS 925		0.10	<10	<10	30	<10	438								
Target Range - Lower Bound		0.07	<10	<10	27	<10	391								
Upper Bound		0.11	20	20	35	20	483								
OxN117															
Target Range - Lower Bound															
Upper Bound															
BLANKS															
BLANK															
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
BLANK								0.01							
BLANK								<0.01							
Target Range - Lower Bound								<0.01							
Upper Bound								0.02							
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	<2								
Upper Bound		0.02	20	20	2	20	4								
BLANK											6.0				
BLANK											6.0				
BLANK											6.0				
BLANK											6.4				
Target Range - Lower Bound											5.5				
Upper Bound											6.9				
BLANK								<0.01	0.01						
BLANK								<0.01	0.01						
BLANK								<0.01	0.01						
BLANK								0.01	0.01						
BLANK									<0.01						
BLANK									0.01						
Target Range - Lower Bound									<0.01						
Upper Bound									0.02						

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Finalized Date: 10-APR-2018
Account: RRR

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QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method / Analyte / Units / LOR	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
ORIGINAL			13.1	2.24	33	<10	10	1.1	3	0.24	<0.5	36	89	86	4.41	10
DUP			15.0	2.37	33	<10	10	1.2	4	0.26	<0.5	38	96	90	4.70	10
Target Range - Lower Bound			13.1	2.18	29	<10	<10	0.6	<2	0.23	<0.5	34	87	84	4.32	<10
Upper Bound			15.0	2.43	37	20	20	1.7	4	0.27	1.0	40	98	92	4.79	20
1129050034																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128031001		0.251														
DUP		0.312														
Target Range - Lower Bound		0.262														
Upper Bound		0.301														
1128031083																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127013140			0.2	1.15	4	<10	60	<0.5	<2	1.39	<0.5	9	81	33	2.02	<10
DUP			0.2	1.19	4	<10	70	<0.5	<2	1.42	<0.5	9	78	34	2.06	<10
Target Range - Lower Bound			<0.2	1.10	<2	<10	50	<0.5	<2	1.32	<0.5	8	75	31	1.93	<10
Upper Bound			0.4	1.24	6	20	80	1.0	4	1.49	1.0	10	84	36	2.15	20
1127014425		0.037														
DUP		0.037														
Target Range - Lower Bound		0.030														
Upper Bound		0.044														
1127015008																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129050500																
DUP																
Target Range - Lower Bound																
Upper Bound																

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555 BURRARD STREET, BOX 212
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Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
ORIGINAL		<1	0.07	10	1.90	360	1	0.05	57	510	274	0.14	12	6	6	<20
DUP		<1	0.08	10	2.03	385	1	0.05	59	550	294	0.14	13	7	6	<20
Target Range - Lower Bound		<1	0.06	<10	1.86	349	<1	0.04	54	490	268	0.12	10	5	5	<20
Upper Bound		2	0.09	20	2.07	396	2	0.06	62	570	300	0.16	15	8	7	40
1129050034																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128031001																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128031083																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127013140		<1	0.25	10	0.70	351	2	0.06	11	400	2	0.39	<2	1	25	<20
DUP		<1	0.26	10	0.72	359	1	0.06	12	420	<2	0.41	<2	2	26	<20
Target Range - Lower Bound		<1	0.23	<10	0.66	332	<1	0.05	10	380	<2	0.37	<2	<1	23	<20
Upper Bound		2	0.28	20	0.76	378	2	0.07	13	440	4	0.43	4	2	28	40
1127014425																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127015008																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129050500																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
ORIGINAL		0.03	<10	<10	73	<10	36								
DUP		0.03	<10	<10	77	<10	38								
Target Range - Lower Bound		0.02	<10	<10	70	<10	33								
Upper Bound		0.04	20	20	80	20	41								
1129050034											8.3				
DUP											8.3				
Target Range - Lower Bound											7.8				
Upper Bound											8.8				
1128031001															
DUP															
Target Range - Lower Bound															
Upper Bound															
1128031083								0.70	2.93	57		-35	91.6	0.62	2
DUP								0.70	2.91	57		-34	90.9	0.63	2
Target Range - Lower Bound								0.67	2.84	53		-37	86.4	0.58	<1
Upper Bound								0.73	3.00	61		-32	96.1	0.67	3
1127013140		0.04	<10	<10	20	10	58								
DUP		0.04	<10	<10	21	10	61								
Target Range - Lower Bound		0.03	<10	<10	18	<10	55								
Upper Bound		0.05	20	20	23	20	64								
1127014425															
DUP															
Target Range - Lower Bound															
Upper Bound															
1127015008									0.55						
DUP									0.54						
Target Range - Lower Bound									0.52						
Upper Bound									0.57						
1129050500								0.93	2.28						
DUP								0.93	2.08						
Target Range - Lower Bound								0.90	2.12						
Upper Bound								0.96	2.24						

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555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method / Analyte / Units / LOR	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1129050030																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128034006			0.9	1.28	39	10	30	<0.5	<2	1.96	<0.5	9	37	19	1.87	<10
DUP			0.6	1.23	40	10	30	<0.5	<2	1.88	<0.5	8	37	18	1.80	<10
Target Range - Lower Bound			0.5	1.18	36	<10	20	<0.5	<2	1.81	<0.5	7	34	17	1.73	<10
Upper Bound			1.0	1.33	43	20	40	1.0	4	2.03	1.0	10	40	20	1.94	20
1128032041		0.353														
DUP		0.317														
Target Range - Lower Bound		0.313														
Upper Bound		0.357														
1127017119																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128033101																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129051419																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130057771																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130057500			0.4	0.44	48	<10	20	<0.5	<2	0.47	1.3	7	39	19	1.75	<10
DUP			0.5	0.46	50	<10	20	<0.5	<2	0.48	1.4	8	41	20	1.78	<10
Target Range - Lower Bound			<0.2	0.42	45	<10	<10	<0.5	<2	0.44	0.8	6	37	18	1.67	<10
Upper Bound			0.7	0.48	53	20	30	1.0	4	0.51	1.9	9	43	21	1.86	20

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1129050030																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128034006		<1	0.15	10	0.64	565	<1	0.05	10	500	12	1.08	<2	1	38	<20
DUP		<1	0.14	10	0.61	544	1	0.05	10	470	11	1.01	<2	1	37	<20
Target Range - Lower Bound		<1	0.13	<10	0.58	522	<1	0.04	9	450	9	0.98	<2	<1	35	<20
Upper Bound		2	0.16	20	0.67	587	2	0.06	12	520	14	1.11	4	2	40	40
1128032041																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127017119																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128033101																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129051419																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130057771																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130057500		<1	0.18	10	0.17	465	1	0.01	8	420	19	1.70	<2	<1	7	<20
DUP		<1	0.18	10	0.17	481	<1	0.01	8	430	19	1.72	<2	<1	7	<20
Target Range - Lower Bound		<1	0.16	<10	0.15	444	<1	<0.01	7	390	16	1.61	<2	<1	6	<20
Upper Bound		2	0.20	20	0.19	502	2	0.02	9	460	22	1.81	4	2	8	40

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SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
1129050030										52		-23	75.3	0.69	2
DUP										53		-22	75.3	0.70	2
Target Range - Lower Bound										49		-25	71.2	0.65	<1
Upper Bound										56		-20	79.4	0.74	3
1128034006		<0.01	<10	<10	6	<10	87								
DUP		<0.01	<10	<10	5	<10	84								
Target Range - Lower Bound		<0.01	<10	<10	4	<10	79								
Upper Bound		0.02	20	20	7	20	92								
1128032041															
DUP															
Target Range - Lower Bound															
Upper Bound															
1127017119											8.8				
DUP											8.8				
Target Range - Lower Bound											8.3				
Upper Bound											9.3				
1128033101											9.4				
DUP											9.4				
Target Range - Lower Bound											8.8				
Upper Bound											10.0				
1129051419								0.52	1.80						
DUP								0.52	1.83						
Target Range - Lower Bound								0.50	1.76						
Upper Bound								0.54	1.87						
1130057771										10		-83	92.5	0.11	1
DUP										10		-83	92.5	0.11	1
Target Range - Lower Bound										9		-88	87.6	0.09	<1
Upper Bound										12		-78	97.4	0.13	2
1130057500		<0.01	<10	<10	3	<10	364								
DUP		<0.01	<10	<10	3	<10	380								
Target Range - Lower Bound		<0.01	<10	<10	2	<10	351								
Upper Bound		0.02	20	20	4	20	393								

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555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method / Analyte / Units / LOR	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1130057608		0.308														
DUP		0.345														
Target Range - Lower Bound		0.305														
Upper Bound		0.348														
1127018241																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128036069		0.068														
DUP		0.067														
Target Range - Lower Bound		0.059														
Upper Bound		0.076														
1127018153																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128036037																
DUP																
Target Range - Lower Bound																
Upper Bound																
V829037																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129051021																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		1.045														
DUP		1.095														
Target Range - Lower Bound		1.010														
Upper Bound		1.130														

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QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method / Analyte / Units / LOR	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20
		DUPLICATES														
1130057608	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1127018241	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128036069	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1127018153	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128036037	DUP															
	Target Range - Lower Bound															
	Upper Bound															
V829037	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1129051021	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL	DUP															
	Target Range - Lower Bound															
	Upper Bound															

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
1130057608															
DUP															
Target Range - Lower Bound															
Upper Bound															
1127018241								0.72							
DUP								0.75							
Target Range - Lower Bound								0.71							
Upper Bound								0.76							
1128036069															
DUP															
Target Range - Lower Bound															
Upper Bound															
1127018153								1.48	1.85						
DUP								1.46	1.86						
Target Range - Lower Bound								1.42	1.80						
Upper Bound								1.52	1.91						
1128036037									1.03	81		49	32.2	2.52	2
DUP									1.06	81		48	33.1	2.45	2
Target Range - Lower Bound									1.01	76		45	30.7	2.35	<1
Upper Bound									1.08	86		52	34.6	2.62	3
V829037								0.04							
DUP								0.02							
Target Range - Lower Bound								0.02							
Upper Bound								0.04							
1129051021											8.4				
DUP											8.4				
Target Range - Lower Bound											7.9				
Upper Bound											8.9				
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOR	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
DUPLICATES																
ORIGINAL		0.085														
DUP		0.079														
Target Range - Lower Bound		0.073														
Upper Bound		0.091														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		0.048														
DUP		0.040														
Target Range - Lower Bound		0.037														
Upper Bound		0.051														
ORIGINAL			<0.2	0.06	43	10	<10	<0.5	<2	6.28	<0.5	<1	8	1	0.04	<10
DUP			0.2	0.06	46	10	<10	<0.5	2	7.00	<0.5	1	8	1	0.04	<10
Target Range - Lower Bound			<0.2	0.05	40	<10	<10	<0.5	<2	6.30	<0.5	<1	7	<1	0.03	<10
Upper Bound			0.4	0.07	49	20	20	1.0	4	6.98	1.0	2	9	2	0.05	20

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QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		4	0.01	<10	0.01	10	<1	0.02	1	90	2	<0.01	<2	<1	41	<20
DUP		4	0.01	<10	0.01	10	<1	0.02	1	90	<2	<0.01	<2	<1	46	<20
Target Range - Lower Bound		3	<0.01	<10	<0.01	<5	<1	<0.01	<1	80	<2	<0.01	<2	<1	40	<20
Upper Bound		5	0.02	20	0.02	16	2	0.03	2	100	4	0.02	4	2	47	40

***** See Appendix Page for comments regarding this certificate *****

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2103 Dollarton Hwy
North Vancouver BC V7H 0A7
Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 10-APR-2018
Account: RRR

Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL		<0.01	<10	<10	1	<10	3								
DUP		<0.01	<10	<10	2	<10	3								
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	<2								
Upper Bound		0.02	20	20	2	20	4								

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Project: Mine Site Lab Pulps January

QC CERTIFICATE OF ANALYSIS TB18054441

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-24	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

QC CERTIFICATE TB18073654

Project: Mine Site Lab Pulps February

P.O. No.: 4500009909

This report is for 143 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 3-APR-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
ATTN: JASON PATTISON
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method / Analyte / Units / LOR	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10		7.06														
G913-10		7.15														
Target Range - Lower Bound		6.66														
Upper Bound		7.52														
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method Analyte Units LOR	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10																
G913-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
Buffer pH6											6.0				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.1				
Target Range - Lower Bound											5.3				
Upper Bound											6.7				
CCU-1e									36.6						
Target Range - Lower Bound									34.3						
Upper Bound									36.8						
DS-1								3.08							
Target Range - Lower Bound								3.01							
Upper Bound								3.25							
DS-1								3.13	2.61						
Target Range - Lower Bound								3.01	2.51						
Upper Bound								3.25	2.71						
G913-10															
G913-10															
Target Range - Lower Bound															
Upper Bound															
GS310-10								1.10							
GS310-10								1.06							
GS310-10								1.09							
Target Range - Lower Bound								1.03							
Upper Bound								1.13							
GS310-10								1.06	0.27						
GS310-10									0.24						
Target Range - Lower Bound									0.25						
Upper Bound									0.29						

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method Analyte Units LOR	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
STANDARDS																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		2.01														
JK-17		1.955														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16		0.514														
LEA-16		0.504														
Target Range - Lower Bound		0.466														
Upper Bound		0.536														
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
MP-1b																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16																
LEA-16																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
MP-1b																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
GS313-8									1.28						
GS313-8								0.91	1.28						
Target Range - Lower Bound								0.90	1.19						
Upper Bound								0.98	1.29						
JK-17															
JK-17															
Target Range - Lower Bound															
Upper Bound															
KZK-1										60		35	25.0	2.40	2
KZK-1										60		35	25.0	2.40	2
KZK-1										60		35	25.0	2.40	2
KZK-1										60		35	25.0	2.40	2
Target Range - Lower Bound										54		30	22.9	2.18	
Upper Bound										64		38	27.1	2.54	
LEA-16															
LEA-16															
Target Range - Lower Bound															
Upper Bound															
MA-1b								2.44							
MA-1b								2.49							
MA-1b								2.45							
Target Range - Lower Bound								2.34							
Upper Bound								2.54							
MA-1b								2.39	1.13						
MA-1b									1.16						
MA-1b									1.22						
Target Range - Lower Bound									1.12						
Upper Bound									1.22						
MP-1b									14.10						
MP-1b									13.40						
Target Range - Lower Bound									13.30						
Upper Bound									14.30						

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method Analyte Units LOR	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
STANDARDS																
MRGeo08			4.3	2.53	32	10	430	0.7	3	1.03	2.1	18	87	593	3.54	10
MRGeo08			4.2	2.59	32	<10	430	0.7	2	1.00	2.0	18	87	620	3.57	10
MRGeo08			4.2	2.50	32	<10	430	0.7	<2	0.99	2.0	19	88	605	3.50	10
Target Range - Lower Bound			3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22	<10
Upper Bound			5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96	30
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08			20.2	2.24	122	<10	60	0.7	11	0.91	18.5	98	83	8450	5.10	10
OGGeo08			19.5	2.20	122	<10	70	0.7	13	0.88	18.9	96	81	8340	5.00	10
Target Range - Lower Bound			18.0	2.05	105	<10	60	<0.5	6	0.82	16.2	86	75	7800	4.51	<10
Upper Bound			22.4	2.53	133	30	110	1.8	15	1.02	21.0	108	93	8980	5.53	30
OREAS 503c		0.694														
OREAS 503c		0.686														
Target Range - Lower Bound		0.651														
Upper Bound		0.745														
OREAS 602			>100	0.61	655	<10	30	<0.5	59	0.50	24.1	10	33	5090	2.01	<10
OREAS 602			>100	0.63	670	<10	30	<0.5	59	0.52	24.8	10	28	5230	2.06	<10
OREAS 602			>100	0.60	668	<10	30	<0.5	59	0.51	25.4	10	28	5180	1.99	<10
Target Range - Lower Bound			106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94	<10
Upper Bound			100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40	30
OREAS 925			2.5	2.86	11	<10	50	0.5	36	0.31	<0.5	26	38	6470	6.43	10
OREAS 925			4.5	2.83	9	<10	50	0.5	34	0.31	<0.5	24	38	6380	6.35	10
Target Range - Lower Bound			1.9	2.56	5	<10	30	<0.5	27	0.27	<0.5	20	34	5850	5.74	<10
Upper Bound			2.9	3.15	13	20	80	1.6	38	0.36	1.6	27	43	6730	7.04	30

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method Analyte Units LOR	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20
STANDARDS																
MRGeo08		2	1.23	30	1.12	401	13	0.32	679	990	1035	0.28	3	7	78	20
MRGeo08		<1	1.23	30	1.10	411	13	0.31	681	960	1035	0.30	<2	7	76	20
MRGeo08		<1	1.24	30	1.09	396	13	0.30	681	1010	1035	0.30	4	7	75	20
Target Range - Lower Bound		<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71	<20
Upper Bound		2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89	60
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08		<1	1.06	30	0.95	397	879	0.30	8690	820	7260	2.76	19	6	65	20
OGGeo08		1	1.05	30	0.95	384	882	0.28	8790	780	7200	2.77	14	6	66	20
Target Range - Lower Bound		<1	0.94	<10	0.84	350	810	0.26	7760	700	6510	2.51	15	4	59	<20
Upper Bound		3	1.18	50	1.05	438	992	0.34	9480	880	7970	3.09	27	9	74	60
OREAS 503c																
OREAS 503c																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		1	0.09	10	0.10	205	4	0.03	61	230	817	1.99	53	1	49	<20
OREAS 602		1	0.09	10	0.10	215	4	0.02	59	220	831	2.02	59	1	49	<20
OREAS 602		1	0.09	10	0.10	211	4	0.02	60	240	839	2.04	55	1	49	<20
Target Range - Lower Bound		<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	46	<1	44	<20
Upper Bound		3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	68	3	56	40
OREAS 925		<1	0.28	30	1.49	872	1	0.01	32	610	111	1.03	<2	3	13	<20
OREAS 925		<1	0.29	30	1.50	863	<1	0.01	34	600	116	1.05	<2	3	14	<20
Target Range - Lower Bound		<1	0.27	<10	1.37	805	<1	<0.01	28	540	98	0.88	<2	<1	10	<20
Upper Bound		2	0.35	50	1.69	995	3	0.02	36	680	124	1.09	5	5	15	50

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method Analyte Units LOR	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
STANDARDS															
MRGeo08		0.37	<10	<10	96	<10	736								
MRGeo08		0.37	<10	<10	96	<10	770								
MRGeo08		0.38	<10	<10	99	<10	738								
Target Range - Lower Bound		0.33	<10	<10	90	<10	708								
Upper Bound		0.43	20	30	112	20	870								
NBM-1										51		42	8.8	5.83	2
NBM-1										50		41	8.8	5.71	2
NBM-1										51		42	8.8	5.83	2
NBM-1										51		42	8.8	5.83	2
Target Range - Lower Bound										45		37	7.8	5.26	
Upper Bound										54		47	9.7	6.08	
OGGeo08		0.32	<10	<10	81	10	7170								
OGGeo08		0.31	<10	<10	80	<10	7030								
Target Range - Lower Bound		0.27	<10	<10	70	<10	6500								
Upper Bound		0.36	20	30	88	20	7950								
OREAS 503c															
OREAS 503c															
Target Range - Lower Bound															
Upper Bound															
OREAS 602		0.01	<10	<10	10	<10	3930								
OREAS 602		0.01	<10	<10	10	<10	4070								
OREAS 602		0.01	<10	<10	10	10	4060								
Target Range - Lower Bound		<0.01	<10	<10	8	<10	3680								
Upper Bound		0.03	20	20	14	20	4500								
OREAS 925		0.09	<10	<10	29	<10	432								
OREAS 925		0.09	<10	<10	29	<10	428								
Target Range - Lower Bound		0.07	<10	<10	27	<10	391								
Upper Bound		0.11	20	20	35	20	483								

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method / Analyte / Units / LOR	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
BLANKS																
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Target Range - Lower Bound			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Upper Bound			0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02	20
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Target Range - Lower Bound		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Upper Bound		2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2	40
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS															
BLANK															
BLANK															
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
BLANK								<0.01							
BLANK								<0.01							
Target Range - Lower Bound								<0.01							
Upper Bound								0.02							
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	<2								
Upper Bound		0.02	20	20	2	20	4								
BLANK											6.0				
BLANK											6.2				
BLANK											6.2				
BLANK											6.3				
Target Range - Lower Bound											5.5				
Upper Bound											6.9				
BLANK								<0.01	<0.01						
BLANK								<0.01	0.01						
BLANK								<0.01	<0.01						
BLANK								<0.01	<0.01						
BLANK									<0.01						
BLANK									<0.01						
Target Range - Lower Bound									<0.01						
Upper Bound									0.02						

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method / Analyte / Units / LOR	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
ORIGINAL		0.802														
DUP		0.630														
Target Range - Lower Bound		0.675														
Upper Bound		0.757														
1128037020																
DUP																
Target Range - Lower Bound																
Upper Bound																
1131067102			1.4	0.29	43	<10	20	<0.5	<2	0.13	0.6	9	161	28	1.53	<10
DUP			1.4	0.29	40	<10	20	<0.5	<2	0.13	0.6	8	153	26	1.47	<10
Target Range - Lower Bound			1.1	0.27	37	<10	<10	<0.5	<2	0.11	<0.5	7	148	25	1.42	<10
Upper Bound			1.7	0.31	46	20	30	1.0	4	0.15	1.0	10	166	29	1.59	20
1128037093		0.661														
DUP		0.698														
Target Range - Lower Bound		0.641														
Upper Bound		0.718														
1127019166																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129098237			2.2	0.86	90	<10	30	<0.5	<2	1.34	9.2	7	66	42	2.28	<10
DUP			2.2	0.87	90	<10	30	<0.5	2	1.35	9.1	7	68	41	2.31	<10
Target Range - Lower Bound			1.9	0.81	84	<10	20	<0.5	<2	1.27	8.2	6	63	39	2.17	<10
Upper Bound			2.5	0.92	97	20	40	1.0	4	1.42	10.1	8	71	44	2.42	20
1129052030																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129052070																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128037020																
DUP																
Target Range - Lower Bound																
Upper Bound																
1131067102		<1	0.11	10	0.07	148	1	0.01	12	190	15	1.56	<2	<1	14	<20
DUP		<1	0.11	10	0.07	144	1	0.01	12	180	16	1.50	<2	<1	14	<20
Target Range - Lower Bound		<1	0.09	<10	0.06	134	<1	<0.01	10	170	13	1.44	<2	<1	12	<20
Upper Bound		2	0.13	20	0.08	158	2	0.02	14	200	18	1.62	4	2	16	40
1128037093																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127019166																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129098237		<1	0.25	10	0.62	818	1	<0.01	9	460	164	2.01	4	<1	21	<20
DUP		1	0.25	10	0.63	824	1	0.01	9	460	163	2.05	4	<1	21	<20
Target Range - Lower Bound		<1	0.23	<10	0.58	775	<1	<0.01	8	430	153	1.92	<2	<1	19	<20
Upper Bound		2	0.27	20	0.67	867	2	0.02	10	490	174	2.14	6	2	23	40
1129052030																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129052070																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
1128037020								1.02	1.82						
DUP								1.04	1.90						
Target Range - Lower Bound								0.99	1.75						
Upper Bound								1.07	1.87						
1131067102		<0.01	<10	<10	2	<10	171			4	8.2	-39	43.1	0.09	1
DUP		<0.01	<10	<10	2	<10	164			4	8.3	-39	43.1	0.09	1
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	157			3	7.7	-42	40.6	0.08	<1
Upper Bound		0.02	20	20	3	20	178			5	8.8	-36	45.6	0.10	2
1128037093															
DUP															
Target Range - Lower Bound															
Upper Bound															
1127019166								0.38							
DUP								0.39							
Target Range - Lower Bound								0.37							
Upper Bound								0.40							
1129098237		<0.01	<10	<10	4	<10	2240	0.49	1.95						
DUP		<0.01	<10	<10	4	<10	2240	0.49	2.00						
Target Range - Lower Bound		<0.01	<10	<10	3	<10	2130	0.47	1.92						
Upper Bound		0.02	20	20	5	20	2350	0.51	2.03						
1129052030											8.5				
DUP											8.5				
Target Range - Lower Bound											8.0				
Upper Bound											9.0				
1129052070										14		-54	67.8	0.21	1
DUP										15		-53	67.8	0.22	1
Target Range - Lower Bound										13		-57	64.1	0.19	<1
Upper Bound										16		-50	71.5	0.24	2

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method / Analyte / Units / LOR	Au-AA23 Au ppm 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1131069047		0.013	<0.2	1.49	8	<10	30	<0.5	<2	0.55	<0.5	8	62	28	1.48	<10
DUP		0.025	<0.2	1.57	7	<10	30	<0.5	<2	0.57	<0.5	8	67	30	1.55	<10
Target Range -	Lower Bound	0.013	<0.2	1.44	5	<10	20	<0.5	<2	0.52	<0.5	7	60	27	1.43	<10
	Upper Bound	0.025	0.4	1.62	10	20	40	1.0	4	0.60	1.0	9	69	31	1.60	20
1128039007																
DUP																
Target Range -	Lower Bound															
	Upper Bound															
1129098339																
DUP																
Target Range -	Lower Bound															
	Upper Bound															
1131069001																
DUP																
Target Range -	Lower Bound															
	Upper Bound															
1128040154			14.7	0.49	61	<10	20	<0.5	6	1.86	6.1	9	92	138	1.97	<10
DUP			15.1	0.49	63	<10	20	<0.5	7	1.89	6.3	9	94	137	2.04	<10
Target Range -	Lower Bound		14.0	0.46	57	<10	<10	<0.5	4	1.77	5.4	8	87	132	1.89	<10
	Upper Bound		15.8	0.52	67	20	30	1.0	9	1.98	7.0	10	99	143	2.12	20
1127021009		0.015														
DUP		0.016														
Target Range -	Lower Bound	0.010														
	Upper Bound	0.021														
1127024083																
DUP																
Target Range -	Lower Bound															
	Upper Bound															
ORIGINAL																
DUP																
Target Range -	Lower Bound															
	Upper Bound															

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
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Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1131069047		<1	0.10	10	0.38	370	1	0.05	6	440	8	0.29	<2	1	48	<20
DUP		<1	0.11	10	0.39	380	1	0.05	6	450	9	0.31	<2	1	51	<20
Target Range - Lower Bound		<1	0.09	<10	0.36	351	<1	0.04	5	410	6	0.28	<2	<1	46	<20
Upper Bound		2	0.12	20	0.41	399	2	0.06	7	480	11	0.33	4	2	53	40
1128039007																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129098339																
DUP																
Target Range - Lower Bound																
Upper Bound																
1131069001																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128040154		1	0.16	<10	0.94	2240	2	0.01	11	400	500	2.32	13	<1	21	<20
DUP		1	0.15	<10	0.95	2300	2	0.01	11	400	502	2.41	13	<1	21	<20
Target Range - Lower Bound		<1	0.14	<10	0.89	2150	<1	<0.01	9	370	474	2.24	10	<1	19	<20
Upper Bound		2	0.17	20	1.00	2390	3	0.02	13	430	528	2.49	16	2	23	40
1127021009																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127024083																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
1131069047		0.01	<10	<10	6	<10	75								
DUP		0.01	<10	<10	6	<10	82								
Target Range - Lower Bound		<0.01	<10	<10	5	<10	73								
Upper Bound		0.02	20	20	7	20	84								
1128039007								1.05	2.12						
DUP								1.05	1.81						
Target Range - Lower Bound								1.01	1.91						
Upper Bound								1.09	2.02						
1129098339											8.3				
DUP											8.3				
Target Range - Lower Bound											7.8				
Upper Bound											8.8				
1131069001									4.45	22		-117	139.1	0.16	2
DUP									4.44	21		-118	138.8	0.15	2
Target Range - Lower Bound									4.32	19		-124	131.7	0.14	<1
Upper Bound									4.57	24		-111	146.2	0.17	3
1128040154		<0.01	<10	<10	2	<10	1485								
DUP		<0.01	<10	<10	2	<10	1485								
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	1410								
Upper Bound		0.02	20	20	3	20	1560								
1127021009								0.41	0.29						
DUP								0.41	0.26						
Target Range - Lower Bound								0.39	0.26						
Upper Bound								0.43	0.29						
1127024083										37	8.6	-48	85.0	0.44	2
DUP										38	8.6	-47	85.0	0.45	2
Target Range - Lower Bound										35	8.1	-51	80.5	0.41	<1
Upper Bound										40	9.1	-44	89.6	0.48	3
ORIGINAL								5.00							
DUP								4.96							
Target Range - Lower Bound								4.85							
Upper Bound								5.11							

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	ppm	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOR	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
DUPLICATES																
ORIGINAL			0.7	2.57	9	<10	50	<0.5	<2	0.49	<0.5	27	16	1400	9.23	10
DUP			0.6	2.63	10	<10	50	<0.5	<2	0.50	<0.5	27	16	1410	9.31	10
Target Range - Lower Bound			0.4	2.46	7	<10	40	<0.5	<2	0.46	<0.5	25	14	1355	8.80	<10
Upper Bound			0.9	2.74	12	20	60	1.0	4	0.53	1.0	29	18	1455	9.74	20
ORIGINAL		0.173														
DUP		0.158														
Target Range - Lower Bound		0.152														
Upper Bound		0.179														
ORIGINAL		0.120														
DUP		0.115														
Target Range - Lower Bound		0.107														
Upper Bound		0.128														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		0.287														
DUP		0.290														
Target Range - Lower Bound		0.269														
Upper Bound		0.308														

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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Finalized Date: 24-APR-2018
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Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOR	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
ORIGINAL		<1	0.27	10	1.97	869	<1	0.02	15	1020	<2	7.14	<2	6	10	<20
DUP		<1	0.27	10	1.99	897	<1	0.02	15	1040	<2	7.20	<2	6	10	<20
Target Range - Lower Bound		<1	0.25	<10	1.87	834	<1	<0.01	13	970	<2	6.80	<2	5	9	<20
Upper Bound		2	0.29	20	2.09	932	2	0.03	17	1090	4	7.54	4	7	12	40
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
ORIGINAL		0.13	<10	<10	91	<10	155								
DUP		0.14	<10	<10	93	<10	154								
Target Range - Lower Bound		0.12	<10	<10	86	<10	145								
Upper Bound		0.15	20	20	98	20	164								
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

Comments: Additional Au-AA23 check assay for sample 1128038092 are 4.21 and 5.55 ppm.

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ALS Canada Ltd.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
SUITE 1800, TWO BENTALL CENTRE
555 BURRARD STREET, BOX 212
VANCOUVER BC V7X 1M9

Finalized Date: 24-APR-2018
Account: RRR

Project: Mine Site Lab Pulps February

QC CERTIFICATE OF ANALYSIS TB18073654

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

ALS Canada Ltd.

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

QC CERTIFICATE TB18098363

Project: Mine Site Lab Pulps March

P.O. No.: 4500009909

This report is for 143 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 27-APR-2018.

The following have access to data associated with this certificate:

JOHN BLIGH	JASON PATTISON	TIM SCHWARTZ

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
ATTN: JASON PATTISON
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Col

ALS Canada Ltd.
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North Vancouver BC V7H 0A7
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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method Analyte Units LOR	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10		6.97														
Target Range - Lower Bound		6.66														
Upper Bound		7.52														
G913-10			7.00													
Target Range - Lower Bound			6.61													
Upper Bound			7.57													
GGC-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method Analyte Units LOR	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10																
Target Range - Lower Bound																
Upper Bound																
G913-10																
Target Range - Lower Bound																
Upper Bound																
GGC-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.1				
Buffer pH6												6.0				
Buffer pH6												6.1				
Buffer pH6												6.0				
Buffer pH6												6.0				
Target Range - Lower Bound												5.3				
Upper Bound												6.7				
DS-1									3.11							
DS-1									3.09							
Target Range - Lower Bound									3.01							
Upper Bound									3.25							
DS-1									3.11	2.66						
DS-1										2.61						
Target Range - Lower Bound										2.51						
Upper Bound										2.71						
G913-10																
Target Range - Lower Bound																
Upper Bound																
G913-10																
Target Range - Lower Bound																
Upper Bound																
GGC-10									5.21							
Target Range - Lower Bound									5.03							
Upper Bound									5.41							
GS310-10									1.04	0.28						
GS310-10									1.06	0.26						
GS310-10										0.26						
GS310-10									1.08	0.27						
GS310-10										0.27						
GS310-10										0.27						
Target Range - Lower Bound										0.25						
Upper Bound										0.29						

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOR	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		1.960														
JK-17		1.945														
JK-17		1.955														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16		0.494														
Target Range - Lower Bound		0.466														
Upper Bound		0.536														
LEA-16			0.55													
Target Range - Lower Bound			0.40													
Upper Bound			0.61													
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08				4.1	2.51	33	10	430	0.7	<2	1.03	2.0	18	88	618	3.45
MRGeo08				4.1	2.48	32	<10	420	0.7	<2	1.02	2.1	18	87	602	3.42
MRGeo08				4.4	2.56	32	<10	430	0.7	<2	1.05	1.9	19	88	627	3.60
MRGeo08				4.4	2.55	32	<10	420	0.7	<2	1.02	2.0	18	86	632	3.62
MRGeo08				4.5	2.60	32	<10	430	0.8	3	1.05	2.2	19	91	603	3.56
MRGeo08				4.4	2.52	34	<10	420	0.7	<2	1.02	2.1	17	87	608	3.48
Target Range - Lower Bound				3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22
Upper Bound				5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOR	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16																
Target Range - Lower Bound																
Upper Bound																
LEA-16																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		10	<1	1.20	30	1.10	396	13	0.32	687	980	1045	0.28	4	7	77
MRGeo08		10	<1	1.19	30	1.09	391	13	0.31	682	970	1040	0.28	<2	7	75
MRGeo08		10	1	1.28	30	1.15	415	14	0.33	713	980	1090	0.30	3	7	77
MRGeo08		10	<1	1.26	30	1.13	394	13	0.33	707	1010	1045	0.30	3	7	76
MRGeo08		10	<1	1.23	30	1.15	405	13	0.33	678	990	1070	0.31	3	7	77
MRGeo08		10	1	1.22	30	1.10	402	13	0.32	683	980	1045	0.28	4	7	77
Target Range - Lower Bound		<10	<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71
Upper Bound		30	2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
GS313-8										1.21						
GS313-8										1.27						
GS313-8										1.23						
Target Range - Lower Bound										1.19						
Upper Bound										1.29						
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1											60		35	25.0	2.40	2
KZK-1											60		35	25.0	2.40	2
KZK-1											59		34	25.0	2.36	2
KZK-1											60		35	25.0	2.40	2
Target Range - Lower Bound											54		30	22.9	2.18	
Upper Bound											64		38	27.1	2.54	
LEA-16																
Target Range - Lower Bound																
Upper Bound																
LEA-16																
Target Range - Lower Bound																
Upper Bound																
MA-1b									2.43	1.20						
MA-1b									2.39	1.17						
MA-1b										1.12						
MA-1b									2.35	1.19						
MA-1b										1.19						
Target Range - Lower Bound										1.12						
Upper Bound										1.22						
MRGeo08		20	0.36	<10	<10	97	<10	752								
MRGeo08		20	0.37	<10	<10	96	<10	739								
MRGeo08		20	0.37	<10	<10	98	<10	785								
MRGeo08		20	0.38	<10	<10	96	<10	746								
MRGeo08		20	0.38	<10	<10	100	<10	748								
MRGeo08		20	0.37	<10	<10	96	<10	752								
Target Range - Lower Bound		<20	0.33	<10	<10	90	<10	708								
Upper Bound		60	0.43	20	30	112	20	870								

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOR	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08				19.7	2.29	120	<10	90	0.7	15	0.88	18.4	94	81	8660	5.14
OGGeo08				20.5	2.19	121	10	110	0.7	11	0.84	18.4	96	82	8350	4.95
OGGeo08				19.3	2.17	122	10	80	0.7	14	0.88	18.4	94	81	8130	4.96
OGGeo08				19.3	2.15	117	<10	70	0.7	13	0.86	18.1	95	79	8410	5.02
Target Range - Lower Bound				18.0	2.05	105	<10	60	<0.5	6	0.82	16.2	86	75	7800	4.51
Upper Bound				22.4	2.53	133	30	110	1.8	15	1.02	21.0	108	93	8980	5.53
OREAS 602				>100	0.59	664	<10	30	<0.5	60	0.51	24.7	9	30	5140	2.00
OREAS 602				>100	0.59	665	<10	30	<0.5	56	0.51	24.8	9	33	5100	2.01
OREAS 602				>100	0.61	660	<10	30	<0.5	61	0.53	24.9	10	32	5360	2.09
OREAS 602				>100	0.63	673	<10	20	<0.5	60	0.54	24.8	10	33	5280	2.10
OREAS 602				>100	0.59	668	<10	30	<0.5	64	0.52	25.3	10	30	5170	2.00
Target Range - Lower Bound				106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94
Upper Bound				100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40
OREAS 925				3.0	2.88	10	<10	50	0.5	34	0.29	0.6	22	36	6560	6.39
OREAS 925				2.4	2.93	11	<10	50	0.5	30	0.29	0.5	24	39	6150	6.30
OREAS 925				2.4	2.88	21	10	50	0.5	33	0.31	0.5	24	38	6550	6.44
Target Range - Lower Bound				1.9	2.56	5	<10	30	<0.5	27	0.27	<0.5	20	34	5850	5.74
Upper Bound				2.9	3.15	13	20	80	1.6	38	0.36	1.6	27	43	6730	7.04
OxE126		0.602														
OxE126		0.598														
OxE126		0.611														
Target Range - Lower Bound		0.581														
Upper Bound		0.665														

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOR	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08		10	<1	1.06	30	0.91	390	879	0.30	8960	820	7170	2.78	22	6	66
OGGeo08		10	1	1.03	30	0.92	379	874	0.28	8830	810	7150	2.78	20	6	65
OGGeo08		<10	1	1.02	30	0.95	376	873	0.29	8480	780	7130	2.75	20	6	64
OGGeo08		10	1	1.03	30	0.93	377	871	0.29	8790	790	7120	2.70	16	6	63
Target Range - Lower Bound		<10	<1	0.94	<10	0.84	350	810	0.26	7760	700	6510	2.51	15	4	59
Upper Bound		30	3	1.18	50	1.05	438	992	0.34	9480	880	7970	3.09	27	9	74
OREAS 602		<10	1	0.08	10	0.10	210	4	0.03	60	220	826	1.95	66	1	46
OREAS 602		<10	1	0.08	10	0.10	206	4	0.03	61	230	822	1.95	64	1	47
OREAS 602		<10	1	0.09	10	0.10	219	4	0.03	63	220	862	1.99	65	1	47
OREAS 602		<10	<1	0.09	10	0.10	209	4	0.03	63	230	835	2.04	58	1	48
OREAS 602		<10	1	0.09	10	0.10	209	4	0.03	61	230	848	2.04	59	1	47
Target Range - Lower Bound		<10	<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	46	<1	44
Upper Bound		30	3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	68	3	56
OREAS 925		10	<1	0.27	20	1.41	866	1	0.01	32	610	107	1.02	<2	3	12
OREAS 925		10	<1	0.27	30	1.50	882	1	0.01	33	630	108	1.01	2	3	14
OREAS 925		10	<1	0.28	30	1.55	879	1	<0.01	33	590	121	1.04	2	3	13
Target Range - Lower Bound		<10	<1	0.27	<10	1.37	805	<1	<0.01	28	540	98	0.88	<2	<1	10
Upper Bound		30	2	0.35	50	1.69	995	3	0.02	36	680	124	1.09	5	5	15
OxE126																
OxE126																
OxE126																
Target Range - Lower Bound																
Upper Bound																

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
NBM-1											50		41	8.8	5.71	2
NBM-1											48		39	8.8	5.49	2
NBM-1											49		40	8.8	5.60	2
NBM-1											50		41	8.8	5.71	2
Target Range - Lower Bound											45		37	7.8	5.26	
Upper Bound											54		47	9.7	6.08	
OGGeo08		20	0.31	<10	<10	79	<10	7110								
OGGeo08		20	0.31	<10	<10	81	10	6820								
OGGeo08		20	0.30	<10	<10	78	10	6730								
OGGeo08		20	0.31	<10	<10	77	<10	7010								
Target Range - Lower Bound		<20	0.27	<10	<10	70	<10	6500								
Upper Bound		60	0.36	20	30	88	20	7950								
OREAS 602		<20	0.01	<10	<10	10	10	3950								
OREAS 602		<20	0.01	<10	<10	10	10	3970								
OREAS 602		<20	0.01	<10	<10	10	<10	4100								
OREAS 602		<20	0.01	<10	<10	10	<10	4040								
OREAS 602		<20	0.01	<10	<10	10	<10	4050								
Target Range - Lower Bound		<20	<0.01	<10	<10	8	<10	3680								
Upper Bound		40	0.03	20	20	14	20	4500								
OREAS 925		<20	0.08	<10	<10	27	<10	425								
OREAS 925		<20	0.08	<10	<10	29	<10	420								
OREAS 925		<20	0.09	<10	<10	29	<10	430								
Target Range - Lower Bound		<20	0.07	<10	<10	27	<10	391								
Upper Bound		50	0.11	20	20	35	20	483								
OxE126																
OxE126																
OxE126																
Target Range - Lower Bound																
Upper Bound																

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOR	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
BLANKS																
BLANK		0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Target Range - Lower Bound				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Upper Bound				0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
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BLANK																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOR	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	2	<10	<2	<0.01	<2	<1	1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
Target Range - Lower Bound		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
Upper Bound		20	2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK									<0.01							
BLANK									0.01							
Target Range - Lower Bound									<0.01							
Upper Bound									0.02							
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<20	<0.01	<10	<10	<1	<10	<2								
Upper Bound		40	0.02	20	20	2	20	4								
BLANK												5.9				
BLANK												6.0				
BLANK												6.1				
BLANK												6.0				
Target Range - Lower Bound												5.5				
Upper Bound												6.9				
BLANK									<0.01	0.01						
BLANK									<0.01	<0.01						
BLANK									<0.01	<0.01						
BLANK										<0.01						
BLANK										0.01						
BLANK									<0.01	<0.01						
BLANK										0.01						
BLANK										<0.01						
Target Range - Lower Bound										<0.01						
Upper Bound										0.02						

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOR	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
ORIGINAL				58.4	0.28	5180	10	100	<0.5	283	0.17	3.5	6	5	1200	18.25
DUP				59.8	0.29	5330	10	100	<0.5	282	0.18	3.7	7	6	1240	18.80
Target Range - Lower Bound				55.9	0.26	4990	<10	80	<0.5	266	0.16	2.9	5	4	1175	17.60
Upper Bound				62.3	0.31	5520	20	120	1.0	299	0.19	4.3	8	7	1265	19.45
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		0.456														
DUP		0.448														
Target Range - Lower Bound		0.424														
Upper Bound		0.480														
ORIGINAL		0.288														
DUP		0.299														
Target Range - Lower Bound		0.274														
Upper Bound		0.313														
ORIGINAL				0.2	4.02	4	<10	150	<0.5	2	1.34	<0.5	28	234	61	4.58
DUP				0.3	4.18	<2	<10	170	<0.5	2	1.39	<0.5	28	239	64	4.65
Target Range - Lower Bound				<0.2	3.89	<2	<10	140	<0.5	<2	1.29	<0.5	26	224	59	4.37
Upper Bound				0.4	4.32	4	20	180	1.0	4	1.44	1.0	30	249	66	4.86
ORIGINAL		0.169														
DUP		0.199														
Target Range - Lower Bound		0.170														
Upper Bound		0.198														
ORIGINAL		<0.005														
DUP		0.024														
Target Range - Lower Bound		0.009														
Upper Bound		0.020														
ORIGINAL			11.35													
DUP			11.10													
Target Range - Lower Bound			10.60													
Upper Bound			11.85													

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOR	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
ORIGINAL		<10	<1	0.38	20	0.05	22	63	0.21	27	790	2710	1.41	1525	<1	474
DUP		<10	<1	0.39	20	0.05	23	64	0.21	28	810	2790	1.45	1520	<1	485
Target Range - Lower Bound		<10	<1	0.36	<10	0.04	16	59	0.19	25	750	2610	1.35	1405	<1	455
Upper Bound		20	2	0.41	30	0.06	29	68	0.23	30	850	2890	1.51	1640	2	504
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		10	<1	0.90	<10	1.71	243	1	0.28	151	640	2	1.21	<2	9	115
DUP		10	<1	0.91	<10	1.75	248	1	0.29	155	660	3	1.21	<2	9	120
Target Range - Lower Bound		<10	<1	0.85	<10	1.63	228	<1	0.26	144	610	<2	1.14	<2	8	111
Upper Bound		20	2	0.96	20	1.83	263	2	0.31	162	690	4	1.28	4	10	124
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
ORIGINAL		<20	<0.01	<10	<10	6	10	106								
DUP		<20	<0.01	<10	<10	6	10	108								
Target Range - Lower Bound		<20	<0.01	<10	<10	5	<10	100								
Upper Bound		40	0.02	20	20	7	20	114								
ORIGINAL									7.06							
DUP									7.11							
Target Range - Lower Bound									6.90							
Upper Bound									7.27							
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<20	0.13	<10	<10	97	<10	58								
DUP		<20	0.13	<10	<10	99	<10	61								
Target Range - Lower Bound		<20	0.11	<10	<10	92	<10	55								
Upper Bound		40	0.15	20	20	104	20	64								
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method / Analyte / Units / LOR	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
ORIGINAL		0.249														
DUP		0.294														
Target Range - Lower Bound		0.253														
Upper Bound		0.290														
1127024368																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128045003																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128045089				0.7	0.44	91	<10	60	<0.5	<2	1.38	1.6	11	88	17	1.56
DUP				0.7	0.46	107	<10	60	<0.5	<2	1.42	1.8	12	91	18	1.62
Target Range - Lower Bound				0.5	0.42	92	<10	50	<0.5	<2	1.32	1.1	10	84	16	1.50
Upper Bound				0.9	0.48	106	20	70	1.0	4	1.48	2.3	13	95	19	1.68
1126003026		0.012														
DUP		0.013														
Target Range - Lower Bound		0.007														
Upper Bound		0.018														
1128043354		0.343														
DUP		0.324														
Target Range - Lower Bound		0.312														
Upper Bound		0.355														
1127023023																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129056006																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method / Analyte / Units / LOR	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127024368																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128045003																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128045089		<10	<1	0.28	10	0.45	1370	2	0.01	13	480	217	1.43	2	1	82
DUP		<10	<1	0.29	10	0.46	1420	1	0.01	13	510	238	1.49	2	1	85
Target Range - Lower Bound		<10	<1	0.26	<10	0.42	1320	<1	<0.01	11	460	214	1.38	<2	<1	78
Upper Bound		20	2	0.31	20	0.49	1470	2	0.02	15	530	241	1.54	4	2	89
1126003026																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128043354																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127023023																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129056006																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Finalized Date: 18-MAY-2018
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Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method / Analyte / Units / LOR	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
		DUPLICATES														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127024368												9.5				
DUP												9.5				
Target Range - Lower Bound												8.9				
Upper Bound												10.1				
1128045003									0.54	0.66	50		29	20.6	2.42	2
DUP									0.53	0.65	51		31	20.3	2.51	2
Target Range - Lower Bound									0.51	0.63	47		28	19.1	2.33	<1
Upper Bound									0.56	0.68	54		33	21.8	2.60	3
1128045089		<20	0.01	<10	<10	4	<10	488								
DUP		<20	0.01	<10	<10	4	<10	501								
Target Range - Lower Bound		<20	<0.01	<10	<10	3	<10	468								
Upper Bound		40	0.02	20	20	5	20	521								
1126003026																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128043354																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127023023									0.37	0.59						
DUP									0.37	0.63						
Target Range - Lower Bound									0.35	0.58						
Upper Bound									0.39	0.64						
1129056006											7		-29	35.6	0.20	1
DUP											8		-28	35.6	0.22	1
Target Range - Lower Bound											6		-31	33.5	0.19	<1
Upper Bound											9		-26	37.7	0.23	2

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QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method / Analyte / Units / LOR	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
		DUPLICATES														
1127025311																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128042101																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128042175																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128042220																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128044119																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128043416		0.290														
DUP		0.297														
Target Range - Lower Bound		0.274														
Upper Bound		0.313														
1126003120																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128047167																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method / Analyte / Units / LOR	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
1127025311	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128042101	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128042175	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128042220	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128044119	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128043416	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1126003120	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128047167	DUP															
	Target Range - Lower Bound															
	Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1127025311												9.4				
DUP												9.4				
Target Range - Lower Bound												8.8				
Upper Bound												10.0				
1128042101									0.29	1.34						
DUP									0.29	1.34						
Target Range - Lower Bound									0.27	1.30						
Upper Bound									0.31	1.38						
1128042175												8.8				
DUP												8.9				
Target Range - Lower Bound												8.3				
Upper Bound												9.4				
1128042220											84		24	60.3	1.39	2
DUP											83		23	60.3	1.38	2
Target Range - Lower Bound											78		21	57.0	1.31	<1
Upper Bound											89		26	63.6	1.46	3
1128044119										1.56						
DUP										1.58						
Target Range - Lower Bound										1.52						
Upper Bound										1.62						
1128043416																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126003120										0.84						
DUP										0.85						
Target Range - Lower Bound										0.81						
Upper Bound										0.88						
1128047167									0.74	1.58						
DUP									0.73	1.66						
Target Range - Lower Bound									0.71	1.57						
Upper Bound									0.76	1.67						

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOR	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
1127031133				1.0	1.45	51	<10	20	<0.5	<2	0.81	13.3	7	108	39	2.42
DUP				1.3	1.50	55	<10	20	<0.5	<2	0.82	13.1	7	109	39	2.44
Target Range - Lower Bound				0.9	1.39	48	<10	<10	<0.5	<2	0.76	12.0	6	102	37	2.30
Upper Bound				1.4	1.56	58	20	30	1.0	4	0.87	14.4	8	115	41	2.56
1128048112		0.404														
DUP		0.364														
Target Range - Lower Bound		0.360														
Upper Bound		0.408														
1128041031																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128047030																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127030042																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		0.065														
DUP		0.096														
Target Range - Lower Bound		0.071														
Upper Bound		0.090														
ORIGINAL				<0.2	1.46	19	<10	10	<0.5	<2	2.24	<0.5	20	64	57	2.09
DUP				<0.2	1.49	19	<10	10	<0.5	<2	2.27	<0.5	20	66	54	2.14
Target Range - Lower Bound				<0.2	1.39	16	<10	<10	<0.5	<2	2.13	<0.5	18	61	53	2.00
Upper Bound				0.4	1.56	22	20	20	1.0	4	2.38	1.0	22	69	58	2.23
ORIGINAL				<0.2	1.13	<2	<10	90	<0.5	<2	1.42	<0.5	14	89	64	1.84
DUP				<0.2	1.15	<2	<10	90	<0.5	<2	1.44	<0.5	15	92	66	1.89
Target Range - Lower Bound				<0.2	1.07	<2	<10	70	<0.5	<2	1.35	<0.5	13	85	62	1.76
Upper Bound				0.4	1.21	4	20	110	1.0	4	1.51	1.0	16	96	68	1.97

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method / Analyte / Units / LOR	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
1127031133		<10	<1	0.23	10	0.75	449	<1	0.04	8	400	23	1.90	<2	<1	26
DUP		<10	<1	0.25	10	0.76	454	1	0.04	10	400	23	1.91	2	<1	26
	Target Range - Lower Bound	<10	<1	0.22	<10	0.71	424	<1	0.03	8	370	20	1.80	<2	<1	24
	Upper Bound	20	2	0.26	20	0.80	479	2	0.05	10	430	26	2.01	4	2	28
1128048112																
DUP																
	Target Range - Lower Bound															
	Upper Bound															
1128041031																
DUP																
	Target Range - Lower Bound															
	Upper Bound															
1128047030																
DUP																
	Target Range - Lower Bound															
	Upper Bound															
1127030042																
DUP																
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL																
DUP																
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL		0	<1	0.02	<10	1.05	458	<1	0.10	40	250	<2	<0.01	<2	7	12
DUP		<10	<1	0.02	<10	1.07	468	<1	0.11	40	250	<2	<0.01	<2	7	12
	Target Range - Lower Bound	<10	<1	<0.01	<10	1.00	435	<1	0.09	37	230	<2	<0.01	<2	6	10
	Upper Bound	20	2	0.03	20	1.12	491	2	0.12	43	270	4	0.02	4	8	14
ORIGINAL		<10	<1	0.27	<10	0.94	272	1	0.09	54	680	<2	0.03	<2	4	20
DUP		<10	<1	0.28	<10	0.96	281	1	0.09	57	690	<2	0.03	<2	4	21
	Target Range - Lower Bound	<10	<1	0.25	<10	0.89	258	<1	0.08	52	640	<2	0.02	<2	3	18
	Upper Bound	20	2	0.30	20	1.01	295	2	0.10	59	730	4	0.04	4	5	23

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1127031133		<20	0.01	<10	<10	5	<10	3380	0.13	1.83						
DUP		<20	0.01	<10	<10	6	<10	3370	0.12	1.75						
Target Range - Lower Bound		<20	<0.01	<10	<10	4	<10	3200	0.11	1.74						
Upper Bound		40	0.02	20	20	7	20	3550	0.14	1.84						
1128048112																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128041031											60		-21	81.3	0.74	2
DUP											59		-22	81.3	0.73	2
Target Range - Lower Bound											56		-24	76.9	0.69	<1
Upper Bound											63		-19	85.7	0.78	3
1128047030										1.85						
DUP										1.86						
Target Range - Lower Bound										1.80						
Upper Bound										1.91						
1127030042												8.6				
DUP												8.6				
Target Range - Lower Bound												8.1				
Upper Bound												9.1				
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<20	0.06	<10	<10	49	<10	25								
DUP		<20	0.07	<10	<10	51	<10	25								
Target Range - Lower Bound		<20	0.05	<10	<10	47	<10	22								
Upper Bound		40	0.08	20	20	54	20	28								
ORIGINAL		<20	0.19	<10	<10	44	<10	26								
DUP		<20	0.20	<10	<10	44	<10	27								
Target Range - Lower Bound		<20	0.18	<10	<10	41	<10	23								
Upper Bound		40	0.21	20	20	47	20	30								

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOR	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
ORIGINAL				8.5	0.76	2	<10	<10	<0.5	67	21.3	0.6	1	7	>10000	2.68
DUP				8.4	0.76	3	<10	<10	<0.5	69	20.7	0.6	1	7	>10000	2.70
Target Range - Lower Bound				7.8	0.71	<2	<10	<10	<0.5	63	19.95	<0.5	<1	6	9650	2.55
Upper Bound				9.1	0.81	4	20	20	1.0	73	22.1	1.0	2	8	>10000	2.83
ORIGINAL				<0.2	1.69	15	<10	160	<0.5	<2	0.32	<0.5	13	53	4	2.54
DUP				<0.2	1.77	16	<10	170	<0.5	<2	0.35	<0.5	14	55	4	2.63
Target Range - Lower Bound				<0.2	1.63	13	<10	140	<0.5	<2	0.31	<0.5	12	50	3	2.45
Upper Bound				0.4	1.83	18	20	190	1.0	4	0.36	1.0	15	58	5	2.72
ORIGINAL				<0.2	0.56	13	<10	70	0.5	<2	0.02	<0.5	7	3	81	3.49
DUP				<0.2	0.56	13	<10	70	0.5	<2	0.02	<0.5	7	3	84	3.53
Target Range - Lower Bound				<0.2	0.52	10	<10	50	<0.5	<2	<0.01	<0.5	6	2	79	3.32
Upper Bound				0.4	0.60	16	20	90	1.0	4	0.03	1.0	8	4	86	3.70
ORIGINAL		0.013														
DUP		0.016														
Target Range - Lower Bound		0.009														
Upper Bound		0.020														

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOR	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
ORIGINAL		<10	1	0.02	<10	0.28	1885	8	0.01	1	320	<2	0.28	<2	1	88
DUP		<10	<1	0.02	<10	0.28	1870	8	0.01	1	330	<2	0.28	2	1	88
Target Range - Lower Bound		<10	<1	<0.01	<10	0.26	1780	7	<0.01	<1	300	<2	0.26	<2	<1	83
Upper Bound		20	2	0.03	20	0.30	1975	9	0.02	2	350	4	0.30	4	2	93
ORIGINAL		10	<1	0.49	20	1.03	507	1	0.03	42	470	2	<0.01	<2	3	25
DUP		10	<1	0.51	20	1.06	527	1	0.03	43	490	2	<0.01	<2	3	27
Target Range - Lower Bound		<10	<1	0.47	<10	0.98	486	<1	0.02	39	450	<2	<0.01	<2	2	24
Upper Bound		20	2	0.54	30	1.11	548	2	0.04	46	510	4	0.02	4	4	28
ORIGINAL		<10	2	0.29	10	0.05	20	3	0.02	10	500	13	2.57	4	<1	32
DUP		<10	2	0.29	10	0.05	20	3	0.02	10	510	14	2.59	3	<1	33
Target Range - Lower Bound		<10	<1	0.27	<10	0.04	14	2	<0.01	9	470	11	2.44	<2	<1	30
Upper Bound		20	3	0.31	20	0.06	26	4	0.03	12	540	16	2.72	4	2	35
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOR	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
ORIGINAL		<20	0.02	<10	<10	8	10	6								
DUP		<20	0.02	<10	<10	8	10	7								
Target Range - Lower Bound		<20	<0.01	<10	<10	7	<10	4								
Upper Bound		40	0.03	20	20	9	20	9								
ORIGINAL		<20	0.06	<10	<10	36	<10	33								
DUP		<20	0.07	<10	<10	38	<10	36								
Target Range - Lower Bound		<20	0.05	<10	<10	34	<10	31								
Upper Bound		40	0.08	20	20	40	20	38								
ORIGINAL		<20	<0.01	<10	<10	3	<10	30								
DUP		<20	<0.01	<10	<10	3	<10	30								
Target Range - Lower Bound		<20	<0.01	<10	<10	2	<10	27								
Upper Bound		40	0.02	20	20	4	20	34								
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 18-MAY-2018
Account: RRR

Project: Mine Site Lab Pulps March

QC CERTIFICATE OF ANALYSIS TB18098363

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

QC CERTIFICATE TB18114640

Project: Mine Site Lab Pulps April 2018

P.O. No.: 4500009909

This report is for 219 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 17-MAY-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34			3.5	2.36	107	<10	100	<0.5	5	1.32	1.2	43	183	5770	4.30	10
CDN-CM-34			3.7	2.44	104	<10	100	<0.5	5	1.37	1.0	42	184	5920	4.42	10
CDN-CM-34			3.4	2.24	99	<10	90	<0.5	3	1.24	1.0	38	169	5470	4.07	10
CDN-CM-34			3.8	2.55	105	<10	80	<0.5	4	1.39	1.0	43	188	6010	4.52	10
Target Range - Lower Bound			3.1	2.14	99	<10	70	<0.5	<2	1.20	<0.5	36	164	5390	3.91	<10
Upper Bound			4.3	2.64	125	30	140	1.4	8	1.49	2.0	47	202	6210	4.80	30
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10		6.99														
G913-10		7.28														
G913-10		6.96														
Target Range - Lower Bound		6.66														
Upper Bound		7.52														

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34		<1	1.16	10	2.48	303	273	0.11	225	1140	19	2.97	3	9	101	<20
CDN-CM-34		<1	1.19	10	2.48	317	278	0.11	232	1200	24	3.14	5	9	103	<20
CDN-CM-34		<1	1.11	10	2.33	278	250	0.10	212	1110	20	2.89	5	9	99	<20
CDN-CM-34		1	1.19	10	2.55	319	287	0.11	237	1220	24	3.21	4	10	104	<20
Target Range - Lower Bound		<1	1.06	<10	2.27	269	245	0.08	204	1050	18	2.70	<2	8	92	<20
Upper Bound		2	1.32	30	2.80	340	301	0.13	252	1310	28	3.32	9	13	115	40
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10																
G913-10																
G913-10																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
Buffer pH6											6.0				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Target Range - Lower Bound											5.3				
Upper Bound											6.7				
CDN-CM-34		0.18	<10	<10	104	10	177								
CDN-CM-34		0.18	<10	<10	106	10	189								
CDN-CM-34		0.16	<10	<10	98	10	166								
CDN-CM-34		0.19	<10	<10	108	10	185								
Target Range - Lower Bound		0.15	<10	<10	95	<10	159								
Upper Bound		0.21	20	20	118	30	199								
DS-1								3.16							
DS-1								3.16							
Target Range - Lower Bound								3.01							
Upper Bound								3.25							
DS-1								3.12	2.70						
DS-1								3.15	2.69						
Target Range - Lower Bound								3.01	2.51						
Upper Bound								3.25	2.71						
G913-10															
G913-10															
G913-10															
Target Range - Lower Bound															
Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		1.960														
JK-17		1.965														
JK-17		1.955														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20
STANDARDS																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
GS310-10								1.11	0.26						
GS310-10								1.10	0.26						
GS310-10								1.08	0.29						
GS310-10								1.05	0.26						
GS310-10									0.27						
GS310-10									0.25						
GS310-10									0.26						
GS310-10									0.26						
GS310-10									0.27						
Target Range - Lower Bound									0.25						
Upper Bound									0.29						
GS313-8								0.95							
Target Range - Lower Bound								0.90							
Upper Bound								0.98							
GS313-8								0.93	1.26						
GS313-8								0.95	1.25						
GS313-8								0.94	1.27						
Target Range - Lower Bound								0.90	1.19						
Upper Bound								0.98	1.29						
JK-17															
JK-17															
JK-17															
Target Range - Lower Bound															
Upper Bound															
KZK-1										60		35	25.0	2.40	2
KZK-1										60		35	25.0	2.40	2
KZK-1										59		34	25.0	2.36	2
KZK-1										60		35	25.0	2.40	2
KZK-1										62		37	25.0	2.48	2
KZK-1										61		36	25.0	2.44	2
Target Range - Lower Bound										54		30	22.9	2.18	
Upper Bound										64		38	27.1	2.54	

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
STANDARDS																
LEA-16		0.496														
LEA-16		0.509														
LEA-16		0.502														
Target Range - Lower Bound		0.466														
Upper Bound		0.536														
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08			4.3	2.49	30	<10	410	0.7	2	1.00	2.0	18	86	588	3.39	10
MRGeo08			4.2	2.45	30	<10	420	0.7	<2	1.01	2.0	17	87	607	3.53	10
MRGeo08			4.6	2.74	33	<10	460	0.8	2	1.09	2.3	18	94	652	3.65	10
MRGeo08			4.5	2.61	33	<10	440	0.7	2	1.07	2.1	19	90	638	3.74	10
Target Range - Lower Bound			3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22	<10
Upper Bound			5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96	30
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
LEA-16																
LEA-16																
LEA-16																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		<1	1.18	30	1.04	396	13	0.31	659	970	1000	0.28	4	6	74	20
MRGeo08		<1	1.21	30	1.09	398	13	0.31	690	970	1035	0.29	4	6	73	20
MRGeo08		<1	1.26	30	1.16	422	14	0.35	714	1050	1080	0.30	4	7	85	20
MRGeo08		<1	1.32	30	1.17	416	14	0.33	713	1020	1095	0.30	4	7	81	20
Target Range - Lower Bound		<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71	<20
Upper Bound		2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89	60
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
LEA-16															
LEA-16															
LEA-16															
Target Range - Lower Bound															
Upper Bound															
MA-1b								2.44							
Target Range - Lower Bound								2.34							
Upper Bound								2.54							
MA-1b									1.18						
MA-1b								2.47	1.17						
MA-1b								2.38	1.17						
MA-1b									1.18						
MA-1b									1.20						
MA-1b									1.17						
MA-1b									1.13						
MA-1b									1.21						
MA-1b									1.12						
Target Range - Lower Bound									1.12						
Upper Bound									1.22						
MP-1b									13.50						
Target Range - Lower Bound									13.30						
Upper Bound									14.30						
MRGeo08		0.36	<10	<10	94	<10	755								
MRGeo08		0.37	<10	<10	97	<10	745								
MRGeo08		0.39	<10	<10	104	<10	788								
MRGeo08		0.38	<10	<10	99	<10	800								
Target Range - Lower Bound		0.33	<10	<10	90	<10	708								
Upper Bound		0.43	20	30	112	20	870								
NBM-1										51		42	8.8	5.83	2
NBM-1										50		41	8.8	5.71	2
NBM-1										49		40	8.8	5.60	2
NBM-1										50		41	8.8	5.71	2
NBM-1										49		40	8.8	5.60	2
NBM-1										49		40	8.8	5.60	2
Target Range - Lower Bound										45		37	7.8	5.26	
Upper Bound										54		47	9.7	6.08	

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
OGGeo08			20.1	2.21	122	<10	60	0.7	12	0.89	18.8	98	84	8590	5.15	10
OGGeo08			20.1	2.24	119	<10	60	0.7	14	0.89	19.1	96	82	8550	5.14	10
OGGeo08			20.4	2.24	120	<10	90	0.7	12	0.87	19.0	98	83	8500	5.09	10
Target Range - Lower Bound			18.0	2.05	105	<10	60	<0.5	6	0.82	16.2	86	75	7800	4.51	<10
Upper Bound			22.4	2.53	133	30	110	1.8	15	1.02	21.0	108	93	8980	5.53	30
OREAS 503c		0.674														
OREAS 503c		0.695														
OREAS 503c		0.692														
Target Range - Lower Bound		0.651														
Upper Bound		0.745														
OREAS 602			>100	0.61	660	<10	30	<0.5	58	0.50	25.1	10	28	5190	1.98	<10
OREAS 602			>100	0.58	661	<10	30	<0.5	58	0.52	25.1	9	32	5130	2.04	<10
OREAS 602			>100	0.63	692	<10	30	<0.5	61	0.53	26.1	10	32	5350	2.04	<10
OREAS 602			>100	0.64	675	<10	30	<0.5	62	0.54	25.6	10	32	5230	2.10	<10
Target Range - Lower Bound			106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94	<10
Upper Bound			100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40	30
BLANKS																
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
OGGeo08		<1	1.06	30	0.96	398	903	0.31	9030	800	7380	2.75	16	6	65	20
OGGeo08		1	1.05	30	0.93	397	898	0.29	8920	830	7260	2.85	19	6	64	20
OGGeo08		<1	1.05	30	0.95	391	890	0.29	8920	830	7210	2.81	21	6	66	20
Target Range - Lower Bound		<1	0.94	<10	0.84	350	810	0.26	7760	700	6510	2.51	15	4	59	<20
Upper Bound		3	1.18	50	1.05	438	992	0.34	9480	880	7970	3.09	27	9	74	60
OREAS 503c																
OREAS 503c																
OREAS 503c																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		1	0.09	10	0.10	211	4	0.03	58	230	821	2.00	62	1	48	<20
OREAS 602		1	0.08	10	0.10	212	4	0.03	62	220	838	1.97	68	1	46	<20
OREAS 602		1	0.09	10	0.10	215	4	0.03	62	240	846	2.05	67	1	47	<20
OREAS 602		1	0.09	10	0.11	216	4	0.02	61	230	861	2.03	66	1	49	<20
Target Range - Lower Bound		<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	46	<1	44	<20
Upper Bound		3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	68	3	56	40
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<1	<0.01	<10	<0.01	<5	<1	0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	2	<1	<1	<20

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
OGGeo08		0.32	<10	<10	81	<10	7120								
OGGeo08		0.31	<10	<10	80	<10	7170								
OGGeo08		0.31	<10	<10	81	<10	7090								
Target Range - Lower Bound		0.27	<10	<10	70	<10	6500								
Upper Bound		0.36	20	30	88	20	7950								
OREAS 503c															
OREAS 503c															
OREAS 503c															
Target Range - Lower Bound															
Upper Bound															
OREAS 602		0.01	<10	<10	10	<10	4030								
OREAS 602		0.01	<10	<10	10	10	3930								
OREAS 602		0.01	<10	<10	10	<10	4110								
OREAS 602		0.01	<10	<10	10	<10	4100								
Target Range - Lower Bound		<0.01	<10	<10	8	<10	3680								
Upper Bound		0.03	20	20	14	20	4500								
BLANKS															
BLANK															
BLANK															
BLANK															
BLANK															
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
BLANK								0.01							
Target Range - Lower Bound								<0.01							
Upper Bound								0.02							
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
BLANKS																
Target Range - Lower Bound			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Upper Bound			0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02	20
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL			<0.2	2.89	402	<10	80	<0.5	14	0.01	<0.5	70	16	919	7.54	20
DUP			0.2	3.15	422	<10	80	<0.5	13	0.01	<0.5	73	17	982	8.14	30
Target Range - Lower Bound			<0.2	2.86	389	<10	60	<0.5	11	<0.01	<0.5	67	15	916	7.44	<10
Upper Bound			0.4	3.18	435	20	100	1.0	16	0.02	1.0	76	18	985	8.24	40

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
BLANKS																
Target Range - Lower Bound		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Upper Bound		2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2	40
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL		<1	0.83	20	0.57	128	<1	0.01	3	130	<2	0.01	<2	3	2	<20
DUP		<1	0.89	20	0.61	143	<1	0.01	5	140	<2	0.01	<2	3	2	<20
Target Range - Lower Bound		<1	0.81	<10	0.55	124	<1	<0.01	3	120	<2	<0.01	<2	2	<1	<20
Upper Bound		2	0.91	30	0.63	147	2	0.02	5	150	4	0.02	4	4	3	40

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS															
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	<2								
Upper Bound		0.02	20	20	2	20	4								
BLANK											6.0				
BLANK											6.1				
BLANK											6.0				
BLANK											6.0				
BLANK											6.0				
BLANK											6.0				
Target Range - Lower Bound											5.5				
Upper Bound											6.9				
BLANK								0.01	<0.01						
BLANK								0.01	0.01						
BLANK								<0.01	<0.01						
BLANK								<0.01	<0.01						
BLANK								0.01	0.01						
BLANK								0.01	<0.01						
BLANK								<0.01	<0.01						
BLANK									0.01						
BLANK									0.01						
BLANK									<0.01						
BLANK									<0.01						
BLANK									<0.01						
BLANK									0.01						
Target Range - Lower Bound									<0.01						
Upper Bound									0.02						
DUPLICATES															
ORIGINAL		0.09	<10	<10	19	<10	12								
DUP		0.09	<10	<10	20	<10	13								
Target Range - Lower Bound		0.08	<10	<10	18	<10	10								
Upper Bound		0.10	20	20	21	20	15								

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Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
ORIGINAL		<0.005														
DUP		0.011														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL			0.2	2.28	7	10	10	<0.5	<2	2.44	0.5	32	20	250	5.04	10
DUP			0.2	2.32	9	10	10	<0.5	<2	2.45	0.5	33	21	247	5.09	10
Target Range - Lower Bound			<0.2	2.18	6	<10	<10	<0.5	<2	2.31	<0.5	30	18	239	4.80	<10
Upper Bound			0.4	2.43	10	20	20	1.0	4	2.58	1.0	35	23	258	5.33	20
1131072046																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127030050		0.523														
DUP		0.401														
Target Range - Lower Bound		0.434														
Upper Bound		0.490														
1127030016																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130101009																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127030101			1.0	1.21	68	<10	30	<0.5	<2	0.34	<0.5	8	141	46	2.34	<10
DUP			1.0	1.23	73	<10	30	<0.5	<2	0.34	<0.5	8	138	42	2.35	<10
Target Range - Lower Bound			0.8	1.15	65	<10	20	<0.5	<2	0.31	<0.5	7	132	41	2.22	<10
Upper Bound			1.3	1.29	76	20	40	1.0	4	0.37	1.0	9	147	47	2.47	20

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<1	0.07	10	1.86	622	<1	0.15	32	860	28	0.28	3	12	27	<20
DUP		<1	0.07	10	1.87	620	<1	0.15	33	860	26	0.28	<2	13	28	<20
Target Range - Lower Bound		<1	0.06	<10	1.76	585	<1	0.13	30	810	24	0.26	<2	11	25	<20
Upper Bound		2	0.08	20	1.97	657	2	0.17	35	910	30	0.30	4	14	30	40
1131072046																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127030050																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127030016																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130101009																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127030101		<1	0.20	10	0.75	454	1	0.01	12	410	32	1.53	<2	<1	8	<20
DUP		<1	0.21	10	0.76	460	<1	0.01	11	420	31	1.53	<2	<1	8	<20
Target Range - Lower Bound		<1	0.18	<10	0.71	429	<1	<0.01	10	380	28	1.44	<2	<1	7	<20
Upper Bound		2	0.23	20	0.80	485	2	0.02	13	450	35	1.62	4	2	9	40

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
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Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL								0.16	<0.01						
DUP								0.15	<0.01						
Target Range - Lower Bound								0.14	<0.01						
Upper Bound								0.17	0.02						
ORIGINAL		0.14	<10	<10	139	<10	122								
DUP		0.14	<10	<10	141	<10	122								
Target Range - Lower Bound		0.12	<10	<10	132	<10	114								
Upper Bound		0.16	20	20	148	20	130								
1131072046										15		-36	51.3	0.29	1
DUP										15		-36	51.3	0.29	1
Target Range - Lower Bound										13		-39	48.4	0.27	<1
Upper Bound										17		-33	54.2	0.31	2
1127030050											8.4				
DUP											8.3				
Target Range - Lower Bound											7.8				
Upper Bound											8.9				
1127030016									2.27						
DUP									2.34						
Target Range - Lower Bound									2.24						
Upper Bound									2.37						
1130101009								0.81	0.46						
DUP								0.81	0.50						
Target Range - Lower Bound								0.78	0.46						
Upper Bound								0.84	0.50						
1127030101		<0.01	<10	<10	5	<10	113								
DUP		<0.01	<10	<10	5	<10	116								
Target Range - Lower Bound		<0.01	<10	<10	4	<10	107								
Upper Bound		0.02	20	20	6	20	122								

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1127036094		0.112														
DUP		0.091														
Target Range - Lower Bound		0.091														
Upper Bound		0.112														
1127041170																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127041214			4.3	0.52	52	<10	20	<0.5	<2	1.20	3.8	8	30	84	1.89	<10
DUP			3.9	0.52	51	<10	20	<0.5	<2	1.18	3.7	8	31	83	1.88	<10
Target Range - Lower Bound			3.7	0.48	47	<10	<10	<0.5	<2	1.12	3.1	7	28	80	1.78	<10
Upper Bound			4.5	0.56	56	20	30	1.0	4	1.26	4.4	9	33	87	1.99	20
1127029114																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127034152		3.20														
DUP		4.12														
Target Range - Lower Bound		3.47														
Upper Bound		3.85														
1127034070																
DUP																
Target Range - Lower Bound																
Upper Bound																
1230004119		0.230														
DUP		0.217														
Target Range - Lower Bound		0.207														
Upper Bound		0.240														
1230004142			2.9	0.78	26	<10	50	<0.5	<2	1.76	3.7	9	122	81	2.23	<10
DUP			2.8	0.79	29	<10	50	<0.5	<2	1.77	3.9	9	124	82	2.24	<10
Target Range - Lower Bound			2.5	0.74	24	<10	40	<0.5	<2	1.67	3.1	8	116	78	2.11	<10
Upper Bound			3.2	0.83	31	20	60	1.0	4	1.86	4.5	10	130	85	2.36	20

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1127036094																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127041170																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127041214		1	0.16	10	0.52	1050	1	0.02	10	410	70	2.09	<2	<1	14	<20
DUP		1	0.16	10	0.52	1040	1	0.02	11	410	51	2.09	<2	<1	13	<20
Target Range - Lower Bound		<1	0.14	<10	0.48	988	<1	<0.01	9	380	55	1.98	<2	<1	12	<20
Upper Bound		2	0.18	20	0.56	1100	2	0.03	12	440	66	2.20	4	2	15	40
1127029114																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127034152																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127034070																
DUP																
Target Range - Lower Bound																
Upper Bound																
1230004119																
DUP																
Target Range - Lower Bound																
Upper Bound																
1230004142		<1	0.21	20	0.47	661	1	0.04	10	480	45	2.38	2	<1	33	<20
DUP		<1	0.22	20	0.47	670	1	0.05	10	480	45	2.41	2	<1	34	<20
Target Range - Lower Bound		<1	0.19	<10	0.44	627	<1	0.03	9	450	41	2.27	<2	<1	31	<20
Upper Bound		2	0.24	30	0.50	704	2	0.06	12	510	49	2.52	4	2	36	40

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EMO ON P0W 1E0

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Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
1127036094															
DUP															
Target Range - Lower Bound															
Upper Bound															
1127041170										43		-24	66.6	0.65	2
DUP										43		-24	66.6	0.65	2
Target Range - Lower Bound										40		-26	63.0	0.61	<1
Upper Bound										46		-22	70.2	0.69	3
1127041214		<0.01	<10	<10	2	<10	1000	0.57	2.02						
DUP		<0.01	<10	<10	2	<10	932	0.58	2.07						
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	916	0.55	1.98						
Upper Bound		0.02	20	20	3	20	1015	0.60	2.11						
1127029114											8.7				
DUP											8.6				
Target Range - Lower Bound											8.1				
Upper Bound											9.2				
1127034152															
DUP															
Target Range - Lower Bound															
Upper Bound															
1127034070									1.96						
DUP									1.91						
Target Range - Lower Bound									1.88						
Upper Bound									1.99						
1230004119															
DUP															
Target Range - Lower Bound															
Upper Bound															
1230004142		<0.01	<10	<10	4	10	976			53	8.4	-23	75.9	0.70	2
DUP		<0.01	<10	<10	4	10	997			53	8.5	-23	75.9	0.70	2
Target Range - Lower Bound		<0.01	<10	<10	3	<10	935			49	7.9	-25	71.8	0.66	<1
Upper Bound		0.02	20	20	5	20	1040			57	9.0	-21	80.0	0.75	3

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1230003232	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1127042162		0.327														
	DUP	0.292														
	Target Range - Lower Bound	0.289														
	Upper Bound	0.330														
1126004113		0.083														
	DUP	0.082														
	Target Range - Lower Bound	0.073														
	Upper Bound	0.092														
1126004165			0.6	1.63	40	<10	50	<0.5	<2	1.96	1.5	6	59	13	1.59	<10
	DUP		0.4	1.78	42	<10	50	<0.5	<2	2.08	1.6	7	68	15	1.71	<10
	Target Range - Lower Bound		0.3	1.61	37	<10	40	<0.5	<2	1.91	1.0	5	59	13	1.56	<10
	Upper Bound		0.7	1.80	45	20	60	1.0	4	2.13	2.1	8	68	15	1.74	20
1230003120	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1126010188	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1230002037	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1230002003		0.219														
	DUP	0.210														
	Target Range - Lower Bound	0.199														
	Upper Bound	0.230														

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1230003232 DUP																
Target Range - Lower Bound																
Upper Bound																
1127042162 DUP																
Target Range - Lower Bound																
Upper Bound																
1126004113 DUP																
Target Range - Lower Bound																
Upper Bound																
1126004165		<1	0.23	10	0.75	519	<1	0.06	7	370	14	0.85	<2	1	36	<20
DUP		<1	0.25	10	0.82	559	<1	0.07	8	400	16	0.91	2	1	38	<20
Target Range - Lower Bound		<1	0.22	<10	0.74	507	<1	0.05	6	360	12	0.83	<2	<1	34	<20
Upper Bound		2	0.26	20	0.83	571	2	0.08	9	410	18	0.93	4	2	40	40
1230003120 DUP																
Target Range - Lower Bound																
Upper Bound																
1126010188 DUP																
Target Range - Lower Bound																
Upper Bound																
1230002037 DUP																
Target Range - Lower Bound																
Upper Bound																
1230002003 DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
1230003232								0.53	1.46						
DUP								0.53	1.42						
Target Range - Lower Bound								0.51	1.35						
Upper Bound								0.55	1.44						
1127042162															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126004113															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126004165		<0.01	<10	<10	6	<10	355								
DUP		<0.01	<10	<10	6	<10	382								
Target Range - Lower Bound		<0.01	<10	<10	5	<10	348								
Upper Bound		0.02	20	20	7	20	389								
1230003120										16		-20	35.6	0.45	1
DUP										16		-20	35.6	0.45	1
Target Range - Lower Bound										14		-22	33.5	0.42	<1
Upper Bound										18		-18	37.7	0.48	2
1126010188								0.71	1.16						
DUP								0.72	1.13						
Target Range - Lower Bound								0.69	1.11						
Upper Bound								0.74	1.18						
1230002037											7.7				
DUP											7.7				
Target Range - Lower Bound											7.2				
Upper Bound											8.2				
1230002003															
DUP															
Target Range - Lower Bound															
Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1126014113			0.9	1.18	51	<10	30	<0.5	<2	1.63	1.3	7	111	18	1.66	<10
DUP			0.8	1.14	51	<10	30	<0.5	<2	1.60	1.4	6	110	17	1.63	<10
Target Range - Lower Bound			0.6	1.09	46	<10	20	<0.5	<2	1.52	0.8	5	104	16	1.55	<10
Upper Bound			1.1	1.23	56	20	40	1.0	4	1.71	1.9	8	117	19	1.74	20
1126007145																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126014073		0.363														
DUP		0.354														
Target Range - Lower Bound		0.336														
Upper Bound		0.381														
1126007003																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126007010																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126012077		0.090														
DUP		0.082														
Target Range - Lower Bound		0.077														
Upper Bound		0.095														
1126012086			<0.2	1.63	4	<10	120	<0.5	<2	1.85	<0.5	12	103	20	2.67	10
DUP			<0.2	1.68	4	<10	120	<0.5	<2	1.88	<0.5	13	107	21	2.73	10
Target Range - Lower Bound			<0.2	1.56	<2	<10	100	<0.5	<2	1.76	<0.5	11	99	19	2.56	<10
Upper Bound			0.4	1.75	6	20	140	1.0	4	1.97	1.0	14	111	22	2.85	20
V829070																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1126014113		<1	0.25	10	0.86	824	1	0.02	6	420	174	1.51	<2	1	33	<20
DUP		<1	0.25	10	0.83	807	1	0.02	6	410	176	1.47	<2	1	32	<20
Target Range - Lower Bound		<1	0.23	<10	0.79	770	<1	<0.01	5	380	164	1.41	<2	<1	30	<20
Upper Bound		2	0.27	20	0.90	861	2	0.03	7	450	186	1.57	4	2	35	40
1126007145																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126014073																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126007003																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126007010																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126012077																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126012086		1	0.39	20	0.93	373	1	0.08	15	680	2	0.24	<2	2	56	<20
DUP		1	0.40	20	0.95	380	<1	0.08	15	690	2	0.25	<2	3	60	<20
Target Range - Lower Bound		<1	0.37	<10	0.88	353	<1	0.07	13	640	<2	0.22	<2	<1	54	<20
Upper Bound		2	0.42	30	1.00	400	2	0.09	17	730	4	0.27	4	4	62	40
V829070																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
1126014113		<0.01	<10	<10	6	<10	363								
DUP		<0.01	<10	<10	5	<10	364								
Target Range - Lower Bound		<0.01	<10	<10	4	<10	343								
Upper Bound		0.02	20	20	7	20	384								
1126007145											9.0				
DUP											9.0				
Target Range - Lower Bound											8.5				
Upper Bound											9.6				
1126014073															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126007003								0.37	0.47	35		20	14.7	2.38	2
DUP								0.37	0.50	35		19	15.6	2.24	2
Target Range - Lower Bound								0.35	0.46	32		18	14.1	2.18	<1
Upper Bound								0.39	0.51	38		21	16.2	2.44	3
1126007010									0.67						
DUP									0.64						
Target Range - Lower Bound									0.63						
Upper Bound									0.68						
1126012077															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126012086		0.08	<10	<10	43	<10	52								
DUP		0.08	<10	<10	44	10	52								
Target Range - Lower Bound		0.07	<10	<10	40	<10	47								
Upper Bound		0.09	20	20	47	20	57								
V829070								0.02							
DUP								0.03							
Target Range - Lower Bound								<0.01							
Upper Bound								0.04							

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Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1230003024	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1126011032	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1126011149	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL																
	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL																
	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL		0.027														
	DUP	0.047														
	Target Range - Lower Bound	0.030														
	Upper Bound	0.044														
ORIGINAL		0.635														
	DUP	0.657														
	Target Range - Lower Bound	0.609														
	Upper Bound	0.683														
ORIGINAL		1.200														
	DUP	1.355														
	Target Range - Lower Bound	1.210														
	Upper Bound	1.345														

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Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method Analyte Units LOD	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20
DUPLICATES																
1230003024																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126011032																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126011149																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
2103 Dollarton Hwy
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Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
1230003024								0.15	1.39						
DUP								0.13	1.39						
	Target Range - Lower Bound							0.13	1.35						
	Upper Bound							0.15	1.43						
1126011032										69		52	17.5	3.94	2
DUP										69		52	17.5	3.94	2
	Target Range - Lower Bound									65		48	16.3	3.73	<1
	Upper Bound									73		56	18.7	4.15	3
1126011149											8.8				
DUP											8.8				
	Target Range - Lower Bound										8.3				
	Upper Bound										9.3				
ORIGINAL									0.74						
DUP									0.77						
	Target Range - Lower Bound								0.73						
	Upper Bound								0.78						
ORIGINAL									1.02						
DUP									1.02						
	Target Range - Lower Bound								0.98						
	Upper Bound								1.06						
ORIGINAL															
DUP															
	Target Range - Lower Bound														
	Upper Bound														
ORIGINAL															
DUP															
	Target Range - Lower Bound														
	Upper Bound														
ORIGINAL															
DUP															
	Target Range - Lower Bound														
	Upper Bound														

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
ORIGINAL		<0.005														
DUP		0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		0.018														
DUP		0.023														
Target Range - Lower Bound		0.014														
Upper Bound		0.027														

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114640

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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EMO ON P0W 1E0

Finalized Date: 14-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps April 2018

QC CERTIFICATE OF ANALYSIS TB18114640

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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Finalized Date: 7-JUN-2018
Account: RRR

QC CERTIFICATE TB18114668

Project: Mine Site Lab Pulps 2017 Backl

P.O. No.: 4500009909

This report is for 154 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 17-MAY-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34			3.5	2.45	104	<10	110	<0.5	4	1.33	1.0	41	180	5830	4.33	10
CDN-CM-34			3.3	2.25	97	<10	100	<0.5	6	1.29	1.0	39	170	5560	4.22	10
CDN-CM-34			3.5	2.32	102	<10	100	<0.5	4	1.26	1.1	39	176	5780	4.19	10
Target Range - Lower Bound			3.1	2.14	99	<10	70	<0.5	<2	1.20	<0.5	36	164	5390	3.91	<10
Upper Bound			4.3	2.64	125	30	140	1.4	8	1.49	2.0	47	202	6210	4.80	30
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10		7.37														
Target Range - Lower Bound		6.66														
Upper Bound		7.52														
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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Project: Mine Site Lab Pulps 2017 Backl

QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CCU-1e																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34		<1	1.22	10	2.52	300	271	0.10	231	1180	24	3.06	5	9	104	<20
CDN-CM-34		<1	1.10	10	2.36	280	258	0.10	211	1100	21	2.92	3	9	97	<20
CDN-CM-34		<1	1.12	10	2.36	299	268	0.11	229	1160	20	2.97	5	9	102	<20
Target Range - Lower Bound		<1	1.06	<10	2.27	269	245	0.08	204	1050	18	2.70	<2	8	92	<20
Upper Bound		2	1.32	30	2.80	340	301	0.13	252	1310	28	3.32	9	13	115	40
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Target Range - Lower Bound											5.3				
Upper Bound											6.7				
CCU-1e									35.1						
Target Range - Lower Bound									34.3						
Upper Bound									36.8						
CDN-CM-34		0.18	<10	<10	105	10	173								
CDN-CM-34		0.17	<10	<10	98	10	169								
CDN-CM-34		0.17	<10	<10	102	10	172								
Target Range - Lower Bound		0.15	<10	<10	95	<10	159								
Upper Bound		0.21	20	20	118	30	199								
DS-1								3.11							
Target Range - Lower Bound								3.01							
Upper Bound								3.25							
DS-1								3.14	2.65						
DS-1								3.22	2.70						
DS-1								3.14	2.63						
DS-1									2.66						
Target Range - Lower Bound									2.51						
Upper Bound									2.71						
G913-10															
Target Range - Lower Bound															
Upper Bound															
GS310-10								1.03	0.27						
GS310-10								1.10	0.26						
GS310-10								1.10	0.26						
GS310-10									0.25						
Target Range - Lower Bound									0.25						
Upper Bound									0.29						

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
STANDARDS																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		2.00														
JK-17		2.01														
JK-17		2.00														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16		0.512														
Target Range - Lower Bound		0.466														
Upper Bound		0.536														
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
GS313-8								0.95							
Target Range - Lower Bound								0.90							
Upper Bound								0.98							
GS313-8								0.95	1.27						
GS313-8								0.96	1.27						
GS313-8								0.93	1.27						
GS313-8									1.26						
Target Range - Lower Bound									1.19						
Upper Bound									1.29						
JK-17															
JK-17															
JK-17															
Target Range - Lower Bound															
Upper Bound															
KZK-1										60		35	25.0	2.40	2
KZK-1										59		34	25.0	2.36	2
KZK-1										60		35	25.0	2.40	2
KZK-1										60		35	25.0	2.40	2
Target Range - Lower Bound										54		30	22.9	2.18	
Upper Bound										64		38	27.1	2.54	
LEA-16															
Target Range - Lower Bound															
Upper Bound															
MA-1b								2.38	1.16						
MA-1b								2.47	1.15						
MA-1b								2.42	1.14						
MA-1b									1.20						
MA-1b									1.15						
Target Range - Lower Bound									1.12						
Upper Bound									1.22						
MP-1b									13.55						
Target Range - Lower Bound									13.30						
Upper Bound									14.30						

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
STANDARDS																
MRGeo08			4.4	2.59	33	<10	430	0.8	<2	1.02	2.2	19	90	625	3.51	10
MRGeo08			4.6	2.81	35	<10	470	0.8	2	1.16	2.3	20	99	656	3.88	10
Target Range - Lower Bound			3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22	<10
Upper Bound			5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96	30
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08			19.5	2.18	118	<10	90	0.7	12	0.88	18.7	95	80	8500	5.04	10
OGGeo08			19.5	2.14	116	<10	70	0.7	14	0.87	18.4	95	80	8370	5.10	10
OGGeo08			19.2	2.13	117	<10	70	0.7	11	0.84	18.0	92	79	8330	4.89	10
Target Range - Lower Bound			18.0	2.05	105	<10	60	<0.5	6	0.82	16.2	86	75	7800	4.51	<10
Upper Bound			22.4	2.53	133	30	110	1.8	15	1.02	21.0	108	93	8980	5.53	30
OREAS 503c		0.708														
OREAS 503c		0.700														
OREAS 503c		0.687														
Target Range - Lower Bound		0.651														
Upper Bound		0.745														
OREAS 602			>100	0.59	665	<10	30	<0.5	59	0.49	25.1	9	32	5180	1.97	<10
OREAS 602			>100	0.68	722	<10	30	<0.5	68	0.56	27.6	10	34	5430	2.20	<10
Target Range - Lower Bound			106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94	<10
Upper Bound			100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40	30
BLANKS																
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														

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EMO ON P0W 1E0

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
MRGeo08		<1	1.20	30	1.10	414	14	0.34	721	1020	1065	0.30	4	7	82	20
MRGeo08		<1	1.32	40	1.23	444	15	0.36	740	1110	1145	0.34	4	8	86	20
Target Range - Lower Bound		<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71	<20
Upper Bound		2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89	60
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08		<1	1.07	30	0.93	382	867	0.29	8880	820	7140	2.77	23	6	65	20
OGGeo08		1	1.02	30	0.93	376	874	0.28	8640	790	7240	2.74	20	6	62	20
OGGeo08		<1	1.00	30	0.89	381	865	0.29	8880	790	7000	2.67	19	6	64	<20
Target Range - Lower Bound		<1	0.94	<10	0.84	350	810	0.26	7760	700	6510	2.51	15	4	59	<20
Upper Bound		3	1.18	50	1.05	438	992	0.34	9480	880	7970	3.09	27	9	74	60
OREAS 503c																
OREAS 503c																
OREAS 503c																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		1	0.08	10	0.10	210	4	0.03	62	230	829	1.97	65	1	47	<20
OREAS 602		1	0.09	10	0.11	226	4	0.03	64	250	893	2.16	63	1	53	<20
Target Range - Lower Bound		<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	46	<1	44	<20
Upper Bound		3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	68	3	56	40
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method Analyte Units LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
STANDARDS															
MRGeo08		0.37	<10	<10	100	<10	773								
MRGeo08		0.40	<10	<10	109	<10	822								
Target Range - Lower Bound		0.33	<10	<10	90	<10	708								
Upper Bound		0.43	20	30	112	20	870								
NBM-1										51		42	8.8	5.83	2
NBM-1										50		41	8.8	5.71	2
NBM-1										51		42	8.8	5.83	2
NBM-1										49		40	8.8	5.60	2
Target Range - Lower Bound										45		37	7.8	5.26	
Upper Bound										54		47	9.7	6.08	
OGGeo08		0.31	<10	<10	79	<10	6840								
OGGeo08		0.30	<10	<10	78	<10	6950								
OGGeo08		0.30	<10	<10	77	10	6720								
Target Range - Lower Bound		0.27	<10	<10	70	<10	6500								
Upper Bound		0.36	20	30	88	20	7950								
OREAS 503c															
OREAS 503c															
OREAS 503c															
Target Range - Lower Bound															
Upper Bound															
OREAS 602		0.01	<10	<10	10	<10	3970								
OREAS 602		0.01	<10	<10	11	<10	4360								
Target Range - Lower Bound		<0.01	<10	<10	8	<10	3680								
Upper Bound		0.03	20	20	14	20	4500								
BLANKS															
BLANK															
BLANK															
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															

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Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
BLANKS																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Target Range - Lower Bound			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Upper Bound			0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02	20
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
BLANKS																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	0.01	<1	<10	<2	0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Target Range - Lower Bound		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Upper Bound		2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2	40
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS															
BLANK								0.01							
Target Range - Lower Bound								<0.01							
Upper Bound								0.02							
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	<2								
Upper Bound		0.02	20	20	2	20	4								
BLANK											6.0				
BLANK											6.0				
BLANK											6.0				
BLANK											5.9				
Target Range - Lower Bound											5.5				
Upper Bound											6.9				
BLANK								<0.01	<0.01						
BLANK								<0.01	0.01						
BLANK								0.01	<0.01						
BLANK								0.01	<0.01						
BLANK								0.01	<0.01						
BLANK								<0.01	<0.01						
BLANK									0.01						
BLANK									0.01						
BLANK									<0.01						
Target Range - Lower Bound									<0.01						
Upper Bound									0.02						
DUPLICATES															
ORIGINAL								11.85	<0.01						
DUP								11.90	<0.01						
Target Range - Lower Bound								11.55	<0.01						
Upper Bound								12.20	0.02						

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
ORIGINAL		1.010														
DUP		1.000														
Target Range - Lower Bound		0.950														
Upper Bound		1.060														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
1128007246																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129025108			0.5	3.64	8	<10	170	<0.5	<2	2.76	1.5	36	204	99	6.34	10
DUP			0.6	3.85	9	<10	170	<0.5	<2	2.89	1.5	38	210	101	6.65	10
Target Range - Lower Bound			0.3	3.55	6	<10	150	<0.5	<2	2.67	0.9	34	196	96	6.16	<10
Upper Bound			0.8	3.94	11	20	190	1.0	4	2.98	2.1	40	218	105	6.83	20
1129027235																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128017058		1.080														
DUP		1.025														
Target Range - Lower Bound		0.995														
Upper Bound		1.110														
1129026040																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128016119			<0.2	1.12	3	<10	60	<0.5	<2	1.11	<0.5	8	305	16	2.02	<10
DUP			<0.2	1.16	4	<10	70	<0.5	<2	1.15	<0.5	8	318	17	2.12	<10
Target Range - Lower Bound			<0.2	1.07	<2	<10	50	<0.5	<2	1.06	<0.5	7	295	15	1.96	<10
Upper Bound			0.4	1.21	4	20	80	1.0	4	1.20	1.0	9	328	18	2.18	20

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Sample Description	Method Analyte Units LOD	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128007246																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129025108		<1	0.59	<10	1.14	835	1	0.22	54	750	6	1.04	<2	8	98	<20
DUP		<1	0.61	<10	1.19	886	1	0.24	56	760	3	1.09	2	9	105	<20
Target Range - Lower Bound		<1	0.56	<10	1.10	812	<1	0.21	51	710	<2	1.00	<2	7	95	<20
Upper Bound		2	0.64	20	1.23	909	2	0.25	59	800	7	1.13	4	10	108	40
1129027235																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128017058																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129026040																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128016119		<1	0.23	10	0.61	272	1	0.07	12	370	<2	0.43	<2	2	26	<20
DUP		<1	0.23	10	0.64	285	2	0.07	15	380	<2	0.45	<2	2	27	<20
Target Range - Lower Bound		<1	0.21	<10	0.58	260	<1	0.06	12	350	<2	0.41	<2	<1	24	<20
Upper Bound		2	0.25	20	0.67	297	2	0.08	15	400	4	0.47	4	3	29	40

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Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
1128007246											9.5				
DUP											9.5				
Target Range - Lower Bound											8.9				
Upper Bound											10.1				
1129025108		0.19	<10	<10	159	10	487								
DUP		0.20	<10	<10	167	<10	515								
Target Range - Lower Bound		0.18	<10	<10	154	<10	474								
Upper Bound		0.21	20	20	172	20	528								
1129027235										44		42	2.2	20.11	2
DUP										46		44	2.2	21.03	2
Target Range - Lower Bound										42		40	1.8	19.53	<1
Upper Bound										48		46	2.6	21.61	3
1128017058															
DUP															
Target Range - Lower Bound															
Upper Bound															
1129026040								0.49	0.17						
DUP								0.49	0.14						
Target Range - Lower Bound								0.47	0.14						
Upper Bound								0.51	0.17						
1128016119		0.04	<10	<10	21	<10	30								
DUP		0.04	<10	<10	22	<10	31								
Target Range - Lower Bound		0.03	<10	<10	19	<10	27								
Upper Bound		0.05	20	20	24	20	34								

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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1128007101	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128015143	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1128016080	DUP	0.028														
	DUP	0.026														
	Target Range - Lower Bound	0.021														
	Upper Bound	0.033														
1128013115	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1130050138	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1129027259	DUP	0.006														
	DUP	0.006														
	Target Range - Lower Bound	<0.005														
	Upper Bound	0.010														
1130052061	DUP		0.4	1.64	24	<10	40	<0.5	2	0.87	0.9	11	222	45	2.37	<10
	DUP		0.4	1.62	23	<10	40	<0.5	<2	0.88	0.9	11	221	45	2.35	<10
	Target Range - Lower Bound		<0.2	1.54	20	<10	30	<0.5	<2	0.82	<0.5	9	209	42	2.23	<10
	Upper Bound		0.6	1.72	27	20	50	1.0	4	0.93	1.0	13	234	48	2.49	20
1127029199	DUP															
	Target Range - Lower Bound															
	Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1128007101																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128015143																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128016080																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128013115																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130050138																
DUP																
Target Range - Lower Bound																
Upper Bound																
1129027259																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130052061		<1	0.21	10	0.87	486	1	0.05	20	500	39	1.27	<2	2	22	<20
DUP		<1	0.21	10	0.87	489	1	0.05	20	500	37	1.25	<2	2	22	<20
Target Range - Lower Bound		<1	0.19	<10	0.82	458	<1	0.04	18	470	34	1.19	<2	<1	20	<20
Upper Bound		2	0.23	20	0.92	517	2	0.06	22	540	42	1.33	4	3	24	40
1127029199																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
1128007101											9.4				
DUP											9.4				
Target Range - Lower Bound											8.8				
Upper Bound											10.0				
1128015143									3.24						
DUP									3.17						
Target Range - Lower Bound									3.11						
Upper Bound									3.30						
1128016080															
DUP															
Target Range - Lower Bound															
Upper Bound															
1128013115										119		102	17.2	6.92	3
DUP										116		99	17.2	6.75	3
Target Range - Lower Bound										111		94	16.0	6.48	2
Upper Bound										124		107	18.4	7.19	>4
1130050138								0.12	1.86						
DUP								0.13	1.80						
Target Range - Lower Bound								0.11	1.77						
Upper Bound								0.14	1.89						
1129027259											9.5				
DUP											9.5				
Target Range - Lower Bound											8.9				
Upper Bound											10.1				
1130052061		0.05	<10	<10	24	<10	258								
DUP		0.05	<10	<10	24	<10	257								
Target Range - Lower Bound		0.04	<10	<10	22	<10	243								
Upper Bound		0.06	20	20	26	20	272								
1127029199										100		63	36.9	2.71	3
DUP										99		62	36.9	2.68	3
Target Range - Lower Bound										94		58	34.8	2.55	2
Upper Bound										105		67	39.0	2.84	>4

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Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1130052019	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1130055080	DUP	0.441														
	DUP	0.421														
	Target Range - Lower Bound	0.404														
	Upper Bound	0.458														
1128015118	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1130055054	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1130049050	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1130048512			0.3	2.57	11	<10	10	<0.5	4	4.70	0.6	43	378	94	6.57	10
	DUP		0.3	2.72	10	<10	10	<0.5	3	4.87	0.5	45	396	99	6.91	10
	Target Range - Lower Bound		<0.2	2.50	8	<10	<10	<0.5	<2	4.54	<0.5	41	367	92	6.39	<10
	Upper Bound		0.4	2.79	13	20	20	1.0	4	5.03	1.0	47	407	101	7.09	20
1130049055	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1127029077	DUP	0.395														
	DUP	0.380														
	Target Range - Lower Bound	0.363														
	Upper Bound	0.412														

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1130052019																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130055080																
DUP																
Target Range - Lower Bound																
Upper Bound																
1128015118																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130055054																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130049050																
DUP																
Target Range - Lower Bound																
Upper Bound																
1130048512		<1	0.02	<10	2.58	953	1	0.03	119	280	<2	1.42	<2	9	91	<20
DUP		<1	0.02	<10	2.71	990	1	0.03	125	290	<2	1.47	2	9	96	<20
Target Range - Lower Bound		<1	<0.01	<10	2.50	918	<1	0.02	115	260	<2	1.36	<2	8	88	<20
Upper Bound		2	0.03	20	2.79	1025	2	0.04	129	310	4	1.53	4	10	99	40
1130049055																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127029077																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
1130052019									0.76						
DUP									0.75						
Target Range - Lower Bound									0.73						
Upper Bound									0.78						
1130055080															
DUP															
Target Range - Lower Bound															
Upper Bound															
1128015118								0.15	1.89						
DUP								0.15	1.96						
Target Range - Lower Bound								0.14	1.87						
Upper Bound								0.16	1.98						
1130055054									0.58						
DUP									0.57						
Target Range - Lower Bound									0.55						
Upper Bound									0.60						
1130049050								0.31	1.67						
DUP								0.31	1.72						
Target Range - Lower Bound								0.29	1.64						
Upper Bound								0.33	1.75						
1130048512		0.08	<10	<10	122	<10	62								
DUP		0.08	<10	<10	128	<10	65								
Target Range - Lower Bound		0.07	<10	<10	118	<10	58								
Upper Bound		0.09	20	20	132	20	69								
1130049055											8.7				
DUP											8.7				
Target Range - Lower Bound											8.2				
Upper Bound											9.2				
1127029077															
DUP															
Target Range - Lower Bound															
Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1130052314																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL			11.2	1.28	754	<10	30	<0.5	11	1.70	43.3	24	4	40	13.25	<10
DUP			12.6	1.30	759	<10	30	<0.5	12	1.69	43.1	23	4	41	13.40	<10
Target Range - Lower Bound			11.1	1.22	717	<10	20	<0.5	9	1.60	40.5	21	3	38	12.65	<10
Upper Bound			12.7	1.36	796	20	40	1.0	14	1.79	45.9	26	5	43	14.00	20
ORIGINAL		1.115														
DUP		1.100														
Target Range - Lower Bound		1.045														
Upper Bound		1.170														
ORIGINAL		0.198														
DUP		0.165														
Target Range - Lower Bound		0.167														
Upper Bound		0.196														
ORIGINAL		0.009														
DUP		0.012														
Target Range - Lower Bound		<0.005														
Upper Bound		0.016														

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method Analyte Units LOD	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20
DUPLICATES																
1130052314																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		2	0.10	<10	0.90	3210	2	<0.01	<1	410	2010	>10.0	43	2	61	<20
DUP		2	0.11	<10	0.90	3220	2	<0.01	1	410	2020	>10.0	41	2	62	<20
Target Range - Lower Bound		<1	0.09	<10	0.85	3050	<1	<0.01	<1	380	1910	9.49	37	<1	57	<20
Upper Bound		3	0.12	20	0.96	3380	3	0.02	2	440	2120	10.00	47	3	66	40
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18114668

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
1130052314										8		-39	46.9	0.17	1
DUP										9		-38	46.9	0.19	1
Target Range - Lower Bound										7		-41	44.3	0.16	<1
Upper Bound										10		-36	49.5	0.20	2
ORIGINAL								0.18							
DUP								0.17							
Target Range - Lower Bound								0.16							
Upper Bound								0.19							
ORIGINAL								0.11	1.05						
DUP								0.10	1.07						
Target Range - Lower Bound								0.09	1.02						
Upper Bound								0.12	1.10						
ORIGINAL		<0.01	<10	<10	36	<10	5050								
DUP		<0.01	<10	<10	36	<10	5060								
Target Range - Lower Bound		<0.01	<10	<10	33	<10	4800								
Upper Bound		0.02	20	20	39	20	5310								
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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Finalized Date: 7-JUN-2018
Account: RRR

Project: Mine Site Lab Pulps 2017 Backl

QC CERTIFICATE OF ANALYSIS TB18114668

CERTIFICATE COMMENTS

ANALYTICAL COMMENTS

NSS is non-sufficient sample.
Applies to Method: ALL METHODS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

QC CERTIFICATE TB18165552

Project: Mine Site Lab Pulps June 2018

P.O. No.: 4500009909

This report is for 153 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 10-JUL-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

ALS Canada Ltd.
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Phone: +1 (604) 984 0221 Fax: +1 (604) 984 0218
www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34			3.4	2.31	97	<10	110	<0.5	2	1.31	0.9	38	173	5560	4.19	10
CDN-CM-34			3.6	2.39	101	<10	100	<0.5	3	1.35	1.0	39	179	5690	4.38	10
Target Range - Lower Bound			3.1	2.14	93	<10	70	<0.5	<2	1.20	<0.5	36	164	5390	3.91	<10
Upper Bound			4.3	2.64	118	30	140	1.4	8	1.49	2.0	46	202	6210	4.80	30
DS-1																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10		7.11														
Target Range - Lower Bound		6.66														
Upper Bound		7.52														
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34		<1	1.14	10	2.40	290	263	0.10	216	1100	19	2.91	6	9	98	<20
CDN-CM-34		<1	1.20	10	2.47	299	268	0.10	225	1150	22	3.03	5	9	103	<20
Target Range - Lower Bound		<1	1.06	<10	2.27	269	245	0.08	204	1050	18	2.70	<2	8	92	<20
Upper Bound		2	1.32	30	2.80	340	301	0.13	252	1310	28	3.32	9	13	115	40
DS-1																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Buffer pH6											6.0				
Target Range - Lower Bound											5.3				
Upper Bound											6.7				
CDN-CM-34		0.17	<10	<10	100	10	160								
CDN-CM-34		0.17	<10	<10	104	10	166								
Target Range - Lower Bound		0.15	<10	<10	95	<10	159								
Upper Bound		0.21	20	20	118	30	199								
DS-1								3.05	2.69						
DS-1								3.04	2.56						
DS-1								3.21	2.65						
DS-1								3.11	2.52						
DS-1									2.70						
Target Range - Lower Bound									2.51						
Upper Bound									2.71						
G913-10															
Target Range - Lower Bound															
Upper Bound															
GS310-10								1.09							
Target Range - Lower Bound								1.03							
Upper Bound								1.13							
GS310-10								1.08	0.27						
GS310-10								1.08	0.28						
GS310-10									0.26						
GS310-10								1.05	0.25						
GS310-10									0.26						
Target Range - Lower Bound									0.25						
Upper Bound									0.29						

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
STANDARDS																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		1.980														
JK-17		1.970														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16		0.506														
Target Range - Lower Bound		0.466														
Upper Bound		0.536														
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08			4.7	2.74	33	<10	460	0.8	2	1.14	2.1	20	95	655	3.72	10
MRGeo08			4.2	2.50	30	<10	430	0.7	3	1.01	2.1	18	86	601	3.50	10
MRGeo08			4.2	2.54	30	<10	410	0.7	4	1.05	2.0	17	84	595	3.43	10
Target Range - Lower Bound			3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22	<10
Upper Bound			5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96	30

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
LEA-16																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		<1	1.32	40	1.20	433	14	0.34	733	1050	1110	0.32	3	7	84	20
MRGeo08		<1	1.26	30	1.09	393	13	0.30	677	990	1035	0.29	3	7	75	20
MRGeo08		<1	1.23	30	1.07	388	13	0.34	652	940	1020	0.28	<2	7	81	20
Target Range - Lower Bound		<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71	<20
Upper Bound		2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89	60

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method Analyte Units LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
STANDARDS															
GS313-8								0.93	1.26						
GS313-8								0.92	1.23						
GS313-8								0.97	1.25						
Target Range - Lower Bound								0.90	1.19						
Upper Bound								0.98	1.29						
JK-17															
JK-17															
Target Range - Lower Bound															
Upper Bound															
KZK-1										60		35	25.0	2.40	2
KZK-1										62		37	25.0	2.48	2
KZK-1										60		35	25.0	2.40	2
KZK-1										61		36	25.0	2.44	2
Target Range - Lower Bound										54		30	22.9	2.18	
Upper Bound										64		38	27.1	2.54	
LEA-16															
Target Range - Lower Bound															
Upper Bound															
MA-1b								2.45							
Target Range - Lower Bound								2.34							
Upper Bound								2.54							
MA-1b								2.44	1.19						
MA-1b								2.40	1.20						
Target Range - Lower Bound								2.34	1.12						
Upper Bound								2.54	1.22						
MP-1b									14.05						
Target Range - Lower Bound									13.30						
Upper Bound									14.30						
MRGeo08		0.40	<10	<10	106	<10	797								
MRGeo08		0.36	<10	<10	96	<10	734								
MRGeo08		0.35	<10	<10	93	<10	733								
Target Range - Lower Bound		0.33	<10	<10	90	<10	708								
Upper Bound		0.43	20	30	112	20	870								

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08			18.8	2.06	108	<10	60	0.6	10	0.85	17.7	91	78	7980	4.89	10
OGGeo08			19.7	2.19	113	<10	60	0.6	12	0.88	18.5	94	81	8310	5.15	<10
Target Range - Lower Bound			18.0	2.05	105	<10	60	<0.5	6	0.82	16.2	86	75	7800	4.51	<10
Upper Bound			22.4	2.53	133	30	110	1.8	15	1.02	21.0	108	93	8980	5.53	30
OREAS 503c		0.689														
OREAS 503c		0.698														
Target Range - Lower Bound		0.651														
Upper Bound		0.745														
OREAS 602			>100	0.67	691	<10	20	<0.5	63	0.56	26.1	10	34	5440	2.08	<10
OREAS 602			>100	0.61	664	<10	30	<0.5	61	0.52	24.7	10	32	5100	1.99	<10
OREAS 602			>100	0.67	658	<10	30	<0.5	60	0.53	24.5	9	29	5260	2.03	10
Target Range - Lower Bound			106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94	<10
Upper Bound			100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40	30
BLANKS																
BLANK		<0.005														
BLANK		0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Target Range - Lower Bound			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Upper Bound			0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02	20

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08		<1	0.99	30	0.90	371	841	0.27	8420	760	6760	2.62	21	5	60	20
OGGeo08		1	1.06	30	0.94	384	876	0.29	8870	800	7080	2.76	21	6	64	20
Target Range - Lower Bound		<1	0.94	<10	0.84	350	810	0.26	7760	700	6510	2.51	15	4	59	<20
Upper Bound		3	1.18	50	1.05	438	992	0.34	9480	880	7970	3.09	27	9	74	60
OREAS 503c																
OREAS 503c																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		1	0.09	10	0.11	219	4	0.02	64	240	865	2.08	61	1	49	<20
OREAS 602		1	0.09	10	0.10	208	4	0.02	61	230	833	1.98	65	1	48	<20
OREAS 602		1	0.10	10	0.10	211	4	0.02	59	230	847	1.98	66	1	51	<20
Target Range - Lower Bound		<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	51	<1	44	<20
Upper Bound		3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	73	3	56	40
BLANKS																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Target Range - Lower Bound		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Upper Bound		2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2	40

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Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
NBM-1										51		42	8.8	5.83	2
NBM-1										50		41	8.8	5.71	2
NBM-1										50		41	8.8	5.71	2
NBM-1										49		40	8.8	5.60	2
Target Range - Lower Bound										45		37	7.8	5.26	
Upper Bound										54		47	9.7	6.08	
OGGeo08		0.29	<10	<10	76	<10	6500								
OGGeo08		0.31	<10	<10	79	<10	6780								
Target Range - Lower Bound		0.27	<10	<10	70	<10	6500								
Upper Bound		0.36	20	30	88	20	7950								
OREAS 503c															
OREAS 503c															
Target Range - Lower Bound															
Upper Bound															
OREAS 602		0.01	<10	<10	11	<10	4130								
OREAS 602		0.01	<10	<10	10	<10	3950								
OREAS 602		0.01	<10	<10	10	<10	4060								
Target Range - Lower Bound		<0.01	<10	<10	8	<10	3680								
Upper Bound		0.03	20	20	14	20	4500								
BLANKS															
BLANK															
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
BLANK								<0.01							
Target Range - Lower Bound								<0.01							
Upper Bound								0.02							
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	<2								
Upper Bound		0.02	20	20	2	20	4								

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method Analyte Units LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		0.018														
DUP		0.023														
Target Range - Lower Bound		0.014														
Upper Bound		0.027														

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
		BLANKS														
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
		DUPLICATES														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS															
BLANK											6.0				
BLANK											6.0				
BLANK											6.0				
BLANK											6.0				
BLANK											6.0				
Target Range - Lower Bound											5.5				
Upper Bound											6.9				
BLANK								<0.01	0.01						
BLANK								<0.01	0.01						
BLANK								<0.01	0.01						
BLANK								<0.01	0.01						
BLANK								<0.01	0.01						
BLANK									<0.01						
BLANK								<0.01	<0.01						
BLANK									0.01						
Target Range - Lower Bound									<0.01						
Upper Bound									0.02						
DUPLICATES															
ORIGINAL									0.88						
DUP									0.87						
Target Range - Lower Bound									0.84						
Upper Bound									0.91						
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
DUPLICATES																
1125021011																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125021156																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126027217			1.1	0.64	27	10	30	<0.5	<2	2.25	2.4	7	73	47	1.99	<10
DUP			1.3	0.64	26	<10	30	<0.5	<2	2.23	2.4	7	72	48	1.96	<10
Target Range - Lower Bound			0.9	0.60	23	<10	20	<0.5	<2	2.12	1.8	6	68	45	1.87	<10
Upper Bound			1.5	0.68	30	20	40	1.0	4	2.36	3.0	8	77	50	2.08	20
1126030119		0.149														
DUP		0.146														
Target Range - Lower Bound		0.135														
Upper Bound		0.160														
1126029083																
DUP																
Target Range - Lower Bound																
Upper Bound																
1232001010																
DUP																
Target Range - Lower Bound																
Upper Bound																
1232001040																
DUP																
Target Range - Lower Bound																
Upper Bound																
1232001152		0.206														
DUP		0.197														
Target Range - Lower Bound		0.186														
Upper Bound		0.217														

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1125021011																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125021156																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126027217		<1	0.14	10	0.71	472	1	0.04	9	350	45	2.10	<2	1	59	<20
DUP		<1	0.14	10	0.71	470	1	0.04	9	350	45	2.07	<2	1	59	<20
Target Range - Lower Bound		<1	0.12	<10	0.66	442	<1	0.03	8	320	41	1.97	<2	<1	55	<20
Upper Bound		2	0.16	20	0.76	500	2	0.05	10	380	49	2.20	4	2	63	40
1126030119																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126029083																
DUP																
Target Range - Lower Bound																
Upper Bound																
1232001010																
DUP																
Target Range - Lower Bound																
Upper Bound																
1232001040																
DUP																
Target Range - Lower Bound																
Upper Bound																
1232001152																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
1125021011								0.59	0.31						
DUP								0.60	0.32						
Target Range - Lower Bound								0.57	0.30						
Upper Bound								0.62	0.33						
1125021156										54	9.5	42	11.9	4.55	2
DUP										54	9.5	42	11.9	4.55	2
Target Range - Lower Bound										50	8.9	39	11.0	4.31	<1
Upper Bound										58	10.1	45	12.8	4.79	3
1126027217		<0.01	<10	<10	3	<10	607								
DUP		<0.01	<10	<10	3	<10	602								
Target Range - Lower Bound		<0.01	<10	<10	2	<10	572								
Upper Bound		0.02	20	20	4	20	637								
1126030119															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126029083								0.61	1.71						
DUP								0.61	1.77						
Target Range - Lower Bound								0.58	1.69						
Upper Bound								0.64	1.79						
1232001010											8.9				
DUP											8.9				
Target Range - Lower Bound											8.4				
Upper Bound											9.4				
1232001040										54		28	26.3	2.06	2
DUP										55		29	26.3	2.10	2
Target Range - Lower Bound										51		26	24.7	1.97	<1
Upper Bound										58		31	27.9	2.19	3
1232001152															
DUP															
Target Range - Lower Bound															
Upper Bound															

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EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1126031265			2.7	1.07	126	<10	170	<0.5	<2	1.45	17.0	10	159	76	2.52	<10
DUP			1.7	1.04	116	<10	160	<0.5	3	1.39	16.4	10	153	74	2.41	<10
Target Range - Lower Bound			1.9	0.99	113	<10	140	<0.5	<2	1.34	15.4	9	147	71	2.33	<10
Upper Bound			2.5	1.12	129	20	190	1.0	4	1.50	18.0	12	165	79	2.60	20
1126029118		0.353														
DUP		0.351														
Target Range - Lower Bound		0.329														
Upper Bound		0.375														
1125003026																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126026210																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125007033																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126026241			1.4	0.38	60	<10	20	<0.5	<2	1.92	3.5	5	93	34	1.67	<10
DUP			0.9	0.39	63	<10	30	<0.5	<2	1.99	3.7	5	97	36	1.73	<10
Target Range - Lower Bound			0.9	0.36	56	<10	<10	<0.5	<2	1.85	2.9	4	89	33	1.61	<10
Upper Bound			1.4	0.41	67	20	40	1.0	4	2.06	4.3	6	101	37	1.80	20
1126028015		0.174														
DUP		0.171														
Target Range - Lower Bound		0.159														
Upper Bound		0.186														
1126026165																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1126031265		<1	0.76	10	0.81	862	1	<0.01	16	960	146	1.98	<2	3	138	<20
DUP		<1	0.75	10	0.77	840	1	<0.01	15	920	140	1.90	<2	3	132	<20
Target Range - Lower Bound		<1	0.71	<10	0.74	803	<1	<0.01	14	880	134	1.83	<2	2	127	<20
Upper Bound		2	0.80	20	0.84	899	2	0.02	17	1000	152	2.05	4	4	143	40
1126029118																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125003026																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126026210																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125007033																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126026241		<1	0.21	10	0.75	1645	<1	<0.01	6	400	171	1.37	<2	<1	36	<20
DUP		<1	0.22	10	0.77	1715	<1	<0.01	7	410	174	1.44	<2	<1	37	<20
Target Range - Lower Bound		<1	0.19	<10	0.71	1590	<1	<0.01	5	370	162	1.32	<2	<1	34	<20
Upper Bound		2	0.24	20	0.81	1770	2	0.02	8	440	183	1.49	4	2	39	40
1126028015																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126026165																
DUP																
Target Range - Lower Bound																
Upper Bound																

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EMO ON P0W 1E0

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
1126031265		0.06	<10	<10	19	<10	3990								
DUP		0.06	<10	<10	18	<10	3900								
Target Range - Lower Bound		0.05	<10	<10	17	<10	3750								
Upper Bound		0.07	20	20	20	20	4140								
1126029118															
DUP															
Target Range - Lower Bound															
Upper Bound															
1125003026								0.33	0.28						
DUP								0.33	0.28						
Target Range - Lower Bound								0.31	0.26						
Upper Bound								0.35	0.30						
1126026210											8.9				
DUP											8.9				
Target Range - Lower Bound											8.4				
Upper Bound											9.4				
1125007033										71		68	3.1	22.72	2
DUP										71		68	3.1	22.72	2
Target Range - Lower Bound										66		64	2.6	21.57	<1
Upper Bound										76		72	3.6	23.87	3
1126026241		<0.01	<10	<10	2	<10	920								
DUP		<0.01	<10	<10	2	<10	947								
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	885								
Upper Bound		0.02	20	20	3	20	982								
1126028015															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126026165									2.05						
DUP									2.07						
Target Range - Lower Bound									2.00						
Upper Bound									2.12						

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EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1126026273																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125003016																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127040017			1.3	0.65	360	<10	20	<0.5	<2	0.42	11.7	6	157	129	2.28	<10
DUP			1.5	0.69	386	<10	20	<0.5	2	0.44	11.8	6	159	120	2.30	<10
Target Range - Lower Bound			1.1	0.63	352	<10	<10	<0.5	<2	0.40	10.7	5	149	119	2.17	<10
Upper Bound			1.7	0.71	394	20	30	1.0	4	0.46	12.8	7	167	130	2.41	20
1125005046		0.121														
DUP		0.115														
Target Range - Lower Bound		0.107														
Upper Bound		0.129														
1126026133		0.205														
DUP		0.217														
Target Range - Lower Bound		0.195														
Upper Bound		0.227														
1126026106																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 3-AUG-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1126026273																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125003016																
DUP																
Target Range - Lower Bound																
Upper Bound																
1127040017		<1	0.21	10	0.40	477	1	<0.01	8	490	194	2.21	4	<1	10	<20
DUP		<1	0.22	10	0.41	493	1	<0.01	8	510	203	2.23	3	<1	10	<20
Target Range - Lower Bound		<1	0.19	<10	0.37	456	<1	<0.01	7	470	187	2.10	<2	<1	9	<20
Upper Bound		2	0.24	20	0.44	514	2	0.02	9	540	210	2.34	4	2	12	40
1125005046																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126026133																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126026106																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
1126026273								0.37	0.97						
DUP								0.37	0.98						
Target Range - Lower Bound								0.35	0.94						
Upper Bound								0.39	1.00						
1125003016											9.6				
DUP											9.6				
Target Range - Lower Bound											9.0				
Upper Bound											10.2				
1127040017		<0.01	<10	<10	3	<10	2760			13		-48	61.3	0.21	1
DUP		<0.01	<10	<10	3	<10	2770			14		-47	61.3	0.23	1
Target Range - Lower Bound		<0.01	<10	<10	2	<10	2620			12		-51	57.9	0.20	<1
Upper Bound		0.02	20	20	4	20	2910			15		-44	64.7	0.24	2
1125005046															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126026133															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126026106											8.9				
DUP											8.9				
Target Range - Lower Bound											8.4				
Upper Bound											9.4				
ORIGINAL								0.30							
DUP								0.30							
Target Range - Lower Bound								0.28							
Upper Bound								0.32							
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
DUPLICATES																
ORIGINAL			0.9	2.26	5	<10	90	0.6	2	1.62	<0.5	14	1	567	6.38	10
DUP			1.0	2.35	6	<10	80	0.6	2	1.67	<0.5	13	2	600	6.58	10
Target Range - Lower Bound			0.7	2.18	3	<10	70	<0.5	<2	1.55	<0.5	12	<1	562	6.15	<10
Upper Bound			1.2	2.43	8	20	100	1.0	4	1.74	1.0	15	2	605	6.81	20
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
ORIGINAL		<1	0.34	10	1.12	3690	1	0.03	1	1090	10	1.74	<2	2	99	<20
DUP		<1	0.36	10	1.16	3780	1	0.03	1	1140	8	1.80	<2	3	102	<20
Target Range - Lower Bound		<1	0.32	<10	1.07	3540	<1	0.02	<1	1050	7	1.67	<2	<1	94	<20
Upper Bound		2	0.38	20	1.21	3930	2	0.04	2	1180	11	1.87	4	4	107	40
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165552

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
ORIGINAL		<0.01	<10	<10	44	<10	159								
DUP		<0.01	<10	<10	46	<10	164								
Target Range - Lower Bound		<0.01	<10	<10	42	<10	151								
Upper Bound		0.02	20	20	48	20	172								
ORIGINAL								3.99	0.39						
DUP								3.99	0.40						
Target Range - Lower Bound								3.88	0.38						
Upper Bound								4.10	0.41						

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Finalized Date: 3-AUG-2018
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Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18165552

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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Finalized Date: 31-JUL-2018
Account: RRR

QC CERTIFICATE TB18165553

Project: Mine Site Lab Pulps May 2018

P.O. No.: 4500009909

This report is for 160 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 10-JUL-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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Finalized Date: 31-JUL-2018
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Project: Mine Site Lab Pulps May 2018

QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34			3.6	2.40	107	<10	110	<0.5	3	1.44	1.0	42	181	5850	4.51	10
CDN-CM-34			3.6	2.40	107	<10	110	<0.5	3	1.44	1.0	41	180	5850	4.51	10
Target Range - Lower Bound			3.1	2.14	93	<10	70	<0.5	<2	1.20	<0.5	36	164	5390	3.91	<10
Upper Bound			4.3	2.64	118	30	140	1.4	8	1.49	2.0	46	202	6210	4.80	30
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10		7.13														
G913-10		7.06														
Target Range - Lower Bound		6.66														
Upper Bound		7.52														

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34		<1	1.22	10	2.61	304	272	0.11	228	1190	21	3.08	5	9	104	<20
CDN-CM-34		<1	1.23	10	2.60	303	272	0.11	229	1200	22	3.13	3	9	104	<20
Target Range - Lower Bound		<1	1.06	<10	2.27	269	245	0.08	204	1050	18	2.70	<2	8	92	<20
Upper Bound		2	1.32	30	2.80	340	301	0.13	252	1310	28	3.32	9	13	115	40
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
G913-10																
G913-10																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
Buffer pH6											6.0				
Buffer pH6											6.1				
Buffer pH6											6.0				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.1				
Buffer pH6											6.0				
Target Range - Lower Bound											5.3				
Upper Bound											6.7				
CDN-CM-34		0.18	<10	<10	105	10	176								
CDN-CM-34		0.18	<10	<10	105	10	175								
Target Range - Lower Bound		0.15	<10	<10	95	<10	159								
Upper Bound		0.21	20	20	118	30	199								
DS-1								3.11							
DS-1								3.08							
DS-1								3.22							
Target Range - Lower Bound								3.01							
Upper Bound								3.25							
DS-1								3.12	2.67						
DS-1									2.65						
DS-1									2.64						
DS-1									2.72						
DS-1									2.62						
Target Range - Lower Bound									2.51						
Upper Bound									2.71						
G913-10															
G913-10															
Target Range - Lower Bound															
Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		1.945														
JK-17		1.985														
JK-17		1.950														
JK-17		1.955														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
GS310-10								1.07							
GS310-10								1.09							
Target Range - Lower Bound								1.03							
Upper Bound								1.13							
GS310-10								1.10	0.26						
GS310-10								1.10	0.27						
GS310-10									0.26						
GS310-10									0.29						
Target Range - Lower Bound									0.25						
Upper Bound									0.29						
GS313-8								0.92							
GS313-8								0.93							
GS313-8								0.94							
Target Range - Lower Bound								0.90							
Upper Bound								0.98							
GS313-8								0.94	1.24						
GS313-8									1.30						
GS313-8									1.28						
GS313-8									1.25						
Target Range - Lower Bound									1.19						
Upper Bound									1.29						
JK-17															
JK-17															
JK-17															
JK-17															
Target Range - Lower Bound															
Upper Bound															
KZK-1										60		35	25.0	2.40	2
KZK-1										59		34	25.0	2.36	2
KZK-1										60		35	25.0	2.40	2
KZK-1										63		38	25.0	2.52	2
KZK-1										60		35	25.0	2.40	2
Target Range - Lower Bound										54		30	22.9	2.18	
Upper Bound										64		38	27.1	2.54	

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
LEA-16		0.517														
LEA-16		0.510														
Target Range - Lower Bound		0.466														
Upper Bound		0.536														
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08			4.6	2.75	35	<10	460	0.8	<2	1.20	2.1	20	96	653	3.88	10
MRGeo08			4.4	2.65	34	<10	450	0.7	2	1.14	2.2	19	91	621	3.73	10
MRGeo08			4.5	2.67	34	10	450	0.7	<2	1.13	2.1	19	93	630	3.69	10
Target Range - Lower Bound			3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22	<10
Upper Bound			5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96	30
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08			19.8	2.18	119	10	70	0.7	9	0.94	18.6	97	82	8590	5.23	10
OGGeo08			19.1	2.11	116	10	70	0.6	8	0.90	17.7	94	78	8220	5.03	10
Target Range - Lower Bound			18.0	2.05	105	<10	60	<0.5	6	0.82	16.2	86	75	7800	4.51	<10
Upper Bound			22.4	2.53	133	30	110	1.8	15	1.02	21.0	108	93	8980	5.53	30
OREAS 503c		0.708														
OREAS 503c		0.704														
OREAS 503c		0.687														
OREAS 503c		0.696														
Target Range - Lower Bound		0.651														
Upper Bound		0.745														
OREAS 602			>100	0.64	664	<10	30	<0.5	58	0.55	24.6	10	36	5170	2.07	10
OREAS 602			>100	0.59	667	<10	30	<0.5	60	0.55	24.7	9	35	5150	2.04	<10

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
LEA-16																
LEA-16																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		<1	1.34	30	1.23	438	14	0.36	742	1070	1120	0.32	5	7	86	20
MRGeo08		<1	1.29	30	1.18	411	14	0.34	713	1050	1080	0.31	3	7	82	20
MRGeo08		<1	1.28	30	1.18	422	14	0.34	717	1030	1085	0.31	3	7	82	20
Target Range - Lower Bound		<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71	<20
Upper Bound		2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89	60
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OGGeo08		1	1.08	30	0.98	394	891	0.29	8970	830	7210	2.81	21	6	64	20
OGGeo08		<1	1.05	30	0.93	375	852	0.29	8640	800	6940	2.71	19	6	62	<20
Target Range - Lower Bound		<1	0.94	<10	0.84	350	810	0.26	7760	700	6510	2.51	15	4	59	<20
Upper Bound		3	1.18	50	1.05	438	992	0.34	9480	880	7970	3.09	27	9	74	60
OREAS 503c																
OREAS 503c																
OREAS 503c																
OREAS 503c																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		1	0.09	10	0.10	212	4	0.03	62	230	830	2.01	67	1	50	<20
OREAS 602		1	0.09	10	0.10	210	4	0.02	62	240	839	2.02	66	1	45	<20

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5967 HWY 11/71
EMO ON P0W 1E0

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
LEA-16															
LEA-16															
Target Range - Lower Bound															
Upper Bound															
MA-1b								2.48							
MA-1b								2.44							
Target Range - Lower Bound								2.34							
Upper Bound								2.54							
MA-1b								2.47	1.23						
MA-1b								2.44	1.18						
MA-1b									1.18						
Target Range - Lower Bound									1.12						
Upper Bound									1.22						
MRGeo08		0.40	<10	<10	106	<10	814								
MRGeo08		0.38	<10	<10	102	<10	777								
MRGeo08		0.38	<10	<10	104	<10	789								
Target Range - Lower Bound		0.33	<10	<10	90	<10	708								
Upper Bound		0.43	20	30	112	20	870								
NBM-1										51		42	8.8	5.83	2
NBM-1										51		42	8.8	5.83	2
NBM-1										50		41	8.8	5.71	2
NBM-1										53		44	8.8	6.06	2
NBM-1										51		42	8.8	5.83	2
Target Range - Lower Bound										45		37	7.8	5.26	
Upper Bound										54		47	9.7	6.08	
OGGeo08		0.31	<10	<10	80	10	6990								
OGGeo08		0.30	<10	<10	77	10	6670								
Target Range - Lower Bound		0.27	<10	<10	70	<10	6500								
Upper Bound		0.36	20	30	88	20	7950								
OREAS 503c															
OREAS 503c															
OREAS 503c															
OREAS 503c															
Target Range - Lower Bound															
Upper Bound															
OREAS 602		0.01	<10	<10	10	<10	3980								
OREAS 602		0.01	<10	<10	10	<10	3940								

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5967 HWY 11/71
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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
STANDARDS																
OREAS 602			>100	0.62	679	<10	30	<0.5	60	0.54	25.3	10	33	5180	2.04	<10
Target Range - Lower Bound			106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94	<10
Upper Bound			100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40	30
BLANKS																
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
BLANK			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Target Range - Lower Bound			<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01	<10
Upper Bound			0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02	20
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
STANDARDS																
OREAS 602		1	0.09	10	0.10	213	4	0.02	61	240	845	2.03	68	1	48	<20
Target Range - Lower Bound		<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	51	<1	44	<20
Upper Bound		3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	73	3	56	40
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
BLANK		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Target Range - Lower Bound		<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1	<20
Upper Bound		2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2	40
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS															
OREAS 602		0.01	<10	<10	10	10	3980								
Target Range - Lower Bound		<0.01	<10	<10	8	<10	3680								
Upper Bound		0.03	20	20	14	20	4500								
BLANKS															
BLANK															
BLANK															
BLANK															
BLANK															
BLANK															
BLANK															
Target Range - Lower Bound															
Upper Bound															
BLANK								<0.01							
BLANK								<0.01							
BLANK								0.01							
BLANK								<0.01							
BLANK								<0.01							
Target Range - Lower Bound								<0.01							
Upper Bound								0.02							
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
BLANK		<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<0.01	<10	<10	<1	<10	<2								
Upper Bound		0.02	20	20	2	20	4								
BLANK											6.1				
BLANK											6.0				
BLANK											6.0				
BLANK											6.0				
BLANK											6.1				
Target Range - Lower Bound											5.5				
Upper Bound											6.9				

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL		0.007														
DUP		0.007														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		0.011														
DUP		0.009														
Target Range - Lower Bound		<0.005														
Upper Bound		0.016														
ORIGINAL		0.023														
DUP		0.020														
Target Range - Lower Bound		0.015														
Upper Bound		0.028														
ORIGINAL		0.068														
DUP		0.069														
Target Range - Lower Bound		0.060														
Upper Bound		0.077														
ORIGINAL		0.478														
DUP		0.465														
Target Range - Lower Bound		0.443														
Upper Bound		0.500														

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS															
BLANK								<0.01	0.01						
BLANK								<0.01	<0.01						
BLANK								<0.01	0.01						
BLANK									0.01						
BLANK									<0.01						
BLANK									0.01						
BLANK									<0.01						
BLANK									0.01						
Target Range - Lower Bound									<0.01						
Upper Bound									0.02						
DUPLICATES															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
ORIGINAL		0.041														
DUP		0.040														
Target Range - Lower Bound		0.033														
Upper Bound		0.048														
ORIGINAL			0.7	2.04	2	10	100	<0.5	<2	1.74	0.9	3	8	381	2.03	10
DUP			0.8	2.03	2	10	100	<0.5	<2	1.75	0.9	3	8	373	2.02	10
Target Range - Lower Bound			0.5	1.92	<2	<10	80	<0.5	<2	1.65	<0.5	2	7	363	1.91	<10
Upper Bound			1.0	2.15	4	20	120	1.0	4	1.84	1.0	4	9	391	2.14	20
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126020040																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125005004																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126020164																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126022104		0.031														
DUP		0.030														
Target Range - Lower Bound		0.024														
Upper Bound		0.037														
1126022145			<0.2	1.10	4	<10	160	<0.5	<2	2.53	<0.5	9	170	52	2.26	<10
DUP			0.2	1.08	3	<10	150	<0.5	<2	2.45	<0.5	9	168	52	2.22	<10
Target Range - Lower Bound			<0.2	1.03	<2	<10	130	<0.5	<2	2.36	<0.5	8	160	49	2.12	<10
Upper Bound			0.4	1.15	4	20	180	1.0	4	2.62	1.0	10	178	55	2.36	20

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5967 HWY 11/71
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Project: Mine Site Lab Pulps May 2018

QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method Analyte Units LOD	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1	ME-ICP41 Th ppm 20
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<1	0.34	10	0.49	294	13	0.17	3	520	76	0.81	<2	1	163	<20
DUP		<1	0.34	10	0.49	293	12	0.17	3	520	73	0.80	<2	1	162	<20
Target Range - Lower Bound		<1	0.31	<10	0.46	274	11	0.15	2	480	69	0.75	<2	<1	153	<20
Upper Bound		2	0.37	20	0.52	313	14	0.19	4	560	80	0.86	4	2	172	40
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126020040																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125005004																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126020164																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126022104																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126022145		<1	0.28	20	0.94	470	1	0.05	12	740	2	0.21	<2	2	125	<20
DUP		<1	0.28	20	0.92	467	1	0.05	12	740	2	0.19	<2	2	122	<20
Target Range - Lower Bound		<1	0.26	<10	0.87	440	<1	0.04	10	690	<2	0.18	<2	<1	116	<20
Upper Bound		2	0.30	30	0.99	497	2	0.06	14	790	4	0.22	4	3	131	40

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL		0.05	<10	<10	6	<10	196								
DUP		0.05	<10	<10	6	<10	198								
Target Range - Lower Bound		0.04	<10	<10	5	<10	185								
Upper Bound		0.06	20	20	7	20	209								
ORIGINAL								0.15							
DUP								0.16							
Target Range - Lower Bound								0.14							
Upper Bound								0.17							
1126020040											9.0				
DUP											8.9				
Target Range - Lower Bound											8.4				
Upper Bound											9.5				
1125005004										25		-7	32.2	0.78	2
DUP										27		-5	32.2	0.84	2
Target Range - Lower Bound										24		-7	30.3	0.76	<1
Upper Bound										28		-5	34.1	0.86	3
1126020164								0.30	2.08						
DUP								0.30	2.03						
Target Range - Lower Bound								0.28	1.99						
Upper Bound								0.32	2.12						
1126022104															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126022145		0.03	<10	<10	24	<10	47								
DUP		0.03	<10	<10	24	<10	46								
Target Range - Lower Bound		0.02	<10	<10	22	<10	42								
Upper Bound		0.04	20	20	26	20	51								

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1229002086		0.215														
DUP		0.208														
Target Range - Lower Bound		0.196														
Upper Bound		0.227														
1229002060																
DUP																
Target Range - Lower Bound																
Upper Bound																
1229002144																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126022016		0.036														
DUP		0.028														
Target Range - Lower Bound		0.025														
Upper Bound		0.039														
1229003609																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126022036			<0.2	0.95	7	<10	40	<0.5	<2	1.71	<0.5	8	169	36	2.01	<10
DUP			0.2	0.96	6	<10	40	<0.5	<2	1.72	<0.5	8	179	35	2.02	<10
Target Range - Lower Bound			<0.2	0.90	4	<10	30	<0.5	<2	1.62	<0.5	7	164	33	1.90	<10
Upper Bound			0.4	1.01	9	20	50	1.0	4	1.81	1.0	9	184	38	2.13	20
1126025200																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126025117																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1229002086																
DUP																
Target Range - Lower Bound																
Upper Bound																
1229002060																
DUP																
Target Range - Lower Bound																
Upper Bound																
1229002144																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126022016																
DUP																
Target Range - Lower Bound																
Upper Bound																
1229003609																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126022036		<1	0.14	10	0.55	311	1	0.04	9	370	<2	0.40	<2	1	25	<20
DUP		<1	0.15	10	0.55	309	1	0.04	10	380	2	0.40	<2	1	25	<20
Target Range - Lower Bound		<1	0.13	<10	0.51	290	<1	0.03	8	350	<2	0.37	<2	<1	23	<20
Upper Bound		2	0.16	20	0.59	331	2	0.05	11	400	4	0.43	4	2	27	40
1126025200																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126025117																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
1229002086															
DUP															
Target Range - Lower Bound															
Upper Bound															
1229002060										3		-78	80.9	0.04	1
DUP										3		-78	80.9	0.04	1
Target Range - Lower Bound										2		-83	76.6	0.03	<1
Upper Bound										4		-73	85.2	0.05	2
1229002144								0.22	2.16						
DUP								0.22	2.13						
Target Range - Lower Bound								0.20	2.15						
Upper Bound								0.24	2.28						
1126022016															
DUP															
Target Range - Lower Bound															
Upper Bound															
1229003609											8.9				
DUP											9.0				
Target Range - Lower Bound											8.4				
Upper Bound											9.5				
1126022036		0.01	<10	<10	14	<10	28								
DUP		0.01	<10	<10	14	<10	28								
Target Range - Lower Bound		<0.01	<10	<10	12	<10	25								
Upper Bound		0.02	20	20	16	20	31								
1126025200								0.34	0.94						
DUP								0.33	0.96						
Target Range - Lower Bound								0.32	0.92						
Upper Bound								0.35	0.98						
1126025117											9.1				
DUP											9.1				
Target Range - Lower Bound											8.5				
Upper Bound											9.7				

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Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1125006073	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1126025121	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1230005194	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1230005142	DUP	0.299														
	Target Range - Lower Bound	0.319														
	Upper Bound	0.289														
		0.329														
1126018041	DUP		1.3	1.20	28	<10	30	<0.5	<2	2.20	0.9	8	121	43	1.85	<10
	Target Range - Lower Bound		1.2	1.14	27	<10	30	<0.5	<2	2.17	1.0	8	119	42	1.83	<10
	Upper Bound		1.0	1.10	24	<10	20	<0.5	<2	2.07	<0.5	7	113	40	1.74	<10
			1.5	1.24	31	20	40	1.0	4	2.30	1.0	9	127	45	1.94	20
1126014002	DUP	1.030														
	Target Range - Lower Bound	1.085														
	Upper Bound	1.000														
		1.115														
1126016046	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1126016147	DUP															
	Target Range - Lower Bound															
	Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1125006073																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126025121																
DUP																
Target Range - Lower Bound																
Upper Bound																
1230005194																
DUP																
Target Range - Lower Bound																
Upper Bound																
1230005142																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126018041		<1	0.21	10	0.85	1020	1	0.04	11	420	131	1.73	<2	1	20	<20
DUP		<1	0.20	10	0.80	996	<1	0.03	10	410	133	1.73	<2	1	20	<20
Target Range - Lower Bound		<1	0.18	<10	0.77	953	<1	0.02	9	380	123	1.63	<2	<1	18	<20
Upper Bound		2	0.23	20	0.88	1065	2	0.05	12	450	141	1.83	4	2	22	40
1126014002																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126016046																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126016147																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
1125006073									1.00						
DUP									0.98						
Target Range - Lower Bound									0.96						
Upper Bound									1.02						
1126025121										71		52	19.4	3.66	2
DUP										71		52	19.4	3.66	2
Target Range - Lower Bound										66		48	18.1	3.47	<1
Upper Bound										76		56	20.7	3.85	3
1230005194								0.57	1.63						
DUP								0.58	1.64						
Target Range - Lower Bound								0.55	1.58						
Upper Bound								0.60	1.69						
1230005142															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126018041		<0.01	<10	<10	5	<10	276								
DUP		<0.01	<10	<10	5	<10	276								
Target Range - Lower Bound		<0.01	<10	<10	4	<10	260								
Upper Bound		0.02	20	20	6	20	292								
1126014002															
DUP															
Target Range - Lower Bound															
Upper Bound															
1126016046										77		23	54.1	1.42	2
DUP										75		21	54.1	1.39	2
Target Range - Lower Bound										71		20	51.1	1.32	<1
Upper Bound										81		24	57.1	1.49	3
1126016147								0.24	2.36						
DUP								0.25	2.32						
Target Range - Lower Bound								0.23	2.27						
Upper Bound								0.26	2.41						

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Finalized Date: 31-JUL-2018
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Project: Mine Site Lab Pulps May 2018

QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01	ME-ICP41 Ga ppm 10
DUPLICATES																
1126018048		0.744	4.1	0.71	38	<10	40	<0.5	<2	2.68	1.8	8	164	33	2.04	<10
DUP		0.688	3.7	0.71	38	<10	40	<0.5	<2	2.62	1.8	7	162	32	2.00	<10
Target Range - Lower Bound		0.675	3.5	0.66	34	<10	30	<0.5	<2	2.51	1.2	6	154	30	1.91	<10
Upper Bound		0.757	4.3	0.76	42	20	50	1.0	4	2.79	2.4	9	172	35	2.13	20
1126019132																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126024083																
DUP																
Target Range - Lower Bound																
Upper Bound																
V829080																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		0.131														
DUP		0.131														
Target Range - Lower Bound		0.119														
Upper Bound		0.143														
ORIGINAL		0.256														
DUP		0.199														
Target Range - Lower Bound		0.211														
Upper Bound		0.244														
ORIGINAL		0.190														
DUP		0.175														
Target Range - Lower Bound		0.168														
Upper Bound		0.197														

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
1126018048		<1	0.23	10	0.89	1750	1	0.02	9	410	198	2.02	3	1	23	<20
DUP		<1	0.23	10	0.87	1705	1	0.02	9	410	194	2.00	2	1	24	<20
Target Range - Lower Bound		<1	0.21	<10	0.83	1635	<1	<0.01	8	380	184	1.90	<2	<1	21	<20
Upper Bound		2	0.25	20	0.93	1820	2	0.03	10	440	208	2.12	4	2	26	40
1126019132																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126024083																
DUP																
Target Range - Lower Bound																
Upper Bound																
V829080																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
1126018048		<0.01	<10	<10	3	<10	492								
DUP		<0.01	<10	<10	3	<10	489								
Target Range - Lower Bound		<0.01	<10	<10	2	<10	464								
Upper Bound		0.02	20	20	4	20	517								
1126019132											9.0				
DUP											8.8				
Target Range - Lower Bound											8.4				
Upper Bound											9.4				
1126024083									1.87	14	8.6	-44	58.4	0.24	1
DUP									1.78	14	8.7	-42	55.6	0.25	1
Target Range - Lower Bound									1.77	12	8.1	-46	53.9	0.22	<1
Upper Bound									1.88	16	9.2	-40	60.2	0.27	2
V829080								0.35							
DUP								0.36							
Target Range - Lower Bound								0.34							
Upper Bound								0.37							
ORIGINAL								0.01							
DUP								0.02							
Target Range - Lower Bound								<0.01							
Upper Bound								0.02							
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	Au-AA23	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe	Ga
	Units	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%	ppm
	LOD	0.005	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01	10
DUPLICATES																
ORIGINAL		0.050														
DUP		0.050														
Target Range - Lower Bound		0.043														
Upper Bound		0.058														
ORIGINAL		0.018														
DUP		0.014														
Target Range - Lower Bound		0.010														
Upper Bound		0.022														
ORIGINAL		0.020														
DUP		0.020														
Target Range - Lower Bound		0.014														
Upper Bound		0.026														

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr	Th
	Units	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm
	LOD	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1	20
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18165553

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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EMO ON P0W 1E0

Finalized Date: 31-JUL-2018
Account: RRR

Project: Mine Site Lab Pulps May 2018

QC CERTIFICATE OF ANALYSIS TB18165553

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	C-IR07	ME-ICP41	OA-ELE07
OA-VOL08	S-IR08		

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

QC CERTIFICATE TB18214709

Project: Mine Site Lab Pulps June 2018

P.O. No.: 4500009909

This report is for 207 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 30-AUG-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34				3.5	2.42	103	<10	70	<0.5	4	1.33	0.9	41	182	5910	4.37
CDN-CM-34				3.6	2.52	102	<10	100	<0.5	3	1.32	1.0	41	182	5660	4.33
CDN-CM-34				3.7	2.42	104	<10	100	<0.5	5	1.33	1.1	41	180	5730	4.33
CDN-CM-34				3.7	2.40	107	<10	90	<0.5	4	1.33	0.9	41	178	5820	4.36
Target Range - Lower Bound				3.1	2.14	93	<10	70	<0.5	<2	1.20	<0.5	36	164	5390	3.91
Upper Bound				4.3	2.64	118	30	140	1.4	8	1.49	2.0	46	202	6210	4.80
CDN-GS-P6A		0.750														
CDN-GS-P6A		0.744														
Target Range - Lower Bound		0.689														
Upper Bound		0.787														
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																

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Account: RRR

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34		10	<1	1.18	10	2.55	311	281	0.12	233	1190	21	3.05	3	9	104
CDN-CM-34		10	1	1.18	10	2.53	300	275	0.10	228	1160	23	3.00	4	9	102
CDN-CM-34		10	<1	1.17	10	2.51	300	269	0.10	226	1140	21	3.02	5	9	102
CDN-CM-34		10	1	1.19	10	2.51	303	268	0.10	228	1160	24	3.04	5	9	102
Target Range - Lower Bound		<10	<1	1.06	<10	2.27	269	245	0.08	204	1050	18	2.70	<2	8	92
Upper Bound		30	2	1.32	30	2.80	340	301	0.13	252	1310	28	3.32	9	13	115
CDN-GS-P6A																
CDN-GS-P6A																
Target Range - Lower Bound																
Upper Bound																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.1				
Target Range - Lower Bound												5.3				
Upper Bound												6.7				
CDN-CM-34		<20	0.18	<10	<10	106	10	176								
CDN-CM-34		<20	0.18	<10	<10	104	10	176								
CDN-CM-34		<20	0.18	<10	<10	103	10	175								
CDN-CM-34		<20	0.18	<10	<10	103	10	175								
Target Range - Lower Bound		<20	0.15	<10	<10	95	<10	159								
Upper Bound		40	0.21	20	20	118	30	199								
CDN-GS-P6A																
CDN-GS-P6A																
Target Range - Lower Bound																
Upper Bound																
DS-1									3.15							
Target Range - Lower Bound									3.01							
Upper Bound									3.25							
DS-1									3.07	2.63						
DS-1									3.16	2.52						
DS-1									3.17	2.67						
DS-1										2.63						
DS-1										2.68						
Target Range - Lower Bound										2.51						
Upper Bound										2.71						

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
EMOG-17				68.3	1.59	597	<10	40	<0.5	8	0.97	20.0	768	47	8670	4.67
EMOG-17				65.1	1.56	567	<10	40	<0.5	6	0.94	19.3	736	46	8080	4.48
EMOG-17				64.5	1.52	565	<10	50	<0.5	5	0.91	19.3	734	45	8120	4.46
EMOG-17				66.8	1.59	584	<10	40	<0.5	8	0.94	19.6	757	46	8360	4.65
Target Range - Lower Bound				59.3	1.45	503	<10	30	<0.5	<2	0.87	17.9	679	42	7780	4.18
Upper Bound				72.9	1.79	619	20	80	1.5	10	1.09	22.9	833	54	8960	5.14
G913-10		7.09														
G913-10		7.23														
Target Range - Lower Bound		6.66														
Upper Bound		7.52														
G913-10			7.18													
Target Range - Lower Bound			6.61													
Upper Bound			7.57													
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		1.990														
JK-17		1.995														
JK-17		1.970														
JK-17		1.975														
JK-17		1.955														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
EMOG-17		10	2	0.66	20	0.79	648	1095	0.16	7810	790	7400	3.23	694	5	55
EMOG-17		10	1	0.64	20	0.76	622	1055	0.16	7520	740	7040	3.06	709	5	54
EMOG-17		<10	1	0.63	20	0.75	616	1040	0.16	7490	730	7000	3.06	702	4	51
EMOG-17		10	1	0.66	20	0.77	637	1070	0.17	7760	780	7220	3.18	711	5	54
Target Range - Lower Bound		<10	<1	0.60	<10	0.73	598	1015	0.15	6930	680	6500	2.90	572	3	47
Upper Bound		30	3	0.76	40	0.91	742	1245	0.20	8470	850	7950	3.56	778	7	59
G913-10																
G913-10																
Target Range - Lower Bound																
Upper Bound																
G913-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
EMOG-17		<20	0.22	<10	<10	65	<10	7440								
EMOG-17		<20	0.21	<10	<10	63	<10	7080								
EMOG-17		<20	0.20	<10	<10	62	<10	7070								
EMOG-17		<20	0.21	<10	<10	63	<10	7250								
Target Range - Lower Bound		<20	0.18	<10	<10	58	<10	6780								
Upper Bound		50	0.25	20	20	74	20	8290								
G913-10																
G913-10																
Target Range - Lower Bound																
Upper Bound																
G913-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10									1.06	0.26						
GS310-10									1.12	0.26						
GS310-10									1.06	0.27						
GS310-10									1.04	0.28						
GS310-10										0.27						
Target Range - Lower Bound										0.25						
Upper Bound										0.29						
GS313-8									0.97							
Target Range - Lower Bound									0.90							
Upper Bound									0.98							
GS313-8									0.93	1.28						
GS313-8									0.97	1.24						
GS313-8									0.94	1.23						
GS313-8										1.24						
GS313-8										1.29						
Target Range - Lower Bound										1.19						
Upper Bound										1.29						
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08				4.5	2.60	36	<10	440	0.7	2	1.06	2.0	19	90	612	3.57
MRGeo08				4.6	2.64	35	<10	440	0.7	<2	1.07	2.2	18	91	630	3.59
MRGeo08				4.4	2.61	35	<10	440	0.7	3	1.06	2.1	19	90	615	3.58
Target Range - Lower Bound				3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22
Upper Bound				5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OREAS 503c		0.678														
OREAS 503c		0.703														
OREAS 503c		0.707														
OREAS 503c		0.697														
OREAS 503c		0.682														
Target Range - Lower Bound		0.651														
Upper Bound		0.745														
OREAS 602				>100	0.64	681	<10	30	<0.5	59	0.53	25.5	10	34	5230	2.05

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5967 HWY 11/71
EMO ON P0W 1E0

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		10	1	1.24	30	1.13	409	13	0.33	697	1010	1065	0.30	<2	7	79
MRGeo08		10	1	1.26	30	1.14	415	13	0.33	700	1000	1065	0.30	3	7	81
MRGeo08		10	1	1.23	30	1.13	407	14	0.33	698	1010	1065	0.29	2	7	81
Target Range - Lower Bound		<10	<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71
Upper Bound		30	2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OREAS 503c																
OREAS 503c																
OREAS 503c																
OREAS 503c																
OREAS 503c																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		<10	1	0.09	10	0.10	214	4	0.02	62	240	852	2.03	68	1	49

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
KZK-1											59		34	25.0	2.36	2
KZK-1											60		35	25.0	2.40	2
KZK-1											59		34	25.0	2.36	2
KZK-1											60		35	25.0	2.40	2
KZK-1											59		34	25.0	2.36	2
KZK-1											59		34	25.0	2.36	2
Target Range - Lower Bound											54		30	22.9	2.18	
Upper Bound											64		38	27.1	2.54	
MA-1b									2.43	1.13						
MA-1b									2.50	1.22						
MA-1b									2.41	1.21						
MA-1b									2.37	1.19						
MA-1b										1.18						
Target Range - Lower Bound										1.12						
Upper Bound										1.22						
MP-1b										13.45						
Target Range - Lower Bound										13.30						
Upper Bound										14.30						
MRGeo08		20	0.38	<10	<10	99	<10	764								
MRGeo08		20	0.38	<10	<10	100	<10	771								
MRGeo08		20	0.38	<10	<10	99	<10	766								
Target Range - Lower Bound		<20	0.33	<10	<10	90	<10	708								
Upper Bound		60	0.43	20	30	112	20	870								
NBM-1											51		42	8.8	5.83	2
NBM-1											51		42	8.8	5.83	2
NBM-1											49		40	8.8	5.60	2
NBM-1											49		40	8.8	5.60	2
NBM-1											50		41	8.8	5.71	2
NBM-1											50		41	8.8	5.71	2
Target Range - Lower Bound											45		37	7.8	5.26	
Upper Bound											54		47	9.7	6.08	
OREAS 503c																
OREAS 503c																
OREAS 503c																
OREAS 503c																
OREAS 503c																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		<20	0.01	<10	<10	10	<10	4050								

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
OREAS 602				>100	0.65	670	<10	30	<0.5	59	0.52	25.3	9	31	5170	2.04
OREAS 602				>100	0.61	668	<10	30	<0.5	60	0.51	25.4	10	30	5170	2.01
Target Range - Lower Bound				106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94
Upper Bound				100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40
BLANKS																
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Target Range - Lower Bound				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Upper Bound				0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
OREAS 602		<10	1	0.09	10	0.11	215	4	0.02	60	240	841	2.02	66	1	49
OREAS 602		<10	1	0.09	10	0.10	209	4	0.02	60	230	837	2.02	65	1	47
Target Range - Lower Bound		<10	<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	51	<1	44
Upper Bound		30	3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	73	3	56
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	1	<0.01	<10	<0.01	<5	<1	<0.01	1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
Target Range - Lower Bound		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
Upper Bound		20	2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
OREAS 602		<20	0.01	<10	<10	10	<10	4020								
OREAS 602		<20	0.01	<10	<10	10	<10	3980								
Target Range - Lower Bound		<20	<0.01	<10	<10	8	<10	3680								
Upper Bound		40	0.03	20	20	14	20	4500								
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK									<0.01							
Target Range - Lower Bound									<0.01							
Upper Bound									0.02							
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<20	<0.01	<10	<10	<1	<10	<2								
Upper Bound		40	0.02	20	20	2	20	4								

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		0.309														
DUP		0.324														
Target Range - Lower Bound		0.296														
Upper Bound		0.337														

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS																
BLANK												6.0				
BLANK												6.0				
BLANK												6.0				
BLANK												5.9				
BLANK												5.9				
BLANK												6.0				
Target Range - Lower Bound												5.5				
Upper Bound												6.9				
BLANK									0.01	0.01						
BLANK									<0.01	<0.01						
BLANK									<0.01	0.01						
BLANK									<0.01	0.01						
BLANK									<0.01	<0.01						
BLANK									<0.01	0.01						
BLANK									<0.01	0.01						
BLANK										<0.01						
BLANK										0.01						
BLANK										<0.01						
Target Range - Lower Bound										<0.01						
Upper Bound										0.02						
DUPLICATES																
ORIGINAL									2.16	1.53						
DUP									2.18	1.52						
Target Range - Lower Bound									2.11	1.44						
Upper Bound									2.23	1.53						
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
ORIGINAL		<0.005														
DUP		0.008														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL			<0.05													
DUP			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
ORIGINAL			<0.05													
DUP			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
ORIGINAL		4.44														
DUP		4.39														
Target Range - Lower Bound		4.19														
Upper Bound		4.64														
ORIGINAL		0.076														
DUP		0.147														
Target Range - Lower Bound		0.101														
Upper Bound		0.122														
ORIGINAL		0.012														
DUP		0.013														
Target Range - Lower Bound		0.007														
Upper Bound		0.018														
1232001120		0.109														
DUP		0.248														
Target Range - Lower Bound		0.165														
Upper Bound		0.192														

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
		DUPLICATES														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
1232001120																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
		DUPLICATES														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
1232001120																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
1232001068																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126033505																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125023147																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125019056				0.5	1.03	6	<10	40	<0.5	<2	1.55	<0.5	10	335	46	2.11
DUP				0.6	1.04	6	<10	40	<0.5	<2	1.55	<0.5	10	340	47	2.14
Target Range - Lower Bound				0.3	0.97	4	<10	30	<0.5	<2	1.46	<0.5	9	320	44	2.01
Upper Bound				0.8	1.10	8	20	50	1.0	4	1.64	1.0	12	355	49	2.24
1125018335		0.521														
DUP		0.512														
Target Range - Lower Bound		0.486														
Upper Bound		0.547														
1125017207																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125017007																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125018309																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
1232001068																
DUP																
Target Range - Lower Bound																
Upper Bound																
1126033505																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125023147																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125019056		10	1	0.09	10	0.59	285	1	0.05	10	410	3	0.56	<2	1	29
DUP		10	1	0.09	10	0.60	284	1	0.05	11	410	3	0.58	<2	1	29
Target Range - Lower Bound		<10	<1	0.08	<10	0.56	265	<1	0.04	9	380	<2	0.53	<2	<1	27
Upper Bound		20	2	0.10	20	0.63	304	2	0.06	12	440	4	0.61	4	2	31
1125018335																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125017207																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125017007																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125018309																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1232001068											51		37	13.8	3.71	2
DUP											53		39	13.8	3.85	2
Target Range - Lower Bound											48		35	12.8	3.58	<1
Upper Bound											56		41	14.8	3.98	3
1126033505									0.33	2.16						
DUP									0.32	2.17						
Target Range - Lower Bound									0.31	2.10						
Upper Bound									0.34	2.23						
1125023147												8.4				
DUP												8.4				
Target Range - Lower Bound												7.9				
Upper Bound												8.9				
1125019056		<20	0.01	<10	<10	14	<10	34								
DUP		<20	0.01	<10	<10	14	<10	32								
Target Range - Lower Bound		<20	<0.01	<10	<10	12	<10	29								
Upper Bound		40	0.02	20	20	16	20	37								
1125018335																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125017207											86		34	52.5	1.64	2
DUP											86		34	52.5	1.64	2
Target Range - Lower Bound											81		31	49.6	1.55	<1
Upper Bound											91		37	55.4	1.73	3
1125017007												8.7				
DUP												8.7				
Target Range - Lower Bound												8.2				
Upper Bound												9.2				
1125018309									0.67	1.55						
DUP									0.68	1.54						
Target Range - Lower Bound									0.65	1.50						
Upper Bound									0.70	1.59						

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Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
1125011091				1.5	0.91	104	<10	40	<0.5	2	1.56	1.5	13	129	66	2.61
DUP				1.2	0.92	106	<10	40	<0.5	<2	1.58	1.5	14	127	66	2.63
Target Range - Lower Bound				1.1	0.86	98	<10	30	<0.5	<2	1.48	0.9	12	121	63	2.48
Upper Bound				1.6	0.97	112	20	50	1.0	4	1.66	2.1	15	135	69	2.76
1125027072																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125015070																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125012054																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125016122		2.03														
DUP		2.10														
Target Range - Lower Bound		1.955														
Upper Bound		2.17														
1125015001				1.8	0.59	79	<10	40	<0.5	<2	3.06	2.5	7	266	31	2.14
DUP				1.5	0.57	74	<10	40	<0.5	<2	2.99	2.3	7	256	30	2.07
Target Range - Lower Bound				1.4	0.54	71	<10	30	<0.5	<2	2.86	1.8	6	247	28	1.99
Upper Bound				1.9	0.62	82	20	50	1.0	4	3.19	3.0	8	275	33	2.22
1125023107																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125009331																
DUP																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
1125011091		<10	<1	0.27	10	0.69	1205	<1	0.02	12	540	93	2.23	2	1	18
DUP		<10	1	0.27	10	0.70	1215	<1	0.02	13	550	96	2.24	<2	1	17
Target Range - Lower Bound		<10	<1	0.25	<10	0.65	1145	<1	<0.01	11	510	88	2.11	<2	<1	16
Upper Bound		20	2	0.29	20	0.74	1275	2	0.03	14	580	101	2.36	4	2	19
1125027072																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125015070																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125012054																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125016122																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125015001		<10	1	0.27	10	1.25	2840	1	0.01	11	390	320	1.65	<2	1	27
DUP		<10	1	0.26	10	1.21	2780	1	0.01	10	390	306	1.59	2	1	26
Target Range - Lower Bound		<10	<1	0.24	<10	1.16	2660	<1	<0.01	9	360	295	1.53	<2	<1	24
Upper Bound		20	2	0.29	20	1.30	2960	2	0.02	12	420	331	1.71	4	2	29
1125023107																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125009331																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1125011091		<20	<0.01	<10	<10	5	<10	378								
DUP		<20	<0.01	<10	<10	5	<10	385								
Target Range - Lower Bound		<20	<0.01	<10	<10	4	<10	360								
Upper Bound		40	0.02	20	20	6	20	403								
1125027072											65		15	50.3	1.29	2
DUP											65		15	50.3	1.29	2
Target Range - Lower Bound											61		13	47.5	1.22	<1
Upper Bound											69		17	53.1	1.36	3
1125015070									0.30	2.83						
DUP									0.31	2.85						
Target Range - Lower Bound									0.29	2.79						
Upper Bound									0.32	2.95						
1125012054												8.9				
DUP												8.9				
Target Range - Lower Bound												8.4				
Upper Bound												9.4				
1125016122																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125015001		<20	<0.01	<10	<10	4	<10	666								
DUP		<20	<0.01	<10	<10	4	<10	639								
Target Range - Lower Bound		<20	<0.01	<10	<10	3	<10	618								
Upper Bound		40	0.02	20	20	5	20	687								
1125023107											35	8.3	-30	65.0	0.54	2
DUP											35	8.3	-30	65.0	0.54	2
Target Range - Lower Bound											32	7.8	-33	61.5	0.50	<1
Upper Bound											38	8.8	-28	68.6	0.58	3
1125009331									1.13	1.80						
DUP									1.13	1.79						
Target Range - Lower Bound									1.09	1.74						
Upper Bound									1.17	1.85						

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5967 HWY 11/71
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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
1125020157				0.9	1.34	45	<10	40	<0.5	<2	1.89	<0.5	7	230	15	1.76
DUP				0.9	1.33	42	<10	40	<0.5	<2	1.85	<0.5	8	230	15	1.74
Target Range - Lower Bound				0.7	1.26	39	<10	30	<0.5	<2	1.77	<0.5	6	218	13	1.65
Upper Bound				1.1	1.41	48	20	50	1.0	4	1.97	1.0	9	243	17	1.85
1125024035		1.055														
DUP		1.225														
Target Range - Lower Bound		1.080														
Upper Bound		1.200														
1125015197																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125012041																
DUP																
Target Range - Lower Bound																
Upper Bound																
V829098				1.5	0.79	2	<10	40	<0.5	<2	0.42	<0.5	9	11	53	2.44
DUP				1.5	0.82	4	<10	40	<0.5	2	0.44	<0.5	10	11	53	2.49
Target Range - Lower Bound				1.2	0.75	<2	<10	30	<0.5	<2	0.40	<0.5	8	9	50	2.33
Upper Bound				1.8	0.86	4	20	50	1.0	4	0.46	1.0	11	13	56	2.60
1125009357																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125023208		0.157														
DUP		0.167														
Target Range - Lower Bound		0.149														
Upper Bound		0.175														
1125014014		0.093														
DUP		0.097														
Target Range - Lower Bound		0.085														
Upper Bound		0.105														

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5967 HWY 11/71
EMO ON P0W 1E0

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QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
1125020157		<10	<1	0.18	10	0.69	486	1	0.07	10	340	15	0.93	<2	1	40
DUP		<10	<1	0.18	10	0.69	475	1	0.07	9	340	14	0.91	<2	1	40
Target Range - Lower Bound		<10	<1	0.16	<10	0.65	451	<1	0.06	8	310	12	0.86	<2	<1	37
Upper Bound		20	2	0.20	20	0.73	510	2	0.08	11	370	17	0.98	4	2	43
1125024035																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125015197																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125012041																
DUP																
Target Range - Lower Bound																
Upper Bound																
V829098		<10	1	0.20	10	0.35	241	3	0.13	11	510	24	0.04	<2	2	18
DUP		<10	1	0.20	10	0.36	246	4	0.14	12	520	24	0.04	<2	2	19
Target Range - Lower Bound		<10	<1	0.18	<10	0.33	226	2	0.12	10	480	21	0.03	<2	<1	17
Upper Bound		20	2	0.22	20	0.38	261	5	0.15	13	550	27	0.05	4	3	20
1125009357																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125023208																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125014014																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES																
1125020157		<20	<0.01	<10	<10	6	<10	103								
DUP		<20	<0.01	<10	<10	6	<10	101								
Target Range - Lower Bound		<20	<0.01	<10	<10	5	<10	95								
Upper Bound		40	0.02	20	20	7	20	109								
1125024035																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125015197											14		-83	96.6	0.14	1
DUP											14		-83	96.6	0.14	1
Target Range - Lower Bound											12		-88	91.5	0.12	<1
Upper Bound											16		-78	101.7	0.16	2
1125012041									0.44	1.74						
DUP									0.45	1.80						
Target Range - Lower Bound									0.42	1.72						
Upper Bound									0.47	1.82						
V829098		<20	0.37	<10	<10	56	<10	58	0.02							
DUP		<20	0.38	<10	<10	58	<10	60	0.02							
Target Range - Lower Bound		<20	0.35	<10	<10	53	<10	54	<0.01							
Upper Bound		40	0.40	20	20	61	20	64	0.03							
1125009357												8.7				
DUP												8.7				
Target Range - Lower Bound												8.2				
Upper Bound												9.2				
1125023208																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125014014												8.3				
DUP												8.2				
Target Range - Lower Bound												7.7				
Upper Bound												8.8				

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Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
1125018256	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1125024201	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL		6.81														
DUP		6.77														
Target Range - Lower Bound		6.45														
Upper Bound		7.13														
ORIGINAL		0.069														
DUP		0.069														
Target Range - Lower Bound		0.061														
Upper Bound		0.077														
ORIGINAL		0.017														
DUP		0.058														
Target Range - Lower Bound		0.031														
Upper Bound		0.044														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL				0.4	0.21	53	<10	20	<0.5	<2	2.89	<0.5	7	6	2	2.62
DUP				0.4	0.22	53	<10	20	<0.5	<2	2.90	<0.5	7	6	2	2.67
Target Range - Lower Bound				<0.2	0.19	48	<10	<10	<0.5	<2	2.74	<0.5	6	5	<1	2.50
Upper Bound				0.6	0.24	58	20	30	1.0	4	3.05	1.0	8	7	3	2.79
ORIGINAL		0.005														
DUP		0.006														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														

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Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
		DUPLICATES														
1125018256																
DUP																
Target Range - Lower Bound																
	Upper Bound															
1125024201																
DUP																
Target Range - Lower Bound																
	Upper Bound															
ORIGINAL																
DUP																
Target Range - Lower Bound																
	Upper Bound															
ORIGINAL																
DUP																
Target Range - Lower Bound																
	Upper Bound															
ORIGINAL																
DUP																
Target Range - Lower Bound																
	Upper Bound															
ORIGINAL																
DUP																
Target Range - Lower Bound																
	Upper Bound															
ORIGINAL		<10	<1	0.17	<10	0.05	853	3	0.02	13	640	3	2.96	<2	1	162
DUP		<10	<1	0.18	<10	0.06	870	3	0.03	14	650	5	3.00	<2	1	170
Target Range - Lower Bound		<10	<1	0.16	<10	0.04	813	2	<0.01	12	600	<2	2.82	<2	<1	157
	Upper Bound	20	2	0.19	20	0.07	910	4	0.04	15	690	6	3.14	4	2	175
ORIGINAL																
DUP																
Target Range - Lower Bound																
	Upper Bound															

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1125018256											100		36	64.4	1.55	3
DUP											101		37	64.4	1.57	3
Target Range - Lower Bound											94		34	60.9	1.47	2
Upper Bound											107		39	67.9	1.65	>4
1125024201									0.25	1.73						
DUP									0.24	1.81						
Target Range - Lower Bound									0.23	1.74						
Upper Bound									0.26	1.84						
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<20	<0.01	<10	<10	6	<10	4								
DUP		<20	<0.01	<10	<10	7	<10	4								
Target Range - Lower Bound		<20	<0.01	<10	<10	5	<10	<2								
Upper Bound		40	0.02	20	20	8	20	6								
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
ORIGINAL		0.009														
DUP		0.007														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL				0.3	2.46	3	<10	730	<0.5	2	1.59	<0.5	6	2	680	7.07
DUP				0.3	2.47	5	<10	730	<0.5	<2	1.59	<0.5	6	2	678	7.05
Target Range - Lower Bound				<0.2	2.33	<2	<10	670	<0.5	<2	1.50	<0.5	5	<1	654	6.70
Upper Bound				0.4	2.60	6	20	790	1.0	4	1.68	1.0	7	3	704	7.42

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Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		10	1	0.40	10	1.24	3990	<1	0.01	2	1060	5	0.10	2	4	115
DUP		10	1	0.41	10	1.23	3980	<1	0.01	2	1040	3	0.10	<2	4	116
Target Range - Lower Bound		<10	<1	0.37	<10	1.16	3780	<1	<0.01	<1	990	<2	0.09	<2	3	109
Upper Bound		20	2	0.44	20	1.31	4190	2	0.02	3	1110	6	0.12	4	5	122

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 28-SEP-2018
Account: RRR

Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18214709

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<20	0.02	<10	<10	75	<10	191								
DUP		<20	0.02	<10	<10	76	<10	188								
Target Range - Lower Bound		<20	<0.01	<10	<10	71	<10	178								
Upper Bound		40	0.03	20	20	80	20	201								

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Finalized Date: 28-SEP-2018
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Project: Mine Site Lab Pulps June 2018

QC CERTIFICATE OF ANALYSIS TB18214709

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

QC CERTIFICATE TB18235181

Project: Mine Site Lab Pulps Aug

P.O. No.: 4500009909

This report is for 148 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 20-SEP-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34				3.7	2.39	101	<10	110	<0.5	4	1.35	1.0	41	179	5680	4.36
CDN-CM-34				3.7	2.46	109	<10	100	<0.5	5	1.40	1.0	42	184	5810	4.45
CDN-CM-34				3.7	2.49	103	<10	80	<0.5	5	1.38	1.2	41	182	5830	4.40
Target Range - Lower Bound				3.1	2.14	93	<10	70	<0.5	<2	1.20	<0.5	36	164	5390	3.91
Upper Bound				4.3	2.64	118	30	140	1.4	8	1.49	2.0	46	202	6210	4.80
CDN-GS-P6A		0.716														
CDN-GS-P6A		0.765														
Target Range - Lower Bound		0.689														
Upper Bound		0.787														
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
EMOG-17				72.0	1.68	618	<10	40	<0.5	7	1.02	21.1	817	49	8890	5.00
EMOG-17				69.1	1.61	606	<10	40	<0.5	8	1.00	20.3	786	48	8540	4.76
EMOG-17				66.6	1.56	580	<10	30	<0.5	7	0.95	19.3	751	45	8420	4.55
Target Range - Lower Bound				59.3	1.45	503	<10	30	<0.5	<2	0.87	17.9	679	42	7780	4.18
Upper Bound				72.9	1.79	619	20	80	1.5	10	1.09	22.9	833	54	8960	5.14

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34		10	<1	1.19	10	2.46	300	269	0.10	241	1140	22	3.01	5	9	104
CDN-CM-34		10	<1	1.21	10	2.57	302	272	0.10	230	1170	23	3.01	3	9	105
CDN-CM-34		10	<1	1.21	10	2.55	307	272	0.10	229	1160	21	3.02	5	9	104
Target Range - Lower Bound		<10	<1	1.06	<10	2.27	269	245	0.08	204	1050	18	2.70	<2	8	92
Upper Bound		30	2	1.32	30	2.80	340	301	0.13	252	1310	28	3.32	9	13	115
CDN-GS-P6A																
CDN-GS-P6A																
Target Range - Lower Bound																
Upper Bound																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
EMOG-17		<10	<1	0.71	20	0.81	688	1150	0.17	8350	820	7600	3.37	738	5	58
EMOG-17		10	1	0.67	20	0.80	648	1085	0.17	7900	790	7380	3.19	683	5	55
EMOG-17		<10	<1	0.64	20	0.76	630	1055	0.16	7630	750	7220	3.09	695	4	53
Target Range - Lower Bound		<10	<1	0.60	<10	0.73	598	1015	0.15	6930	680	6500	2.90	572	3	47
Upper Bound		30	3	0.76	40	0.91	742	1245	0.20	8470	850	7950	3.56	778	7	59

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Target Range - Lower Bound												5.3				
Upper Bound												6.7				
CDN-CM-34		<20	0.18	<10	<10	104	10	173								
CDN-CM-34		<20	0.18	<10	<10	106	10	175								
CDN-CM-34		<20	0.18	<10	<10	105	10	178								
Target Range - Lower Bound		<20	0.15	<10	<10	95	<10	159								
Upper Bound		40	0.21	20	20	118	30	199								
CDN-GS-P6A																
CDN-GS-P6A																
Target Range - Lower Bound																
Upper Bound																
DS-1									3.17							
Target Range - Lower Bound									3.01							
Upper Bound									3.25							
DS-1									3.13	2.54						
DS-1									3.17	2.64						
DS-1										2.64						
DS-1										2.66						
Target Range - Lower Bound										2.51						
Upper Bound										2.71						
EMOG-17		<20	0.22	<10	<10	68	<10	7650								
EMOG-17		<20	0.21	<10	<10	65	<10	7450								
EMOG-17		<20	0.21	<10	<10	62	<10	7330								
Target Range - Lower Bound		<20	0.18	<10	<10	58	<10	6780								
Upper Bound		50	0.25	20	20	74	20	8290								

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
STANDARDS																
G913-10		7.09														
G913-10		7.16														
G913-10		7.15														
Target Range - Lower Bound		6.66														
Upper Bound		7.52														
G915-10			48.5													
Target Range - Lower Bound			45.7													
Upper Bound			51.7													
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		2.02														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
JK-17			1.93													
Target Range - Lower Bound			1.83													
Upper Bound			2.17													
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
STANDARDS																
G913-10																
G913-10																
G913-10																
Target Range - Lower Bound																
Upper Bound																
G915-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
Target Range - Lower Bound																
Upper Bound																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																

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EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
STANDARDS																
G913-10																
G913-10																
G913-10																
Target Range - Lower Bound																
Upper Bound																
G915-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10									1.12							
Target Range - Lower Bound									1.03							
Upper Bound									1.13							
GS310-10									1.10	0.26						
GS310-10									1.11	0.28						
GS310-10										0.27						
Target Range - Lower Bound										0.25						
Upper Bound										0.29						
GS313-8									0.95							
Target Range - Lower Bound									0.90							
Upper Bound									0.98							
GS313-8									0.94	1.26						
GS313-8									0.92	1.24						
GS313-8										1.26						
GS313-8										1.24						
Target Range - Lower Bound										1.19						
Upper Bound										1.29						
JK-17																
Target Range - Lower Bound																
Upper Bound																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1											59		34	25.0	2.36	2
KZK-1											60		35	25.0	2.40	2
KZK-1											59		34	25.0	2.36	2
KZK-1											60		35	25.0	2.40	2
Target Range - Lower Bound											54		30	22.9	2.18	
Upper Bound											64		38	27.1	2.54	

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QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
STANDARDS																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08				4.5	2.63	35	<10	440	0.7	2	1.09	2.2	19	91	637	3.64
MRGeo08				4.5	2.52	32	<10	430	0.7	<2	1.04	2.1	19	89	609	3.50
MRGeo08				4.4	2.60	32	<10	420	0.7	<2	1.01	2.0	19	87	621	3.60
Target Range - Lower Bound				3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22
Upper Bound				5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OREAS 503c		0.701														
Target Range - Lower Bound		0.651														
Upper Bound		0.745														
OREAS 602				>100	0.61	665	<10	30	<0.5	59	0.53	25.2	9	28	5090	2.00
OREAS 602				>100	0.63	690	<10	30	<0.5	62	0.54	26.3	10	31	5360	2.07
OREAS 602				>100	0.63	654	<10	20	<0.5	58	0.50	23.5	10	30	5030	1.95
Target Range - Lower Bound				106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94
Upper Bound				100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40

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EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
MA-1b																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		10	<1	1.29	30	1.15	415	14	0.33	711	1020	1080	0.31	2	7	80
MRGeo08		10	<1	1.20	30	1.10	404	13	0.33	698	1000	1050	0.29	4	7	80
MRGeo08		10	<1	1.29	30	1.12	398	13	0.33	705	980	1035	0.29	3	7	81
Target Range - Lower Bound		<10	<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71
Upper Bound		30	2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OREAS 503c																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		<10	1	0.09	10	0.10	207	4	0.03	58	220	833	1.98	62	1	49
OREAS 602		10	1	0.09	10	0.10	221	4	0.03	63	240	864	2.05	66	1	51
OREAS 602		<10	1	0.09	10	0.10	206	4	0.02	60	220	806	1.92	53	1	49
Target Range - Lower Bound		<10	<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	51	<1	44
Upper Bound		30	3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	73	3	56

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
MA-1b									2.48	1.16						
MA-1b									2.42	1.20						
MA-1b									2.45	1.19						
MA-1b										1.15						
Target Range - Lower Bound										1.12						
Upper Bound										1.22						
MP-1b										13.85						
Target Range - Lower Bound										13.30						
Upper Bound										14.30						
MRGeo08		20	0.39	<10	<10	101	<10	772								
MRGeo08		20	0.37	<10	<10	99	<10	760								
MRGeo08		20	0.37	<10	<10	96	<10	734								
Target Range - Lower Bound		<20	0.33	<10	<10	90	<10	708								
Upper Bound		60	0.43	20	30	112	20	870								
NBM-1											50		41	8.8	5.71	2
NBM-1											50		41	8.8	5.71	2
NBM-1											50		41	8.8	5.71	2
NBM-1											50		41	8.8	5.71	2
Target Range - Lower Bound											45		37	7.8	5.26	
Upper Bound											54		47	9.7	6.08	
OREAS 503c																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		<20	0.01	<10	<10	10	<10	3910								
OREAS 602		<20	0.01	<10	<10	11	<10	4230								
OREAS 602		<20	0.01	<10	<10	10	<10	3800								
Target Range - Lower Bound		<20	<0.01	<10	<10	8	<10	3680								
Upper Bound		40	0.03	20	20	14	20	4500								

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
BLANKS																
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Target Range - Lower Bound				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Upper Bound				0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	2	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	1	<10	<2	<0.01	<2	<1	<1
Target Range - Lower Bound		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
Upper Bound		20	2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
									BLANKS							
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK									<0.01							
Target Range - Lower Bound									<0.01							
Upper Bound									0.02							
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<20	<0.01	<10	<10	<1	<10	<2								
Upper Bound		40	0.02	20	20	2	20	4								
BLANK												6.0				
BLANK												6.0				
BLANK												6.0				
BLANK												6.0				
Target Range - Lower Bound												5.5				
Upper Bound												6.9				
BLANK									<0.01	0.01						
BLANK									<0.01	<0.01						
BLANK									<0.01	<0.01						
BLANK									0.01	<0.01						
BLANK									<0.01	0.01						
BLANK										<0.01						
BLANK										<0.01						
BLANK										<0.01						
Target Range - Lower Bound										<0.01						
Upper Bound										0.02						

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL			<0.05													
DUP			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
ORIGINAL			<0.05													
DUP			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
ORIGINAL				1.3	0.87	<2	<10	10	<0.5	5	0.41	<0.5	1315	154	3680	39.3
DUP				1.3	0.90	<2	<10	10	<0.5	5	0.44	<0.5	1365	161	3810	40.8
Target Range - Lower Bound				1.0	0.83	<2	<10	<10	<0.5	3	0.39	<0.5	1270	149	3610	38.0
Upper Bound				1.6	0.94	4	20	20	1.0	7	0.46	1.0	1410	166	3880	42.1
1125014101		0.048														
DUP		0.072														
Target Range - Lower Bound		0.052														
Upper Bound		0.068														
1125029121																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125014158																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<10	<1	0.03	<10	0.49	187	1	0.01	>10000	40	3	7.66	<2	2	4
DUP		<10	<1	0.03	<10	0.51	194	1	0.01	>10000	40	<2	7.77	<2	2	4
Target Range - Lower Bound		<10	<1	0.02	<10	0.47	176	<1	<0.01	9500	30	<2	7.32	<2	<1	3
Upper Bound		20	2	0.04	20	0.54	205	2	0.02	>10000	50	4	8.11	4	3	5
1125014101																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125029121																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125014158																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
ORIGINAL										2.18						
DUP										2.22						
Target Range - Lower Bound										2.14						
Upper Bound										2.27						
ORIGINAL									<0.01	0.01						
DUP									<0.01	0.01						
Target Range - Lower Bound									<0.01	<0.01						
Upper Bound									0.02	0.02						
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<20	0.08	<10	<10	61	<10	91								
DUP		<20	0.09	<10	<10	64	<10	96								
Target Range - Lower Bound		<20	0.07	<10	<10	58	<10	87								
Upper Bound		40	0.10	20	20	67	20	100								
1125014101																
DUP																
Target Range - Lower Bound																
Upper Bound																
1125029121											34		-14	47.8	0.71	2
DUP											34		-14	47.8	0.71	2
Target Range - Lower Bound											31		-16	45.1	0.66	<1
Upper Bound											37		-12	50.5	0.76	3
1125014158												9.5				
DUP												9.5				
Target Range - Lower Bound												8.9				
Upper Bound												10.1				

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5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
1125014159				<0.2	1.22	2	<10	80	<0.5	<2	2.48	<0.5	11	106	2	2.44
DUP				<0.2	1.29	2	<10	90	<0.5	<2	2.51	<0.5	12	110	2	2.53
Target Range - Lower Bound				<0.2	1.18	<2	<10	70	<0.5	<2	2.36	<0.5	10	102	<1	2.35
Upper Bound				0.4	1.33	4	20	100	1.0	4	2.63	1.0	13	114	3	2.62
1124005123																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124016016																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124010082																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124014020		0.044														
DUP		0.046														
Target Range - Lower Bound		0.038														
Upper Bound		0.052														
V835503				2.5	1.14	<2	<10	90	<0.5	<2	0.74	<0.5	14	9	57	3.24
DUP				2.5	1.18	<2	<10	90	<0.5	<2	0.78	<0.5	14	9	59	3.31
Target Range - Lower Bound				2.2	1.09	<2	<10	70	<0.5	<2	0.71	<0.5	12	8	55	3.10
Upper Bound				2.8	1.23	4	20	110	1.0	4	0.81	1.0	16	10	61	3.45
1124020037																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124020002																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
1125014159		10	<1	0.28	20	0.98	614	1	0.04	19	680	<2	0.67	<2	2	63
DUP		10	<1	0.29	20	1.03	631	1	0.04	19	700	<2	0.70	<2	2	65
Target Range - Lower Bound		<10	<1	0.26	<10	0.94	586	<1	0.03	17	650	<2	0.64	<2	<1	60
Upper Bound		20	2	0.31	30	1.07	659	2	0.05	21	730	4	0.73	4	3	68
1124005123																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124016016																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124010082																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124014020																
DUP																
Target Range - Lower Bound																
Upper Bound																
V835503		10	<1	0.27	10	0.56	307	11	0.10	16	750	7	0.09	<2	3	17
DUP		<10	<1	0.28	10	0.57	315	11	0.11	17	760	8	0.07	<2	3	18
Target Range - Lower Bound		<10	<1	0.25	<10	0.53	290	9	0.09	15	710	5	0.07	<2	2	16
Upper Bound		20	2	0.30	20	0.60	332	13	0.12	18	800	10	0.09	4	4	19
1124020037																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124020002																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

ALS Canada Ltd.
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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES																
1125014159		<20	0.04	<10	<10	33	<10	70								
DUP		<20	0.04	<10	<10	34	<10	74								
Target Range - Lower Bound		<20	0.03	<10	<10	31	<10	66								
Upper Bound		40	0.05	20	20	36	20	78								
1124005123									0.68	1.79						
DUP									0.70	1.82						
Target Range - Lower Bound									0.66	1.75						
Upper Bound									0.72	1.86						
1124016016										1.00						
DUP										0.87						
Target Range - Lower Bound										0.90						
Upper Bound										0.97						
1124010082											25		12	13.1	1.90	2
DUP											25		12	13.1	1.90	2
Target Range - Lower Bound											23		10	12.1	1.80	<1
Upper Bound											27		14	14.1	2.01	3
1124014020																
DUP																
Target Range - Lower Bound																
Upper Bound																
V835503		<20	0.37	<10	<10	81	<10	51								
DUP		<20	0.39	<10	<10	84	<10	52								
Target Range - Lower Bound		<20	0.35	<10	<10	77	<10	47								
Upper Bound		40	0.41	20	20	88	20	56								
1124020037												8.5				
DUP												8.5				
Target Range - Lower Bound												8.0				
Upper Bound												9.0				
1124020002									1.00	1.67						
DUP									1.03	1.64						
Target Range - Lower Bound									0.98	1.60						
Upper Bound									1.05	1.71						

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
1124018091				1.3	1.19	61	<10	30	<0.5	<2	1.73	2.0	11	47	53	1.81
DUP				1.0	1.26	59	<10	30	<0.5	<2	1.76	2.1	8	45	54	1.84
Target Range - Lower Bound				0.9	1.15	55	<10	20	<0.5	<2	1.65	1.4	8	43	51	1.72
Upper Bound				1.4	1.30	65	20	40	1.0	4	1.84	2.7	11	49	56	1.93
1124003061																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124003015																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124003131																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124004054		1.095														
DUP		1.095														
Target Range - Lower Bound		1.035														
Upper Bound		1.155														
1124003125				2.7	0.50	141	<10	20	<0.5	<2	1.15	4.3	9	72	56	2.18
DUP				2.9	0.51	163	<10	20	<0.5	<2	1.16	4.5	9	73	58	2.21
Target Range - Lower Bound				2.5	0.47	142	<10	<10	<0.5	<2	1.09	3.7	8	68	54	2.08
Upper Bound				3.1	0.54	162	20	30	1.0	4	1.22	5.1	10	77	60	2.31
1124005016																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124005035																
DUP																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
1124018091		<10	1	0.24	10	0.83	886	9	0.02	11	380	62	1.32	<2	1	28
DUP		<10	<1	0.25	10	0.86	905	9	0.03	9	390	66	1.37	<2	1	29
Target Range - Lower Bound		<10	<1	0.22	<10	0.79	846	8	<0.01	9	360	59	1.27	<2	<1	26
Upper Bound		20	2	0.27	20	0.90	945	10	0.04	12	410	69	1.42	4	2	31
1124003061																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124003015																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124003131																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124004054																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124003125		<10	1	0.17	10	0.39	985	1	0.01	9	440	505	2.17	2	<1	12
DUP		<10	1	0.17	10	0.40	994	1	0.01	21	440	518	2.18	2	<1	12
Target Range - Lower Bound		<10	<1	0.15	<10	0.37	935	<1	<0.01	13	410	484	2.06	<2	<1	10
Upper Bound		20	2	0.19	20	0.42	1045	2	0.02	17	470	539	2.29	4	2	14
1124005016																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124005035																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1124018091		<20	<0.01	<10	<10	5	10	571			48		8	39.7	1.21	2
DUP		<20	<0.01	<10	<10	6	<10	591			49		9	39.7	1.23	2
Target Range - Lower Bound		<20	<0.01	<10	<10	4	<10	550			45		7	37.4	1.15	<1
Upper Bound		40	0.02	20	20	7	20	612			52		10	42.0	1.29	3
1124003061												8.8				
DUP												8.8				
Target Range - Lower Bound												8.3				
Upper Bound												9.3				
1124003015										1.97						
DUP										1.98						
Target Range - Lower Bound										1.92						
Upper Bound										2.03						
1124003131									0.83	1.34						
DUP									0.85	1.35						
Target Range - Lower Bound									0.81	1.30						
Upper Bound									0.87	1.39						
1124004054																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124003125		<20	<0.01	<10	<10	3	<10	1160								
DUP		<20	<0.01	<10	<10	3	<10	1230								
Target Range - Lower Bound		<20	<0.01	<10	<10	2	<10	1135								
Upper Bound		40	0.02	20	20	4	20	1255								
1124005016											56		-10	66.3	0.85	2
DUP											57		-9	66.3	0.86	2
Target Range - Lower Bound											53		-11	62.7	0.80	<1
Upper Bound											60		-8	69.9	0.91	3
1124005035												8.8				
DUP												8.8				
Target Range - Lower Bound												8.3				
Upper Bound												9.3				

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
		DUPLICATES														
1124007011																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		<0.005														
DUP		0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		1.275														
DUP		1.295														
Target Range - Lower Bound		1.215														
Upper Bound		1.355														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL				20.8	0.37	247	<10	40	0.5	<2	6.24	32.5	9	5	40	2.91
DUP				20.4	0.37	248	10	40	0.5	<2	6.35	32.9	9	5	39	2.90
Target Range - Lower Bound				19.4	0.34	233	<10	30	<0.5	<2	5.97	30.6	8	4	37	2.75
Upper Bound				21.8	0.40	262	20	50	1.0	4	6.62	34.8	10	6	42	3.06

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method Analyte Units LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
1124007011																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<10	<1	0.23	10	0.32	1260	2	<0.01	25	680	2860	3.08	30	3	148
DUP		<10	<1	0.23	10	0.32	1270	2	<0.01	25	670	2870	3.11	29	3	147
Target Range - Lower Bound		<10	<1	0.21	<10	0.29	1195	<1	<0.01	23	630	2720	2.93	25	2	139
Upper Bound		20	2	0.25	20	0.35	1335	3	0.02	27	720	3010	3.26	34	4	156

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES																
1124007011									0.35	0.88						
DUP									0.34	0.86						
Target Range - Lower Bound									0.33	0.84						
Upper Bound									0.36	0.90						
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL									2.08							
DUP									2.11							
Target Range - Lower Bound									2.03							
Upper Bound									2.16							
ORIGINAL		<20	<0.01	<10	<10	11	<10	4530								
DUP		<20	<0.01	<10	<10	11	<10	4520								
Target Range - Lower Bound		<20	<0.01	<10	<10	9	<10	4300								
Upper Bound		40	0.02	20	20	13	20	4750								

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EMO ON P0W 1E0

Finalized Date: 16-OCT-2018
Account: RRR

Project: Mine Site Lab Pulps Aug

QC CERTIFICATE OF ANALYSIS TB18235181

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

QC CERTIFICATE TB18315376

Project: Mine Site Lab Pulps Nov 2018

P.O. No.: 4500023138

This report is for 236 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 10-DEC-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

<Original signed by>

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34				3.6	2.34	102	<10	70	<0.5	5	1.34	1.2	40	172	5710	4.32
CDN-CM-34				3.7	2.35	104	<10	90	<0.5	7	1.32	1.1	40	176	5640	4.25
Target Range - Lower Bound				3.1	2.14	93	<10	70	<0.5	<2	1.20	<0.5	36	164	5390	3.91
Upper Bound				4.3	2.64	118	30	140	1.4	8	1.49	2.0	46	202	6210	4.80
CDN-ME1606			1.13													
Target Range - Lower Bound			0.95													
Upper Bound			1.18													
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																

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Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34		10	<1	1.15	10	2.38	293	256	0.10	222	1120	23	2.93	3	9	99
CDN-CM-34		10	<1	1.16	10	2.44	299	264	0.11	224	1130	22	2.97	3	9	101
Target Range - Lower Bound		<10	<1	1.06	<10	2.27	269	245	0.08	204	1050	18	2.70	<2	8	92
Upper Bound		30	2	1.32	30	2.80	340	301	0.13	252	1310	28	3.32	9	13	115
CDN-ME1606																
Target Range - Lower Bound																
Upper Bound																
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.1				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.1				
Target Range - Lower Bound												5.3				
Upper Bound												6.7				
CDN-CM-34		<20	0.16	<10	<10	100	10	171								
CDN-CM-34		<20	0.17	<10	<10	101	10	171								
Target Range - Lower Bound		<20	0.15	<10	<10	95	<10	159								
Upper Bound		40	0.21	20	20	118	30	199								
CDN-ME1606																
Target Range - Lower Bound																
Upper Bound																
DS-1									3.25							
Target Range - Lower Bound									3.01							
Upper Bound									3.25							
DS-1									3.23	2.58						
DS-1									3.25	2.58						
DS-1									3.23	2.63						
DS-1										2.68						
DS-1										2.62						
DS-1										2.59						
Target Range - Lower Bound										2.51						
Upper Bound										2.71						

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
EMOG-17				67.3	1.63	596	<10	30	<0.5	7	0.99	20.3	759	46	8580	4.76
EMOG-17				68.4	1.60	599	<10	30	<0.5	9	0.96	19.9	774	47	8530	4.68
Target Range - Lower Bound				60.1	1.45	503	<10	30	<0.5	<2	0.87	17.9	679	42	7780	4.18
Upper Bound				73.9	1.79	619	20	80	1.5	10	1.09	22.9	833	54	8960	5.14
G915-7			11.80													
Target Range - Lower Bound			11.60													
Upper Bound			13.15													
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		1.925														
JK-17		1.955														
JK-17		1.980														
JK-17		1.915														
JK-17		1.905														
JK-17		1.985														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
STANDARDS																
EMOG-17		<10	1	0.67	20	0.77	656	1070	0.17	7850	780	7330	3.18	665	5	53
EMOG-17		10	1	0.67	20	0.79	658	1085	0.17	7880	780	7410	3.21	677	5	54
Target Range - Lower Bound		<10	<1	0.60	<10	0.73	598	1015	0.15	6930	680	6500	2.90	572	3	47
Upper Bound		30	3	0.76	40	0.91	742	1245	0.20	8470	850	7950	3.56	778	7	59
G915-7																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
EMOG-17		<20	0.21	<10	<10	64	<10	7600								
EMOG-17		<20	0.21	<10	<10	63	<10	7510								
Target Range - Lower Bound		<20	0.18	<10	<10	58	<10	6780								
Upper Bound		50	0.25	20	20	74	20	8290								
G915-7																
Target Range - Lower Bound																
Upper Bound																
GS310-10									1.08							
Target Range - Lower Bound									1.03							
Upper Bound									1.13							
GS310-10									1.09	0.26						
GS310-10									1.08	0.27						
GS310-10									1.07	0.26						
GS310-10										0.27						
Target Range - Lower Bound										0.25						
Upper Bound										0.29						
GS313-8									0.96							
Target Range - Lower Bound									0.90							
Upper Bound									0.98							
GS313-8									0.91	1.22						
GS313-8									0.92	1.23						
GS313-8									0.96	1.23						
GS313-8										1.24						
Target Range - Lower Bound										1.19						
Upper Bound										1.29						
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08				4.4	2.53	32	10	430	0.7	2	1.06	2.2	18	89	620	3.49
MRGeo08				4.5	2.66	32	10	440	0.7	<2	1.07	2.2	19	90	644	3.62
MRGeo08				4.5	2.59	32	<10	430	0.7	4	1.06	2.3	19	90	612	3.52
MRGeo08				4.6	2.63	35	<10	430	0.7	4	1.07	2.3	18	90	614	3.53
MRGeo08				4.7	2.74	35	10	460	0.8	<2	1.11	2.1	19	94	635	3.73
Target Range - Lower Bound				3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22
Upper Bound				5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		10	<1	1.22	30	1.11	414	13	0.31	690	1000	1060	0.30	<2	7	78
MRGeo08		10	<1	1.27	30	1.14	420	13	0.33	715	1000	1090	0.31	3	7	82
MRGeo08		10	<1	1.23	30	1.13	413	14	0.33	695	1000	1065	0.30	3	7	79
MRGeo08		10	1	1.25	30	1.12	411	13	0.34	691	980	1055	0.30	3	7	82
MRGeo08		10	<1	1.31	30	1.19	418	13	0.35	726	1060	1100	0.32	6	7	85
Target Range - Lower Bound		<10	<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71
Upper Bound		30	2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
KZK-1											60		35	25.0	2.40	2
KZK-1											60		35	25.0	2.40	2
KZK-1											60		35	25.0	2.40	2
KZK-1											60		35	25.0	2.40	2
KZK-1											60		35	25.0	2.40	2
KZK-1											60		35	25.0	2.40	2
KZK-1											60		35	25.0	2.40	2
Target Range - Lower Bound											54		30	22.9	2.18	
Upper Bound											64		38	27.1	2.54	
MA-1b									2.54							
Target Range - Lower Bound									2.34							
Upper Bound									2.54							
MA-1b									2.49	1.15						
MA-1b									2.56	1.20						
MA-1b									2.45	1.16						
Target Range - Lower Bound									2.34	1.12						
Upper Bound									2.54	1.22						
MRGeo08		20	0.38	<10	<10	98	<10	772								
MRGeo08		20	0.38	<10	<10	99	<10	781								
MRGeo08		20	0.37	<10	<10	98	<10	752								
MRGeo08		20	0.38	<10	<10	98	<10	743								
MRGeo08		20	0.39	<10	<10	104	<10	773								
Target Range - Lower Bound		<20	0.33	<10	<10	90	<10	708								
Upper Bound		60	0.43	20	30	112	20	870								
NBM-1											50		41	8.8	5.71	2
NBM-1											50		41	8.8	5.71	2
NBM-1											50		41	8.8	5.71	2
NBM-1											51		42	8.8	5.83	2
NBM-1											50		41	8.8	5.71	2
NBM-1											49		40	8.8	5.60	2
NBM-1											50		41	8.8	5.71	2
Target Range - Lower Bound											45		37	7.8	5.26	
Upper Bound											54		47	9.7	6.08	

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Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
OREAS 602				>100	0.66	700	<10	30	<0.5	63	0.58	26.9	11	36	5490	2.19
OREAS 602				>100	0.62	660	<10	30	<0.5	60	0.53	25.2	10	34	5150	2.04
OREAS 602				>100	0.64	680	<10	30	<0.5	59	0.53	25.7	10	30	5300	2.09
OREAS 602				>100	0.67	682	<10	30	<0.5	60	0.53	25.5	10	34	5320	2.10
OREAS 602				>100	0.64	670	<10	20	<0.5	59	0.52	25.0	10	31	5020	1.99
Target Range - Lower Bound				106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94
Upper Bound				100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40
OREAS-218		0.528														
OREAS-218		0.526														
OREAS-218		0.530														
Target Range - Lower Bound		0.494														
Upper Bound		0.568														
PMP-18		0.295														
PMP-18		0.296														
Target Range - Lower Bound		0.277														
Upper Bound		0.323														
BLANKS																
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		0.007														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
OREAS 602		10	1	0.09	10	0.11	229	4	0.02	64	250	889	2.14	65	1	52
OREAS 602		<10	<1	0.09	10	0.10	210	4	0.02	61	230	840	1.99	63	1	49
OREAS 602		<10	1	0.09	10	0.10	219	4	0.03	62	230	860	2.02	65	1	50
OREAS 602		<10	1	0.10	10	0.11	216	4	0.03	64	240	864	2.03	63	1	52
OREAS 602		<10	<1	0.09	10	0.10	205	4	0.02	60	220	832	1.96	52	1	50
Target Range - Lower Bound		<10	<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	51	<1	44
Upper Bound		30	3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	73	3	56
OREAS-218																
OREAS-218																
OREAS-218																
Target Range - Lower Bound																
Upper Bound																
PMP-18																
PMP-18																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
OREAS 602		<20	0.01	<10	<10	11	<10	4340								
OREAS 602		<20	0.01	<10	<10	10	<10	4070								
OREAS 602		<20	0.01	<10	<10	10	<10	4110								
OREAS 602		<20	0.01	<10	<10	11	<10	4090								
OREAS 602		<20	<0.01	<10	<10	10	<10	3890								
Target Range - Lower Bound		<20	<0.01	<10	<10	8	<10	3680								
Upper Bound		40	0.03	20	20	14	20	4500								
OREAS-218																
OREAS-218																
OREAS-218																
Target Range - Lower Bound																
Upper Bound																
PMP-18																
PMP-18																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK									0.01							
BLANK									<0.01							
Target Range - Lower Bound									<0.01							
Upper Bound									0.02							

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
BLANKS																
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Target Range - Lower Bound				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Upper Bound				0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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5967 HWY 11/71
EMO ON P0W 1E0

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
BLANKS																
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	0.01	1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	3	<1	<1
Target Range - Lower Bound		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
Upper Bound		20	2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS																
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<20	<0.01	<10	<10	<1	<10	<2								
Upper Bound		40	0.02	20	20	2	20	4								
BLANK												6.0				
BLANK												6.0				
BLANK												5.7				
BLANK												5.8				
BLANK												5.8				
BLANK												5.9				
BLANK												5.8				
Target Range - Lower Bound												5.5				
Upper Bound												6.9				
BLANK									<0.01	<0.01						
BLANK									0.01	<0.01						
BLANK									0.01	<0.01						
BLANK									0.01	0.01						
BLANK									0.01	<0.01						
BLANK									<0.01	<0.01						
BLANK										<0.01						
BLANK										0.01						
BLANK										0.01						
Target Range - Lower Bound										<0.01						
Upper Bound										0.02						

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
ORIGINAL			<0.05													
DUP			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
ORIGINAL			<0.05													
DUP			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
ORIGINAL		0.012														
DUP		0.013														
Target Range - Lower Bound		0.007														
Upper Bound		0.018														
ORIGINAL		0.244														
DUP		0.258														
Target Range - Lower Bound		0.233														
Upper Bound		0.269														
ORIGINAL		0.399														
DUP		0.427														
Target Range - Lower Bound		0.387														
Upper Bound		0.439														
ORIGINAL		0.692														
DUP		0.874														
Target Range - Lower Bound		0.739														
Upper Bound		0.827														
V853275				0.4	0.52	73	<10	20	<0.5	<2	1.46	1.3	6	4	15	1.55
DUP				0.6	0.59	77	<10	30	<0.5	<2	1.54	1.4	7	5	16	1.66
Target Range - Lower Bound				0.3	0.52	69	<10	<10	<0.5	<2	1.42	0.8	5	3	14	1.51
Upper Bound				0.7	0.59	81	20	40	1.0	4	1.59	1.9	8	6	17	1.70
1123015079																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V853275		<10	<1	0.16	10	0.52	1335	1	<0.01	5	390	71	1.28	<2	<1	22
DUP		<10	<1	0.18	10	0.58	1430	1	0.01	6	420	76	1.37	<2	<1	23
Target Range - Lower Bound		<10	<1	0.15	<10	0.51	1310	<1	<0.01	4	370	68	1.25	<2	<1	20
Upper Bound		20	2	0.19	20	0.59	1455	2	0.02	7	440	79	1.40	4	2	25
1123015079																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
		DUPLICATES														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V853275		<20	<0.01	<10	<10	3	<10	321								
DUP		<20	<0.01	<10	<10	3	<10	348								
Target Range - Lower Bound		<20	<0.01	<10	<10	2	<10	316								
Upper Bound		40	0.02	20	20	4	20	353								
1123015079									0.47	1.22						
DUP									0.49	1.22						
Target Range - Lower Bound									0.46	1.18						
Upper Bound									0.50	1.26						

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
1124029330		1.070														
DUP		0.833														
Target Range - Lower Bound		0.899														
Upper Bound		1.005														
1122003029																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123016020																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123016033		0.112														
DUP		0.115														
Target Range - Lower Bound		0.103														
Upper Bound		0.124														
1123020082				1.5	0.86	91	<10	60	<0.5	<2	0.35	19.5	6	129	193	2.19
DUP				2.1	0.88	85	<10	60	<0.5	<2	0.35	19.6	6	132	188	2.23
Target Range - Lower Bound				1.5	0.82	82	<10	50	<0.5	<2	0.32	18.1	5	123	183	2.09
Upper Bound				2.1	0.92	94	20	70	1.0	4	0.38	21.0	7	138	198	2.33
1123006017																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123014186		0.824														
DUP		1.025														
Target Range - Lower Bound		0.873														
Upper Bound		0.976														
1123013057																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
1124029330																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122003029																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123016020																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123016033																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123020082		<10	<1	0.46	10	0.56	784	1	<0.01	7	320	118	1.79	5	<1	48
DUP		<10	<1	0.47	10	0.57	798	1	<0.01	7	310	116	1.81	4	<1	49
Target Range - Lower Bound		<10	<1	0.43	<10	0.53	746	<1	<0.01	6	290	109	1.70	<2	<1	45
Upper Bound		20	2	0.50	20	0.60	836	2	0.02	8	340	125	1.90	7	2	52
1123006017																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123014186																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123013057																
DUP																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
									DUPLICATES							
1124029330																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122003029												9.0				
DUP												9.0				
Target Range - Lower Bound												8.5				
Upper Bound												9.6				
1123016020											34		-24	57.5	0.59	2
DUP											34		-24	57.5	0.59	2
Target Range - Lower Bound											31		-26	54.3	0.55	<1
Upper Bound											37		-22	60.7	0.63	3
1123016033																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123020082		<20	0.02	<10	<10	5	<10	4300								
DUP		<20	0.02	<10	<10	5	<10	4370								
Target Range - Lower Bound		<20	<0.01	<10	<10	4	<10	4120								
Upper Bound		40	0.03	20	20	6	20	4550								
1123006017									0.64	0.92						
DUP									0.64	0.88						
Target Range - Lower Bound									0.61	0.87						
Upper Bound									0.67	0.93						
1123014186																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123013057												8.9				
DUP												8.8				
Target Range - Lower Bound												8.3				
Upper Bound												9.4				

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
1123013023																
DUP																
Target Range - Lower Bound																
Upper Bound																
1231002049				2.9	1.20	15	<10	40	<0.5	<2	1.84	1.4	9	150	125	1.90
DUP				1.7	1.25	17	<10	40	<0.5	<2	1.90	1.5	10	157	128	1.93
Target Range - Lower Bound				2.0	1.15	13	<10	30	<0.5	<2	1.77	0.9	8	145	121	1.81
Upper Bound				2.6	1.30	19	20	50	1.0	4	1.97	2.0	11	162	132	2.02
1123015030																
DUP																
Target Range - Lower Bound																
Upper Bound																
V835520																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123020150		2.73														
DUP		1.770														
Target Range - Lower Bound		2.13														
Upper Bound		2.37														
1122002019																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122005040																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122005092				0.6	1.78	19	<10	50	<0.5	<2	1.80	<0.5	8	143	18	2.03
DUP				0.5	1.80	18	10	50	<0.5	<2	1.82	<0.5	8	150	17	2.06
Target Range - Lower Bound				0.3	1.69	16	<10	40	<0.5	<2	1.71	<0.5	7	138	16	1.93
Upper Bound				0.8	1.89	21	20	60	1.0	4	1.91	1.0	9	155	19	2.16

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method Analyte Units LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
		DUPLICATES														
1123013023																
DUP																
Target Range - Lower Bound																
Upper Bound																
1231002049		<10	<1	0.23	20	0.71	485	1	0.05	17	470	2	0.60	<2	1	35
DUP		<10	<1	0.23	20	0.74	497	1	0.05	15	480	3	0.61	<2	1	35
Target Range - Lower Bound		<10	<1	0.21	<10	0.68	461	<1	0.04	14	440	<2	0.56	<2	<1	32
Upper Bound		20	2	0.25	30	0.77	521	2	0.06	18	510	4	0.65	4	2	38
1123015030																
DUP																
Target Range - Lower Bound																
Upper Bound																
V835520																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123020150																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122002019																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122005040																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122005092		10	<1	0.16	10	0.75	415	1	0.13	12	420	8	0.63	<2	1	79
DUP		10	<1	0.16	10	0.76	420	1	0.13	12	420	9	0.63	2	1	79
Target Range - Lower Bound		<10	<1	0.14	<10	0.71	392	<1	0.11	10	390	6	0.59	<2	<1	74
Upper Bound		20	2	0.18	20	0.80	443	2	0.15	14	450	11	0.67	4	2	84

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Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES																
1123013023											37		6	30.6	1.21	2
DUP											37		6	30.6	1.21	2
Target Range - Lower Bound											34		5	28.8	1.14	<1
Upper Bound											40		7	32.4	1.28	3
1231002049		<20	0.03	<10	<10	16	<10	385								
DUP		<20	0.03	<10	<10	16	<10	389								
Target Range - Lower Bound		<20	0.02	<10	<10	14	<10	366								
Upper Bound		40	0.04	20	20	18	20	408								
1123015030									0.51	1.50						
DUP									0.53	1.63						
Target Range - Lower Bound									0.50	1.52						
Upper Bound									0.54	1.61						
V835520									0.02							
DUP									0.02							
Target Range - Lower Bound									<0.01							
Upper Bound									0.03							
1123020150																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122002019												8.6				
DUP												8.7				
Target Range - Lower Bound												8.1				
Upper Bound												9.2				
1122005040											29		11	17.8	1.63	2
DUP											30		12	17.8	1.68	2
Target Range - Lower Bound											27		10	16.6	1.56	<1
Upper Bound											32		13	19.0	1.75	3
1122005092		<20	0.01	<10	<10	15	<10	81								
DUP		<20	0.01	<10	<10	15	<10	82								
Target Range - Lower Bound		<20	<0.01	<10	<10	13	<10	75								
Upper Bound		40	0.02	20	20	17	20	88								

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
1122002175		0.267														
DUP		0.273														
Target Range - Lower Bound		0.252														
Upper Bound		0.289														
1123006027																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123011005																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123009025				0.7	0.54	154	<10	40	<0.5	<2	1.65	1.0	9	105	57	1.81
DUP				0.7	0.59	161	<10	40	<0.5	<2	1.74	1.1	10	108	59	1.87
Target Range - Lower Bound				0.5	0.53	148	<10	30	<0.5	<2	1.60	<0.5	8	100	55	1.74
Upper Bound				0.9	0.60	167	20	50	1.0	4	1.79	1.6	11	113	61	1.94
1123009005																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123008138																
DUP																
Target Range - Lower Bound																
Upper Bound																
1231005088		0.021														
DUP		0.020														
Target Range - Lower Bound		0.014														
Upper Bound		0.027														
1123008224																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
1122002175																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123006027																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123011005																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123009025		<10	<1	0.24	10	0.66	1370	1	0.02	15	380	106	1.64	<2	1	19
DUP		<10	<1	0.26	10	0.69	1450	1	0.03	15	400	110	1.71	<2	1	20
Target Range - Lower Bound		<10	<1	0.23	<10	0.63	1335	<1	<0.01	13	360	101	1.58	<2	<1	18
Upper Bound		20	2	0.27	20	0.72	1485	2	0.04	17	420	115	1.77	4	2	21
1123009005																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123008138																
DUP																
Target Range - Lower Bound																
Upper Bound																
1231005088																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123008224																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1122002175																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123006027									0.30	1.36						
DUP									0.31	1.35						
Target Range - Lower Bound									0.29	1.31						
Upper Bound									0.32	1.40						
1123011005												8.7				
DUP												8.7				
Target Range - Lower Bound												8.2				
Upper Bound												9.2				
1123009025		<20	<0.01	<10	<10	3	<10	254								
DUP		<20	<0.01	<10	<10	4	<10	272								
Target Range - Lower Bound		<20	<0.01	<10	<10	2	<10	248								
Upper Bound		40	0.02	20	20	5	20	278								
1123009005											60		-13	73.4	0.82	2
DUP											61		-12	73.4	0.83	2
Target Range - Lower Bound											56		-14	69.4	0.77	<1
Upper Bound											65		-11	77.4	0.88	3
1123008138									1.42	1.59						
DUP									1.41	1.68						
Target Range - Lower Bound									1.37	1.58						
Upper Bound									1.46	1.69						
1231005088																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123008224												9.1				
DUP												9.2				
Target Range - Lower Bound												8.6				
Upper Bound												9.7				

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Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
V835525				9.8	0.93	3	<10	80	<0.5	3	0.56	<0.5	11	9	49	2.85
DUP				9.8	0.95	<2	<10	80	<0.5	3	0.57	<0.5	12	9	48	2.85
Target Range - Lower Bound				9.1	0.88	<2	<10	60	<0.5	<2	0.53	<0.5	10	8	46	2.70
Upper Bound				10.5	1.00	4	20	100	1.0	4	0.60	1.0	13	10	51	3.00
1122004035																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123018125		0.075														
DUP		0.073														
Target Range - Lower Bound		0.065														
Upper Bound		0.083														
1123018021																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122004125		0.029														
DUP		0.031														
Target Range - Lower Bound		0.024														
Upper Bound		0.037														
1123017189																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123017241				1.3	1.42	49	<10	110	<0.5	<2	1.57	11.8	7	190	71	2.25
DUP				1.3	1.55	50	<10	110	<0.5	<2	1.63	11.9	8	198	73	2.36
Target Range - Lower Bound				1.0	1.40	45	<10	90	<0.5	<2	1.51	10.8	6	183	68	2.18
Upper Bound				1.6	1.57	54	20	130	1.0	4	1.69	12.9	9	205	76	2.43
1123002106																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
V835525		<10	1	0.19	10	0.41	266	20	0.14	13	610	8	0.06	<2	2	20
DUP		<10	<1	0.19	10	0.41	264	20	0.15	13	590	7	0.06	<2	2	20
Target Range - Lower Bound		<10	<1	0.17	<10	0.38	247	18	0.13	11	560	5	0.05	<2	<1	18
Upper Bound		20	2	0.21	20	0.44	283	22	0.16	15	640	10	0.07	4	3	22
1122004035																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123018125																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123018021																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122004125																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123017189																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123017241		<10	1	0.39	20	1.06	792	1	0.02	11	650	64	1.30	<2	2	86
DUP		<10	<1	0.43	20	1.12	842	<1	0.02	11	670	66	1.35	<2	2	91
Target Range - Lower Bound		<10	<1	0.38	<10	1.03	771	<1	<0.01	9	620	60	1.25	<2	<1	83
Upper Bound		20	2	0.44	30	1.15	863	2	0.03	13	700	70	1.40	4	3	94
1123002106																
DUP																
Target Range - Lower Bound																
Upper Bound																

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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
V835525		<20	0.42	<10	<10	69	<10	48								
DUP		<20	0.41	<10	<10	69	<10	47								
Target Range - Lower Bound		<20	0.38	<10	<10	65	<10	43								
Upper Bound		40	0.45	20	20	73	20	52								
1122004035											64		28	35.9	1.78	2
DUP											64		28	35.9	1.78	2
Target Range - Lower Bound											60		26	33.8	1.68	<1
Upper Bound											68		30	38.0	1.88	3
1123018125																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123018021									0.58	0.79						
DUP									0.58	0.76						
Target Range - Lower Bound									0.56	0.75						
Upper Bound									0.60	0.80						
1122004125																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123017189												8.7				
DUP												8.8				
Target Range - Lower Bound												8.2				
Upper Bound												9.3				
1123017241		<20	0.05	<10	<10	14	<10	2750								
DUP		<20	0.05	<10	<10	15	<10	2850								
Target Range - Lower Bound		<20	0.04	<10	<10	13	<10	2660								
Upper Bound		40	0.06	20	20	16	20	2940								
1123002106											49		43	6.3	7.84	2
DUP											51		45	6.3	8.16	2
Target Range - Lower Bound											47		41	5.7	7.59	<1
Upper Bound											54		47	6.9	8.41	3

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 10-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
								DUPLICATES								
1123009043																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124024034																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123001306																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		0.396														
DUP		0.628														
Target Range - Lower Bound		0.481														
Upper Bound		0.543														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		0.011														
DUP		0.009														
Target Range - Lower Bound		<0.005														
Upper Bound		0.016														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES																
1123009043	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1124024034	DUP															
	Target Range - Lower Bound															
	Upper Bound															
1123001306	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL	DUP															
	Target Range - Lower Bound															
	Upper Bound															
ORIGINAL	DUP															
	Target Range - Lower Bound															
	Upper Bound															

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Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1123009043									1.24	2.26						
DUP									1.26	2.26						
Target Range - Lower Bound									1.21	2.19						
Upper Bound									1.29	2.33						
1124024034												9.3				
DUP												9.3				
Target Range - Lower Bound												8.7				
Upper Bound												9.9				
1123001306											37		-63	100.3	0.37	2
DUP											37		-63	100.3	0.37	2
Target Range - Lower Bound											34		-67	95.0	0.34	<1
Upper Bound											40		-59	105.6	0.40	3
ORIGINAL										0.12						
DUP										0.12						
Target Range - Lower Bound										0.11						
Upper Bound										0.13						
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
ORIGINAL			17.25													
DUP			17.45													
Target Range - Lower Bound			16.45													
Upper Bound			18.25													

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315376

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315376

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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Finalized Date: 9-JAN-2019
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QC CERTIFICATE TB18315377

Project: Mine Site Lab Pulps Nov 2018

P.O. No.: 4500023138

This report is for 132 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 10-DEC-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

<Original signed by>

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34				3.8	2.42	108	<10	110	<0.5	4	1.38	1.0	42	183	5900	4.46
CDN-CM-34				3.6	2.41	102	<10	90	<0.5	5	1.33	0.8	40	177	5740	4.37
CDN-CM-34				3.8	2.63	108	<10	80	<0.5	4	1.44	1.1	43	192	6150	4.61
Target Range - Lower Bound				3.1	2.14	93	<10	70	<0.5	<2	1.20	<0.5	36	164	5390	3.91
Upper Bound				4.3	2.64	118	30	140	1.4	8	1.49	2.0	46	202	6210	4.80
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
EMOG-17				66.5	1.55	566	<10	50	<0.5	7	0.94	19.2	742	45	8320	4.57
EMOG-17				65.1	1.56	563	<10	40	<0.5	6	0.92	19.0	738	45	8360	4.58
EMOG-17				67.5	1.61	572	<10	30	<0.5	6	0.97	19.7	757	47	8530	4.67
Target Range - Lower Bound				60.1	1.45	503	<10	30	<0.5	<2	0.87	17.9	679	42	7780	4.18
Upper Bound				73.9	1.79	619	20	80	1.5	10	1.09	22.9	833	54	8960	5.14
G915-10			49.2													
Target Range - Lower Bound			45.7													
Upper Bound			51.7													
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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Finalized Date: 9-JAN-2019
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Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34		10	<1	1.23	10	2.54	304	276	0.10	235	1180	21	3.08	6	9	106
CDN-CM-34		10	<1	1.23	10	2.44	299	268	0.10	227	1150	23	2.94	3	9	103
CDN-CM-34		10	<1	1.26	10	2.68	320	284	0.11	239	1210	25	3.11	3	10	106
Target Range - Lower Bound		<10	<1	1.06	<10	2.27	269	245	0.08	204	1050	18	2.70	<2	8	92
Upper Bound		30	2	1.32	30	2.80	340	301	0.13	252	1310	28	3.32	9	13	115
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
EMOG-17		<10	2	0.67	20	0.76	625	1055	0.16	7680	760	7110	3.10	662	5	52
EMOG-17		<10	1	0.66	20	0.74	631	1045	0.16	7610	740	7070	3.05	681	5	52
EMOG-17		<10	<1	0.68	20	0.78	643	1060	0.17	7690	770	7260	3.11	667	5	54
Target Range - Lower Bound		<10	<1	0.60	<10	0.73	598	1015	0.15	6930	680	6500	2.90	572	3	47
Upper Bound		30	3	0.76	40	0.91	742	1245	0.20	8470	850	7950	3.56	778	7	59
G915-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																

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Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Target Range - Lower Bound												5.3				
Upper Bound												6.7				
CDN-CM-34		<20	0.18	<10	<10	106	10	180								
CDN-CM-34		<20	0.17	<10	<10	104	10	171								
CDN-CM-34		<20	0.19	<10	<10	110	10	178								
Target Range - Lower Bound		<20	0.15	<10	<10	95	<10	159								
Upper Bound		40	0.21	20	20	118	30	199								
DS-1									3.13	2.53						
DS-1									3.20	2.58						
DS-1									3.20	2.57						
Target Range - Lower Bound									3.01	2.51						
Upper Bound									3.25	2.71						
EMOG-17		<20	0.21	10	<10	64	20	7350								
EMOG-17		<20	0.21	<10	<10	64	10	7260								
EMOG-17		<20	0.21	<10	<10	64	<10	7430								
Target Range - Lower Bound		<20	0.18	<10	<10	58	<10	6780								
Upper Bound		50	0.25	20	20	74	20	8290								
G915-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10									1.10							
GS310-10									1.08							
Target Range - Lower Bound									1.03							
Upper Bound									1.13							

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		1.915														
JK-17		2.01														
JK-17		1.970														
JK-17		1.965														
JK-17		1.985														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
JK-17			1.98													
Target Range - Lower Bound			1.83													
Upper Bound			2.17													
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method Analyte Units LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
STANDARDS																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
GS310-10									1.10	0.25						
GS310-10									1.09	0.25						
GS310-10										0.27						
Target Range - Lower Bound										0.25						
Upper Bound										0.29						
GS313-8									0.91	1.24						
GS313-8									0.97	1.28						
GS313-8									0.97	1.21						
Target Range - Lower Bound									0.90	1.19						
Upper Bound									0.98	1.29						
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1											59		34	25.0	2.36	2
KZK-1											60		35	25.0	2.40	2
KZK-1											59		34	25.0	2.36	2
KZK-1											60		35	25.0	2.40	2
Target Range - Lower Bound											54		30	22.9	2.18	
Upper Bound											64		38	27.1	2.54	
MA-1b									2.45							
MA-1b									2.54							
Target Range - Lower Bound									2.34							
Upper Bound									2.54							
MA-1b									2.45	1.17						
MA-1b									2.46	1.16						
MA-1b										1.13						
Target Range - Lower Bound										1.12						
Upper Bound										1.22						

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08				4.3	2.60	31	<10	440	0.7	<2	1.05	1.8	19	88	611	3.56
MRGeo08				4.5	2.71	32	10	450	0.8	<2	1.09	1.8	19	91	631	3.69
Target Range - Lower Bound				3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22
Upper Bound				5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OREAS 602				>100	0.62	659	<10	30	<0.5	59	0.53	25.0	9	33	5180	2.08
OREAS 602				>100	0.62	664	<10	30	<0.5	61	0.52	25.4	10	37	5240	2.08
Target Range - Lower Bound				106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94
Upper Bound				100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40
OREAS-218		0.526														
OREAS-218		0.559														
OREAS-218		0.531														
OREAS-218		0.530														
Target Range - Lower Bound		0.494														
Upper Bound		0.568														
PMP-18		0.314														
Target Range - Lower Bound		0.277														
Upper Bound		0.323														
BLANKS																
BLANK		<0.005														
BLANK		0.014														
BLANK		0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														

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5967 HWY 11/71
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Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
MP-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		10	<1	1.26	30	1.10	402	13	0.33	693	980	1060	0.29	3	7	80
MRGeo08		10	<1	1.32	30	1.14	412	13	0.35	718	1010	1090	0.31	3	7	84
Target Range - Lower Bound		<10	<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71
Upper Bound		30	2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		<10	1	0.09	10	0.10	215	4	0.02	62	230	840	1.98	67	1	50
OREAS 602		<10	1	0.09	10	0.10	214	4	0.02	64	240	841	1.98	66	1	48
Target Range - Lower Bound		<10	<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	51	<1	44
Upper Bound		30	3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	73	3	56
OREAS-218																
OREAS-218																
OREAS-218																
OREAS-218																
Target Range - Lower Bound																
Upper Bound																
PMP-18																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
MP-1b										13.70						
Target Range - Lower Bound										13.30						
Upper Bound										14.30						
MRGeo08		20	0.36	<10	<10	99	<10	759								
MRGeo08		20	0.37	<10	<10	102	<10	781								
Target Range - Lower Bound		<20	0.33	<10	<10	90	<10	708								
Upper Bound		60	0.43	20	30	112	20	870								
NBM-1											51		42	8.8	5.83	2
NBM-1											48		39	8.8	5.49	2
NBM-1											50		41	8.8	5.71	2
NBM-1											50		41	8.8	5.71	2
Target Range - Lower Bound											45		37	7.8	5.26	
Upper Bound											54		47	9.7	6.08	
OREAS 602		<20	0.01	<10	<10	10	10	4100								
OREAS 602		<20	0.01	<10	<10	10	10	4130								
Target Range - Lower Bound		<20	<0.01	<10	<10	8	<10	3680								
Upper Bound		40	0.03	20	20	14	20	4500								
OREAS-218																
OREAS-218																
OREAS-218																
OREAS-218																
Target Range - Lower Bound																
Upper Bound																
PMP-18																
Target Range - Lower Bound																
Upper Bound																
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
BLANKS																
BLANK			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Target Range - Lower Bound				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Upper Bound				0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
BLANKS																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
Target Range - Lower Bound		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
Upper Bound		20	2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK									<0.01							
BLANK									<0.01							
Target Range - Lower Bound									<0.01							
Upper Bound									0.02							
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<20	<0.01	<10	<10	<1	<10	<2								
Upper Bound		40	0.02	20	20	2	20	4								
BLANK												6.0				
BLANK												6.0				
BLANK												6.0				
BLANK												6.0				
Target Range - Lower Bound												5.5				
Upper Bound												6.9				
BLANK									<0.01	<0.01						
BLANK									<0.01	0.01						
BLANK									0.01	0.01						
BLANK									<0.01	0.01						
BLANK									0.01	<0.01						
BLANK										0.01						
Target Range - Lower Bound										<0.01						
Upper Bound										0.02						

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		0.012														
DUP		0.013														
Target Range - Lower Bound		0.007														
Upper Bound		0.018														
ORIGINAL			18.20													
DUP			16.65													
Target Range - Lower Bound			16.50													
Upper Bound			18.35													
ORIGINAL			8.12													
DUP			8.71													
Target Range - Lower Bound			7.94													
Upper Bound			8.89													
ORIGINAL		0.244														
DUP		0.258														
Target Range - Lower Bound		0.233														
Upper Bound		0.269														
ORIGINAL		0.399														
DUP		0.427														
Target Range - Lower Bound		0.387														
Upper Bound		0.439														
ORIGINAL		0.692														
DUP		0.874														
Target Range - Lower Bound		0.739														
Upper Bound		0.827														
V850864				3.1	0.93	484	<10	20	<0.5	2	0.34	18.2	7	6	248	3.71
DUP				2.5	0.93	460	<10	20	<0.5	2	0.34	18.3	7	6	246	3.69
Target Range - Lower Bound				2.5	0.87	446	<10	<10	<0.5	<2	0.31	16.8	6	5	237	3.51
Upper Bound				3.1	0.99	498	20	30	1.0	4	0.37	19.7	8	7	257	3.90

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V850864		<10	<1	0.19	10	0.59	420	1	<0.01	7	350	46	3.00	3	<1	11
DUP		<10	<1	0.19	10	0.59	417	1	<0.01	7	360	42	2.98	<2	<1	11
Target Range - Lower Bound		<10	<1	0.17	<10	0.55	393	<1	<0.01	6	330	40	2.83	<2	<1	9
Upper Bound		20	2	0.21	20	0.63	444	2	0.02	8	380	48	3.15	4	2	13

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
ORIGINAL									0.23	0.02						
DUP									0.22	0.02						
Target Range - Lower Bound									0.21	<0.01						
Upper Bound									0.24	0.03						
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V850864		<20	0.01	<10	<10	5	10	4490								
DUP		<20	0.01	<10	<10	5	10	4480								
Target Range - Lower Bound		<20	<0.01	<10	<10	4	<10	4260								
Upper Bound		40	0.02	20	20	6	20	4710								

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V835520																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124025119																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123002091																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124019104				0.8	2.52	23	<10	130	<0.5	<2	2.48	<0.5	16	97	27	3.65
DUP				0.7	2.51	24	<10	130	<0.5	<2	2.47	<0.5	15	94	27	3.60
Target Range - Lower Bound				0.5	2.38	20	<10	110	<0.5	<2	2.34	<0.5	14	90	25	3.43
Upper Bound				1.0	2.65	27	20	150	1.0	4	2.61	1.0	17	101	29	3.82
1124012085																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124019110		0.429														
DUP		0.440														
Target Range - Lower Bound		0.408														
Upper Bound		0.461														
V835510																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
V835520																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124025119																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123002091																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124019104		10	<1	0.51	20	0.96	724	1	0.18	25	600	18	1.51	<2	4	186
DUP		10	<1	0.51	20	0.94	709	1	0.19	24	590	19	1.49	<2	4	187
Target Range - Lower Bound		<10	<1	0.47	<10	0.89	676	<1	0.17	22	560	16	1.42	<2	3	176
Upper Bound		20	2	0.55	30	1.01	757	2	0.20	27	630	21	1.59	4	5	197
1124012085																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124019110																
DUP																
Target Range - Lower Bound																
Upper Bound																
V835510																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
ORIGINAL									0.21	0.03						
DUP									0.21	0.03						
Target Range - Lower Bound									0.19	0.02						
Upper Bound									0.23	0.04						
V835520									0.02							
DUP									0.02							
Target Range - Lower Bound									<0.01							
Upper Bound									0.03							
1124025119												9.0				
DUP												9.0				
Target Range - Lower Bound												8.5				
Upper Bound												9.6				
1123002091											43		35	8.4	5.10	2
DUP											44		36	8.4	5.21	2
Target Range - Lower Bound											40		33	7.7	4.89	<1
Upper Bound											47		38	9.1	5.42	3
1124019104		<20	0.09	<10	<10	70	<10	160								
DUP		<20	0.09	<10	<10	69	<10	157								
Target Range - Lower Bound		<20	0.08	<10	<10	65	<10	149								
Upper Bound		40	0.10	20	20	74	20	168								
1124012085									0.78	1.00						
DUP									0.80	0.99						
Target Range - Lower Bound									0.76	0.96						
Upper Bound									0.82	1.03						
1124019110																
DUP																
Target Range - Lower Bound																
Upper Bound																
V835510									0.01							
DUP									0.01							
Target Range - Lower Bound									<0.01							
Upper Bound									0.02							

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
1124018094																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124018075																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124013120		0.084														
DUP		0.088														
Target Range - Lower Bound		0.077														
Upper Bound		0.095														
1124021127				1.2	1.47	55	<10	30	<0.5	2	1.97	18.7	9	69	95	2.43
DUP				1.2	1.48	58	<10	30	<0.5	3	1.97	18.6	8	70	94	2.38
Target Range - Lower Bound				0.9	1.39	52	<10	20	<0.5	<2	1.86	17.2	7	65	90	2.27
Upper Bound				1.5	1.56	61	20	40	1.0	4	2.08	20.1	10	74	99	2.54
1124026020																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123001198			19.30													
DUP			12.15													
Target Range - Lower Bound			14.90													
Upper Bound			16.55													
1124012018																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124012044																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
1124018094																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124018075																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124013120																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124021127		<10	1	0.15	10	0.58	734	1	0.14	12	410	95	2.37	<2	<1	34
DUP		<10	<1	0.15	10	0.58	730	1	0.14	11	410	94	2.32	<2	<1	35
Target Range - Lower Bound		<10	<1	0.13	<10	0.54	690	<1	0.12	10	380	88	2.22	<2	<1	32
Upper Bound		20	2	0.17	20	0.62	774	2	0.16	13	440	101	2.47	4	2	37
1124026020																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123001198																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124012018																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124012044																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES																
1124018094												8.7				
DUP												8.7				
Target Range - Lower Bound												8.2				
Upper Bound												9.2				
1124018075											25		-28	53.1	0.47	2
DUP											24		-29	53.1	0.45	2
Target Range - Lower Bound											22		-31	50.1	0.43	<1
Upper Bound											27		-26	56.1	0.49	3
1124013120																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124021127		<20	<0.01	<10	<10	4	10	3920								
DUP		<20	<0.01	<10	<10	4	10	3930								
Target Range - Lower Bound		<20	<0.01	<10	<10	3	<10	3730								
Upper Bound		40	0.02	20	20	5	20	4120								
1124026020									0.87	1.32						
DUP									0.89	1.31						
Target Range - Lower Bound									0.85	1.27						
Upper Bound									0.91	1.36						
1123001198																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124012018												9.3				
DUP												9.3				
Target Range - Lower Bound												8.7				
Upper Bound												9.9				
1124012044											41		27	14.4	2.85	2
DUP											42		28	14.4	2.92	2
Target Range - Lower Bound											38		25	13.4	2.73	<1
Upper Bound											45		30	15.4	3.04	3

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
V835513				9.4	0.93	<2	<10	80	<0.5	<2	0.54	<0.5	11	8	50	2.87
DUP				9.5	0.98	<2	<10	80	<0.5	<2	0.57	<0.5	11	9	50	2.95
Target Range - Lower Bound				8.8	0.90	<2	<10	60	<0.5	<2	0.52	<0.5	9	7	47	2.75
Upper Bound				10.1	1.01	4	20	100	1.0	4	0.59	1.0	13	10	53	3.07
1123001101		0.635														
DUP		0.580														
Target Range - Lower Bound		0.572														
Upper Bound		0.643														
1123001018																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124024034																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123001306																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124026001		0.021														
DUP		0.014														
Target Range - Lower Bound		0.012														
Upper Bound		0.023														
1124026016				0.7	2.62	65	<10	70	<0.5	<2	2.98	0.6	31	149	78	7.82
DUP				0.6	2.57	63	<10	70	<0.5	<2	2.90	0.7	30	146	83	7.65
Target Range - Lower Bound				0.4	2.46	59	<10	50	<0.5	<2	2.78	<0.5	28	139	77	7.34
Upper Bound				0.9	2.73	69	20	90	1.0	4	3.10	1.0	33	156	84	8.13
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
V835513		<10	<1	0.20	10	0.40	261	19	0.14	13	620	8	0.06	<2	2	19
DUP		<10	<1	0.20	10	0.41	270	19	0.15	13	610	6	0.06	<2	2	20
Target Range - Lower Bound		<10	<1	0.18	<10	0.37	247	17	0.13	11	570	5	0.05	<2	<1	18
Upper Bound		20	2	0.22	20	0.44	284	21	0.16	15	660	9	0.07	4	3	21
1123001101																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123001018																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124024034																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123001306																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124026001																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124026016		10	<1	0.27	10	1.27	1040	1	0.06	50	600	4	2.00	<2	8	64
DUP		10	<1	0.26	10	1.25	1010	1	0.05	55	590	5	1.95	<2	7	63
Target Range - Lower Bound		<10	<1	0.24	<10	1.19	969	<1	0.04	49	560	<2	1.87	<2	6	59
Upper Bound		20	2	0.29	20	1.33	1080	2	0.07	56	630	7	2.08	4	9	68
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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www.alsglobal.com/geochemistry

To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
V835513		<20	0.41	<10	<10	70	<10	47								
DUP		<20	0.42	<10	<10	71	<10	50								
Target Range - Lower Bound		<20	0.38	<10	<10	66	<10	44								
Upper Bound		40	0.45	20	20	75	20	53								
1123001101																
DUP																
Target Range - Lower Bound																
Upper Bound																
1123001018									0.42	1.74						
DUP									0.43	1.67						
Target Range - Lower Bound									0.40	1.65						
Upper Bound									0.45	1.76						
1124024034												9.3				
DUP												9.3				
Target Range - Lower Bound												8.7				
Upper Bound												9.9				
1123001306											37		-63	100.3	0.37	2
DUP											37		-63	100.3	0.37	2
Target Range - Lower Bound											34		-67	95.0	0.34	<1
Upper Bound											40		-59	105.6	0.40	3
1124026001																
DUP																
Target Range - Lower Bound																
Upper Bound																
1124026016		<20	0.12	10	<10	138	<10	232								
DUP		<20	0.12	10	<10	135	<10	226								
Target Range - Lower Bound		<20	0.10	<10	<10	129	<10	216								
Upper Bound		40	0.14	20	20	144	20	242								
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
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Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES																
ORIGINAL		<0.005														
DUP		0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		>10.0														
DUP		>10.0														
Target Range - Lower Bound		9.50														
Upper Bound		10.00														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Finalized Date: 9-JAN-2019
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Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB18315377

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL										0.64						
DUP										0.61						
Target Range - Lower Bound										0.60						
Upper Bound										0.65						

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 9-JAN-2019
Account: RRR

Project: Mine Site Lab Pulps Nov 2018

QC CERTIFICATE OF ANALYSIS TB18315377

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:			
LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:			
Au-AA23	Au-GRA21	C-IR07	ME-ICP41
OA-ELE07	OA-VOL08	S-IR08	

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

QC CERTIFICATE TB19005962

Project: Mine Site Lab Pulps Nov2018 V2

P.O. No.: 4500023138

This report is for 214 Pulp samples submitted to our lab in Thunder Bay, ON, Canada on 28-DEC-2018.

The following have access to data associated with this certificate:

RAINY RIVER AP TIM SCHWARTZ	JOHN BLIGH	JASON PATTISON

SAMPLE PREPARATION

ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-23	Pulp Login - Rcvd with Barcode
LOG-QC	QC Test on Received Samples

ANALYTICAL PROCEDURES

ALS CODE	DESCRIPTION	
OA-VOL08	Basic Acid Base Accounting	
S-IR08	Total Sulphur (Leco)	LECO
OA-ELE07	Paste pH	
C-IR07	Total Carbon (Leco)	LECO
Au-AA23	Au 30g FA-AA finish	AAS
Au-GRA21	Au 30g FA-GRAV finish	WST-SIM
ME-ICP41	35 Element Aqua Regia ICP-AES	ICP-AES

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

***** See Appendix Page for comments regarding this certificate *****

<Original signed by>

Signature:
Colin Ramshaw, Vancouver Laboratory Manager

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34				4.1	2.50	106	<10	120	<0.5	7	1.41	1.2	41	183	5910	4.51
CDN-CM-34				3.6	2.46	106	<10	60	<0.5	5	1.38	1.0	40	181	6030	4.46
CDN-CM-34				3.7	2.40	105	<10	120	<0.5	7	1.39	1.1	42	181	5890	4.36
Target Range - Lower Bound				3.1	2.14	93	<10	70	<0.5	<2	1.20	<0.5	36	164	5390	3.91
Upper Bound				4.3	2.64	118	30	140	1.4	8	1.49	2.0	46	202	6210	4.80
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
EMOG-17				66.1	1.58	577	<10	50	<0.5	10	0.97	19.4	750	46	8370	4.66
EMOG-17				66.9	1.58	586	<10	30	<0.5	6	0.95	19.2	744	46	8530	4.68
EMOG-17				67.3	1.56	593	<10	50	<0.5	9	0.97	19.9	765	47	8510	4.62
Target Range - Lower Bound				60.1	1.45	503	<10	30	<0.5	<2	0.87	17.9	679	42	7780	4.18
Upper Bound				73.9	1.79	619	20	80	1.5	10	1.09	22.9	833	54	8960	5.14

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Buffer pH6																
Target Range - Lower Bound																
Upper Bound																
CDN-CM-34		10	<1	1.24	10	2.61	306	279	0.11	233	1190	23	3.13	5	9	106
CDN-CM-34		10	1	1.23	10	2.58	304	278	0.11	234	1160	20	3.03	4	9	105
CDN-CM-34		10	<1	1.20	10	2.55	303	276	0.11	232	1160	22	3.01	6	9	103
Target Range - Lower Bound		<10	<1	1.06	<10	2.27	269	245	0.08	204	1050	18	2.70	<2	8	92
Upper Bound		30	2	1.32	30	2.80	340	301	0.13	252	1310	28	3.32	9	13	115
DS-1																
Target Range - Lower Bound																
Upper Bound																
DS-1																
DS-1																
DS-1																
Target Range - Lower Bound																
Upper Bound																
EMOG-17		<10	<1	0.67	20	0.78	631	1065	0.17	7680	770	7140	3.16	712	5	53
EMOG-17		<10	1	0.67	20	0.78	631	1070	0.17	7850	750	7230	3.13	636	5	54
EMOG-17		<10	<1	0.65	20	0.79	644	1085	0.16	7820	780	7460	3.15	694	4	53
Target Range - Lower Bound		<10	<1	0.60	<10	0.73	598	1015	0.15	6930	680	6500	2.90	572	3	47
Upper Bound		30	3	0.76	40	0.91	742	1245	0.20	8470	850	7950	3.56	778	7	59

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Buffer pH6												6.0				
Target Range - Lower Bound												5.3				
Upper Bound												6.7				
CDN-CM-34		<20	0.18	<10	<10	105	10	175								
CDN-CM-34		<20	0.18	<10	<10	105	10	178								
CDN-CM-34		<20	0.18	<10	<10	104	10	177								
Target Range - Lower Bound		<20	0.15	<10	<10	95	<10	159								
Upper Bound		40	0.21	20	20	118	30	199								
DS-1									3.12							
Target Range - Lower Bound									3.01							
Upper Bound									3.25							
DS-1									3.19	2.69						
DS-1									3.10	2.66						
DS-1									3.11	2.63						
Target Range - Lower Bound									3.01	2.51						
Upper Bound									3.25	2.71						
EMOG-17		<20	0.21	<10	<10	62	<10	7170								
EMOG-17		<20	0.21	10	<10	63	<10	7350								
EMOG-17		<20	0.21	<10	<10	63	<10	7420								
Target Range - Lower Bound		<20	0.18	<10	<10	58	<10	6780								
Upper Bound		50	0.25	20	20	74	20	8290								

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
G915-10			49.0													
Target Range - Lower Bound			45.7													
Upper Bound			51.7													
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17		2.01														
JK-17		2.03														
JK-17		2.00														
JK-17		2.04														
JK-17		2.03														
Target Range - Lower Bound		1.875														
Upper Bound		2.12														
JK-17			1.94													
Target Range - Lower Bound			1.83													
Upper Bound			2.17													
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																

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Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
G915-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10																
GS310-10																
GS310-10																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
GS313-8																
GS313-8																
GS313-8																
Target Range - Lower Bound																
Upper Bound																
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
KZK-1																
Target Range - Lower Bound																
Upper Bound																

***** See Appendix Page for comments regarding this certificate *****

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
G915-10																
Target Range - Lower Bound																
Upper Bound																
GS310-10									1.04	0.25						
GS310-10									1.09	0.27						
GS310-10									1.09	0.25						
Target Range - Lower Bound									1.03	0.25						
Upper Bound									1.13	0.29						
GS313-8									0.90							
Target Range - Lower Bound									0.90							
Upper Bound									0.98							
GS313-8									0.91	1.21						
GS313-8									0.94	1.21						
GS313-8									0.94	1.26						
Target Range - Lower Bound									0.90	1.19						
Upper Bound									0.98	1.29						
JK-17																
JK-17																
JK-17																
JK-17																
JK-17																
Target Range - Lower Bound																
Upper Bound																
JK-17																
Target Range - Lower Bound																
Upper Bound																
KZK-1											59		34	25.0	2.36	2
KZK-1											61		36	25.0	2.44	2
KZK-1											61		36	25.0	2.44	2
KZK-1											59		34	25.0	2.36	2
KZK-1											59		34	25.0	2.36	2
KZK-1											62		37	25.0	2.48	2
Target Range - Lower Bound											54		30	22.9	2.18	
Upper Bound											64		38	27.1	2.54	

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
STANDARDS																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08				4.7	2.79	32	<10	450	0.8	4	1.17	2.4	20	93	642	3.78
MRGeo08				4.7	2.72	32	<10	450	0.8	5	1.14	2.4	20	94	644	3.69
MRGeo08				4.5	2.58	31	<10	440	0.7	3	1.07	2.2	19	90	607	3.56
MRGeo08				4.6	2.70	36	<10	440	0.8	5	1.12	2.4	19	92	629	3.72
Target Range - Lower Bound				3.8	2.44	27	<10	370	<0.5	<2	1.00	1.1	16	81	586	3.22
Upper Bound				5.1	3.00	39	20	530	1.9	5	1.24	3.4	22	102	676	3.96
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OREAS 602				>100	0.66	677	<10	30	<0.5	60	0.54	25.1	10	30	5280	2.06
OREAS 602				>100	0.63	672	<10	30	<0.5	62	0.54	25.4	10	34	5200	2.04
OREAS 602				>100	0.65	705	<10	30	<0.5	63	0.56	26.7	10	33	5370	2.13
OREAS 602				>100	0.61	645	<10	30	<0.5	59	0.52	24.4	10	31	5060	1.98
Target Range - Lower Bound				106.0	0.57	577	<10	<10	<0.5	50	0.46	22.2	7	26	4810	1.94
Upper Bound				100.0	0.71	709	20	50	1.3	66	0.59	28.2	12	34	5530	2.40
OREAS-218		0.538														
OREAS-218		0.554														
Target Range - Lower Bound		0.494														
Upper Bound		0.568														
PMP-18		0.310														
PMP-18		0.314														
PMP-18		0.314														
Target Range - Lower Bound		0.277														
Upper Bound		0.323														

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
STANDARDS																
MA-1b																
MA-1b																
MA-1b																
Target Range - Lower Bound																
Upper Bound																
MRGeo08		10	<1	1.33	30	1.20	425	14	0.37	724	1020	1105	0.32	<2	7	87
MRGeo08		10	<1	1.28	30	1.20	427	14	0.35	729	1030	1130	0.32	5	7	84
MRGeo08		10	<1	1.24	30	1.14	408	14	0.32	701	1000	1090	0.29	3	7	78
MRGeo08		10	<1	1.28	30	1.18	419	14	0.34	713	1040	1085	0.31	6	7	82
Target Range - Lower Bound		<10	<1	1.12	20	1.03	378	12	0.30	621	900	957	0.27	<2	5	71
Upper Bound		30	2	1.40	60	1.29	473	17	0.39	761	1130	1175	0.35	8	10	89
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
NBM-1																
Target Range - Lower Bound																
Upper Bound																
OREAS 602		<10	1	0.10	10	0.11	213	4	0.02	61	230	845	2.05	69	1	51
OREAS 602		<10	<1	0.09	10	0.10	212	4	0.02	63	230	867	1.98	65	1	49
OREAS 602		<10	<1	0.09	10	0.11	222	4	0.03	64	240	908	2.07	67	1	51
OREAS 602		<10	<1	0.09	10	0.10	204	4	0.02	60	230	818	1.97	69	1	47
Target Range - Lower Bound		<10	<1	0.07	<10	0.08	193	2	<0.01	54	210	768	1.81	51	<1	44
Upper Bound		30	3	0.12	30	0.13	247	7	0.05	68	280	944	2.23	73	3	56
OREAS-218																
OREAS-218																
Target Range - Lower Bound																
Upper Bound																
PMP-18																
PMP-18																
PMP-18																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
STANDARDS																
MA-1b									2.45	1.16						
MA-1b									2.48	1.21						
MA-1b									2.49	1.20						
Target Range - Lower Bound									2.34	1.12						
Upper Bound									2.54	1.22						
MRGeo08		20	0.39	<10	<10	102	<10	786								
MRGeo08		20	0.39	<10	<10	103	<10	795								
MRGeo08		20	0.38	<10	<10	99	<10	766								
MRGeo08		20	0.39	<10	<10	101	<10	771								
Target Range - Lower Bound		<20	0.33	<10	<10	90	<10	708								
Upper Bound		60	0.43	20	30	112	20	870								
NBM-1											48		39	8.8	5.49	2
NBM-1											52		43	8.8	5.94	2
NBM-1											52		43	8.8	5.94	2
NBM-1											51		42	8.8	5.83	2
NBM-1											51		42	8.8	5.83	2
NBM-1											50		41	8.8	5.71	2
Target Range - Lower Bound											45		37	7.8	5.26	
Upper Bound											54		47	9.7	6.08	
OREAS 602		<20	0.01	<10	<10	10	<10	3990								
OREAS 602		<20	0.01	<10	<10	10	<10	4060								
OREAS 602		<20	0.01	<10	<10	11	<10	4260								
OREAS 602		<20	0.01	<10	<10	10	<10	3850								
Target Range - Lower Bound		<20	<0.01	<10	<10	8	<10	3680								
Upper Bound		40	0.03	20	20	14	20	4500								
OREAS-218																
OREAS-218																
Target Range - Lower Bound																
Upper Bound																
PMP-18																
PMP-18																
PMP-18																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
BLANKS																
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
BLANK		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
BLANK			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
BLANK				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Target Range - Lower Bound				<0.2	<0.01	<2	<10	<10	<0.5	<2	<0.01	<0.5	<1	<1	<1	<0.01
Upper Bound				0.4	0.02	4	20	20	1.0	4	0.02	1.0	2	2	2	0.02
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	1	<10	<2	<0.01	<2	<1	<1
BLANK		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	1	<10	<2	<0.01	<2	<1	<1
Target Range - Lower Bound		<10	<1	<0.01	<10	<0.01	<5	<1	<0.01	<1	<10	<2	<0.01	<2	<1	<1
Upper Bound		20	2	0.02	20	0.02	10	2	0.02	2	20	4	0.02	4	2	2
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT OPERATIONS**
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
BLANKS																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK																
Target Range - Lower Bound																
Upper Bound																
BLANK									<0.01							
Target Range - Lower Bound									<0.01							
Upper Bound									0.02							
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
BLANK		<20	<0.01	<10	<10	<1	<10	<2								
Target Range - Lower Bound		<20	<0.01	<10	<10	<1	<10	<2								
Upper Bound		40	0.02	20	20	2	20	4								
BLANK												6.0				
BLANK												6.0				
BLANK												6.0				
BLANK												6.0				
BLANK												6.0				
BLANK												6.0				
Target Range - Lower Bound												5.5				
Upper Bound												6.9				
BLANK									<0.01	<0.01						
BLANK									<0.01	<0.01						
BLANK									<0.01	<0.01						
BLANK									<0.01	0.01						
BLANK									<0.01	0.01						
BLANK									<0.01	<0.01						
Target Range - Lower Bound									<0.01	<0.01						
Upper Bound									0.02	0.02						

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
ORIGINAL		0.373														
DUP		0.372														
Target Range - Lower Bound		0.349														
Upper Bound		0.396														
ORIGINAL			0.48													
DUP			0.43													
Target Range - Lower Bound			0.38													
Upper Bound			0.53													
ORIGINAL			<0.05													
DUP			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
ORIGINAL			<0.05													
DUP			<0.05													
Target Range - Lower Bound			<0.05													
Upper Bound			0.10													
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		0.370														
DUP		0.353														
Target Range - Lower Bound		0.338														
Upper Bound		0.385														
ORIGINAL		1.060														
DUP		1.110														
Target Range - Lower Bound		1.025														
Upper Bound		1.145														

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
		DUPLICATES														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
		DUPLICATES														
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL											219		214	5.0	43.80	3
DUP											220		215	4.7	46.93	3
Target Range - Lower Bound											208		203	4.3	43.09	2
Upper Bound											231		226	5.4	47.64	>4
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
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QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description / Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES															
1122014105															
DUP															
Target Range - Lower Bound															
Upper Bound															
1231003342			1.1	0.77	196	<10	50	<0.5	<2	1.48	1.7	7	131	24	1.83
DUP			1.3	0.76	188	<10	50	<0.5	<2	1.47	1.7	8	127	25	1.84
Target Range - Lower Bound			0.9	0.72	180	<10	40	<0.5	<2	1.39	1.1	6	122	23	1.73
Upper Bound			1.5	0.81	204	20	60	1.0	4	1.56	2.3	9	136	26	1.94
1122014181															
DUP															
Target Range - Lower Bound															
Upper Bound															
1122011118	0.076														
DUP	0.075														
Target Range - Lower Bound	0.067														
Upper Bound	0.084														
1122011187															
DUP															
Target Range - Lower Bound															
Upper Bound															
1122016065															
DUP															
Target Range - Lower Bound															
Upper Bound															
V835530			9.5	0.99	<2	<10	80	<0.5	4	0.61	<0.5	12	9	50	2.99
DUP			9.6	0.97	<2	<10	80	<0.5	2	0.60	<0.5	11	9	50	2.94
Target Range - Lower Bound			8.9	0.92	<2	<10	60	<0.5	<2	0.56	<0.5	10	8	47	2.81
Upper Bound			10.2	1.04	4	20	100	1.0	4	0.65	1.0	13	10	53	3.12
1231009008															
DUP															
Target Range - Lower Bound															
Upper Bound															

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5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description / Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES															
1122014105															
DUP															
Target Range - Lower Bound															
Upper Bound															
1231003342	<10	<1	0.37	10	0.59	1145	1	0.01	9	380	533	1.54	<2	<1	13
DUP	<10	<1	0.37	10	0.59	1150	<1	0.01	8	390	531	1.54	<2	<1	13
Target Range - Lower Bound	<10	<1	0.34	<10	0.55	1085	<1	<0.01	7	360	503	1.45	<2	<1	11
Upper Bound	20	2	0.40	20	0.63	1210	2	0.02	10	410	561	1.63	4	2	15
1122014181															
DUP															
Target Range - Lower Bound															
Upper Bound															
1122011118															
DUP															
Target Range - Lower Bound															
Upper Bound															
1122011187															
DUP															
Target Range - Lower Bound															
Upper Bound															
1122016065															
DUP															
Target Range - Lower Bound															
Upper Bound															
V835530	<10	<1	0.20	10	0.43	269	19	0.15	14	610	9	0.05	<2	2	20
DUP	<10	<1	0.20	10	0.42	262	19	0.15	12	610	8	0.05	<2	2	20
Target Range - Lower Bound	<10	<1	0.18	<10	0.39	247	17	0.13	11	570	6	0.04	<2	<1	18
Upper Bound	20	2	0.22	20	0.46	284	21	0.17	15	650	11	0.06	4	3	22
1231009008															
DUP															
Target Range - Lower Bound															
Upper Bound															

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QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description / Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES															
1122014105								0.31	1.56						
DUP								0.31	1.55						
Target Range - Lower Bound								0.29	1.51						
Upper Bound								0.33	1.60						
1231003342	<20	<0.01	<10	<10	4	<10	450								
DUP	<20	<0.01	<10	<10	4	<10	460								
Target Range - Lower Bound	<20	<0.01	<10	<10	3	<10	430								
Upper Bound	40	0.02	20	20	5	20	480								
1122014181											9.1				
DUP											9.1				
Target Range - Lower Bound											8.5				
Upper Bound											9.7				
1122011118															
DUP															
Target Range - Lower Bound															
Upper Bound															
1122011187										45		33	12.2	3.69	2
DUP										45		33	12.2	3.69	2
Target Range - Lower Bound										42		30	11.3	3.50	<1
Upper Bound										48		36	13.1	3.88	3
1122016065								0.47	1.75						
DUP								0.48	1.78						
Target Range - Lower Bound								0.45	1.71						
Upper Bound								0.50	1.82						
V835530	<20	0.43	<10	<10	71	<10	50								
DUP	<20	0.43	<10	<10	70	<10	48								
Target Range - Lower Bound	<20	0.40	<10	<10	66	<10	45								
Upper Bound	40	0.46	20	20	75	20	53								
1231009008											8.4				
DUP											8.5				
Target Range - Lower Bound											7.9				
Upper Bound											9.0				

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QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description / Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES															
1122015189	0.073														
DUP	0.073														
Target Range - Lower Bound	0.064														
Upper Bound	0.082														
1231008150															
DUP															
Target Range - Lower Bound															
Upper Bound															
1230010341			0.7	1.75	10	10	40	<0.5	3	1.66	<0.5	17	155	80	3.30
DUP			0.8	1.79	8	10	40	<0.5	<2	1.68	<0.5	17	154	82	3.32
Target Range - Lower Bound			0.5	1.67	7	<10	30	<0.5	<2	1.58	<0.5	15	146	77	3.13
Upper Bound			1.0	1.87	11	20	50	1.0	4	1.76	1.0	19	163	85	3.49
1230010402	0.166														
DUP	0.134														
Target Range - Lower Bound	0.138														
Upper Bound	0.163														
1231009207															
DUP															
Target Range - Lower Bound															
Upper Bound															
1231009049															
DUP															
Target Range - Lower Bound															
Upper Bound															
1231009017			0.9	1.55	11	<10	30	<0.5	<2	0.43	1.7	14	199	81	2.58
DUP			0.9	1.62	12	<10	30	<0.5	<2	0.44	1.7	15	201	84	2.67
Target Range - Lower Bound			0.7	1.50	9	<10	20	<0.5	<2	0.40	1.1	13	189	79	2.48
Upper Bound			1.1	1.67	14	20	40	1.0	4	0.47	2.3	16	211	86	2.77
1122011196	0.022														
DUP	0.019														
Target Range - Lower Bound	0.014														
Upper Bound	0.027														

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5967 HWY 11/71
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Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description / Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES															
1122015189															
DUP															
Target Range - Lower Bound															
Upper Bound															
1231008150															
DUP															
Target Range - Lower Bound															
Upper Bound															
1230010341	10	<1	0.26	10	1.39	1220	1	0.03	27	570	8	0.98	<2	6	29
DUP	10	<1	0.27	10	1.41	1235	1	0.03	27	600	6	0.99	2	6	30
Target Range - Lower Bound	<10	<1	0.24	<10	1.32	1160	<1	0.02	25	550	5	0.93	<2	5	27
Upper Bound	20	2	0.29	20	1.48	1295	2	0.04	29	620	9	1.04	4	7	32
1230010402															
DUP															
Target Range - Lower Bound															
Upper Bound															
1231009207															
DUP															
Target Range - Lower Bound															
Upper Bound															
1231009049															
DUP															
Target Range - Lower Bound															
Upper Bound															
1231009017	<10	<1	0.11	20	1.16	455	1	0.08	35	680	8	2.32	<2	2	31
DUP	<10	<1	0.11	20	1.21	467	1	0.09	36	700	7	2.40	<2	3	33
Target Range - Lower Bound	<10	<1	0.09	<10	1.12	433	<1	0.07	33	650	5	2.23	<2	<1	29
Upper Bound	20	2	0.13	30	1.25	489	2	0.10	38	730	10	2.49	4	4	35
1122011196															
DUP															
Target Range - Lower Bound															
Upper Bound															

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1122015189																
DUP																
Target Range - Lower Bound																
Upper Bound																
1231008150											20		-85	104.7	0.19	1
DUP											20		-85	104.7	0.19	1
Target Range - Lower Bound											18		-90	99.2	0.17	<1
Upper Bound											22		-80	110.2	0.21	2
1230010341		<20	0.03	<10	<10	45	<10	88	0.50	1.00						
DUP		<20	0.03	<10	<10	45	<10	89	0.50	0.96						
Target Range - Lower Bound		<20	0.02	<10	<10	42	<10	82	0.48	0.95						
Upper Bound		40	0.04	20	20	48	20	95	0.52	1.01						
1230010402																
DUP																
Target Range - Lower Bound																
Upper Bound																
1231009207												8.3				
DUP												8.3				
Target Range - Lower Bound												7.8				
Upper Bound												8.8				
1231009049											17		-101	117.5	0.14	1
DUP											18		-100	117.5	0.15	1
Target Range - Lower Bound											16		-107	111.3	0.13	<1
Upper Bound											19		-94	123.7	0.16	2
1231009017		<20	<0.01	<10	<10	21	<10	447								
DUP		<20	<0.01	<10	<10	21	<10	458								
Target Range - Lower Bound		<20	<0.01	<10	<10	19	<10	428								
Upper Bound		40	0.02	20	20	23	20	477								
1122011196									0.43	0.36						
DUP									0.45	0.35						
Target Range - Lower Bound									0.42	0.34						
Upper Bound									0.46	0.37						

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Sample Description / Method / Analyte / Units / LOD	Au-AA23 Au g/t 0.005	Au-GRA21 Au g/t 0.05	ME-ICP41 Ag ppm 0.2	ME-ICP41 Al % 0.01	ME-ICP41 As ppm 2	ME-ICP41 B ppm 10	ME-ICP41 Ba ppm 10	ME-ICP41 Be ppm 0.5	ME-ICP41 Bi ppm 2	ME-ICP41 Ca % 0.01	ME-ICP41 Cd ppm 0.5	ME-ICP41 Co ppm 1	ME-ICP41 Cr ppm 1	ME-ICP41 Cu ppm 1	ME-ICP41 Fe % 0.01
DUPLICATES															
1129009304 DUP															
Target Range - Lower Bound															
Upper Bound															
1122012108			1.5	1.07	50	<10	20	<0.5	2	0.84	17.4	7	235	42	2.59
DUP			2.6	1.15	51	<10	20	<0.5	2	0.87	18.3	7	246	44	2.77
Target Range - Lower Bound			1.7	1.04	46	<10	<10	<0.5	<2	0.80	16.5	6	227	40	2.54
Upper Bound			2.4	1.18	55	20	30	1.0	4	0.91	19.2	8	254	46	2.82
1122012063 DUP															
Target Range - Lower Bound															
Upper Bound															
1122009089 DUP															
Target Range - Lower Bound															
Upper Bound															
1122012123 DUP															
Target Range - Lower Bound															
Upper Bound															
1122006013			0.7	1.35	49	10	30	<0.5	<2	1.67	<0.5	8	79	27	1.73
DUP			0.6	1.34	31	10	30	<0.5	<2	1.62	<0.5	7	72	24	1.71
Target Range - Lower Bound			0.4	1.27	36	<10	20	<0.5	<2	1.55	<0.5	6	71	24	1.62
Upper Bound			0.9	1.42	44	20	40	1.0	4	1.74	1.0	9	80	27	1.82
1122008014 DUP															
Target Range - Lower Bound															
Upper Bound															
1122008031 DUP															
Target Range - Lower Bound															
Upper Bound															

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
1129009304																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122012108		<10	<1	0.15	10	0.81	576	1	0.01	9	390	24	1.84	4	<1	15
DUP		<10	1	0.16	10	0.87	608	1	0.01	10	410	26	1.96	4	<1	16
Target Range - Lower Bound		<10	<1	0.14	<10	0.79	557	<1	<0.01	8	370	22	1.80	<2	<1	14
Upper Bound		20	2	0.17	20	0.89	627	2	0.02	11	430	28	2.01	6	2	17
1122012063																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122009089																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122012123																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122006013		<10	<1	0.12	10	0.84	437	1	0.03	9	400	13	1.10	2	1	27
DUP		<10	<1	0.12	10	0.84	434	1	0.03	9	390	13	1.08	<2	1	26
Target Range - Lower Bound		<10	<1	0.10	<10	0.79	409	<1	0.02	8	370	10	1.03	<2	<1	24
Upper Bound		20	2	0.14	20	0.89	462	2	0.04	10	420	16	1.15	4	2	29
1122008014																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122008031																
DUP																
Target Range - Lower Bound																
Upper Bound																

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To: **NEW GOLD INC. - RAINY RIVER PROJECT**
OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Finalized Date: 1-FEB-2019
Account: RRR

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method / Analyte / Units / LOD	ME-ICP41 Th ppm 20	ME-ICP41 Ti % 0.01	ME-ICP41 Tl ppm 10	ME-ICP41 U ppm 10	ME-ICP41 V ppm 1	ME-ICP41 W ppm 10	ME-ICP41 Zn ppm 2	C-IR07 C % 0.01	S-IR08 S % 0.01	OA-VOL08 NP tCaCO3/1Kt 1	OA-ELE07 pH Unity 0.1	OA-VOL08 NNP tCaCO3/1Kt 1	OA-VOL08 MPA tCaCO3/1Kt 0.3	OA-VOL08 Ratio (N Unity 0.01	OA-VOL08 FIZZ RAT Unity 1
DUPLICATES																
1129009304												9.0				
DUP												9.0				
Target Range - Lower Bound												8.5				
Upper Bound												9.6				
1122012108		<20	0.02	<10	<10	5	<10	4300								
DUP		<20	0.02	<10	<10	5	<10	4520								
Target Range - Lower Bound		<20	<0.01	<10	<10	4	<10	4190								
Upper Bound		40	0.03	20	20	6	20	4630								
1122012063											34		-12	46.3	0.74	2
DUP											34		-12	46.3	0.74	2
Target Range - Lower Bound											31		-14	43.7	0.69	<1
Upper Bound											37		-10	48.9	0.79	3
1122009089									0.11	1.10						
DUP									0.12	1.14						
Target Range - Lower Bound									0.10	1.08						
Upper Bound									0.13	1.16						
1122012123												8.9				
DUP												8.9				
Target Range - Lower Bound												8.4				
Upper Bound												9.4				
1122006013		<20	<0.01	<10	<10	6	<10	150								
DUP		<20	<0.01	<10	<10	5	<10	154								
Target Range - Lower Bound		<20	<0.01	<10	<10	4	<10	142								
Upper Bound		40	0.02	20	20	7	20	162								
1122008014											49		25	24.1	2.04	2
DUP											49		25	24.1	2.04	2
Target Range - Lower Bound											46		23	22.6	1.93	<1
Upper Bound											52		27	25.6	2.15	3
1122008031									1.17	1.84						
DUP									1.18	1.85						
Target Range - Lower Bound									1.14	1.79						
Upper Bound									1.21	1.90						

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5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
1122008001		0.102														
DUP		0.104														
Target Range - Lower Bound		0.093														
Upper Bound		0.113														
V835538																
DUP																
Target Range - Lower Bound																
Upper Bound																
1122005206																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL				<0.2	1.91	46	<10	190	0.8	2	0.57	<0.5	16	57	11	2.92
DUP				<0.2	1.96	48	<10	200	0.8	2	0.59	<0.5	17	59	11	3.00
Target Range - Lower Bound				<0.2	1.83	43	<10	170	<0.5	<2	0.54	<0.5	15	54	10	2.80
Upper Bound				0.4	2.04	51	20	220	1.0	4	0.62	1.0	18	62	12	3.12
ORIGINAL		0.207														
DUP		0.213														
Target Range - Lower Bound		0.195														
Upper Bound		0.226														
ORIGINAL		<0.005														
DUP		0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														
ORIGINAL		<0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														

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Sample Description / Method / Analyte / Units / LOD	ME-ICP41 Ga ppm 10	ME-ICP41 Hg ppm 1	ME-ICP41 K % 0.01	ME-ICP41 La ppm 10	ME-ICP41 Mg % 0.01	ME-ICP41 Mn ppm 5	ME-ICP41 Mo ppm 1	ME-ICP41 Na % 0.01	ME-ICP41 Ni ppm 1	ME-ICP41 P ppm 10	ME-ICP41 Pb ppm 2	ME-ICP41 S % 0.01	ME-ICP41 Sb ppm 2	ME-ICP41 Sc ppm 1	ME-ICP41 Sr ppm 1
DUPLICATES															
1122008001															
DUP															
Target Range - Lower Bound															
Upper Bound															
V835538															
DUP															
Target Range - Lower Bound															
Upper Bound															
1122005206															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL	10	<1	0.97	30	1.62	505	<1	0.04	13	740	6	<0.01	3	5	58
DUP	10	<1	1.00	30	1.67	517	<1	0.04	13	750	5	<0.01	3	5	60
Target Range - Lower Bound	<10	<1	0.93	20	1.55	480	<1	0.03	11	700	3	<0.01	<2	4	55
Upper Bound	20	2	1.04	40	1.74	542	2	0.05	15	790	8	0.02	4	6	63
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															
ORIGINAL															
DUP															
Target Range - Lower Bound															
Upper Bound															

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
1122008001																
DUP																
Target Range - Lower Bound																
Upper Bound																
V835538									0.06							
DUP									0.06							
Target Range - Lower Bound									0.05							
Upper Bound									0.07							
1122005206												9.2				
DUP												9.2				
Target Range - Lower Bound												8.6				
Upper Bound												9.8				
ORIGINAL		<20	0.17	<10	<10	58	<10	42								
DUP		<20	0.18	<10	<10	60	<10	43								
Target Range - Lower Bound		<20	0.16	<10	<10	55	<10	38								
Upper Bound		40	0.19	20	20	63	20	47								
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	Au-AA23	Au-GRA21	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41
	Analyte	Au	Au	Ag	Al	As	B	Ba	Be	Bi	Ca	Cd	Co	Cr	Cu	Fe
	Units	g/t	g/t	ppm	%	ppm	ppm	ppm	ppm	ppm	%	ppm	ppm	ppm	ppm	%
	LOD	0.005	0.05	0.2	0.01	2	10	10	0.5	2	0.01	0.5	1	1	1	0.01
DUPLICATES																
ORIGINAL		0.005														
DUP		<0.005														
Target Range - Lower Bound		<0.005														
Upper Bound		0.010														

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	Analyte	Ga	Hg	K	La	Mg	Mn	Mo	Na	Ni	P	Pb	S	Sb	Sc	Sr
	Units	ppm	ppm	%	ppm	%	ppm	ppm	%	ppm	ppm	ppm	%	ppm	ppm	ppm
	LOD	10	1	0.01	10	0.01	5	1	0.01	1	10	2	0.01	2	1	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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Sample Description	Method	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	ME-ICP41	C-IR07	S-IR08	OA-VOL08	OA-ELE07	OA-VOL08	OA-VOL08	OA-VOL08	OA-VOL08
	Analyte	Th	Ti	Tl	U	V	W	Zn	C	S	NP	pH	NNP	MPA	Ratio (N	FIZZ RAT
	Units	ppm	%	ppm	ppm	ppm	ppm	ppm	%	%	tCaCO3/1Kt	Unity	tCaCO3/1Kt	tCaCO3/1Kt	Unity	Unity
	LOD	20	0.01	10	10	1	10	2	0.01	0.01	1	0.1	1	0.3	0.01	1
DUPLICATES																
ORIGINAL																
DUP																
Target Range - Lower Bound																
Upper Bound																

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OPERATIONS
5967 HWY 11/71
EMO ON P0W 1E0

Project: Mine Site Lab Pulps Nov2018 V2

QC CERTIFICATE OF ANALYSIS TB19005962

CERTIFICATE COMMENTS

LABORATORY ADDRESSES

Processed at ALS Thunder Bay located at 645 Norah Crescent, Thunder Bay, ON, Canada

Applies to Method:				
	LOG-23	LOG-QC	WEI-21	

Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.

Applies to Method:				
	Au-AA23	Au-GRA21	C-IR07	ME-ICP41
	OA-ELE07	OA-VOL08	S-IR08	

NEW GOLD RAINY RIVER MINE
APPENDIX B
MDMER RESULTS

newgold™ Rainy River

2018 Discharge

	ECA		MDMER		01-Apr-18	01-Apr-18	05-Apr-18	15-Apr-18	22-Apr-18
	Daily	Monthly	Daily	Monthly	In Pit Sump 5 Discharge	In Pit Sump 6 Discharge	Overburden and WMRS Sump 1 Discharge	In Pit Sump 5 Discharge	In Pit Sump 6 Discharge
pH*	6.0	9.5	6.0	9.5	8.21	8.17	7.82	8.13	8.45
Ammonia, Unionized (mg/L)	0.08	0.04	-	-	0.001	0.002	0.005	0.012	0.025
Arsenic, Total (mg/L)	0.034	0.017	1.0	0.5	0.00161	0.00181	0.00133	0.00213	0.00221
Copper, Total (mg/L)	0.028	0.014	0.6	0.3	0.00388	0.00404	0.00266	0.00418	0.00264
Cyanide, Free (mg/L)	0.02	0.01	-	-	-	-	-	-	-
Cyanide, Total (mg/L)	0.1	0.05	-	-	0.0001	0.0001	0.0001	0.0068	0.0004
Lead, Total (mg/L)	0.03	0.015	0.4	0.2	0.0006	0.00065	0.00018	0.00096	0.00082
Nickel, Total (mg/L)	0.094	0.047	1.0	0.5	0.0021	0.00222	0.0019	0.00206	0.00218
Radium (Bq/L)	-	-	1.11	0.37	0.005	0.005	0.005	0.005	0.005
Total Suspended Solids (mg/L)	30	15	30	15	4	7.5	1	2.5	3.5
Zinc, Total (mg/L)	0.348	0.174	1.0	0.5	0.0102	0.0104	0.0032	0.0128	0.0148
Acute Toxicity - Rainbow Trout	P/F^				P	P	P	P	P
Acute Toxicity - *Daphnia magma*	P/F^				P	P	P	P	P

* Lower and upper range as opposed to daily and monthly limit

^ Pass or fail result

NEW GOLD RAINY RIVER MINE
APPENDIX C
FLEDGLING INCIDENT REPORT

Appendix K:

Species Encounter Reporting Form

Name and position of Observer Phone Number	Garnet Cornell, Maintenance Truck Shop 1-807-0106
Species Observed	Juvenile Barn Swallow
Date and time (EST) of Observation	2018-07-26 1700
Location of Observation {UTM coordinates & description)	Truck Maintenance Shop Zone 15U 426508 5410660
General description of Observation (eg. nest, individual, behaviour)	Thursday late afternoon was found dead in the open box it was placed in.
Actions taken to minimize/mitigate adverse impacts (if required)	Was found on shop floor two days earlier uninjured and was placed in an open box near nest, with hopes that parents would still care for it.

NEW GOLD RAINY RIVER MINE
APPENDIX D
2018 SPECIES AT RISK REPORT

New Gold Inc. Rainy River Project

2018 Species at Risk Monitoring Report
Per Condition 7.2(a) of Permit FF-C-001-14 under the Endangered Special Act
TC111504

Prepared for:

New Gold Inc.

January 2019

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'Wood' is a trading name for John Wood Group PLC and its subsidiaries

New Gold Inc. Rainy River Project

2018 Species at Risk Monitoring Report
TC111504

Prepared for:

New Gold Inc.

Prepared by:

Wood Environment & Infrastructure Solutions
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T: (905) 568-2929
January 2019

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Executive Summary

An Ontario *Endangered Species Act* (ESA) permit for Species at Risk (SAR) was issued to New Gold Inc. (New Gold) for their Rainy River Mine (RRM) by the Minister of Natural Resources and Forestry on November 7, 2014. The ESA permit addresses two provincially threatened bird species, Eastern Whip-poor-will and Bobolink, and allows construction and operation of the RRM. Where adverse effects to Eastern Whip-poor-will and Bobolink habitat were anticipated to occur, New Gold, through provisions of the ESA permit, has provided compensatory habitat referred to as Overall Benefit Areas to offset adverse effects. The ESA permit requires New Gold to manage these Overall Benefit Areas for the benefit of Eastern Whip-poor-will and Bobolink. Management is required until such time as habitat restoration can be demonstrated to be capable of supporting a prescribed number of SAR bird territories, or acreages, as defined in the ESA permit.

A comprehensive monitoring program is defined in Condition 6 of the ESA permit, with reporting requirements for this monitoring program defined in Condition 7. The primary objectives of the monitoring program are to i) quantify any adverse effects to Eastern Whip-poor-will and Bobolink and to confirm that these effects are limited to those identified in the ESA permit, and ii) to confirm that Overall Benefit Areas are functioning to provide the required compensatory offsets. This 2018 Annual Monitoring Report addresses Phases 1 and 2 of the monitoring programs for Eastern Whip-poor-will and Bobolink, as per Appendices G and J of the ESA permit, respectively.

Condition 4.1(g) of the ESA permit also requires sound monitoring to be carried out during the first week in May and June of each year of construction, at two Eastern Whip-poor-will receptor locations (positioned north and south of the Project site) where the highest Project-related sound levels are expected to occur. This report summarizes the results of the 2018 sound monitoring activities (final year of construction) and further details are provided in a separate report (Wood 2018).

Results of Phase 1 and Phase 2 monitoring of Eastern Whip-poor-will and Bobolink as outlined in Condition 6 and Appendix G of the ESA permit are as follows. In 2018, 53 Eastern Whip-poor-will were recorded within the Eastern Whip-poor-will Overall Benefit Areas and 16 individuals were recorded within the Project site boundary or around its periphery. A total of 89 Bobolink individuals were recorded within the Bobolink Overall Benefit Areas. Additional surveys were conducted outside of these areas as part of the Rainy River Mine Wildlife Monitoring Program. These surveys detected one additional Eastern Whip-poor-will, and 17 additional Bobolinks within the Study Area.

Other Species at Risk recorded during the 2018 surveys included (in order of abundance from highest to lowest): Barn Swallow, Wood Thrush, Golden-winged Warbler, American White Pelican, Eastern Wood-Pewee, Canada Warbler, Common Nighthawk, Bald Eagle, Olive-sided Flycatcher, and Evening Grosbeak.

Hourly sound levels were within the criteria limit of L_{eq} 50 dBA for 319 of the 336 hours of data collected at the two receptor locations. During the May 2018 monitoring period, there were two exceedances of the hourly L_{eq} 50 dBA sound criteria threshold due to inclement weather, which occurred at both the North and South Receptor Habitat locations. There was an additional threshold exceedance at the North Receptor due to a combination of mine equipment and wildlife, and another threshold exceedance at the South Receptor due to wildlife. During the June 2018 monitoring, all exceedances (14) that occurred at the North and South Receptor Habitat locations were caused by inclement weather and were not caused by mine activities.

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1.0 Introduction

1.1 Purpose of Application

An Ontario *Endangered Species Act* (*ESA*) permit for Species at Risk (SAR) was issued to New Gold Inc. (New Gold) for their Rainy River Project (RRM) by the Minister of Natural Resources and Forestry (MNRF) on November 7, 2014 (Permit # FF-C-001-14). The ESA permit addresses two provincially threatened bird species: Eastern Whip-poor-will and Bobolink. The permit authorizes construction and operation of the RRM despite anticipated Project-related adverse effects to these two SAR birds, including:

- Destruction of SAR habitat;
- Damage to SAR habitat; and
- Potential harm to and/or harassment of SAR.

Destroyed habitats are defined in the ESA permit to include Eastern Whip-poor-will and Bobolink occupancy areas and habitats that are anticipated to be directly displaced by mine development activities. Examples of mine development activities include open pit mining, the construction of buildings and yard areas, and the establishment of mineral stockpiles and tailings areas.

Sound levels thresholds due to Project-related activities may exceed 50 decibel A-Weighted (dBA). The 50 dBA threshold is defined as the 50 dBA sound level averaged over one hour (50 dBA, L_{Aeq} 1 hr), as determined through standard Ministry of the Environment (MOE; 1977b) NPC-103 monitoring procedures, and excluding blast noise. Frequent or continuous sound levels in excess of 50 dBA have the potential to diminish habitat suitability for sensitive bird species. Therefore, The ESA permit defines damaged habitats as those habitats located adjacent to or near destroyed habitats, where a reduction in habitat suitability is expected to occur over the longer-term, primarily due to Project-related noise emissions.

Short-term increases in noise levels due to Project-related activities are thought to result in potential harm to and harassment of SAR species.

Where adverse effects to SAR habitat were anticipated to occur, New Gold has provided compensatory habitat through provisions of the ESA permit, referred to as Overall Benefit Areas (OB Areas). The ESA permit requires New Gold to manage these OB Areas for the benefit of Eastern Whip-poor-will and Bobolink, until habitat restoration can be demonstrated to be capable of supporting the prescribed number of SAR bird territories, or acreages, defined in the ESA permit.

For Eastern Whip-poor-will, the MNRF determined that 18 identified Eastern Whip-poor-will breeding territories could potentially be affected by mine developments. To offset this effect, New Gold acquired land title (surface rights) to a total of 1,468.3 hectares (ha) of lands having the potential to support approximately 36 Eastern Whip-poor-will breeding territories, providing a 2:1 ratio of offset to affected territories. This 2:1 ratio was set as a conservative measure to account for any uncertainties in the quality or utilization of offset territories by Eastern Whip-poor-will.

In the case of Bobolink, MNRF determined that 348 ha of Bobolink habitat had the potential to be adversely affected by mine developments (destroyed or damaged). To offset this effect, New Gold acquired land surface rights to a total of 348 ha of field habitat considered to be suitable for use as breeding habitat by Bobolink, for protection and management.

To confirm that adverse effects to Eastern Whip-poor-will and Bobolink are limited to those identified in the ESA permit, and that OB Areas are functioning as intended, a comprehensive monitoring program is defined in Condition 6 of the ESA permit. Reporting requirements for this monitoring program are defined in Condition 7.

The monitoring program for Eastern Whip-poor-will includes:

- Phase 1 monitoring to determine whether areas within and adjacent to the Project Site are occupied by Eastern Whip-poor-will during and after construction and operation activities. Phase 1 monitoring shall also include an assessment of sound levels, during the breeding season in identified Eastern Whip-poor-will receptor habitats.

- Phase 2 monitoring of the OB Areas to determine which areas are occupied by Eastern-Whip-poor-will, and to assess the distribution of the areas relative to implemented management actions, as set out in the Management Plan.

- Phase 3 monitoring after implementation of the Eastern Whip-poor-will site rehabilitation plan to determine Eastern Whip-poor-will occupancy rates at the mine site compared with pre-mining condition. Phase 3 monitoring will take place post-closure.

Specific guidance is provided in Condition 6.2 and Appendix G of the ESA permit describing how the monitoring program for Eastern Whip-poor-will is to be carried out. This guidance includes the times during which monitoring is to be carried out, qualifications of the monitors, and information to be collected.

The monitoring program for Bobolink includes:

- Phase 1 monitoring to determine the response of Bobolink to construction and operation activities within the Project site and within the adjacent occupancy areas;

- Phase 2 monitoring to determine habitat use by Bobolink within the OB Areas; and

- Phase 3 monitoring after implementation of the Bobolink rehabilitation plan to determine Bobolink occupancy rates at the mine site compared with pre-mining occupancy rates. Phase 3 monitoring will take place post-closure.

Specific guidance is provided in Condition 6.4 and Appendix J of the ESA permit outlining how the monitoring program for Bobolink is to be conducted. Guidance includes the times during which monitoring is to be carried out, qualifications of the monitors, and information to be collected.

This 2018 annual monitoring report addresses both Phase 1 and Phase 2 of the monitoring programs for Eastern Whip-poor-will and Bobolink. Phase 3 monitoring is not required until post-closure, following site rehabilitation, and accordingly is not described herein.

1.2 Table of Concordance

This report has been submitted to the MNRF within six months following the last survey of the 2018 survey sequence (as per Condition 7.2) and has been prepared in accordance with Condition 7.3 (Table 1-1).

2.0 Summary of Construction Activities Undertaken

Condition 7.3(e) requires descriptions of operation and construction activities undertaken in 2018 and these activities are shown as equipment operating hours in Table 2-1 and further detailed with status and completion dates in Table 2-2.

3.0 Habitat Management and Assessment Criteria

3.1 Adaptive Management

A key component of the monitoring program is adaptive management whereby ongoing results of the monitoring program are used to inform response strategies. In the case of SAR monitoring for the RRM, it is anticipated that monitoring results will:

- Confirm sound level predictions in relation to damaged habitats; and
- Confirm Eastern Whip-poor-will and Bobolink occupancies within and adjacent to the Project site.

If Project-related sound levels in Eastern Whip-poor-will receptor habitat should exceed sound level thresholds defined in the ESA permit, additional mitigation measures will be implemented to reduce sound levels in accordance with Condition 4.1(g) and 4.2(b) of the ESA permit.

Should Eastern Whip-poor-will and Bobolink occupancies in areas peripheral to the Project site be diminished in comparison to historic and control data (where available), including allowances for increased sound levels in damaged and harmed and harassed areas, New Gold will investigate the basis for any such diminished use. If related to Project operations, New Gold will attempt to mitigate any related adverse effects.

3.2 Habitat Creation Criteria

3.2.1 Eastern Whip-poor-will

Habitat creation objectives (criteria) for Eastern Whip-poor-will apply to mine site reclamation following the completion of mining and to rehabilitation of the Tait Quarry. Habitat management within the OB Areas is considered separate from habitat creation criteria. Habitat creation criteria for the development of Eastern Whip-poor-will habitat at closure includes:

- Habitat restoration to include provision for the creation of 13 Eastern Whip-poor-will territorial males, with the average territory being approximately 30 ha; and
- Habitat to be developed as self-sustaining, patchy forest habitat, consisting of an interspersed mix of mid-successional to mature trees and open patches, with limited to sparse understory development within forest patches.

The criterion of 13 male territories is defined in the ESA permit. Details of the idealized patchy forest type (or types) for reclamation targets will be developed through the Research Program. In 2017, macro- and micro-habitat features were compared between occupied OB Areas and Project Lands and unoccupied adjacent lands. The description of these macro- and micro-habitat features were documented and will be used to refine habitat creation criteria.

3.2.2 Bobolink

Bobolink habitat preferences are well understood. Habitat creation criteria for this species, are the following:

- The quantity of Bobolink habitat developed at closure is to be equal to or greater than that which is destroyed as a result of Project development; and

- Habitat is to be developed and maintained as late maturing grass hayfields, with at least one grass species that is greater than 50 cm in height, and devoid of invasive woody species.

3.3 Habitat Management Criteria

3.3.1 Eastern Whip-poor-will

The following habitat management mitigations were developed, as per Conditions 4.1 and 4.2 of the ESA permit to manage habitat for Eastern Whip-poor-will in the Project site and adjacent area:

- Avoid Project-related tree clearing during the breeding season, defined as occurring from May 1 to August 15 (criterion for success – timing windows adhered to).

- Where practicable, limit tree clearing in advance of, or following, the breeding season, to those areas which are needed for Project development in the near to intermediate term, as per Appendix E of the ESA permit (criterion for success – area of tree clearing consistent with associated construction works development need).

- To the extent reasonably possible, retain landscape topography and nature features (e.g., tree growth) around the perimeter of the Project development area (criterion for success – perimeter topography and features retained).

- Manage Project generated sound levels during the breeding season, such that sound levels do not exceed 50 dBA within whip-poor-will receptor habitats, as defined in the ESA permit (criterion for success – no Project related exceedances of the hourly L_{eq} 50 dBA sound criteria threshold at receptor habitats).

- During the breeding season, ensure that blasting is carried out during the daytime only, defined as extending from a half hour after sunrise to a half hour before sunset (criterion for success – blasting carried out within the prescribed time interval).

- To the extent possible, and taking worker safety into consideration, direct Project related lighting inwards towards Project development areas, and away from the Project site perimeter (criterion for success – lighting directed inwards to extent practicable).

- Use applicable dust control measures to avoid excessive dust suppression on Eastern Whip-poor-will receptor habitats, as defined in the ESA permit (criterion for success – total suspended particulate levels consistent with air quality model prediction for total particulate material).

The applicable above mitigation measures for Eastern Whip-poor-will were employed, resulting in habitat management criteria being met in 2018, during site development.

Habitat management criteria for the OB Areas will be developed as part of the Management Plan for the Eastern Whip-poor-will Overall Benefit Areas, to be submitted to the MNRF by January 28, 2019.

3.3.2 Bobolink

The following habitat management criteria have been developed for Bobolink habitat management in the Project site and adjacent area, as per Conditions 4.1 and 4.2 of the ESA permit:

- Avoid Project-related habitat removal during the breeding season, which occurs from May 1 to July 31 (criterion for success – timing windows adhered to); and
- Manage Project-generated noise levels during the breeding season to below 50 dBA, as defined in the ESA permit, within proximal high quality Bobolink habitats to the south and west of the Project site.

All of the above mitigation measures as applicable were employed / habitat management criteria were met for Bobolink, during 2018 in connection with site development and operations.

3.4 Effectiveness

All habitat management criteria related to Eastern Whip-poor-will and Bobolink were met without incident in 2018.

4.0 Methods

This 2018 Annual Monitoring Report addresses Phases 1 and 2 of the monitoring programs for both Eastern Whip-poor-will and Bobolink, as per Appendices G and J of the ESA permit, respectively.

4.1 Eastern Whip-poor-will Surveys

Surveys were conducted in accordance with the survey protocol provided by the Whip-poor-will Roadside Survey Participant's Guide (BSC 2012). Surveys commenced 30 minutes after sunset and continued until approximately midnight or 1:00 am (depending on weather conditions, brightness of the moon, and level of singing activity by the birds). All survey stations were sampled at least once per round on calm, clear nights with little or no cloud cover, no precipitation and winds of no greater than 3 on the Beaufort Scale.

Eastern Whip-poor-wills are known to call most actively during periods of high lunar illumination, when at least 50% of the moon face is illuminated (Mills 1986; Wilson and Watts 2006). Accordingly, the two survey rounds completed during 2018 were scheduled to coincide with periods of greatest lunar illumination. Surveys were conducted between the first and third quarters of the lunar cycle, both in late May and June, during the Eastern Whip-poor-will breeding period. These lunar phases occurred between May 26 and June 6, and between June 20 and July 6, 2018. The 2018 Eastern Whip-poor-will surveys at RRM were conducted from May 29 to June 4 and from June 21 to June 27, 2018. Survey stations (Figure 4-1) visited during the first round of surveys were repeated to determine whether birds occurring in late May and early June were still present in late June, and therefore assumed to have established breeding territories.

A total of 101 stations were surveyed for Eastern Whip-poor-will, where:

- 24 stations were located near the proposed mine site footprint (e.g., within the footprint or within 3 kilometres (km) of the footprint); and
- 77 stations were located within Eastern Whip-poor-will OB Areas (Figure 4-1).

Surveys lasted six minutes at each station, and for each Eastern Whip-poor-will heard, distance and direction to the bird from the survey station were recorded on high resolution aerial imagery and data sheets. In most cases, the bird's location was determined by triangulating from additional survey locations during the survey.

Upon the completion of field studies, Eastern Whip-poor-will field data was analyzed to determine the approximate location of occupied areas and to estimate the number of birds present. Eastern Whip-poor-will locations were compared between repeated visits and between adjacent survey stations in an effort to accurately establish whether recorded observations were repeats of the same bird.

4.2 Bobolink Surveys

Point count surveys for Bobolink were undertaken at predetermined long-term monitoring stations located within the Bobolink OB Areas. As per the monitoring schedule outlined in Appendix J of the ESA permit, Bobolink surveys were not required at long-term monitoring stations located within the Project site or around its periphery in 2018. Surveys were conducted according to protocols described in *Mining*

Project Baseline Desktop Assessment and Survey Requirements (Environment Canada 2014) and the Ontario Breeding Bird Atlas (OBBA; 2001).

Two rounds of point count surveys were conducted between June and July 2018 by qualified biologists skilled in the identification of birds by sight and sound. Surveys were initiated prior to sunrise and extended to 5 hours after sunrise, depending on the weather conditions. Surveys were conducted during dry atmospheric conditions (no precipitation) and winds of no greater than 3 on the Beaufort Scale. Surveys lasted 10 minutes at each point count station and all birds seen or heard within four distance regimes (0 to 50 m; 50 to 100 m; outside 100 m; and birds seen flying overhead) were recorded. Bird observations were also recorded within three time intervals: (0 to 3 minutes, 3 to 5 minutes, and 5 to 10 minutes).

A total of 43 point count stations were surveyed within Bobolink OB Areas in 2018 (Figure 4-2). Point count stations were previously established using digital Forest Resource Inventory (FRI) imagery and satellite imagery and were stationed approximately 250 m apart from each other to maximize coverage and minimize overlap. Stations were geo-referenced in the field using a hand-held Global Positioning System (GPS) unit with 5 m accuracy. The first round of surveys was conducted on May 30 to 31 and between June 2 and 5, 2018. The second round of surveys was conducted on June 22 and June 5 to 6, 2018. During the second round of sampling, stations were surveyed in the reverse order from the first round to reduce temporal sampling bias.

4.3 Eastern Whip-poor-will Sound Monitoring

Condition 4.1(g) of the ESA permit provides for sound monitoring to be carried out at two Eastern Whip-poor-will receptor habitats where the highest sound levels are expected to occur. Sound monitoring is to be completed during the first week in May and June of each year of construction. Sound monitoring in 2018 occurred from May 1 to 7 and June 1 to 7 at two monitoring locations specified in the ESA permit (Figure 4-3). For monitoring rounds, hourly L_{eq} sound levels were measured and compared with the 50 dBA criteria limit for the assessment, following technical requirements set out in MOE guidelines NPC-102 (MOE 1977a) and NPC-103 (MOE 1977b), and as defined in the ESA permit. Measurements taken during periods of inclement weather (wind velocities above 20 km/hour or relative humidity greater than 90%) were noted. Microphones recorded sound types during the program to support later interpretation of the data.

A summary of the 2018 sound monitoring results are presented in the sections below. Detailed methodology and results are provided in a separate report (Wood 2018), attached as Appendix A.

5.0 Results

5.1 Eastern Whip-poor-will Observations within and Peripheral to the Mine Site (Phase 1 Monitoring)

Figure 5-1 shows the results of the two 2018 Eastern Whip-poor-will surveys. Figures 5-1b, 5-1c and 5-1d show the survey results from within or around the periphery (within 3 km) of the Project site, satisfying the requirements of Phase 1 of Eastern Whip-poor-will monitoring (*…monitoring to determine whether, during and after construction and operation activities, that areas within and peripheral to the Project Site are occupied by Eastern Whip-poor-will*), as outlined in Condition 6 and Appendix G of the ESA permit.

The results shown in Figures 5-1b to 5-1d indicate that only one Eastern Whip-poor-will core range overlapped the Project footprint (Figure 5-1c). One additional Eastern Whip-poor-will individual was located within the Project site boundary (Figure 5-1c), and fourteen individuals were located outside of the Project site boundary but within the periphery of the Project footprint (eight in Figure 5-1b, four in Figure 5-1c and three in Figure 5-1d). Therefore, a total of seventeen Eastern Whip-poor-wills were recorded within the Project site or around its periphery in 2018 (Table 5-1).

This is the fourth consecutive year that surveys have been conducted at these precise survey stations (Figures 4-1; Table 5-1). A total of 19, 14, and 9 Eastern Whip-poor-wills were recorded at these same sites during surveys completed between 2015 and 2017 (Figure 5-2; Table 5-1), with many individuals being recorded in similar locations between years.

Eastern Whip-poor-will occupancy decreased in the area to the southeast of the Project boundary from 11 individuals in 2015 to 2 individuals in 2017 and 4 individuals in 2018. (Figure 5-2; Table 5-1). West of the Project footprint, the number of individuals decreased from three in 2015, to one in 2016, with no birds recorded in 2017 or 2018 (Figure 5-2b; Table 5-1). Eastern Whip-poor-will occupancy rates in the area to the northeast of the Project Footprint have stayed relatively consistent (Figure 5-2c). Surveys at these precise survey stations were not undertaken prior to 2015, though the general Project area (the Project footprint and surrounding areas) was well studied in 2010 to 2013 (AMEC 2011, 2012, 2013; KCB 2011; MNR 2013a; Amec Foster Wheeler 2014; Rand 2014; see Figure 5-3).

5.2 Eastern Whip-poor-will Observations within the Overall Benefit Areas (Phase 2 Monitoring)

Figures 5-1a and 5-1b show the results of the 2018 Eastern Whip-poor-will surveys within the two OB Areas, satisfying the requirements of Phase 2 of the Eastern Whip-poor-will monitoring (*…monitoring of the OB Areas to determine which areas are occupied by Eastern-Whip-poor-will*), as required by Condition 6 and Appendix G of the ESA permit.

A total of 29 Eastern Whip-poor-wills were recorded in the northern OB Area (Figure 5-1a) during the first 2018 survey round and 38 individuals were recorded in the second survey round. Birds observed during both rounds (15 individuals) were considered to be established territorial males (Table 5-2). This is the fourth consecutive year that surveys have been conducted at these locations. During the surveys from 2015 to 2017, the number of individuals recorded in the first and second rounds were 11 and 11, 14 and 27, and 29 and 27, respectively (Wood 2017; Figure 5-2a; Table 5-2). Surveys at these precise survey stations were not conducted prior to 2015, but the northern OB Area was well studied in 2010 to 2013 (AMEC 2012, 2013; MNR 2013a; AMEC 2014; Rand 2014; see Figure 5-3).

In the southern OB Area (Figure 5-1b), six Eastern Whip-poor-wills were recorded during the first round and six were observed during the second round (Table 5-2). Similar to the northern OB Area, birds observed during both rounds were considered to be established territorial males. This is also the fourth consecutive year that surveys have been conducted at these precise survey stations in the southern OB Area (e.g., the survey stations shown in Figures 4-1). During the surveys from 2015 to 2017, the number of individuals recorded in the first and second rounds were 11 and 11, 6 and 12, and 10 and 7, respectively (Wood 2017; Figure 5-2b; Table 5-2). Surveys at these precise survey stations were not conducted prior to 2015 but the southern OB Area was well studied in 2010 to 2013 (AMEC 2012, 2013; MNR 2013a; AMEC 2014; Rand 2014; per Figure 5-3).

These results indicate that at least 17 Eastern Whip-poor-will occupied the two OB Areas in 2018. As such, the OB Areas are functioning as intended to provide the required offsets.

5.3 Rainy River Mine Wildlife Monitoring Program

Concurrent with Eastern Whip-poor-will surveys within the OB Areas and within and peripheral to the Project site, morning bird surveys were conducted at control and impact sites located within the Project site or around its periphery as part of the RRM Wildlife Monitoring Program. One additional Eastern Whip-poor-will was detected at one of the morning bird survey locations.

5.4 Eastern Whip-poor-will Sound Monitoring

Sound level monitoring was carried out in two Eastern Whip-poor-will Receptor Habitats (Figure 4-3) during the first weeks of May and June 2018 as described in Section 4.3, and as required by Phase 1 of Eastern Whip-poor-will monitoring outlined in Condition 6 of the ESA permit. Monitoring results are presented in Table 5-3 and detailed discussions of these results are presented in Appendix A.

The hourly sound levels were within the criteria limit of L_{eq} 50 dBA for 319 of the 336 hours of data collected at the receptor locations. During the May 2018 monitoring period, there were two exceedances of the hourly L_{eq} 50 dBA sound criteria threshold which occurred at both the North and South Receptor Habitat locations, due to inclement weather. There was an additional threshold exceedance at the North Receptor due to a combination of mine equipment and wildlife, and another threshold exceedance at the South Receptor due to wildlife. During the June 2018 monitoring, all exceedances (14) that occurred at the North and South Receptor Habitat locations were caused by inclement weather and were not caused by RRM activities.

5.5 Bobolink Observations within and Peripheral to the Mine Site (Phase 1 Monitoring)

As per the monitoring schedule outlined in Appendix J of the ESA permit, Bobolink surveys were not required within the Project site or around its periphery in 2018 and were only conducted within the OB Areas.

5.6 Bobolink Observations within the Overall Benefit Areas (Phase 2 Monitoring)

Figure 5-4 shows the results of the two 2018 Bobolink surveys, including the Bobolink OB Areas, satisfying the requirements of Phase 2 of Bobolink monitoring ("*…monitoring to determine habitat use by Bobolink within the OB Area*"), as outlined in Condition 6 and Appendix J of the ESA permit.

There was a total of 89 Bobolink observations in the Bobolink OB Areas in 2018. Birds were observed in all but five of the OB Areas, three illustrated in Figure 5-4 and two additional OB Areas located to the northwest (Figure 4-2). Bobolink nesting took place from late May to late July and fledging occurred in June and August, consistent with previous years.

This is the fourth consecutive year that surveys have been conducted at these precise survey stations. During both the 2015 and 2016 surveys 94 Bobolinks were observed in the OB Areas, and in 2017, 65 Bobolinks were observed in the OB Areas (Table 5-4, Figure 5-5). In 2015, Bobolink were observed in all but three of the OB Areas, in 2016 they were absent in seven of the OB Areas, and in 2017 they were absent in five of the OB Areas (Figure 5-5). In 2018, they were absent in five of the OB Areas. Surveys at these precise survey stations were not conducted prior to 2015, however the general Project area (footprint and surrounding areas) was well studied in 2010, 2011 and 2012 (AMEC 2011, KCB 2011, AMEC 2012, MNR 2013b, AMEC 2014; Figure 5-6).

These survey results indicate that the OB Areas are functioning as intended to provide the required offsets.

5.7 Rainy River Mine Wildlife Monitoring Program

Concurrent with Bobolink surveys within the OB Area, morning bird surveys were conducted at control and impact sites located within the Project site or around its periphery as part of the RRM Wildlife Monitoring Program. An additional 17 Bobolinks were detected at 9 locations during the morning bird surveys.

5.8 Other Species at Risk Observations

Other SAR observations within the study area were recorded both incidentally and during the following three surveys in 2018:

- Morning point count surveys for Bobolink;
- Crepuscular bird surveys for Eastern Whip-poor-will; and
- Morning point count surveys for the overall RRM Wildlife Monitoring Program (Amec Foster Wheeler 2015, 2016);

The following observations were made (also see Figure 5-7 and Table 5-5):

- A total of 22 American White Pelicans (listed provincially as threatened, not listed federally) were recorded at five point count locations. Small flocks (2 to 15 birds) were also incidentally observed flying over the study area during surveys periods in late May and June.

- Two Bald Eagles (listed provincially as special concern, not listed federally) were recorded at a nest site at a single point count location, and three others were observed at three separate point count locations.
- A total of 71 individual Barn Swallows (listed provincially and federally as threatened) were recorded at seven point count sites.
- Twelve Canada Warblers (listed provincially as special concern, listed federally as threatened) were recorded at 11 point count locations.
- Nine Common Nighthawks (listed provincially as special concern, listed federally as threatened) were recorded at six crepuscular bird survey stations.
- Twelve Eastern Wood-pewee (listed provincially and federally as special concern) were recorded at eleven point count locations.
- Three Evening Grosbeak (listed provincially as special concern, not listed federally) were recorded at one point count location.
- Twenty-six Golden-winged Warblers (listed provincially as special concern, listed federally as threatened) were recorded at 22 point count locations.
- Four Olive-sided Flycatchers (listed provincially as special concern, listed federally as threatened) were recorded at 4 point count locations.
- Twenty-nine Wood Thrush (listed provincially as special concern, listed federally as threatened) were recorded at 26 point count locations.

Other SAR observations recorded in 2015 to 2017 (Wood 2017) are shown in Figure 5-8 and summarized in Table 5-5.

Four Barn Swallow nest structures erected as habitat compensation in the winter of 2015 were checked by Wood biologists for evidence of nesting in June and July, 2018. No evidence of current nesting activities in these structures was observed. As previously reported, a nesting attempt had been observed on July 28, 2016 at Structure D; however, this nest was abandoned.

Evidence of Bank Swallow nests were observed by New Gold on June 5, 14 and 20, 2017 but no birds were observed in 2018 (Figure 5-8). It is possible that birds were foraging away from the nests at the time of the observations, but it is more likely that these nests are inactive nests from previous years.

New Gold personnel also documented 77 observations of SAR in 2018, as detailed in Appendix B and in the New Gold monthly SAR reports.

6.0 Summary of Habitat Management Activities Undertaken

6.1 Tait Quarry

The ESA permit specifies a process to use the RRM Tait Quarry closure as an Eastern Whip-poor-will habitat reclamation study, the results of which can guide the development of a site-wide RRM Eastern Whip-poor-will Site Rehabilitation Plan to be implemented at closure of the RRM. A detailed closure and reclamation plan was submitted to the MNRF in October 2017, outlining closure activities and earthworks commenced in November 2017. Revegetation activities were completed in August of 2018.

6.2 Project Site

Project site development during 2018 has met substantial completion, little to no further clearing is required. The underground mining operation and development of the portal began in 2018 as well as the completion of Cell 3 Dam, Water Discharge Pond, Sediment Ponds 1 and 2 and clearing for Constructed Wetland.

In 2017, the progressive reclamation process began, where possible, and approximately 137 ha were reclaimed, including parts of the following Project components:

- Clark Pond and diversion;
- Teeple Pond and diversion;
- West Creek Pond and diversion;
- Stockpile Pond and diversion;
- East Access Corridor;
- Areas south of Sump #1; and
- Tait Quarry.

SAR habitat management activities for the Project site area in 2018 were essentially restricted to limiting tree clearing to those areas where such clearing was necessary to allow Project site development.

6.3 Eastern Whip-poor-will Overall Benefit Areas

In accordance with Condition 5.1(b)(ii) of the ESA permit, a Management Plan for the Eastern Whip-poor-will OB Area is to be submitted to the MNRF by January 28, 2019 and this plan is to be approved by MNRF by January 28, 2020. Until the Eastern Whip-poor-will OB Area Management Plan is approved, no physical work is scheduled to be undertaken within the OB Areas. As such, no habitat management activities were undertaken in the Eastern Whip-poor-will OB Areas in 2018.

In September 2017, the MNRF requested a comparison of aerial imagery of the Eastern Whip-poor-will OB Areas from 2014 (when these lands were purchased by New Gold) and 2017 (when new aerial imagery became available). Comparative images were examined and no changes in the habitat were found within the OB Areas between 2014 and June 2017 (Wood 2017).

6.4 Bobolink Overall Benefit Areas

Condition 5.3(a) states that New Gold shall maintain and enhance "at least 348 hectares of land that will be managed as Bobolink habitat in accordance with the sites delineated in Appendix I", with such maintenance and enhancement to include:

- Bobolink OB Areas 3, 4, 5, and 7 to 21 totaling 317.5 ha to be managed from the ESA permit Effective Date (January 28, 2015); and
- With Bobolink OB Areas 1, 2 and 6 totaling 30.5 ha to be converted to suitable Bobolink habitat within two years of the ESA permit Effective Date (by January 28, 2017).
- All Bobolink OB Areas that were suitable for haying in 2018 were hayed. However due to poor weather conditions in the fall Areas 7, 17, 20 and 21 could not be hayed.

Bobolink OB Areas 2 and 6 were cleared of woody vegetation in 2017 and have been planted in the spring of 2018 with an appropriate grass mix to establish suitable habitat for Bobolink in these areas. Bobolink OB Areas 2 and 6 were seeded in late June 2018 and expected to achieve suitable habitat in 2019.

As specified in the ESA permit, all Bobolink OB Areas are to be maintained as hayfields in conditions suitable for Bobolink, consisting of late maturing grasses with at least one grass species that exceeds 50 cm in height under normal growing conditions, and fields void of woody species. Bobolink OB Areas require periodic renewal through ploughing and replanting, as per normal agricultural practice, to maintain the grasslands and to prevent invasion by woody species which would otherwise degrade the habitat. Haying (hay removed) and mowing (grass left in the field) was first implemented by New Gold in late August and mid-November 2016. To date, no recommendations on the field renewal process have been received from the MNRF nor ECCC.

7.0 Summary of Mortality Events and Associated Adaptive Management Measures

Section 7.3 of the ESA permit requires the reporting of any SAR mortalities occurring within the Project site or OB Areas. In 2018 one SAR mortality event was documented and reported to the MNRF and ECCC. On July 26, 2018, a juvenile Barn Swallow (listed provincially and federally as threatened) was found deceased at the truck maintenance shop.

8.0 References

AMEC Environment & Infrastructure. 2011. Rainy River Gold Project Species at Risk Report for 2011.

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Table 1-1: Table of Concordance for Permit Condition 7.3

Permit Condition 7.3	Monitoring Reporting Conditions	Relevant Section of 2018 Species at Risk Report
(a)	A summary of survey protocol used	Section 4.0 Methods
(b)	All information collected pursuant to Conditions 4.1(f), 4.2(a), 6.2(f) and 6.4(e).	4.1 (f) and 4.2 (a): not relevant; no Eastern Whip-poor-will or Bobolink observed nesting within Project Site. 6.2 (f) and 6.4 (e): excel spreadsheets with Eastern Whip-poor-will and Bobolink survey data submitted separately to MNRF. Figure 4-1: 2018 Eastern Whip-poor-will Survey Stations. Figure 4-2: 2018 Bobolink Survey Stations.
(c)	an analysis of monitoring results for the specified survey sequence including an estimate and illustration of site occupancy.	Section 5.0 Results. Figure 5-1: 2018 Eastern Whip-poor-will observations. Figure 5-4: 2018 Bobolink observations.
(d)	A summary of any habitat management activities taken.	Section 6.0 Summary of Habitat Management Activities Undertaken.
(e)	A summary of any Operation Activities that occurred within the Project Site during the previous year. If relevant, the report shall include information related to: i. Dates that the activities took place; ii. Duration of the activities iii. Location and extent of the activities; and iv. Nature of the activities (e.g., blasting, stockpiling, etc.).	Table 2-1 Operation Activities Undertaken in 2018.
(f)	With respect to Eastern Whip-poor-will: i. An assessment of the quality and functionality of habitat rehabilitated, created, enhanced or managed in accordance with this permit, including an estimate and illustration of the number of occupancy areas located at the Project Site, and the Eastern Whip-poor-will Overall Benefit Area. ii. A description of Acoustic Audits and any abatement measures implemented.	i. Section 5.0 Results. ii. Sections 4.3 and 5.4 Sound Monitoring. Table 5-3 Eastern Whip-poor-will Receptor Habitat Sound Monitoring Results. Appendix A Whip-poor-will Habitat Receptor Sound Monitoring Report 2018.
(g)	With respect to Bobolink: i. A summary of Bobolink Overall Benefit Area occupancy, nesting periods and fledgling dates through the survey sequence, contrasted with past sequences. ii. A summary of recommendations received, and technical data on field productivity and state of management used to support decisions on Renewal	i. Occupancy, nesting periods and fledging dates noted. ii. Section 6.4 Bobolink Overall Benefit Areas
(h)	The criteria by which the Permit Holder assessed the success of the habitat creation and/or management measures, and statement on the effectiveness.	Not applicable during current reporting period.

Permit Condition 7.3	Monitoring Reporting Conditions	Relevant Section of 2018 Species at Risk Report
(i)	An assessment of impacts of succession, or management of vegetation communities.	Not applicable during current reporting period.
(j)	Within an appendix of the report, a summary regarding training provided to staff as described under Condition 4.3.	Appendix C: Record of Species at Risk Training Provided to Staff.
(k)	Within an appendix, a summary of any mortality events occurring either at the Project Site or the Species Overall Benefit Areas and where applicable the AEWHA(s), and adaptive management considerations that may minimize future mortality events.	Section 7.0 Summary of Mortality Events and Associated Adaptive Management Measures
(l)	For all species listed on the Species at Risk in Ontario List observed within the Project Site, the Permit Holder shall submit a Species Encounter Reporting Form, within 30 days of the encounter or observance.	Appendix B: New Gold 2017 Species at Risk Observations.

Table 2-1: Equipment Operating Hours in 2018

Equipment	Operating Hours
Dozers	172,858
Excavators	129,558
Graders	40,662
Loaders	19.734
Packers	18,018
Rock Trucks	177,606
Mechanical & Service Trucks	150,150
Fuel Trucks	12,012
Miscellaneous Pick-up Trucks	117,702
Drills	43,967

Table 2-2: Operation Activities undertaken in 2018

Construction Activities	Status	Start	End	Comments
Water Discharge Pond	Complete	August 2018	September 2018	Earthworks at the Water Discharge Pond for construction of the dam, spillway and associated haul roads required.
WMP Seepage Collection System	Complete	April 2018	August 2018	Earthworks at the TMA North Dam associated with completing the seepage collection pond, ditch, finger drains, sumps, spillways, drainage pipes and required haul roads.
West Creek Diversion (Removal of Temporary Structures + Stabilization)	Complete	August 2018	October 2018	Earthworks associated diverting the West Creek including the removal of existing culverts, installation of a low flow channel, completion of berms, channels, plugs and stabilization works.
Sediment Ponds	Pending Items	April 2018	November 2018	Earthworks at Sediment Ponds 1 and 2 for construction of the dam, pond, spillway, ancillary hydraulic structures and associated haul roads Repairs to be completed in Spring 2019.
TMA Lifts – Filter Sand	Complete	January 2018	November 2018	Contractors providing sand and crushed rock necessary for Dam raises.
TMA Stage 1 (Cell 2 Construction including Instrumentation)	Complete	January 2018	July 2018	Earthwork activities to raise Dam for Cell 2 to an elevation of 366.5.
TMA Stage 1 (Cell 3 Construction including Instrumentation)	Complete	April 2018	October 2018	Earthwork activities to raise Dam for Cell 3 to an elevation of 366.6.
Clearing of TMA	Complete	--	--	Tree activities throughout TMA footprint.
TMA Fencing – Long Term (Deer)	Ongoing	October 2018	May 2019	Bottom portion of fence to be completed after winter thaw (May 2019).
Site Plant Lighting	Complete	January 2018	October 2018	Engineering, supply and installation of 16 LED lights (including all required hardware, transformers, poles etc.) throughout the Plant Site area.

Table 5-1: Summary of Eastern Whip-poor-will Observations within and Peripheral to the Mine Site 2015-2018 (Phase 1)

Number of Eastern Whip-poor-will Observed			
2015	**2016**	**2017**	**2018**
8 in Project Site 11 around	7 in Project Site 7 around	1 in Project Site 8 around	*2 in Project Site* *14 around*

Table 5-2: Summary of Eastern Whip-poor-will Observations within Overall Benefit Areas 2015-2018 (Phase 2)

Number of Eastern Whip-poor-will Observed			
2015	**2016**	**2017**	**2018**
11 in North 11 in South	27 in North 12 in South	29 in North 10 in South	*43 in North* *10 in South*

Table 5-3: 2018 Eastern Whip-poor-will Receptor Habitat Sound Monitoring Results

Monitoring Results	North Receptor	South Receptor
May 1 to May 7		
Total hourly data records	168	167
Hourly data records with inclement weather	42	42
Hourly data records without inclement weather	126	125
Number of exceedances of the hourly Leq 50 dBA threshold – all data	2	2
Number of exceedances of the hourly Leq 50 dBA threshold – not due to inclement weather condition*	1	1
June 1 to June 7		
Total hourly data records	168	168
Hourly data records with inclement weather	80	80
Hourly data records without inclement weather	88	88
Number of exceedances of the hourly Leq 50 dBA threshold – all data	10	11
Number of exceedances of the hourly Leq 50 dBA threshold – not due to inclement weather condition*	0	0

Note:
Data taken from Amec Foster Wheeler (2018)
* Exceedance caused by birds chirping and/or other wildlife activities (not caused by Project-related activities)

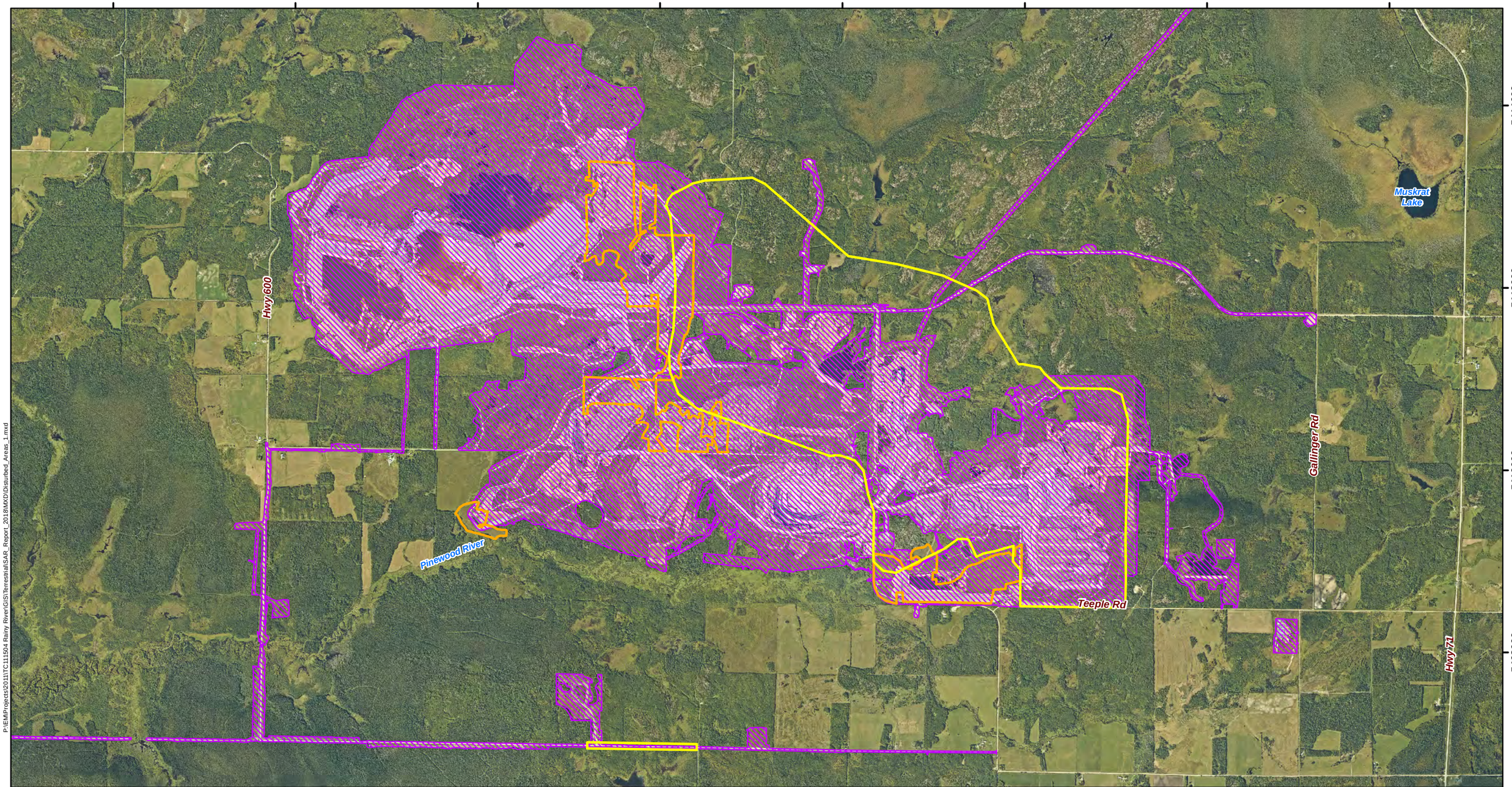
Table 5-4: Summary of Bobolink Observations within Overall Benefit Areas 2015-2018 (Phase 2)

Number of Bobolink Observed			
2015	**2016**	**2017**	**2018**
94	94	65	89

Table 5-5: Summary of Other Species at Risk Observations 2015-2018

Species	2015	2016	2017	2018
American White Pelican	4 (fly overs)	0	1	22
Barn Swallow	29	25	21	71
Bank Swallow	0	23	0	0
Bald Eagle	3 (fly overs)	1	2	5
Canada Warbler	4	10	0	12
Common Nighthawk	13	4	4	9
Eastern Wood-pewee	18	0	7	12
Eastern Meadowlark	1	0	0	0
Evening Grosbeak	0	0	0	3
Golden-winged Warbler	16	26	7	26
Olive-sided Flycatcher	0	1	0	4
Red-headed Woodpecker	0	2	0	0
Wood Thrush	4	0	3	29

Figures



LEGEND

- Whip-poor-will Impacted Habitat (from MNRF, October 14, 2014)
- Bobolink Impacted Habitat (from MNRF, October 14, 2014)
- Disturbance Areas (as of October 2018)

NOTES:
- Imagery Scene from September 6, 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF
- Disturbance areas provide by New Gold, January 7, 2019.

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Disturbance Areas and Species at Risk Habitat

PROJECT N°: TC111504 | **FIGURE: 2-1**

SCALE: 1:40,000 | DATE: January 2019

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MCW-32 MCW-34 MCW-33 MCW-35 MCW-A MCW-29 MCW-71 MCW-28 MCW-B MCW-39 MCW-04 MCW-06 MCW-25 MCW-72 MCW-05 MCW-D MCW-08 MCW-76 MCW-03 MCW-41 MCW-70 MCW-C MCW-10 MCW-22 MCW-02 MCW-42 MCW-68 MCW-01 MCW-66 MCW-69 MCW-14 MCW-09 MCW-21 MCW-13 MCW-12 MCW-65 MCW-58 MCW-80 MCW-76A MCW-11 MCW-52 MCW-19 MCW-40 MCW-57 MCW-20 MCW-18 MCW-43 MCW-50 MCW-63 MCW-59 MCW-48 MCW-38 MCW-51 MCW-56 MCW-49 MCW-79 MCW-17 MCW-16 MCW-47 MCW-37

MCW-99 MCW-96 MCW-97 MCW-94 MCW-87 MCW-85 MCW-98 MCW-93 MCW-91 MCW-86 MCW-100 MCW-92 MCW-88 MCW-82 MCW-81 MCW-83 MCW-84

W-1 W-2 W-4 W-3 W-5 W-6 W-22 W-24 W-21 W-19 W-23 W-20 W-18 W-17 W-10 W-13 W-14 W-15 W-16 W-11 W-7 W-8 W-9 W-12

Splitrock River
Kashkatoosis River
Log Creek
Hwy 617
Pinewood River
Sturgeon Creek

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LEGEND

- Monitoring Stations Located on Whip-poor-will Compensation Lands
- Additional Whip-poor-will Stations (Periphery of Mine Site)
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2018 Eastern Whip-poor-will Survey Stations

PROJECT N^{O}: TC111504	**FIGURE: 4-1**
SCALE: 1:75,000	DATE: January 2019

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Mathieu Rd
Strachan Rd
Log Creek
Spillrock River
Hwy 71
Fisher Rd
Kishkatoosis River
Richardson Rd
Hwy 600
Hwy 617
Pinewood River
Taul Rd
Caul Rd
Barwick Rd
Sturgeon Creek

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LEGEND

- Monitoring Stations Located on Bobolink Compensation Lands
- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

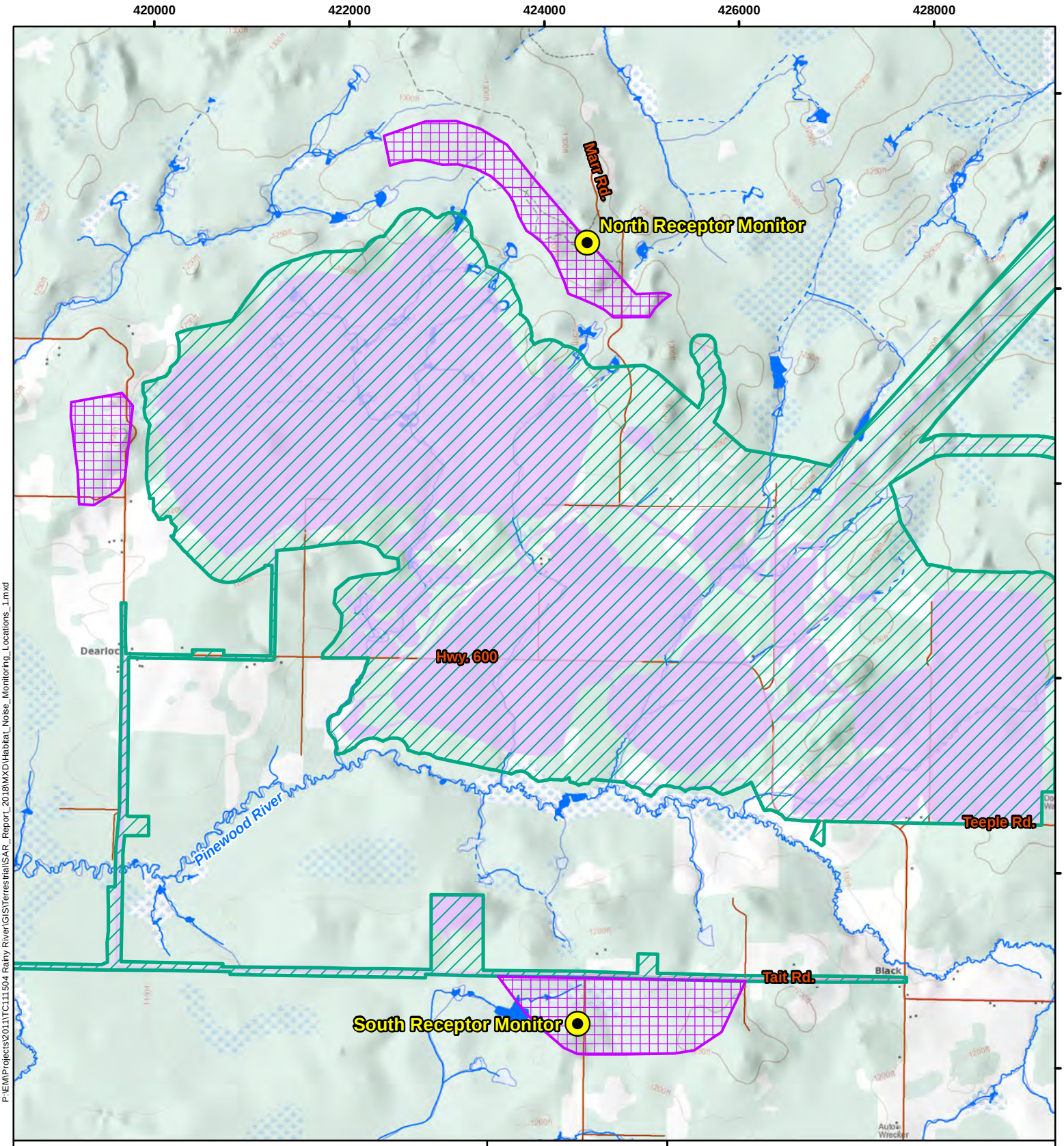
newgold™ Rainy River Project wood.

RAINY RIVER MINE

2018 Bobolink Survey Stations

PROJECT N°: TC111504 | **FIGURE: 4-2**

SCALE: 1:75,000 | DATE: January 2019



LEGEND

- Approximate Principal RRM Facilities
- 2015 Noise Monitoring Locations
- Whip-poor-will Receptor Habitat
- Project Site Boundary (ESA)

NOTES:

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RAINY RIVER MINE

Eastern Whip-poor-will Receptor Habitat Noise Monitoring Locations

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Projection: UTM Zone 15N

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PROJECT N°: TC111504 | **FIGURE: 4-3**

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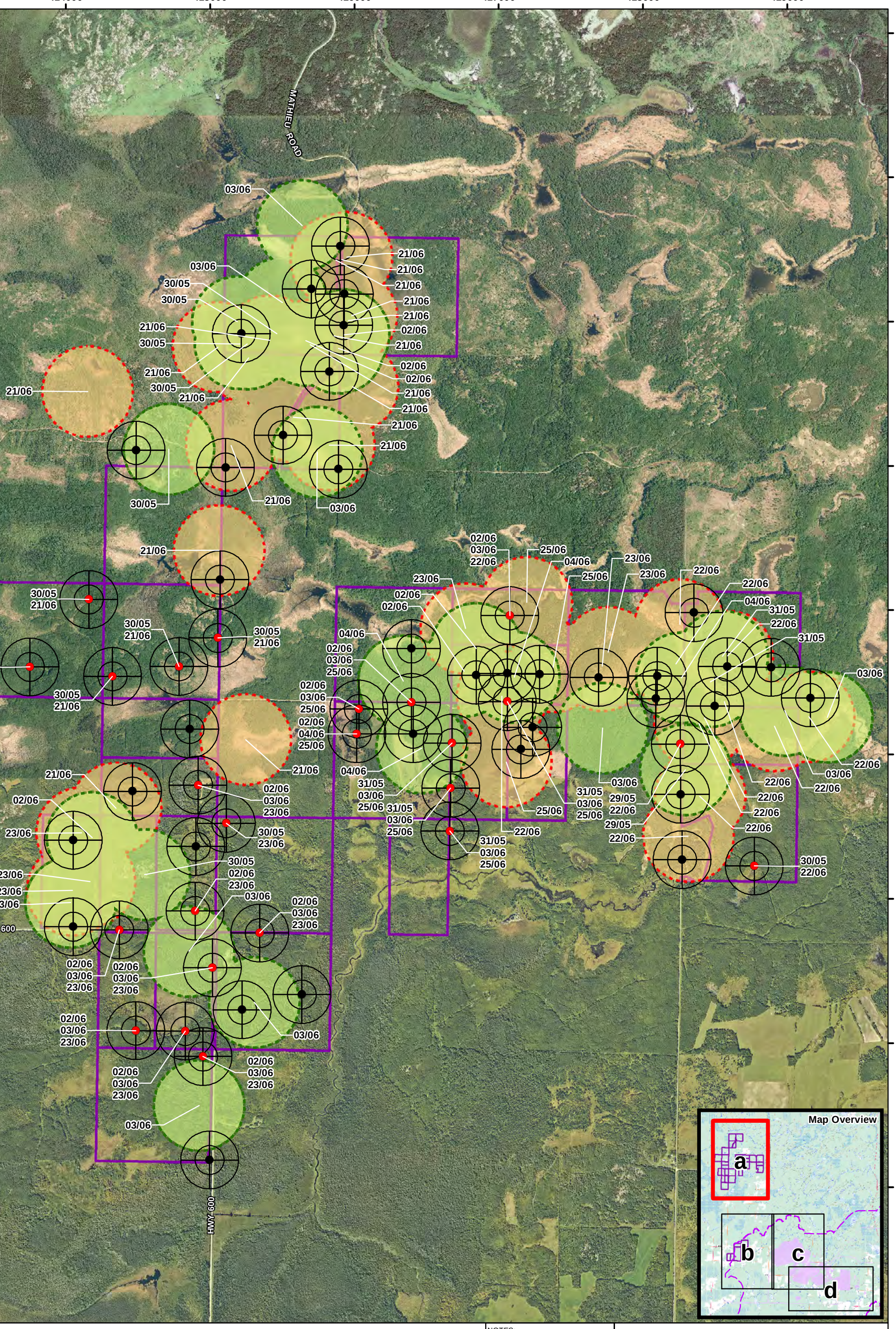

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LEGEND

- Whip-poor-will Observation - Core Use Area (Round 1) (Labelled with day and month of observation)
- Whip-poor-will Observation - Core Use Area (Round 2) (Labelled with day and month of observation)
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area (LSA)
- Whip-poor-will Survey Quadrants

Whip-poor-will Survey Locations

- No Whip-poor-will Observed (Labelled with day and month of survey)
- Whip-poor-will Observed

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018

Datum: NAD83
Projection: UTM Zone 15N

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newgold Rainy River Project wood.

RAINY RIVER MINE

2018 Eastern Whip-poor-will Observations

PROJECT N^{o}: TC111504	**FIGURE: 5-1a**
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Map Overview

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LEGEND

- Whip-poor-will Observation - Core Use Area (Round 1) (Labelled with day and month of observation)
- Whip-poor-will Observation - Core Use Area (Round 2) (Labelled with day and month of observation)
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area (LSA)
- Whip-poor-will Survey Quadrants

Whip-poor-will Survey Locations

- No Whip-poor-will Observed (Labelled with day and month of survey)
- Whip-poor-will Observed

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018

Datum: NAD83
Projection: UTM Zone 15N

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newgold™ Rainy River Project wood.

RAINY RIVER MINE

2018 Eastern Whip-poor-will Observations

PROJECT N^{o}: TC111504	**FIGURE: 5-1b**
SCALE: 1:24,000	DATE: January 2019

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HWY 600

Map Overview
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LEGEND

- Whip-poor-will Observation - Core Use Area (Round 1) (Labelled with day and month of observation)
- Whip-poor-will Observation - Core Use Area (Round 2) (Labelled with day and month of observation)
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area (LSA)
- Whip-poor-will Survey Quadrants

Whip-poor-will Survey Locations

- No Whip-poor-will Observed (Labelled with day and month of survey)
- Whip-poor-will Observed

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018

Datum: NAD83
Projection: UTM Zone 15N

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newgold Rainy River Project wood.

RAINY RIVER MINE

2018 Eastern Whip-poor-will Observations

PROJECT N^{o}: TC111504	**FIGURE: 5-1c**
SCALE: 1:24,000	DATE: January 2019

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Roein Rd.

HWY 600

TAIT ROAD

BARWICK ROAD

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Map Overview

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LEGEND

- Whip-poor-will Observation - Core Use Area (Round 1) (Labelled with day and month of observation)
- Whip-poor-will Observation - Core Use Area (Round 2) (Labelled with day and month of observation)
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area (LSA)
- Whip-poor-will Survey Quadrants

Whip-poor-will Survey Locations

- No Whip-poor-will Observed (Labelled with day and month of survey)
- Whip-poor-will Observed

0 0.25 0.5 1 1.5 2 2.5 Kilometres

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project | wood.

RAINY RIVER MINE

2018 Eastern Whip-poor-will Observations

PROJECT N^{O}: TC111504 | **FIGURE: 5-1d**

SCALE: 1:24,000 | DATE: January 2019

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Map Overview

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LEGEND

- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area

2018 Eastern Whip-poor-will Observations: Round 1, Round 2

2017 Eastern Whip-poor-will Observations: Round 1, Round 2

2016 Eastern Whip-poor-will Observations: Round 1, Round 2

2015 Eastern Whip-poor-will Observations: Round 1, Round 2

0 0.25 0.5 1 1.5 2 2.5 Kilometres

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2015 - 2018
Eastern Whip-poor-will Observations

PROJECT N^{o}: TC111504	**FIGURE: 5-2a**
SCALE: 1:25,000	DATE: January 2019

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Map Overview

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LEGEND

- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area

2018 Eastern Whip-poor-will Observations: Round 1, Round 2

2017 Eastern Whip-poor-will Observations: Round 1, Round 2

2016 Eastern Whip-poor-will Observations: Round 1, Round 2

2015 Eastern Whip-poor-will Observations: Round 1, Round 2

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018

Datum: NAD83
Projection: UTM Zone 15N

0 0.25 0.5 1 1.5 2 2.5 Kilometres

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2015 - 2018 Eastern Whip-poor-will Observations

PROJECT No: TC111504	**FIGURE: 5-2b**
SCALE: 1:24,000	DATE: January 2019

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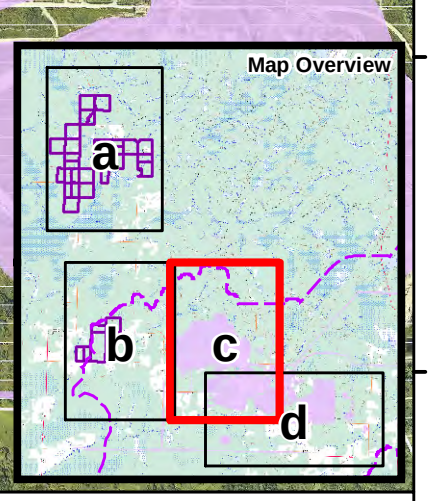
Roen Rd.



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LEGEND

- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area

2018 Eastern Whip-poor-will Observations
- Round 1
- Round 2

2017 Eastern Whip-poor-will Observations
- Round 1
- Round 2

2016 Eastern Whip-poor-will Observations
- Round 1
- Round 2

2015 Eastern Whip-poor-will Observations
- Round 1
- Round 2

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018

Datum: NAD83
Projection: UTM Zone 15N

0 0.25 0.5 1 1.5 2 2.5 Kilometres

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2015 - 2018
Eastern Whip-poor-will Observations

PROJECT N^{O}: TC111504	**FIGURE: 5-2c**
SCALE: 1:24,000	DATE: January 2019

422000 423000 424000 425000 426000 427000 428000 429000 430000 431000

5411000 5410000 5409000 5408000 5407000

Roen Rd.

HWY 600

TAIT ROAD

BARWICK ROAD

Map Overview

a b c d

Document Path: P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\SAR Report 2018\MXD\EWPW_Estimated_Location_2015_to_2018_Landscape_1.mxd

LEGEND

- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area (LSA)

2018 Eastern Whip-poor-will Observations
- Round 1
- Round 2

2016 Eastern Whip-poor-will Observations
- Round 1
- Round 2

2017 Eastern Whip-poor-will Observations
- Round 1
- Round 2

2015 Eastern Whip-poor-will Observations
- Round 1
- Round 2

0 0.25 0.5 1 1.5 2 2.5 Kilometres

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2015 - 2018
Eastern Whip-poor-will Observations

PROJECT N^{0}: TC111504 | **FIGURE: 5-2d**

SCALE: 1:24,000 | DATE: January 2019

415000 420000 425000 430000 435000 440000

5435000 5430000 5425000 5420000 5415000 5410000 5405000 5400000 5395000

MATHIEU WEST RD
MATHIEU RD
GOHERE BAY RD
BURNT CK RD
STRACHAN RD
HWY 401 EAST RD
FISHER RD
HWY 600
HWY 71
HWY 615
HWY 617
TAIT RD
BARWICK RD
ANGUS RD
OFF LK RD
MOULTON RD
CON RD
SCHRAM RD

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\SAR_Report_2018\MXD\EWPW_Estimated_Location_2010_to_2013_1.mxd

LEGEND

- AMEC 2013 Whip-poor-will Observations
- AMEC 2012 Whip-poor-will Observations
- AMEC 2011 Whip-poor-will Observations
- MNR/Trent U. (CRA) 2012 Geographic Mean Centre of Telemetry Record Point Clusters
- MNR 2010 Whip-poor-will Observations
- KCB 2010 Whip-poor-will Observations
- Transmission Line
- Road
- Watercourse
- Waterbody
- Natural Local Study Area
- Whip-poor-will Compensation Areas
- Project Site Boundary (ESA)
- Approximate Principal RRM Facilities

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018
- Road and watercouse data extracted from Land Information Ontario, MNRF.
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 4 6 8 10 Kilometres

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2010 - 2013
Eastern Whip-poor-will Observations

PROJECT N^0: TC111504	**FIGURE: 5-3**
SCALE: 1:115,000	DATE: January 2019

415000 420000 425000 430000

5415000 5410000 5405000

Highway 600 Hwy 617 Pinewood River Caul Rd Barwick Rd Highway 613

LEGEND

- Survey Locations Where Bobolink Were Observed (Labelled with number of individuals, if greater than 1)
- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

0 2.5 5 10 15 Kilometres

NOTES:
- Imagery Scene from 20 July 2014, and 6 September 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2018 Bobolink Observations

PROJECT N°: TC111504 | **FIGURE: 5-4**

SCALE: 1:57,000 | DATE: January 2019

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415000 420000 425000 430000 435000

5410000

5405000

Highway 600 Pollard Rd Hwy 617 Pinewood River Caul Rd Burwick Rd Highway 615 HOWEY 21

2015: 1 2016: 4 2017: 1 2018: 2
2015: 5 2016: 3 2017: 4 2018: 4
2015: 5 2016: 3 2017: 2 2018: 3
2015: 1 2017: 1 2018: 2
2017: 1
2017: 1 2018: 3
2015: 1 2017: 2 2018: 5
2015: 4 2016: 2 2017: 2 2018: 2
2016: 1
2016: 1 2017: 3 2018: 3
2015: 2 2016: 4 2017: 2 2018: 6
2015: 1 2017: 1
2015: 6 2016: 2 2017: 1 2018: 2
2015: 1 2016: 2 2017: 1 2018: 1
2015: 2 2016: 1 2017: 2 2018: 4
2015: 2 2016: 4 2017: 1 2018: 1
2015: 2 2016: 2 2017: 1
2015: 1 2016: 3 2018: 4
2015: 2 2016: 1 2018: 4
2015: 3 2016: 2 2017: 1
2015: 1 2016: 2 2017: 3 2018: 5
2015: 1 2016: 3 2017: 2
2015: 3 2016: 2 2017: 5 2018: 10
2015: 4 2016: 6 2017: 5
2015: 3 2016: 4 2018: 3
2015: 4 2016: 4 2017: 4 2018: 2
2015: 3 2016: 1 2017: 1 2018: 2
2015: 4 2016: 5 2017: 1
2015: 3 2016: 2 2017: 2 2018: 3
2017: 1
2015: 1 2016: 3 2017: 1
2015: 3 2016: 4 2017: 2 2018: 3
2015: 4 2016: 3 2017: 2 2018: 3
2015: 3 2016: 4 2017: 2 2018: 7
2015: 3 2016: 3 2017: 2 2018: 6
2015: 7 2016: 6 2017: 2 2018: 4
2015: 1 2016: 1 2018: 1
2015: 4 2016: 2 2018: 3
2015: 8 2016: 2 2018: 2
2015: 7 2016: 4 2018: 1
2015: 2 2016: 3 2017: 1
2015: 6 2016: 4 2017: 2 2018: 2
2016: 1 2018: 1
2016: 2
2015: 1 2018: 1
2015: 4 2016: 2 2018: 1
2015: 2 2016: 1
2016: 1

LEGEND

- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody
- Survey Locations Where Bobolink Were Observed (2015 - 2018) (Labelled year and number of individuals observed)

NOTES:
- Imagery Scene from 20 July 2014, and 6 September 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 2.75 5.5 11 16.5 Kilometres

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2015 - 2018 Bobolink Observations

PROJECT N^{O}: TC111504 | **FIGURE: 5-5**

SCALE: 1:62,000 | DATE: January 2019

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405000 412500 420000 427500 435000 442500

5422500 5415000 5407500

Sifton Township Conservation Reserve

Spruce Island Provincial Park

Hwy 619

Hwy 617

Hwy 600

Hwy 615

Hwy 71

Kishkakoesis River

Pinewood River

Little Pine Lake

Boundary Lake

Muskrat Lake

Off Lake

Burditt Lake

Rainy Lake I.R. No. 17B

Pinewood Lake

Abbott Lake

2 2 2 2 4 4 3

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\SAR Report 2018\MXD\Bobolink Obs 2010to2012 and 2014 1.mxd

LEGEND

- Transmission Line
- Road
- Permanent Watercourse
- Intermittent (Intermittent Watercourse)
- Waterbody
- Natutral Local Study Area
- Whip-poor-will Compensation Areas
- Project Site Boundary (ESA)
- Approximate Principal RRM Facilities

Bobolink Observations and Habitat Information
(Labelled with number of individuals, if greater than 1)

- Bobolink Observation (AMEC 2014)
- Bobolink Observation (AMEC 2012)
- Bobolink Observation (AMEC 2011)
- Bobolink Observation (KCB 2010)
- Bobolink Habitat - (Agriculture and Cultural Meadow Areas, derived from FRI and Ecosite data)

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF
- Base map data from Geogratis NRCan Toporama DRG 1:50k sheets.
- Habitats derived from MNRF FRI data, MNR Ecosite data and conversion into Provincial ELC classes

Datum: NAD83
Projection: UTM Zone 15N

0 5 10 20 30 Kilometres

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2010 - 2012 and 2014 Bobolink Observations

PROJECT N^{o}: TC111504 | **FIGURE: 5-6**

SCALE: 1:112,000 | DATE: January 2019

415000 420000 425000 430000 435000

5425000

5420000

5415000

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Map Overview

a

b

LEGEND

- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

2018 Survey Stations Where Species at Risk Were Observed (Labelled with number of individuals, if greater than 1)

- American White Pelican
- Bald Eagle
- Barn Swallow
- Canada Warbler
- Common Nighthawk
- Eastern Wood-pewee
- Evening Grosbeak
- Golden-winged Warbler
- Olive-sided Flycatcher
- Wood Thrush

0 2.5 5 10 15 Kilometres

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Other Species at Risk Observations in 2018

PROJECT N^{O}: TC111504	**FIGURE: 5-7a**
SCALE: 1:65,000	DATE: January 2019

415000 420000 425000 430000 435000

5410000

5405000

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Hwy 617 Hwy 600 Hwy 600 Hwy 600 Hwy 617 Pinewood River Tait Rd Hwy 600 Hwy 600 Hwy 600 Hwy 600 Cawl Rd Barrick Rd Angus Rd

Map Overview

a

b

LEGEND

- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

2018 Survey Stations Where Species at Risk Were Observed (Labelled with number of individuals, if greater than 1)

- American White Pelican
- Bald Eagle
- Barn Swallow
- Canada Warbler
- Common Nighthawk
- Eastern Wood-pewee
- Evening Grosbeak
- Golden-winged Warbler
- Olive-sided Flycatcher
- Wood Thrush

0 2.5 5 10 15 Kilometres

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Other Species at Risk Observations in 2018

PROJECT N^{O}: TC111504	**FIGURE: 5-7b**
SCALE: 1:65,000	DATE: January 2019

415000 420000 425000 430000 435000

5425000

5420000

5415000

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Map Overview

a

b

LEGEND

- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

2015 - 2018 Survey Stations Where Species at Risk Were Observed
(Labelled with number of individuals, if greater than 1)

Year of Observation
- 2018
- 2017
- 2016
- 2015

Species
- Olive-sided Flycatcher
- Red-Headed Woodpecker
- American White Pelican
- Bald Eagle
- Bank Swallow
- Barn Swallow
- Canada Warbler
- Common Nighthawk
- Eastern Meadowlark
- Eastern Wood-pewee
- Evening Grosbeak
- Golden-winged Warbler
- Wood Thrush

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 2.5 5 10 15 Kilometres

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Other Species at Risk Observations in 2015 - 2018

PROJECT N°: TC111504 | **FIGURE: 5-8a**

SCALE: 1:65,000 | DATE: January 2019

415000 420000 425000 430000 435000

5410000

5405000

Hwy 617 Hwy 600 Hwy 600 Hwy 600 Hwy 600 Hwy 600 Hwy 600 Hwy 617 Hwy 600 Phaneuf River Tait Rd Caul Rd Barnacle Rd Andrus Rd Hwy 600

Nest

Inactive Nest

Nest

Map Overview

a

b

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LEGEND

- Bobolink Compensation Areas
- Whip-poor-will Compensation Areas
- Approximate Principal RRM Facilities
- Project Site Boundary (ESA)
- Natural Local Study Area
- Road
- Watercourse
- Waterbody

2015 - 2018 Survey Stations Where Species at Risk Were Observed
(Labelled with number of individuals, if greater than 1)

Year of Observation
- 2018
- 2017
- 2016
- 2015

Species
- Olive-sided Flycatcher
- Red-Headed Woodpecker
- American White Pelican
- Bald Eagle
- Bank Swallow
- Barn Swallow
- Canada Warbler
- Common Nighthawk
- Eastern Meadowlark
- Eastern Wood-pewee
- Evening Grosbeak
- Golden-winged Warbler
- Wood Thrush

0 2.5 5 10 15 Kilometres

NOTES:
- Imagery Scene from 20 July 2014, 6 June 2017 and 6 September 2018
- Road and watercourse data extracted from Land Information Ontario, MNRF

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Other Species at Risk Observations in 2015 - 2018

PROJECT N°: TC111504	**FIGURE: 5-8b**
SCALE: 1:65,000	DATE: January 2019

Appendix A

Whip-poor-will Habitat Receptor Sound Monitoring Report 2018

2018 Whip-poor-will Habitat Receptor Sound Monitoring Report

Rainy River Mine
Chapple, ON
TC111504.2018.5

Prepared for:

New Gold Inc.
5967 Hwy 11 / 71, P.O. Box 5, Emo, Ontario P0W 1E0

11-Jan-19

Wood Environment & Infrastructure Solutions
160 Traders Blvd. E.
Suite 110
Mississauga, ON, L4Z 3K7
Canada
T: 905-568-2929
www.woodplc.com

11-Jan-19

New Gold Inc.
Rainy River Mine
5967 Hwy 11 / 71, P.O. Box 5
Emo, Ontario P0W 1E0

Attn: Sylvie St. Jean, Environmental Manager

Dear Sylvie St. Jean,

RE: 2018 Whip-Poor-Will Habitat Receptor Sound Monitoring Program

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (hereinafter referred to as Wood), is a leading environment and infrastructure, engineering, consulting and project management organization. Our team of professionals provides a full range of services to clients in a wide range of sectors including government, industrial & commercial, water, transportation, minerals & metals, oil & gas clients and clean energy. Environment and Infrastructure's core competencies are in environmental assessments, health and environmental risk assessment, environmental geology (site investigation), remediation engineering, geotechnical engineering and testing, and water resource services.

Wood is pleased to submit to New Gold Inc. (New Gold) the attached report summarizing the results of the 2018 whip-poor-will habitat sound monitoring program at the Rainy River Mine. The monitoring program was undertaken during the weeks of May 1-7 and June 1-7, 2018.

Wood appreciates the opportunity to provide support to the Rainy River Mine. Should you have any questions regarding this report, please do not hesitate to contact the undersigned.

Sincerely,
Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited

Dan Russell, P.Geo.
Associate Geoscientist

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

2018 Whip-poor-will Habitat Receptor Sound Monitoring Report

Rainy River Mine

Chapple, ON

TC111504.2018.5

Prepared for:
New Gold Inc.
5967 Hwy 11 / 71, P.O. Box 5, Emo, Ontario P0W 1E0

Prepared by:
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Mississauga, ON, L4Z 3K7
Canada
T: 905-568-2929

11-Jan-19

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Executive summary

The Rainy River Mine (RRM) is located approximately 65 kilometres by road, northwest of Fort Frances in northwestern Ontario. Wood Environment & Infrastructure Solutions (Wood) was retained by New Gold Inc. (New Gold) to complete a sound monitoring study at two Eastern Whip-poor-will habitat receptor locations adjacent to the RRM site. The sound monitoring study is required by the Ministry of Natural Resources and Forestry *Endangered Species Act* Overall Benefits Permit No. FF-C-001-14 (the Permit).

During the field program, the RRM was transitioning from the development phase to the operational phase. The main activities associated with the operations at the time were aggregate extraction, material handling, vehicle movement, plant operations, crushing operations and other mining fleet operations. The Permit requires monitoring sound levels at two whip-poor-will habitat receptor areas near the RRM site every year during the beginning of May and June. The purpose of this sound monitoring study is to confirm that the RRM construction and operational sound levels are within the Sound Level Threshold (50 dBA (A-weighted decibels)), as specified in the Permit. This assessment was completed by Qualified Professionals as required by the Permit under Sections 3.1 and 4.1(g).

Bruel & Kjaer 2250E Class 1 integrating sound level meters were used for the sound level measurements. The monitors were set to automatically measure the A-weighted hourly energy equivalent sound level (L_{Aeq-1h}) and to continuously record audio. Monitored sound levels can be affected by meteorological conditions and to account for this influence, weather data was obtained from the RRM's Barron site weather station to identify periods when monitored sound levels could have been affected.

Measurements were conducted during regular site activities required for the transition from the development to the operational phase. The sound levels collected during periods of inclement weather were not considered for this assessment, but were reported.

The hourly sound levels were within the Sound Level Threshold for 331 out of 336 hours of data collected at the receptor locations. One exceedance hour revealed contributions from both RRM equipment and wildlife; however, it is inconclusive as to which source was the cause of the exceedance. A review of the remaining exceedances' audio files revealed they were caused by either wildlife activities or wind. As the recordings did not reveal any exceedances which were primarily caused by the RRM site-related activities, the sound levels measured at the whip-poor-will receptor locations are believed to have been in compliance with the 50 dBA Sound Level Threshold during the monitoring periods of May and June 2018.

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3.0 Whip-poor-will Habitat Receptors 3
4.0 Sound Monitoring 3
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4.3 Meteorological Conditions 4
4.4 Sound Monitoring Results 5
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B Calibration Certificates
C Hourly Sound Levels and Weather Data

1.0 Introduction

The Rainy River Mine (RRM) is located approximately 65 kilometres (km) by road, northwest of Fort Frances, Ontario. Wood Environment & Infrastructure Solutions (Wood) was retained by New Gold Inc. (New Gold) to complete a sound monitoring study at two Eastern Whip-poor-will habitat receptor locations adjacent to the RRM site. The sound monitoring study is required by the Ministry of Natural Resources and Forestry (MNRF) *Endangered Species Act* (ESA) Overall Benefits Permit No. FF-C-001-14.

During the field program, the RRM was transitioning from the development phase to the operational phase. The main activities associated with the current operations at the time were aggregate extraction, material handling, vehicle movement, plant operations, crushing operations, open pit development and other mining fleet operations.

The MNRF ESA Permit requires monitoring of sound levels at two whip-poor-will habitat receptor areas near the RRM site at the beginning of May and June every year. The purpose of this sound monitoring study was to fulfill the requirements of the Permit, and confirm that the RRM sound levels are within the Sound Level Threshold of 50 dBA (A-weighted decibels), as defined in the Permit. This study was completed by Qualified Professionals as required by the Permit per Sections 3.1 and 4.1(g).

A glossary of commonly used sound terminology is provided in Appendix A of this report.

2.0 Project Description

The RRM includes an open pit, underground mine, a processing plant, and related facilities and infrastructure. Overburden and mine rock removed from the open pit are stored in adjacent stockpiles. Ore is processed at the onsite processing plant.

The project is currently in transition from the development phase to the operational phase. The aggregate pits will continue to operate during the transition phase and the underground mining operations are not expected to start during this period. The RRM crushing plants at the aggregate pits and other site activities were in operation during these sound monitoring periods. The monitoring period and collected sound data are representative of regular site activities required for the transition from the construction phase to the operational phase. .

3.0 Whip-poor-will Habitat Receptors

As defined in the ESA Permit, there are three whip-poor-will habitat receptor areas within the vicinity of the RRM site (Figure 1). There are two Eastern Locations which are located directly north and south of the RRM , and one Western Location, located west of the RRM. Sound monitoring is required at the two Eastern Receptor Locations as they are predicted to experience higher levels of sound than the Western Location, as specified in the ESA Permit.

4.0 Sound Monitoring

Automated sound measurements were conducted at the beginning of May and June 2018 (May 1-7 and June 1-7). Sound monitoring conformed to the technical requirements set out within the Ministry of the Environment (MOE) publications NPC-102 and NPC-103 (MOE 1977a,b). The measurement locations, instrumentation, weather conditions and results are discussed in the following sections.

4.1 Monitoring Locations

Two sound monitors (South Receptor Monitor – SRM, and North Receptor Monitor – NRM) were used for this sound monitoring program (Figure 1). UTM coordinates are provided in Table 1.

Table 1: Sound Monitoring Locations

Description of Monitor Location	Sound Monitor ID	UTM Coordinates [1]	
		Easting (m)	Northing (m)
North Receptor	NRM	424444	5414473
South Receptor	SRM	424444	5406426

Note

1. All coordinates are in the UTM coordinate system Zone 15T (NAD83).

Abbreviation(s)

m: metres

4.2 Instrumentation

Bruel & Kjaer 2250E Class 1 integrating sound level meters, were used for the sound level measurements. The monitors were set to automatically measure the A-weighted hourly energy equivalent sound level (L_{Aeq-1h}) and to continuously record audio.

Both sound level meters were factory calibrated within the preceding 24 months from the field program, and were field calibrated with a Bruel & Kjaer Type 4231 sound calibrator at the beginning and end of the monitoring periods. Calibration certificates for the monitors are provided in Appendix B. The microphones were fitted on vertical masts, approximately 1.5 m above the ground, and were provided with windscreens and bird-deterrent wires.

4.3 Meteorological Conditions

Monitored sound levels can be affected by meteorological conditions. To account for this influence, weather data was obtained from the RRM site weather station (Barron Site Station). The data from the station for the period of the investigation is presented in Appendix C.

For this sound monitoring study, and as defined in NPC-103 (MOE 1977b), inclement weather conditions are considered to have occurred under any of the following conditions:

- Humidity levels were above 90% or precipitation has occurred; and/or
- Wind speed was exceeded 20 km/hour; and/or
- Temperature was outside the operating range defined by the manufacturer of the sound level meter (i.e., below -10 °C or above +50 °C).

Inclement weather typically produces sound levels which are much higher than would otherwise be recorded absent such conditions. Therefore, sound data collected during inclement weather periods were not included in the assessment of measured sound levels against the Sound Level Threshold. However, all recorded sound level measurements, including periods of inclement weather conditions are reported in Appendix C for completeness of documentation.

4.4 Sound Monitoring Results

After the initial setup of the two sound monitors and verification of their functionality, the monitors were generally left unattended to record the sound levels. Each monitor was visited daily to download data and check on working condition.

The hourly L_{Aeq-1h} sound levels measured are provided in Appendix C. A summary of the hourly sound levels measured at both locations during these periods is provided in Table 2.

Table 2: Hourly Sound Level Results Summary

Monitor	Hourly Sound Levels (L_{Aeq-1h}, dBA)					
	May 2018			June 2018		
	Minimum	Average	Maximum	Minimum	Average	Maximum
North Monitor — NRM	27	39	52	26	42	51
South Monitor — SRM	25	36	56	30	41	52

Note

1. All coordinates are in the UTM coordinate system Zone 15T (NAD83).

For the purposes of this assessment, and as per the MOE NPC-103 guidelines for sound measurements, sound data collected during inclement weather was not included in the assessment against the 50 dBA criteria limit and were excluded from the results presented in Table 2. The complete hourly data is reported in Appendix C.

The hourly sound levels at NRM and SRM in 2018 were within the Sound Level Threshold of 50 dBA for 331 of 336 hours of data collected at the receptor locations. The measured hourly sound levels are graphically presented in Appendix D. A review of the audio files revealed that four of the five exceedances noted were a result of either wildlife activities or wind, and were not primarily caused by RRM activities.

The fifth exceedance which occurred at the NRM on May 3rd, 2018, during the hour of 21:00 was noteworthy. The measured L_{Aeq-1h} was 52 dBA, 2 dB over the Sound Level Threshold of 50 dBA. The audio file revealed both audible mine equipment noise, likely dozers, as well as wildlife noise. Throughout the hour, these two sources of sound often occurred simultaneously without either of them being subjectively louder than the other. As a result, it is inconclusive whether the RRM equipment, wildlife, or the combination of them caused the exceedance. Therefore, the RRM sound levels measured at the whip-poor-will receptor locations during the monitoring periods of May and June 2018 are believed to satisfy 50 dBA Sound Level Threshold identified in the Permit.

5.0 Conclusions

Sound monitoring at the two Eastern Whip-poor-will habitat receptor locations, as required by the ESA Overall Beneits Permit (No. FF-C-001-14) for the RRM, was completed at the beginning of May and June 2018. The sound measurements were conducted in accordance with the applicable MOE publications NPC-102 and NPC-103 (MOE 1977a,b).

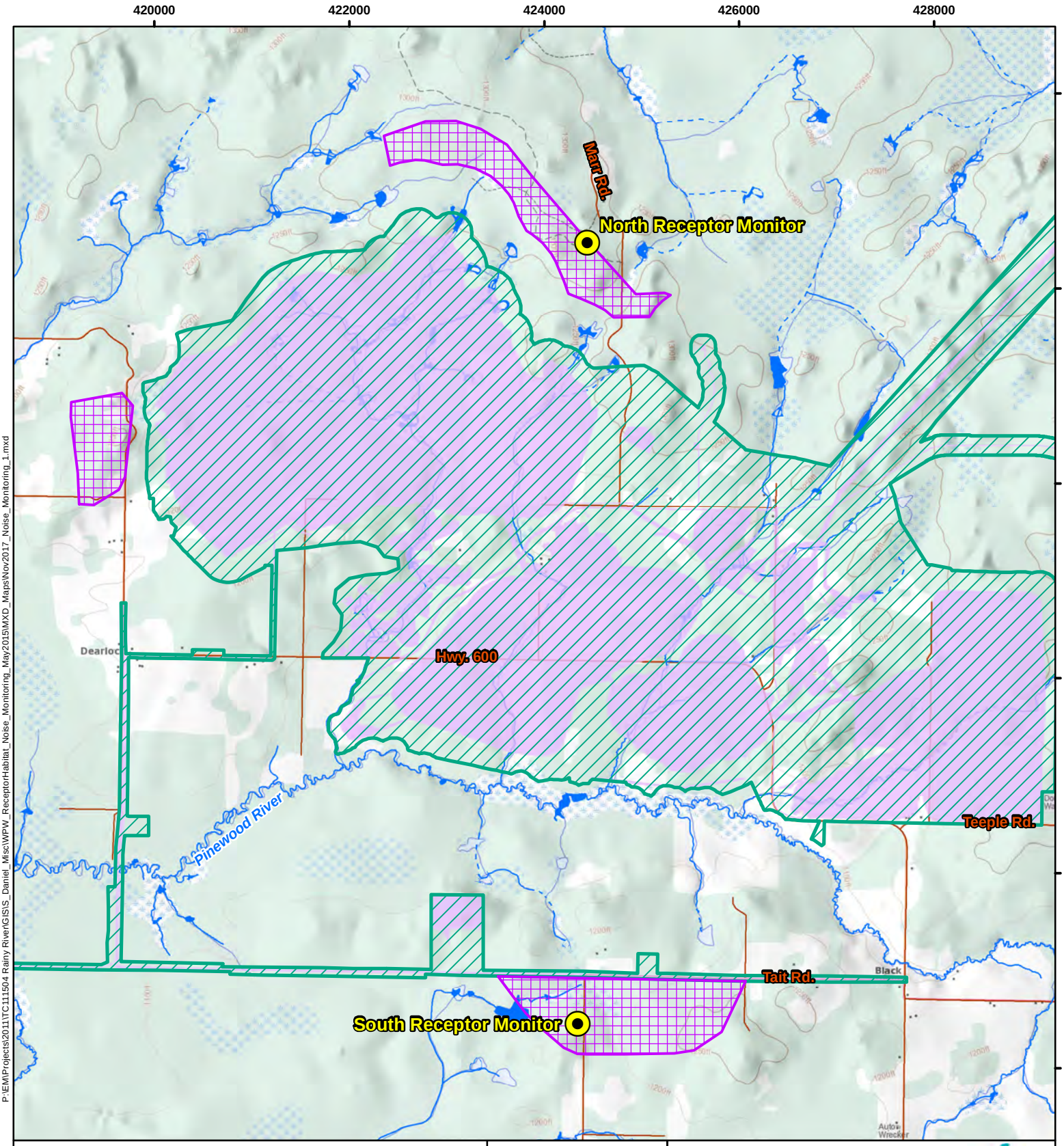
The hourly sound levels were within the Sound Level Threshold of 50 dBA for the entire monitoring period, with the exception of 5 out of 336 hours of data collected at the receptor locations. A review of the audio files revealed that the exceedances were not primarily caused by the RRM activities. Therefore, based on the data collected the RRM sound levels measured at the whip-poor-will receptor locations are

believed to have been in compliance with the 50 dBA Sound Level Threshold during the monitoring periods of May and June 2018.

6.0 References

Ministry of the Environment (MOE). 1977a. *Publication NPC-102 Instrumentation,* published under the Model Municipal Noise Control Bylaw, 1977.

Ministry of the Environment (MOE). 1977b. Publication NPC-103, *Measurement Procedure*, published under the Model Municipal Noise Control Bylaw, 1977.



LEGEND

- Approximate Principal RRP Facilities
- 2015 Noise Monitoring Locations
- Whip-poor-will Receptor Habitat
- Project Site Boundary (ESA)

NOTES:

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

Whip-poor-will Receptor Habitat Noise Monitoring Locations

Datum: NAD83
Projection: UTM Zone 15N

0 1 2 3 4 Kilometres

N W E S

PROJECT N°: TC111504 | **FIGURE: 1**

SCALE: 1:53,000 | DATE: November 2017

Appendix A

Glossary of Sound Terminology

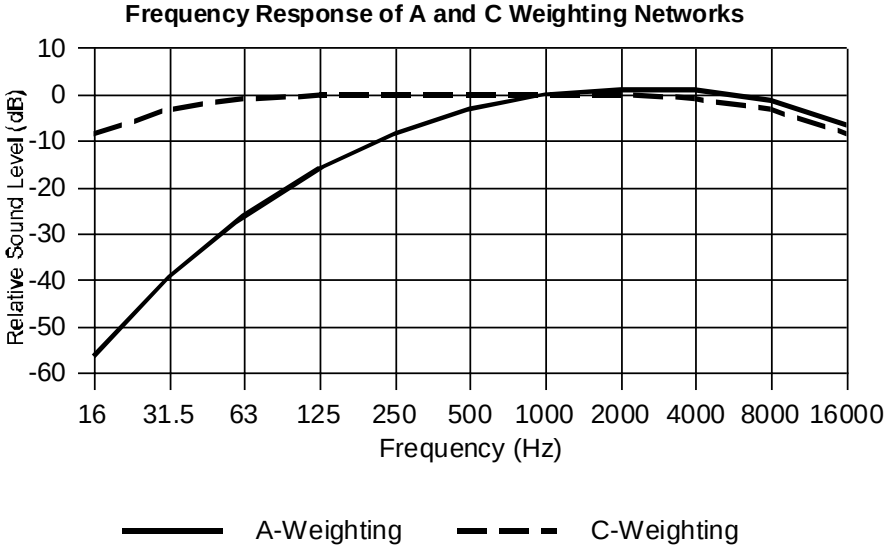
Glossary of Commonly Used Sound Terminology

Ambient or Background Noise: The ambient noise from all sources other than the sound of interest (i.e. sound other than that being measured). Under most MOE guidelines, aircraft overflights and train noise, due to their transient nature, are normally excluded from measurements of background noise.

Attenuation: The reduction of sound intensity by various means (e.g., air, humidity, porous materials, etc.).

dB - Decibel: The logarithmic units associated with sound pressure level, sound power level, or acceleration level. See sound pressure level, for example.

dBA - Decibel, A-Weighted: The logarithmic units associated with a sound pressure level, where the sound pressure signal has been filtered using a frequency weighting that mimics the response of the human ear to quiet sound levels. The resultant sound pressure level is therefore representative of the subjective response of the human ear. A-weighted sound pressure levels are denoted by the suffix 'A' (ie. dBA), and the term pressure is normally omitted from the description (i.e., sound level or noise level).



dBC - Decibel, C-Weighted: The logarithmic units associated with a sound pressure level, where the sound pressure signal has been filtered using a frequency weighting that mimics the response of the human ear to loud sound levels. C-weighted sound pressure levels are denoted by the suffix 'C' (ie. dBC). C-weighted levels are often used in low-frequency noise analysis, as the filtering effect is nearly flat at lower frequencies.

dBL or dBLin - Decibel, Linear: The logarithmic units associated with a sound pressure level, where the sound pressure signal is unfiltered, and represents the full spectrum of incoming noise.

Calibrator (Acoustical): A device which produces a known sound pressure on the microphone of a sound level measurement system, and is used to adjust the system to standard specifications.

Directivity Factor (Q) (also, **Directional** or **Directionality Factor):** A factor mathematically related to Directivity Index, used in calculating propagated sound levels to account for the effect of reflecting surfaces near to the source. For example, for a source in free space where the sound is radiating spherically, Q = 1. For a source located on or very near to a surface (such as the ground, a wall, rooftop, etc.), where the sound is radiating hemispherically, Q = 2. This accounts for the additional sound energy reflecting off the surface, and translates into a +3 dB add.

Energy Equivalent Sound Level (L_{eq}): An energy-average sound level taken over a specified period of time. It represents the average sound pressure encountered for the period. The time period is often added as a suffix to the label (e.g., $L_{eq}(24)$ for the 24-hour equivalent sound level). L_{eq} is usually A-weighted. An L_{eq} value expressed in dBA is a good, single value descriptor of the annoyance of noise.

Exceedance Noise Level (L_N): The noise level exceeded N% of the time. It is a statistical measure of the noise level. For highly varying sounds, the L_{90} represents the background noise level, L_{50} represents the median or typical noise level, and L_{10} represents the short term peak noise levels, such as those due to occasional traffic or a barking dog.

Far Field: Describes a region in free space where the sound pressure level from a source obeys the inverse-square law (the sound pressure level decreases 6 dB with each doubling of distance from the source). Also, in this region the sound particle velocity is in phase with the sound pressure. Closer to the source where these two conditions do not hold constitutes the "near field" region.

Free Sound Field (Free Field): A sound field in which the effects of obstacles or boundaries on sound propagated in that field are negligible.

Frequency: The number of times per second that the sine wave of sound or of a vibrating object repeats itself, now expressed in hertz (Hz), formerly in cycles per second (cps).

Hertz (Hz): Unit of measurement of frequency, numerically equal to cycles per second.

Human Perception of Sound: The human perception of noise impact is an important consideration in qualifying the noise effects caused by projects. The following table presents a general guideline.

Increase in Noise Level (dB)	Perception
3 or less	insignificant due to imperceptibility
4 to 5	just-noticeable difference
6 to 9	marginally significant
10 or more	significant, perceived as a doubling of sound exposure

Impact Sound: The sound produced by the collision of two solid objects, e.g., footsteps, dropped objects, etc., on an interior surface (wall, floor, or ceiling) of a building. Typical industrial sources include punch presses, forging hammers, etc.

Impulsive Noise: a) Single or multiple sound pressure peak(s) (with either a rise time less than 200 milliseconds or total duration less than 200 milliseconds) spaced at least by 500 millisecond pauses, b) A sharp sound pressure peak occurring in a short interval of time.

Infrasonic: Sounds of a frequency lower than 20 hertz.

Insertion Loss (IL): The arithmetic difference between the sound level from a source before and after the installation of a noise mitigation measure, at the same location. Insertion loss is typically presented as a positive number, i.e., the post-mitigation sound level is lower than the pre-mitigation level. Insertion loss is expressed in dB and is usually specified per 1/1 octave band, per 1/3 octave band, or overall.

Low Frequency Noise (LFN): Noise in the low frequency range, from infrasonic sounds (<20 Hz) up to 250 Hz.

Masking: a) The process by which the threshold of audibility for a sound is raised by the presence of another (masking) sound, or b) The amount by which the threshold of audibility of a sound is raised by the presence of another (masking) sound.

Near Field: The sound field very near to a source, where sound pressure does not obey the inverse-square law and the particle velocity is not in phase with the sound pressure.

Noise: Unwanted sound.

Noise Level: Same as Sound Level, except applied to unwanted sounds.

Peak Sound Pressure Level: Same as Sound Pressure Level except that peak (not peak-to-peak) sound pressure values are used in place of RMS pressures.

Quasi-Steady Impulsive Noise: Noise composed of a series of short, discrete events, characterized by rapid rise times, but with less than 0.5 seconds elapsing between events.

RMS Sound Pressure: The square-root of the mean-squared pressure of a sound (usually the result of an RMS detector on a microphone signal).

Reverberant Field: The region in a room where the reflected sound dominates, as opposed to the region close to the noise source where the direct sound dominates.

Sound: a dynamic (fluctuating) pressure.

Sound Exposure Level (SEL): An L_{eq} referenced to a one second duration. Also known as the Single Event Level. It is a measure of the cumulative noise exposure for a single event. It provides a measure of the accumulation of sound energy over the duration of the event.

Sound Intensity: The sound energy flow through a unit area in a unit time.

Sound Level Meter: An instrument comprised of a microphone, amplifier, output meter, and frequency-weighting networks which is used for the measurement of noise and sound levels.

Sound Pressure Level (SPL): The logarithmic ratio of the RMS sound pressure to the sound pressure at the threshold of hearing. The sound pressure level is defined by equation (1) where P is the RMS pressure due to a sound and P_0 is the reference pressure. P_0 is usually taken as 2.0×10^{-5} Pascals.

(1) $SPL\ (dB) = 20 \log(P_{RMS}/P_0)$

Sound Power Level (PWL): The logarithmic ratio of the instantaneous sound power (energy) of a noise source to that of an international standard reference power. The sound power level is defined by equation (2) where W is the sound power of the source in watts, and W_0 is the reference power of 10^{-12} watts.

(2) $PWL\ (dB) = 10 \log(W/W_0)$

Interrelationships between sound pressure level (SPL) and sound power level (PWL) depend on the location and type of source.

Spectrum: The description of a sound wave's resolution into its components of frequency and amplitude.

Speed (Velocity) of Sound in Air: 344 m/s (1128 ft/s) at 70°F (21°C) in air at sea level.

Threshold of Audibility (Threshold of Detectability): The minimum sound pressure level at which a person can hear a specified frequency of sound over a specified number of trials.

Appendix B

Calibration Certificates

Brüel & Kjær
North America Inc.

The Brüel & Kjær Calibration Laboratory
2815 Colonnades Court
Norcross, GA 30071-1588
Telephone: 770/209-6907
Fax: 770/447-4033
Web site address: http://www.bkhome.com

ACCREDITED
Calibration Certificate Number 1568.01

CERTIFICATE OF CALIBRATION

Certificate No: CAS-146276-J5X2Q3-801

CALIBRATION OF:

Sound Level Meter:	Brüel & Kjær	2250	Serial No: 3006066
Microphone:	Brüel & Kjær	4189	Serial No: 2820087
Preamplifier:	Brüel & Kjær	ZC-0032	Serial No: 20423
Software version:	BZ7222 Version 4.6.2		

CLIENT:

XSCALA Rental Instruments
234-5149 Country Hills Blvd. NW
Calgary, AB T3A 5K8

CALIBRATION CONDITIONS:

Preconditioning: 4 hours at 23 ± 3 °C

Environment conditions See actual values in Environmental Condition sections

SPECIFICATIONS:

This document certifies that the instrument as listed under "Model/Serial Number" has been calibrated and unless otherwise indicated under "Final Data", meets acceptance criteria as prescribed by the referenced Procedure. The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95%. Statements of compliance, where applicable, are based on calibration results falling within specified criteria with no reduction by the uncertainty of the measurement. The calibration of the listed instrumentation, was accomplished using a test system which conforms with the requirements of ISO/IEC 17025, ANSI/NCSL Z540-1, and ISO 10012-1. For "as received" and/or "final" data, see the attached page(s). Items marked with one asterisk (*) are not covered by the scope of the current A2LA accreditation This Certificate and attached data pages shall not be reproduced, except in full, without the written approval of the Brüel and Kjær Calibration Laboratory-Norcross, GA. Results relate only to the items tested. This instrument has been calibrated using Measurement Standards with values traceable to the National Institute of Standards and Technology, National Measurement Institutes or derived from natural physical constants.

PROCEDURE:

Brüel and Kjær Model 3630 Sound Level Meter Calibration System Software 7763 Version 6.0 - DB: 6.01 Test Collection 2250-4189.

RESULTS:

As Received Condition	As Received Data	Final Data
_X_ Received in good condition	___ Within acceptance criteria	_X_ Within acceptance criteria
___ Damaged - See attached report	___ Outside acceptance criteria	___ Limited test - See attached details
	___ Inoperative	
	_X_ Data not taken	

Date of Calibration: 15 Jul. 2016

Certificate issued: 15 Jul. 2016

<Original signed by>

Debra Wilson

Calibration Technician

Quality Representative

Brüel & Kjær
North America Inc.

The Brüel & Kjær Calibration Laboratory
3079 Premiere Parkway Suite 120
Duluth, GA 30097
Telephone: 770/209-6907
Fax: 770/447-4033
Web site address: http://www.bkhome.com

ACCREDITED Calibration Certificate Number 1568.01

CERTIFICATE OF CALIBRATION

Certificate No: CAS-211483-P5Y5M4-101

CALIBRATION OF:

Sound Level Meter:	Brüel & Kjær	2250	Serial No: 3007557
Microphone:	Brüel & Kjær	4189	Serial No: 2983082
Preamplifier:	Brüel & Kjær	ZC-0032	Serial No: 13445
Supplied Calibrator:	Brüel & Kjær	4231	Serial No: 2053018
Software version:	BZ7222 Version 4.7.2		

CLIENT:

XSCALA Rental Instruments
234-5149 Country Hills Blvd. NW
Calgary, AB T3A 5K8

CALIBRATION CONDITIONS:

Preconditioning: 4 hours at 23 ± 3 °C
Environment conditions See actual values in Environmental Condition sections

SPECIFICATIONS:

This document certifies that the instrument as listed under "Model/Serial Number" has been calibrated and unless otherwise indicated under "Final Data", meets acceptance criteria as prescribed by the referenced Procedure. The reported expanded uncertainty is based on the standard uncertainty multiplied by a coverage factor $k = 2$ providing a level of confidence of approximately 95%. Statements of compliance, where applicable, are based on calibration results falling within specified criteria with no reduction by the uncertainty of the measurement. The calibration of the listed instrumentation, was accomplished using a test system which conforms with the requirements of ISO/IEC 17025, ANSI/NCSL Z540-1, and ISO 10012-1. For "as received" and/or "final" data, see the attached page(s). Items marked with one asterisk (*) are not covered by the scope of the current A2LA accreditation This Certificate and attached data pages shall not be reproduced, except in full, without the written approval of the Brüel and Kjær Calibration Laboratory-Duluth, GA. Results relate only to the items tested. This instrument has been calibrated using Measurement Standards with values traceable to the National Institute of Standards and Technology, National Measurement Institutes or derived from natural physical constants.

PROCEDURE:

Brüel and Kjær Model 3630 Sound Level Meter Calibration System Software 7763 Version 6.0 - DB: 6.01 Test Collection 2250-4189.

RESULTS:

As Received Condition	As Received Data	Final Data
_X_ Received in good condition	_X_ Within acceptance criteria	_X_ Within acceptance criteria
___ Damaged - See attached report	___ Outside acceptance criteria	___ Limited test - See attached details
	___ Inoperative	
	___ Data not taken	

Date of Calibration: 19 Apr. 2017

Certificate issued: 19 Apr. 2017
<Original signed by>

John Avitabile

Calibration Technician

Quality Representative

Appendix C

Hourly Sound Levels and Weather Data

May 2018

Note:

[1] Represents periods with not enough reportable data for the hour.

[2] Minutes from the hour that was affected by human activity downloading data was excluded from the L_{Aeq-1h}.

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
5/1/2018	0:00	1.73	10.44	0.00	65.46	40	43	50	NO	YES	-
5/1/2018	1:00	2.39	9.49	0.00	68.20	42	42	50	NO	YES	-
5/1/2018	2:00	2.34	8.69	0.00	70.29	43	44	50	NO	YES	-
5/1/2018	3:00	3.19	7.70	9.30	79.63	61	60	50	YES	NO	Inclement Weather Conditions
5/1/2018	4:00	4.19	4.93	2.30	93.60	47	46	50	YES	YES	Inclement Weather Conditions
5/1/2018	5:00	3.10	5.15	0.10	92.90	44	44	50	YES	YES	Inclement Weather Conditions
5/1/2018	6:00	2.56	4.94	0.20	93.50	39	43	50	YES	YES	Inclement Weather Conditions
5/1/2018	7:00	3.15	4.43	0.50	94.70	34	37	50	YES	YES	Inclement Weather Conditions
5/1/2018	8:00	3.34	4.08	0.10	93.90	34	40	50	YES	YES	Inclement Weather Conditions
5/1/2018	9:00	3.40	3.80	0.00	93.80	38	37	50	YES	YES	Inclement Weather Conditions
5/1/2018	10:00	3.34	3.70	0.00	93.80	38	36	50	YES	YES	Inclement Weather Conditions
5/1/2018	11:00	3.17	3.83	0.00	91.60	39	32	50	YES	YES	Inclement Weather Conditions
5/1/2018	12:00	3.58	3.84	0.00	91.70	37	33	50	YES	YES	Inclement Weather Conditions
5/1/2018	13:00	3.86	4.37	0.00	86.50	39	38 [2]	50	NO	YES	-
5/1/2018	14:00	3.26	4.01	0.00	86.80	38	33 [2]	50	NO	YES	-
5/1/2018	15:00	2.97	4.37	0.00	83.60	34	33	50	NO	YES	-
5/1/2018	16:00	2.90	4.59	0.00	81.80	30 [2]	39	50	NO	YES	-
5/1/2018	17:00	3.01	4.83	0.00	79.82	37	37	50	NO	YES	-
5/1/2018	18:00	2.49	4.62	0.00	79.20	34	36	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
5/1/2018	19:00	1.83	4.50	0.00	79.71	33	27	50	NO	YES	-
5/1/2018	20:00	1.62	4.15	0.00	83.10	34	36	50	NO	YES	-
5/1/2018	21:00	1.56	3.64	0.00	85.20	40	38	50	NO	YES	-
5/1/2018	22:00	0.76	3.34	0.00	86.70	37	35	50	NO	YES	-
5/1/2018	23:00	0.54	3.19	0.00	88.90	36	28	50	NO	YES	-
5/2/2018	0:00	0.26	3.03	0.00	90.00	39	30	50	NO	YES	-
5/2/2018	1:00	0.45	2.96	0.00	91.30	37	34	50	YES	YES	Inclement Weather Conditions
5/2/2018	2:00	0.84	2.92	0.00	91.30	37	32	50	YES	YES	Inclement Weather Conditions
5/2/2018	3:00	1.05	2.80	0.00	91.20	38	35	50	YES	YES	Inclement Weather Conditions
5/2/2018	4:00	1.28	2.32	0.00	91.20	35	35	50	YES	YES	Inclement Weather Conditions
5/2/2018	5:00	0.63	2.20	0.00	92.80	41	39	50	YES	YES	Inclement Weather Conditions
5/2/2018	6:00	0.66	2.32	0.00	93.70	36	31	50	YES	YES	Inclement Weather Conditions
5/2/2018	7:00	0.69	3.44	0.00	88.40	34	31	50	NO	YES	-
5/2/2018	8:00	1.88	4.48	0.00	80.20	36	31	50	NO	YES	-
5/2/2018	9:00	2.49	5.58	0.00	75.20	35	30	50	NO	YES	-
5/2/2018	10:00	3.08	6.29	0.00	71.62	38	27 [2]	50	NO	YES	-
5/2/2018	11:00	3.17	7.26	0.00	67.73	36	28 [2]	50	NO	YES	-
5/2/2018	12:00	2.38	8.85	0.00	60.51	36 [2]	28	50	NO	YES	-
5/2/2018	13:00	3.16	10.03	0.00	54.65	39	29	50	NO	YES	-
5/2/2018	14:00	4.02	11.38	0.00	49.02	39	33	50	NO	YES	-
5/2/2018	15:00	3.85	12.52	0.00	44.13	35	32	50	NO	YES	-
5/2/2018	16:00	3.39	13.63	0.00	39.48	37	30	50	NO	YES	-
5/2/2018	17:00	2.96	14.11	0.00	36.59	38	32	50	NO	YES	-
5/2/2018	18:00	2.92	14.39	0.00	35.89	39	34	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
5/2/2018	19:00	1.35	13.40	0.00	39.88	43	41	50	NO	YES	-
5/2/2018	20:00	0.85	11.39	0.00	50.52	49	37	50	NO	YES	-
5/2/2018	21:00	2.16	10.78	0.00	52.34	46	35	50	NO	YES	-
5/2/2018	22:00	2.23	10.40	0.00	54.52	42	34	50	NO	YES	-
5/2/2018	23:00	2.59	9.84	0.00	57.26	42	33	50	NO	YES	-
5/3/2018	0:00	3.02	9.34	0.00	56.65	42	33	50	NO	YES	-
5/3/2018	1:00	0.65	7.60	0.00	62.79	42	33	50	NO	YES	-
5/3/2018	2:00	0.73	5.61	0.00	70.16	43	32	50	NO	YES	-
5/3/2018	3:00	0.53	1.95	0.00	87.70	40	40	50	NO	YES	-
5/3/2018	4:00	0.22	0.52	0.00	92.80	43	46	50	YES	YES	Inclement Weather Conditions
5/3/2018	5:00	0.36	0.50	0.00	93.50	41	45	50	YES	YES	Inclement Weather Conditions
5/3/2018	6:00	1.29	3.58	0.00	95.10	35	42	50	YES	YES	Inclement Weather Conditions
5/3/2018	7:00	2.59	5.81	0.00	97.40	36	34	50	YES	YES	Inclement Weather Conditions
5/3/2018	8:00	2.11	6.40	0.00	98.20	34	39	50	YES	YES	Inclement Weather Conditions
5/3/2018	9:00	1.79	7.37	0.00	98.70	38	39	50	YES	YES	Inclement Weather Conditions
5/3/2018	10:00	1.65	10.44	0.00	87.40	38 [2]	33	50	NO	YES	-
5/3/2018	11:00	2.52	14.59	0.00	55.49	36 [2]	N/A [1]	50	NO	YES	-
5/3/2018	12:00	3.05	16.09	0.00	39.65	35	34 [2]	50	NO	YES	-
5/3/2018	13:00	2.93	16.74	0.00	34.75	35	35	50	NO	YES	-
5/3/2018	14:00	2.92	17.71	0.00	31.98	36	31	50	NO	YES	-
5/3/2018	15:00	3.68	18.33	0.00	31.20	37	30	50	NO	YES	-
5/3/2018	16:00	4.08	18.91	0.00	30.01	39	31	50	NO	YES	-
5/3/2018	17:00	4.34	19.17	0.00	28.51	42	37	50	NO	YES	-
5/3/2018	18:00	3.89	18.94	0.00	28.93	45	34	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
5/3/2018	19:00	3.08	17.80	0.00	31.47	46	35	50	NO	YES	-
5/3/2018	20:00	1.20	14.15	0.00	43.49	50	35	50	NO	YES	-
5/3/2018	21:00	0.74	10.70	0.00	56.37	52	38	50	NO	NO	Mine equipment/Wildlife
5/3/2018	22:00	0.54	8.23	0.00	67.55	48	35	50	NO	YES	-
5/3/2018	23:00	1.24	7.55	0.00	65.43	44	33	50	NO	YES	-
5/4/2018	0:00	0.72	4.84	0.00	78.54	46	33	50	NO	YES	-
5/4/2018	1:00	0.33	3.13	0.00	86.60	45	35	50	NO	YES	-
5/4/2018	2:00	0.62	2.28	0.00	87.80	43	34	50	NO	YES	-
5/4/2018	3:00	1.26	3.46	0.00	80.60	42	40	50	NO	YES	-
5/4/2018	4:00	0.40	1.57	0.00	88.20	42	43	50	NO	YES	-
5/4/2018	5:00	0.85	1.08	0.00	92.70	41	44	50	YES	YES	Inclement Weather Conditions
5/4/2018	6:00	0.99	1.30	0.00	92.00	40	40	50	YES	YES	Inclement Weather Conditions
5/4/2018	7:00	1.80	7.51	0.00	73.68	40	43	50	NO	YES	-
5/4/2018	8:00	2.44	12.11	0.00	57.07	37	44	50	NO	YES	-
5/4/2018	9:00	2.50	15.01	0.00	46.02	39	36	50	NO	YES	-
5/4/2018	10:00	5.87	16.98	0.00	34.33	44	42	50	YES	YES	Inclement Weather Conditions
5/4/2018	11:00	6.54	17.38	0.00	30.11	46 [2]	45	50	YES	YES	Inclement Weather Conditions
5/4/2018	12:00	6.46	17.74	0.00	31.22	46	46 [2]	50	YES	YES	Inclement Weather Conditions
5/4/2018	13:00	6.27	18.70	0.00	27.62	46	48	50	YES	YES	Inclement Weather Conditions
5/4/2018	14:00	6.36	18.93	0.00	25.37	45	43	50	YES	YES	Inclement Weather Conditions
5/4/2018	15:00	6.38	19.13	0.00	24.37	42	40	50	YES	YES	Inclement Weather Conditions
5/4/2018	16:00	5.80	19.52	0.00	23.60	43	42	50	YES	YES	Inclement Weather Conditions
5/4/2018	17:00	5.15	19.24	0.00	23.63	44	42	50	NO	YES	-
5/4/2018	18:00	5.13	18.66	0.00	23.47	48	42	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
5/4/2018	19:00	5.68	16.95	0.00	23.04	48	43	50	YES	YES	Inclement Weather Conditions
5/4/2018	20:00	4.01	15.12	0.00	25.06	48	42	50	NO	YES	-
5/4/2018	21:00	2.79	13.29	0.00	27.76	48	42	50	NO	YES	-
5/4/2018	22:00	1.10	9.54	0.00	40.88	50	43	50	NO	YES	-
5/4/2018	23:00	0.56	4.38	0.00	67.15	47	42	50	NO	YES	-
5/5/2018	0:00	0.57	2.37	0.00	76.74	42	41	50	NO	YES	-
5/5/2018	1:00	1.12	1.36	0.00	78.71	40	41	50	NO	YES	-
5/5/2018	2:00	1.08	1.31	0.00	81.30	40	41	50	NO	YES	-
5/5/2018	3:00	0.36	2.08	0.00	83.70	38	40	50	NO	YES	-
5/5/2018	4:00	0.59	1.46	0.00	87.00	38	40	50	NO	YES	-
5/5/2018	5:00	0.73	-0.19	0.00	90.90	39	44	50	YES	YES	Inclement Weather Conditions
5/5/2018	6:00	1.11	-0.27	0.00	89.60	33	39	50	NO	YES	-
5/5/2018	7:00	0.64	3.48	0.00	78.01	35	37	50	NO	YES	-
5/5/2018	8:00	0.51	8.75	0.00	54.25	39	29	50	NO	YES	-
5/5/2018	9:00	1.01	12.49	0.00	37.36	40	25	50	NO	YES	-
5/5/2018	10:00	2.69	14.28	0.00	32.66	30	39	50	NO	YES	-
5/5/2018	11:00	2.73	16.27	0.00	28.57	31	26 [2]	50	NO	YES	-
5/5/2018	12:00	2.46	16.45	0.00	28.55	29 [2]	38	50	NO	YES	-
5/5/2018	13:00	1.46	17.22	0.00	27.43	29	47	50	NO	YES	-
5/5/2018	14:00	1.94	17.21	0.00	28.90	35	46	50	NO	YES	-
5/5/2018	15:00	2.36	17.48	0.00	29.47	29	28	50	NO	YES	-
5/5/2018	16:00	2.63	18.34	0.00	29.36	33	29	50	NO	YES	-
5/5/2018	17:00	3.56	18.93	0.00	28.54	32	35	50	NO	YES	-
5/5/2018	18:00	3.97	17.82	0.00	30.65	30	39	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
5/5/2018	19:00	3.10	16.31	0.00	34.21	30	34	50	NO	YES	-
5/5/2018	20:00	1.85	14.79	0.00	37.70	46	41	50	NO	YES	-
5/5/2018	21:00	0.94	9.02	0.00	61.65	49	46	50	NO	YES	-
5/5/2018	22:00	0.85	5.87	0.00	74.46	47	45	50	NO	YES	-
5/5/2018	23:00	0.96	4.64	0.00	81.50	42	44	50	NO	YES	-
5/6/2018	0:00	0.58	3.48	0.00	85.70	41	40	50	NO	YES	-
5/6/2018	1:00	0.73	1.33	0.00	90.30	38	37	50	YES	YES	Inclement Weather Conditions
5/6/2018	2:00	0.44	0.27	0.00	92.10	37	31	50	YES	YES	Inclement Weather Conditions
5/6/2018	3:00	1.05	-0.30	0.00	93.90	40	35	50	YES	YES	Inclement Weather Conditions
5/6/2018	4:00	0.99	0.57	0.00	92.80	43	39	50	YES	YES	Inclement Weather Conditions
5/6/2018	5:00	0.98	0.65	0.00	92.70	44	41	50	YES	YES	Inclement Weather Conditions
5/6/2018	6:00	0.83	1.61	0.00	91.10	40	37	50	YES	YES	Inclement Weather Conditions
5/6/2018	7:00	0.29	5.55	0.00	81.60	36	56	50	NO	NO	Wildlife
5/6/2018	8:00	1.11	10.89	0.00	59.05	34	38	50	NO	YES	-
5/6/2018	9:00	2.35	14.38	0.00	38.33	38	30	50	NO	YES	-
5/6/2018	10:00	2.54	15.72	0.00	32.26	31	30	50	NO	YES	-
5/6/2018	11:00	2.17	16.67	0.00	30.73	29 [2]	30 [2]	50	NO	YES	-
5/6/2018	12:00	2.29	17.64	0.00	28.21	27	30	50	NO	YES	-
5/6/2018	13:00	2.48	18.41	0.00	27.61	28	30	50	NO	YES	-
5/6/2018	14:00	2.72	19.25	0.00	27.39	28	36	50	NO	YES	-
5/6/2018	15:00	3.21	19.97	0.00	26.62	31	32	50	NO	YES	-
5/6/2018	16:00	3.11	20.34	0.00	25.99	30	35	50	NO	YES	-
5/6/2018	17:00	3.07	20.22	0.00	26.89	35	38	50	NO	YES	-
5/6/2018	18:00	2.66	19.71	0.00	28.19	36	34	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
5/6/2018	19:00	2.49	18.34	0.00	31.05	37	38	50	NO	YES	-
5/6/2018	20:00	2.43	15.93	0.00	36.70	43	41	50	NO	YES	-
5/6/2018	21:00	1.77	12.62	0.00	47.39	47	40	50	NO	YES	-
5/6/2018	22:00	1.00	8.57	0.00	66.50	42	38	50	NO	YES	-
5/6/2018	23:00	0.74	5.65	0.00	79.23	35	34	50	NO	YES	-
5/7/2018	0:00	0.76	3.67	0.00	86.10	34	31	50	NO	YES	-
5/7/2018	1:00	1.00	3.10	0.00	86.00	34	31	50	NO	YES	-
5/7/2018	2:00	0.71	2.52	0.00	89.00	34	37	50	NO	YES	-
5/7/2018	3:00	1.15	1.78	0.00	90.60	35	34	50	YES	YES	Inclement Weather Conditions
5/7/2018	4:00	1.03	1.35	0.00	91.40	38	40	50	YES	YES	Inclement Weather Conditions
5/7/2018	5:00	0.74	0.65	0.00	92.80	41	45	50	YES	YES	Inclement Weather Conditions
5/7/2018	6:00	0.79	1.83	0.00	89.00	39	36	50	NO	YES	-
5/7/2018	7:00	0.91	8.69	0.00	68.51	40	33	50	NO	YES	-
5/7/2018	8:00	1.98	12.58	0.00	54.11	43	41	50	NO	YES	-
5/7/2018	9:00	1.90	17.35	0.00	41.37	40	29	50	NO	YES	-
5/7/2018	10:00	2.99	21.05	0.00	31.53	31	26	50	NO	YES	-
5/7/2018	11:00	3.91	23.53	0.00	24.91	32 [2]	27 [2]	50	NO	YES	-
5/7/2018	12:00	3.62	25.30	0.00	20.73	33 [2]	28	50	NO	YES	-
5/7/2018	13:00	3.56	26.61	0.00	19.78	35	31	50	NO	YES	-
5/7/2018	14:00	4.87	27.69	0.00	18.25	39	38	50	NO	YES	-
5/7/2018	15:00	5.53	27.94	0.00	18.27	42	37	50	NO	YES	-
5/7/2018	16:00	5.49	27.99	0.00	18.05	41	36	50	NO	YES	-
5/7/2018	17:00	4.87	28.35	0.00	17.40	35	38	50	NO	YES	-
5/7/2018	18:00	4.87	27.21	0.00	21.50	41	42	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
5/7/2018	19:00	3.88	25.37	0.00	29.69	39	39	50	NO	YES	-
5/7/2018	20:00	1.26	21.39	0.00	40.59	44	39	50	NO	YES	-
5/7/2018	21:00	1.16	18.57	0.00	51.95	49	39	50	NO	YES	-
5/7/2018	22:00	3.64	19.92	0.00	45.54	46	43	50	NO	YES	-
5/7/2018	23:00	3.90	23.23	0.00	29.49	38	37	50	NO	YES	-

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Note:

[1] Represents periods with not enough reportable data for the hour.

[2] Minutes from the hour that was affected by human activity downloading data was excluded from the L_{Aeq-1h}.

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1,2]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
6/1/2018	0:00	4.36	10.38	0.00	86.70	39	37	50	NO	YES	-
6/1/2018	1:00	3.83	9.79	0.00	87.60	39	39	50	NO	YES	-
6/1/2018	2:00	3.64	9.15	0.00	88.80	39	38	50	NO	YES	-
6/1/2018	3:00	3.71	8.94	0.00	87.30	38	36	50	NO	YES	-
6/1/2018	4:00	3.59	8.86	0.00	87.80	44	49	50	NO	YES	-
6/1/2018	5:00	3.64	9.02	0.00	85.00	43	48	50	NO	YES	-
6/1/2018	6:00	3.85	9.09	0.00	86.00	42	47	50	NO	YES	-
6/1/2018	7:00	3.82	9.40	0.00	86.70	43	42	50	NO	YES	-
6/1/2018	8:00	3.94	10.09	0.00	82.10	40	43 [2]	50	NO	YES	-
6/1/2018	9:00	5.02	10.59	0.00	80.40	43 [2]	43 [2]	50	NO	YES	-
6/1/2018	10:00	5.69	10.93	0.00	79.17	44 [2]	44	50	YES	YES	Inclement Weather Conditions
6/1/2018	11:00	5.37	11.47	0.00	78.56	47	44	50	NO	YES	-
6/1/2018	12:00	5.54	12.38	0.00	73.84	44	45	50	NO	YES	-
6/1/2018	13:00	5.47	12.87	0.00	72.48	45	46	50	NO	YES	-
6/1/2018	14:00	6.35	13.66	0.00	69.49	48	46	50	YES	YES	Inclement Weather Conditions
6/1/2018	15:00	6.24	13.77	0.00	68.90	47	45	50	YES	YES	Inclement Weather Conditions
6/1/2018	16:00	5.67	14.09	0.00	68.18	46	46	50	YES	YES	Inclement Weather Conditions
6/1/2018	17:00	5.91	14.23	0.00	67.92	48	47	50	YES	YES	Inclement Weather Conditions

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1,2]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
6/1/2018	18:00	6.16	13.75	0.00	68.49	48	47	50	YES	YES	Inclement Weather Conditions
6/1/2018	19:00	5.90	13.03	0.00	71.66	49	49	50	YES	YES	Inclement Weather Conditions
6/1/2018	20:00	5.96	12.29	0.00	74.40	47	46	50	YES	YES	Inclement Weather Conditions
6/1/2018	21:00	5.92	11.71	0.00	76.38	47	46	50	YES	YES	Inclement Weather Conditions
6/1/2018	22:00	5.09	11.65	0.00	78.28	43	45	50	NO	YES	-
6/1/2018	23:00	6.43	11.51	0.00	78.98	50	49	50	YES	YES	Inclement Weather Conditions
6/2/2018	0:00	8.36	10.76	0.00	74.79	54	51	50	YES	NO	Inclement Weather Conditions
6/2/2018	1:00	6.85	10.34	0.00	67.72	51	51	50	YES	NO	Inclement Weather Conditions
6/2/2018	2:00	7.45	10.35	0.00	62.62	53	51	50	YES	NO	Inclement Weather Conditions
6/2/2018	3:00	4.23	10.32	0.00	60.96	45	41	50	NO	YES	-
6/2/2018	4:00	3.51	10.01	0.00	60.98	44	44	50	NO	YES	-
6/2/2018	5:00	5.19	9.78	1.20	61.92	47	49	50	YES	YES	Inclement Weather Conditions
6/2/2018	6:00	5.11	8.57	0.30	74.96	47	47	50	YES	YES	Inclement Weather Conditions
6/2/2018	7:00	6.70	9.99	0.00	67.10	51	49	50	YES	NO	Inclement Weather Conditions
6/2/2018	8:00	6.33	10.99	0.00	66.10	49	46	50	YES	YES	Inclement Weather Conditions
6/2/2018	9:00	4.78	11.49	0.10	69.67	46 [2]	43	50	YES	YES	Inclement Weather Conditions
6/2/2018	10:00	3.44	10.53	3.90	83.80	45 [2]	45 [2]	50	YES	YES	Inclement Weather Conditions
6/2/2018	11:00	3.02	9.91	5.40	93.10	47	48 [2]	50	YES	YES	Inclement Weather Conditions
6/2/2018	12:00	3.73	10.26	1.70	94.60	44	43	50	YES	YES	Inclement Weather Conditions
6/2/2018	13:00	3.72	10.60	2.60	94.40	45	46	50	YES	YES	Inclement Weather Conditions
6/2/2018	14:00	3.52	10.49	4.30	95.30	46	46	50	YES	YES	Inclement Weather Conditions
6/2/2018	15:00	4.12	10.41	1.20	93.80	44	45	50	YES	YES	Inclement Weather Conditions
6/2/2018	16:00	4.29	10.47	0.90	93.70	45	42	50	YES	YES	Inclement Weather Conditions
6/2/2018	17:00	4.33	10.80	0.00	92.50	45	48	50	YES	YES	Inclement Weather Conditions

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1,2]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
6/2/2018	18:00	3.93	10.41	1.30	94.90	42	46	50	YES	YES	Inclement Weather Conditions
6/2/2018	19:00	3.76	10.26	0.10	95.20	40	38	50	YES	YES	Inclement Weather Conditions
6/2/2018	20:00	4.00	10.16	0.00	95.60	42	38	50	YES	YES	Inclement Weather Conditions
6/2/2018	21:00	3.66	10.05	0.10	96.60	43	36	50	YES	YES	Inclement Weather Conditions
6/2/2018	22:00	3.66	10.22	0.10	97.00	41	33	50	YES	YES	Inclement Weather Conditions
6/2/2018	23:00	3.10	10.51	0.10	97.10	39	29	50	YES	YES	Inclement Weather Conditions
6/3/2018	0:00	2.58	10.94	0.10	97.20	40	28	50	YES	YES	Inclement Weather Conditions
6/3/2018	1:00	1.83	11.02	0.00	96.90	38	24	50	YES	YES	Inclement Weather Conditions
6/3/2018	2:00	1.02	10.70	0.00	96.80	37	24	50	YES	YES	Inclement Weather Conditions
6/3/2018	3:00	0.79	10.64	0.00	97.00	34	32	50	YES	YES	Inclement Weather Conditions
6/3/2018	4:00	0.81	10.64	0.00	97.20	44	43	50	YES	YES	Inclement Weather Conditions
6/3/2018	5:00	1.12	10.70	0.00	97.20	43	43	50	YES	YES	Inclement Weather Conditions
6/3/2018	6:00	1.38	10.87	0.20	97.00	41	42	50	YES	YES	Inclement Weather Conditions
6/3/2018	7:00	1.83	11.20	0.40	96.00	40	40	50	YES	YES	Inclement Weather Conditions
6/3/2018	8:00	3.37	11.50	0.20	95.00	48 [2]	47	50	YES	YES	Inclement Weather Conditions
6/3/2018	9:00	4.84	10.79	0.10	92.70	50	49 [2]	50	YES	YES	Inclement Weather Conditions
6/3/2018	10:00	5.07	10.43	0.50	92.40	49	50	50	YES	YES	Inclement Weather Conditions
6/3/2018	11:00	4.82	10.09	0.40	92.60	49	51	50	YES	NO	Inclement Weather Conditions
6/3/2018	12:00	5.35	9.96	0.00	87.00	50	51	50	NO	NO	Wind
6/3/2018	13:00	4.85	10.57	0.00	80.90	47	49	50	NO	YES	-
6/3/2018	14:00	5.64	12.33	0.00	71.88	53	54	50	YES	NO	Inclement Weather Conditions
6/3/2018	15:00	7.24	14.00	0.00	60.49	55	54	50	YES	NO	Inclement Weather Conditions
6/3/2018	16:00	6.89	15.04	0.00	56.72	53	53	50	YES	NO	Inclement Weather Conditions
6/3/2018	17:00	5.76	15.62	0.00	56.08	51	49	50	YES	NO	Inclement Weather Conditions

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1,2]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
6/3/2018	18:00	3.93	15.82	0.00	58.11	46	43	50	NO	YES	-
6/3/2018	19:00	3.57	15.65	0.00	58.45	43	44	50	NO	YES	-
6/3/2018	20:00	2.17	14.50	0.00	63.02	42	40	50	NO	YES	-
6/3/2018	21:00	1.11	11.25	0.00	81.70	40	40	50	NO	YES	-
6/3/2018	22:00	0.67	8.16	0.00	94.30	35	38	50	YES	YES	Inclement Weather Conditions
6/3/2018	23:00	0.56	6.38	0.00	96.30	29	36	50	YES	YES	Inclement Weather Conditions
6/4/2018	0:00	1.10	5.87	0.00	96.80	35	37	50	YES	YES	Inclement Weather Conditions
6/4/2018	1:00	1.13	5.26	0.00	97.10	38	37	50	YES	YES	Inclement Weather Conditions
6/4/2018	2:00	1.92	7.41	0.00	95.60	37	38	50	YES	YES	Inclement Weather Conditions
6/4/2018	3:00	1.76	8.03	0.00	90.70	34	39	50	YES	YES	Inclement Weather Conditions
6/4/2018	4:00	1.41	7.59	0.00	92.80	44	44	50	YES	YES	Inclement Weather Conditions
6/4/2018	5:00	0.78	6.15	0.00	93.90	43	45	50	YES	YES	Inclement Weather Conditions
6/4/2018	6:00	1.25	7.76	0.00	91.50	42	41	50	YES	YES	Inclement Weather Conditions
6/4/2018	7:00	2.59	11.43	0.00	75.45	42	44	50	NO	YES	-
6/4/2018	8:00	3.19	12.69	0.00	66.47	42	43	50	NO	YES	-
6/4/2018	9:00	4.45	14.12	0.00	59.81	46	45	50	NO	YES	-
6/4/2018	10:00	4.91	15.09	0.00	55.36	44	46	50	NO	YES	-
6/4/2018	11:00	4.34	16.19	0.00	53.47	45	46	50	NO	YES	-
6/4/2018	12:00	4.34	16.81	0.00	51.89	45	50	50	NO	YES	-
6/4/2018	13:00	5.04	17.57	0.00	48.99	49 [2]	52	50	NO	NO	Wind
6/4/2018	14:00	4.00	17.80	0.00	48.37	46	50 [2]	50	NO	YES	-
6/4/2018	15:00	3.23	18.36	0.00	47.53	42	46	50	NO	YES	-
6/4/2018	16:00	3.62	18.59	0.00	42.06	40	44	50	NO	YES	-
6/4/2018	17:00	4.16	18.04	0.00	41.05	40	43	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1,2]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
6/4/2018	18:00	3.81	17.61	0.00	39.97	41	40	50	NO	YES	-
6/4/2018	19:00	2.68	16.99	0.00	41.59	39	46	50	NO	YES	-
6/4/2018	20:00	1.84	14.98	0.00	51.44	38	33	50	NO	YES	-
6/4/2018	21:00	1.56	9.92	0.00	80.60	37	36	50	NO	YES	-
6/4/2018	22:00	2.48	9.44	0.00	76.91	29	40	50	NO	YES	-
6/4/2018	23:00	1.80	7.41	0.00	87.20	26	33	50	NO	YES	-
6/5/2018	0:00	2.24	6.13	0.00	91.10	32	35	50	YES	YES	Inclement Weather Conditions
6/5/2018	1:00	1.97	5.64	0.00	92.20	34	36	50	YES	YES	Inclement Weather Conditions
6/5/2018	2:00	1.08	4.95	0.00	94.10	38	33	50	YES	YES	Inclement Weather Conditions
6/5/2018	3:00	1.35	4.02	0.00	96.10	39	31	50	YES	YES	Inclement Weather Conditions
6/5/2018	4:00	1.58	4.05	0.00	96.60	45	47	50	YES	YES	Inclement Weather Conditions
6/5/2018	5:00	1.51	4.80	0.00	96.60	43	43	50	YES	YES	Inclement Weather Conditions
6/5/2018	6:00	1.44	7.48	0.00	92.20	43	40	50	YES	YES	Inclement Weather Conditions
6/5/2018	7:00	2.92	10.96	0.00	80.30	42	43	50	NO	YES	-
6/5/2018	8:00	3.32	12.87	0.00	70.74	42	40	50	NO	YES	-
6/5/2018	9:00	3.14	14.29	0.00	63.19	40	38	50	NO	YES	-
6/5/2018	10:00	3.29	16.14	0.00	54.92	40 [2]	40	50	NO	YES	-
6/5/2018	11:00	3.79	17.36	0.00	52.68	42	43 [2]	50	NO	YES	-
6/5/2018	12:00	4.10	17.71	0.00	51.64	42	44	50	NO	YES	-
6/5/2018	13:00	3.71	18.81	0.00	51.75	42	41	50	NO	YES	-
6/5/2018	14:00	3.84	19.85	0.00	49.90	41	40	50	NO	YES	-
6/5/2018	15:00	4.48	19.65	0.00	49.00	40	41	50	NO	YES	-
6/5/2018	16:00	3.61	20.61	0.00	46.76	40	40	50	NO	YES	-
6/5/2018	17:00	3.43	20.99	0.00	48.56	41	40	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1,2]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
6/5/2018	18:00	4.09	21.06	0.00	48.38	42	44	50	NO	YES	-
6/5/2018	19:00	2.83	20.03	0.00	49.69	41	39	50	NO	YES	-
6/5/2018	20:00	2.06	18.93	0.00	55.91	39	30	50	NO	YES	-
6/5/2018	21:00	1.22	15.43	0.00	72.19	40	33	50	NO	YES	-
6/5/2018	22:00	1.10	12.69	0.00	84.70	41	37	50	NO	YES	-
6/5/2018	23:00	2.11	14.50	0.00	68.51	42	37	50	NO	YES	-
6/6/2018	0:00	2.27	14.15	0.00	68.05	43	34	50	NO	YES	-
6/6/2018	1:00	2.27	13.62	0.00	69.19	44	37	50	NO	YES	-
6/6/2018	2:00	3.62	13.27	0.00	70.59	48	43	50	NO	YES	-
6/6/2018	3:00	2.48	13.34	0.00	71.59	42	32	50	NO	YES	-
6/6/2018	4:00	1.85	12.59	0.00	78.61	45	44	50	NO	YES	-
6/6/2018	5:00	1.72	11.44	0.00	85.10	44	45	50	NO	YES	-
6/6/2018	6:00	1.15	11.72	0.00	88.60	42	41	50	NO	YES	-
6/6/2018	7:00	2.11	14.65	0.00	83.80	41	43	50	NO	YES	-
6/6/2018	8:00	4.09	17.23	0.00	74.44	46	46	50	NO	YES	-
6/6/2018	9:00	4.96	18.02	0.00	70.12	48	48	50	NO	YES	-
6/6/2018	10:00	5.40	18.43	0.00	66.58	50	50	50	NO	YES	-
6/6/2018	11:00	5.48	17.84	0.00	66.41	51	51	50	NO	NO	Wind
6/6/2018	12:00	6.14	17.82	0.00	60.33	51 [2]	50 [2]	50	YES	NO	Inclement Weather Conditions
6/6/2018	13:00	6.08	16.88	0.00	63.19	50	52 [2]	50	YES	NO	Inclement Weather Conditions
6/6/2018	14:00	4.99	16.08	0.00	66.39	48	50	50	NO	YES	-
6/6/2018	15:00	5.20	17.30	0.00	60.28	48	50	50	NO	YES	-
6/6/2018	16:00	4.41	17.93	0.00	57.55	47	49	50	NO	YES	-
6/6/2018	17:00	3.93	18.36	0.00	56.05	43	49	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1,2]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
6/6/2018	18:00	3.21	18.66	0.00	55.51	40	41	50	NO	YES	-
6/6/2018	19:00	3.42	18.24	0.00	54.28	40	41	50	NO	YES	-
6/6/2018	20:00	1.45	16.45	0.00	63.62	36	33	50	NO	YES	-
6/6/2018	21:00	0.17	11.74	0.00	87.60	39	40	50	NO	YES	-
6/6/2018	22:00	0.12	8.94	0.00	95.10	36	37	50	YES	YES	Inclement Weather Conditions
6/6/2018	23:00	0.48	7.33	0.00	96.20	30	36	50	YES	YES	Inclement Weather Conditions
6/7/2018	0:00	0.34	6.07	0.00	96.40	29	37	50	YES	YES	Inclement Weather Conditions
6/7/2018	1:00	0.86	5.06	0.00	96.50	27	39	50	YES	YES	Inclement Weather Conditions
6/7/2018	2:00	0.46	4.40	0.00	96.60	26	39	50	YES	YES	Inclement Weather Conditions
6/7/2018	3:00	0.81	3.82	0.00	96.70	31	35	50	YES	YES	Inclement Weather Conditions
6/7/2018	4:00	1.01	3.14	0.00	96.70	44	45	50	YES	YES	Inclement Weather Conditions
6/7/2018	5:00	0.70	3.02	0.00	96.70	43	42	50	YES	YES	Inclement Weather Conditions
6/7/2018	6:00	0.50	6.14	0.00	95.70	43	40	50	YES	YES	Inclement Weather Conditions
6/7/2018	7:00	0.31	10.30	0.00	91.00	41	40	50	YES	YES	Inclement Weather Conditions
6/7/2018	8:00	1.00	14.97	0.00	78.37	41	41	50	NO	YES	-
6/7/2018	9:00	1.79	17.28	0.00	67.60	38	38	50	NO	YES	-
6/7/2018	10:00	1.27	19.30	0.00	54.72	37	42	50	NO	YES	-
6/7/2018	11:00	1.58	20.35	0.00	46.08	38 [2]	37	50	NO	YES	-
6/7/2018	12:00	1.78	21.52	0.00	43.94	36 [2]	42 [2]	50	NO	YES	-
6/7/2018	13:00	1.46	22.36	0.00	37.88	38	39	50	NO	YES	-
6/7/2018	14:00	2.34	23.48	0.00	34.82	45	37	50	NO	YES	-
6/7/2018	15:00	1.83	24.21	0.00	35.62	36	39	50	NO	YES	-
6/7/2018	16:00	2.77	24.70	0.00	33.90	37	37	50	NO	YES	-
6/7/2018	17:00	2.39	25.10	0.00	32.97	36	35	50	NO	YES	-

Date	Time	Meteorological Data				Measured Hourly Sound Levels (L_{Aeq-1h}, dBA) [1,2]		Assigned Limit (dBA)	Inclement Weather Conditions (YES/NO)	L_{Aeq-1h} Exceedance (YES/NO)	Comments on Measurement/Audio File
		Wind Speed (m/s)	Temp. (°C)	Precipitation (mm)	Humidity (%)	North Receptor Monitor	South Receptor Monitor				
6/7/2018	18:00	2.72	24.70	0.00	35.69	36	37	50	NO	YES	-
6/7/2018	19:00	2.49	23.47	0.00	42.12	32	33	50	NO	YES	-
6/7/2018	20:00	1.76	21.45	0.00	54.73	37	31	50	NO	YES	-
6/7/2018	21:00	0.96	17.90	0.00	68.29	40	32	50	NO	YES	-
6/7/2018	22:00	0.40	13.69	0.00	88.90	41	35	50	NO	YES	-
6/7/2018	23:00	0.47	12.60	0.00	91.80	40	33	50	YES	YES	Inclement Weather Conditions

Limitations (optional)

Limitations (optional)

1. The work performed in the preparation of this report and the conclusions presented are subject to the following:
    a. The Standard Terms and Conditions which form a part of our Professional Services Contract;
    b. The Scope of Services;
    c. Time and Budgetary limitations as described in our Contract; and
    d. The Limitations stated herein.
2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
3. The conclusions presented in this report were based, in part, on visual observations of the Site and attendant structures. Our conclusions cannot and are not extended to include those portions of the Site or structures, which are not reasonably available, in Wood's opinion, for direct observation.
4. The environmental conditions at the Site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the Site with any applicable local, provincial or federal bylaws, orders-in-council, legislative enactments and regulations was not performed.
5. The Site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.
6. Where testing was performed, it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on-site and may be revealed by different or other testing not provided for in our contract.
7. Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, Wood must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
8. The utilization of Wood's services during the implementation of any remedial measures will allow Wood to observe compliance with the conclusions and recommendations contained in the report. Wood's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.
9. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or the part, or any reliance thereon or decisions made based on any information or conclusions in the report is the sole responsibility of such third party. Wood accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.
10. This report is not to be given over to any third party for any purpose whatsoever without the written permission of Wood.
11. Provided that the report is still reliable, and less than 12 months old, Wood will issue a third-party reliance letter to parties that the client identifies in writing, upon payment of the then current fee for such letters. All third parties relying on Wood's report, by such reliance agree to be bound by our proposal and Wood's standard reliance letter. Wood's standard reliance letter indicates that in no event shall Wood be liable for any damages, howsoever arising, relating to third-party reliance on Wood's report. No reliance by any party is permitted without such agreement.

Appendix B

New Gold 2018 Species at Risk Observations

Date	Species	Provincial ESA Designation	Federal SARA Designation	Comments
01/17/2018	Bald Eagle	Special Concern	--	End of Loslo Rd feeding on a deer carcass
03/11/2018	Bald Eagle	Special Concern	--	Flying over West Gate
03/12/2018	Bald Eagle	Special Concern	--	2 near underground portal location, roosting in a tree
03/16/2018	Barn Owl	Endangered	Endangered	In a tree on Eliuk Rd
03/21/2018	Bald Eagle	Special Concern	--	Flying over West Creek Diversion
03/24/2018	Bald Eagle	Special Concern	--	Flying over south air quality station
03/26/2018	Bald Eagle	Special Concern	--	Flying over Loslo Creek
03/26/2018	Bald Eagle	Special Concern	--	Flying over West Creek Diversion
04/12/2018	Bald Eagle	Special Concern	--	Flying over Barrons site
04/16/2018	Bald Eagle	Special Concern	--	Flying over Tait quarry
04/16/2018	Bald Eagle	Special Concern	--	Flying over Mine Rock Pond
04/16/2018	Bald Eagle	Special Concern	--	Flying over Marr site
04/27/2018	Bald Eagle	Special Concern	--	Attacking a duck in the air over the Mine Rock Pond
05/07/2018	Bobolink	Threatened	Threatened	Calling on a power line near the Nielson house
05/09/2018	Bald Eagle	Special Concern	--	Roosting in a tree near the hydrometric station
05/09/2018	American White Pelican	Threatened	--	Flying over Mine Rock Pond
05/12/2018	Barn Swallow	Threatened	Threatened	Sitting on a power line on Gallenger road
05/12/2018	American White Pelican	Threatened	--	Hazed off of Cell 2 pond
05/19/2018	Bald Eagle	Special Concern	--	Flying above the Mill
05/22/2018	Snapping Turtle	Special Concern	Special Concern	Crossing Teeple road
05/25/2018	Bald Eagle	Special Concern	--	Flying over Mine Rock Pond
05/25/2018	Bobolink	Threatened	Threatened	Calling from perches around Westgate
05/26/2018	Bald Eagle	Special Concern	--	Flying over Korpi road
05/27/2018	American White Pelican	Threatened	--	Flying over batch plant
05/27/2018	Bobolink	Threatened	Threatened	Calling from a pole near Westgate
06/06/2018	Barn Swallow	Threatened	Threatened	4 flying around the Admin building
06/06/2018	Bobolink	Threatened	Threatened	Calling and flying at OB17
06/07/2018	Bobolink	Threatened	Threatened	Calling from a hydro pole by the West Gate
06/07/2018	Barn Swallow	Threatened	Threatened	6 sitting on a power line at the West Gate
06/09/2018	Barn Swallow	Threatened	Threatened	Flying around the West Gate
06/10/2018	Bobolink	Threatened	Threatened	Flying around the West Gate
06/15/2018	Bald Eagle	Special Concern	--	2 flying above West Creek Pond

06/22/2018	American White Pelican	Threatened	--	22 flying over Mine Rock Pond
06/22/2018	Bobolink	Threatened	Threatened	Flying at OB17
06/22/2018	Bald Eagle	Special Concern	--	Flying over Mine Rock Pond
06/22/2018	American White Pelican	Threatened	--	Flying over Mine Rock Pond
06/23/2018	American White Pelican	Threatened	--	9 flying over Mine Rock Pond
06/23/2018	Bald Eagle	Special Concern	--	Flying over Marr site
06/24/2018	Bald Eagle	Special Concern	--	Flying above West Creek Pond
06/24/2018	American White Pelican	Threatened	--	Flying over Mine Rock Pond
06/25/2018	Bald Eagle	Special Concern	--	Flying over Mine Rock Pond
06/25/2018	American White Pelican	Threatened	--	25 flying over Mine Rock Pond
06/29/2018	American White Pelican	Threatened	--	18 flying over Mine Rock Pond
07/04/2018	Bald Eagle	Special Concern	--	Flying around the Mine Rock Pond
07/07/2018	American White Pelican	Threatened	--	7 flying above Marr Site
07/07/2018	Barn Swallow	Threatened	Threatened	20 on a hydro line by the West Gate
07/08/2018	Bald Eagle	Special Concern	--	Flying above Korpi Road
07/08/2018	Bobolink	Threatened	Threatened	14 flying around the West Gate
07/13/2018	American White Pelican	Threatened	--	13 flying around the Mine Rock Pond
07/26/2018	Barn Swallow	Threatened	Threatened	3 flying around maintenance truck shop, one fledgling found dead
08/14/2018	Barn Swallow	Threatened	Threatened	20 roosting on the Fire Suppression Tank
08/16/2018	Barn Swallow	Threatened	Threatened	13 around West Gate
08/17/2018	American White Pelican	Threatened	--	14 flying over Mine Rock Pond
08/17/2018	Barn Swallow	Threatened	Threatened	50 around West Gate
09/02/2018	Barn Swallow	Threatened	Threatened	20 sitting on a wire by West Gate
09/04/2018	Bald Eagle	Special Concern	--	Flying over Cell 2
09/06/2018	Bald Eagle	Special Concern	--	Roosting in a tree by West Creek Pond
09/13/2018	Bald Eagle	Special Concern	--	Flying over Korpi Rd
09/14/2018	Bald Eagle	Special Concern	--	Flying over the Gate House
09/16/2018	Bald Eagle	Special Concern	--	Roosting in a tree by West Creek Pond
09/19/2018	Bald Eagle	Special Concern	--	2 roosting in a tree by West Creek Pond
09/20/2018	Bald Eagle	Special Concern	--	Flying over Teeple Rd
09/20/2018	Bald Eagle	Special Concern	--	Flying over Roen Rd
09/20/2018	Bald Eagle	Special Concern	--	2 flying over Mine Rock Pond

09/24/2018	Bald Eagle	Special Concern	--	Flying over Teeple Rd
09/25/2018	Bald Eagle	Special Concern	--	4 flying over Teeple Pond
09/29/2018	Bald Eagle	Special Concern	--	12 in OBA land 16 feeding on a deer carcass
10/05/2018	Golden Eagle	Endangered	--	Flying over Roen pit
10/13/2018	Bald Eagle	Special Concern	--	Flying over East Access Rd
10/25/2018	Bald Eagle	Special Concern	--	Flying over the batch plant
10/31/2018	Bald Eagle	Special Concern	--	Flying over West Gate
11/05/2018	Bald Eagle	Special Concern	--	Flying over Gallenger Rd
11/10/2018	Cougar	Endangered	--	Crossing Korpi Rd
11/14/2018	Bald Eagle	Special Concern	--	Flying over the Gallenger Rd
12/19/2018	Bald Eagle	Special Concern	--	Roosting in a tree over West Creek Pond.

Appendix C

Species at Risk Training provided to Staff

Name	Date of Orientation
Perry Podaima	2018/12/29
Jessie Thorsen	2018/12/27
Scott Familetti	2018/12/26
John Asselstine	2018/12/24
Bradley Stilla	2018/12/21
Bradley Stilla	2018/12/21
Clarence Obrian	2018/12/21
Derek Wilford	2018/12/21
Klaye Oberkirsch	2018/12/21
Anne Day	2018/12/19
Brian Annes	2018/12/19
Christian Begin	2018/12/19
Ian Dyll	2018/12/19
Renaud Adams	2018/12/19
Ryan Martin	2018/12/19
Samantha Boernsen	2018/12/19
Dillon Vester	2018/12/18
Gordon Shine	2018/12/18
Jim Martin	2018/12/18
John Boucha	2018/12/18
Mykel Spinks	2018/12/18
Rachid Aouatefi	2018/12/18
Ron Councillor	2018/12/18
Sean Kelly	2018/12/18
Seth Judson	2018/12/18
Trevor States	2018/12/18
Adam Parker	2018/12/17
Brendan Schlamp	2018/12/17
Dan Deluca	2018/12/17
Dwight Holliday	2018/12/15
Gary Nelson	2018/12/15
Joe Jardine	2018/12/15
Joe Jardine	2018/12/15
Johnathan	2018/12/15
Johnathan Reid	2018/12/15
Shannon Fontaine	2018/12/15
Kieth McNally	2018/12/14
Pierre Nussbaumer	2018/12/14
Daniel Matheson	2018/12/13
Lloyd Elliott	2018/12/12
Walter Fletcher	2018/12/12
David Jewett	2018/12/11
Dylan Taylor	2018/12/11
Guillaume Lebeau	2018/12/11
Joon Ho Lee	2018/12/11
Luke Palmer	2018/12/11
Ray Lucas	2018/12/11
Reagan Rosvold	2018/12/11
Shane Lofgren	2018/12/11
Steve Aho	2018/12/11
Doug Brown	2018/12/10

Aaron Teodorovici	2018/12/08
Brad Stephenson	2018/12/08
Brian Temple	2018/12/08
Bryce Libby	2018/12/08
Eldon Klimchuk	2018/12/08
John Potter	2018/12/08
Joshua Guillemin	2018/12/08
Leif Highland	2018/12/08
Luke Jeffrey	2018/12/08
Patrick Rye	2018/12/08
Reuben Shoemaker	2018/12/08
Robert Rye	2018/12/08
Shane Gilbert	2018/12/08
Steven Rosvold	2018/12/08
Tim Taylor	2018/12/08
Troy Hall	2018/12/08
Alayn Bluff	2018/12/07
Alex Bohler	2018/12/07
Donnie Bush	2018/12/07
Greggory Kaukinen	2018/12/07
Gregory Kaukinen	2018/12/07
Jordan Stanford	2018/12/07
Lucas Merkoske	2018/12/07
Nick Glass	2018/12/07
Paul Honkey	2018/12/07
Steve Spoon	2018/12/07
Corey Smith	2018/12/06
Danual J Carey	2018/12/06
Danual J Carey	2018/12/06
Jordan Stanford	2018/12/06
Mathieu Baillargeon	2018/12/06
Robert Matzig	2018/12/06
Vance Hemphill	2018/12/06
Katelynn Jack	2018/12/05
Katlynn Jack	2018/12/05
Miranda Henttonen	2018/12/05
Tyler Karhu	2018/12/05
Craig Madsen	2018/12/04
Gregg Vickell	2018/12/04
Mitchael Hamer	2018/12/04
Norman Mueller	2018/12/04
Brady McMahon	2018/12/03
Duane Croswell	2018/12/03
Jesse Manford	2018/12/02
Kevin Sanden	2018/12/02
Mike Chaval	2018/12/02
Paul Chartrand	2018/12/01
Alex Tom	2018/11/30
Alex Benavides	2018/11/29
Samuel Ernst	2018/11/29
Beau Larocque	2018/11/28
Corey Papineau	2018/11/28

Danny Giroux	2018/11/28
Denny Cunningham	2018/11/28
Eric Pruden	2018/11/28
Glen Austin	2018/11/28
Glen Austin	2018/11/28
Kelly Gagnon	2018/11/28
Marcel LeClair	2018/11/28
Marvin Fege	2018/11/28
Milan Vucko	2018/11/28
Diane Sheppard	2018/11/27
Elif Sharpe	2018/11/27
Bill Speak	2018/11/26
Gilles Benoit	2018/11/26
Jason Siegfried	2018/11/26
Rebekah Maxton	2018/11/26
Rickey Perrault	2018/11/26
Robert Armstrong	2018/11/26
Ryan Martinson	2018/11/26
Thomas Onichuk	2018/11/26
Wayne Gregor	2018/11/26
James Otoo	2018/11/23
Madeline Calvert	2018/11/23
Dirk Crans	2018/11/22
Karen Jensen	2018/11/22
Mark Richard	2018/11/22
Gabriel Proulx	2018/11/21
George Robinson	2018/11/21
Keean Hachey	2018/11/21
Raphael Boutin	2018/11/21
Alcide Boudreau	2018/11/20
Brandon Cholette	2018/11/20
Clifford Ennis	2018/11/20
David Kell	2018/11/20
Dennis Duquette	2018/11/20
Don Chartrand	2018/11/20
Ed Luski	2018/11/20
Jeffrey Tjihoreko	2018/11/20
Mark Schmidt	2018/11/20
Ray Tucker	2018/11/20
Ron Bordeleau	2018/11/20
Roxanne Mueller	2018/11/20
Russell Gregoire	2018/11/20
Sean Ahrens	2018/11/20
Sebastien Gareau	2018/11/20
Steven Savard	2018/11/20
Taylor Golka	2018/11/20
William Wilson	2018/11/20
Sabina Janik	2018/11/19
Andrew Hawkes	2018/11/18
mmn	2018/11/17
Eugene Oshawee	2018/11/16
Trevor Linley	2018/11/16

James Kirkbride	2018/11/15
James Urquhart	2018/11/15
Matt Beach	2018/11/15
Patrick Desruisseaux	2018/11/15
Robert Labrash	2018/11/15
Thomas Fitzpatrick	2018/11/15
Jerry Avery	2018/11/14
Kandi Ewen	2018/11/14
Steve Keenan	2018/11/14
Austin Bour	2018/11/13
Brendan Sampson	2018/11/13
Graham Hay	2018/11/13
Graham Hay	2018/11/13
Hal Cooper	2018/11/13
Jason Shumka	2018/11/13
Jason Shumka	2018/11/13
Jeffrey Maisonneuve	2018/11/13
Joe Anthony	2018/11/13
Shayne Peckham	2018/11/13
Brad Schamerhorn	2018/11/12
Chad Gagnon	2018/11/12
Claire Tibbs	2018/11/12
Daniel Perras	2018/11/12
David Portilla	2018/11/12
Jacob Grenier	2018/11/12
Jarrod Dewaal	2018/11/12
Len Beda	2018/11/12
Luke DeCal	2018/11/12
Nathan Parker	2018/11/12
Paul Lis	2018/11/12
Sarah Moreth	2018/11/12
Scott Johnson	2018/11/12
Tommy Pritchard	2018/11/12
Tyler Byers	2018/11/12
Jordan Gagne	2018/11/11
Neil Keefe	2018/11/10
Danny Wensley	2018/11/07
Geoff Kearney	2018/11/07
Daylen Hoffman	2018/11/06
Hubert Seymour	2018/11/06
Leon Harder	2018/11/06
Mark Griffiths	2018/11/06
Michael Kolisnik	2018/11/06
Rick Christiansen	2018/11/06
Steve Leonard	2018/11/06
Wayne Markow	2018/11/06
Wayne Markow	2018/11/06
Darren Procup	2018/11/05
David Bocking	2018/11/05
Dennis Helder	2018/11/05
Les Ligetfalvy	2018/11/05
Mathew Bourne	2018/11/03

Robert Fontaine	2018/11/03
Stephen Morris	2018/11/03
Will Bryden	2018/11/03
Zak Wallace	2018/11/02
Bryan Card	2018/11/01
Raymond Mac Eachen	2018/11/01
Rick Grant	2018/11/01
Wayne Gregor	2018/11/01
Devon Bourdin	2018/10/31
Donna Edwards	2018/10/31
Dustin Loewen	2018/10/31
Heidi Manicke	2018/10/31
Jarrett Menzies	2018/10/31
Perrin Kieftenbeld	2018/10/31
Alvin McMillen	2018/10/29
Andre Nault	2018/10/29
Dave Erb	2018/10/29
Nick Grolway	2018/10/29
Matt Whitney	2018/10/27
Krista Gouliquer	2018/10/26
Noah Zimmerman	2018/10/26
James Degroot	2018/10/25
Julie Fedorak	2018/10/25
Sheila Prince	2018/10/25
Marilyn Jourdain	2018/10/24
Jean-Francois Mercier	2018/10/23
Ben Strong	2018/10/22
Derick Michaelis	2018/10/22
Rody Mafuta	2018/10/22
Roger Bertrand	2018/10/22
Brendan Morand	2018/10/21
John Young	2018/10/21
Catherine Groulx	2018/10/19
Keith Haw	2018/10/19
Ken Aucoin	2018/10/19
Wade Johnson	2018/10/19
Jeff Poulton	2018/10/18
Joanie Spoon	2018/10/18
Martin Vienneau	2018/10/18
Ryan Cullum	2018/10/18
Chris Wark	2018/10/17
Georgina Bragg	2018/10/17
James Kaemingh	2018/10/17
Jim Labelle	2018/10/17
Matt Hazell	2018/10/17
Aimee Coutu	2018/10/16
Alex Rubenick	2018/10/16
Bethany Friesen	2018/10/16
Brett Corbett	2018/10/16
Brian Beaucage	2018/10/16
Brittany Gartner	2018/10/16
Campbell Gregory	2018/10/16

Chris Beaucage	2018/10/16
Cole Anderson	2018/10/16
Cory Rooks	2018/10/16
Dallas Davis	2018/10/16
Dalton Lundgren	2018/10/16
Deirdre Connell	2018/10/16
Devin Cramer	2018/10/16
Don Godin	2018/10/16
Donald Matheson	2018/10/16
Donald Minott	2018/10/16
Fredrick Morton	2018/10/16
Glenn Richardson	2018/10/16
Gordon Pedersen	2018/10/16
Jason Baldwin	2018/10/16
Karl Harrison	2018/10/16
Kyle Mattocks	2018/10/16
Lee Mosley	2018/10/16
Lloyd Kerkermeier	2018/10/16
Robert Price	2018/10/16
Steven Pedersen	2018/10/16
Wade Patabon	2018/10/16
Wayne Farnum	2018/10/16
Wes Poneira	2018/10/16
Christian Pepin	2018/10/15
Keegan McDougall	2018/10/15
Paolo Tomasone	2018/10/15
Cody Noseworthy	2018/10/14
Roger Allen	2018/10/14
Andre Villeneuve	2018/10/13
Tyler Ormerod	2018/10/13
Jeff Forsberg	2018/10/12
Kyle Benson	2018/10/12
Peter Canfield	2018/10/11
Sam Hawkins	2018/10/11
Anne Rousseau	2018/10/10
Corey Monkman	2018/10/10
Gavin Smith	2018/10/10
Jamie Loveday	2018/10/10
Jonathan Van Troyen	2018/10/10
Katherine Lunney	2018/10/10
Kevin Nordberg	2018/10/10
Linden Langlais	2018/10/10
Marcy Loveday	2018/10/10
Sydney Stanley	2018/10/10
Hunter Ottoson	2018/10/09
Bill Cameron	2018/10/07
Micheal Koopmann	2018/10/07
William Towes	2018/10/06
Kirk Shaw	2018/10/04
Richard Levesque	2018/10/04
Graham Meyer	2018/10/03
Tyler Lief	2018/10/03

Brent Thierry	2018/10/02
Cody Lennstrom	2018/10/01
Craig Stover	2018/10/01
Espirit Friday	2018/10/01
Jamie Murphy	2018/10/01
Tyler Eyolfson	2018/10/01
Scott Frechette	2018/09/30
Keith Baker	2018/09/29
Alexandre Duval	2018/09/27
Martin Bernard	2018/09/27
Ivan Magdic	2018/09/26
Joel Taylor	2018/09/26
Joel Wilson	2018/09/26
Lochart Inglis	2018/09/26
Rick Ongaro	2018/09/26
Charles Hennessey	2018/09/25
Dan Baxter	2018/09/25
Richard Gan	2018/09/25
Romeo Amuan	2018/09/25
Allan Johnston	2018/09/24
Anthony Venables	2018/09/24
Ashley Siemens	2018/09/24
Brandon Kukula	2018/09/24
Brennan Anderson	2018/09/24
Chris Ruby	2018/09/24
Curtis Hartlin	2018/09/24
Dalton Alexander	2018/09/24
David Farebrother	2018/09/24
Deanne Lyons	2018/09/24
James Kennedy	2018/09/24
Jessie Blackhawk	2018/09/24
John Laco	2018/09/24
Kayle Bryant	2018/09/24
Lionel Horton	2018/09/24
Marco Lessard	2018/09/24
Mathi Shan	2018/09/24
Matthew Cote	2018/09/24
Michael Cochrane	2018/09/24
Nerissa McRury	2018/09/24
Robert Conn	2018/09/24
Roger Sheppard	2018/09/24
Sean Derkson	2018/09/24
Shelley Thompson	2018/09/24
Tyler Venerus	2018/09/24
Victoria Clifford	2018/09/24
Bruce Bauman	2018/09/22
Jeff Ross	2018/09/22
James Leonard	2018/09/21
Kevin Brunet	2018/09/21
Wayne Champayne	2018/09/21
Charles DeBungee	2018/09/20
Landon Wall	2018/09/20

Thomas Mel Durie	2018/09/19
Alex Pylypenko	2018/09/18
Andre Lebel	2018/09/18
Bradley Williams	2018/09/18
Brysin Shaw	2018/09/18
Darwin Lance	2018/09/18
Devon Hockley	2018/09/18
Dylan Anderson	2018/09/18
Gordon Amos	2018/09/18
Robert Gagne	2018/09/18
William Whalen	2018/09/18
Alexander Pucci	2018/09/17
Carl Hurcombe	2018/09/17
David Brunet	2018/09/17
James Trendiak	2018/09/17
Josiah Knox	2018/09/17
kevin vandenbossche	2018/09/17
Dennis Andrade	2018/09/16
Kobe Gardiman	2018/09/16
Dan Galloway	2018/09/15
Jean Pelchat	2018/09/14
Wendell Nixon	2018/09/14
Eric Bouchard	2018/09/13
Ramy Kamel	2018/09/13
Floyd St. Bernard	2018/09/12
Karl hamilton	2018/09/12
Ryen Amos	2018/09/12
Amy Gushulak	2018/09/11
Andrew Clark	2018/09/11
Bret McQuaker	2018/09/11
Bret Mcquaker33:26782	2018/09/11
Curt Pearson	2018/09/11
Dennis Lemay	2018/09/11
Dwight Gallusha	2018/09/11
Eric Lalonde	2018/09/11
Fedrick Forth	2018/09/11
Gino Come	2018/09/11
Ian Kopp	2018/09/11
Jake Doherty	2018/09/11
Jerry Dolph	2018/09/11
John Lawe	2018/09/11
Jonathan Szyszka	2018/09/11
Justin St. Denis	2018/09/11
Justin Takacs	2018/09/11
Kailey Singh	2018/09/11
keith Catton	2018/09/11
Kelsea Hunsperger	2018/09/11
Ken Manty	2018/09/11
Kyle Kuntz	2018/09/11
Lucie Dubnick	2018/09/11
Mackenzie Dawson	2018/09/11
Mike Dubois	2018/09/11

Myrica Hinich	2018/09/11
Peter Woodhouse	2018/09/11
Randal Secord	2018/09/11
Sonya Tremblett	2018/09/11
Sott Ahrens	2018/09/11
Tyrell Worrall	2018/09/11
Derek McKinnon	2018/09/10
Jon Ross	2018/09/10
Keith Caul	2018/09/10
Sandy Tavelli	2018/09/10
Vaughn Rodwell	2018/09/10
Parker Johnson	2018/09/07
Percy Gomez	2018/09/07
Joe Hall	2018/09/06
Matthew Allen	2018/09/06
Mitchell Rundle	2018/09/06
Ryan Johnson	2018/09/06
Shaun Beardy	2018/09/06
William Pendergras	2018/09/06
Brian Mattie	2018/09/05
Iran Betty	2018/09/05
James Taylor	2018/09/05
John Gellner	2018/09/05
Jonas McKenzie	2018/09/05
Kale Harris	2018/09/05
Kira Tivy	2018/09/05
Phil Friesen	2018/09/05
Eiji Moller	2018/09/04
Fred Cramer	2018/09/04
Sean McGinn	2018/09/04
Thomas Chartrand	2018/09/04
Trevor Boimistruck	2018/09/04
Paul Scharf	2018/09/03
Zach Roy	2018/09/03
Brian Melanson	2018/09/02
Chris Cuyler	2018/09/02
Clayton Spence	2018/09/02
Cody Dew	2018/09/02
Frank Sikora	2018/09/02
Kim Heath	2018/09/02
Michael Moody	2018/09/02
Steve Bedard	2018/09/02
Chris O'Gorman	2018/08/30
Mark Skrzypek	2018/08/30
Peter Dyck	2018/08/30
Shane Rencher	2018/08/30
Cody Huls	2018/08/29
Jeanie Townson	2018/08/29
Kathie Zatulsky	2018/08/29
Mark Mallette	2018/08/29
Matt Meadwell	2018/08/29
Samuel Dube	2018/08/29

Steven Laffin	2018/08/29
Tom Reid	2018/08/29
Bryan Dahl	2018/08/28
Chloe Machura	2018/08/28
Colin Potter	2018/08/28
Ian Grant	2018/08/28
Jordan Zimmer	2018/08/28
Joshua Fisher	2018/08/28
Martin Dickson	2018/08/28
Michael Forsyth	2018/08/28
Robert Handorgan	2018/08/28
Ryan Kalika	2018/08/28
Chris Foran	2018/08/27
Dylan Stanley	2018/08/27
Garth Sutton	2018/08/27
Kennedy Kingston	2018/08/27
Kurtis KostamoKurtis Ksstamo	2018/08/27
Michael Arseneault	2018/08/27
Todd McIntyre	2018/08/27
Zain Ghaffur	2018/08/27
Becky Lengyel	2018/08/26
Sean McGuirk	2018/08/25
Clint Reid	2018/08/24
Frank Meekis	2018/08/23
Jordan Nelson	2018/08/23
Liane Rouse	2018/08/23
Mike Wilson	2018/08/23
Ryan Campbell	2018/08/23
Brady Cawston	2018/08/22
Douglas Reid	2018/08/22
Edwin Bluebird	2018/08/22
Hugh Smith	2018/08/22
Matt Velemirovich	2018/08/22
Michael Keeliny	2018/08/22
Michael Thibault	2018/08/22
Mike Sabourin	2018/08/22
Nathan Middleton	2018/08/22
Richard Lancaster	2018/08/22
Roger Leger	2018/08/22
unknown	2018/08/22
Wayne Widgren	2018/08/22
Joelle Smith	2018/08/21
Kimberly Conrod	2018/08/21
Larry Beniusis	2018/08/21
Matthew Schlue	2018/08/21
Michael Keeliny	2018/08/21
Patrick Elvish	2018/08/21
Randy Fincaryk	2018/08/21
scott Kuchma	2018/08/21
Tyler Schultz	2018/08/21
Ben Collins	2018/08/20
Curtis Levesque	2018/08/20

Ed Fread	2018/08/20
Konstantin Polishchuk	2018/08/20
Madison Ainsworth	2018/08/20
Sara Halwas	2018/08/20
Sympathy Moyo	2018/08/20
Adrian Harvey	2018/08/19
Andrew Elder	2018/08/19
Andrew Piechota	2018/08/19
Audie Davis	2018/08/19
Blaine Bonnell	2018/08/19
Brett Lawrence	2018/08/19
Brian McKinnon	2018/08/19
Cecil Lampi	2018/08/19
Chris Leeds	2018/08/19
Cole Mattson	2018/08/19
Dylan Patterson	2018/08/19
Edward Selman	2018/08/19
Eric Marshall	2018/08/19
Evan Kytayko	2018/08/19
Frank Bennardo	2018/08/19
Geoff Dexter	2018/08/19
Henry Froese	2018/08/19
James Locke	2018/08/19
James MacNeil	2018/08/19
Joey Strakowicz	2018/08/19
John Matheson	2018/08/19
Jordan Bell	2018/08/19
Jordan McArthur	2018/08/19
Karl Tonn	2018/08/19
Kevin Stecyk	2018/08/19
Marc Boucher	2018/08/19
Nicholas Macmillan	2018/08/19
Nick DeViono	2018/08/19
Randy Maybroda	2018/08/19
Rob Price	2018/08/19
Samuel Toki	2018/08/19
Seth Haddick	2018/08/19
Shane Lamppu	2018/08/19
spencer	2018/08/19
Spencer Turcotte	2018/08/19
Stephen Skwarek	2018/08/19
Sterling Lesperance	2018/08/19
Tanner Permes	2018/08/19
Timothy Hoffele	2018/08/19
Todd Gilmaster	2018/08/19
Troy Cunningham	2018/08/19
Uriah Laing	2018/08/19
William Froude	2018/08/19
William Pruys	2018/08/19
William Smith	2018/08/19
Wyatt Thompson	2018/08/19
Clarence Gardipy	2018/08/17

Clayton Park	2018/08/17
Greg FitzPatrick	2018/08/17
Helen Cup	2018/08/17
Kristien Holmstrom	2018/08/17
Murray Cook	2018/08/17
Rob Jedruch	2018/08/17
James Peach	2018/08/16
Don McRae	2018/08/15
Paul Sorin	2018/08/15
Scott Menzies	2018/08/15
Aaron Letandre	2018/08/14
Arthur Van Ael	2018/08/14
Brent Williams	2018/08/14
Daniel Crossingham	2018/08/14
Darryl Bodnar	2018/08/14
Jade Malcolm	2018/08/14
Joe Jagodzinski	2018/08/14
Justin Whitecrow	2018/08/14
Malcolm Paul Sawler	2018/08/14
Malcolm Sawler	2018/08/14
Matthew Wilson	2018/08/14
Paul Visser	2018/08/14
Phillip Ottertail	2018/08/14
Shawn Pollard	2018/08/14
William Goodwin	2018/08/14
Andy Tattrie	2018/08/13
Lisa Bobbie	2018/08/13
Shawn Nishimura	2018/08/13
Julian Collette	2018/08/11
Robert Stockla	2018/08/11
Mitchell Bryant	2018/08/10
Dave Posaluko	2018/08/09
Dustyn Rebryna	2018/08/09
Jason Jones	2018/08/09
Josh Innanen	2018/08/09
Mike Foster	2018/08/09
Robert Ramsay	2018/08/09
Shane LeTual	2018/08/09
Roy Smith	2018/08/08
Sherry Sinclair	2018/08/08
Attila Zavicsa	2018/08/07
Eric Erkkila	2018/08/07
John Huska	2018/08/07
Josh Merante	2018/08/07
Murray Gill	2018/08/07
Stephen Alexander	2018/08/07
Taher Hosseinzadeh	2018/08/07
Donald Bourque	2018/08/06
Jeremy Enders	2018/08/06
John Boldt	2018/08/06
Robert Potts	2018/08/06
Steven Allen	2018/08/03

Adam Chippett	2018/08/02
Billy Beardy	2018/08/02
Don Hay	2018/08/02
Ivan Genaille	2018/08/02
Jarrod Smith	2018/08/02
Kyle Lane	2018/08/02
Nazareth Nasikapow	2018/08/02
Adam Trycznski	2018/08/01
Brandon Thurier	2018/08/01
Control Room Data Center	2018/08/01
Control Room Data Center	2018/08/01
Control Room Data Center	2018/08/01
Control Room Data Center	2018/08/01
Daniel Normore	2018/08/01
Jimmy White	2018/08/01
Mark Huckerby	2018/08/01
Nelson Haney	2018/08/01
Paul Barrie	2018/08/01
Phillip Desaulniers	2018/08/01
Tim Ross	2018/08/01
Troy Paquette	2018/08/01
Wayne Bull	2018/08/01
Andrew Smith	2018/07/31
Derek Bobbie	2018/07/31
Garth Hayter	2018/07/31
Mitchell Caruso	2018/07/30
Kevin Myall	2018/07/29
Nathan Vaillant	2018/07/29
Bernard Gagnon	2018/07/28
Tammy Hodder	2018/07/28
Brent Rehkoph	2018/07/27
Trevor Manchester	2018/07/27
Angus McKenzie	2018/07/26
Chandler Pollard	2018/07/26
Craig Gray	2018/07/26
Denis Yarosh	2018/07/26
Jessica Jordan	2018/07/26
Martina Mamakwa	2018/07/26
Ron Dusener	2018/07/26
Ryan Bruce	2018/07/26
Derek Johnson	2018/07/25
Jackson Penner	2018/07/25
Katie Shoemaker	2018/07/25
Matthew Jackson	2018/07/25
Michelle Trevor	2018/07/25
Richard Wyryha	2018/07/25
Shane Killam	2018/07/25
Shayna Desaulniers	2018/07/25
Yahya Abdi	2018/07/25
Anthony Perpich	2018/07/24
Behshad Sabah	2018/07/24
Brian Cinq-Mars	2018/07/24

Colin Wright	2018/07/24
Dan Paul	2018/07/24
Derek Wheelans	2018/07/24
Gary Sherban	2018/07/24
Guy Hutchison	2018/07/24
Jason Methot	2018/07/24
Jeff Pederson	2018/07/24
Justin Bougie	2018/07/24
Kelly Campbell	2018/07/24
Kevin Honke	2018/07/24
Launa White	2018/07/24
Mike Gerow	2018/07/24
Noel Mejia	2018/07/24
Nolan Campbell	2018/07/24
Richard Fenez	2018/07/24
Sheldon Armstrong	2018/07/24
Travis Paradis	2018/07/24
Tristan Slater	2018/07/24
Tyson Skead-Stevens	2018/07/24
Victor Leonard	2018/07/24
Victor Stamler	2018/07/24
Vincent Houle	2018/07/24
Allan Borden	2018/07/23
Brian Captain	2018/07/23
Bryan Morris	2018/07/23
Christopher Whalen	2018/07/23
Dave Robinson	2018/07/23
David Johnston	2018/07/23
Elwyn Benedictson	2018/07/23
Greg Way	2018/07/23
Jarrod Fitzner	2018/07/23
Lloyd Penner	2018/07/23
Mark Matthews	2018/07/23
Patrick Bemister	2018/07/23
Richard Fernandez	2018/07/23
Robert Carpenter	2018/07/23
Ryan Saunders	2018/07/23
Scott Lambert	2018/07/23
Sean Yardley	2018/07/23
Vaughn Jorgensen	2018/07/23
Alan Coulter	2018/07/22
Kevin Algner Herbert	2018/07/22
Ruslen Trokhanovskyy	2018/07/22
Sasha Strebchuk	2018/07/22
Cher Pruys	2018/07/21
Michael Cooper	2018/07/21
Craig Yelle	2018/07/20
Garland Magnusson	2018/07/20
Jordan Taggert	2018/07/20
Leslie Moritz	2018/07/20
Steve Lavallee	2018/07/20
Adam Young	2018/07/19

Brady Shaddick	2018/07/19
Erwin Stobert	2018/07/19
Jeff Nishimura	2018/07/19
Larry Cove	2018/07/19
Nishant Chauhan	2018/07/19
Paul Holland	2018/07/19
Raychel Crebo	2018/07/19
Soheil Sayedinazad	2018/07/19
Ted Green	2018/07/19
Andrew Hopper	2018/07/18
Oscar Galindo	2018/07/18
Rob McDonald	2018/07/18
Anthony Amadi	2018/07/17
Dalton Meilliur	2018/07/17
Danton Meilleur	2018/07/17
Matthew Boudreau	2018/07/17
Mike Christopher Mitchell	2018/07/17
Shanna Whalen	2018/07/17
Brett Eyolfson	2018/07/16
Frederick Silcox	2018/07/16
Hunter Longshore	2018/07/16
Lenora Deschamps	2018/07/16
Patricia Albert	2018/07/16
Rikky Eshane	2018/07/16
Tim Dodd	2018/07/16
Tucker Johnson	2018/07/16
Cody Colby	2018/07/15
Cole Bellerose-Mackay	2018/07/15
Dave Kozyra	2018/07/15
Paul Smart33:33:	2018/07/15
Susan Tomalty	2018/07/15
Brody Anderson	2018/07/14
Cole Radics	2018/07/14
Daniel Prentice	2018/07/14
Darcy Masson	2018/07/14
David Rose	2018/07/14
Ed Turner	2018/07/14
Ed Turner	2018/07/14
Garnet Favell	2018/07/14
Harold Kelly	2018/07/14
Jaysson Christensen	2018/07/14
Joey Pereira	2018/07/14
Johnathon Therrien	2018/07/14
Kevin Ciemny	2018/07/14
Kevin Francois	2018/07/14
Kunyu Luo	2018/07/14
Phillip Smith	2018/07/14
Rodney Waldner	2018/07/14
Aiden Chmielak	2018/07/13
Clayton Mcdowell	2018/07/13
David Jolly	2018/07/13
Brittany Kaun	2018/07/12

Caitlin Anderson	2018/07/12
Catlin Mackinnon	2018/07/12
Christine Loveday	2018/07/12
Robert Salmen	2018/07/12
Rudy Anderson	2018/07/12
Ryan Campbell	2018/07/12
Sean MacInnis	2018/07/12
Sherman Sonnier	2018/07/12
Tanner Wood	2018/07/12
Alex Tookenay	2018/07/11
Andy Grift	2018/07/11
Barry Smith	2018/07/11
Dan Rivera	2018/07/11
Darren Henderson	2018/07/11
David Jenson	2018/07/11
Glen Taylor	2018/07/11
Glenn Pennell	2018/07/11
John Boyd	2018/07/11
Michael Ganes	2018/07/11
Neil Sully	2018/07/11
Richard Houlahan	2018/07/11
Scott Christianson	2018/07/11
Stephan Langlois	2018/07/11
Tommy Dube	2018/07/11
Tyler Jacobson	2018/07/11
Vince Rovinelli	2018/07/11
Barry Secord	2018/07/10
Ben Fishburn	2018/07/10
Bill Barty	2018/07/10
Braidyn Anderson	2018/07/10
Evan Howie	2018/07/10
Fyland Gallagher	2018/07/10
Jason Sedesky	2018/07/10
Mark Cunnington	2018/07/10
Matt Ogden	2018/07/10
Rodney Ralph	2018/07/10
Ron MacPhee	2018/07/10
Sean Bruce	2018/07/10
Todd Poirier	2018/07/10
Tony Lospe	2018/07/10
Brett Evans	2018/07/09
Cassidy Dunnet	2018/07/09
Charlotte Arnold	2018/07/09
Dan Zambrano	2018/07/09
Dana Dusener	2018/07/09
Jon Woodgate	2018/07/09
Kelyn Vos	2018/07/09
Kenneth Cook	2018/07/09
Marlas Larson	2018/07/09
Paul Morrison	2018/07/09
Reed King	2018/07/09
Sam Glover	2018/07/09

Willard Stuparyk	2018/07/09
Bryson Wark	2018/07/08
Deidrick Smith	2018/07/08
Michele Randle	2018/07/08
Ross Adamoski	2018/07/08
Sean Li	2018/07/08
sheldon roberts	2018/07/08
Alex Fennig	2018/07/07
Brandon Pelz	2018/07/07
Doug Rupert	2018/07/07
Jesse Morden	2018/07/07
Luc Desserre	2018/07/07
Mathew Grandbois	2018/07/07
Mike Woloshyn	2018/07/07
Preston Azevedo	2018/07/07
Samuel Catton	2018/07/07
Bradley Macphee	2018/07/06
Brady White	2018/07/06
Braydon Jupp	2018/07/06
Brett Sweezey	2018/07/06
D. Tony Mcelhatton	2018/07/06
Daniel Turney	2018/07/06
Denis Bouffard	2018/07/06
Denny Grandmaison	2018/07/06
Donald St. Pierre	2018/07/06
Donovan Cochrane	2018/07/06
Jason Paulson	2018/07/06
Jason Ploschak	2018/07/06
John Bechard	2018/07/06
Kai Koopmann	2018/07/06
Marvin Paul	2018/07/06
Reid Bennett	2018/07/06
Richard Wait	2018/07/06
Sekina Scheibler	2018/07/06
Stephan Koopmann	2018/07/06
Steve Titterton	2018/07/06
Tyler Dunahee	2018/07/06
Andrew Marck	2018/07/05
Arash Rafat	2018/07/05
Braden Richards	2018/07/05
Cara Bedard	2018/07/05
Corrine Caisse	2018/07/05
Cory McAllister	2018/07/05
Dan Kearsey	2018/07/05
Doug MacDonald	2018/07/05
James McDuffie	2018/07/05
Jay Burk	2018/07/05
John Danard	2018/07/05
Jordan Routhier	2018/07/05
Jordan Wicks	2018/07/05
Kevin Cardinal	2018/07/05
Kevin Kaspick	2018/07/05

Micheal McAllister	2018/07/05
Morgan Redford	2018/07/05
Nathen Debungee	2018/07/05
Sherie Lees	2018/07/05
Siegfried Wenninger	2018/07/05
Terrell Yerxa-Mosher	2018/07/05
Adam Hughson	2018/07/04
Adam Phillips	2018/07/04
Anthony Pusic	2018/07/04
Bryan Quesnel	2018/07/04
Charles Parker JR	2018/07/04
Danny Wensley	2018/07/04
Doug Britten	2018/07/04
Gary Ferguson	2018/07/04
Jason Hill	2018/07/04
Jerry Morrow	2018/07/04
Jonathan Sheppard	2018/07/04
Larry Loveday	2018/07/04
Matt Heinte	2018/07/04
Michael Adamosk	2018/07/04
Mike Dubois	2018/07/04
Norman Pettis	2018/07/04
Paul Morrison	2018/07/04
Paul Schaff	2018/07/04
Tom Michaluk	2018/07/04
Cole Wickenden	2018/05/26
Emmanuel Abuwa	2018/05/26
Andrew Hinshelwood	2018/05/24
David Craig	2018/05/24
Kenneth Bombay	2018/05/24
Rick Puukila	2018/05/24
Scott Foster	2018/05/24
Troy Power	2018/05/24
Joe Gilbertson	2018/05/23
Rolly Arseneault	2018/05/23
Eric Balon	2018/05/22
John Moffatt	2018/05/22
Logan Miller	2018/05/22
Martin Moore	2018/05/22
Pylypenko Oleksandra	2018/05/22
Ryan Scheurer	2018/05/22
Shawn Dobransky	2018/05/22
Ian Mark	2018/05/21
Jennifer Schreiner	2018/05/21
Jordan Beardy	2018/05/21
Jesse Thorne	2018/05/20
Marcel Lamoureux	2018/05/19
Trystn Vacek	2018/05/19
Fabricio Araujo Da Silva	2018/05/18
Remy Pellerin	2018/05/18
Bethany Wiebe	2018/05/17
Chris White	2018/05/17

Clarke Bouchie	2018/05/17
Jesse Morrisseau	2018/05/17
Parth Patel	2018/05/17
Patrick Cortens	2018/05/17
Robert Cole	2018/05/17
Wally Pennell	2018/05/17
Adrian Churcher	2018/05/16
Allan Stone	2018/05/16
Ben Miller	2018/05/16
Caleb Koomans	2018/05/16
Christopher Stone	2018/05/16
Ken Huntingford	2018/05/16
Martin Gramlich	2018/05/16
Whitney Speaker	2018/05/16
Cheryl McEvoy	2018/05/15
Doug Caul	2018/05/15
Edward Vergnaud	2018/05/15
Gregory Vassberg	2018/05/15
Irakli Khorbaladze	2018/05/15
Jacob Halverson	2018/05/15
Lawrence Kelly	2018/05/15
Lloyd Sexton	2018/05/15
Michael Hatton	2018/05/15
Randy Pinder	2018/05/15
Riley Caul	2018/05/15
Robin Grynol	2018/05/15
Shane Constantine	2018/05/15
Stacey Boshey	2018/05/15
Stephan Jackson	2018/05/15
Thomas Hunter	2018/05/15
Tim Pangman	2018/05/15
Trevor Stein	2018/05/15
Adekunle Bakare	2018/05/14
Brian Kirk	2018/05/14
Jeff Bevans	2018/05/14
LLoyd Johnson	2018/05/14
Kevin Crocker	2018/05/12
Andrew Woodd	2018/05/11
Bev Lofthang	2018/05/11
Chris Kavanagh	2018/05/11
Colby Koecher	2018/05/11
Jun Yong Erh	2018/05/11
Leroy Gross	2018/05/11
New user	2018/05/11
Romeo Kovacevic	2018/05/11
Shania Laforce	2018/05/11
Steve Doyle	2018/05/11
Steven Oliver	2018/05/11
Terry Lofthang	2018/05/11
John Bettiol	2018/05/10
Ronald Chatel	2018/05/10
David Meredith	2018/05/09

Caron Cridland	2018/05/08
Chris Pound	2018/05/08
Deaydra Delorme	2018/05/08
Ebenezer Gwirah	2018/05/08
Emerson Klassen	2018/05/08
Geoff Neilson	2018/05/08
Gordon Robinson	2018/05/08
Johnny Beaudrow	2018/05/08
Joseph Bodnar	2018/05/08
Ryan Steiner	2018/05/08
Tom Bishop	2018/05/08
Chris Nabess	2018/05/07
Donald Hooper	2018/05/07
Dustin Turpin	2018/05/07
Garett Gamsby	2018/05/07
James Olson	2018/05/07
Jory Glomba	2018/05/07
Justin Enns	2018/05/07
Kaleb McDonald	2018/05/07
Mark Williams	2018/05/07
Nicole Warriner	2018/05/07
Richard Abbott	2018/05/07
Richard Earley	2018/05/07
Tino Gusola	2018/05/07
Dennis Jalbert	2018/05/06
Everett Chojko-Bolec	2018/05/06
Greg Holm	2018/05/06
Jeffrey Churchley	2018/05/06
Robert Smith	2018/05/06
James Leonard	2018/05/05
Chelsea Scora	2018/05/04
David Martin	2018/05/04
Fredwic Wicks	2018/05/04
George Fortune	2018/05/04
Jeremy Maendel	2018/05/04
John McCord	2018/05/04
Jonathan Enojo	2018/05/04
Mark Caines	2018/05/04
Miles Crockatt	2018/05/04
New user	2018/05/04
Ryan Hudson	2018/05/04
Tylor Bonnett	2018/05/04
Brendon Edwards	2018/05/03
Curtis Johnson	2018/05/03
Doug York	2018/05/03
Joseph Noel	2018/05/03
Stephane Desjardins	2018/05/03
Taylor Manning	2018/05/03
Yan Gagnon	2018/05/03
Ben Schmidt	2018/05/02
Charles Bennett	2018/05/02
Frank Arella	2018/05/02

Hailey Moncrief	2018/05/02
Jodie Ball	2018/05/02
Ryan Gibson	2018/05/02
Tyler Edwards	2018/05/02
Bryan Swanton	2018/05/01
Leslie Kay	2018/05/01
Michael Sadewasser	2018/05/01
Nick Skinner	2018/05/01
Olga Bondarenko	2018/05/01
Zaeem Khalid	2018/05/01
Andrey Zapolskiy	2018/04/30
Brian Morgenstern	2018/04/30
Chris Johnston	2018/04/30
Don Baxter	2018/04/30
Mark Loveday	2018/04/30
Michael Murdoch	2018/04/30
Rich Tribe	2018/04/30
Scott Boles	2018/04/30
Shivraj Sagar	2018/04/30
Tony Casagranda	2018/04/30
Adam Payne	2018/04/27
Curtis Jansen	2018/04/27
Curtis Johansen	2018/04/27
Dale Thibault	2018/04/27
Gerald Janes	2018/04/27
Leonard Gott	2018/04/27
Mitchel Richard	2018/04/27
New user	2018/04/27
Nick Ewasiuk	2018/04/27
Ryan Demings	2018/04/27
Scott Hillyard	2018/04/27
Sean Dearlove	2018/04/27
Steve Toews	2018/04/27
Matthew Lalonde	2018/04/26
John Buyting	2018/04/25
Kurtis Gagne	2018/04/25
Alain Minier	2018/04/24
Chris Arnold	2018/04/24
Colin Johnson	2018/04/24
Darren O'Donnell	2018/04/24
Dustin Masson	2018/04/24
John Vacek	2018/04/24
Julie Mattson	2018/04/24
Karen Vacek	2018/04/24
Tearyn Wiebe	2018/04/24
Theron Holden	2018/04/24
Wayne Caul	2018/04/24
Aaron Law	2018/04/23
Andrew Ingram	2018/04/23
Dale Klodnicki	2018/04/23
Dan Oechsler	2018/04/23
Henry M Smith IV	2018/04/23

Jonathan Flamand	2018/04/23
Mike Paul	2018/04/23
Ryan Nagy	2018/04/23
Sergii Stetsenko	2018/04/23
Wayne Gordon	2018/04/23
Bill Wilson	2018/04/21
Dele Oyelese	2018/04/20
Jeremy Potson	2018/04/20
Willy Miller	2018/04/20
Aaron Arnholtz	2018/04/19
James Luck	2018/04/19
Ray Skoleski	2018/04/19
Tyrell Griffith	2018/04/19
Chris Elyk	2018/04/18
Cory Cole	2018/04/18
Donovan Dean	2018/04/18
George Unrau	2018/04/18
John Bell	2018/04/18
Matt Hyland	2018/04/18
New user	2018/04/18
Roger Yurick	2018/04/18
Romero Paul	2018/04/18
Shamus Crites	2018/04/18
Trent Charles	2018/04/18
Troy Dixson	2018/04/18
Anthony Gebert	2018/04/17
Craig Chaval	2018/04/17
Donna Court	2018/04/17
Jake Mazur	2018/04/17
Jaxon Angus	2018/04/17
John Esselink	2018/04/17
Jonathan McLean	2018/04/17
Josh Cousineau	2018/04/17
Josh Gouin	2018/04/17
Keith Arvelin	2018/04/17
Kyle Reykdal	2018/04/17
Shane Loyie	2018/04/17
Stefan Gerber	2018/04/17
Travis Blackjack	2018/04/17
Wayne Angus	2018/04/17
Chris Methot	2018/04/16
Lisa Braxton	2018/04/16
Milton Braxton	2018/04/16
Ronald Matysio	2018/04/16
Tim Harper	2018/04/16
Lyle Singbell	2018/04/15
Brad Kirkwood	2018/04/14
Branden DeVisser	2018/04/14
Brayden McAuley	2018/04/14
Daniel Wiltshire	2018/04/14
Johnny Crnkovich	2018/04/14
Chris Murphy	2018/04/13

Daniel Gagne	2018/04/13
Darrin Ward	2018/04/13
Derek Hill	2018/04/13
Ken Lindsay	2018/04/13
Kieth St. Peter	2018/04/13
New user	2018/04/13
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Robert Irvine	2018/04/13
Scott Bird	2018/04/13
Justin Collier	2018/04/12
New user	2018/04/12
Brett Malo	2018/04/11
Curtis Monkman	2018/04/11
Dalton Betts	2018/04/11
Duncan McCabe	2018/04/11
Geoff Vaillent	2018/04/11
Leonard Chornoby	2018/04/11
Richard Adams	2018/04/11
Sean VanHaesendonck	2018/04/11
Tarlia Mackay	2018/04/11
Travis Michelle	2018/04/11
Troy Salois	2018/04/11
Allan Mychasiw	2018/04/10
Chelsey Sharp	2018/04/10
David O'Brien	2018/04/10
Edwin Fui	2018/04/10
Harold Brun	2018/04/10
James Blattner	2018/04/10
Jeff Kelly	2018/04/10
Jesse Paypompee	2018/04/10
Joseph Luby	2018/04/10
Mylo Smith	2018/04/10
Randal Turk	2018/04/10
Travis George	2018/04/10
Trevor Brown	2018/04/10
Aaron De Long	2018/04/09
Andy Edwards	2018/04/09
Chris Longton	2018/04/09
D.J. Wilson	2018/04/09
Donald Gray	2018/04/09
Doug Baggs	2018/04/09
Justin Larson	2018/04/09
Kevin Norberg	2018/04/09
Zach Ridge	2018/04/09
Zachary Purdy	2018/04/09
Raimo Lustig	2018/04/08
Kathy Piotrowski	2018/04/07
Richard Poitrowski	2018/04/07
Joe Glenn	2018/04/06
Michael Ryckman	2018/04/06
Raymon Beaulieu	2018/04/06
Chris Winstl	2018/04/05

Jared Rose	2018/04/05
Kevin Pelz	2018/04/05
Ryan Bently	2018/04/05
Christopher Foulds	2018/04/04
Micheal Colaneri	2018/04/04
Jamie Caouette	2018/04/03
Jesse Csuzdi	2018/04/03
Jodie Bodnariuk	2018/04/03
Joel Inkster	2018/04/03
Marissa Loveday	2018/04/03
Mitchell Spence	2018/04/03
Peter Candler	2018/04/03
Randy DesRoches	2018/04/03
Terence Potson	2018/04/03
Tiffany Page	2018/04/03
Tyler Nielson	2018/04/03
Aren Nazari	2018/04/02
Darren Duncan	2018/04/02
Dean Hoey	2018/04/02
Faith Bruyere	2018/04/02
Steve Novak	2018/04/02
Gertrude Littlejohn	2018/03/29
Ross Malley	2018/03/29
Alden Wood	2018/03/28
Brock Kasstan	2018/03/28
Darren Ainsley	2018/03/28
Doug Johnson	2018/03/28
Erika Sheppard	2018/03/28
Jeffrey Robinson	2018/03/28
Jorgen Haney	2018/03/28
Justin Cooper	2018/03/28
Keith Ramsdale	2018/03/28
Marcel Nadeau	2018/03/28
Michael Hanson	2018/03/28
Oscar LaBelle	2018/03/28
Sheldon Jourdain	2018/03/28
Troy Lennon	2018/03/28
Zoe Hynes	2018/03/28
Andrew Shenfield	2018/03/26
Barry Fiebelkorn	2018/03/26
George Giesbrecht	2018/03/26
Gerard Kirk	2018/03/26
Terry Frailick	2018/03/26
Theodore Rud	2018/03/26
Troy Street	2018/03/26
Réal Taylor	2018/03/22
Antonio Fernandez	2018/03/21
Bentley Miller	2018/03/21
Chad James Morningstar	2018/03/21
Joshua Jacob Enns	2018/03/21
Zachary Gerhart Sawdo	2018/03/21
Barry Chabluk	2018/03/19

Buckley Morrison	2018/03/19
Glen Gagnon	2018/03/19
James Wark	2018/03/19
Michael Sobkowicz	2018/03/19
Richard Glena	2018/03/19
Steven Perrault	2018/03/19
Troy Holmes	2018/03/19
Brent Carruthers	2018/03/16
Clarise Allard	2018/03/16
Landon Mariouw	2018/03/16
Russell Vincent	2018/03/16
Chris Anderson	2018/03/14
David Alexis	2018/03/14
Derek Yuill	2018/03/14
Dylan Lee	2018/03/14
Jason Schram	2018/03/14
John Hand	2018/03/14
Jordan Malcolm	2018/03/14
Kenneth Kakeeway	2018/03/14
Matthew Smallwood	2018/03/14
Michael Bone	2018/03/14
Mike Johnson	2018/03/14
Nicholas Lajeunesse	2018/03/13
Robert Ross Steele	2018/03/13
Cameron Yerxa	2018/03/12
Justin Harper	2018/03/12
Matthew Soldier	2018/03/12
Vivian Margret Beehan	2018/03/09
Curtis Devlin	2018/03/08
Calvin Krahn	2018/03/07
Eugene Tolmay	2018/03/07
Harold Gibson	2018/03/07
Mark Davis	2018/03/07
Misty Kelly	2018/03/07
Scott Gobeil	2018/03/07
Travis Weir	2018/03/07
Austin Chambers	2018/03/05
Carl Carlson	2018/03/05
Christopher Schram	2018/03/05
Craig Will	2018/03/05
Daniel Mosher	2018/03/05
Dave Muir	2018/03/05
Derek Frederick	2018/03/05
Don Kruse	2018/03/05
Gary Zurkan	2018/03/05
Glenn Simpson	2018/03/05
Gordon Shine	2018/03/05
James Dionne	2018/03/05
James Kempton	2018/03/05
Jamie Townsend	2018/03/05
Jason Giebeler	2018/03/05
Jeffrey Simpson	2018/03/05

Jerimy Erickson	2018/03/05
Jesse de Montigny	2018/03/05
Joe Hopkins	2018/03/05
Jonathon Abraham	2018/03/05
Justin Bishop	2018/03/05
Larry Ogden	2018/03/05
Leon Kelly	2018/03/05
Lyle Steele	2018/03/05
Marcel Jean	2018/03/05
Mathew McLeod	2018/03/05
Matthew Halanen	2018/03/05
Matthew Henry	2018/03/05
Matthew Warren	2018/03/05
Michael Lusk	2018/03/05
Mike Adey	2018/03/05
Mike Montgomery	2018/03/05
Neil Gavel	2018/03/05
Nelson Fontaine	2018/03/05
Patrick Arsenault	2018/03/05
Pete Makarchuk	2018/03/05
Raymond Anderson	2018/03/05
Richard Beaucage	2018/03/05
Richard Fenez	2018/03/05
Robert Kuusela	2018/03/05
Robert Patridge	2018/03/05
Robert Stevenson	2018/03/05
Roch Belanger	2018/03/05
Simon Marcoux	2018/03/05
Spencer Belanger	2018/03/05
Steve Pederson	2018/03/05
Steven Johnson	2018/03/05
Thomas Pritchard	2018/03/05
Travis Gibson	2018/03/05
Trevor Mitchell	2018/03/05
Tyler Byers	2018/03/05
William Younger	2018/03/05
Cameron Noy	2018/03/03
New user	2018/03/03
Jordan Hanninen	2018/03/02
Lawrence Kwak	2018/03/02
Alex Rummel	2018/02/28
Andy Cameron	2018/02/28
Dalton Seversen	2018/02/28
Darren Angus	2018/02/28
Jamie Northcott	2018/02/28
Keith McCracken	2018/02/28
Lori Ottoson	2018/02/28
Trevor Moyer	2018/02/28
Austin Wray	2018/02/26
Brendan Nordberg	2018/02/26
Brodie McGowan	2018/02/26
Jason Flinders	2018/02/26

Reese Kieftenbeld	2018/02/26
Ryan King	2018/02/26
Tylor Serool	2018/02/26
William Ross	2018/02/26
Brian Henry Smith	2018/02/23
Kevin Andrew Nielsen	2018/02/23
Visitor 003	2018/02/22
Visitor 005	2018/02/22
Visitor 013	2018/02/22
Visitor 016	2018/02/22
Visitor 018	2018/02/22
Visitor 020	2018/02/22
Visitor 022	2018/02/22
Visitor 025	2018/02/22
Weixi Liu	2018/02/22
Aaron Vivian	2018/02/21
Andrew Patterson	2018/02/21
Carla Jack	2018/02/21
Daniel Sinclair	2018/02/21
Doug Bailey	2018/02/21
Doug Newfeld	2018/02/21
George Saunders	2018/02/21
Jean-Paul Petel	2018/02/21
Kurtis Golka	2018/02/21
Marilyn Faragher	2018/02/21
Marvin Fernstrum	2018/02/21
Michael Stromberg	2018/02/21
Stuart Crabbe	2018/02/21
Todd Durand	2018/02/21
Joshua Charbonneau	2018/02/17
Alan Craig	2018/02/16
Dominic Lachance	2018/02/16
Gary Silander	2018/02/16
Jason Mattson	2018/02/16
Kevin Crocker	2018/02/16
Michael Dodge	2018/02/16
Shayne Kehl	2018/02/16
Travis Pastachak	2018/02/16
Andrew Leslie	2018/02/15
Oleg Polyau	2018/02/15
Patrick Stubbs	2018/02/15
Aurel Grandbois	2018/02/14
Daris Cowieson	2018/02/14
Gerald Elliott	2018/02/14
Lynne Brazeau	2018/02/14
Achton Favreau	2018/02/12
Brent McFarlane	2018/02/12
Gavin Paull	2018/02/12
Gregg Kozie	2018/02/12
Jamie Jorgesen	2018/02/12
Ron Hughes	2018/02/12
Timothy Duncan	2018/02/12

Trevor Judson	2018/02/12
Adam Castle	2018/02/07
Brendon Fawcett	2018/02/07
Darren Chobotar	2018/02/07
Eric Yakubicka	2018/02/07
Harvey Bunting	2018/02/07
Henri LaChance	2018/02/07
Jessica Dark	2018/02/07
Kim Chalifoux	2018/02/07
Kimley Gray	2018/02/07
Lee Gall	2018/02/07
Peter MacLaren	2018/02/07
Roy Smith	2018/02/07
Samuel Neatby	2018/02/07
Samuel Paypompee	2018/02/07
Sean Henley	2018/02/07
Thomas Mills	2018/02/07
Derek Grandbois	2018/02/05
Duane Aiton	2018/02/05
Gary Brown	2018/02/05
Gilles Sarrazin	2018/02/05
Jamie Kerr	2018/02/05
Jian Feng Wang	2018/02/05
Leonard Smith	2018/02/05
Reece Manulak	2018/02/05
Taiseer Elsabawy	2018/02/05
Todd Alcock	2018/02/05
Brandon Siclair	2018/02/03
Kris Nagy	2018/02/03
Jordan Balzar	2018/02/02
Gillian Allen	2018/01/31
Jeffrey Loeb	2018/01/31
Jeramy Bell	2018/01/31
Matthew Chochla	2018/01/31
Michael Cole	2018/01/31
Perry Miller	2018/01/31
Robert Perchuk	2018/01/31
Timo Kirchner	2018/01/31
William Johnson	2018/01/31
Brad Gabrielli	2018/01/29
Chandler Pearson	2018/01/29
Daniel Lambert	2018/01/29
Eric Pedwell	2018/01/29
Joey Morin	2018/01/29
Michael Jelencic	2018/01/29
Mikhail Rachalovskiy	2018/01/29
Rolando Rongcal	2018/01/29
Thomas Morrisseau	2018/01/29
William Krag	2018/01/29
Connor McAmmond	2018/01/24
Cory Burnett	2018/01/24
Dane Blais	2018/01/24

David Hempel	2018/01/24
Eric Judd	2018/01/24
Leslie Semmler	2018/01/24
Nick Lajoie	2018/01/24
Stephen Starkes	2018/01/24
Jose Lescano	2018/01/22
Nicholas Leininger	2018/01/22
Dustin Duguay	2018/01/20
Chris Pollard	2018/01/19
Donald Zaparniuk	2018/01/18
Joe Hainrich	2018/01/18
Cory Moberg	2018/01/17
Curtis Carl	2018/01/17
Eldon Krebs	2018/01/17
Eric O'Neill	2018/01/17
Fabian Copeland	2018/01/17
Francois Lansard	2018/01/17
Henry Sprong	2018/01/17
Jesse Twidale	2018/01/17
Mark Sawdo	2018/01/17
Ramie Fissel	2018/01/17
Aaron Cvar	2018/01/15
Andrew Morsette	2018/01/15
Ian Bates	2018/01/15
James Austin McVeigh	2018/01/15
Jeremy Asselin	2018/01/15
Josh McMahon	2018/01/15
Nicholas Kawula	2018/01/15
Richard Carlson	2018/01/15
Richard Ronmark	2018/01/15
Ronald Chapman	2018/01/15
Bradley Eric Kowalchuk	2018/01/12
Bradley Kowalchuk	2018/01/12
David Bowbell	2018/01/10
Dustin Tkachyk	2018/01/10
Ernest Holowachuk	2018/01/10
James Caul	2018/01/10
Jason Coghlan	2018/01/10
Kayla Morrison	2018/01/10
Michael Deforge	2018/01/10
Richard Lemire	2018/01/10
Timothy Friesen	2018/01/10
Wesley Caul	2018/01/10
Tammy-Lynn Kozakevich	2018/01/09
Andrea Ogden	2018/01/08
Austin Bour	2018/01/08
Christopher Roberts	2018/01/08
Guy Chretien	2018/01/08
Jeffrey Haggerty	2018/01/08
Keith Bousquet	2018/01/08
Matthew Rantala	2018/01/08
Michael McDuffee	2018/01/08

Perry French	2018/01/08
Robert Lopatka	2018/01/08
Stephen Kpabitey	2018/01/08
Tyrone Maunu	2018/01/08
Bonnie Penny	2018/01/05
Eamonn Goggin	2018/01/05
Erick Redlan	2018/01/05
Glen Bateman	2018/01/05
New user	2018/01/05
Paul Belair	2018/01/05
Steven Fry	2018/01/05
Ernesto Caner	2018/01/03
Jake McCafferty	2018/01/03
Jeremy Johnston	2018/01/03
Lawrence Buttner	2018/01/03
Marcello Locatelli	2018/01/03
Quentin Bellerose	2018/01/03
Sylvie St-Jean	2018/01/03
Tommaso Raponi	2018/01/03
Ward Howardson	2018/01/03
Leslie Abraham	2018/01/02

Name	New Gold Staff Position	Date of Orientation
Abraham Randall	Heavy Duty Mechanic	01/02/2018
French Perry	Mine Geologist	01/02/2018
Kpabitey Stephen	Drill and Blast Engineer	01/02/2018
Krueger Michael	Warehouse Supervisor	01/02/2018
McCafferty Jake	Electrician	01/02/2018
St-Jean Sylvie	Environmental Manager	01/03/2018
Fry Steven	Electrician	01/04/2018
Gebert Anthony	Senior Modelling Anyalyst	01/08/2018
Ogden Andrea	Mill Operator	01/08/2018
Caul Wesley	Surface Miner	01/09/2018
Deforge Michael	Surface Miner	01/09/2018
Dobransky Paul	Surface Miner Utility	01/09/2018
Friesen Timothy	Business Development Officer	01/09/2018
McMahon Joshua	Electrician	01/09/2018
St.Arnaud DeMarillac	Business Improvement Specialist	01/09/2018
Tkachyk Dustin	Mobile Maintenance Welder	01/09/2018
Vandenbrand Jack	Coach Operator	01/09/2018
Siemens Jack	Coach Operator	01/15/2018
Sawdo Mark	Heavy Duty Mechanic	01/16/2018
Hampel David	Open Pit Mine Superintendant	01/22/2018
Lescano Diaz Jose	Maintenance Planner Fixed Plant	01/22/2018
Boven Harrold	Coach Operator	01/23/2018
McAmmond Conner	Surface Miner Utility	01/23/2018
Mainville Andrew	Maintenance General Labourer	01/24/2018
Jelencic Michael	Mill Operator Utility	01/29/2018
Krag William	Mill Operator	01/29/2018
Morrisseau Thomas	Mill Operator	01/29/2018
Chochla Matthew	Mobile Maintenance Welder	01/31/2018
Gobeil Scott	Coach Operator	01/31/2018
Kerr Jamie	Maintenance Superintendent	02/05/2018
Sarrazin Gilles	Chief Surveyor	02/05/2018
Cheetham Matthew	Maintenance General Labourer	02/06/2018
Jewell Jordin	Maintenance General Labourer	02/06/2018
Durand Todd	Mill Superintendent	02/20/2018
Nordberg Brendan	Electrician	02/26/2018
Angus Darren	Heavy Duty Mechanic	02/27/2018
McCracken Keith	Heavy Duty Mechanic	02/27/2018
Mosbeck Kari	Cleaner	02/27/2018
Moyer Trevor	Geological Labourer	02/27/2018
Rummel Alex	Geological Labourer	02/27/2018
Davis Mark	Underground Mine Captain	03/05/2018
De Montigny Jesse	Mill Operator - Temp	03/05/2018
Gibson Harold	Truck and Coach Mechanic	03/06/2018
Krahn Calvin	Surface Miner	03/06/2018
Steele Robert	Geological Labourer	03/06/2018

Tolmay Eugene	Heavy Duty Mechanic	03/06/2018
Weir Travis	Millwright	03/06/2018
Beehan Derek	Project Manager	03/08/2018
Beehan Vivian	Mill & Commissioning Manager	03/08/2018
Anderson Christopher	Mill Labourer	03/12/2018
Bone Michael	Mill Labourer	03/12/2018
Malcolm Jordan	Mill Labourer	03/12/2018
Johnson Michael	Maintenance General Labourer	03/13/2018
Lee Dylan	Heavy Duty Mechanic	03/13/2018
Enns Joshua	Maintenance General Labourer	03/20/2018
Fernandez Antonio	Maintenance General Labourer	03/20/2018
Miller Bentley	Maintanence General Labourer	03/20/2018
Sawdo Zachary	Maintenance General Labourer	03/20/2018
Taylor Real	Maintanence General Labourer	03/20/2018
Sheppard Erika	Finance Aboriginal Trainee	03/26/2018
Haney-Slusarchuk Jorgen	Surface Miner Utility	03/27/2018
Hynes Zoe	Construction Miner	03/27/2018
Jourdain Sheldon	Surface Miner	03/27/2018
La Belle Oscar	Construction Miner	03/27/2018
Lennon Troy	Surface Miner	03/27/2018
Littlejohn Gertrude	Equipment Operator Temporary TMA	03/27/2018
Nadeau Marcel	Surface Miner	03/27/2018
Yen Chia-Fei	Senior Business Analyst	04/02/2018
Candler Peter	Construction Miner	04/03/2018
Caouette Jamie	Surface Miner	04/03/2018
Csuzdi Jesse	Surface Miner	04/03/2018
Des Roches Randy	Millwright	04/03/2018
Inkster Joel	Surface Miner	04/03/2018
Loveday Marissa	Equipment Operator Temporary TMA	04/03/2018
Potson Terry	Equipment Operator Temporary TMA	04/03/2018
Spence Mitchell	Mill Operator	04/03/2018
Beaulieu Raymon	Geological Labourer	04/09/2018
Blattner James	Surface Miner Utility	04/09/2018
Brown Trevor	Mill Labourer	04/09/2018
Brun Harold	Surface Miner	04/09/2018
Fui Edwin	Surface Miner Utility	04/09/2018
George Travis	Water Treatment Operator	04/09/2018
Mychasiw Allan	Surface Miner	04/09/2018
Paypompee Jesse	Surface Miner	04/09/2018
Ridge Zachary	Geological Labourer	04/09/2018
Sharp Chelsey	Surface Miner	04/09/2018
Smith Mylo	Mill Labourer	04/09/2018
O'Brien David	Mill Shift Supervisor	04/10/2018
Angus Jaxon	Surface Miner Utility	04/16/2018
Angus Wayne	Surface Miner	04/16/2018
Arvelin Keith	Mill Labourer	04/16/2018
Blackjack Travis	Surface Miner Utility	04/16/2018

Chaval Craig	Surface Miner	04/16/2018
Court Donnalee	Accounts Payable Officer	04/16/2018
Cousineau Joshua	Surface Miner	04/16/2018
Esselink John	Millwright	04/16/2018
Gouin Josh	Surface Miner Utility	04/16/2018
Loyie Shane	Mill Labourer	04/16/2018
Minier Alain	Assay Lab Technician	04/24/2018
Wiebe Tearyn	Assay Lab Technician	04/24/2018
Beaudrow Johnny	Heavy Duty Mechanic	05/07/2018
Bodnar Joseph	Millwright	05/07/2018
Cridland Caron	Environmental Admin Coordinator	05/07/2018
Gwirah Ebenezer	Prep Lab Technician	05/07/2018
Neilson Geoff	Surface Miner Driller	05/07/2018
Steiner Ryan	Surface Miner Utility	05/07/2018
Boshey Stacey	Surface Miner	05/14/2018
Caul Doug	Surface Miner	05/14/2018
Grynol Robin	Mill Operator	05/14/2018
Halverson Jacob	Mill Labourer	05/14/2018
Kelly Lawrence	Surface Miner	05/14/2018
Khorbaladze Irakli	Mill Operator Refinery	05/14/2018
Leonard James	Mill Labourer	05/14/2018
McEvoy Cheryl	HR Training Admin Coordinator	05/14/2018
Pangman Timithy	Maintenance General Labourer	05/14/2018
Pinder Randall	Surface Miner	05/14/2018
Sexton Lloyd	Senior Business Analyst	05/14/2018
Da Silva Fabricio	Geotechnical Engineer	05/18/2018
Griswold Ryan	Mine Engineer In Training	06/04/2018
Albright William	Lead Hand	06/11/2018
Bruce Sean	Electrician	06/11/2018
Desserre Luc	Surface Miner	06/11/2018
Handorgan Robert	Casual Assay Lab Technician	06/11/2018
Kerr Garth	Mill Trainer	06/11/2018
Loveday Christine	Surface Miner	06/11/2018
Pennell Glenn	Mill Shift Supervisor	06/11/2018
Pucci Alexander	GIS Summer Student	06/11/2018
Routhier Jordan	Welder Journeyman	06/11/2018
Sigurdson Roy	Labourer	06/11/2018
Vaillant Nathan	Heavy Duty Mechanic	06/11/2018
Dunahee Tyler	Surface Miner	06/18/2018
Dusener Dana	Undergound Surveyor	06/18/2018
Gervais Marie-Louise	Surface Miner	06/18/2018
Salmen Robert	Millwright	06/18/2018
Anderson Rudy	Pipefitter Journeyman	06/19/2018
Ogden Matthew	Mill Operator	06/26/2018
Cochrane Cassandra	Temp Community Coordinator	07/03/2018
Colby Cody	Mill Operator	07/09/2018
Eshane Gaofenngwe	Metallurgist Technician	07/09/2018

Prentice Daniel	Millwright	07/09/2018
Albert Patricia	Mill Labourer	07/16/2018
Dill James	Surface Miner Lead Hand	07/18/2018
Johnston Ashley	Surface Miner	07/25/2018
Bodnar Darryl	Surface Miner	08/13/2018
Gardner Troy	Surface Miner	08/13/2018
Goodwin William	Mill Labourer	08/13/2018
Letandre Aaron	Mill Labourer	08/13/2018
Ottertail Phillip	Mill Labourer	08/13/2018
Pollard Shawn	Utility Operator	08/13/2018
Van Ael Arthur	Mill Labourer	08/13/2018
Visser Paul	Utility Operator	08/13/2018
Whitecrow Justin	Mill Labourer	08/13/2018
Wilson Matthew	Environmental Specialist	08/13/2018
Smith Joelle	Surface Miner	08/21/2018
Emms Donald	Mill Trainer	09/04/2018
Ahrens Scott	Power Engineer	09/10/2018
Dolph Gerry	Surface Miner	09/10/2018
Dubnick Lucie	Senior Accountant	09/10/2018
Dubois Michael	Surface Miner	09/10/2018
Galusha Dwight	Surface Miner	09/10/2018
Gushulak Amy	Accounts Payable Officer	09/10/2018
Hunsperger Kelsea	Environmental Specialist	09/10/2018
Manty Kenneth	Casual Assay Lab Technician	09/10/2018
McQuaker Bret	Surface Miner	09/10/2018
Pearson Curt	Surface Miner	09/10/2018
Pitkanen Dave	Surface Miner	09/10/2018
Sinclair Erik	Millwright	09/10/2018
Singh Kailey	Surface Miner	09/10/2018
Szyszka Jonathan	Surface Miner	09/10/2018
Anderson Dylan	Surface Miner	09/17/2018
Hockley Devon	Surface Miner	09/17/2018
Lance Darwin	Surface Miner	09/17/2018
Pylypenko Oleksandra	Surface Miner	09/17/2018
Whalen William	Surface Miner	09/17/2018
Anderson Brennen	Assay Lab Technician	09/24/2018
Blackhawk Jessie Anne	Surface Miner	09/24/2018
Clifford Victoria	Surface Miner	09/24/2018
Hennessey Charles	General Manager	09/24/2018
Laco John	Surface Miner	09/24/2018
Lyons Deanne	Surface Miner	09/24/2018
Siemens Ashley	Surface Miner	09/24/2018
Venables Anthony	Surface Miner	09/24/2018
Venerus Tyler	Surface Miner	09/24/2018
Friday Espirit	Finance Aboriginal Trainee	10/01/2018
Loveday Jamie	Surface Miner	10/09/2018
Loveday Marcella	Surface Miner	10/09/2018

Manchester Trevor	Surface Miner	10/09/2018
Mantas Nicholas	Metallurgist	10/09/2018
Monkman Corey	Electrician	10/09/2018
Morrison Paul	Pipe Fitter	10/09/2018
Nordberg Kevin	Electrician	10/09/2018
Rousseau Anne Marie	Temp Community Coordinator	10/09/2018
Smith Gavin	Surface Miner Driller	10/09/2018
Stanley Sydney	Warehouse Technician	10/09/2018
Van Troyen Jonathan	Labourer	10/09/2018
Allen Roger	Geological Labourer	10/13/2018
Baldwin Jason	Surface Miner	10/15/2018
Friesen Bethany	Surface Miner	10/15/2018
Lundgren Dalton	Surface Miner	10/15/2018
Matheson Donald	Warehouse Technician	10/15/2018
Minott Donald	Millwright	10/15/2018
Morton Fredrick	Heavy Duty Mechanic	10/15/2018
Mosley Lee	Surface Miner	10/15/2018
Noseworthy Cody	Surface Miner	10/15/2018
Price Robert	Pipefitter Journeyman	10/15/2018
Mafuta Kasonga	Undergound Project Engineer	10/22/2018
Michaelis Derick	Mill Operator	10/22/2018
Mercier Jean-Francois	ERT/Security Supervisor	10/23/2018
Grolway Nicholos	Crane Operator	10/29/2018
Gregor Wayne	Geological Labourer	11/02/2018
Peckham Shayne	Millwright	11/13/2018
Sampson Brendan	Millwright	11/13/2018
Ahrens Sean	Electrician	11/19/2018
Gregoire Russell	Surface Miner	11/19/2018
Janik Sabina	Mine Site Controller	11/19/2018
Mueller Roxanne	Mill Operator	11/19/2018
Tucker Raymond	Construction Miner	11/19/2018
Grolway Nicholos	Crane Operator	11/21/2018
Richard Mark	Construction Superintendent	11/21/2018
Benoit Gilles	Mine Construction Operator - Temporary	11/26/2018
Maxton Rebekah	Surface Miner	11/26/2018
Perrault Rickey	Surface Miner	11/26/2018
Branscombe George	Construction Superintendent	11/28/2018
Mueller Norman	Mine Construction Operator - Temporary	12/04/2018
Vickell Gregg	Senior Production Metallurgist - Temp	12/04/2018
Aho Stephen	Construction Miner	12/10/2018
Jewett David	Surface Miner	12/10/2018
Lucas Raymond	Logistics Driver - Temp	12/10/2018
Palmer Luke	Welder Journeyman	12/10/2018
Taylor Dylan	Surface Miner	12/10/2018
Aouatefi Rachid	Mill Labourer	12/17/2018
Biasiol Ryan	Mill Labourer	12/17/2018
Councillor Ronald	Mill Labourer	12/17/2018

Judson Houston	Utility Operator	12/17/2018
Kelly Sean	Surface Miner	12/17/2018
Martin Michael	Construction Miner	12/17/2018
Shine Gordon	Utility Operator	12/17/2018
Spinks Mykel	Mill Shift Supervisor	12/17/2018
States Trevor	Utility Operator	12/17/2018
Vester Dillon	Mill Labourer	12/17/2018

NEW GOLD RAINY RIVER MINE
APPENDIX E
ACOUSTIC MONITORING RESULTS

RAINY RIVER PROJECT

UPDATED ACOUSTIC ASSESSMENT REPORT FOR EARLY OPERATIONS

Prepared for:
New Gold Inc.

Prepared by:
Amec Foster Wheeler
160 Traders Blvd., Suite 110
Mississauga, Ontario
L4Z 3K7

January 2018
TC111504

January 17, 2018

TC111504

Mr. Nigel Fisher, Environmental Superintendent
New Gold Inc.
Rainy River Project
317 Heatwole Road
Barwick, Ontario, Canada, P0W 1E0

Dear Mr. Fisher:

Re: Rainy River Project, Updated Acoustic Assessment Report for Early Operations

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited, is pleased to provide the attached Updated Acoustic Assessment Report (AAR) for the Rainy River Project (RRP).

The original AAR was prepared in support of the Environmental Compliance Approval – Air and Noise and it addressed sound impacts from the development and operational phases. The current update addresses the RRP early operation phase which is a transitional phase from the development phase into operation. The current update also incorporates source sound data collected during our recent field measurements.

We greatly appreciate the opportunity to provide support for the Rainy River Project. Should you have any questions regarding the study, please do not hesitate to contact us.

Yours sincerely,
Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited
<Original signed by>

Dan Russell, P.Geo.
Senior Environmental Geoscientist

Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited
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EXECUTIVE SUMMARY

The Rainy River Project (RPP) site is within the Township of Chapple, approximately 65 kilometres (km), by road, northwest of Fort Frances within northwestern Ontario. Amec Foster Wheeler Environment & Infrastructure (Amec Foster Wheeler) was retained by New Gold Inc. (New Gold) to update the Acoustic Assessment Report (AAR) to satisfy the conditions in the Environmental Compliance Approval (ECA) for the RRP site. The RRP currently operates under ECA No. 0412-A2LR4V, issued on September 24, 2015.

The original AAR [1] was prepared in support of the ECA application and it addressed sound impacts from the development and operational phases. The RRP is currently in transition from the development phase to the operational phase. During this transitional phase some of the development phase activities will overlap with operation phase activities. The current update only addresses sound impacts from the RRP transition phase (early operations) as this aspect was not assessed in the original AAR. This report provides a complete AAR for the early operation phase. The life of mine operations will be assessed separately prior to start of underground mining operations.

The current update excludes the receptors (Points of Reception 05, 13, 18 and 26) which have been acquired by New Gold since the original AAR was prepared. The current update also incorporates source sound data collected from the field measurements on September 2017.

The main activities associated with the early operation phase include aggregate extraction, material handling, vehicle movement, plant operations, crushing operations and other mining fleet operations. However, the underground portal has yet to be developed and underground mining is expected to start in 2019. Therefore, sound sources associated with the underground operations are excluded from the current assessment, they will only be included with the assessment for life of mine operations.

A blast impact assessment was previously completed for the site by Amec Foster Wheeler under a separate cover [2]. An update of the blast impact assessment is not required as there are no changes to the blast location or charge size.

The RRP site operates 24 hours per day, 7 days per week. Nineteen types of significant sound sources were identified at the RRP site and included in this assessment. The emergency generators (EG1 and EG2) and fire pumps are assessed separately as required by the guidelines for the testing purpose only.

Twenty-two representative Points of Reception were identified and considered for this assessment, including six accessible vacant lot receptors.

The applicable guideline for the RRP site is the Ministry of the Environment and Climate Change (MOECC) Environmental Noise Guideline NPC-300, ‘’Noise Assessment Criteria for Stationary Sources and for Land Use Planning.” The RRP site is located in a rural area which is best

described as a Class 3 area in accordance with the area classifications defined within Publication NPC-300.

Receptor sound impacts associated with the RRP early operations were assessed through predictive acoustic modelling. The MOECC exclusionary sound level limits were used for this assessment. Under the predictable worst-case sound emission scenario, the RRP site is predicted to operate in compliance with the applicable MOECC NPC-300 guideline for day-time, evening and night-time during early operation phase.

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1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure (Amec Foster Wheeler) was retained by New Gold Inc. (New Gold) to update the Acoustic Assessment Report (AAR) to support the Environmental Compliance Approval (ECA) for the Rainy River Project (RRP). The RRP currently operates under ECA No. 0412-A2LR4V, issued on September 24, 2015.

An AAR [1] was prepared by Amec Foster Wheeler in September 2014 in support of the ECA (Air and Noise) application, and it addressed sound impacts from development and operational phases. The RRP is currently in transition from the development phase to the operational phase. During this transitional phase some of the development phase activities will overlap with operational phase activities. The underground mining operations have not yet commenced but are expected to start in 2019. The current update only addresses sound impacts from the RRP transitional phase (early operations) as this aspect was not assessed in the original AAR. The life of mine operations will be assessed separately prior to start of underground mining operations.

The RRP site does not have any large sources of vibration other than blasting activity at the site. As such, this assessment focuses only on potential steady sound impacts from the RRP site. A blast impact assessment was previously completed for the site by Amec Foster Wheeler under a separate cover [2]. An update of the blast impact assessment is not required as there are no changes to the blast location or charge size.

The current update excludes the Points of Reception (PORs) 05, 13, 18 and 26 which have been acquired by New Gold since the original AAR was prepared. The current update also incorporates source sound data collected from the field measurements on September 2017. This report provides a complete AAR for the early operation and is intended to meet the Ministry of the Environment and Climate Change (MOECC) requirements outlined in References [3] and [4].

A completed copy of the Acoustic Assessment Report Checklist, as required by Reference [3], has been included in Appendix A.

An Emissions Summary and Dispersion Modelling Report (ESDM report) for the site was completed by Amec Foster Wheeler in support of the ECA application. Where possible, we have used the same source names and identification numbers in this AAR as those used within the ESDM report.

2.0 PROJECT DESCRIPTION

The RRP site is within the Township of Chapple, approximately 65 kilometres (km), by road, northwest of Fort Frances within northwestern Ontario. The maximum expected ore production during the operation phase is approximately 7,200 kilotonnes (kt) per year of ore and that includes both open pit and underground mining operations. In order to achieve the annual production rate, daily ore production rates may vary but is not expected to exceed 32 kt per day. The North American Industry Classification System (NAICS) code for the RRP site is 212220 described as “Gold and Silver Ore Mining.”

The RRP includes an open pit, underground mine, processing plant, and related facilities and infrastructure. Overburden and mine rock removed from the open pit are stored in stockpiles nearby. Ore is processed at the onsite processing plant. The RRP is currently in transition from development phase to operation. The current activities at the site include aggregate extraction, material handling, vehicle movement, plant operations, crushing operations and other mining fleet operations.

The area surrounding the RRP site is a rural area with an acoustical environment dominated by natural sounds having little or no road traffic. However, the receptors along Highway 600 experience high background sound levels during daytime from Highway 600 traffic.

The following figure and appendices provide information about the RRP site and points of reception location and surrounding land uses:

- Figure 1: Site Aerial Map with Points of Reception Location;
- Appendix B: Land-use Zoning Map of the Site and Surrounding Area; and
- Appendix C: Site Layout.

The RRP site operates 24 hours per day and 7 days per week.

3.0 SOUND SOURCE SUMMARY

There are 19 types of sound sources identified as significant (i.e., as emitting sound at a level where their cumulative impacts could be of concern) at the RRP site for the early operational phase. Where possible, the same source names and identification numbers as provided within the ESDM report have been used.

The significant sound sources identified are summarized below:

- 4 blast hole drills (2 Sandvik DR461i and 2 Sandvik DP1500i);
- 2 reverse circulation drills (Sandvik DR580);
- 6 diesel powered excavators (1 Komatsu PC8000, 2 Komatsu PC5500, 1 Komatsu PC3000, 1 Komatsu PC800LC and 1 Komatsu PC360LC);
- 15 track dozers (Komatsu D375, Komatsu D475, CAT D8, CAT D9, CAT D10 and CAT D11);
- 2 wheel loaders (Komatsu WA1200 and WA900);
- 1 wheel dozer (Komatsu KM WD600);
- 2 water trucks per hour on any haul routes (Komatsu CR20000);

- 1 motor grader per hour on any haul routes (CAT16H, 16M and 24M);
- 4 truck routes (Pit-PAG with 17 truck round trips/hour, Pit-NPAG/OB with 27 truck round trips/hour and Pit-stockpile with 6 truck round trips/hour) with Komatsu 830E trucks;
- 4 aggregate pits (LD4, Roen, Outcrop 3 and East Outcrop) each with portable a crusher, screener, loader, excavator and a truck route;
- 1 primary crusher;
- 2 dust collectors (primary and reclaim dust collectors);
- 1 wet scrubber (pebble crusher scrubber);
- 4 air compressors at Water Management Pond;
- 20 water pumps for dewatering operations in the pit and other areas;
- 1 power generator (CAT 660 kilowatts; kW) at Pinewood River pumphouse;
- 2 emergency generators (CAT 2,500 kW each) at the process plant;
- 2 fire pumps at the process plant; and
- 2 substation transformers at the process plant.

Sound emissions for many of the sources associated with the RRP were measured in the field by Amec Foster Wheeler (see Appendix D for measurements details). Where sound measurements were available the sound power levels were calculated from the measured levels. Sound levels for the generators, fire pumps and screeners were taken from manufacturer's datasheets. Komatsu 830E trucks with and without load were measured for the haul routes since the empty trucks were much quieter than the fully loaded trucks. Empty trucks were found to emit sound levels of approximately 11 decibel (dB) lower when compared with fully loaded trucks.

A summary of the significant sound sources is provided in Table 1, including sound power levels, sound characteristics, and any sound control measures. The locations of the sound sources considered in the assessment are shown in Figure 2.

The MOECC NPC-104 guideline prescribes adjustments for sources with special qualities or characters of sound. These are punitive adjustments which apply to sound sources with subjectively annoying characteristics, including tonal sounds, quasi-impulsive sounds, and beating sounds (sounds with cyclically varying amplitudes). Therefore, a tonal penalty of 5 dB was applied to the substation transformers, Komatsu D475 track dozers and Komatsu PC3000 excavator, as they exhibit tonal characteristics based on the mathematical qualification which is

outlined in Reference [5]. The measured equipment sound levels and sound calculations are provided in Appendix D.

All insignificant sound sources at the RRP site are listed in Appendix E.

Details of the RRP site sound sources are provided in the following table, figure and appendices:

- Table 1: Significant Sound Source Summary;
- Figure 2: Significant Sound Source Locations;
- Appendix D: Sound Measurement Details and Calculations; and
- Appendix E: List of Insignificant Sound Sources.

4.0 SOUND MITIGATION MEASURES SUMMARY

New Gold has taken a proactive approach to minimize sound impacts to neighbors and mitigation measures have been incorporated into the project from the onset of design. These measures are inherent to the current design of the RRP site and are reflected in the noise model predictions.

The sound pressure level of the emergency generators EG1 and EG2 is 80 A-weighted decibels (dBA) at 15 metres (m) and 74 dBA at 15 m for the power generator PG1 (660 kW).

As part of the sound mitigation, the following are considered for the RRP early operations:

- Aggregate pit operations are limited to daytime only (07:00 to 19:00), except for East Outcrop. Crushing operations at East Outcrop aggregate pit, and truck hauling/loading operations at all aggregate pits can be done 24 hours/day.

- The operation of the Komatsu D475 track dozers is limited to daytime only at the stockpiles (e.g., PAG, NPAG and ore stockpiles). Other track dozer models (e.g., Komatsu D375, CATD8, D9, or D10) can be used at those locations during evening and night-time periods (19:00 to 07:00).

- Emergency generators and fire pumps are expected to test during daytime only.

- Open pit bottom elevation is currently at 270 m which provides sufficient screening to the fleet equipment in the open pit.

The type of trucks used for the material handling and the number of round trips considered in the assessment are summarized in Appendix D.

5.0 POINT OF RECEPTION SUMMARY

Noise sensitive receptors of interest under NPC-300 guidelines include the following sound sensitive land uses:

- Permanent, seasonal, or rental residences;
- Hotels, motels and campgrounds;
- Schools, universities, libraries and daycare centres;
- Hospitals and clinics, nursing / retirement homes; and
- Churches and places of worship.

Three vacant lot receptors and one existing dwelling near Pinewood river (PORs 05, 13, 18 and 26) were acquired by New Gold since the original AAR was prepared. Therefore, these receptors have been removed from this assessment. A total of 22 representative (most-exposed) points of reception (PORs), including 6 accessible vacant lots, were identified and considered in this acoustic assessment. The existing dwellings identified in the area are two-storey houses.

The receptor location considered for the existing dwellings is given below:

- For the Plane of Window PORs, the receptor location is at 4.5 m above ground for a two-storey house (i.e., highest window level); and

- For the Outdoor PORs, the receptor location is at 1.5 m above ground within 30 m of a facade of a dwelling.

The receptor location for the vacant lots is chosen at 4.5 m height. The receptors presented for the existing dwellings in this report are the worst-impacted receptor location only. The PORs considered in the assessment are shown in Figure 1.

6.0 APPLICABLE SOUND GUIDELINES

The applicable guideline used for the RRP site is the MOECC Environmental Noise Guideline NPC-300, NPC-300 establishes four classes of acoustical environment to classify ambient background sound environment and establish class specific assessment sound level limits. The MOECC classifications, based on ambient background sound, are given below:

- Class 1 Area is used to describe an area with an acoustical environment typical of a major population centre, where the background sound level is dominated by the urban hum.

- Class 2 Area defines an area with an acoustical environment that has qualities representative of both Class 1 and Class 3 Areas. That means, absence of urban hum or a low ambient sound level is expected during early evening (i.e., between 19:00 and 23:00) than that in Class 1 Areas.

- Class 3 Area means a rural area with an acoustical environment dominated by natural sounds having little or no road traffic. Examples are small communities with populations of less than 1,000, agricultural areas, rural recreational areas, such as a cottage or a resort area, and wilderness areas.

- Class 4 Area is a newly classified area that would otherwise be defined as Class 1 (urban) or Class 2 (suburban). It has a relaxed criterion compared to any other Classes, is added for the new sound-sensitive developments in the industrial areas.

The area surrounding the RRP is best described as a Class 3 Area as per the guideline. NPC-300 states that non-impulsive (steady) one hour sound levels (L_{eq-1hr}) from stationary sound sources in Class 3 Areas shall not exceed that of the background, where the background (typically caused by natural sound sources) is considered to be:

- The higher of 45 dBA MOECC exclusionary sound level limit or background sound at both outdoor and plane of window receptor locations during day-time hours (07:00 to 19:00); and

- The higher of 40 dBA MOECC exclusionary sound level limit or background sound at both outdoor and plane of window receptor during the early evenings (19:00 to 23:00), and at the plane of window during night-time (23:00 to 07:00).

The guidelines also stipulate that the assessment consider the potential sound impact during a predictable worse case hour of operation, which is defined as a situation when the normally busy activity of the sources coincides with a low hourly background sound level. The MOECC's exclusionary sound limits were used for this assessment.

The non-emergency operation (i.e., testing and maintenance) of the emergency generators and fire pumps is assessed separately as required by the NPC-300 guidelines and a criterion of 50 dBA for Class 3 area is used for the assessment as they are tested during daytime hours only.

7.0 SOUND IMPACT ASSESSMENT

7.1 Methodology

The sound assessment for the RRP early operations was completed using a sound prediction software package (CadnaA), published by Datakustik GmbH and configured to implement the ISO 9613-2 environmental sound propagation algorithms. Off-site sound exposures due to the early operations were modelled. The CadnaA sound modelling software is widely accepted by the consulting industry and by the MOECC. All sound sources were assumed to operate simultaneously to model the predictable worst-case scenario.

In order to provide a better sound prediction at the receptor locations, due to sound emissions from a specific source(s), the modelling took into account the following factors:

- Source sound power level and directivity;
- Distance attenuation;
- Source-receptor geometry, including heights and elevations;
- Barrier effects of the building and surrounding topography;

- Ground and air (atmospheric) attenuation; and
- Foliage attenuation.

Komatsu 830E trucks with load and without are modelled separately for the haul routes since the sound levels measured for the empty trucks are about 11 dB lower than the fully loaded trucks. Water trucks and graders are modeled as line sources as they are moving along the haul routes within the site. For graders and track dozers, sound data for the loudest equipment model was used for this assessment to model the worst-case scenario without restricting operation of any of those equipment model to any particular area.

The predictable worst-case sound impact was modelled and assessed at the receptor locations. The RRP site operates 24 hours per day. However, the aggregate pits are expected to operate during daytime only, except loading and hauling. Therefore, the acoustic modelling has been completed for both daytime and night-time operations. The testing of emergency generators and fire pumps is assessed separately as required by the guidelines.

7.2 Modelling Results

The combined steady sound levels ($L_{eq\text{-}1hr}$) in dBA values for the predictable worst-case for the RRP early operations were calculated at the identified points of reception using sound emissions from the individual significant sources, as summarized in Table 1. The sound contours for the predictable worst-case operation are shown in Figures 3 through 5, and a point of reception impact summary is provided in Table 2 as required by the MOECC. The values provided in Table 2 represent individual contributions at the receptor locations from each of the sources identified in Table 1.

An acoustic assessment summary is provided in Table 3. Under the predicable worst-case sound emission scenario, the RRP early operations are predicted to be in compliance with the applicable MOECC NPC-300 guideline for day-time, evening and night-time operations. The sound levels at the receptors reported as part of this acoustic assessment represent the predictable worst-case operational impact. Key parameters included in the model and sample calculations are provided in Appendix F.

8.0 CONCLUSIONS

The AAR for the RRP early operations has been updated to address the changes during the RRP transition phase. Twenty-two PORs, including six accessible vacant lot receptors, are identified in the vicinity of the site and considered for this assessment. The existing PORs included in the assessment are 2-storey residential dwellings surrounding the site.

Receptor sound impact associated with the RRP early operations was assessed through predictive acoustic modelling. The MOECC exclusionary sound level limits were used as the criteria for the assessment. Under the predictable worst-case operational scenario, the RRP early operations sound levels at the receptor locations are expected to meet the applicable MOECC NPC-300 guideline limits for day-time, evening and night-time.

Therefore, the RRP early operations are expected to be in compliance with the applicable MOECC NPC-300 guideline sound level limits for day-time, evening and night-time.

9.0 REFERENCES

[1] AMEC Environment & Infrastructure. 2014. Acoustic Assessment Report for Rainy River Project. September 2014.

[2] AMEC Environment & Infrastructure. 2014. Blasting Vibration and Overpressure Sound Assessment Report for Rainy River Project. April 2013.

[3] Ontario Ministry of the Environment and Climate Change (MOECC), *Guide for Applying for Approval (Air & Noise) s.9 EPA*, February 2005.

[4] Ontario Ministry of the Environment and Climate Change (MOECC) Publication NPC-233, *Information to be Submitted for Approval of Stationary Sources of Sound*, October 1995.

[5] ISO 1996-2:2007(E). *Description, measurement and assessment of environmental noise - Part 2: Determination of environmental noise levels*.

[6] Ontario Ministry of the Environment and Climate Change (MOECC) Publication NPC-104, *Sound Level Adjustments*, published under the Model Municipal Noise Control Bylaw, 1977.

[7] ISO-9613-1. *Acoustics – Attenuation of Sound during propagation outdoors*. *Part 1 – Calculation of the absorption of sound by the atmosphere.*

[8] ISO-9613-2. *Acoustics – Attenuation of Sound during propagation outdoors*. *Part 2 – General method of calculation.*

[9] Ontario Ministry of the Environment and Climate Change (MOECC) Publication NPC-300, *Noise Assessment Criteria for Stationary Sources and for Land Use Planning*, August 2013.

10.0 CLOSING

This updated acoustic assessment report was prepared by Amec Foster Wheeler for the sole benefit of New Gold Inc. for specific application to the Rainy River Project. The quality of information, conclusions and estimates contained herein are consistent with the level of effort involved in Amec Foster Wheeler's services and based on: i) information available at the time of preparation, ii) data supplied by outside sources and iii) the assumptions, conditions and qualifications set forth in this document.

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If you require further information regarding the above or the project in general, please contact the undersigned at (905) 568-2929. Thank you for the opportunity to be of service to New Gold Inc.

Yours truly,
Amec Foster Wheeler Environment & Infrastructure
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Table 1: Noise Source Summary

Project: RRP
Location: Township of Chapple ON

Source ID	Source Description	Sound Power Level (dBA/dBAI)	Source Location [1] (I or O)	Sound Characteristics [2] (S,Q,I,B,T,C)	Noise Control Measures [3] (S,A,B,L,E,O,U)
AC1	WMP Air Compressor 1	99	O	S	U
AC2	WMP Air Compressor 2	99	O	S	U
AC3	WMP Air Compressor 3	99	O	S	U
AC4	WMP Air Compressor 4	99	O	S	U
BD1	Blast Hole Drill 1- Sandvik DR461i	121	O	S	U
BD2	Blast Hole Drill 2- Sandvik DR461i	121	O	S	U
BD3	Blast Hole Drill 3 - Sandvik DP1500i	117	O	S	U
BD4	Blast Hole Drill 4 - Sandvik DP1500i	117	O	S	U
C	Crusher	111	O	S	U
DC1	Dust Collector 1	105	O	S	U
DC2	Dust Collector 2	105	O	S	U
E1	Komatsu Diesel Excavator PC5500	116	O	S	U
E2	Komatsu Diesel Excavator PC5500	116	O	S	U
E3	Komatsu Diesel Excavator PC8000	121	O	S	U
E4	Komatsu Diesel Excavator PC3000	125	O	S, T	U
E5	Komatsu Diesel Excavator PC800LC	113	O	S	U
E6	Komatsu Diesel Excavator PC360LC	116	O	S	U
EO_E	East Outcrop Aggregate Pit Excavator PC360LC	116	O	S	U
EO_FEL	East Outcrop Graval Pit Mobile Crushing Plant Loader (CAT 966H)	114	O	S	U
EO_PS	East Outcrop Graval Pit Mobile Primary Crusher (PowerScreen)	119	O	S	U
EO_SCNR	East Outcrop Graval Pit Mobile Screener (Atlas Copco HCS3715)	102	O	S	U
LD4_E	LD4 Aggregate Pit Excavator PC360LC	116	O	S	U
LD4_FEL	LD4 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	114	O	S	U
LD4_PS	LD4 Graval Pit Mobile Primary Crusher (PowerScreen)	119	O	S	U
LD4_SCNR	LD4 Graval Pit Mobile Screener (Atlas Copco HCS3715)	102	O	S	U
Outcrop3_E	Outcrop 3 Aggregate Pit Excavator PC360LC	116	O	S	U
Outcrop3_FEL	Outcrop 3 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	114	O	S	U
Outcrop3_PS	Outcrop 3 Graval Pit Mobile Primary Crusher (PowerScreen)	119	O	S	U
Outcrop3_SCNR	Outcrop3 Graval Pit Mobile Screener (Atlas Copco HCS3715)	102	O	S	U
PG1	Pinewood River Pumphouse Generator (CAT 660 kW)	105	O	S	E,S
RD1	RC Drill Sandvik DR580	119	O	S	U
RD2	RC Drill Sandvik DR580	119	O	S	U
Roen_E	Roen Aggregate Pit Excavator PC360LC	116	O	S	U
Roen_FEL	Roen Graval Pit Mobile Crushing Plant Loader (CAT 966H)	114	O	S	U
Roen_PS	Roen Graval Pit Mobile Primary Crusher (PowerScreen)	119	O	S	U
Roen_SCNR	Roen Graval Pit Mobile Screener (Atlas Copco HCS3715)	102	O	S	U
T1	Transformer 1	113	O	S, T	U
T2	Transformer 2	113	O	S, T	U
TD01	Track Dozer 01 (Pit - Komatsu D475)	121	O	S, T	U
TD02	Track Dozer 02 (Pit -CAT D10)	121	O	S, T	U
TD03	Track Dozer 03 (Pit -CAT D10)	121	O	S, T	U
TD04	Track Dozer 04 (Pit -CAT D10)	115	O	S	U
TD05	Track Dozer 05 (PAG - Komatsu D375)	115	O	S	U
TD06	Track Dozer 06 (PAG - Komatsu D375)	115	O	S	U
TD07	Track Dozer 07 (PAG - Komatsu D475)	121	O	S, T	U

Table 1: Noise Source Summary

Project: RRP
Location: Township of Chapple ON

Source ID	Source Description	Sound Power Level (dBA/dBAI)	Source Location [1] (I or O)	Sound Characteristics [2] (S,Q,I,B,T,C)	Noise Control Measures [3] (S,A,B,L,E,O,U)
TD08	Track Dozer 08 (PAG - Komatsu D375)	121	O	S, T	U
TD09	Track Dozer 09 (Ore -CAT D9)	115	O	S	U
TD10	Track Dozer 10 (Ore -CAT D8)	115	O	S	U
TD11	Track Dozer 11 (NPAG/OB - Komatsu D475)	121	O	S, T	U
TD12	Track Dozer 12 (NPAG/OB - Komatsu D375)	121	O	S, T	U
TD13	Track Dozer 13 (NPAG/OB -CAT D9)	115	O	S	U
TD14	Track Dozer 14 (NPAG/OB -CAT D9)	115	O	S	U
TD15	Track Dozer 15 (NPAG/OB -CAT D9)	115	O	S	U
TD16	Track Dozer 16 (NPAG/OB -CAT D9)	115	O	S	U
WD	Komatsu Wheel Dozer KM WD600	105	O	S	U
WL1	Komatsu Wheel Loader WA1200	117	O	S	U
WL2	Komatsu Wheel Loader WA900	117	O	S	U
WP01	Water Pump WP01	106	O	S	U
WP02	Water Pump WP02	106	O	S	U
WP03	Water Pump WP03	106	O	S	U
WP04	Water Pump WP04	106	O	S	U
WP05	Water Pump WP05	106	O	S	U
WP06	Water Pump WP06	106	O	S	U
WP07	Water Pump WP07	106	O	S	U
WP08	Water Pump WP08	106	O	S	U
WP09	Water Pump WP09	106	O	S	U
WP10	Water Pump WP10	106	O	S	U
WP11	Water Pump WP11	106	O	S	U
WP12	Water Pump WP12	106	O	S	U
WP13	Water Pump WP13	106	O	S	U
WP14	Water Pump WP14	106	O	S	U
WP15	Water Pump WP15	106	O	S	U
WP16	Water Pump WP16	106	O	S	U
WP17	Water Pump WP17	106	O	S	U
WP18	Water Pump WP18	106	O	S	U
WP19	Water Pump WP19	106	O	S	U
WP20	Pinewood River Water Pump	106	O	S	U
WS	Wet Scrubber	105	O	S	U
MGR_SP	Motor Grader Route Stockpile	111	O	S	U
MGR_NPAG	Motor Grader Route NPAG	111	O	S	U
MGR_OB	Motor Grader Route OB	111	O	S	U
MGR_OPMill	Motor Grader Route Open Pit to Mill	111	O	S	U
MGR_PAG	Motor Grader Route PAG	111	O	S	U
TRE_NPAG	Truck Route-NPAG (Empty Truck)	108	O	S	U
TRE_OB	Truck Route-Overburden (Empty Truck)	108	O	S	U
TRE_OPMill	Truck Route Open Pit to Mill (Empty Truck)	108	O	S	U
TRE_PAG	Truck Route PAG (Empty Truck)	108	O	S	U
TRE_SP	Truck Route Stockpile (Empty Truck)	108	O	S	U
TRL_NPAG	Truck Route-NPAG (Loaded Truck)	119	O	S	U
TRL_OB	Truck Route-Overburden (Loaded Truck)	119	O	S	U
TRL_OPMill	Truck Route Open Pit to Mill (Loaded Truck)	119	O	S	U

Table 1: Noise Source Summary

Project: RRP
Location: Township of Chapple ON

Source ID	Source Description	Sound Power Level (dBA/dBAI)	Source Location [1] (I or O)	Sound Characteristics [2] (S,Q,I,B,T,C)	Noise Control Measures [3] (S,A,B,L,E,O,U)
TRL_PAG	Truck Route PAG (Loaded Truck)	119	O	S	U
TRL_SP	Truck Route Stockpile (Loaded Truck)	119	O	S	U
WTR_NPAG	Water Truck Route NPAG	114	O	S	U
WTR_OB	Water Truck Route OB	114	O	S	U
WTR_OPMill	Water Truck Route Open Pit to Mill	114	O	S	U
WTR_PAG	Water Truck Route PAG	114	O	S	U
WTR_SP	Water Truck Route Stockpile	114	O	S	U
LD4_TR	LD4 Aggregate Pit Truck Route	107	O	S	U
OC3_TR	OC3 Aggregate Pit Truck Route	107	O	S	U
EO_TR	EO Aggregate Pit Truck Route	107	O	S	U
Roen_TR	Roen Aggregate Pit Truck Route	107	O	S	U
EG1	Emergency Generator 1 (CAT 2.5 MW)	129	O	S	U
EG2	Emergency Generator 2 (CAT 2.5 MW)	129	O	S	U
FP1	Fire Pump 1	137	O	S	U
FP2	Fire Pump 2	137	O	S	U

Notes: 1. Source Location: O = Outside of building, including the roof, I = Inside of building

2. Sound Characteristic, per NPC-104

S = Steady; I = Impulsive; T = Tonal
Q = Quasi-Steady Impulsive; B = Buzzing; C = Cyclic

3. Noise Control Measures To Be Included

S = Silencer/Muffler; L = Lagging; O = other
A = Acoustic lining, plenum; E = acoustic enclosure; U = uncontrolled
B = Barrier

4 Sound power levels include 5 dB tonal penality for the sources with tonal characteristics.

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

Source ID	Source Description	Point of Reception ID	POR01			Point of Reception ID	POR02			Point of Reception ID	POR03			Point of Reception ID	POR04			Point of Reception ID	POR06		
		Point of Reception Description	House 01 - North			Point of Reception Description	House 02 - East			Point of Reception Description	House 03 - East			Point of Reception Description	House 04 - East			Point of Reception Description	House 06 -Southeast		
		Point of reception coordinates	X	Y	Z	Point of reception coordinates	X	Y	Z	Point of reception coordinates	X	Y	Z	Point of reception coordinates	X	Y	Z	Point of reception coordinates	X	Y	Z
			424437	5415498	391.2		431274	5412538	384.5		431587	5411870	389.5		431496	5411644	389.5		431077	5408660	374.5
		Point of Reception 1				Point of Reception 2				Point of Reception 3				Point of Reception 4				Point of Reception 5			
		Distance	Sound Level	Units		Distance	Sound Level	Units		Distance	Sound Level	Units		Distance	Sound Level	Units		Distance	Sound Level	Units	
		(m)	at PoR			(m)	at PoR			(m)	at PoR			(m)	at PoR			(m)	at PoR		
AC1	WMP Air Compressor 1	5191	-6	dBA		10121	-7	dBA		10382	-7	dBA		10284	-7	dBA		10245	-7	dBA	
AC2	WMP Air Compressor 2	5607	-7	dBA		10858	-8	dBA		11130	-8	dBA		11035	-8	dBA		11000	-8	dBA	
AC3	WMP Air Compressor 3	5323	-8	dBA		11091	-8	dBA		11409	-8	dBA		11329	-8	dBA		11482	-9	dBA	
AC4	WMP Air Compressor 4	4668	-6	dBA		9945	-7	dBA		10244	-6	dBA		10159	-7	dBA		10291	-8	dBA	
BD1	Blast Hole Drill 1- Sandvik DR461i	5979	13	dBA		6525	13	dBA		6546	13	dBA		6385	14	dBA		5710	14	dBA	
BD2	Blast Hole Drill 2- Sandvik DR461i	5982	13	dBA		6510	13	dBA		6531	13	dBA		6370	14	dBA		5695	14	dBA	
BD3	Blast Hole Drill 3 - Sandvik DP1500i	6046	6	dBA		6573	6	dBA		6587	7	dBA		6424	7	dBA		5717	7	dBA	
BD4	Blast Hole Drill 4 - Sandvik DP1500i	6049	6	dBA		6560	6	dBA		6574	7	dBA		6411	7	dBA		5703	7	dBA	
C	Crusher	5783	14	dBA		5066	14	dBA		5090	14	dBA		4934	11	dBA		4572	9	dBA	
DC1	Dust Collector 1	5746	7	dBA		5042	9	dBA		5072	10	dBA		4917	7	dBA		4582	8	dBA	
DC2	Dust Collector 2	5474	6	dBA		5098	5	dBA		5167	6	dBA		5022	6	dBA		4819	5	dBA	
E1	Komatsu Diesel Excavator PC5500	5977	15	dBA		6556	15	dBA		6578	15	dBA		6417	16	dBA		5742	16	dBA	
E2	Komatsu Diesel Excavator PC5500	6003	15	dBA		6438	15	dBA		6454	15	dBA		6291	16	dBA		5610	16	dBA	
E3	Komatsu Diesel Excavator PC8000	6019	20	dBA		6487	20	dBA		6503	20	dBA		6340	20	dBA		5649	20	dBA	
E4	Komatsu Diesel Excavator PC3000	6036	24	dBA		6524	24	dBA		6538	24	dBA		6375	24	dBA		5674	24	dBA	
E5	Komatsu Diesel Excavator PC800LC	6056	10	dBA		6416	10	dBA		6425	10	dBA		6261	8	dBA		5556	11	dBA	
E6	Komatsu Diesel Excavator PC360LC	6037	13	dBA		6483	13	dBA		6496	13	dBA		6334	13	dBA		5634	14	dBA	
EO_E	East Outcrop Aggregate Pit Excavator PC360LC	6394	15	dBA		5302	15	dBA		5241	16	dBA		5063	16	dBA		4307	16	dBA	
EO_FEL	East Outcrop Graval Pit Mobile Crushing Plant Loader (CAT 966H)	6413	19	dBA		5301	19	dBA		5237	19	dBA		5059	16	dBA		4292	19	dBA	
EO_PS	East Outcrop Graval Pit Mobile Primary Crusher (PowerScreen)	6400	18	dBA		5311	18	dBA		5249	18	dBA		5071	18	dBA		4310	19	dBA	
EO_SCNR	East Outcrop Graval Pit Mobile Screener (Atlas Copco HCS3715)	6392	6	dBA		5327	6	dBA		5266	7	dBA		5089	8	dBA		4329	7	dBA	
LD4_E	LD4 Aggregate Pit Excavator PC360LC	5322	9	dBA		8533	8	dBA		8696	9	dBA		8570	9	dBA		8234	8	dBA	
LD4_FEL	LD4 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	5283	14	dBA		8459	14	dBA		8622	14	dBA		8497	14	dBA		8170	14	dBA	
LD4_PS	LD4 Graval Pit Mobile Primary Crusher (PowerScreen)	5313	11	dBA		8520	11	dBA		8683	11	dBA		8557	11	dBA		8224	10	dBA	
LD4_SCNR	LD4 Graval Pit Mobile Screener (Atlas Copco HCS3715)	5305	1	dBA		8467	0	dBA		8629	1	dBA		8503	1	dBA		8168	0	dBA	
Outcrop3_E	Outcrop 3 Aggregate Pit Excavator PC360LC	6737	17	dBA		3527	18	dBA		3398	19	dBA		3212	23	dBA		2909	19	dBA	
Outcrop3_FEL	Outcrop 3 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	6711	21	dBA		3542	22	dBA		3418	22	dBA		3233	25	dBA		2939	22	dBA	
Outcrop3_PS	Outcrop 3 Graval Pit Mobile Primary Crusher (PowerScreen)	6738	22	dBA		3536	23	dBA		3406	23	dBA		3220	26	dBA		2911	21	dBA	
Outcrop3_SCN	Outcrop3 Graval Pit Mobile Screener (Atlas Copco HCS3715)	6735	11	dBA		3573	11	dBA		3443	12	dBA		3257	11	dBA		2927	9	dBA	
PG1	Pinewood River Pumphouse Generator (CAT 660 kW)	12239	0	dBA		16620	0	dBA		16711	0	dBA		16560	0	dBA		15573	0	dBA	
RD1	RC Drill Sandvik DR580	6094	15	dBA		6340	15	dBA		6342	16	dBA		6177	10	dBA		5458	14	dBA	
RD2	RC Drill Sandvik DR580	6119	15	dBA		6363	15	dBA		6363	16	dBA		6197	8	dBA		5464	12	dBA	
Roen_E	Roen Aggregate Pit Excavator PC360LC	4142	15	dBA		5610	15	dBA		5846	15	dBA		5748	14	dBA		6071	12	dBA	
Roen_FEL	Roen Graval Pit Mobile Crushing Plant Loader (CAT 966H)	4215	19	dBA		5525	18	dBA		5754	18	dBA		5654	18	dBA		5967	16	dBA	
Roen_PS	Roen Graval Pit Mobile Primary Crusher (PowerScreen)	4125	17	dBA		5638	17	dBA		5875	17	dBA		5778	16	dBA		6101	14	dBA	
Roen_SCNR	Roen Graval Pit Mobile Screener (Atlas Copco HCS3715)	4168	6	dBA		5698	5	dBA		5929	5	dBA		5829	5	dBA		6116	3	dBA	
T1	Transformer 1	4865	16	dBA		4743	15	dBA		4910	15	dBA		4794	15	dBA		5043	12	dBA	
T2	Transformer 2	4876	16	dBA		4747	15	dBA		4911	15	dBA		4795	15	dBA		5037	13	dBA	
TD01	Track Dozer 01 (Pit - Komatsu D475)	6042	17	dBA		6388	17	dBA		6398	17	dBA		6235	15	dBA		5538	17	dBA	
TD02	Track Dozer 02 (Pit -CAT D10)	5991	16	dBA		6608	16	dBA		6630	16	dBA		6469	18	dBA		5786	17	dBA	
TD03	Track Dozer 03 (Pit -CAT D10)	6026	16	dBA		6501	16	dBA		6515	17	dBA		6353	16	dBA		5657	17	dBA	
TD04	Track Dozer 04 (Pit -CAT D10)	5976	11	dBA		6376	11	dBA		6393	11	dBA		6232	10	dBA		5567	12	dBA	
TD05	Track Dozer 05 (PAG - Komatsu D375)	6698	17	dBA		4053	18	dBA		3930	19	dBA		3742	21	dBA		3177	17	dBA	
TD06	Track Dozer 06 (PAG - Komatsu D375)	7037	16	dBA		4417	17	dBA		4239	18	dBA		4038	21	dBA		3102	18	dBA	
TD07D	Track Dozer 07 (PAG - Komatsu D475)	6556	23	dBA		4238	23	dBA		4140	24	dBA		3958	26	dBA		3407	22	dBA	
TD07N	Track Dozer 07 (PAG - Komatsu D475)	6556	0	dBA		4238	0	dBA		4140	0	dBA		3958	0	dBA		3407	0	dBA	
TD08D	Track Dozer 08 (PAG - Komatsu D375)	6356	24	dBA		3916	24	dBA		3856	25	dBA		3684	26	dBA		3416	22	dBA	
TD08N	Track Dozer 08 (PAG - Komatsu D375)	6356	0	dBA		3916	0	dBA		3856	0	dBA		3684	0	dBA		3416	0	dBA	
TD09	Track Dozer 09 (Ore -CAT D9)	6849	15	dBA		4713	16	dBA		4572	16	dBA		4378	20	dBA		3479	17	dBA	
TD10	Track Dozer 10 (Ore -CAT D8)	6710	14	dBA		5060	14	dBA		4948	15	dBA		4760	18	dBA		3867	19	dBA	
TD11D	Track Dozer 11 (NPAG/OB - Komatsu D475)	5175	12	dBA		8194	12	dBA		8356	12	dBA		8231	13	dBA		7925	12	dBA	
TD11N	Track Dozer 11 (NPAG/OB - Komatsu D475)	5175	0	dBA		8194	0	dBA		8356	0	dBA		8231	0	dBA		7925	0	dBA	
TD12D	Track Dozer 12 (NPAG/OB - Komatsu D375)	4771	16	dBA		6476	16	dBA		6634	16	dBA		6511	17	dBA		6389	15	dBA	
TD12N	Track Dozer 12 (NPAG/OB - Komatsu D375)	4771	0	dBA		6476	0	dBA		6634	0	dBA		6511	0	dBA		6389	0	dBA	
TD13	Track Dozer 13 (NPAG/OB -CAT D9)	5798	7	dBA		7961	7	dBA		8052	7	dBA		7907	9	dBA		7332	8	dBA	
TD14	Track Dozer 14 (NPAG/OB -CAT D9)	5905	8	dBA		7666	8	dBA		7734	8	dBA		7583	10	dBA		6946	9	dBA	
TD15	Track Dozer 15 (NPAG/OB -CAT D9)	5043	10	dBA		6595	10	dBA		6725	10	dBA		6592	11	dBA		6340	9	dBA	
TD16	Track Dozer 16 (NPAG/OB -CAT D9)	5145	8	dBA		7794	7	dBA		7944	8	dBA		7816	8	dBA		7499	7	dBA	
WD	Komatsu Wheel Dozer KM WD600	6042	4	dBA		6444	4	dBA		6455	4	dBA		6292	4	dBA		5592	4	dBA	
WL1	Komatsu Wheel Loader WA1200	6011	15	dBA		6606	15	dBA		6625	15	dBA		6464	17	dBA		5771	16	dBA	
WL2	Komatsu Wheel Loader WA900	6014	15	dBA		6576	15	dBA		6594	15	dBA		6432	16	dBA		5740	16	dBA	
WP01	Water Pump WP01	5932	1	dBA		6428	1	dBA		6452	1	dBA		6292	2	dBA		5645	1	dBA	

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

	Point of Reception ID	Point of Reception Description	Point of reception coordinates X	Y	Z
	POR01	House 01 - North	424437	5415498	391.2
	POR02	House 02 - East	431274	5412538	384.5
	POR03	House 03 - East	431587	5411870	389.5
	POR04	House 04 - East	431496	5411644	389.5
	POR06	House 06 -Southeast	431077	5408660	374.5

Source ID	Source Description	POR01 Distance (m)	POR01 Sound Level at PoR	POR01 Units	POR02 Distance (m)	POR02 Sound Level at PoR	POR02 Units	POR03 Distance (m)	POR03 Sound Level at PoR	POR03 Units	POR04 Distance (m)	POR04 Sound Level at PoR	POR04 Units	POR06 Distance (m)	POR06 Sound Level at PoR	POR06 Units
WP02	Water Pump WP02	5980	1	dBA	6304	-1	dBA	6319	0	dBA	6157	-8	dBA	5494	-1	dBA
WP03	Water Pump WP03	6042	1	dBA	6290	1	dBA	6298	-1	dBA	6134	-4	dBA	5442	0	dBA
WP04	Water Pump WP04	6118	1	dBA	6323	-2	dBA	6322	-3	dBA	6156	-13	dBA	5426	-11	dBA
WP05	Water Pump WP05	6118	1	dBA	6433	1	dBA	6434	1	dBA	6269	-4	dBA	5533	-2	dBA
WP06	Water Pump WP06	6084	1	dBA	6534	1	dBA	6543	1	dBA	6379	1	dBA	5655	1	dBA
WP07	Water Pump WP07	6060	0	dBA	6641	0	dBA	6656	1	dBA	6494	2	dBA	5777	1	dBA
WP08	Water Pump WP08	5983	0	dBA	6650	0	dBA	6674	1	dBA	6514	2	dBA	5833	1	dBA
WP09	Water Pump WP09	6379	0	dBA	6734	0	dBA	6714	1	dBA	6543	3	dBA	5675	2	dBA
WP10	Water Pump WP10	6522	1	dBA	6369	1	dBA	6320	1	dBA	6142	3	dBA	5211	3	dBA
WP11	Water Pump WP11	6541	2	dBA	5958	2	dBA	5893	2	dBA	5713	4	dBA	4795	3	dBA
WP12	Water Pump WP12	6427	-2	dBA	7994	-2	dBA	8022	-2	dBA	7860	0	dBA	7024	-1	dBA
WP13	Water Pump WP13	6190	-1	dBA	7541	-1	dBA	7574	-1	dBA	7414	0	dBA	6649	0	dBA
WP14	Water Pump WP14	5365	-3	dBA	8505	-3	dBA	8662	-3	dBA	8535	-2	dBA	8179	-3	dBA
WP15	Water Pump WP15	5354	-3	dBA	8467	-3	dBA	8623	-3	dBA	8496	-2	dBA	8141	-3	dBA
WP16	Water Pump WP16	5385	1	dBA	6353	1	dBA	6439	1	dBA	6296	2	dBA	5910	1	dBA
WP17	Water Pump WP17	4530	-1	dBA	7336	-1	dBA	7534	-1	dBA	7421	-1	dBA	7348	-2	dBA
WP18	Water Pump WP18	6548	-5	dBA	9848	-5	dBA	9963	-5	dBA	9822	-4	dBA	9190	-4	dBA
WP19	Water Pump WP19	5462	2	dBA	5276	-15	dBA	5346	-16	dBA	5201	-16	dBA	4961	-18	dBA
WP20	Pinewood River Water Pump	12235	0	dBA	16615	0	dBA	16705	0	dBA	16554	0	dBA	15567	0	dBA
WS	Wet Scrubber	5023	-14	dBA	4948	-11	dBA	5084	-12	dBA	4959	-15	dBA	5046	-11	dBA
MGR_SP	Motor Grader Route Stockpile	N/A	4	dBA	N/A	4	dBA	N/A	5	dBA	N/A	4	dBA	N/A	3	dBA
MGR_NPAG	Motor Grader Route NPAG	N/A	2	dBA	N/A	2	dBA	N/A	2	dBA	N/A	3	dBA	N/A	2	dBA
MGR_OB	Motor Grader Route OB	N/A	-1	dBA	N/A	-2	dBA	N/A	-2	dBA	N/A	-1	dBA	N/A	-2	dBA
MGR_OPMill	Motor Grader Route Open Pit to Mill	N/A	3	dBA	N/A	3	dBA	N/A	3	dBA	N/A	4	dBA	N/A	3	dBA
MGR_PAG	Motor Grader Route PAG	N/A	2	dBA	N/A	3	dBA	N/A	4	dBA	N/A	5	dBA	N/A	2	dBA
TRE_NPAG	Truck Route-NPAG (Empty Truck)	N/A	7	dBA	N/A	7	dBA	N/A	7	dBA	N/A	8	dBA	N/A	7	dBA
TRE_OB	Truck Route-Overburden (Empty Truck)	N/A	7	dBA	N/A	7	dBA	N/A	7	dBA	N/A	8	dBA	N/A	7	dBA
TRE_OPMill	Truck Route Open Pit to Mill (Empty Truck)	N/A	3	dBA	N/A	3	dBA	N/A	4	dBA	N/A	4	dBA	N/A	3	dBA
TRE_PAG	Truck Route PAG (Empty Truck)	N/A	11	dBA	N/A	11	dBA	N/A	12	dBA	N/A	12	dBA	N/A	10	dBA
TRE_SP	Truck Route Stockpile (Empty Truck)	N/A	6	dBA	N/A	6	dBA	N/A	6	dBA	N/A	6	dBA	N/A	5	dBA
TRL_NPAG	Truck Route-NPAG (Loaded Truck)	N/A	22	dBA	N/A	22	dBA	N/A	22	dBA	N/A	23	dBA	N/A	22	dBA
TRL_OB	Truck Route-Overburden (Loaded Truck)	N/A	22	dBA	N/A	22	dBA	N/A	22	dBA	N/A	23	dBA	N/A	22	dBA
TRL_OPMill	Truck Route Open Pit to Mill (Loaded Truck)	N/A	18	dBA	N/A	18	dBA	N/A	18	dBA	N/A	19	dBA	N/A	18	dBA
TRL_PAG	Truck Route PAG (Loaded Truck)	N/A	25	dBA	N/A	25	dBA	N/A	25	dBA	N/A	26	dBA	N/A	25	dBA
TRL_SP	Truck Route Stockpile (Loaded Truck)	N/A	20	dBA	N/A	20	dBA	N/A	20	dBA	N/A	20	dBA	N/A	19	dBA
WTR_NPAG	Water Truck Route NPAG	N/A	-1	dBA	N/A	-1	dBA	N/A	-1	dBA	N/A	0	dBA	N/A	-1	dBA
WTR_OB	Water Truck Route OB	N/A	-4	dBA	N/A	-5	dBA	N/A	-4	dBA	N/A	-4	dBA	N/A	-5	dBA
WTR_OPMill	Water Truck Route Open Pit to Mill	N/A	0	dBA	N/A	0	dBA	N/A	0	dBA	N/A	1	dBA	N/A	0	dBA
WTR_PAG	Water Truck Route PAG	N/A	0	dBA	N/A	1	dBA	N/A	2	dBA	N/A	3	dBA	N/A	-1	dBA
WTR_SP	Water Truck Route Stockpile	N/A	2	dBA	N/A	2	dBA	N/A	2	dBA	N/A	2	dBA	N/A	0	dBA
LD4_TR	LD4 Aggregate Pit Truck Route	N/A	7	dBA	N/A	6	dBA	N/A	6	dBA	N/A	6	dBA	N/A	5	dBA
OC3_TR	OC3 Aggregate Pit Truck Route	N/A	2	dBA	N/A	3	dBA	N/A	3	dBA	N/A	4	dBA	N/A	0	dBA
EO_TR	EO Aggregate Pit Truck Route	N/A	9	dBA	N/A	9	dBA	N/A	10	dBA	N/A	11	dBA	N/A	10	dBA
Roen_TR	Roen Aggregate Pit Truck Route	N/A	7	dBA	N/A	7	dBA	N/A	7	dBA	N/A	7	dBA	N/A	6	dBA
EG1	Emergency Generator 1 (CAT 2.5 MW)	4845	35	dBA	4803	34	dBA	4971	34	dBA	4854	34	dBA	5090	32	dBA
EG2	Emergency Generator 2 (CAT 2.5 MW)	3322	33	dBA	5711	32	dBA	6042	32	dBA	5975	31	dBA	6645	29	dBA
FP1	Fire Pump 1	4871	42	dBA	4907	44	dBA	5066	44	dBA	4948	40	dBA	5130	37	dBA
FP2	Fire Pump 2	4903	31	dBA	4917	37	dBA	5072	37	dBA	4951	35	dBA	5113	35	dBA

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

	Point of Reception ID	Point of Reception Description	Point of reception coordinates X	Y	Z
	POR07	House 07 - South	431034	5406873	378.5
	POR08	House 08 - South	430117	5406700	367.8
	POR09	House 9 - South	429796	5406515	367.9
	POR10	House 10 - South	429116	5406626	361.5
	POR11	House 11 - South	428590	5406620	369.5

Source ID	Source Description	Point of Reception 6 Distance (m)	Sound Level at PoR	Units	Point of Reception 7 Distance (m)	Sound Level at PoR	Units	Point of Reception 8 Distance (m)	Sound Level at PoR	Units	Point of Reception 9 Distance (m)	Sound Level at PoR	Units	Point of Reception 10 Distance (m)	Sound Level at PoR	Units
AC1	WMP Air Compressor 1	10826	-6	dBA	10082	-6	dBA	9890	-5	dBA	9248	-4	dBA	8805	-3	dBA
AC2	WMP Air Compressor 2	11559	-7	dBA	10803	-7	dBA	10604	-6	dBA	9955	-5	dBA	9504	-5	dBA
AC3	WMP Air Compressor 3	12128	-8	dBA	11399	-8	dBA	11215	-7	dBA	10578	-6	dBA	10141	-6	dBA
AC4	WMP Air Compressor 4	10964	-7	dBA	10251	-6	dBA	10078	-5	dBA	9451	-5	dBA	9026	-4	dBA
BD1	Blast Hole Drill 1- Sandvik DR461i	6221	15	dBA	5502	16	dBA	5338	17	dBA	4729	18	dBA	4337	16	dBA
BD2	Blast Hole Drill 2- Sandvik DR461i	6207	15	dBA	5488	16	dBA	5324	17	dBA	4716	18	dBA	4325	15	dBA
BD3	Blast Hole Drill 3 - Sandvik DP1500i	6206	9	dBA	5480	8	dBA	5311	8	dBA	4698	6	dBA	4301	3	dBA
BD4	Blast Hole Drill 4 - Sandvik DP1500i	6193	8	dBA	5468	8	dBA	5299	8	dBA	4687	6	dBA	4290	3	dBA
C	Crusher	5410	10	dBA	4846	10	dBA	4773	12	dBA	4280	13	dBA	4022	15	dBA
DC1	Dust Collector 1	5432	6	dBA	4873	6	dBA	4802	8	dBA	4313	9	dBA	4057	11	dBA
DC2	Dust Collector 2	5703	5	dBA	5151	6	dBA	5081	7	dBA	4591	8	dBA	4332	10	dBA
E1	Komatsu Diesel Excavator PC5500	6249	17	dBA	5528	17	dBA	5362	19	dBA	4752	18	dBA	4358	16	dBA
E2	Komatsu Diesel Excavator PC5500	6128	17	dBA	5413	17	dBA	5252	19	dBA	4646	18	dBA	4259	15	dBA
E3	Komatsu Diesel Excavator PC8000	6157	22	dBA	5437	22	dBA	5273	23	dBA	4665	21	dBA	4274	17	dBA
E4	Komatsu Diesel Excavator PC3000	6173	25	dBA	5450	26	dBA	5284	25	dBA	4673	25	dBA	4280	22	dBA
E5	Komatsu Diesel Excavator PC800LC	6065	12	dBA	5349	12	dBA	5187	11	dBA	4581	9	dBA	4194	7	dBA
E6	Komatsu Diesel Excavator PC360LC	6138	15	dBA	5418	15	dBA	5253	15	dBA	4644	12	dBA	4253	9	dBA
EO_E	East Outcrop Aggregate Pit Excavator PC360LC	4969	18	dBA	4343	18	dBA	4241	20	dBA	3714	22	dBA	3427	20	dBA
EO_FEL	East Outcrop Graval Pit Mobile Crushing Plant Loader (CAT 966H)	4950	19	dBA	4324	20	dBA	4221	20	dBA	3695	22	dBA	3407	20	dBA
EO_PS	East Outcrop Graval Pit Mobile Primary Crusher (PowerScreen)	4968	20	dBA	4341	21	dBA	4238	22	dBA	3711	24	dBA	3422	21	dBA
EO_SCNR	East Outcrop Graval Pit Mobile Screener (Atlas Copco HCS3715)	4986	8	dBA	4357	9	dBA	4253	10	dBA	3724	11	dBA	3433	10	dBA
LD4_E	LD4 Aggregate Pit Excavator PC360LC	8741	10	dBA	7987	10	dBA	7794	11	dBA	7151	12	dBA	6712	14	dBA
LD4_FEL	LD4 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	8685	15	dBA	7935	15	dBA	7743	16	dBA	7103	17	dBA	6665	17	dBA
LD4_PS	LD4 Graval Pit Mobile Primary Crusher (PowerScreen)	8733	12	dBA	7980	12	dBA	7786	14	dBA	7145	15	dBA	6705	16	dBA
LD4_SCNR	LD4 Graval Pit Mobile Screener (Atlas Copco HCS3715)	8679	1	dBA	7927	2	dBA	7734	3	dBA	7093	4	dBA	6655	5	dBA
Outcrop3_E	Outcrop 3 Aggregate Pit Excavator PC360LC	4124	20	dBA	3822	20	dBA	3884	21	dBA	3624	21	dBA	3596	22	dBA
Outcrop3_FEL	Outcrop 3 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	4149	22	dBA	3843	22	dBA	3903	23	dBA	3639	23	dBA	3606	24	dBA
Outcrop3_PS	Outcrop 3 Graval Pit Mobile Primary Crusher (PowerScreen)	4122	22	dBA	3818	22	dBA	3880	23	dBA	3618	23	dBA	3589	24	dBA
Outcrop3_SCI	Outcrop3 Graval Pit Mobile Screener (Atlas Copco HCS3715)	4124	10	dBA	3812	10	dBA	3870	11	dBA	3603	11	dBA	3569	11	dBA
PG1	Pinewood River Pumphouse Generator (CAT 660 kW)	15447	-5	dBA	14533	-5	dBA	14218	-4	dBA	13535	-4	dBA	13009	-3	dBA
RD1	RC Drill Sandvik DR580	5971	13	dBA	5257	13	dBA	5098	12	dBA	4495	10	dBA	4112	9	dBA
RD2	RC Drill Sandvik DR580	5968	11	dBA	5252	10	dBA	5091	9	dBA	4486	8	dBA	4101	7	dBA
Roen_E	Roen Aggregate Pit Excavator PC360LC	7071	13	dBA	6542	13	dBA	6476	14	dBA	5981	15	dBA	5707	16	dBA
Roen_FEL	Roen Graval Pit Mobile Crushing Plant Loader (CAT 966H)	6970	17	dBA	6446	17	dBA	6382	18	dBA	5892	18	dBA	5621	19	dBA
Roen_PS	Roen Graval Pit Mobile Primary Crusher (PowerScreen)	7098	15	dBA	6568	15	dBA	6501	16	dBA	6005	17	dBA	5729	18	dBA
Roen_SCNR	Roen Graval Pit Mobile Screener (Atlas Copco HCS3715)	7095	4	dBA	6556	4	dBA	6485	5	dBA	5983	6	dBA	5701	6	dBA
T1	Transformer 1	6110	14	dBA	5639	14	dBA	5606	14	dBA	5165	15	dBA	4949	16	dBA
T2	Transformer 2	6102	14	dBA	5630	14	dBA	5596	14	dBA	5155	15	dBA	4937	16	dBA
TD01	Track Dozer 01 (Pit - Komatsu D475)	6055	18	dBA	5341	19	dBA	5181	18	dBA	4577	16	dBA	4192	13	dBA
TD02	Track Dozer 02 (Pit -CAT D10)	6283	18	dBA	5557	19	dBA	5389	20	dBA	4776	19	dBA	4378	16	dBA
TD03	Track Dozer 03 (Pit -CAT D10)	6161	18	dBA	5441	19	dBA	5276	19	dBA	4666	15	dBA	4275	13	dBA
TD04	Track Dozer 04 (Pit -CAT D10)	6100	13	dBA	5391	13	dBA	5233	15	dBA	4632	14	dBA	4250	12	dBA
TD05	Track Dozer 05 (PAG - Komatsu D375)	4195	19	dBA	3777	18	dBA	3789	20	dBA	3442	20	dBA	3341	22	dBA
TD06	Track Dozer 06 (PAG - Komatsu D375)	3936	20	dBA	3443	20	dBA	3424	22	dBA	3035	22	dBA	2904	24	dBA
TD07D	Track Dozer 07 (PAG - Komatsu D475)	4373	24	dBA	3918	24	dBA	3909	25	dBA	3527	26	dBA	3391	28	dBA
TD07N	Track Dozer 07 (PAG - Komatsu D475)	4373	0	dBA	3918	0	dBA	3909	0	dBA	3527	0	dBA	3391	0	dBA
TD08D	Track Dozer 08 (PAG - Komatsu D375)	4518	23	dBA	4126	23	dBA	4145	24	dBA	3804	25	dBA	3700	26	dBA
TD08N	Track Dozer 08 (PAG - Komatsu D375)	4518	0	dBA	4126	0	dBA	4145	0	dBA	3804	0	dBA	3700	0	dBA
TD09	Track Dozer 09 (Ore -CAT D9)	4232	19	dBA	3682	19	dBA	3629	21	dBA	3182	22	dBA	2990	24	dBA
TD10	Track Dozer 10 (Ore -CAT D8)	4533	18	dBA	3928	18	dBA	3842	20	dBA	3342	25	dBA	3091	24	dBA
TD11D	Track Dozer 11 (NPAG/OB - Komatsu D475)	8467	13	dBA	7728	14	dBA	7543	15	dBA	6909	16	dBA	6480	18	dBA
TD11N	Track Dozer 11 (NPAG/OB - Komatsu D475)	8467	0	dBA	7728	0	dBA	7543	0	dBA	6909	0	dBA	6480	0	dBA
TD12D	Track Dozer 12 (NPAG/OB - Komatsu D375)	7143	16	dBA	6501	17	dBA	6376	18	dBA	5807	19	dBA	5455	20	dBA
TD12N	Track Dozer 12 (NPAG/OB - Komatsu D375)	7143	0	dBA	6501	0	dBA	6376	0	dBA	5807	0	dBA	5455	0	dBA
TD13	Track Dozer 13 (NPAG/OB -CAT D9)	7757	9	dBA	6986	10	dBA	6785	12	dBA	6137	13	dBA	5693	14	dBA
TD14	Track Dozer 14 (NPAG/OB -CAT D9)	7363	10	dBA	6594	11	dBA	6395	13	dBA	5750	13	dBA	5309	15	dBA
TD15	Track Dozer 15 (NPAG/OB -CAT D9)	7029	11	dBA	6361	11	dBA	6223	13	dBA	5639	13	dBA	5272	15	dBA
TD16	Track Dozer 16 (NPAG/OB -CAT D9)	8063	9	dBA	7335	9	dBA	7158	11	dBA	6532	12	dBA	6113	13	dBA
WD	Komatsu Wheel Dozer KM WD600	6101	5	dBA	5383	6	dBA	5221	6	dBA	4614	5	dBA	4225	2	dBA
WL1	Komatsu Wheel Loader WA1200	6264	17	dBA	5537	17	dBA	5368	18	dBA	4754	18	dBA	4356	15	dBA
WL2	Komatsu Wheel Loader WA900	6236	17	dBA	5511	17	dBA	5343	18	dBA	4731	17	dBA	4335	15	dBA
WP01	Water Pump WP01	6180	3	dBA	5470	3	dBA	5311	5	dBA	4708	5	dBA	4324	4	dBA

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

	Point of Reception ID	Point of Reception ID	Point of Reception ID	Point of Reception ID	Point of Reception ID
	POR07	POR08	POR09	POR10	POR11
	Point of Reception Description	Point of Reception Description	Point of Reception Description	Point of Reception Description	Point of Reception Description
	House 07 - South	House 08 - South	House 9 - South	House 10 - South	House 11 - South
	Point of reception coordinates	Point of reception coordinates	Point of reception coordinates	Point of reception coordinates	Point of reception coordinates
	X Y Z	X Y Z	X Y Z	X Y Z	X Y Z
	431034 5406873 378.5	430117 5406700 367.8	429796 5406515 367.9	429116 5406626 361.5	428590 5406620 369.5

Source ID	Source Description	Point of Reception 6			Point of Reception 7			Point of Reception 8			Point of Reception 9			Point of Reception 10		
		Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units
WP02	Water Pump WP02	6038	3	dBA	5334	3	dBA	5180	4	dBA	4582	4	dBA	4205	1	dBA
WP03	Water Pump WP03	5975	1	dBA	5268	1	dBA	5113	1	dBA	4514	-1	dBA	4137	-3	dBA
WP04	Water Pump WP04	5936	-10	dBA	5223	-10	dBA	5063	-10	dBA	4461	-10	dBA	4079	-10	dBA
WP05	Water Pump WP05	6027	-4	dBA	5305	-5	dBA	5141	-6	dBA	4532	-7	dBA	4142	-8	dBA
WP06	Water Pump WP06	6142	-1	dBA	5415	-3	dBA	5247	-5	dBA	4634	-6	dBA	4239	-8	dBA
WP07	Water Pump WP07	6254	1	dBA	5523	-1	dBA	5351	-3	dBA	4734	-6	dBA	4332	-7	dBA
WP08	Water Pump WP08	6326	2	dBA	5599	3	dBA	5429	4	dBA	4814	4	dBA	4414	1	dBA
WP09	Water Pump WP09	6069	3	dBA	5313	4	dBA	5126	5	dBA	4496	7	dBA	4079	8	dBA
WP10	Water Pump WP10	5623	4	dBA	4882	5	dBA	4708	7	dBA	4092	8	dBA	3694	10	dBA
WP11	Water Pump WP11	5275	5	dBA	4568	6	dBA	4416	7	dBA	3826	9	dBA	3463	11	dBA
WP12	Water Pump WP12	7311	1	dBA	6504	1	dBA	6280	3	dBA	5616	4	dBA	5151	5	dBA
WP13	Water Pump WP13	7011	1	dBA	6230	2	dBA	6024	3	dBA	5374	4	dBA	4928	6	dBA
WP14	Water Pump WP14	8678	-2	dBA	7922	-2	dBA	7727	0	dBA	7084	0	dBA	6644	2	dBA
WP15	Water Pump WP15	8643	-2	dBA	7888	-2	dBA	7694	0	dBA	7052	1	dBA	6612	2	dBA
WP16	Water Pump WP16	6567	2	dBA	5895	2	dBA	5756	3	dBA	5174	4	dBA	4811	6	dBA
WP17	Water Pump WP17	8055	-1	dBA	7380	-1	dBA	7234	0	dBA	6638	1	dBA	6255	2	dBA
WP18	Water Pump WP18	9471	-3	dBA	8646	-3	dBA	8405	-2	dBA	7730	-1	dBA	7245	0	dBA
WP19	Water Pump WP19	5807	-16	dBA	5234	-16	dBA	5154	-15	dBA	4648	-14	dBA	4372	-13	dBA
WP20	Pinewood River Water Pump	15441	-10	dBA	14527	-9	dBA	14212	-9	dBA	13528	-8	dBA	13002	-8	dBA
WS	Wet Scrubber	6039	-15	dBA	5532	-10	dBA	5482	-13	dBA	5017	-12	dBA	4778	-12	dBA
MGR_SP	Motor Grader Route Stockpile	N/A	4	dBA	N/A	4	dBA	N/A	6	dBA	N/A	7	dBA	N/A	9	dBA
MGR_NPAG	Motor Grader Route NPAG	N/A	4	dBA	N/A	4	dBA	N/A	5	dBA	N/A	7	dBA	N/A	7	dBA
MGR_OB	Motor Grader Route OB	N/A	-1	dBA	N/A	0	dBA	N/A	1	dBA	N/A	2	dBA	N/A	3	dBA
MGR_OPMill	Motor Grader Route Open Pit to Mill	N/A	4	dBA	N/A	4	dBA	N/A	6	dBA	N/A	7	dBA	N/A	8	dBA
MGR_PAG	Motor Grader Route PAG	N/A	3	dBA	N/A	3	dBA	N/A	5	dBA	N/A	6	dBA	N/A	7	dBA
TRE_NPAG	Truck Route-NPAG (Empty Truck)	N/A	9	dBA	N/A	9	dBA	N/A	10	dBA	N/A	12	dBA	N/A	11	dBA
TRE_OB	Truck Route-Overburden (Empty Truck)	N/A	8	dBA	N/A	9	dBA	N/A	10	dBA	N/A	11	dBA	N/A	11	dBA
TRE_OPMill	Truck Route Open Pit to Mill (Empty Truck)	N/A	5	dBA	N/A	5	dBA	N/A	6	dBA	N/A	7	dBA	N/A	7	dBA
TRE_PAG	Truck Route PAG (Empty Truck)	N/A	11	dBA	N/A	12	dBA	N/A	13	dBA	N/A	14	dBA	N/A	15	dBA
TRE_SP	Truck Route Stockpile (Empty Truck)	N/A	6	dBA	N/A	6	dBA	N/A	7	dBA	N/A	8	dBA	N/A	9	dBA
TRL_NPAG	Truck Route-NPAG (Loaded Truck)	N/A	23	dBA	N/A	24	dBA	N/A	24	dBA	N/A	26	dBA	N/A	26	dBA
TRL_OB	Truck Route-Overburden (Loaded Truck)	N/A	23	dBA	N/A	23	dBA	N/A	24	dBA	N/A	25	dBA	N/A	25	dBA
TRL_OPMill	Truck Route Open Pit to Mill (Loaded Truck)	N/A	19	dBA	N/A	20	dBA	N/A	21	dBA	N/A	21	dBA	N/A	22	dBA
TRL_PAG	Truck Route PAG (Loaded Truck)	N/A	26	dBA	N/A	26	dBA	N/A	27	dBA	N/A	28	dBA	N/A	29	dBA
TRL_SP	Truck Route Stockpile (Loaded Truck)	N/A	21	dBA	N/A	21	dBA	N/A	22	dBA	N/A	23	dBA	N/A	23	dBA
WTR_NPAG	Water Truck Route NPAG	N/A	1	dBA	N/A	1	dBA	N/A	3	dBA	N/A	5	dBA	N/A	5	dBA
WTR_OB	Water Truck Route OB	N/A	-4	dBA	N/A	-3	dBA	N/A	-2	dBA	N/A	-1	dBA	N/A	1	dBA
WTR_OPMill	Water Truck Route Open Pit to Mill	N/A	2	dBA	N/A	2	dBA	N/A	3	dBA	N/A	5	dBA	N/A	6	dBA
WTR_PAG	Water Truck Route PAG	N/A	1	dBA	N/A	1	dBA	N/A	3	dBA	N/A	4	dBA	N/A	6	dBA
WTR_SP	Water Truck Route Stockpile	N/A	2	dBA	N/A	2	dBA	N/A	4	dBA	N/A	6	dBA	N/A	8	dBA
LD4_TR	LD4 Aggregate Pit Truck Route	N/A	6	dBA	N/A	6	dBA	N/A	7	dBA	N/A	8	dBA	N/A	9	dBA
OC3_TR	OC3 Aggregate Pit Truck Route	N/A	1	dBA	N/A	1	dBA	N/A	2	dBA	N/A	3	dBA	N/A	4	dBA
EO_TR	EO Aggregate Pit Truck Route	N/A	11	dBA	N/A	11	dBA	N/A	13	dBA	N/A	15	dBA	N/A	15	dBA
Roen_TR	Roen Aggregate Pit Truck Route	N/A	7	dBA	N/A	7	dBA	N/A	8	dBA	N/A	9	dBA	N/A	10	dBA
EG1	Emergency Generator 1 (CAT 2.5 MW)	6147	33	dBA	5668	33	dBA	5632	34	dBA	5185	34	dBA	4963	35	dBA
EG2	Emergency Generator 2 (CAT 2.5 MW)	7756	30	dBA	7273	30	dBA	7226	31	dBA	6755	31	dBA	6499	32	dBA
FP1	Fire Pump 1	6158	36	dBA	5664	36	dBA	5621	38	dBA	5163	39	dBA	4931	40	dBA
FP2	Fire Pump 2	6134	36	dBA	5637	36	dBA	5592	38	dBA	5133	39	dBA	4899	39	dBA

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

Point of Reception ID	POR12	POR14	POR15	POR16	POR17
Point of Reception Description	House 12 - South	House 14 - South	House 15 - West	House 16 - West	House 17 - Nothwest
Point of reception coordinates X	428175	427450	419623	419645	419827
Point of reception coordinates Y	5406947	5406952	5410178	5410314	5413577
Point of reception coordinates Z	361.5	362.9	358.0	359.5	372.5

Source ID	Source Description	Point of Reception 11			Point of Reception 12			Point of Reception 13			Point of Reception 14			Point of Reception 15		
		Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units
AC1	WMP Air Compressor 1	8279	-2	dBA	7677	15	dBA	2024	14	dBA	1925	11	dBA	2556	0	dBA
AC2	WMP Air Compressor 2	8980	-4	dBA	8363	15	dBA	1604	14	dBA	1477	13	dBA	2129	1	dBA
AC3	WMP Air Compressor 3	9614	-5	dBA	9018	11	dBA	2191	10	dBA	2054	11	dBA	1331	-1	dBA
AC4	WMP Air Compressor 4	8498	-3	dBA	7924	12	dBA	2508	11	dBA	2395	12	dBA	2186	-1	dBA
BD1	Blast Hole Drill 1- Sandvik DR461i	3811	22	dBA	3327	7	dBA	5852	15	dBA	5845	12	dBA	6881	5	dBA
BD2	Blast Hole Drill 2- Sandvik DR461i	3799	22	dBA	3317	8	dBA	5868	15	dBA	5861	12	dBA	6895	5	dBA
BD3	Blast Hole Drill 3 - Sandvik DP1500i	3774	11	dBA	3281	-1	dBA	5842	8	dBA	5837	5	dBA	6909	-1	dBA
BD4	Blast Hole Drill 4 - Sandvik DP1500i	3764	11	dBA	3272	0	dBA	5856	8	dBA	5851	5	dBA	6920	-1	dBA
C	Crusher	3550	16	dBA	3326	9	dBA	7152	9	dBA	7131	8	dBA	7721	3	dBA
DC1	Dust Collector 1	3586	12	dBA	3366	4	dBA	7158	4	dBA	7136	3	dBA	7708	-4	dBA
DC2	Dust Collector 2	3858	11	dBA	3620	1	dBA	6995	1	dBA	6969	4	dBA	7461	-4	dBA
E1	Komatsu Diesel Excavator PC5500	3832	23	dBA	3344	9	dBA	5819	16	dBA	5813	14	dBA	6857	9	dBA
E2	Komatsu Diesel Excavator PC5500	3734	23	dBA	3261	15	dBA	5953	16	dBA	5946	14	dBA	6968	9	dBA
E3	Komatsu Diesel Excavator PC8000	3749	27	dBA	3268	18	dBA	5912	21	dBA	5905	19	dBA	6946	14	dBA
E4	Komatsu Diesel Excavator PC3000	3754	29	dBA	3268	21	dBA	5885	25	dBA	5879	23	dBA	6935	18	dBA
E5	Komatsu Diesel Excavator PC800LC	3669	13	dBA	3197	10	dBA	6005	11	dBA	5999	9	dBA	7032	4	dBA
E6	Komatsu Diesel Excavator PC360LC	3728	19	dBA	3247	11	dBA	5926	14	dBA	5920	12	dBA	6966	7	dBA
EO_E	East Outcrop Aggregate Pit Excavator PC360LC	2942	24	dBA	2696	11	dBA	7272	11	dBA	7262	12	dBA	8096	7	dBA
EO_FEL	East Outcrop Graval Pit Mobile Crushing Plant Loader (CAT 966H)	2923	23	dBA	2678	16	dBA	7285	16	dBA	7275	18	dBA	8114	15	dBA
EO_PS	East Outcrop Graval Pit Mobile Primary Crusher (PowerScreen)	2937	26	dBA	2688	13	dBA	7268	13	dBA	7258	15	dBA	8096	10	dBA
EO_SCNR	East Outcrop Graval Pit Mobile Screener (Atlas Copco HCS3715)	2947	13	dBA	2694	3	dBA	7248	3	dBA	7238	2	dBA	8078	-2	dBA
LD4_E	LD4 Aggregate Pit Excavator PC360LC	6185	15	dBA	5593	21	dBA	3404	21	dBA	3377	18	dBA	4529	13	dBA
LD4_FEL	LD4 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	6138	19	dBA	5550	23	dBA	3476	24	dBA	3448	21	dBA	4563	19	dBA
LD4_PS	LD4 Graval Pit Mobile Primary Crusher (PowerScreen)	6179	18	dBA	5587	24	dBA	3416	24	dBA	3389	20	dBA	4532	16	dBA
LD4_SCNR	LD4 Graval Pit Mobile Screener (Atlas Copco HCS3715)	6128	6	dBA	5538	11	dBA	3472	11	dBA	3445	8	dBA	4577	2	dBA
Outcrop3_E	Outcrop 3 Aggregate Pit Excavator PC360LC	3298	22	dBA	3466	8	dBA	8996	8	dBA	8974	7	dBA	9412	4	dBA
Outcrop3_FEL	Outcrop 3 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	3305	23	dBA	3467	13	dBA	8967	13	dBA	8946	13	dBA	9382	14	dBA
Outcrop3_PS	Outcrop 3 Graval Pit Mobile Primary Crusher (PowerScreen)	3291	24	dBA	3458	10	dBA	8990	10	dBA	8968	9	dBA	9409	8	dBA
Outcrop3_SCI	Outcrop3 Graval Pit Mobile Screener (Atlas Copco HCS3715)	3267	11	dBA	3429	0	dBA	8959	0	dBA	8938	-1	dBA	9387	-4	dBA
PG1	Pinewood River Pumphouse Generator (CAT 660 kW)	12587	-2	dBA	11862	10	dBA	5109	11	dBA	5211	4	dBA	7788	28	dBA
RD1	RC Drill Sandvik DR580	3588	15	dBA	3127	16	dBA	6102	16	dBA	6096	14	dBA	7122	10	dBA
RD2	RC Drill Sandvik DR580	3576	13	dBA	3111	16	dBA	6094	16	dBA	6089	14	dBA	7129	10	dBA
Roen_E	Roen Aggregate Pit Excavator PC360LC	5220	16	dBA	4921	13	dBA	6281	16	dBA	6231	16	dBA	6252	7	dBA
Roen_FEL	Roen Graval Pit Mobile Crushing Plant Loader (CAT 966H)	5137	20	dBA	4847	17	dBA	6364	21	dBA	6315	21	dBA	6356	16	dBA
Roen_PS	Roen Graval Pit Mobile Primary Crusher (PowerScreen)	5241	19	dBA	4939	16	dBA	6254	19	dBA	6204	19	dBA	6222	11	dBA
Roen_SCNR	Roen Graval Pit Mobile Screener (Atlas Copco HCS3715)	5211	7	dBA	4899	5	dBA	6191	6	dBA	6142	6	dBA	6194	-1	dBA
T1	Transformer 1	4497	17	dBA	4313	10	dBA	7173	10	dBA	7133	13	dBA	7293	3	dBA
T2	Transformer 2	4485	17	dBA	4301	10	dBA	7171	10	dBA	7132	13	dBA	7297	3	dBA
TD01	Track Dozer 01 (Pit - Komatsu D475)	3668	22	dBA	3200	17	dBA	6024	18	dBA	6018	15	dBA	7039	9	dBA
TD02	Track Dozer 02 (Pit -CAT D10)	3852	24	dBA	3356	4	dBA	5774	16	dBA	5768	15	dBA	6831	9	dBA
TD03	Track Dozer 03 (Pit -CAT D10)	3749	23	dBA	3266	13	dBA	5903	18	dBA	5897	15	dBA	6943	9	dBA
TD04	Track Dozer 04 (Pit -CAT D10)	3726	20	dBA	3263	11	dBA	5999	12	dBA	5992	9	dBA	6988	4	dBA
TD05	Track Dozer 05 (PAG - Komatsu D375)	2988	25	dBA	3068	6	dBA	8547	6	dBA	8530	7	dBA	9100	2	dBA
TD06	Track Dozer 06 (PAG - Komatsu D375)	2535	28	dBA	2607	6	dBA	8492	6	dBA	8482	7	dBA	9219	2	dBA
TD07D	Track Dozer 07 (PAG - Komatsu D475)	3008	28	dBA	3029	12	dBA	8302	12	dBA	8285	14	dBA	8872	7	dBA
TD07N	Track Dozer 07 (PAG - Komatsu D475)	3008	0	dBA	3029	0	dBA	8302	0	dBA	8285	0	dBA	8872	0	dBA
TD08D	Track Dozer 08 (PAG - Komatsu D375)	3338	26	dBA	3389	12	dBA	8449	12	dBA	8427	14	dBA	8878	7	dBA
TD08N	Track Dozer 08 (PAG - Komatsu D375)	3338	0	dBA	3389	0	dBA	8449	0	dBA	8427	0	dBA	8878	0	dBA
TD09	Track Dozer 09 (Ore -CAT D9)	2571	28	dBA	2532	7	dBA	8102	7	dBA	8093	8	dBA	8873	3	dBA
TD10	Track Dozer 10 (Ore -CAT D8)	2630	28	dBA	2476	8	dBA	7700	8	dBA	7693	9	dBA	8538	3	dBA
TD11D	Track Dozer 11 (NPAG/OB - Komatsu D475)	5952	19	dBA	5379	25	dBA	3740	29	dBA	3711	21	dBA	4721	16	dBA
TD11N	Track Dozer 11 (NPAG/OB - Komatsu D475)	5952	0	dBA	5379	0	dBA	3740	0	dBA	3711	0	dBA	4721	0	dBA
TD12D	Track Dozer 12 (NPAG/OB - Komatsu D375)	4938	22	dBA	4509	19	dBA	5454	19	dBA	5419	22	dBA	5927	12	dBA
TD12N	Track Dozer 12 (NPAG/OB - Komatsu D375)	4938	0	dBA	4509	0	dBA	5454	0	dBA	5419	0	dBA	5927	0	dBA
TD13	Track Dozer 13 (NPAG/OB -CAT D9)	5167	16	dBA	4570	17	dBA	4224	18	dBA	4219	13	dBA	5545	10	dBA
TD14	Track Dozer 14 (NPAG/OB -CAT D9)	4783	17	dBA	4196	15	dBA	4608	16	dBA	4605	12	dBA	5908	9	dBA
TD15	Track Dozer 15 (NPAG/OB -CAT D9)	4751	17	dBA	4298	14	dBA	5392	13	dBA	5364	15	dBA	6031	7	dBA
TD16	Track Dozer 16 (NPAG/OB -CAT D9)	5585	14	dBA	5031	18	dBA	4164	17	dBA	4137	15	dBA	5076	7	dBA
WD	Komatsu Wheel Dozer KM WD600	3700	8	dBA	3225	4	dBA	5968	5	dBA	5962	3	dBA	6999	-1	dBA
WL1	Komatsu Wheel Loader WA1200	3830	21	dBA	3334	7	dBA	5788	16	dBA	5783	15	dBA	6852	10	dBA
WL2	Komatsu Wheel Loader WA900	3808	21	dBA	3316	9	dBA	5820	16	dBA	5814	14	dBA	6876	10	dBA
WP01	Water Pump WP01	3800	9	dBA	3331	-2	dBA	5923	-3	dBA	5915	0	dBA	6910	-4	dBA

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

	Point of Reception ID	Point of Reception ID	Point of Reception ID	Point of Reception ID	Point of Reception ID
	POR12	POR14	POR15	POR16	POR17
Point of Reception Description	House 12 - South	House 14 - South	House 15 - West	House 16 - West	House 17 - Nothwest
Point of reception coordinates X	428175	427450	419623	419645	419827
Point of reception coordinates Y	5406947	5406952	5410178	5410314	5413577
Point of reception coordinates Z	361.5	362.9	358.0	359.5	372.5

Source ID	Source Description	Point of Reception 11			Point of Reception 12			Point of Reception 13			Point of Reception 14			Point of Reception 15		
		Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units
WP02	Water Pump WP02	3683	9	dBA	3230	2	dBA	6074	1	dBA	6065	0	dBA	7044	-5	dBA
WP03	Water Pump WP03	3614	5	dBA	3161	2	dBA	6122	2	dBA	6114	-1	dBA	7110	-5	dBA
WP04	Water Pump WP04	3555	-6	dBA	3095	1	dBA	6133	2	dBA	6128	-1	dBA	7157	-5	dBA
WP05	Water Pump WP05	3617	-4	dBA	3141	1	dBA	6025	2	dBA	6020	0	dBA	7078	-5	dBA
WP06	Water Pump WP06	3713	-4	dBA	3223	-2	dBA	5903	2	dBA	5898	0	dBA	6972	-4	dBA
WP07	Water Pump WP07	3805	-3	dBA	3302	-12	dBA	5780	-13	dBA	5776	0	dBA	6871	-4	dBA
WP08	Water Pump WP08	3887	8	dBA	3387	-13	dBA	5727	-3	dBA	5721	0	dBA	6791	-4	dBA
WP09	Water Pump WP09	3550	11	dBA	3021	2	dBA	5887	2	dBA	5890	-1	dBA	7111	-4	dBA
WP10	Water Pump WP10	3168	12	dBA	2688	1	dBA	6350	1	dBA	6352	-1	dBA	7512	-2	dBA
WP11	Water Pump WP11	2946	15	dBA	2547	0	dBA	6760	0	dBA	6758	-2	dBA	7809	-3	dBA
WP12	Water Pump WP12	4631	7	dBA	3999	5	dBA	4575	5	dBA	4589	1	dBA	6178	-2	dBA
WP13	Water Pump WP13	4402	8	dBA	3808	4	dBA	4914	4	dBA	4918	1	dBA	6299	0	dBA
WP14	Water Pump WP14	6117	3	dBA	5523	7	dBA	3446	7	dBA	3421	5	dBA	4600	-1	dBA
WP15	Water Pump WP15	6085	3	dBA	5493	1	dBA	3485	2	dBA	3460	5	dBA	4626	-1	dBA
WP16	Water Pump WP16	4291	7	dBA	3852	2	dBA	5747	2	dBA	5726	1	dBA	6493	-2	dBA
WP17	Water Pump WP17	5729	3	dBA	5236	6	dBA	4553	5	dBA	4510	4	dBA	5005	-3	dBA
WP18	Water Pump WP18	6737	2	dBA	6068	12	dBA	2410	12	dBA	2434	4	dBA	4626	1	dBA
WP19	Water Pump WP19	3889	-12	dBA	3621	-20	dBA	6830	-19	dBA	6804	-1	dBA	7334	-6	dBA
WP20	Pinewood River Water Pump	12581	-7	dBA	11856	5	dBA	5105	5	dBA	5206	-2	dBA	7785	25	dBA
WS	Wet Scrubber	4314	8	dBA	4097	1	dBA	7005	1	dBA	6970	1	dBA	7248	-5	dBA
MGR_SP	Motor Grader Route Stockpile	N/A	12	dBA	N/A	-1	dBA	N/A	0	dBA	N/A	-1	dBA	N/A	-5	dBA
MGR_NPAG	Motor Grader Route NPAG	N/A	10	dBA	N/A	6	dBA	N/A	6	dBA	N/A	5	dBA	N/A	1	dBA
MGR_OB	Motor Grader Route OB	N/A	7	dBA	N/A	3	dBA	N/A	3	dBA	N/A	3	dBA	N/A	-3	dBA
MGR_OPMill	Motor Grader Route Open Pit to Mill	N/A	11	dBA	N/A	2	dBA	N/A	3	dBA	N/A	1	dBA	N/A	-4	dBA
MGR_PAG	Motor Grader Route PAG	N/A	8	dBA	N/A	-5	dBA	N/A	-5	dBA	N/A	-5	dBA	N/A	-9	dBA
TRE_NPAG	Truck Route-NPAG (Empty Truck)	N/A	14	dBA	N/A	10	dBA	N/A	10	dBA	N/A	9	dBA	N/A	7	dBA
TRE_OB	Truck Route-Overburden (Empty Truck)	N/A	14	dBA	N/A	9	dBA	N/A	10	dBA	N/A	9	dBA	N/A	6	dBA
TRE_OPMill	Truck Route Open Pit to Mill (Empty Truck)	N/A	11	dBA	N/A	2	dBA	N/A	4	dBA	N/A	2	dBA	N/A	-1	dBA
TRE_PAG	Truck Route PAG (Empty Truck)	N/A	17	dBA	N/A	7	dBA	N/A	8	dBA	N/A	8	dBA	N/A	4	dBA
TRE_SP	Truck Route Stockpile (Empty Truck)	N/A	12	dBA	N/A	3	dBA	N/A	4	dBA	N/A	3	dBA	N/A	-1	dBA
TRL_NPAG	Truck Route-NPAG (Loaded Truck)	N/A	28	dBA	N/A	25	dBA	N/A	25	dBA	N/A	23	dBA	N/A	21	dBA
TRL_OB	Truck Route-Overburden (Loaded Truck)	N/A	28	dBA	N/A	24	dBA	N/A	24	dBA	N/A	23	dBA	N/A	20	dBA
TRL_OPMill	Truck Route Open Pit to Mill (Loaded Truck)	N/A	24	dBA	N/A	16	dBA	N/A	17	dBA	N/A	17	dBA	N/A	13	dBA
TRL_PAG	Truck Route PAG (Loaded Truck)	N/A	31	dBA	N/A	22	dBA	N/A	22	dBA	N/A	22	dBA	N/A	18	dBA
TRL_SP	Truck Route Stockpile (Loaded Truck)	N/A	26	dBA	N/A	17	dBA	N/A	18	dBA	N/A	17	dBA	N/A	13	dBA
WTR_NPAG	Water Truck Route NPAG	N/A	8	dBA	N/A	4	dBA	N/A	4	dBA	N/A	2	dBA	N/A	-2	dBA
WTR_OB	Water Truck Route OB	N/A	5	dBA	N/A	1	dBA	N/A	1	dBA	N/A	1	dBA	N/A	-6	dBA
WTR_OPMill	Water Truck Route Open Pit to Mill	N/A	10	dBA	N/A	-1	dBA	N/A	0	dBA	N/A	-2	dBA	N/A	-8	dBA
WTR_PAG	Water Truck Route PAG	N/A	6	dBA	N/A	-8	dBA	N/A	-8	dBA	N/A	-8	dBA	N/A	-14	dBA
WTR_SP	Water Truck Route Stockpile	N/A	11	dBA	N/A	-4	dBA	N/A	-3	dBA	N/A	-4	dBA	N/A	-10	dBA
LD4_TR	LD4 Aggregate Pit Truck Route	N/A	10	dBA	N/A	17	dBA	N/A	17	dBA	N/A	19	dBA	N/A	7	dBA
OC3_TR	OC3 Aggregate Pit Truck Route	N/A	7	dBA	N/A	-7	dBA	N/A	-7	dBA	N/A	-5	dBA	N/A	-9	dBA
EO_TR	EO Aggregate Pit Truck Route	N/A	17	dBA	N/A	13	dBA	N/A	13	dBA	N/A	15	dBA	N/A	6	dBA
Roen_TR	Roen Aggregate Pit Truck Route	N/A	12	dBA	N/A	14	dBA	N/A	13	dBA	N/A	12	dBA	N/A	5	dBA
EG1	Emergency Generator 1 (CAT 2.5 MW)	4508	36	dBA	4314	30	dBA	7112	30	dBA	7072	31	dBA	7239	25	dBA
EG2	Emergency Generator 2 (CAT 2.5 MW)	6021	33	dBA	5739	31	dBA	6335	33	dBA	6269	33	dBA	5864	26	dBA
FP1	Fire Pump 1	4470	45	dBA	4260	41	dBA	7017	41	dBA	6978	44	dBA	7182	40	dBA
FP2	Fire Pump 2	4437	45	dBA	4225	41	dBA	7012	41	dBA	6974	44	dBA	7194	40	dBA

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

	Point of Reception ID	Point of Reception ID	Point of Reception ID	Point of Reception ID	Point of Reception ID
	POR19	POR20	POR21	POR22	POR23
	Point of Reception Description	Point of Reception Description	Point of Reception Description	Point of Reception Description	Point of Reception Description
	Vacant Lot Near Pinewood River	Vacant Lot 56041-0138	Vacant Lot 56036-0023	Vacant Lot 56036-0184	Vacant Lot 56041-0037
	Point of reception coordinates	Point of reception coordinates	Point of reception coordinates	Point of reception coordinates	Point of reception coordinates
	X Y Z	X Y Z	X Y Z	X Y Z	X Y Z
	416140 5407200 344.5	425325 5406877 373.2	429474 5408438 384.1	428602 5406751 366.5	424360 5407033 369.5

Source ID	Source Description	Point of Reception 16			Point of Reception 17			Point of Reception 18			Point of Reception 19			Point of Reception 20		
		Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units
AC1	WMP Air Compressor 1	6605	1	dBA	6134	-4	dBA	8786	-4	dBA	8745	3	dBA	5406	1	dBA
AC2	WMP Air Compressor 2	6128	-1	dBA	6741	-6	dBA	9533	-5	dBA	9447	2	dBA	5962	-1	dBA
AC3	WMP Air Compressor 3	6506	-2	dBA	7468	-6	dBA	10058	-6	dBA	10078	-1	dBA	6716	-2	dBA
AC4	WMP Air Compressor 4	7081	0	dBA	6490	-5	dBA	8878	-5	dBA	8959	1	dBA	5813	1	dBA
BD1	Blast Hole Drill 1- Sandvik DR461i	9612	22	dBA	2734	18	dBA	4196	18	dBA	4257	11	dBA	2795	21	dBA
BD2	Blast Hole Drill 2- Sandvik DR461i	9628	21	dBA	2735	17	dBA	4180	16	dBA	4245	11	dBA	2801	22	dBA
BD3	Blast Hole Drill 3 - Sandvik DP1500i	9578	4	dBA	2662	10	dBA	4193	6	dBA	4223	1	dBA	2722	4	dBA
BD4	Blast Hole Drill 4 - Sandvik DP1500i	9591	5	dBA	2663	10	dBA	4180	6	dBA	4212	1	dBA	2728	4	dBA
C	Crusher	11052	18	dBA	3634	16	dBA	3229	13	dBA	3911	17	dBA	3990	18	dBA
DC1	Dust Collector 1	11069	14	dBA	3675	12	dBA	3247	9	dBA	3946	13	dBA	4027	14	dBA
DC2	Dust Collector 2	10972	10	dBA	3821	11	dBA	3513	8	dBA	4222	9	dBA	4112	10	dBA
E1	Komatsu Diesel Excavator PC5500	9579	21	dBA	2729	20	dBA	4226	19	dBA	4279	13	dBA	2778	21	dBA
E2	Komatsu Diesel Excavator PC5500	9708	22	dBA	2733	18	dBA	4097	18	dBA	4178	15	dBA	2829	22	dBA
E3	Komatsu Diesel Excavator PC8000	9660	26	dBA	2707	23	dBA	4132	21	dBA	4194	17	dBA	2789	26	dBA
E4	Komatsu Diesel Excavator PC3000	9626	27	dBA	2683	27	dBA	4154	25	dBA	4201	20	dBA	2757	27	dBA
E5	Komatsu Diesel Excavator PC800LC	9743	14	dBA	2693	10	dBA	4039	9	dBA	4113	8	dBA	2809	14	dBA
E6	Komatsu Diesel Excavator PC360LC	9669	17	dBA	2691	16	dBA	4115	13	dBA	4173	10	dBA	2780	17	dBA
EO_E	East Outcrop Aggregate Pit Excavator PC360LC	10992	23	dBA	3118	19	dBA	2845	22	dBA	3321	21	dBA	3580	23	dBA
EO_FEL	East Outcrop Graval Pit Mobile Crushing Plant Loader (CAT 966H)	11000	25	dBA	3110	20	dBA	2828	23	dBA	3302	23	dBA	3576	24	dBA
EO_PS	East Outcrop Graval Pit Mobile Primary Crusher (PowerScreen)	10986	24	dBA	3109	22	dBA	2846	24	dBA	3317	23	dBA	3570	24	dBA
EO_SCNR	East Outcrop Graval Pit Mobile Screener (Atlas Copco HCS3715)	10966	11	dBA	3100	12	dBA	2865	11	dBA	3328	11	dBA	3557	10	dBA
LD4_E	LD4 Aggregate Pit Excavator PC360LC	7576	19	dBA	4182	12	dBA	6735	13	dBA	6650	21	dBA	3593	19	dBA
LD4_FEL	LD4 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	7649	22	dBA	4162	17	dBA	6674	17	dBA	6603	23	dBA	3588	22	dBA
LD4_PS	LD4 Graval Pit Mobile Primary Crusher (PowerScreen)	7589	21	dBA	4181	15	dBA	6726	15	dBA	6644	23	dBA	3594	21	dBA
LD4_SCNR	LD4 Graval Pit Mobile Screener (Atlas Copco HCS3715)	7637	9	dBA	4144	4	dBA	6670	4	dBA	6593	11	dBA	3567	9	dBA
Outcrop3_E	Outcrop 3 Aggregate Pit Excavator PC360LC	12838	17	dBA	4690	25	dBA	1973	21	dBA	3465	15	dBA	5317	17	dBA
Outcrop3_FEL	Outcrop 3 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	12812	20	dBA	4678	28	dBA	1995	23	dBA	3476	19	dBA	5300	20	dBA
Outcrop3_PS	Outcrop 3 Graval Pit Mobile Primary Crusher (PowerScreen)	12830	19	dBA	4682	26	dBA	1970	24	dBA	3459	18	dBA	5308	19	dBA
Outcrop3_SCI	Outcrop3 Graval Pit Mobile Screener (Atlas Copco HCS3715)	12795	8	dBA	4645	13	dBA	1966	11	dBA	3438	6	dBA	5271	8	dBA
PG1	Pinewood River Pumphouse Generator (CAT 660 kW)	574	2	dBA	9738	-5	dBA	13956	-4	dBA	13017	2	dBA	8772	2	dBA
RD1	RC Drill Sandvik DR580	9832	15	dBA	2686	11	dBA	3941	10	dBA	4030	11	dBA	2836	15	dBA
RD2	RC Drill Sandvik DR580	9815	12	dBA	2657	9	dBA	3944	8	dBA	4019	9	dBA	2807	12	dBA
Roen_E	Roen Aggregate Pit Excavator PC360LC	10554	20	dBA	4711	17	dBA	4867	15	dBA	5600	17	dBA	4743	20	dBA
Roen_FEL	Roen Graval Pit Mobile Crushing Plant Loader (CAT 966H)	10623	24	dBA	4677	20	dBA	4766	19	dBA	5514	20	dBA	4730	24	dBA
Roen_PS	Roen Graval Pit Mobile Primary Crusher (PowerScreen)	10531	23	dBA	4717	19	dBA	4895	17	dBA	5623	19	dBA	4743	23	dBA
Roen_SCNR	Roen Graval Pit Mobile Screener (Atlas Copco HCS3715)	10460	9	dBA	4652	7	dBA	4895	6	dBA	5596	8	dBA	4669	9	dBA
T1	Transformer 1	11314	16	dBA	4547	18	dBA	3901	15	dBA	4833	16	dBA	4793	16	dBA
T2	Transformer 2	11310	16	dBA	4535	18	dBA	3893	15	dBA	4822	16	dBA	4782	16	dBA
TD01	Track Dozer 01 (Pit - Komatsu D475)	9769	22	dBA	2714	16	dBA	4023	16	dBA	4110	15	dBA	2836	21	dBA
TD02	Track Dozer 02 (Pit -CAT D10)	9528	20	dBA	2707	22	dBA	4266	19	dBA	4300	11	dBA	2741	20	dBA
TD03	Track Dozer 03 (Pit -CAT D10)	9648	21	dBA	2697	20	dBA	4139	15	dBA	4195	13	dBA	2777	21	dBA
TD04	Track Dozer 04 (Pit -CAT D10)	9766	21	dBA	2775	13	dBA	4060	14	dBA	4167	12	dBA	2884	21	dBA
TD05	Track Dozer 05 (PAG - Komatsu D375)	12334	17	dBA	4175	27	dBA	1988	21	dBA	3214	15	dBA	4787	17	dBA
TD06	Track Dozer 06 (PAG - Komatsu D375)	12161	18	dBA	3795	28	dBA	1736	23	dBA	2778	19	dBA	4458	18	dBA
TD07D	Track Dozer 07 (PAG - Komatsu D475)	12097	23	dBA	4019	32	dBA	2164	27	dBA	3266	21	dBA	4600	23	dBA
TD07N	Track Dozer 07 (PAG - Komatsu D475)	12097	0	dBA	4019	0	dBA	2164	0	dBA	3266	0	dBA	4600	0	dBA
TD08D	Track Dozer 08 (PAG - Komatsu D375)	12324	22	dBA	4377	31	dBA	2318	25	dBA	3573	20	dBA	4934	22	dBA
TD08N	Track Dozer 08 (PAG - Komatsu D375)	12324	0	dBA	4377	0	dBA	2318	0	dBA	3573	0	dBA	4934	0	dBA
TD09	Track Dozer 09 (Ore -CAT D9)	11775	20	dBA	3515	26	dBA	2059	23	dBA	2870	21	dBA	4131	19	dBA
TD10	Track Dozer 10 (Ore -CAT D8)	11365	25	dBA	3214	25	dBA	2400	26	dBA	2979	22	dBA	3778	24	dBA
TD11D	Track Dozer 11 (NPAG/OB - Komatsu D475)	7907	27	dBA	4070	16	dBA	6439	17	dBA	6414	29	dBA	3550	27	dBA
TD11N	Track Dozer 11 (NPAG/OB - Komatsu D475)	7907	0	dBA	4070	0	dBA	6439	0	dBA	6414	0	dBA	3550	0	dBA
TD12D	Track Dozer 12 (NPAG/OB - Komatsu D375)	9592	28	dBA	3900	20	dBA	5004	19	dBA	5365	24	dBA	3795	28	dBA
TD12N	Track Dozer 12 (NPAG/OB - Komatsu D375)	9592	0	dBA	3900	0	dBA	5004	0	dBA	5365	0	dBA	3795	0	dBA
TD13	Track Dozer 13 (NPAG/OB -CAT D9)	8090	25	dBA	3227	13	dBA	5797	13	dBA	5633	27	dBA	2752	25	dBA
TD14	Track Dozer 14 (NPAG/OB -CAT D9)	8404	26	dBA	2947	13	dBA	5406	13	dBA	5248	28	dBA	2571	26	dBA
TD15	Track Dozer 15 (NPAG/OB -CAT D9)	9455	23	dBA	3624	14	dBA	4916	14	dBA	5186	20	dBA	3514	23	dBA
TD16	Track Dozer 16 (NPAG/OB -CAT D9)	8282	18	dBA	3842	12	dBA	6020	12	dBA	6044	20	dBA	3411	18	dBA
WD	Komatsu Wheel Dozer KM WD600	9711	9	dBA	2698	6	dBA	4075	4	dBA	4145	2	dBA	2801	9	dBA
WL1	Komatsu Wheel Loader WA1200	9535	14	dBA	2688	20	dBA	4249	17	dBA	4279	9	dBA	2728	14	dBA
WL2	Komatsu Wheel Loader WA900	9567	19	dBA	2691	19	dBA	4219	17	dBA	4256	11	dBA	2742	19	dBA
WP01	Water Pump WP01	9702	11	dBA	2800	5	dBA	4139	5	dBA	4242	3	dBA	2881	10	dBA

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

	Point of Reception ID	Point of Reception ID	Point of Reception ID	Point of Reception ID	Point of Reception ID
	POR19	POR20	POR21	POR22	POR23
Point of Reception Description	Vacant Lot Near Pinewood River	Vacant Lot 56041-0138	Vacant Lot 56036-0023	Vacant Lot 56036-0184	Vacant Lot 56041-0037
Point of reception coordinates X	416140	425325	429474	428602	424360
Point of reception coordinates Y	5407200	5406877	5408438	5406751	5407033
Point of reception coordinates Z	344.5	373.2	384.1	366.5	369.5

Source ID	Source Description	Point of Reception 16			Point of Reception 17			Point of Reception 18			Point of Reception 19			Point of Reception 20		
		Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units	Distance (m)	Sound Level at PoR	Units
WP02	Water Pump WP02	9842	11	dBA	2795	-6	dBA	3991	3	dBA	4121	5	dBA	2928	10	dBA
WP03	Water Pump WP03	9871	6	dBA	2747	-5	dBA	3934	-1	dBA	4053	1	dBA	2899	6	dBA
WP04	Water Pump WP04	9856	-2	dBA	2672	-10	dBA	3908	-10	dBA	3996	-6	dBA	2834	-2	dBA
WP05	Water Pump WP05	9742	-4	dBA	2635	-4	dBA	4009	-7	dBA	4062	-7	dBA	2761	-4	dBA
WP06	Water Pump WP06	9627	-3	dBA	2637	2	dBA	4130	-6	dBA	4160	-6	dBA	2720	-3	dBA
WP07	Water Pump WP07	9509	-6	dBA	2636	4	dBA	4250	-6	dBA	4256	-8	dBA	2675	-6	dBA
WP08	Water Pump WP08	9482	-1	dBA	2707	6	dBA	4312	4	dBA	4337	-6	dBA	2725	-1	dBA
WP09	Water Pump WP09	9500	14	dBA	2322	6	dBA	4117	7	dBA	4007	13	dBA	2412	14	dBA
WP10	Water Pump WP10	9938	16	dBA	2332	8	dBA	3655	8	dBA	3616	12	dBA	2602	16	dBA
WP11	Water Pump WP11	10377	15	dBA	2557	10	dBA	3257	9	dBA	3375	11	dBA	2944	15	dBA
WP12	Water Pump WP12	8145	15	dBA	2540	3	dBA	5447	4	dBA	5101	18	dBA	2070	13	dBA
WP13	Water Pump WP13	8582	15	dBA	2581	4	dBA	5090	4	dBA	4869	14	dBA	2278	15	dBA
WP14	Water Pump WP14	7592	7	dBA	4111	0	dBA	6677	1	dBA	6583	9	dBA	3524	7	dBA
WP15	Water Pump WP15	7629	7	dBA	4091	0	dBA	6640	1	dBA	6550	9	dBA	3512	7	dBA
WP16	Water Pump WP16	9703	9	dBA	3318	5	dBA	4465	5	dBA	4723	9	dBA	3319	9	dBA
WP17	Water Pump WP17	8816	6	dBA	4281	2	dBA	5941	1	dBA	6173	7	dBA	3955	6	dBA
WP18	Water Pump WP18	6205	5	dBA	4268	-2	dBA	7621	-1	dBA	7206	8	dBA	3435	5	dBA
WP19	Water Pump WP19	10799	-12	dBA	3727	-12	dBA	3630	-14	dBA	4265	-13	dBA	3987	-12	dBA
WP20	Pinewood River Water Pump	568	-2	dBA	9732	-9	dBA	13950	-8	dBA	13011	-3	dBA	8766	-2	dBA
WS	Wet Scrubber	11100	11	dBA	4271	-11	dBA	3834	-12	dBA	4665	10	dBA	4511	10	dBA
MGR_SP	Motor Grader Route Stockpile	N/A	12	dBA	N/A	10	dBA	N/A	8	dBA	N/A	10	dBA	N/A	11	dBA
MGR_NPAG	Motor Grader Route NPAG	N/A	16	dBA	N/A	7	dBA	N/A	6	dBA	N/A	14	dBA	N/A	16	dBA
MGR_OB	Motor Grader Route OB	N/A	10	dBA	N/A	2	dBA	N/A	2	dBA	N/A	8	dBA	N/A	10	dBA
MGR_OPMill	Motor Grader Route Open Pit to Mill	N/A	12	dBA	N/A	8	dBA	N/A	7	dBA	N/A	9	dBA	N/A	12	dBA
MGR_PAG	Motor Grader Route PAG	N/A	4	dBA	N/A	10	dBA	N/A	6	dBA	N/A	2	dBA	N/A	4	dBA
TRE_NPAG	Truck Route-NPAG (Empty Truck)	N/A	19	dBA	N/A	11	dBA	N/A	11	dBA	N/A	17	dBA	N/A	19	dBA
TRE_OB	Truck Route-Overburden (Empty Truck)	N/A	18	dBA	N/A	11	dBA	N/A	10	dBA	N/A	15	dBA	N/A	18	dBA
TRE_OPMill	Truck Route Open Pit to Mill (Empty Truck)	N/A	12	dBA	N/A	8	dBA	N/A	7	dBA	N/A	9	dBA	N/A	12	dBA
TRE_PAG	Truck Route PAG (Empty Truck)	N/A	17	dBA	N/A	16	dBA	N/A	14	dBA	N/A	15	dBA	N/A	17	dBA
TRE_SP	Truck Route Stockpile (Empty Truck)	N/A	12	dBA	N/A	10	dBA	N/A	9	dBA	N/A	10	dBA	N/A	12	dBA
TRL_NPAG	Truck Route-NPAG (Loaded Truck)	N/A	31	dBA	N/A	25	dBA	N/A	25	dBA	N/A	30	dBA	N/A	31	dBA
TRL_OB	Truck Route-Overburden (Loaded Truck)	N/A	31	dBA	N/A	25	dBA	N/A	25	dBA	N/A	29	dBA	N/A	31	dBA
TRL_OPMill	Truck Route Open Pit to Mill (Loaded Truck)	N/A	25	dBA	N/A	22	dBA	N/A	21	dBA	N/A	23	dBA	N/A	25	dBA
TRL_PAG	Truck Route PAG (Loaded Truck)	N/A	30	dBA	N/A	30	dBA	N/A	28	dBA	N/A	29	dBA	N/A	30	dBA
TRL_SP	Truck Route Stockpile (Loaded Truck)	N/A	25	dBA	N/A	24	dBA	N/A	23	dBA	N/A	23	dBA	N/A	25	dBA
WTR_NPAG	Water Truck Route NPAG	N/A	15	dBA	N/A	4	dBA	N/A	4	dBA	N/A	13	dBA	N/A	15	dBA
WTR_OB	Water Truck Route OB	N/A	8	dBA	N/A	0	dBA	N/A	-1	dBA	N/A	7	dBA	N/A	8	dBA
WTR_OPMill	Water Truck Route Open Pit to Mill	N/A	11	dBA	N/A	6	dBA	N/A	5	dBA	N/A	8	dBA	N/A	11	dBA
WTR_PAG	Water Truck Route PAG	N/A	3	dBA	N/A	9	dBA	N/A	5	dBA	N/A	0	dBA	N/A	2	dBA
WTR_SP	Water Truck Route Stockpile	N/A	10	dBA	N/A	8	dBA	N/A	7	dBA	N/A	8	dBA	N/A	10	dBA
LD4_TR	LD4 Aggregate Pit Truck Route	N/A	14	dBA	N/A	8	dBA	N/A	8	dBA	N/A	15	dBA	N/A	14	dBA
OC3_TR	OC3 Aggregate Pit Truck Route	N/A	1	dBA	N/A	8	dBA	N/A	3	dBA	N/A	0	dBA	N/A	1	dBA
EO_TR	EO Aggregate Pit Truck Route	N/A	18	dBA	N/A	16	dBA	N/A	14	dBA	N/A	17	dBA	N/A	18	dBA
Roen_TR	Roen Aggregate Pit Truck Route	N/A	16	dBA	N/A	10	dBA	N/A	9	dBA	N/A	14	dBA	N/A	16	dBA
EG1	Emergency Generator 1 (CAT 2.5 MW)	11255	35	dBA	4520	37	dBA	3938	34	dBA	4848	35	dBA	4755	35	dBA
EG2	Emergency Generator 2 (CAT 2.5 MW)	10752	34	dBA	5502	33	dBA	5546	31	dBA	6390	33	dBA	5474	34	dBA
FP1	Fire Pump 1	11148	46	dBA	4425	36	dBA	3950	39	dBA	4817	45	dBA	4650	45	dBA
FP2	Fire Pump 2	11136	46	dBA	4392	34	dBA	3926	39	dBA	4786	45	dBA	4619	46	dBA

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

Point of Reception ID	POR24	POR25
Point of Reception Description	Vacant Lot 56041-0135	Vacant Lot 56041-0139
Point of reception coordinates X	425216	426109
Point of reception coordinates Y	5406873	5406850
Point of reception coordinates Z	372.2	378.7

Source ID	Source Description	Point of Reception 21 Distance (m)	Point of Reception 21 Sound Level at PoR	Point of Reception 21 Units	Point of Reception 22 Distance (m)	Point of Reception 22 Sound Level at PoR	Point of Reception 22 Units
AC1	WMP Air Compressor 1	6065	0	dBA	6703	0	dBA
AC2	WMP Air Compressor 2	6666	-2	dBA	7344	0	dBA
AC3	WMP Air Compressor 3	7396	-3	dBA	8046	0	dBA
AC4	WMP Air Compressor 4	6427	-1	dBA	7018	0	dBA
BD1	Blast Hole Drill 1- Sandvik DR461i	2744	22	dBA	2836	0	dBA
BD2	Blast Hole Drill 2- Sandvik DR461i	2745	22	dBA	2833	0	dBA
BD3	Blast Hole Drill 3 - Sandvik DP1500i	2672	6	dBA	2772	0	dBA
BD4	Blast Hole Drill 4 - Sandvik DP1500i	2673	6	dBA	2768	0	dBA
C	Crusher	3682	19	dBA	3424	0	dBA
DC1	Dust Collector 1	3722	15	dBA	3466	0	dBA
DC2	Dust Collector 2	3862	10	dBA	3658	0	dBA
E1	Komatsu Diesel Excavator PC5500	2738	23	dBA	2840	0	dBA
E2	Komatsu Diesel Excavator PC5500	2748	18	dBA	2808	0	dBA
E3	Komatsu Diesel Excavator PC8000	2719	26	dBA	2794	0	dBA
E4	Komatsu Diesel Excavator PC3000	2694	28	dBA	2778	0	dBA
E5	Komatsu Diesel Excavator PC800LC	2710	9	dBA	2755	0	dBA
E6	Komatsu Diesel Excavator PC360LC	2704	18	dBA	2775	0	dBA
EO_E	East Outcrop Aggregate Pit Excavator PC360LC	3176	24	dBA	2838	0	dBA
EO_FEL	East Outcrop Graval Pit Mobile Crushing Plant Loader (CAT 966H)	3169	25	dBA	2826	0	dBA
EO_PS	East Outcrop Graval Pit Mobile Primary Crusher (PowerScreen)	3166	25	dBA	2829	0	dBA
EO_SCNR	East Outcrop Graval Pit Mobile Screener (Atlas Copco HCS3715)	3157	11	dBA	2825	0	dBA
LD4_E	LD4 Aggregate Pit Excavator PC360LC	4127	20	dBA	4680	0	dBA
LD4_FEL	LD4 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	4108	20	dBA	4651	0	dBA
LD4_PS	LD4 Graval Pit Mobile Primary Crusher (PowerScreen)	4126	19	dBA	4677	0	dBA
LD4_SCNR	LD4 Graval Pit Mobile Screener (Atlas Copco HCS3715)	4090	8	dBA	4635	0	dBA
Outcrop3_E	Outcrop 3 Aggregate Pit Excavator PC360LC	4769	19	dBA	4198	0	dBA
Outcrop3_FEL	Outcrop 3 Graval Pit Mobile Crushing Plant Loader (CAT 966H)	4757	21	dBA	4190	0	dBA
Outcrop3_PS	Outcrop 3 Graval Pit Mobile Primary Crusher (PowerScreen)	4761	21	dBA	4189	0	dBA
Outcrop3_SCI	Outcrop3 Graval Pit Mobile Screener (Atlas Copco HCS3715)	4724	9	dBA	4154	0	dBA
PG1	Pinewood River Pumphouse Generator (CAT 660 kW)	9630	1	dBA	10523	0	dBA
RD1	RC Drill Sandvik DR580	2706	11	dBA	2720	0	dBA
RD2	RC Drill Sandvik DR580	2677	9	dBA	2694	0	dBA
Roen_E	Roen Aggregate Pit Excavator PC360LC	4726	20	dBA	4732	0	dBA
Roen_FEL	Roen Graval Pit Mobile Crushing Plant Loader (CAT 966H)	4693	24	dBA	4682	0	dBA
Roen_PS	Roen Graval Pit Mobile Primary Crusher (PowerScreen)	4731	23	dBA	4743	0	dBA
Roen_SCNR	Roen Graval Pit Mobile Screener (Atlas Copco HCS3715)	4664	9	dBA	4686	0	dBA
T1	Transformer 1	4584	17	dBA	4396	0	dBA
T2	Transformer 2	4573	17	dBA	4384	0	dBA
TD01	Track Dozer 01 (Pit - Komatsu D475)	2731	14	dBA	2769	0	dBA
TD02	Track Dozer 02 (Pit -CAT D10)	2714	22	dBA	2832	0	dBA
TD03	Track Dozer 03 (Pit -CAT D10)	2709	22	dBA	2787	0	dBA
TD04	Track Dozer 04 (Pit -CAT D10)	2791	16	dBA	2835	0	dBA
TD05	Track Dozer 05 (PAG - Komatsu D375)	4252	22	dBA	3708	0	dBA
TD06	Track Dozer 06 (PAG - Komatsu D375)	3877	24	dBA	3290	0	dBA
TD07D	Track Dozer 07 (PAG - Komatsu D475)	4093	25	dBA	3586	0	dBA
TD07N	Track Dozer 07 (PAG - Komatsu D475)	4093	0	dBA	3586	0	dBA
TD08D	Track Dozer 08 (PAG - Komatsu D375)	4448	24	dBA	3955	0	dBA
TD08N	Track Dozer 08 (PAG - Komatsu D375)	4448	0	dBA	3955	0	dBA
TD09	Track Dozer 09 (Ore -CAT D9)	3591	25	dBA	3064	0	dBA
TD10	Track Dozer 10 (Ore -CAT D8)	3284	27	dBA	2829	0	dBA
TD11D	Track Dozer 11 (NPAG/OB - Komatsu D475)	4022	25	dBA	4524	0	dBA
TD11N	Track Dozer 11 (NPAG/OB - Komatsu D475)	4022	0	dBA	4524	0	dBA
TD12D	Track Dozer 12 (NPAG/OB - Komatsu D375)	3897	27	dBA	4058	0	dBA
TD12N	Track Dozer 12 (NPAG/OB - Komatsu D375)	3897	0	dBA	4058	0	dBA
TD13	Track Dozer 13 (NPAG/OB -CAT D9)	3181	19	dBA	3679	0	dBA
TD14	Track Dozer 14 (NPAG/OB -CAT D9)	2911	24	dBA	3350	0	dBA
TD15	Track Dozer 15 (NPAG/OB -CAT D9)	3620	18	dBA	3800	0	dBA
TD16	Track Dozer 16 (NPAG/OB -CAT D9)	3803	17	dBA	4241	0	dBA
WD	Komatsu Wheel Dozer KM WD600	2713	3	dBA	2770	0	dBA
WL1	Komatsu Wheel Loader WA1200	2695	16	dBA	2810	0	dBA
WL2	Komatsu Wheel Loader WA900	2700	20	dBA	2805	0	dBA
WP01	Water Pump WP01	2813	7	dBA	2879	0	dBA

Table 2: Point of Reception Sound Impact

Project: RRP
Location: Township of Chapple ON

	Point of Reception ID	Point of Reception Description	Point of reception coordinates X	Y	Z
	POR24	Vacant Lot 56041-0135	425216	5406873	372.2
	POR25	Vacant Lot 56041-0139	426109	5406850	378.7

Source ID	Source Description	Point of Reception 21 Distance (m)	Sound Level at PoR	Units	Point of Reception 22 Distance (m)	Sound Level at PoR	Units
WP02	Water Pump WP02	2814	6	dBA	2834	0	dBA
WP03	Water Pump WP03	2768	0	dBA	2774	0	dBA
WP04	Water Pump WP04	2693	-6	dBA	2697	0	dBA
WP05	Water Pump WP05	2652	-6	dBA	2693	0	dBA
WP06	Water Pump WP06	2649	-1	dBA	2730	0	dBA
WP07	Water Pump WP07	2643	-5	dBA	2765	0	dBA
WP08	Water Pump WP08	2712	2	dBA	2846	0	dBA
WP09	Water Pump WP09	2333	13	dBA	2443	0	dBA
WP10	Water Pump WP10	2363	14	dBA	2300	0	dBA
WP11	Water Pump WP11	2604	13	dBA	2392	0	dBA
WP12	Water Pump WP12	2491	13	dBA	3026	0	dBA
WP13	Water Pump WP13	2550	13	dBA	2961	0	dBA
WP14	Water Pump WP14	4055	5	dBA	4609	0	dBA
WP15	Water Pump WP15	4036	5	dBA	4584	0	dBA
WP16	Water Pump WP16	3325	9	dBA	3425	0	dBA
WP17	Water Pump WP17	4254	5	dBA	4590	0	dBA
WP18	Water Pump WP18	4185	7	dBA	4931	0	dBA
WP19	Water Pump WP19	3764	-11	dBA	3597	0	dBA
WP20	Pinewood River Water Pump	9624	-3	dBA	10517	0	dBA
WS	Wet Scrubber	4307	8	dBA	4134	0	dBA
MGR_SP	Motor Grader Route Stockpile	N/A	12	dBA	N/A	0	dBA
MGR_NPAG	Motor Grader Route NPAG	N/A	15	dBA	N/A	0	dBA
MGR_OB	Motor Grader Route OB	N/A	9	dBA	N/A	0	dBA
MGR_OPMill	Motor Grader Route Open Pit to Mill	N/A	12	dBA	N/A	0	dBA
MGR_PAG	Motor Grader Route PAG	N/A	6	dBA	N/A	0	dBA
TRE_NPAG	Truck Route-NPAG (Empty Truck)	N/A	18	dBA	N/A	0	dBA
TRE_OB	Truck Route-Overburden (Empty Truck)	N/A	17	dBA	N/A	0	dBA
TRE_OPMill	Truck Route Open Pit to Mill (Empty Truck)	N/A	11	dBA	N/A	0	dBA
TRE_PAG	Truck Route PAG (Empty Truck)	N/A	17	dBA	N/A	0	dBA
TRE_SP	Truck Route Stockpile (Empty Truck)	N/A	12	dBA	N/A	0	dBA
TRL_NPAG	Truck Route-NPAG (Loaded Truck)	N/A	30	dBA	N/A	0	dBA
TRL_OB	Truck Route-Overburden (Loaded Truck)	N/A	30	dBA	N/A	0	dBA
TRL_OPMill	Truck Route Open Pit to Mill (Loaded Truck)	N/A	24	dBA	N/A	0	dBA
TRL_PAG	Truck Route PAG (Loaded Truck)	N/A	30	dBA	N/A	0	dBA
TRL_SP	Truck Route Stockpile (Loaded Truck)	N/A	25	dBA	N/A	0	dBA
WTR_NPAG	Water Truck Route NPAG	N/A	14	dBA	N/A	0	dBA
WTR_OB	Water Truck Route OB	N/A	8	dBA	N/A	0	dBA
WTR_OPMill	Water Truck Route Open Pit to Mill	N/A	10	dBA	N/A	0	dBA
WTR_PAG	Water Truck Route PAG	N/A	4	dBA	N/A	0	dBA
WTR_SP	Water Truck Route Stockpile	N/A	11	dBA	N/A	0	dBA
LD4_TR	LD4 Aggregate Pit Truck Route	N/A	12	dBA	N/A	0	dBA
OC3_TR	OC3 Aggregate Pit Truck Route	N/A	5	dBA	N/A	0	dBA
EO_TR	EO Aggregate Pit Truck Route	N/A	18	dBA	N/A	0	dBA
Roen_TR	Roen Aggregate Pit Truck Route	N/A	15	dBA	N/A	0	dBA
EG1	Emergency Generator 1 (CAT 2.5 MW)	4556	35	dBA	4379	0	dBA
EG2	Emergency Generator 2 (CAT 2.5 MW)	5511	34	dBA	5549	0	dBA
FP1	Fire Pump 1	4460	46	dBA	4296	0	dBA
FP2	Fire Pump 2	4427	46	dBA	4262	0	dBA

Table 3: Acoustic Assessment Summary Table

Project: RRP
Location: Township of Chapple ON

Point of Reception ID	Point of Reception Description	Operation	Time Period [1]	Operational Sound Level at POR (dBA) [2]		Verified by Acoustic Audit [3]	Performance Limit [4]	Peformance Limit Source [5]	Compliance with Performance Limit
				Early Operations	Life of Mine Operations	(Yes/No)	(dBA/dBAI)	(C / M/ D)	(Yes/No)
POR01	House 01 - North	Regular	Daytime	35	N/A	No	45	D	Yes
			Evening/Night	34	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	48		No	50		Yes
POR02	House 02 - East	Regular	Daytime	35	N/A	No	45	D	Yes
			Evening/Night	34	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	43		No	50		Yes
POR03	House 03 - East	Regular	Daytime	35	N/A	No	45	D	Yes
			Evening/Night	34	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	45		No	50		Yes
POR04	House 04 - East	Regular	Daytime	35	N/A	No	45	D	Yes
			Evening/Night	34	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	45		No	50		Yes
POR06	House 06 -Southeast	Regular	Daytime	37	N/A	No	45	D	Yes
			Evening/Night	35	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	42		No	50		Yes
POR07	House 07 - South	Regular	Daytime	35	N/A	No	45	D	Yes
			Evening/Night	34	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	40		No	50		Yes
POR08	House 08 - South	Regular	Daytime	36	N/A	No	45	D	Yes
			Evening/Night	35	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	40		No	50		Yes
POR09	House 9 - South	Regular	Daytime	36	N/A	No	45	D	Yes
			Evening/Night	35	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	41		No	50		Yes
POR10	House 10 - South	Regular	Daytime	37	N/A	No	45	D	Yes
			Evening/Night	36	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	42		No	50		Yes

Table 3: Acoustic Assessment Summary Table

Project: RRP
Location: Township of Chapple ON

Point of Reception ID	Point of Reception Description	Operation	Time Period [1]	Operational Sound Level at POR (dBA) [2]		Verified by Acoustic Audit [3]	Performance Limit [4]	Peformance Limit Source [5]	Compliance with Performance Limit
				Early Operations	Life of Mine Operations	(Yes/No)	(dBA/dBAI)	(C / M/ D)	(Yes/No)
POR11	House 11 - South	Regular	Daytime	38	N/A	No	45	D	Yes
			Evening/Night	37	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	43		No	50		Yes
POR12	House 12 - South	Regular	Daytime	38	N/A	No	45	D	Yes
			Evening/Night	37	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	44		No	50		Yes
POR14	House 14 - South	Regular	Daytime	41	N/A	No	45	D	Yes
			Evening/Night	40	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	48		No	50		Yes
POR15	House 15 - West	Regular	Daytime	35	N/A	No	45	D	Yes
			Evening/Night	33	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	44		No	50		Yes
POR16	House 16 - West	Regular	Daytime	36	N/A	No	45	D	Yes
			Evening/Night	35	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	44		No	50		Yes
POR17	House 17 - Nothwest	Regular	Daytime	34	N/A	No	45	D	Yes
			Evening/Night	33	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	48		No	50		Yes
POR19	Vacant Lot Near Pinewood River	Regular	Daytime	33	N/A	No	45	D	Yes
			Evening/Night	32	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	43		No	50		Yes
POR20	Vacant Lot 56041-0138	Regular	Daytime	41	N/A	No	45	D	Yes
			Evening/Night	40	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	49		No	50		Yes
POR21	Vacant Lot 56036-0023	Regular	Daytime	40	N/A	No	45	D	Yes
			Evening/Night	39	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	41		No	50		Yes

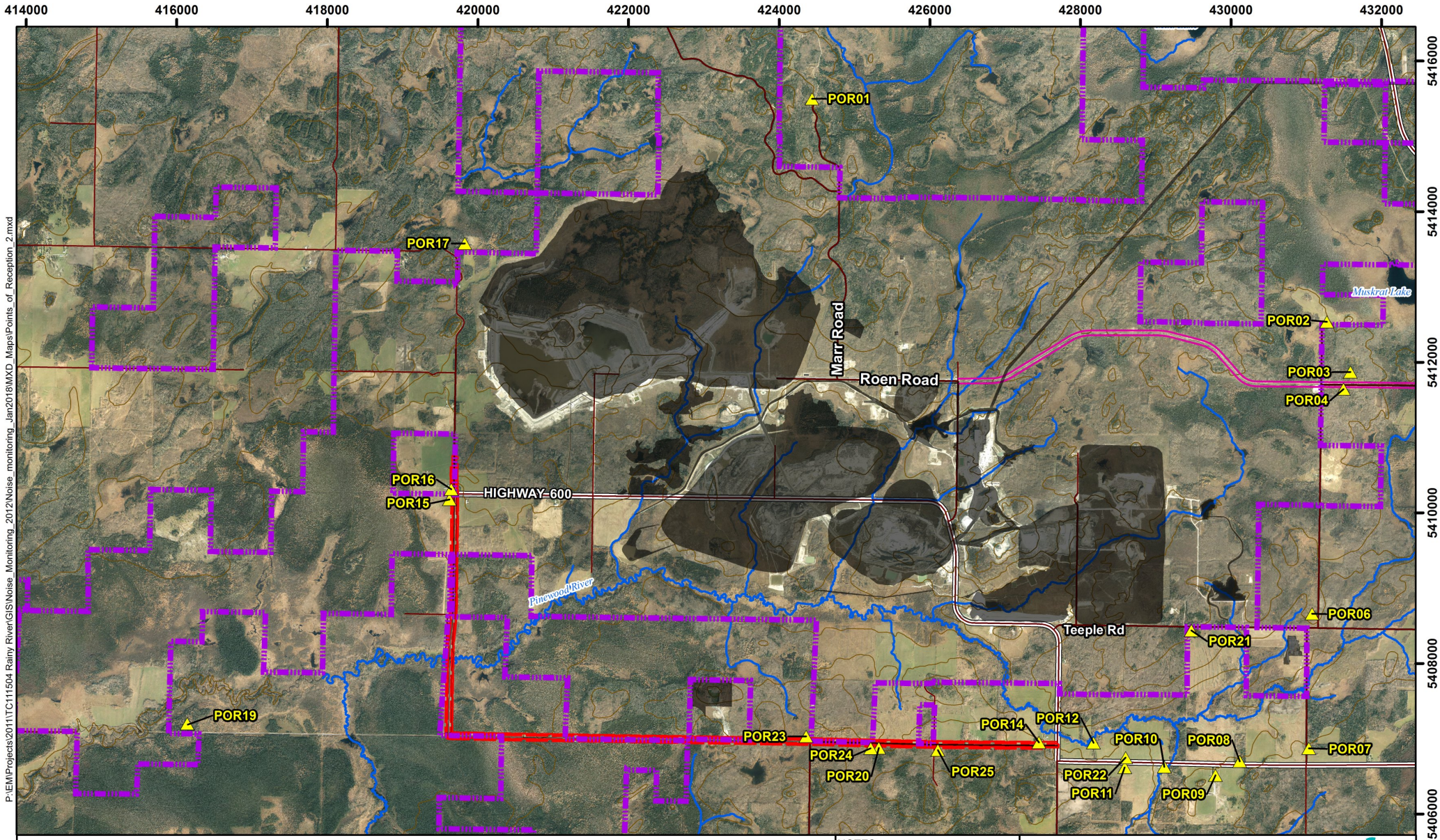
Table 3: Acoustic Assessment Summary Table

Project: RRP
Location: Township of Chapple ON

Point of Reception ID	Point of Reception Description	Operation	Time Period [1]	Operational Sound Level at POR (dBA) [2]		Verified by Acoustic Audit [3]	Performance Limit [4]	Peformance Limit Source [5]	Compliance with Performance Limit
				Early Operations	Life of Mine Operations	(Yes/No)	(dBA/dBAI)	(C / M/ D)	(Yes/No)
POR22	Vacant Lot 56036-0184	Regular	Daytime	38	N/A	No	45	D	Yes
			Evening/Night	37	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	43		No	50		Yes
POR23	Vacant Lot 56041-0037	Regular	Daytime	39	N/A	No	45	D	Yes
			Evening/Night	39	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	48		No	50		Yes
POR24	Vacant Lot 56041-0135	Regular	Daytime	41	N/A	No	45	D	Yes
			Evening/Night	40	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	49		No	50		Yes
POR25	Vacant Lot 56041-0139	Regular	Daytime	41	N/A	No	45	D	Yes
			Evening/Night	40	N/A	No	40		Yes
		Emergency Equipment Testing	Daytime	49		No	50		Yes

Notes :

1 Daytime occurs from 0700-1900h. Evening occurs from 1900h to 2300h. Night-time occurs from 2300-0700h
2 Worst-case cumulative sound level from all applicable sources operating.
3 Has an acoustic audit (as defined in Publication NPC-233) been conducted with source in place and operating?
4 Applicable worst-case NPC-300 sound level limit.
5 Performance limit (aka guideline limit) based on following:
C = Calculated based on road traffic volumes in compliance with NPC-206 requirements.
M = Measured based on monitoring for a minimum 48 hour period, in accordance with NPC-233 requirements.
D = Default guideline minima per NCP300, as applicable (e.g., 45 dBA daytime limit for Class 3 Areas)



LEGEND

- Receptor (labelled with ID)
- RRP-NG Property Boundary

Proposed Site Features

- Approximate Principal RRP Facilities
- Highway Re-alignment
- East Access Road

- Contours, 10 m interval
- Existing Highway
- Existing Road
- River

NOTES:
- Aerial Imagery provided by NewGold Scene date is October 2017.
- Only major facilities are shown connecting infrastructure and supporting facilities are generally shown.

0 2 4 6 8 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

N W E S

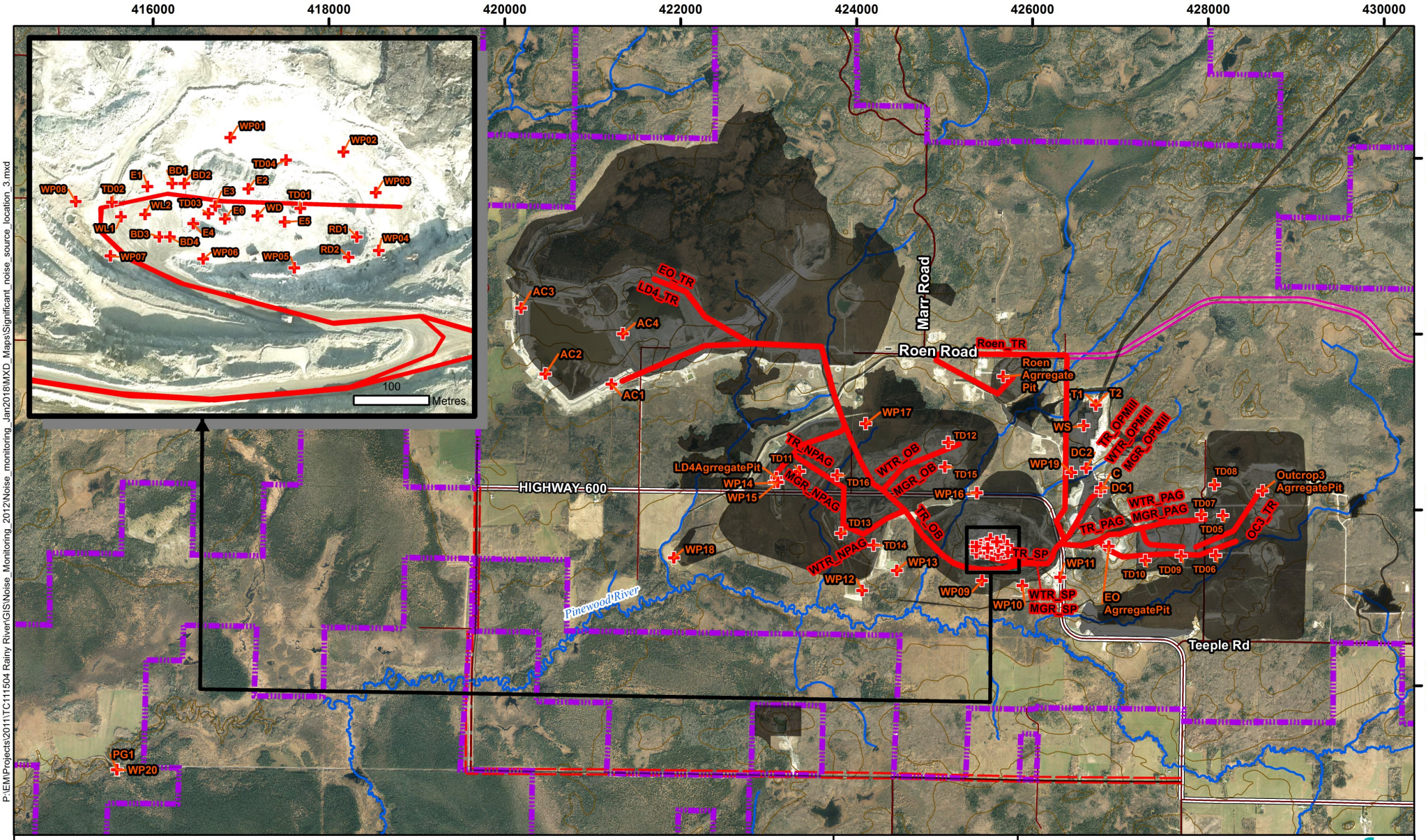
newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER MINE

Site Aerial Map with Points of Reception

PROJECT N°: TC111504	FIGURE: 1
SCALE: 1:70,000	DATE: January 2018



LEGEND

- Point Source (labelled with ID)
- Line Source (labelled with ID)
- RRP-NG Property Boundary

Proposed Site Features

- Approximate Principal RRP Facilities
- Highway Re-alignment
- East Access Road

- Contours, 10 m interval
- Existing Highway
- Existing Road
- River

NOTES:
- Aerial Imagery provided by NewGold Scene date is October 2017.
- Only major facilities are shown connecting infrastructure and supporting facilities are generally shown.

0 2 4 6 8 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

N W E S

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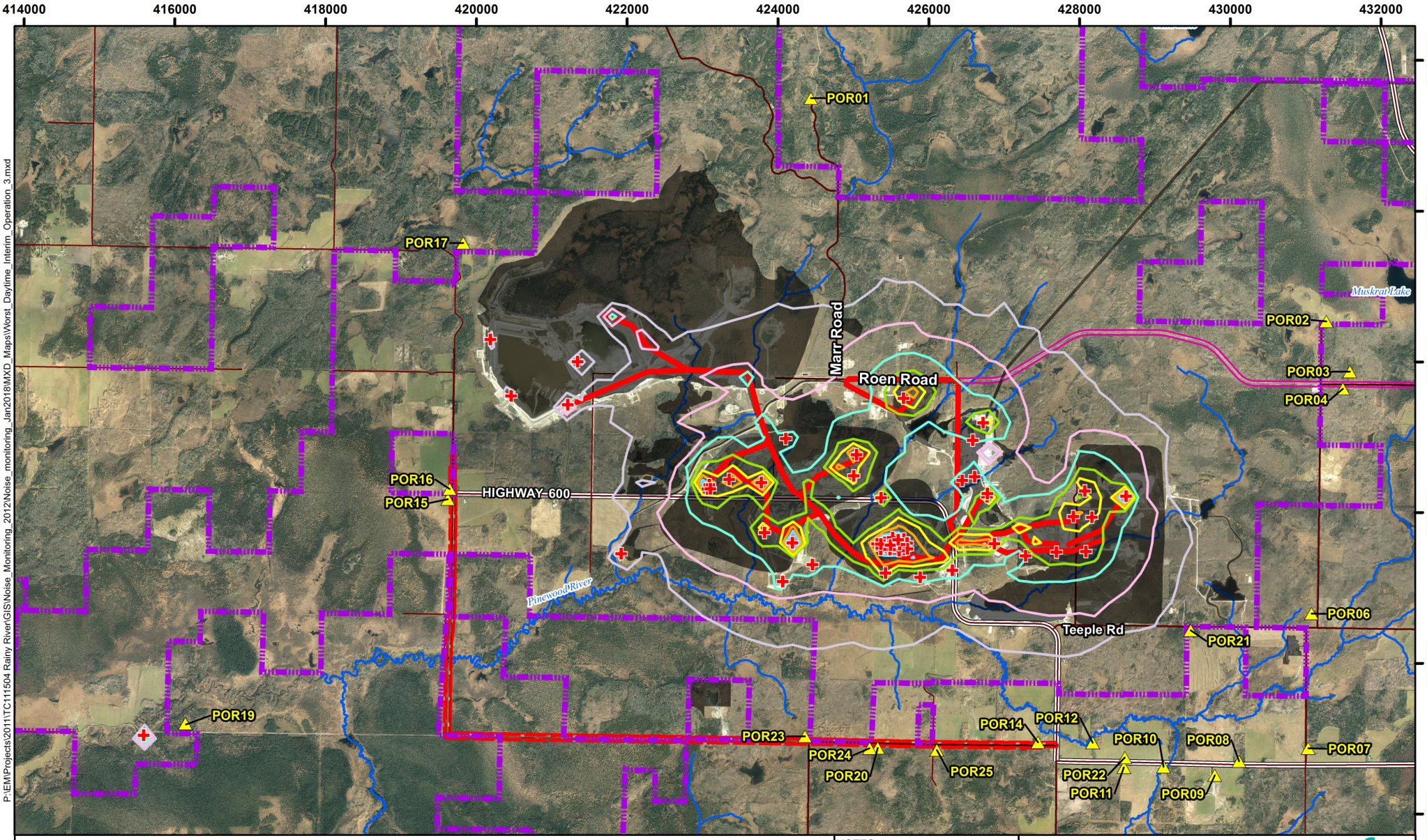
RAINY RIVER MINE

Significant Sound Source Locations

PROJECT N°: TC111504	FIGURE: 2
SCALE: 1:60,000	DATE: January 2018



LEGEND

- Point Source
- Line Source
- Receptor (labelled with ID)
- RRP-NG Property Boundary

Proposed Site Features

- Approximate Principal RRP Facilities
- Highway Re-alignment
- East Access Road

Worst Daytime Interim Operation dBA Contours

- >=45
- >=50
- >=55
- >=60
- >=65
- >=70
- >=75
- >=80
- >=85

0 2 4 6 8 Kilometres

NOTES:
- Aerial Imagery provided by NewGold Scene date is October 2017.
- Only major facilities are shown connecting infrastructure and supporting facilities are generally shown.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project

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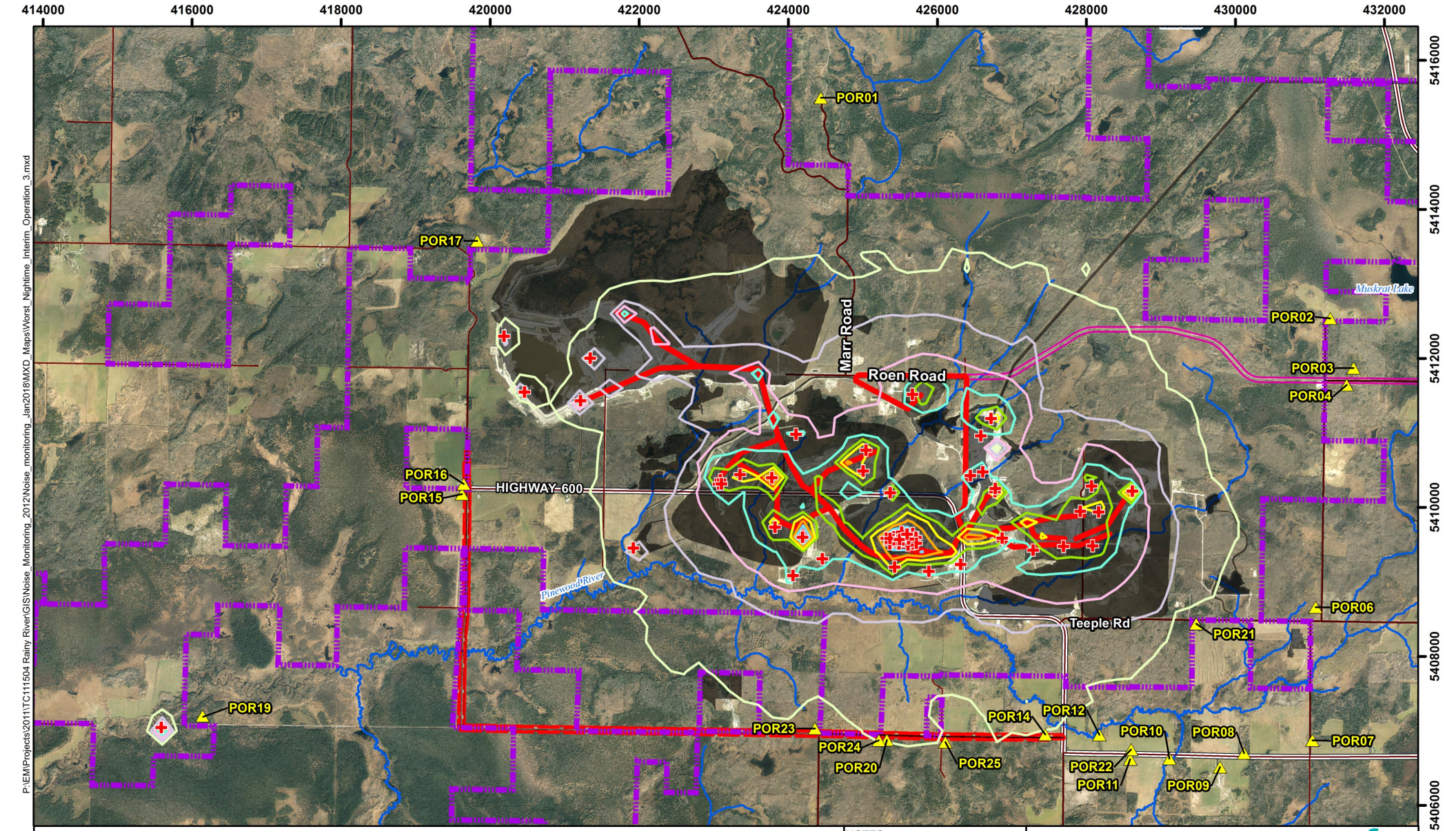
RAINY RIVER MINE

Sound Contours for Worst-Case Daytime Early Operations

PROJECT N°: TC111504	FIGURE: 3
SCALE: 1:70,000	DATE: January 2018



LEGEND

- Point Source
- Line Source
- Receptor (labelled with ID)
- RRP-NG Property Boundary

Proposed Site Features

- Approximate Principal RRP Facilities
- Highway Re-alignment
- East Access Road

Worst Night-time Interim Operation dBA Contours

- >=40
- >=45
- >=50
- >=55
- >=60
- >=65
- >=70
- >=75
- >=80
- >=85

0 2 4 6 8 Kilometres

NOTES:
- Aerial Imagery provided by NewGold Scene date is October 2017.
- Only major facilities are shown connecting infrastructure and supporting facilities are generally shown.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

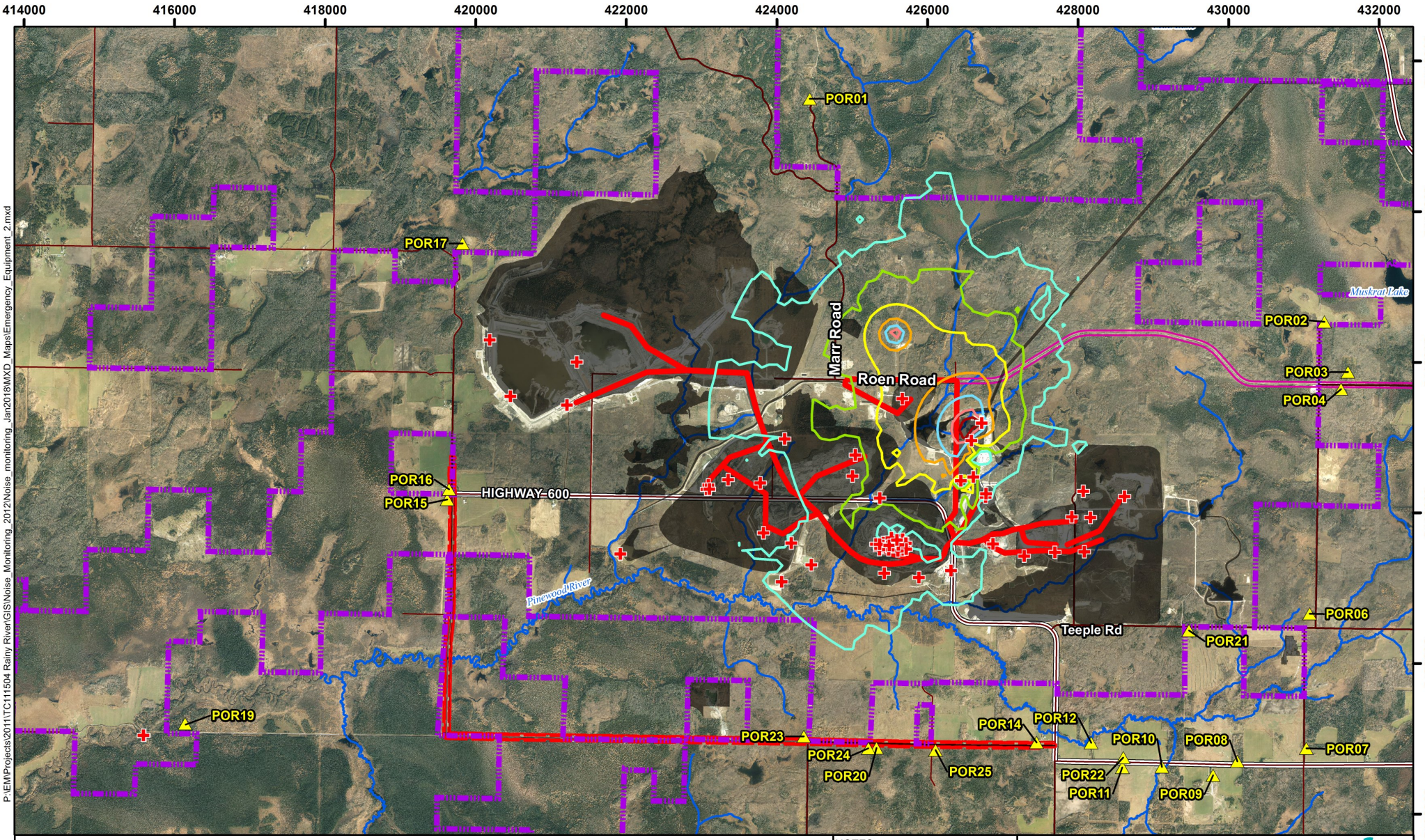
newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER MINE

Sound Contours for Worst-Case Evening and Night-time Early Operations

PROJECT N°: TC111504	FIGURE: 4
SCALE: 1:70,000	DATE: January 2018



LEGEND

- Point Source
- Line Source
- Receptor (labelled with ID)
- RRP-NG Property Boundary

Proposed Site Features

- Approximate Principal RRP Facilities
- Highway Re-alignment
- East Access Road

Emergency Equipment Testing Operation dBA Contours

- >=55
- >=60
- >=65
- >=70
- >=75
- >=80
- >=85

0 2 4 6 8 Kilometres

NOTES:
- Aerial Imagery provided by NewGold Scene date is October 2017.
- Only major facilities are shown connecting infrastructure and supporting facilities are generally shown.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER MINE

Sound Contours for Emergency Equipment Testing

PROJECT N°: TC111504	FIGURE: 5
SCALE: 1:70,000	DATE: January 2018

APPENDIX A

ACOUSTIC ASSESSMENT REPORT CHECK-LIST

Ministry of the Environment | Ministère de l'Environnement

Ontario

ACOUSTIC ASSESSMENT REPORT CHECK-LIST

Company Name: New Gold Inc.

Company Address: 1111 Victoria Ave. East

Thunder Bay, Ontario, P7C 1B7

Location of Facility: Rainy River Project

Township of Chapple, Ontario

The attached Acoustic Assessment Report was prepared in accordance with the guidance in the ministry document "Information to be Submitted for Approval of Stationary Sources of Sound" (NPC 233) dated October 1995 and the minimum required information identified in the check-list on the reverse of this sheet has been submitted.

Company Contact: New Gold Inc.

Name: _____

Title: _____

Phone Number: _____

Signature: _____

Date: _____

Technical Contact: Amec Foster Wheeler

Name: Mohammed Salim, P.Eng.

Representing: New Gold Inc.

Phone Number: (905) 568 2929 Extn. 4212

Signature: <Original signed by>

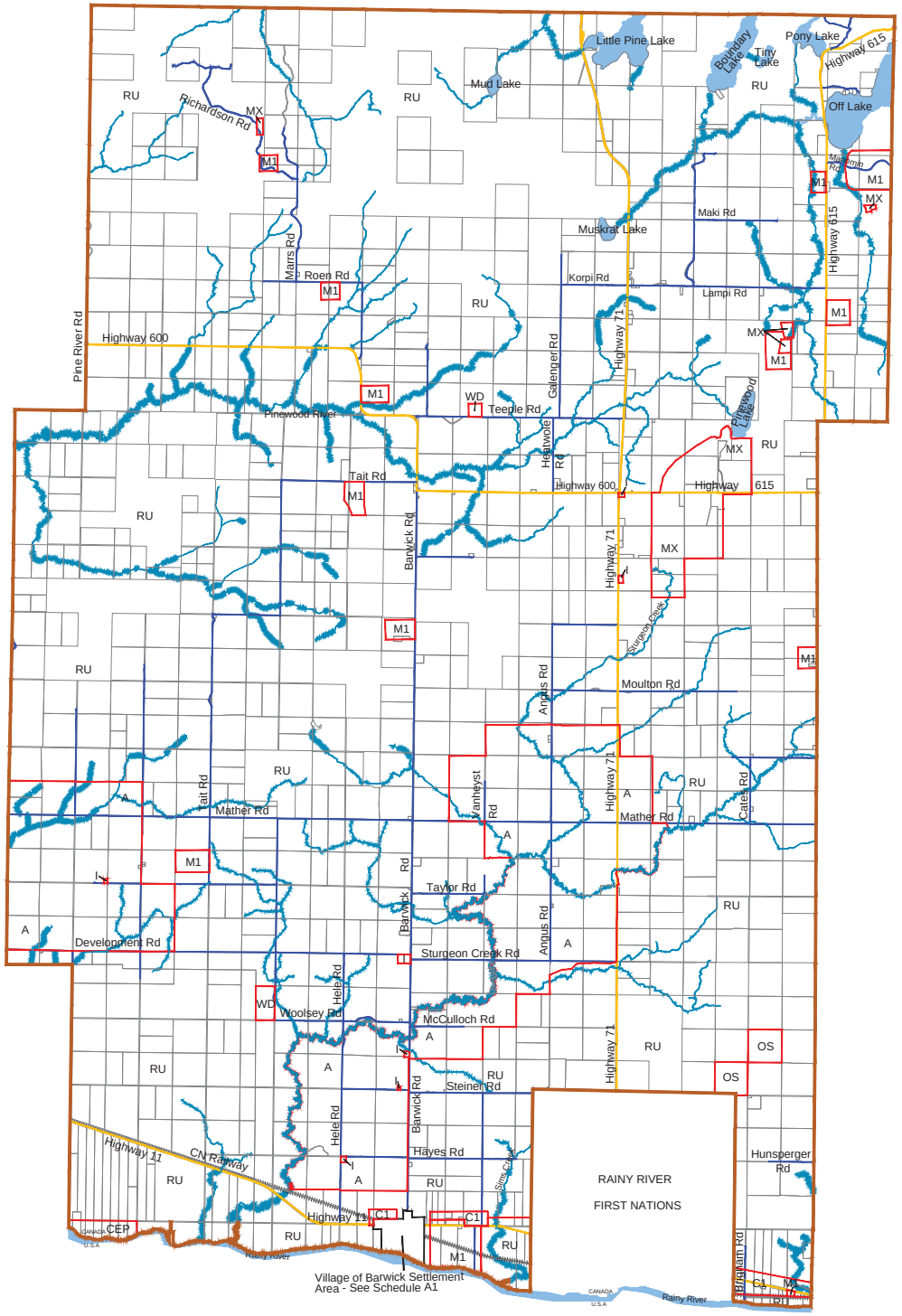
Date: October 20, 2017

ACOUSTIC ASSESSMENT REPORT CHECKLIST

	Required Information			
			Submitted	Explanation/Reference
1.0	**Introduction** (Project Background and Overview)		☑ Yes	Section 1
2.0	**Facility Description**			
	2.1	Operating hours of facility and significant Noise Sources	☑ Yes	Section 2 & Section 3
	2.2	Site Plan identifying all significant Noise Sources	☑ Yes	Figure 2
3.0	**Noise Source Summary**			
	3.1	***Noise Source Summary Table***	☑ Yes	Table 1
	3.2	Source noise emissions specifications	☑ Yes	Section 3
	3.3	Source Power/capacity ratings	☑ Yes	Appendix D
	3.4	Noise control equipment description and acoustical specifications	☑ Yes	Section 4
4.0	**Point of Reception Noise Impact Calculations**			
	4.1	***Point of Reception Noise Impact Table***	☑ Yes	Table 2
	4.2	Point(s) of Reception (POR) list and description	☑ Yes	Section 5
	4.3	Land-use Zoning Plan	☑ Yes	Appendix B
	4.4	Scaled Area Location Plan	☑ Yes	Figure 1
	4.5	Procedure used to assess noise impacts at each POR	☑ Yes	Section 7
	4.6	List of parameters/assumptions used in calculations	☑ Yes	Section 7/Appendix F
5.0	**Acoustic Assessment Summary**			
	5.1	***Acoustic Assessment Summary Table***	☑ Yes	Table 3
	5.2	Rationale for selecting applicable noise guideline limits	☑ Yes	Section 6
	5.3	Predictable Worst Case Impacts Operating Scenario	☑ Yes	Section 7
6.0	**Conclusions**			
	6.1	Statement of compliance with the selected noise performance limits	☑ Yes	Section 8
7.0	**Appendices** (Provide details such as)			
		Listing of Insignificant Noise Sources	☑ Yes	Appendix E
		Manufacture's Noise Specifications	☐ Yes	N/A
		Calculations	☑ Yes	Appendix D
		Instrumentation	☑ Yes	Appendix D
		Meteorology during Sound level Measurements	☑ Yes	Appendix D
		Raw Data from Measurements	☑ Yes	Appendix D
		Drawings (Facility/Equipment)	☑ Yes	Appendix C

APPENDIX B

LAND-USE ZONING MAP OF THE SITE AND SURROUNDING AREA



TOWNSHIP OF CHAPPLE

ZONING BY-LAW SCHEDULE A

Council Adoption October 8, 2013

Village Settlement Area
Zone Boundary

A - Agricultural Zone
RU - Rural Zone
C1 - Highway Commercial Zone
I - Institutional
M1 - Industrial Zone
MX - Aggregate Extraction Zone
WD - Waste Disposal Zone
OS - Open Space Zone
CEP - Conservation and Environmental Protection Zone

Transportation
- Provincial Highway
- Township Roads
- CN Railway

Watercourses

Digital Map Created By:

CGIS Spatial Solutions
52 South Street
Perth, ON K7H 2G7
TEL: 613-368-4321
www.cgis.com

FOTENN PLANNING & URBAN DESIGN

500m 1000m 1500m 2000m 2500m

Note: The base information on this plan was prepared from a variety of map sources and was used by permission of the Township of Chapple. It is not a legal plan of survey. For precise location of plan features recourse should be had to the original source data.

APPENDIX C

FACILITY DRAWINGS

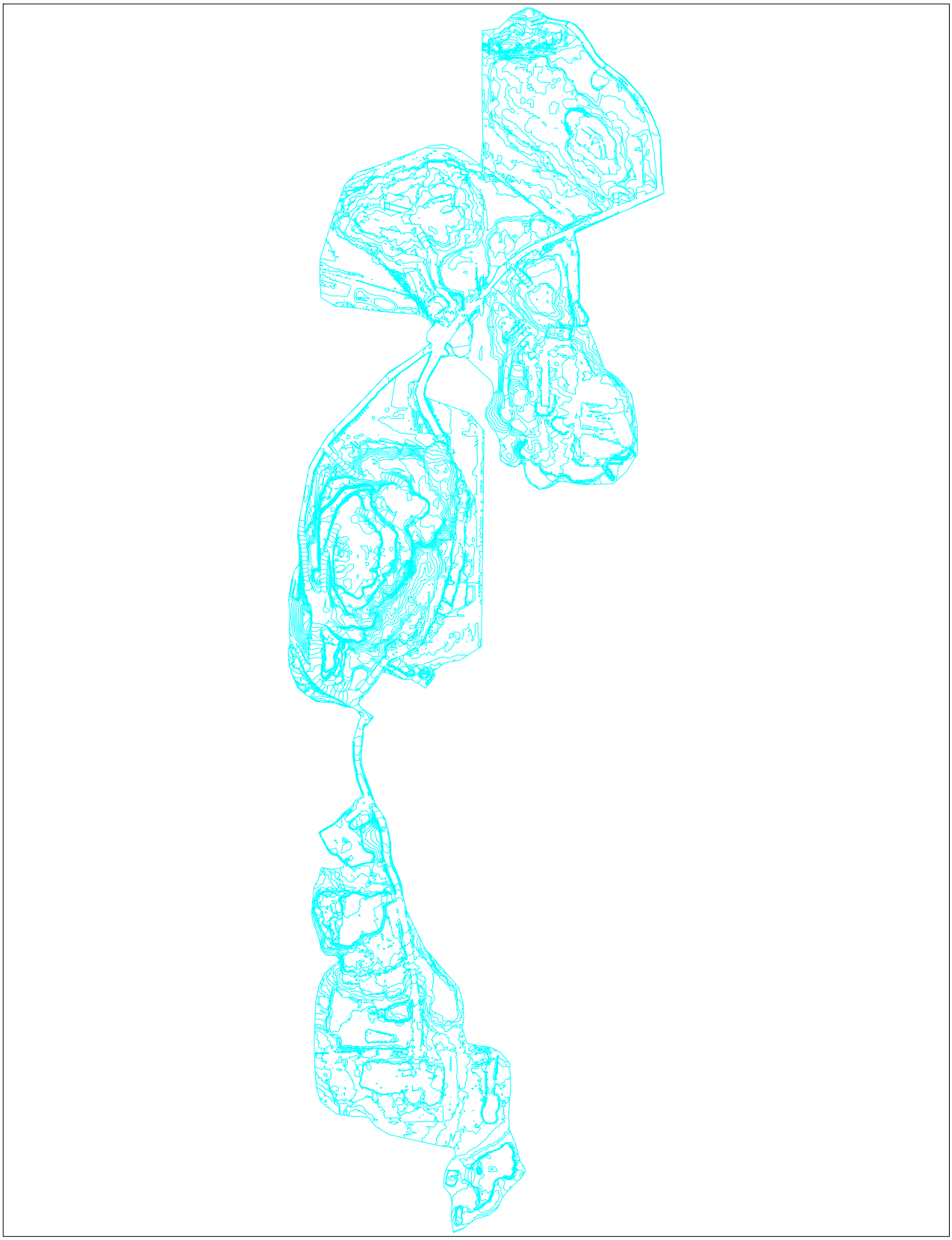
RAINY RIVER MINE GENERAL ARRANGEMENT

VISIBILITY BUFFER
TAILINGS MANAGEMENT AREA
LAYDOWN AREA 1
CELL 2
CELL 3
TMA START-UP CELL
WATER MANAGEMENT POND
LAYDOWN AREA 2A
LAYDOWN AREA 2B
LAYDOWN AREA 3
LAYDOWN AREA 5
LAYDOWN AREA 16
ROEN ROAD PIT EXPANSION
OUTCROP 4 QUARRY
CONSTRUCTED WETLAND
OVERBURDEN STOCKPILE
LAYDOWN AREA 4
WEST MINE ROCK STOCKPILE
OPEN PIT
STARTER OPEN PIT
LAYDOWN AREA 7
LAYDOWN AREA 8
TREATMENT POND
DETENTION POND
MINE ROCK POND
MILL LAYDOWN AREA (MINE SITE)
COARSE ORE CRUSHING
OUTCROP 3 QUARRY
LAYDOWN AREA 14
LOW GRADE ORE STOCKPILE
LAYDOWN AREA 9
EAST MINE ROCK STOCKPILE
LAYDOWN AREA 13
LAYDOWN AREA 12
LAYDOWN AREA 11
OLD HIGHWAY 600 (CLOSED)
McCallum Creek
Pinewood River
Clark Creek
Oak Creek
Robert Lambert Drain
600

0 2,750 metres

newgold™
Rainy River Project
GIS GROUP, THUNDER BAY

NG GIS Team Thunder Bay, NG GIS Team, Thunder Bay



APPENDIX D

SOUND MEASUREMENT DETAILS AND CALCULATIONS

CONVERSION OF SOUND PRESSURE LEVELS TO SOUND POWER LEVELS

Project Name: RRP
Project Number: TC111504
Location: Barwick ON

A-WEIGHTING (dB) - Applied to total PWL								
-39.4	-26.2	-16.1	-8.6	-3.2	0.0	1.2	1.0	-1.1

1/4 WAVELENGTH CRITERION (m)								
2.722	1.361	0.686	0.343	0.172	0.086	0.043	0.021	0.011

Measurement Reference [1,2]	Source Description	Calc Type [3] (A, C, or S)	SPL Ref Distance [4] (S or C) (m)	Length [5] (C only) (m)	Partition Coefficient (S or C) (%)	Net Surface Area [5] (m^2)	Spectral Weighting (A or Flat)	Octave Band Sound Pressure Level Data (dB or dBA) [6] 31.5	63	125	250	500	1000	2000	4000	8000	Total (dBA)	Octave Band Sound Power Level Data [8] (dB or dBA) [7] 31.5	63	125	250	500	1000	2000	4000	8000	Total (dBA)
831_Data.001	Komatsu Diesel Excavator PC360LC	S	10.0		50%	628.0	Flat	85.1	87.4	89.0	89.0	85.4	84.0	80.1	71.0	65.2	88	113.1	115.4	117.0	117.0	113.3	111.9	108.1	99.0	93.2	116
831_Data.002	Truck Komatsu 830 - Pass-by (Empty Truck)	C	16.0	21.0	50%	1055.0	Flat	83.1	87.8	84.6	77.9	75.9	72.1	68.7	63.9	57.2	78	113.3	118.0	114.8	108.1	106.1	102.3	98.9	94.2	87.4	108
831_Data.003	Truck Komatsu 830 - Pass-by (Loaded Truck)	C	16.0	21.0	50%	1055.0	Flat	90.3	99.4	102.6	89.4	83.9	77.7	72.9	68.6	64.9	89	120.5	129.7	132.9	119.6	114.1	108.0	103.1	98.9	95.2	119
831_Data.006	Komatsu Wheel Loader WA1200	S	15.5		50%	1508.8	Flat	80.9	89.3	91.9	81.2	79.8	78.5	78.2	73.4	68.9	85	112.7	121.1	123.7	113.0	111.6	110.3	110.0	105.2	100.7	117
831_Data.007	Komatsu Wheel Dozer KM WD600	S	11.0		50%	759.9	Flat	77.4	84.7	79.8	74.2	71.7	72.3	68.1	61.1	54.7	76	106.2	113.5	108.6	103.0	100.5	101.1	96.9	89.9	83.5	105
831_Data.008	Motor Grader CAT 16M	S	10.0		50%	628.0	Flat	80.5	84.8	86.4	81.5	80.3	77.6	75.2	71.5	68.2	83	108.5	112.8	114.4	109.5	108.3	105.6	103.1	99.4	96.2	111
831_Data.009	Motor Grader CAT 14	S	7.3		50%	334.7	Flat	74.2	78.5	79.5	84.1	78.7	76.9	74.5	69.4	59.7	82	99.4	103.7	104.8	109.4	103.9	102.2	99.8	94.6	85.0	108
831_Data.010	Track Dozer CAT9T	S	10.0		50%	628.0	Flat	71.8	75.0	78.4	79.1	78.1	76.6	75.9	72.2	65.2	82	99.8	103.0	106.4	107.1	106.0	104.6	103.9	100.2	93.2	110
831_Data.011	Track Dozer CAT10T	S	10.0		50%	628.0	Flat	79.4	82.9	86.9	85.6	85.4	82.4	79.1	70.9	64.4	87	107.4	110.8	114.9	113.6	113.4	110.4	107.1	98.9	92.4	115
831_Data.012	Track Dozer Komatsu 375	S	10.0		50%	628.0	Flat	75.1	82.4	79.7	79.8	78.3	75.3	75.6	67.2	60.3	81	103.1	110.4	107.7	107.8	106.3	103.3	103.6	95.1	88.3	109
831_Data.013	Komatsu Diesel Excavator PC5500	S	13.0		50%	1061.3	Flat	83.2	87.9	91.7	86.6	83.4	79.2	75.8	68.8	61.6	85	113.5	118.2	122.0	116.9	113.7	109.4	106.1	99.1	91.8	116
831_Data.014	Blast Hole Drill 2- Sandvik DR461i	S	10.0		50%	628.0	Flat	80.0	84.6	86.3	86.5	88.5	90.0	85.0	80.6	74.5	93	107.9	112.6	114.3	114.5	116.4	118.0	113.0	108.6	102.5	121
831_Data.015	Komatsu Diesel Excavator PC3000	S	13.0		50%	1061.3	Flat	84.8	87.7	95.9	90.4	86.8	84.5	78.8	73.3	67.2	89	115.1	118.0	126.2	120.6	117.0	114.8	109.0	103.5	97.4	120
831_Data.017	Track Dozer Komatsu 475	S	10.0		50%	628.0	Flat	82.5	82.9	86.3	85.1	87.6	81.9	79.6	77.8	72.3	88	110.5	110.9	114.3	113.1	115.6	109.9	107.6	105.7	100.2	116
831_Data.019	Motor Grader CAT 16H	S	7.0		50%	307.7	Flat	71.1	84.8	72.6	72.4	75.0	77.9	75.1	70.0	64.7	81	96.0	109.6	97.5	97.3	99.9	102.8	100.0	94.9	89.6	106
831_Data.021	Water Truck (Komatsu HD785 / CR20000K) Pass-by	C	9.5	21.0	50%	626.4	Flat	73.4	78.7	84.5	82.0	79.6	81.9	79.6	72.3	65.7	86	101.4	106.7	112.5	109.9	107.6	109.9	107.6	100.3	93.6	114
831_Data.022	Diesel Water Pump WP004	S	2.7		50%	45.8	Flat	83.1	91.9	91.7	80.4	84.0	85.4	84.1	76.9	73.1	90	99.7	108.5	108.3	97.1	100.6	102.0	100.7	93.5	89.7	106
831_Data.023	Blast Hole Drill 3 - Sandvik DP1500i	S	9.0		50%	508.7	Flat	77.7	83.4	82.1	79.4	83.4	83.5	84.1	80.5	83.0	90	104.8	110.4	109.2	106.4	110.5	110.5	111.2	107.6	110.1	117
831_Data.024	Crusher	S	7.9		50%	391.9	Flat	79.0	78.6	74.5	69.9	65.3	58.8	52.2	46.5	42.9	67	104.9	104.5	100.4	95.9	91.3	84.8	78.1	72.4	68.9	93
831_Data.025	Crusher - Dumping	S	15.0		50%	1413.0	Flat	77.1	84.3	77.2	75.0	76.0	74.9	72.3	68.2	61.3	79	108.6	115.9	108.7	106.5	107.5	106.4	103.8	99.7	92.8	111
831_Data.026	Crusher - Filling	S	15.0		50%	1413.0	Flat	71.2	73.1	73.1	71.2	71.2	64.0	64.1	60.6	50.2	72	102.7	104.6	104.6	102.7	102.8	95.5	95.6	92.1	81.7	104
831_Data.027	Aggregate Pit Primary Crusher (Powerscreen)	S	6.0		50%	226.1	Flat	91.1	97.0	93.7	94.9	93.3	90.3	87.4	82.7	76.0	96	114.6	120.6	117.3	118.4	116.9	113.8	110.9	106.3	99.5	119
831_Data.028	Aggregate Pit Loader (CAT 980H)	S	11.0		50%	759.9	Flat	89.7	99.4	92.4	81.2	82.0	81.0	76.3	70.7	65.2	86	118.5	128.2	121.2	110.0	110.8	109.8	105.1	99.5	94.0	114
831_Data.030	Truck Komatsu 400 - Pass-by	C	10.0	21.0	50%	659.4	Flat	74.4	86.8	83.0	82.4	74.9	72.8	68.7	63.9	56.9	79	102.6	114.9	111.2	110.6	103.1	101.0	96.9	92.1	85.1	107
831_Data.031	Dust Collector	S	4.3		50%	116.1	Flat	81.8	80.8	82.7	87.3	81.5	77.9	74.8	71.5	68.9	84	102.5	101.5	103.4	107.9	102.2	98.6	95.4	92.1	89.6	105
831_Data.032	RC Drill Sandvik DR580	S	7.6		50%	362.7	Flat	89.6	100.4	93.1	83.5	87.7	88.9	88.1	83.9	80.7	94	115.2	126.0	118.7	109.1	113.3	114.5	113.7	109.5	106.3	119
831_Data.034	Komatsu Diesel Excavator PC800LC	S	20.0		50%	2512.0	Flat	74.6	81.8	81.4	73.2	77.7	73.1	69.8	64.7	58.8	79	108.6	115.8	115.4	107.2	111.7	107.1	103.8	98.7	92.8	113
831_Data.035	Komatsu Diesel Excavator PC8000	S	15.0		50%	1413.0	Flat	86.2	95.0	90.0	90.6	88.8	83.3	79.9	71.8	63.6	90	117.7	126.5	121.5	122.1	120.3	114.8	111.4	103.3	95.1	121
831_Data.037	Track Dozer CAT8T	S	7.5		50%	353.3	Flat	74.2	78.2	80.4	79.0	78.8	77.3	73.9	67.6	59.1	82	99.7	103.7	105.8	104.5	104.3	102.8	99.4	93.1	84.6	107

Notes:

1. All measurements conducted on September 26-28, 2017, using Larson Davis 831 SLM.
2. All measurements were consistent with the applicable portions of the MOECC Publication NPC-103.
3. Calc Type of C, A, or S refer to the source geometry, and represent Cylindrical, Area, or Spherical sources, respectively.
4. SPL Ref Distance refers to the radial distance from the microphone to the acoustic centre of a spherical source or the symmetrical axis of a cylindrical source.
5. Net surface area refers to surface area corrected for partition coefficient. Partition coefficient applies only to spherical and cylindrical geometries. Sound power level is estimated using an area correction 10 log A.
6. Refer to "Spectral Weighting" column for dB or dBA application information.

Measure Raw Data

File Name	1/1 Octave Frequency Range									1/3 Octave Frequency Band																													
	31.5	63	125	250	500	1000	2000	4000	8000	20	25	32	40	50	63	80	100	125	160	200	250	315	400	500	630	800	1000	1250	1600	2000	2500	3150	4000	5000	6300	8000	10000	12500
831_Data.001	85.1	87.4	89.0	89.0	85.4	84.0	80.1	71.0	65.2	70.4	70.6	72.8	84.8	79.7	83.7	83.4	86.0	83.2	83.2	88.2	81.6	77.4	81.9	81.1	78.0	80.3	79.3	77.9	77.8	74.8	71.7	68.8	64.9	63.2	62.7	59.5	57.7	57.5
831_Data.002	83.1	87.8	84.6	77.9	75.9	72.1	68.7	63.9	57.2	70.7	68.0	73.4	82.5	84.1	76.4	84.5	82.5	78.3	75.8	74.2	72.7	72.7	72.9	70.4	69.6	69.1	67.0	65.2	65.3	63.2	62.8	61.2	58.4	56.7	54.6	51.8	49.2	45.4
831_Data.003	90.3	99.4	102.6	89.4	83.9	77.7	72.9	68.6	64.9	73.4	75.0	80.9	89.3	94.6	89.6	97.0	98.9	99.9	88.8	85.4	84.9	82.4	81.2	77.8	77.2	74.7	72.5	70.4	69.1	68.1	66.9	65.4	62.8	63.0	63.7	56.9	54.9	49.2
831_Data.004	86.5	96.2	96.9	88.3	85.5	81.3	77.7	74.4	69.9	73.0	75.0	78.9	85.3	85.3	90.7	93.9	92.8	93.6	87.9	86.0	82.5	78.8	80.3	81.4	80.2	77.4	76.6	75.4	73.6	72.8	72.2	71.0	68.9	68.2	68.0	63.6	60.9	55.9
831_Data.005	80.5	88.5	89.4	80.9	80.7	77.5	74.5	69.9	64.9	68.3	71.7	75.7	77.8	83.0	82.9	84.4	88.2	82.2	79.8	76.1	75.8	76.1	77.0	75.5	75.3	73.7	72.6	71.8	70.6	69.7	68.8	66.4	64.8	63.5	62.9	59.3	55.2	49.7
831_Data.006	80.9	89.3	91.9	81.2	79.8	78.5	78.2	73.4	68.9	75.6	72.5	77.1	77.4	81.0	83.4	86.8	91.0	84.7	80.7	74.6	75.5	77.9	75.9	74.0	75.3	74.6	73.2	73.4	76.0	71.8	71.8	69.1	68.7	67.9	66.7	63.6	59.3	54.0
831_Data.007	77.4	84.7	79.8	74.2	71.7	72.3	68.1	61.1	54.7	62.8	64.4	67.9	76.9	80.3	80.3	79.2	77.5	75.0	71.7	69.4	70.2	68.5	67.0	67.1	66.5	65.9	65.7	69.7	66.1	61.4	60.0	58.3	55.7	54.0	52.0	49.6	46.5	43.6
831_Data.008	80.5	84.8	86.4	81.5	80.3	77.6	75.2	71.5	68.2	65.1	67.7	70.2	79.7	75.7	82.0	80.8	84.4	80.7	79.6	77.2	74.0	77.9	77.3	74.4	73.4	73.5	72.6	72.1	71.0	70.5	69.7	67.9	66.1	65.4	65.6	62.7	60.5	57.9
831_Data.009	74.2	78.5	79.5	84.1	78.7	76.9	74.5	69.4	59.7	65.7	64.9	71.0	70.5	76.1	70.3	72.4	73.8	73.9	76.0	82.9	77.2	75.0	73.6	75.1	72.8	72.5	72.1	72.1	71.3	69.0	68.3	67.5	63.1	59.7	57.0	54.8	50.8	49.1
831_Data.010	71.8	75.0	78.4	79.1	78.1	76.6	75.9	72.2	65.2	64.3	66.5	65.8	68.7	69.8	69.4	71.8	73.8	75.0	71.4	71.6	75.3	75.5	72.2	74.0	73.6	71.7	71.7	72.0	73.3	69.7	69.8	69.3	67.1	65.0	62.3	59.9	57.9	56.6
831_Data.011	79.4	82.9	86.9	85.6	85.4	82.4	79.1	70.9	64.4	70.3	71.3	74.4	76.8	77.2	76.9	79.7	82.3	82.5	81.8	79.7	81.5	81.3	80.4	82.3	77.4	76.7	75.0	80.1	76.9	71.2	69.7	67.9	65.9	63.6	61.3	59.5	57.0	60.2
831_Data.012	75.1	82.4	79.7	79.8	78.3	75.3	75.6	67.2	60.3	69.6	69.4	70.7	71.4	72.5	76.6	80.6	75.0	75.2	74.6	74.4	75.7	75.0	72.5	75.4	72.0	71.7	70.6	69.3	70.2	73.2	66.5	64.3	61.7	60.0	57.2	55.4	52.7	49.4
831_Data.013	83.2	87.9	91.7	86.6	83.4	79.2	75.8	68.8	61.6	74.8	75.6	80.4	78.4	80.1	79.1	85.9	91.9	79.9	79.7	85.9	78.8	76.5	81.2	78.0	74.6	73.5	72.2	76.8	72.0	69.5	68.5	65.9	63.3	61.3	58.9	56.8	52.5	48.2
831_Data.014	80.0	84.6	86.3	86.5	88.5	90.0	85.0	80.6	74.5	69.3	70.0	75.6	77.5	78.4	76.5	82.0	84.9	78.1	79.7	82.6	81.8	80.8	83.5	83.5	84.1	85.9	86.1	83.5	80.8	80.0	79.7	77.0	75.5	74.3	72.0	68.4	66.9	66.3
831_Data.015	84.8	87.7	95.9	90.4	86.8	84.5	78.8	73.3	67.2	73.3	75.5	82.2	80.1	78.8	77.7	86.0	93.3	82.0	92.8	85.7	84.1	84.9	81.8	82.5	81.4	81.2	79.6	77.9	75.8	73.5	71.9	69.8	67.3	68.1	62.2	59.5	64.1	52.8
831_Data.016	84.6	90.3	95.7	87.9	84.9	81.9	76.4	70.6	62.9	73.2	74.7	81.6	80.6	77.3	79.0	89.3	95.8	81.7	85.2	84.3	80.3	83.9	80.7	79.9	79.7	77.7	77.2	76.4	73.0	71.1	69.9	67.0	65.7	63.8	60.0	58.4	53.0	46.9
831_Data.017	82.5	82.9	86.3	85.1	87.6	81.9	79.6	77.8	72.3	71.1	73.9	80.1	76.8	77.5	75.8	80.3	81.4	80.5	82.5	78.8	81.2	80.7	79.9	85.5	80.5	77.5	77.1	76.7	76.2	73.6	74.4	73.3	71.5	73.7	69.9	65.5	65.2	61.6
831_Data.019	71.1	84.8	72.6	72.4	75.0	77.9	75.1	70.0	64.7	61.8	65.0	67.6	65.4	78.8	83.2	68.7	66.5	69.2	66.9	65.5	68.5	68.5	67.6	71.3	71.1	73.3	73.6	72.7	71.2	71.1	68.3	67.2	64.9	62.4	59.9	58.6	60.8	56.7
831_Data.021	73.4	78.7	84.5	82.0	79.6	81.9	79.6	72.3	65.7	66.5	65.8	70.2	68.5	69.3	70.2	77.2	82.0	80.1	76.0	74.5	79.9	74.9	73.5	74.2	76.3	77.3	77.1	77.2	78.0	73.6	69.2	68.4	68.5	64.9	63.5	60.1	56.5	52.0
831_Data.022	83.1	91.9	91.7	80.4	84.0	85.4	84.1	76.9	73.1	59.0	59.0	64.4	80.0	91.9	73.4	82.3	92.6	74.8	69.2	69.3	77.6	76.6	71.9	81.7	79.6	79.5	81.3	80.9	79.8	78.7	79.5	74.3	70.3	69.5	69.8	68.5	66.1	66.3
831_Data.023	77.7	83.4	82.1	79.4	83.4	83.5	84.1	80.5	83.0	67.8	67.9	70.9	76.0	79.2	77.0	79.6	79.7	75.5	75.5	75.5	69.6	76.6	78.0	76.3	80.8	77.4	79.6	78.6	79.3	79.2	79.5	75.4	75.7	76.2	79.9	77.7	76.8	74.0
831_Data.024	79.0	78.6	74.5	69.9	65.3	58.8	52.2	46.5	42.9	71.7	73.5	75.2	73.4	75.5	74.8	67.4	71.0	70.2	66.7	68.3	62.4	62.2	61.8	59.0	60.4	56.0	53.3	51.4	49.0	47.3	44.9	43.5	41.3	39.4	38.3	38.0	38.3	39.0
831_Data.025	77.1	84.3	77.2	75.0	76.0	74.9	72.3	68.2	61.3	68.7	70.5	72.4	73.1	76.3	81.7	80.0	73.0	73.0	71.2	71.2	67.8	70.4	72.5	70.7	70.6	70.9	70.0	69.7	68.6	67.5	66.4	65.1	63.1	61.3	59.0	56.0	52.4	48.4
831_Data.026	71.2	73.1	73.1	71.2	71.2	64.0	64.1	60.6	50.2	65.3	66.0	68.4	64.3	67.1	69.4	68.7	68.3	69.0	67.8	66.4	62.4	68.5	68.0	65.2	65.4	62.2	57.2	55.9	60.0	60.3	57.4	56.9	57.7	48.4	46.2	45.6	44.4	41.6
831_Data.027	91.1	97.0	93.7	94.9	93.3	90.3	87.4	82.7	76.0	75.9	78.6	81.8	90.2	88.7	94.9	90.9	87.9	87.8	90.6	91.9	88.6	89.0	89.5	87.7	88.7	86.8	85.2	84.2	83.1	83.2	81.3	79.9	77.5	75.1	73.1	70.9	68.3	64.4
831_Data.028	89.7	99.4	92.4	81.2	82.0	81.0	76.3	70.7	65.2	62.8	67.3	72.2	89.7	92.9	96.9	92.7	92.3	80.8	78.6	76.8	76.2	76.4	78.1	77.1	76.6	76.2	75.0	77.1	72.6	71.3	69.4	67.1	65.5	64.7	62.0	59.8	58.9	60.6
831_Data.030	74.4	86.8	83.0	82.4	74.9	72.8	68.7	63.9	56.9	59.7	67.4	65.5	73.1	70.9	82.9	84.1	80.4	73.6	78.3	81.9	72.1	70.7	71.4	70.7	68.1	69.3	68.3	66.0	64.9	64.1	62.8	61.2	58.5	56.1	53.7	52.4	49.4	47.7
831_Data.031	81.8	80.8	82.7	87.3	81.5	77.9	74.8	71.5	68.9	80.6	77.9	76.8	77.0	76.3	76.0	75.7	74.0	78.2	79.8	70.9	86.6	77.8	73.3	79.0	76.1	74.7	70.6	72.9	70.0	69.5	70.0	67.4	66.3	66.4	64.1	62.3	65.5	56.7
831_Data.032	89.6	100.4	93.1	83.5	87.7	88.9	88.1	83.9	80.7	70.0	73.1	89.2	76.7	81.0	100.2	86.1	90.0	88.5	86.8	78.1	79.8	78.3	82.5	84.3	81.9	84.9	84.1	83.3	85.0	83.5	80.7	81.0	79.0	76.3	74.5	78.2	73.9	72.6
831_Data.033	74.7	81.3	82.8	73.1	69.0	70.1	69.8	62.9	52.6	70.9	68.1	70.9	70.1	72.1	76.7	78.3	82.7	73.1	70.0	68.1	69.1	68.1	65.3	63.1	64.0	64.2	66.5	64.6	68.4	61.4	63.8	61.7	54.2	52.7	51.4	45.1	40.5	39.6
831_Data.034	74.6	81.8	81.4	73.2	77.7	73.1	69.8	64.7	58.8	69.1	66.8	72.4	68.9	74.3	78.1	77.8	79.6	75.7	73.1	69.6	68.9	65.7	72.7	74.6	71.4	67.9	69.6	66.9	67.0	63.7	64.0	61.7	59.3	57.8	56.3	53.4	50.4	46.7
831_Data.035	86.2	95.0	90.0	90.6	88.8	83.3	79.9	71.8	63.6	74.9	78.6	80.2	83.4	85.1	86.3	93.9	83.0	86.9	84.6	85.8	84.9	86.8	86.1	82.6	82.6	80.0	78.2	77.0	76.7	75.6	71.8	68.8	66.5	64.6	61.4	58.3	53.0	47.8
831_Data.036	69.9	74.8	75.7	72.5	73.4	72.2	70.0	63.9	55.6	61.5	61.6	64.6	67.6	67.8	68.7	72.1	73.3	70.9	67.4	66.0	67.7	68.9	67.6	69.0	68.8	68.7	66.9	66.7	67.4	64.5	62.6	60.8	59.2	56.2	53.4	49.8	47.1	46.2
831_Data.037	74.2	78.2	80.4	79.0	78.8	77.3	73.9	67.6	59.1	64.6	66.7	69.4	71.3	72.0	72.6	75.2	75.7	75.5	75.2	72.4	73.1	76.1	74.0	74.8	73.1	72.4	70.8	74.0	71.3	68.2	66.5	64.8	62.8	59.2	57.0	53.3	50.5	48.0

Sound Level Measurement Instrumentation

Equipment sound level measurements at the RRP site were conducted by Amec Foster Wheeler on September 27 through 29, 2017. A Larson Davis Sound Track 831 Type I sound level meter equipped with a windscreen was used for the measurement. The Model 831 uses a Larson Davis Model PRML831 preamplifier and a PCB Electronics Model 377B02 precision microphone, which have been factory calibrated with the SLM unit. The SLM meets IEC 61672-1 Type 1 requirements. The sound level meter was field calibrated with a Larson-Davis Model CA200 precision acoustic calibrator before and after the measurements.

All measurements were conducted in accordance with MOECC NPC-103 measurement protocols. The sound level meter was programmed to record 1-second L_{eq}, L_{min} and L_{max}.

Vehicle Trips and Speed

Description	Route ID	Vehicle Type	Number of Trips/hr	Speed (km/h)
Motor Grader Route Stockpile	MGR_SP	CAT16M	1	10
Motor Grader Route NPAG	MGR_NPAG	CAT16M	1	10
Motor Grader Route OB	MGR_OB	CAT16M	1	10
Motor Grader Route Open Pit to Mill	MGR_OPMill	CAT16M	1	10
Motor Grader Route PAG	MGR_PAG	CAT16M	1	10
Truck Route-NPAG	TR_NPAG	Komatsu 830E	28	70
Truck Route-Overburden	TR_OB	Komatsu 830E	26	70
Truck Route Open Pit to Mill	TR_OPMill	Komatsu 830E	14	70
Truck Route PAG	TR_PAG	Komatsu 830E	34	70
Truck Route Stockpile	TR_SP	Komatsu 830E	12	70
Water Truck Route NPAG	WTR_NPAG	Komatsu CR20000	2	30
Water Truck Route OB	WTR_OB	Komatsu CR20000	2	30
Water Truck Route Open Pit to Mill	WTR_OPMill	Komatsu CR20000	2	30
Water Truck Route PAG	WTR_PAG	Komatsu CR20000	2	30
Water Truck Route Stockpile	WTR_SP	Komatsu CR20000	2	30
LD4 Aggregate Pit Truck Route	LD4_TR	CAT777/Komatsu 400/Equivalent	32	70
OC3 Aggregate Pit Truck Route	OC3_TR	CAT777/Komatsu 400/Equivalent	6	70
EO Aggregate Pit Truck Route	EO_TR	CAT777/Komatsu 400/Equivalent	12	70
Roen Aggregate Pit Truck Route	Roen_TR	CAT777/Komatsu 400/Equivalent	6	70

APPENDIX E

INSIGNIFICANT SOUND SOURCES

Summary of Insignificant Noise Sources

Project: Norbord Inc.
Location: Barwick, ON

Source ID	Source Description	Reason/Rational
DC3	Furnace Dust Collector	Small unit - no significant noise source
DC4	Lime Bin Dust Collector	Small unit - no significant noise source
DC5	Flocculant Handling Cartridge Filter	Small unit - no significant noise source
DC6	Copper Sulphate Loading & Mixing	Small unit - no significant noise source
DC7	Sodium Metabisulphate Loading	Small unit - no significant noise source
EF2	Cyanide Tank Exhaust	Small unit - no significant noise source
EF3	Dilute Acid Tank	Small unit - no significant noise source
VENT3	Hydrochloric Acid Tank	Not a noise source
LEACH	Leach Tanks	Not a noise source
HCND1	CN Destruction Tank	Not a noise source
HCND2	CN Destruction Tank	Not a noise source
Various	Space Heating in Buildings	Not noise sources

APPENDIX F

KEY PARAMETERS INCLUDED IN THE MODEL AND SAMPLE CALCULATIONS

Key Parameters Included in the Noise Model

Project: RRP
Location: Township of Chapple ON

Parameter	Value	Rationale
Ground Absorption	0.7	Accounts mostly soft surface between facility and receptors of interest.
Temperature	10°C	Ontario standard conditions
Relative Humidity	70%	Ontario standard conditions
Max. Order of Reflection	1	To account reflections from buildings and structures.
Reflection Coefficient	N/A	Accounts for absorption/attenuation from building surfaces

Receiver
Name: House 14 - South
ID: POR14
X: 427450.26
Y: 5406952.27
Z: 362.87

Point Source, ISO 9613, Name: "Komatsu Diesel Excavator PC3000", ID: "E4"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5052	425474.25	5409553.14	273.00	0	DEN	A	124.7	0.0	0.0	0.0	0.0	81.3	6.2	0.7	0.5	0.0	6.7	0.0	0.0	29.3

Point Source, ISO 9613, Name: "Track Dozer 01 (Pit - Komatsu D475)", ID: "TD01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5053	425616.05	5409573.45	272.00	0	DEN	A	121.4	0.0	0.0	0.0	0.0	81.1	8.2	0.3	0.8	0.0	9.4	0.0	0.0	21.6

Point Source, ISO 9613, Name: "Track Dozer 03 (Pit -CAT D10)", ID: "TD03"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5055	425493.52	5409566.02	272.00	0	DEN	A	121.4	0.0	0.0	0.0	0.0	81.3	8.3	0.3	0.8	0.0	8.1	0.0	0.0	22.6

Point Source, ISO 9613, Name: "Track Dozer 02 (Pit -CAT D10)", ID: "TD02"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5057	425365.79	5409581.00	272.00	0	DEN	A	121.4	0.0	0.0	0.0	0.0	81.5	8.4	0.3	0.9	0.0	6.7	0.0	0.0	23.6

Point Source, ISO 9613, Name: "Komatsu Diesel Excavator PC8000", ID: "E3"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5059	425503.23	5409575.74	274.00	0	DEN	A	121.1	0.0	0.0	0.0	0.0	81.3	6.7	-0.9	0.7	0.0	6.8	0.0	0.0	26.5

Point Source, ISO 9613, Name: "Blast Hole Drill 2- Sandvik DR461i", ID: "BD2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5060	425462.14	5409605.87	272.00	0	DEN	A	121.0	0.0	0.0	0.0	0.0	81.4	10.6	-0.3	0.9	0.0	6.4	0.0	0.0	21.9

Point Source, ISO 9613, Name: "Blast Hole Drill 1- Sandvik DR461i", ID: "BD1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5064	425446.18	5409606.15	272.00	0	DEN	A	121.0	0.0	0.0	0.0	0.0	81.4	10.6	-0.3	0.9	0.0	6.4	0.0	0.0	21.9

Point Source, ISO 9613, Name: "East Outcrop Graval Pit Mobile Primary Crusher (PowerScreen)", ID: "EO_PS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5065	426865.70	5409576.31	374.00	0	DEN	A	119.1	0.0	0.0	0.0	0.0	79.6	7.1	0.3	0.9	0.0	4.7	0.0	0.0	26.4

Point Source, ISO 9613, Name: "RC Drill Sandvik DR580", ID: "RD2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5068	425679.85	5409508.19	271.50	0	DEN	A	119.4	0.0	0.0	0.0	0.0	80.9	10.7	-0.6	0.1	0.0	15.8	0.0	0.0	12.5

Point Source, ISO 9613, Name: "RC Drill Sandvik DR580", ID: "RD1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5071	425690.73	5409535.38	271.50	0	DEN	A	119.4	0.0	0.0	0.0	0.0	80.9	10.8	-0.6	0.1	0.0	13.2	0.0	0.0	15.1

Point Source, ISO 9613, Name: "East Outcrop Aggregate Pit Excavator PC360LC", ID: "EO_E"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5073	426870.62	5409584.69	374.00	0	DEN	A	116.4	0.0	0.0	0.0	0.0	79.6	6.7	0.8	0.9	0.0	4.2	0.0	0.0	24.3

Point Source, ISO 9613, Name: "Track Dozer 10 (Ore -CAT D8)", ID: "TD10"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5075	427286.03	5409422.56	390.28	0	DEN	A	115.2	0.0	0.0	0.0	0.0	78.9	6.6	0.3	1.1	0.0	0.0	0.0	0.0	28.3

Point Source, ISO 9613, Name: "Track Dozer 09 (Ore -CAT D9)", ID: "TD09"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5076	427694.14	5409472.79	374.00	0	DEN	A	115.2	0.0	0.0	0.0	0.0	79.1	6.7	0.3	1.1	0.0	0.0	0.0	0.0	28.0

Point Source, ISO 9613, Name: "Track Dozer 06 (PAG - Komatsu D375)", ID: "TD06"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5078	428085.83	5409480.41	374.67	0	DEN	A	115.2	0.0	0.0	0.0	0.0	79.3	6.9	0.3	1.1	0.0	0.0	0.0	0.0	27.6

Point Source, ISO 9613, Name: "Blast Hole Drill 4 - Sandvik DP1500i", ID: "BD4"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5079	425442.74	5409534.81	271.50	0	DEN	A	117.0	0.0	0.0	0.0	0.0	81.3	13.1	0.7	0.7	0.0	10.6	0.0	0.0	10.5

Point Source, ISO 9613, Name: "Blast Hole Drill 3 - Sandvik DP1500i", ID: "BD3"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5080	425428.58	5409534.81	271.50	0	DEN	A	117.0	0.0	0.0	0.0	0.0	81.3	13.2	0.7	0.7	0.0	10.5	0.0	0.0	10.6

Point Source, ISO 9613, Name: "Track Dozer 07 (PAG - Komatsu D475)", ID: "TD07D"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5083	427921.22	5409944.86	373.19	0	D	A	121.4	0.0	0.0	0.0	0.0	80.6	7.8	0.3	0.9	0.0	4.1	0.0	0.0	27.6
5083	427921.22	5409944.86	373.19	0	N	A	121.4	0.0	-188.0	0.0	0.0	80.6	7.8	0.3	0.9	0.0	4.1	0.0	0.0	-160.4
5083	427921.22	5409944.86	373.19	0	E	A	121.4	0.0	-188.0	0.0	0.0	80.6	7.8	0.3	0.9	0.0	4.1	0.0	0.0	-160.4

Point Source, ISO 9613, Name: "Komatsu Diesel Excavator PC360LC", ID: "E6"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5084	425516.35	5409558.98	272.00	0	DEN	A	116.4	0.0	0.0	0.0	0.0	81.2	7.6	1.0	0.7	0.0	7.3	0.0	0.0	18.6

Point Source, ISO 9613, Name: "Komatsu Wheel Loader WA900", ID: "WL2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5087	425409.83	5409564.52	272.00	0	DEN	A	116.5	0.0	0.0	0.0	0.0	81.4	7.5	1.4	0.3	0.0	5.1	0.0	0.0	20.9

Point Source, ISO 9613, Name: "Komatsu Wheel Loader WA1200", ID: "WL1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5089	425377.81	5409561.82	273.00	0	DEN	A	116.5	0.0	0.0	0.0	0.0	81.5	7.5	0.7	0.3	0.0	5.4	0.0	0.0	21.2

Point Source, ISO 9613, Name: "East Outcrop Graval Pit Mobile Crushing Plant Loader (CAT 966H)", ID: "EO_FEL"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5090	426882.01	5409568.78	375.35	0	DEN	A	114.3	0.0	0.0	0.0	0.0	79.6	5.6	-1.3	0.5	0.0	6.7	0.0	0.0	23.2

Point Source, ISO 9613, Name: "Track Dozer 05 (PAG - Komatsu D375)", ID: "TD05"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5092	428166.79	5409934.89	379.45	0	DEN	A	115.2	0.0	0.0	0.0	0.0	80.7	7.7	0.5	0.9	0.0	0.0	0.0	0.0	25.3

Point Source, ISO 9613, Name: "Track Dozer 08 (PAG - Komatsu D375)", ID: "TD08D"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5097	428071.74	5410284.02	382.04	0	D	A	121.4	0.0	0.0	0.0	0.0	81.6	8.5	0.3	0.9	0.0	4.1	0.0	0.0	26.0
5097	428071.74	5410284.02	382.04	0	N	A	121.4	0.0	-188.0	0.0	0.0	81.6	8.5	0.3	0.9	0.0	4.1	0.0	0.0	-162.0
5097	428071.74	5410284.02	382.04	0	E	A	121.4	0.0	-188.0	0.0	0.0	81.6	8.5	0.3	0.9	0.0	4.1	0.0	0.0	-162.0

Point Source, ISO 9613, Name: "Komatsu Diesel Excavator PC5500", ID: "E2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5099	425547.03	5409599.19	273.00	0	DEN	A	115.7	0.0	0.0	0.0	0.0	81.3	6.0	0.5	0.6	0.0	4.0	0.0	0.0	23.3

Point Source, ISO 9613, Name: "Komatsu Diesel Excavator PC5500", ID: "E1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5100	425413.33	5409602.18	273.00	0	DEN	A	115.7	0.0	0.0	0.0	0.0	81.5	6.1	0.5	0.6	0.0	4.4	0.0	0.0	22.6

Point Source, ISO 9613, Name: "Track Dozer 04 (Pit -CAT D10)", ID: "TD04"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5102	425597.37	5409636.80	272.00	0	DEN	A	115.2	0.0	0.0	0.0	0.0	81.3	8.1	0.6	0.8	0.0	5.0	0.0	0.0	19.5

Point Source, ISO 9613, Name: "Outcrop 3 Graval Pit Mobile Crushing Plant Loader (CAT 966H)", ID: "Outcrop3_FEL"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5103	428590.07	5410226.58	374.00	0	DEN	A	114.3	0.0	0.0	0.0	0.0	81.8	6.5	-1.5	0.2	0.0	3.9	0.0	0.0	23.4

Point Source, ISO 9613, Name: "Track Dozer 12 (NPAG/OB - Komatsu D375)", ID: "TD12D"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5108	425044.71	5410766.17	368.00	0	D	A	121.4	0.0	0.0	0.0	0.0	84.1	10.4	0.6	0.9	0.0	3.9	0.0	0.0	21.6
5108	425044.71	5410766.17	368.00	0	N	A	121.4	0.0	-188.0	0.0	0.0	84.1	10.4	0.6	0.9	0.0	3.9	0.0	0.0	-166.4
5108	425044.71	5410766.17	368.00	0	E	A	121.4	0.0	-188.0	0.0	0.0	84.1	10.4	0.6	0.9	0.0	3.9	0.0	0.0	-166.4

Point Source, ISO 9613, Name: "Outcrop 3 Graval Pit Mobile Primary Crusher (PowerScreen)", ID: "Outcrop3_PS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5110	428612.73	5410209.23	374.00	0	D	A	119.1	0.0	0.0	0.0	0.0	81.8	8.4	0.5	0.8	0.0	3.7	0.0	0.0	23.8
5110	428612.73	5410209.23	374.00	0	N	A	119.1	0.0	-188.0	0.0	0.0	81.8	8.4	0.5	0.8	0.0	3.7	0.0	0.0	-164.2
5110	428612.73	5410209.23	374.00	0	E	A	119.1	0.0	-188.0	0.0	0.0	81.8	8.4	0.5	0.8	0.0	3.7	0.0	0.0	-164.2

Point Source, ISO 9613, Name: "Track Dozer 14 (NPAG/OB -CAT D9)", ID: "TD14"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5114	424194.32	5409598.40	352.00	0	DEN	A	115.2	0.0	0.0	0.0	0.0	83.5	9.6	0.9	0.8	0.0	3.6	0.0	0.0	16.9

Point Source, ISO 9613, Name: "Track Dozer 15 (NPAG/OB -CAT D9)", ID: "TD15"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5116	425005.74	5410487.02	360.00	0	DEN	A	115.2	0.0	0.0	0.0	0.0	83.7	9.8	0.9	0.8	0.0	3.5	0.0	0.0	16.5

Point Source, ISO 9613, Name: "Komatsu Diesel Excavator PC800LC", ID: "E5"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5118	425594.55	5409554.60	273.00	0	DEN	A	112.6	0.0	0.0	0.0	0.0	81.1	7.7	-0.8	0.5	0.0	11.0	0.0	0.0	13.2

Point Source, ISO 9613, Name: "Track Dozer 13 (NPAG/OB -CAT D9)", ID: "TD13"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5122	423823.44	5409732.75	358.36	0	DEN	A	115.2	0.0	0.0	0.0	0.0	84.2	10.2	1.0	0.8	0.0	3.5	0.0	0.0	15.6

Point Source, ISO 9613, Name: "Track Dozer 11 (NPAG/OB - Komatsu D475)", ID: "TD11D"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5126	423353.77	5410438.11	364.00	0	D	A	121.4	0.0	0.0	0.0	0.0	85.6	11.8	0.8	0.8	0.0	3.7	0.0	0.0	18.7
5126	423353.77	5410438.11	364.00	0	N	A	121.4	0.0	-188.0	0.0	0.0	85.6	11.8	0.8	0.8	0.0	3.7	0.0	0.0	-169.3
5126	423353.77	5410438.11	364.00	0	E	A	121.4	0.0	-188.0	0.0	0.0	85.6	11.8	0.8	0.8	0.0	3.7	0.0	0.0	-169.3

Point Source, ISO 9613, Name: "Track Dozer 16 (NPAG/OB -CAT D9)", ID: "TD16"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5129	423780.87	5410394.72	352.16	0	DEN	A	115.2	0.0	0.0	0.0	0.0	85.0	10.9	1.1	0.8	0.0	3.4	0.0	0.0	14.1

Point Source, ISO 9613, Name: "Track Dozer 07 (PAG - Komatsu D475)", ID: "TD07N"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5131	427921.22	5409944.86	373.19	0	D	A	115.2	0.0	-188.0	0.0	0.0	80.6	7.6	0.5	0.9	0.0	3.9	0.0	0.0	-166.3
5131	427921.22	5409944.86	373.19	0	N	A	115.2	0.0	0.0	0.0	0.0	80.6	7.6	0.5	0.9	0.0	3.9	0.0	0.0	21.7
5131	427921.22	5409944.86	373.19	0	E	A	115.2	0.0	-188.0	0.0	0.0	80.6	7.6	0.5	0.9	0.0	3.9	0.0	0.0	-166.3

Point Source, ISO 9613, Name: "Roen Graval Pit Mobile Crushing Plant Loader (CAT 966H)", ID: "Roen_FEL"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5136	425842.83	5411524.72	372.00	0	DEN	A	114.3	0.0	0.0	0.0	0.0	84.7	7.6	-1.9	0.1	0.0	3.9	0.0	0.0	19.8

Point Source, ISO 9613, Name: "Transformer 2", ID: "T2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5142	426722.32	5411191.07	376.55	0	DEN	A	113.3	0.0	0.0	0.0	0.0	83.7	7.8	1.1	0.6	0.0	3.2	0.0	0.0	16.9

Point Source, ISO 9613, Name: "Transformer 1", ID: "T1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5145	426722.50	5411203.18	375.99	0	DEN	A	113.3	0.0	0.0	0.0	0.0	83.7	7.8	1.1	0.6	0.0	3.2	0.0	0.0	16.8

Point Source, ISO 9613, Name: "Crusher", ID: "C"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5148	426774.93	5410209.00	396.00	0	DEN	A	110.9	0.0	0.0	0.0	0.0	81.4	9.6	-0.5	0.7	0.0	4.1	0.0	0.0	15.6

Point Source, ISO 9613, Name: "Outcrop 3 Aggregate Pit Excavator PC360LC", ID: "Outcrop3_E"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5153	428618.55	5410215.86	374.00	0	D	A	116.4	0.0	0.0	0.0	0.0	81.8	7.9	1.0	0.8	0.0	3.3	0.0	0.0	21.5
5153	428618.55	5410215.86	374.00	0	N	A	116.4	0.0	-188.0	0.0	0.0	81.8	7.9	1.0	0.8	0.0	3.3	0.0	0.0	-166.5
5153	428618.55	5410215.86	374.00	0	E	A	116.4	0.0	-188.0	0.0	0.0	81.8	7.9	1.0	0.8	0.0	3.3	0.0	0.0	-166.5

Point Source, ISO 9613, Name: "Track Dozer 08 (PAG - Komatsu D375)", ID: "TD08N"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5158	428071.74	5410284.02	382.04	0	D	A	115.2	0.0	-188.0	0.0	0.0	81.6	8.3	0.6	0.9	0.0	3.8	0.0	0.0	-167.9
5158	428071.74	5410284.02	382.04	0	N	A	115.2	0.0	0.0	0.0	0.0	81.6	8.3	0.6	0.9	0.0	3.8	0.0	0.0	20.1
5158	428071.74	5410284.02	382.04	0	E	A	115.2	0.0	-188.0	0.0	0.0	81.6	8.3	0.6	0.9	0.0	3.8	0.0	0.0	-167.9

Point Source, ISO 9613, Name: "Roen Graval Pit Mobile Primary Crusher (PowerScreen)", ID: "Roen_PS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5165	425718.77	5411577.59	372.00	0	D	A	119.1	0.0	0.0	0.0	0.0	84.9	10.6	0.8	0.8	0.0	3.4	0.0	0.0	18.6
5165	425718.77	5411577.59	372.00	0	N	A	119.1	0.0	-188.0	0.0	0.0	84.9	10.6	0.8	0.8	0.0	3.4	0.0	0.0	-169.4
5165	425718.77	5411577.59	372.00	0	E	A	119.1	0.0	-188.0	0.0	0.0	84.9	10.6	0.8	0.8	0.0	3.4	0.0	0.0	-169.4

Point Source, ISO 9613, Name: "LD4 Graval Pit Mobile Crushing Plant Loader (CAT 966H)", ID: "LD4_FEL"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5169	423092.38	5410389.41	353.06	0	DEN	A	114.3	0.0	0.0	0.0	0.0	85.9	8.1	-2.1	0.0	0.0	3.9	0.0	0.0	18.5

Point Source, ISO 9613, Name: "LD4 Graval Pit Mobile Primary Crusher (PowerScreen)", ID: "LD4_PS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5176	423033.38	5410373.89	356.00	0	D	A	119.1	0.0	0.0	0.0	0.0	85.9	11.5	0.8	0.0	0.0	3.3	0.0	0.0	17.5
5176	423033.38	5410373.89	356.00	0	N	A	119.1	0.0	-188.0	0.0	0.0	85.9	11.5	0.8	0.0	0.0	3.3	0.0	0.0	-170.5
5176	423033.38	5410373.89	356.00	0	E	A	119.1	0.0	-188.0	0.0	0.0	85.9	11.5	0.8	0.0	0.0	3.3	0.0	0.0	-170.5

Point Source, ISO 9613, Name: "Water Pump WP11", ID: "WP11"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5182	426316.27	5409233.06	362.27	0	DEN	A	106.3	0.0	0.0	0.0	0.0	79.1	8.9	2.1	1.0	0.0	0.0	0.0	0.0	15.2

Point Source, ISO 9613, Name: "Water Pump WP10", ID: "WP10"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5186	425887.64	5409139.23	357.61	0	DEN	A	106.3	0.0	0.0	0.0	0.0	79.6	9.2	2.2	0.9	0.0	2.6	0.0	0.0	11.9

Point Source, ISO 9613, Name: "Track Dozer 12 (NPAG/OB - Komatsu D375)", ID: "TD12N"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5191	425044.71	5410766.17	368.00	0	D	A	115.2	0.0	-188.0	0.0	0.0	84.1	10.1	1.0	0.8	0.0	3.5	0.0	0.0	-172.2
5191	425044.71	5410766.17	368.00	0	N	A	115.2	0.0	0.0	0.0	0.0	84.1	10.1	1.0	0.8	0.0	3.5	0.0	0.0	15.8

Point Source, ISO 9613, Name: "Track Dozer 12 (NPAG/OB - Komatsu D375)", ID: "TD12N"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5191	425044.71	5410766.17	368.00	0	E	A	115.2	0.0	-188.0	0.0	0.0	84.1	10.1	1.0	0.8	0.0	3.5	0.0	0.0	-172.2

Point Source, ISO 9613, Name: "Roen Aggregate Pit Excavator PC360LC", ID: "Roen_E"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5203	425747.92	5411568.95	372.00	0	D	A	116.4	0.0	0.0	0.0	0.0	84.8	10.0	1.5	0.8	0.0	2.9	0.0	0.0	16.4
5203	425747.92	5411568.95	372.00	0	N	A	116.4	0.0	-188.0	0.0	0.0	84.8	10.0	1.5	0.8	0.0	2.9	0.0	0.0	-171.6
5203	425747.92	5411568.95	372.00	0	E	A	116.4	0.0	-188.0	0.0	0.0	84.8	10.0	1.5	0.8	0.0	2.9	0.0	0.0	-171.6

Point Source, ISO 9613, Name: "Water Pump WP09", ID: "WP09"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5212	425427.68	5409196.41	349.19	0	DEN	A	106.3	0.0	0.0	0.0	0.0	80.6	9.8	2.2	0.6	0.0	2.5	0.0	0.0	10.6

Point Source, ISO 9613, Name: "Water Pump WP04", ID: "WP04"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5218	425720.13	5409517.11	270.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	80.8	10.0	2.2	0.3	0.0	18.9	0.0	0.0	-5.9

Point Source, ISO 9613, Name: "Water Pump WP05", ID: "WP05"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5219	425608.12	5409494.17	270.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	80.9	10.1	2.2	0.2	0.0	16.7	0.0	0.0	-3.8

Point Source, ISO 9613, Name: "Water Pump WP03", ID: "WP03"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5221	425716.08	5409594.04	270.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	81.0	10.1	2.3	0.3	0.0	7.9	0.0	0.0	4.8

Point Source, ISO 9613, Name: "Water Pump WP06", ID: "WP06"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5227	425486.66	5409506.32	270.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	81.2	10.2	2.3	0.2	0.0	16.3	0.0	0.0	-3.8

Point Source, ISO 9613, Name: "Water Pump WP02", ID: "WP02"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5229	425672.89	5409648.02	270.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	81.2	10.2	2.3	0.5	0.0	3.3	0.0	0.0	8.9

Point Source, ISO 9613, Name: "LD4 Aggregate Pit Excavator PC360LC", ID: "LD4_E"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5238	423021.76	5410367.74	356.00	0	D	A	116.4	0.0	0.0	0.0	0.0	86.0	10.8	1.6	0.0	0.0	2.8	0.0	0.0	15.2
5238	423021.76	5410367.74	356.00	0	N	A	116.4	0.0	-188.0	0.0	0.0	86.0	10.8	1.6	0.0	0.0	2.8	0.0	0.0	-172.8
5238	423021.76	5410367.74	356.00	0	E	A	116.4	0.0	-188.0	0.0	0.0	86.0	10.8	1.6	0.0	0.0	2.8	0.0	0.0	-172.8

Point Source, ISO 9613, Name: "Track Dozer 11 (NPAG/OB - Komatsu D475)", ID: "TD11N"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5245	423353.77	5410438.11	364.00	0	D	A	115.2	0.0	-188.0	0.0	0.0	85.6	11.4	1.2	0.8	0.0	3.3	0.0	0.0	-175.0
5245	423353.77	5410438.11	364.00	0	N	A	115.2	0.0	0.0	0.0	0.0	85.6	11.4	1.2	0.8	0.0	3.3	0.0	0.0	13.0
5245	423353.77	5410438.11	364.00	0	E	A	115.2	0.0	-188.0	0.0	0.0	85.6	11.4	1.2	0.8	0.0	3.3	0.0	0.0	-175.0

Point Source, ISO 9613, Name: "Water Pump WP07", ID: "WP07"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5251	425363.85	5409510.37	270.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	81.4	10.4	2.3	0.2	0.0	15.4	0.0	0.0	-3.3

Point Source, ISO 9613, Name: "Water Pump WP01", ID: "WP01"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5256	425523.49	5409667.40	270.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	81.5	10.4	2.3	0.5	0.0	2.5	0.0	0.0	9.2

Sample Calculations

Point Source, ISO 9613, Name: "Water Pump WP08", ID: "WP08"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5262	425317.96	5409581.89	270.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	81.6	10.5	2.3	0.4	0.0	3.7	0.0	0.0	7.9

Point Source, ISO 9613, Name: "Water Pump WP19", ID: "WP19"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5280	426445.21	5410424.32	154.89	0	DEN	A	106.3	0.0	0.0	0.0	0.0	82.2	10.9	2.3	0.5	0.0	22.0	0.0	0.0	-11.6

Point Source, ISO 9613, Name: "Komatsu Wheel Dozer KM WD600", ID: "WD"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5291	425558.89	5409562.62	272.00	0	DEN	A	104.9	0.0	0.0	0.0	0.0	81.2	7.8	-0.3	0.3	0.0	8.3	0.0	0.0	7.7

Point Source, ISO 9613, Name: "Water Pump WP13", ID: "WP13"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5295	424459.30	5409308.63	348.45	0	DEN	A	106.3	0.0	0.0	0.0	0.0	82.6	11.2	2.3	0.5	0.0	2.3	0.0	0.0	7.5

Point Source, ISO 9613, Name: "Water Pump WP16", ID: "WP16"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5303	425369.52	5410194.45	350.85	0	DEN	A	106.3	0.0	0.0	0.0	0.0	82.7	11.3	2.3	0.5	0.0	2.2	0.0	0.0	7.3

Point Source, ISO 9613, Name: "Dust Collector 1", ID: "DC1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5307	426780.20	5410251.09	397.00	0	DEN	A	105.0	0.0	0.0	0.0	0.0	81.5	6.9	0.4	0.9	0.0	3.7	0.0	0.0	11.5

Point Source, ISO 9613, Name: "Water Pump WP12", ID: "WP12"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5316	424065.23	5409081.91	350.33	0	DEN	A	106.3	0.0	0.0	0.0	0.0	83.0	11.5	2.3	0.5	0.0	2.2	0.0	0.0	6.8

Point Source, ISO 9613, Name: "Dust Collector 2", ID: "DC2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5327	426611.94	5410474.13	369.41	0	DEN	A	105.0	0.0	0.0	0.0	0.0	82.2	7.3	0.4	0.9	0.0	3.7	0.0	0.0	10.5

Point Source, ISO 9613, Name: "East Outcrop Graval Pit Mobile Screener (Atlas Copco HCS3715)", ID: "EO_SCNR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5358	426845.69	5409577.47	374.00	0	DEN	A	101.5	0.0	0.0	0.0	0.0	79.6	3.3	3.2	0.7	0.0	2.3	0.0	0.0	12.5

Point Source, ISO 9613, Name: "Wet Scrubber", ID: "WS"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5367	426584.81	5410957.29	373.97	0	DEN	A	105.0	0.0	0.0	0.0	0.0	83.3	7.9	1.8	0.9	0.0	2.8	0.0	0.0	8.4

Point Source, ISO 9613, Name: "Water Pump WP17", ID: "WP17"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5381	424105.05	5410979.95	355.42	0	DEN	A	106.3	0.0	0.0	0.0	0.0	85.4	13.1	2.1	0.3	0.0	2.1	0.0	0.0	3.3

Point Source, ISO 9613, Name: "Water Pump WP15", ID: "WP15"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5393	423105.04	5410312.80	346.64	0	DEN	A	106.3	0.0	0.0	0.0	0.0	85.8	13.4	2.1	0.3	0.0	2.1	0.0	0.0	2.6

Point Source, ISO 9613, Name: "Water Pump WP14", ID: "WP14"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5399	423065.90	5410311.46	353.00	0	DEN	A	106.3	0.0	0.0	0.0	0.0	85.8	13.4	2.0	0.0	0.0	2.1	0.0	0.0	2.9

Point Source, ISO 9613, Name: "Water Pump WP18", ID: "WP18"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5426	421921.50	5409452.64	345.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	86.7	14.0	1.9	0.0	0.0	2.2	0.0	0.0	1.6

Line Source, ISO 9613, Name: "Truck Route-NPAG (Loaded Truck)", ID: "TRL_NPAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5215	423588.65	5410425.62	357.09	0	DEN	A	82.3	28.0	0.0	0.0	0.0	85.3	3.7	2.1	0.1	0.0	2.0	0.0	0.0	17.1
5225	424863.06	5409601.02	355.94	0	DEN	A	82.3	25.0	0.0	0.0	0.0	82.4	2.9	2.1	0.2	0.0	2.1	0.0	0.0	17.7
5230	425631.13	5409578.92	272.50	0	DEN	A	82.3	23.7	0.0	0.0	0.0	81.1	2.6	2.1	0.1	0.0	4.3	0.0	0.0	15.9
5249	424652.91	5409852.22	356.25	0	DEN	A	82.3	25.4	0.0	0.0	0.0	83.1	3.1	2.1	0.2	0.0	0.0	0.0	0.0	19.2
5259	425556.58	5409447.84	294.43	0	DEN	A	82.3	23.2	0.0	0.0	0.0	80.9	2.6	2.1	0.1	0.0	10.0	0.0	0.0	9.8
5263	425588.80	5409328.01	337.34	0	DEN	A	82.3	22.8	0.0	0.0	0.0	80.6	2.5	2.1	0.1	0.0	7.7	0.0	0.0	12.2
5273	423851.12	5410040.68	357.23	0	DEN	A	82.3	26.3	0.0	0.0	0.0	84.5	3.5	2.1	0.1	0.0	8.9	0.0	0.0	9.5
5299	424210.85	5409812.81	355.72	0	DEN	A	82.3	25.0	0.0	0.0	0.0	83.7	3.3	2.1	0.1	0.0	2.0	0.0	0.0	16.1
5304	425316.70	5409335.94	355.75	0	DEN	A	82.3	22.1	0.0	0.0	0.0	81.1	2.6	2.1	0.2	0.0	2.1	0.0	0.0	16.4
5324	425041.41	5409441.92	354.94	0	DEN	A	82.3	22.2	0.0	0.0	0.0	81.8	2.8	2.1	0.2	0.0	2.1	0.0	0.0	15.6
5329	425738.14	5409357.59	325.97	0	DEN	A	82.3	20.7	0.0	0.0	0.0	80.4	2.5	2.1	0.1	0.0	5.9	0.0	0.0	12.1
5331	425715.33	5409425.81	318.99	0	DEN	A	82.3	20.8	0.0	0.0	0.0	80.6	2.5	2.1	0.2	0.0	2.2	0.0	0.0	15.6
5336	423963.54	5409775.56	360.35	0	DEN	A	82.3	24.0	0.0	0.0	0.0	84.0	3.4	2.1	0.1	0.0	2.0	0.0	0.0	14.7
5339	424448.61	5409947.90	354.25	0	DEN	A	82.3	23.6	0.0	0.0	0.0	83.5	3.2	2.1	0.1	0.0	2.0	0.0	0.0	14.9
5341	425171.97	5409370.15	355.50	0	DEN	A	82.3	21.3	0.0	0.0	0.0	81.4	2.7	2.1	0.2	0.0	2.1	0.0	0.0	15.2
5368	425445.75	5409321.97	351.12	0	DEN	A	82.3	19.9	0.0	0.0	0.0	80.8	2.6	2.1	0.2	0.0	2.1	0.0	0.0	14.5
5401	425395.32	5409583.25	272.50	0	DEN	A	82.3	19.6	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	3.1	0.0	0.0	12.4
5415	425423.50	5409490.18	273.88	0	DEN	A	82.3	18.8	0.0	0.0	0.0	81.2	2.6	2.1	0.1	0.0	14.1	0.0	0.0	0.9
5418	425476.60	5409587.50	272.50	0	DEN	A	82.3	18.7	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	3.1	0.0	0.0	11.7
5453	425790.98	5409416.03	324.43	0	DEN	A	82.3	16.3	0.0	0.0	0.0	80.5	2.5	2.1	0.2	0.0	2.1	0.0	0.0	11.3
5455	425370.43	5409524.25	272.50	0	DEN	A	82.3	17.2	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	10.0	0.0	0.0	3.3
5500	425799.97	5409390.54	324.50	0	DEN	A	82.3	14.3	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.2	0.0	0.0	9.3
5510	425351.11	5409558.08	272.50	0	DEN	A	82.3	15.0	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	5.7	0.0	0.0	5.3

Line Source, ISO 9613, Name: "Truck Route-Overburden (Loaded Truck)", ID: "TRL_OB"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5197	424849.97	5410618.91	366.88	0	D	A	82.0	28.4	0.0	0.0	0.0	84.1	3.4	2.1	0.2	0.0	0.0	0.0	0.0	20.7
5197	424849.97	5410618.91	366.88	0	N	A	82.0	28.4	0.0	0.0	0.0	84.1	3.4	2.1	0.2	0.0	0.0	0.0	0.0	20.7
5197	424849.97	5410618.91	366.88	0	E	A	82.0	28.4	0.0	0.0	0.0	84.1	3.4	2.1	0.2	0.0	0.0	0.0	0.0	20.7
5261	425630.86	5409578.95	272.50	0	D	A	82.0	23.7	0.0	0.0	0.0	81.1	2.6	2.1	0.1	0.0	4.2	0.0	0.0	15.5
5261	425630.86	5409578.95	272.50	0	N	A	82.0	23.7	0.0	0.0	0.0	81.1	2.6	2.1	0.1	0.0	4.2	0.0	0.0	15.5
5261	425630.86	5409578.95	272.50	0	E	A	82.0	23.7	0.0	0.0	0.0	81.1	2.6	2.1	0.1	0.0	4.2	0.0	0.0	15.5
5266	424653.62	5409851.80	356.23	0	D	A	82.0	25.3	0.0	0.0	0.0	83.1	3.1	2.1	0.2	0.0	0.0	0.0	0.0	18.8
5266	424653.62	5409851.80	356.23	0	N	A	82.0	25.3	0.0	0.0	0.0	83.1	3.1	2.1	0.2	0.0	0.0	0.0	0.0	18.8
5266	424653.62	5409851.80	356.23	0	E	A	82.0	25.3	0.0	0.0	0.0	83.1	3.1	2.1	0.2	0.0	0.0	0.0	0.0	18.8
5267	425555.94	5409447.62	294.25	0	D	A	82.0	23.3	0.0	0.0	0.0	80.9	2.6	2.1	0.1	0.0	10.1	0.0	0.0	9.5
5267	425555.94	5409447.62	294.25	0	N	A	82.0	23.3	0.0	0.0	0.0	80.9	2.6	2.1	0.1	0.0	10.1	0.0	0.0	9.5
5267	425555.94	5409447.62	294.25	0	E	A	82.0	23.3	0.0	0.0	0.0	80.9	2.6	2.1	0.1	0.0	10.1	0.0	0.0	9.5
5275	425591.86	5409328.39	337.02	0	D	A	82.0	22.7	0.0	0.0	0.0	80.6	2.5	2.1	0.1	0.0	8.1	0.0	0.0	11.3
5275	425591.86	5409328.39	337.02	0	N	A	82.0	22.7	0.0	0.0	0.0	80.6	2.5	2.1	0.1	0.0	8.1	0.0	0.0	11.3
5275	425591.86	5409328.39	337.02	0	E	A	82.0	22.7	0.0	0.0	0.0	80.6	2.5	2.1	0.1	0.0	8.1	0.0	0.0	11.3
5286	424427.12	5410109.54	356.23	0	D	A	82.0	25.4	0.0	0.0	0.0	83.8	3.3	2.1	0.2	0.0	0.0	0.0	0.0	18.0
5286	424427.12	5410109.54	356.23	0	N	A	82.0	25.4	0.0	0.0	0.0	83.8	3.3	2.1	0.2	0.0	0.0	0.0	0.0	18.0
5286	424427.12	5410109.54	356.23	0	E	A	82.0	25.4	0.0	0.0	0.0	83.8	3.3	2.1	0.2	0.0	0.0	0.0	0.0	18.0
5311	424413.83	5410358.11	361.50	0	D	A	82.0	25.5	0.0	0.0	0.0	84.2	3.4	2.1	0.1	0.0	2.0	0.0	0.0	15.6
5311	424413.83	5410358.11	361.50	0	N	A	82.0	25.5	0.0	0.0	0.0	84.2	3.4	2.1	0.1	0.0	2.0	0.0	0.0	15.6
5311	424413.83	5410358.11	361.50	0	E	A	82.0	25.5	0.0	0.0	0.0	84.2	3.4	2.1	0.1	0.0	2.0	0.0	0.0	15.6
5320	425308.84	5409337.94	356.01	0	D	A	82.0	22.0	0.0	0.0	0.0	81.1	2.6	2.1	0.2	0.0	2.1	0.0	0.0	15.9
5320	425308.84	5409337.94	356.01	0	N	A	82.0	22.0	0.0	0.0	0.0	81.1	2.6	2.1	0.2	0.0	2.1	0.0	0.0	15.9
5320	425308.84	5409337.94	356.01	0	E	A	82.0	22.0	0.0	0.0	0.0	81.1	2.6	2.1	0.2	0.0	2.1	0.0	0.0	15.9
5322	424825.32	5409635.11	356.44	0	D	A	82.0	23.3	0.0	0.0	0.0	82.5	2.9	2.1	0.2	0.0	0.0	0.0	0.0	17.5
5322	424825.32	5409635.11	356.44	0	N	A	82.0	23.3	0.0	0.0	0.0	82.5	2.9	2.1	0.2	0.0	0.0	0.0	0.0	17.5
5322	424825.32	5409635.11	356.44	0	E	A	82.0	23.3	0.0	0.0	0.0	82.5	2.9	2.1	0.2	0.0	0.0	0.0	0.0	17.5
5343	425738.38	5409357.57	325.93	0	D	A	82.0	20.7	0.0	0.0	0.0	80.4	2.5	2.1	0.1	0.0	5.9	0.0	0.0	11.8
5343	425738.38	5409357.57	325.93	0	N	A	82.0	20.7	0.0	0.0	0.0	80.4	2.5	2.1	0.1	0.0	5.9	0.0	0.0	11.8
5343	425738.38	5409357.57	325.93	0	E	A	82.0	20.7	0.0	0.0	0.0	80.4	2.5	2.1	0.1	0.0	5.9	0.0	0.0	11.8
5344	425716.15	5409425.27	319.14	0	D	A	82.0	20.8	0.0	0.0	0.0	80.6	2.5	2.1	0.2	0.0	2.2	0.0	0.0	15.2

Line Source, ISO 9613, Name: "Truck Route-Overburden (Loaded Truck)", ID: "TRL_OB"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5344	425716.15	5409425.27	319.14	0	N	A	82.0	20.8	0.0	0.0	0.0	80.6	2.5	2.1	0.2	0.0	2.2	0.0	0.0	15.2
5344	425716.15	5409425.27	319.14	0	E	A	82.0	20.8	0.0	0.0	0.0	80.6	2.5	2.1	0.2	0.0	2.2	0.0	0.0	15.2
5350	425046.39	5409436.86	354.50	0	D	A	82.0	21.7	0.0	0.0	0.0	81.8	2.8	2.1	0.2	0.0	2.1	0.0	0.0	14.8
5350	425046.39	5409436.86	354.50	0	N	A	82.0	21.7	0.0	0.0	0.0	81.8	2.8	2.1	0.2	0.0	2.1	0.0	0.0	14.8
5350	425046.39	5409436.86	354.50	0	E	A	82.0	21.7	0.0	0.0	0.0	81.8	2.8	2.1	0.2	0.0	2.1	0.0	0.0	14.8
5360	425167.98	5409371.49	355.50	0	D	A	82.0	21.2	0.0	0.0	0.0	81.4	2.7	2.1	0.2	0.0	2.1	0.0	0.0	14.7
5360	425167.98	5409371.49	355.50	0	N	A	82.0	21.2	0.0	0.0	0.0	81.4	2.7	2.1	0.2	0.0	2.1	0.0	0.0	14.7
5360	425167.98	5409371.49	355.50	0	E	A	82.0	21.2	0.0	0.0	0.0	81.4	2.7	2.1	0.2	0.0	2.1	0.0	0.0	14.7
5363	425443.87	5409323.62	351.10	0	D	A	82.0	20.5	0.0	0.0	0.0	80.8	2.6	2.1	0.2	0.0	2.1	0.0	0.0	14.7
5363	425443.87	5409323.62	351.10	0	N	A	82.0	20.5	0.0	0.0	0.0	80.8	2.6	2.1	0.2	0.0	2.1	0.0	0.0	14.7
5363	425443.87	5409323.62	351.10	0	E	A	82.0	20.5	0.0	0.0	0.0	80.8	2.6	2.1	0.2	0.0	2.1	0.0	0.0	14.7
5385	424943.13	5409519.90	355.44	0	D	A	82.0	20.7	0.0	0.0	0.0	82.1	2.8	2.1	0.2	0.0	2.1	0.0	0.0	13.4
5385	424943.13	5409519.90	355.44	0	N	A	82.0	20.7	0.0	0.0	0.0	82.1	2.8	2.1	0.2	0.0	2.1	0.0	0.0	13.4
5385	424943.13	5409519.90	355.44	0	E	A	82.0	20.7	0.0	0.0	0.0	82.1	2.8	2.1	0.2	0.0	2.1	0.0	0.0	13.4
5409	425395.00	5409583.31	272.50	0	D	A	82.0	19.6	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	3.1	0.0	0.0	12.1
5409	425395.00	5409583.31	272.50	0	N	A	82.0	19.6	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	3.1	0.0	0.0	12.1
5409	425395.00	5409583.31	272.50	0	E	A	82.0	19.6	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	3.1	0.0	0.0	12.1
5428	425421.34	5409491.11	273.60	0	D	A	82.0	18.8	0.0	0.0	0.0	81.2	2.6	2.1	0.1	0.0	14.1	0.0	0.0	0.7
5428	425421.34	5409491.11	273.60	0	N	A	82.0	18.8	0.0	0.0	0.0	81.2	2.6	2.1	0.1	0.0	14.1	0.0	0.0	0.7
5428	425421.34	5409491.11	273.60	0	E	A	82.0	18.8	0.0	0.0	0.0	81.2	2.6	2.1	0.1	0.0	14.1	0.0	0.0	0.7
5434	425476.90	5409587.56	272.50	0	D	A	82.0	18.8	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	3.1	0.0	0.0	11.4
5434	425476.90	5409587.56	272.50	0	N	A	82.0	18.8	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	3.1	0.0	0.0	11.4
5434	425476.90	5409587.56	272.50	0	E	A	82.0	18.8	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	3.1	0.0	0.0	11.4
5458	425791.49	5409415.83	324.49	0	D	A	82.0	16.2	0.0	0.0	0.0	80.5	2.5	2.1	0.2	0.0	2.1	0.0	0.0	10.9
5458	425791.49	5409415.83	324.49	0	N	A	82.0	16.2	0.0	0.0	0.0	80.5	2.5	2.1	0.2	0.0	2.1	0.0	0.0	10.9
5458	425791.49	5409415.83	324.49	0	E	A	82.0	16.2	0.0	0.0	0.0	80.5	2.5	2.1	0.2	0.0	2.1	0.0	0.0	10.9
5460	425368.99	5409525.35	272.50	0	D	A	82.0	17.0	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	9.8	0.0	0.0	3.0
5460	425368.99	5409525.35	272.50	0	N	A	82.0	17.0	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	9.8	0.0	0.0	3.0
5460	425368.99	5409525.35	272.50	0	E	A	82.0	17.0	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	9.8	0.0	0.0	3.0
5509	425800.02	5409390.79	324.50	0	D	A	82.0	14.3	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.2	0.0	0.0	9.0
5509	425800.02	5409390.79	324.50	0	N	A	82.0	14.3	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.2	0.0	0.0	9.0
5509	425800.02	5409390.79	324.50	0	E	A	82.0	14.3	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.2	0.0	0.0	9.0
5521	425350.50	5409558.44	272.50	0	D	A	82.0	15.0	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	5.7	0.0	0.0	4.9
5521	425350.50	5409558.44	272.50	0	N	A	82.0	15.0	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	5.7	0.0	0.0	4.9
5521	425350.50	5409558.44	272.50	0	E	A	82.0	15.0	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	5.7	0.0	0.0	4.9

Point Source, ISO 9613, Name: "Outcrop3 Graval Pit Mobile Screener (Atlas Copco HCS3715)", ID: "Outcrop3_SCNR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5573	428581.67	5410189.02	374.00	0	D	A	101.5	0.0	0.0	0.0	0.0	81.7	3.8	3.3	0.3	0.0	1.4	0.0	0.0	11.1
5573	428581.67	5410189.02	374.00	0	N	A	101.5	0.0	-188.0	0.0	0.0	81.7	3.8	3.3	0.3	0.0	1.4	0.0	0.0	-176.9
5573	428581.67	5410189.02	374.00	0	E	A	101.5	0.0	-188.0	0.0	0.0	81.7	3.8	3.3	0.3	0.0	1.4	0.0	0.0	-176.9

Point Source, ISO 9613, Name: "Pinewood River Water Pump", ID: "WP20"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5611	415594.37	5407042.99	340.75	0	DEN	A	106.3	0.0	0.0	0.0	0.0	92.5	17.7	0.3	0.0	0.0	2.8	0.0	0.0	-7.0

Line Source, ISO 9613, Name: "Water Truck Route PAG", ID: "WTR_PAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5446	427734.84	5409874.76	379.29	0	DEN	A	71.9	26.6	0.0	0.0	0.0	80.4	9.6	-0.3	0.9	0.0	4.0	0.0	0.0	3.9
5595	427428.21	5409835.98	387.44	0	DEN	A	71.9	22.2	0.0	0.0	0.0	80.2	9.5	-0.3	0.9	0.0	4.0	0.0	0.0	-0.1
5647	427277.39	5409801.98	390.95	0	DEN	A	71.9	21.5	0.0	0.0	0.0	80.1	9.4	-0.3	0.9	0.0	4.1	0.0	0.0	-0.7

Line Source, ISO 9613, Name: "Water Truck Route OB", ID: "WTR_OB"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5493	424846.28	5410617.34	365.01	0	DEN	A	71.9	28.4	0.0	0.0	0.0	84.1	12.4	0.4	0.9	0.0	0.0	0.0	0.0	2.6
5606	424426.76	5410109.35	356.24	0	DEN	A	71.9	25.4	0.0	0.0	0.0	83.8	12.2	0.4	0.9	0.0	0.0	0.0	0.0	0.1
5669	424411.70	5410356.21	359.50	0	DEN	A	71.9	25.4	0.0	0.0	0.0	84.2	12.5	0.5	0.8	0.0	3.6	0.0	0.0	-4.1

Line Source, ISO 9613, Name: "Truck Route Open Pit to Mill (Loaded Truck)", ID: "TRL_OPMill"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5289	426038.87	5409390.74	335.10	0	DEN	A	79.3	24.3	0.0	0.0	0.0	80.0	2.4	2.1	0.6	0.0	9.6	0.0	0.0	9.0
5353	425629.72	5409578.70	272.50	0	DEN	A	79.3	23.7	0.0	0.0	0.0	81.1	2.6	2.1	0.1	0.0	4.2	0.0	0.0	12.9
5355	426345.87	5409644.29	366.78	0	DEN	A	79.3	22.9	0.0	0.0	0.0	80.3	2.4	2.1	0.2	0.0	2.1	0.0	0.0	15.1
5357	426538.83	5409923.32	385.70	0	DEN	A	79.3	23.3	0.0	0.0	0.0	80.8	2.6	2.1	0.3	0.0	0.0	0.0	0.0	16.9
5361	425556.60	5409447.40	294.41	0	DEN	A	79.3	23.2	0.0	0.0	0.0	80.9	2.6	2.1	0.1	0.0	10.1	0.0	0.0	6.8
5403	425840.07	5409411.51	324.61	0	DEN	A	79.3	21.3	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.1	0.0	0.0	13.4
5405	426451.31	5409770.81	376.37	0	DEN	A	79.3	21.4	0.0	0.0	0.0	80.5	2.5	2.1	0.3	0.0	0.0	0.0	0.0	15.4
5430	425715.40	5409425.95	319.00	0	DEN	A	79.3	20.8	0.0	0.0	0.0	80.6	2.5	2.1	0.2	0.0	2.2	0.0	0.0	12.5
5435	426198.87	5409424.30	349.80	0	DEN	A	79.3	19.5	0.0	0.0	0.0	79.9	2.4	2.0	0.6	0.0	2.6	0.0	0.0	11.4
5444	426616.94	5410059.66	390.65	0	DEN	A	79.3	20.0	0.0	0.0	0.0	81.1	2.6	2.1	0.2	0.0	2.1	0.0	0.0	11.2
5448	426236.26	5409496.49	356.92	0	DEN	A	79.3	18.8	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	11.4
5472	425394.90	5409583.08	272.50	0	DEN	A	79.3	19.6	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	3.1	0.0	0.0	9.4
5476	426703.70	5410166.27	393.25	0	DEN	A	79.3	19.4	0.0	0.0	0.0	81.4	2.7	2.1	0.2	0.0	2.1	0.0	0.0	10.3
5477	425422.66	5409490.06	273.82	0	DEN	A	79.3	18.8	0.0	0.0	0.0	81.2	2.6	2.1	0.1	0.0	14.2	0.0	0.0	-2.1
5479	425476.27	5409587.12	272.50	0	DEN	A	79.3	18.7	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	3.1	0.0	0.0	8.7
5488	426261.44	5409555.18	360.19	0	DEN	A	79.3	17.2	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	9.6
5541	425369.42	5409524.53	272.50	0	DEN	A	79.3	17.1	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	10.0	0.0	0.0	0.3
5554	426655.98	5410121.94	389.96	0	DEN	A	79.3	16.6	0.0	0.0	0.0	81.3	2.7	2.1	0.2	0.0	2.1	0.0	0.0	7.6
5694	425350.40	5409558.15	272.50	0	DEN	A	79.3	15.1	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	5.7	0.0	0.0	2.3

Point Source, ISO 9613, Name: "Pinewood River Pumphouse Generator (CAT 660 kW)", ID: "PG1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5710	415588.16	5407043.32	342.00	0	DEN	A	105.2	0.0	0.0	0.0	0.0	92.5	10.7	3.0	0.0	0.0	1.4	0.0	0.0	-2.4

Line Source, ISO 9613, Name: "Motor Grader Route OB", ID: "MGR_OB"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5515	424846.71	5410617.03	365.09	0	DEN	A	71.1	28.4	0.0	0.0	0.0	84.1	9.6	0.5	0.7	0.0	0.0	0.0	0.0	4.6
5685	424426.86	5410109.39	356.24	0	DEN	A	71.1	25.4	0.0	0.0	0.0	83.8	9.4	0.5	0.7	0.0	0.0	0.0	0.0	2.1
5722	424412.01	5410356.27	359.59	0	DEN	A	71.1	25.4	0.0	0.0	0.0	84.2	9.7	0.6	0.6	0.0	3.4	0.0	0.0	-1.9

Line Source, ISO 9613, Name: "Motor Grader Route PAG", ID: "MGR_PAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5473	427734.84	5409874.76	379.29	0	DEN	A	71.1	26.6	0.0	0.0	0.0	80.4	7.4	0.1	0.7	0.0	3.8	0.0	0.0	5.3
5668	427428.21	5409835.98	387.44	0	DEN	A	71.1	22.2	0.0	0.0	0.0	80.2	7.3	0.1	0.7	0.0	3.8	0.0	0.0	1.2
5727	427280.60	5409802.25	390.64	0	DEN	A	71.1	21.3	0.0	0.0	0.0	80.1	7.3	0.1	0.8	0.0	3.8	0.0	0.0	0.5

Point Source, ISO 9613, Name: "Roen Graval Pit Mobile Screener (Atlas Copco HCS3715)", ID: "Roen_SCNR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5804	425668.03	5411515.58	372.00	0	D	A	101.5	0.0	0.0	0.0	0.0	84.8	4.8	3.4	0.3	0.0	1.2	0.0	0.0	7.1
5804	425668.03	5411515.58	372.00	0	N	A	101.5	0.0	-188.0	0.0	0.0	84.8	4.8	3.4	0.3	0.0	1.2	0.0	0.0	-180.9
5804	425668.03	5411515.58	372.00	0	E	A	101.5	0.0	-188.0	0.0	0.0	84.8	4.8	3.4	0.3	0.0	1.2	0.0	0.0	-180.9

Line Source, ISO 9613, Name: "Truck Route Stockpile (Loaded Truck)", ID: "TRL_SP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5258	427524.15	5409592.10	387.98	0	DEN	A	78.6	25.7	0.0	0.0	0.0	79.4	2.3	2.0	0.6	0.0	6.9	0.0	0.0	13.1
5319	426038.75	5409390.55	335.09	0	DEN	A	78.6	24.3	0.0	0.0	0.0	80.0	2.4	2.1	0.6	0.0	9.8	0.0	0.0	8.1
5334	426432.91	5409603.33	373.37	0	DEN	A	78.6	23.8	0.0	0.0	0.0	80.1	2.4	2.1	0.3	0.0	0.0	0.0	0.0	17.7
5371	425631.27	5409578.87	272.50	0	DEN	A	78.6	23.7	0.0	0.0	0.0	81.1	2.6	2.1	0.1	0.0	4.3	0.0	0.0	12.2
5374	426638.34	5409616.36	380.50	0	DEN	A	78.6	22.4	0.0	0.0	0.0	79.9	2.4	2.0	0.2	0.0	2.1	0.0	0.0	14.4
5375	425557.71	5409447.01	294.74	0	DEN	A	78.6	23.2	0.0	0.0	0.0	80.9	2.6	2.1	0.1	0.0	10.1	0.0	0.0	6.1
5376	426796.68	5409678.62	385.50	0	DEN	A	78.6	22.3	0.0	0.0	0.0	80.0	2.4	2.0	0.2	0.0	2.1	0.0	0.0	14.2
5407	427068.94	5409750.48	394.19	0	DEN	A	78.6	21.6	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	13.5
5416	426935.43	5409722.19	390.52	0	DEN	A	78.6	21.1	0.0	0.0	0.0	80.0	2.4	2.1	0.3	0.0	0.0	0.0	0.0	15.1
5419	425840.98	5409411.19	324.69	0	DEN	A	78.6	21.3	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.1	0.0	0.0	12.7
5436	427267.01	5409719.16	394.50	0	DEN	A	78.6	20.0	0.0	0.0	0.0	79.9	2.4	2.0	0.2	0.0	2.2	0.0	0.0	12.0
5437	425716.63	5409425.45	319.18	0	DEN	A	78.6	20.8	0.0	0.0	0.0	80.6	2.5	2.1	0.2	0.0	2.2	0.0	0.0	11.9
5442	426199.24	5409424.15	349.80	0	DEN	A	78.6	19.5	0.0	0.0	0.0	79.9	2.4	2.0	0.6	0.0	2.6	0.0	0.0	10.7
5462	427177.12	5409782.45	393.17	0	DEN	A	78.6	19.1	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	10.9
5465	426236.18	5409496.59	357.03	0	DEN	A	78.6	18.9	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	10.7

Line Source, ISO 9613, Name: "Truck Route Stockpile (Loaded Truck)", ID: "TRL_SP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5480	425395.60	5409583.43	272.50	0	DEN	A	78.6	19.5	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	3.1	0.0	0.0	8.7
5486	425422.45	5409490.02	274.06	0	DEN	A	78.6	19.0	0.0	0.0	0.0	81.2	2.6	2.1	0.1	0.0	14.2	0.0	0.0	-2.5
5503	425476.42	5409587.79	272.50	0	DEN	A	78.6	18.7	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	3.1	0.0	0.0	8.1
5507	426261.76	5409556.01	360.53	0	DEN	A	78.6	17.4	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	9.1
5530	426294.77	5409595.16	364.77	0	DEN	A	78.6	16.9	0.0	0.0	0.0	80.2	2.4	2.1	0.2	0.0	2.1	0.0	0.0	8.5
5543	427324.82	5409616.26	399.04	0	DEN	A	78.6	15.9	0.0	0.0	0.0	79.5	2.3	2.0	0.6	0.0	2.1	0.0	0.0	7.9
5574	425368.22	5409524.95	272.50	0	DEN	A	78.6	17.1	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	9.9	0.0	0.0	-0.5
5601	427298.96	5409639.05	398.83	0	DEN	A	78.6	14.9	0.0	0.0	0.0	79.6	2.3	2.0	0.3	0.0	0.0	0.0	0.0	9.3
5660	427231.03	5409784.83	390.50	0	DEN	A	78.6	14.7	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	6.5
5730	427284.95	5409661.13	398.83	0	DEN	A	78.6	13.4	0.0	0.0	0.0	79.7	2.3	2.0	0.3	0.0	0.0	0.0	0.0	7.7
5757	425351.12	5409558.61	272.50	0	DEN	A	78.6	14.9	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	5.7	0.0	0.0	1.6
5877	427249.50	5409774.00	390.50	0	DEN	A	78.6	11.9	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	3.8

Point Source, ISO 9613, Name: "WMP Air Compressor 1", ID: "AC1"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5890	421213.68	5411429.46	370.28	0	DEN	A	99.0	0.0	0.0	0.0	0.0	88.7	8.1	4.0	0.0	0.0	0.6	0.0	0.0	-2.4

Point Source, ISO 9613, Name: "LD4 Graval Pit Mobile Screener (Atlas Copco HCS3715)", ID: "LD4_SCNR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5896	423089.66	5410366.72	352.00	0	D	A	101.5	0.0	0.0	0.0	0.0	85.9	5.2	3.4	0.0	0.0	1.2	0.0	0.0	5.9
5896	423089.66	5410366.72	352.00	0	N	A	101.5	0.0	-188.0	0.0	0.0	85.9	5.2	3.4	0.0	0.0	1.2	0.0	0.0	-182.1
5896	423089.66	5410366.72	352.00	0	E	A	101.5	0.0	-188.0	0.0	0.0	85.9	5.2	3.4	0.0	0.0	1.2	0.0	0.0	-182.1

Point Source, ISO 9613, Name: "WMP Air Compressor 4", ID: "AC4"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5932	421343.51	5412002.41	366.00	0	DEN	A	99.0	0.0	0.0	0.0	0.0	89.0	8.3	4.0	0.0	0.0	0.6	0.0	0.0	-2.9

Point Source, ISO 9613, Name: "WMP Air Compressor 2", ID: "AC2"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5969	420461.43	5411544.61	364.13	0	DEN	A	99.0	0.0	0.0	0.0	0.0	89.4	8.6	3.9	0.0	0.0	0.6	0.0	0.0	-3.6

Point Source, ISO 9613, Name: "WMP Air Compressor 3", ID: "AC3"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
6006	420185.80	5412295.08	363.39	0	DEN	A	99.0	0.0	0.0	0.0	0.0	90.1	9.0	3.9	0.0	0.0	0.7	0.0	0.0	-4.7

Line Source, ISO 9613, Name: "Water Truck Route NPAG", ID: "WTR_NPAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5534	423588.91	5410425.34	357.10	0	DEN	A	71.9	28.0	0.0	0.0	0.0	85.3	13.4	0.7	0.7	0.0	3.4	0.0	0.0	-3.6
5555	424857.88	5409605.74	356.23	0	DEN	A	71.9	24.8	0.0	0.0	0.0	82.4	11.1	0.1	0.8	0.0	3.8	0.0	0.0	-1.5
5565	424653.14	5409852.45	356.25	0	DEN	A	71.9	25.4	0.0	0.0	0.0	83.1	11.6	0.2	0.9	0.0	0.0	0.0	0.0	1.5
5590	425589.14	5409327.95	337.35	0	DEN	A	71.9	22.7	0.0	0.0	0.0	80.6	9.7	-0.2	0.7	0.0	13.4	0.0	0.0	-9.6
5602	423851.49	5410040.72	357.25	0	DEN	A	71.9	26.3	0.0	0.0	0.0	84.5	12.8	0.5	0.5	0.0	14.2	0.0	0.0	-14.3
5655	424210.92	5409812.69	355.70	0	DEN	A	71.9	25.0	0.0	0.0	0.0	83.7	12.1	0.4	0.8	0.0	3.6	0.0	0.0	-3.6
5697	425036.42	5409446.90	355.23	0	DEN	A	71.9	22.5	0.0	0.0	0.0	81.8	10.6	-0.0	0.8	0.0	3.9	0.0	0.0	-2.7
5713	425301.21	5409339.17	356.08	0	DEN	A	71.9	21.7	0.0	0.0	0.0	81.1	10.1	-0.1	0.9	0.0	4.0	0.0	0.0	-2.3
5724	425736.31	5409357.53	326.16	0	DEN	A	71.9	20.8	0.0	0.0	0.0	80.4	9.6	-0.3	0.7	0.0	11.0	0.0	0.0	-8.7
5746	423963.81	5409775.42	360.34	0	DEN	A	71.9	24.0	0.0	0.0	0.0	84.0	12.4	0.4	0.8	0.0	3.6	0.0	0.0	-5.2
5759	424448.77	5409948.08	354.25	0	DEN	A	71.9	23.6	0.0	0.0	0.0	83.5	12.0	0.3	0.8	0.0	3.7	0.0	0.0	-4.7
5760	425436.44	5409324.57	351.28	0	DEN	A	71.9	20.9	0.0	0.0	0.0	80.9	9.9	-0.2	0.9	0.0	4.0	0.0	0.0	-2.6
5775	425167.88	5409371.59	355.50	0	DEN	A	71.9	21.0	0.0	0.0	0.0	81.4	10.3	-0.1	0.9	0.0	3.9	0.0	0.0	-3.5
6061	425790.18	5409416.40	324.41	0	DEN	A	71.9	16.2	0.0	0.0	0.0	80.5	9.6	-0.2	0.9	0.0	4.1	0.0	0.0	-6.6
6138	425798.97	5409391.23	324.50	0	DEN	A	71.9	14.2	0.0	0.0	0.0	80.4	9.6	-0.3	0.9	0.0	4.2	0.0	0.0	-8.6

Line Source, ISO 9613, Name: "Water Truck Route Open Pit to Mill", ID: "WTR_OPMill"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5498	426041.08	5409390.69	335.36	0	DEN	A	71.9	24.2	0.0	0.0	0.0	80.0	9.3	-0.3	0.8	0.0	16.1	0.0	0.0	-9.8
5553	425631.88	5409578.88	272.50	0	DEN	A	71.9	23.7	0.0	0.0	0.0	81.1	10.1	-0.1	0.7	0.0	8.7	0.0	0.0	-4.8

Line Source, ISO 9613, Name: "Water Truck Route Open Pit to Mill", ID: "WTR_OPMill"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5557	426345.87	5409644.29	366.78	0	DEN	A	71.9	22.9	0.0	0.0	0.0	80.3	9.5	-0.3	0.9	0.0	4.0	0.0	0.0	0.4
5558	426538.83	5409923.32	385.70	0	DEN	A	71.9	23.3	0.0	0.0	0.0	80.8	9.9	-0.2	0.9	0.0	0.0	0.0	0.0	3.7
5568	425560.58	5409446.41	295.26	0	DEN	A	71.9	23.2	0.0	0.0	0.0	80.9	10.0	-0.2	0.6	0.0	16.0	0.0	0.0	-12.2
5675	425844.00	5409411.55	324.96	0	DEN	A	71.9	21.4	0.0	0.0	0.0	80.4	9.6	-0.3	0.9	0.0	4.1	0.0	0.0	-1.3
5693	426451.31	5409770.81	376.37	0	DEN	A	71.9	21.4	0.0	0.0	0.0	80.5	9.7	-0.2	0.9	0.0	0.0	0.0	0.0	2.5
5751	425719.47	5409425.42	319.50	0	DEN	A	71.9	20.7	0.0	0.0	0.0	80.6	9.7	-0.2	0.9	0.0	4.3	0.0	0.0	-2.6
5779	426198.89	5409424.32	349.80	0	DEN	A	71.9	19.5	0.0	0.0	0.0	79.9	9.2	-0.3	1.0	0.0	5.5	0.0	0.0	-3.7
5837	426616.94	5410059.66	390.65	0	DEN	A	71.9	20.0	0.0	0.0	0.0	81.1	10.1	-0.1	0.9	0.0	4.0	0.0	0.0	-4.0
5858	426236.26	5409496.49	356.92	0	DEN	A	71.9	18.8	0.0	0.0	0.0	80.0	9.3	-0.3	0.9	0.0	4.1	0.0	0.0	-3.2
5910	425395.27	5409582.92	272.50	0	DEN	A	71.9	19.7	0.0	0.0	0.0	81.5	10.4	-0.1	0.8	0.0	6.5	0.0	0.0	-7.5
5934	426703.70	5410166.27	393.25	0	DEN	A	71.9	19.4	0.0	0.0	0.0	81.4	10.3	-0.1	0.9	0.0	3.9	0.0	0.0	-5.1
5945	425424.74	5409489.19	274.26	0	DEN	A	71.9	19.0	0.0	0.0	0.0	81.2	10.2	-0.1	0.6	0.0	20.2	0.0	0.0	-21.2
5973	425477.98	5409587.36	272.50	0	DEN	A	71.9	18.8	0.0	0.0	0.0	81.4	10.3	-0.1	0.8	0.0	6.5	0.0	0.0	-8.1
5990	426261.44	5409555.18	360.19	0	DEN	A	71.9	17.2	0.0	0.0	0.0	80.1	9.4	-0.3	0.9	0.0	4.1	0.0	0.0	-5.0
6060	425370.05	5409523.95	272.50	0	DEN	A	71.9	17.2	0.0	0.0	0.0	81.4	10.3	-0.1	0.6	0.0	15.8	0.0	0.0	-18.9
6074	426655.98	5410121.94	389.96	0	DEN	A	71.9	16.6	0.0	0.0	0.0	81.3	10.2	-0.1	0.9	0.0	3.9	0.0	0.0	-7.6
6142	425350.52	5409557.70	272.50	0	DEN	A	71.9	15.0	0.0	0.0	0.0	81.5	10.4	-0.1	0.7	0.0	10.7	0.0	0.0	-16.3

Line Source, ISO 9613, Name: "LD4 Aggregate Pit Truck Route", ID: "LD4_TR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5512	423198.10	5411877.59	359.35	0	DEN	A	73.7	29.1	0.0	0.0	0.0	87.3	9.1	0.4	0.0	0.0	3.1	0.0	0.0	2.8
5550	423595.43	5410813.66	360.92	0	DEN	A	73.7	26.8	0.0	0.0	0.0	85.7	8.1	0.6	0.3	0.0	7.5	0.0	0.0	-1.8
5572	423663.44	5411614.67	357.86	0	DEN	A	73.7	27.0	0.0	0.0	0.0	86.6	8.6	0.5	0.0	0.0	3.1	0.0	0.0	1.8
5589	423224.87	5410573.58	356.47	0	DEN	A	73.7	26.4	0.0	0.0	0.0	85.9	8.2	0.6	0.0	0.0	3.1	0.0	0.0	2.2
5630	422537.17	5412047.57	361.50	0	DEN	A	73.7	27.8	0.0	0.0	0.0	88.0	9.6	0.3	0.0	0.0	3.2	0.0	0.0	0.4
5671	423779.11	5411211.95	357.98	0	DEN	A	73.7	25.3	0.0	0.0	0.0	86.0	8.3	0.6	0.0	0.0	3.1	0.0	0.0	1.0
5846	421882.84	5412552.36	365.03	0	DEN	A	73.7	26.0	0.0	0.0	0.0	88.9	10.2	0.2	0.0	0.0	3.2	0.0	0.0	-2.9
5874	422173.01	5412338.89	363.11	0	DEN	A	73.7	25.5	0.0	0.0	0.0	88.5	10.0	0.2	0.0	0.0	3.2	0.0	0.0	-2.8
6079	423846.06	5411016.09	358.48	0	DEN	A	73.7	19.0	0.0	0.0	0.0	85.7	8.1	0.6	0.5	0.0	3.1	0.0	0.0	-5.4
6145	423839.64	5410910.06	360.92	0	DEN	A	73.7	17.2	0.0	0.0	0.0	85.6	8.0	0.6	0.5	0.0	3.1	0.0	0.0	-7.0
6150	423858.92	5410953.97	358.50	0	DEN	A	73.7	17.1	0.0	0.0	0.0	85.6	8.1	0.6	0.5	0.0	3.1	0.0	0.0	-7.2

Line Source, ISO 9613, Name: "Motor Grader Route NPAG", ID: "MGR_NPAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5579	423588.85	5410425.47	357.07	0	DEN	A	71.1	28.0	0.0	0.0	0.0	85.3	10.4	0.7	0.6	0.0	3.3	0.0	0.0	-1.1
5634	424652.81	5409852.25	356.25	0	DEN	A	71.1	25.4	0.0	0.0	0.0	83.1	9.0	0.4	0.8	0.0	0.0	0.0	0.0	3.2
5644	425588.15	5409327.40	337.43	0	DEN	A	71.1	22.8	0.0	0.0	0.0	80.6	7.5	0.1	0.5	0.0	12.1	0.0	0.0	-6.9
5673	423851.17	5410040.27	357.25	0	DEN	A	71.1	26.3	0.0	0.0	0.0	84.5	9.9	0.6	0.3	0.0	12.2	0.0	0.0	-10.1
5716	424211.06	5409812.83	355.70	0	DEN	A	71.1	25.0	0.0	0.0	0.0	83.7	9.4	0.5	0.6	0.0	3.4	0.0	0.0	-1.5
5741	425302.99	5409338.96	355.91	0	DEN	A	71.1	22.1	0.0	0.0	0.0	81.1	7.8	0.2	0.7	0.0	3.7	0.0	0.0	-0.4
5753	424825.01	5409635.22	356.44	0	DEN	A	71.1	23.3	0.0	0.0	0.0	82.5	8.6	0.3	0.8	0.0	0.0	0.0	0.0	2.2
5791	425736.85	5409358.23	326.08	0	DEN	A	71.1	20.7	0.0	0.0	0.0	80.4	7.4	0.1	0.5	0.0	9.5	0.0	0.0	-6.1
5799	423963.76	5409775.36	360.34	0	DEN	A	71.1	24.0	0.0	0.0	0.0	84.0	9.6	0.5	0.6	0.0	3.4	0.0	0.0	-3.0
5810	424448.65	5409947.94	354.25	0	DEN	A	71.1	23.6	0.0	0.0	0.0	83.5	9.3	0.5	0.6	0.0	3.5	0.0	0.0	-2.6
5824	425041.75	5409441.14	354.52	0	DEN	A	71.1	21.6	0.0	0.0	0.0	81.8	8.2	0.3	0.7	0.0	3.6	0.0	0.0	-1.9
5828	425162.00	5409375.86	355.46	0	DEN	A	71.1	21.2	0.0	0.0	0.0	81.5	8.0	0.2	0.7	0.0	3.7	0.0	0.0	-1.7
5839	425438.48	5409321.87	351.31	0	DEN	A	71.1	20.5	0.0	0.0	0.0	80.9	7.7	0.1	0.7	0.0	3.7	0.0	0.0	-1.5
5947	424941.20	5409521.32	355.47	0	DEN	A	71.1	20.6	0.0	0.0	0.0	82.1	8.4	0.3	0.7	0.0	3.6	0.0	0.0	-3.4
6081	425790.31	5409416.47	324.40	0	DEN	A	71.1	16.2	0.0	0.0	0.0	80.5	7.5	0.1	0.7	0.0	3.8	0.0	0.0	-5.2
6154	425799.18	5409391.28	324.50	0	DEN	A	71.1	14.3	0.0	0.0	0.0	80.4	7.4	0.1	0.7	0.0	3.9	0.0	0.0	-7.2

Line Source, ISO 9613, Name: "EO Aggregate Pit Truck Route", ID: "EO_TR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5484	428105.04	5409564.14	373.36	0	DEN	A	69.4	26.5	0.0	0.0	0.0	79.6	5.1	0.6	0.8	0.0	3.3	0.0	0.0	6.5
5529	427735.51	5409493.45	379.10	0	DEN	A	69.4	25.1	0.0	0.0	0.0	79.2	4.9	0.5	0.9	0.0	0.0	0.0	0.0	9.0
5536	427179.61	5409478.46	394.62	0	DEN	A	69.4	24.8	0.0	0.0	0.0	79.1	4.9	0.5	0.9	0.0	0.0	0.0	0.0	8.9
5584	427452.74	5409495.59	390.75	0	DEN	A	69.4	23.9	0.0	0.0	0.0	79.1	4.9	0.5	0.9	0.0	0.0	0.0	0.0	7.8
5607	426038.92	5409390.64	335.11	0	DEN	A	69.4	24.3	0.0	0.0	0.0	80.0	5.3	0.6	0.6	0.0	12.5	0.0	0.0	-5.3
5642	426932.32	5409512.59	385.21	0	DEN	A	69.4	23.3	0.0	0.0	0.0	79.3	5.0	0.5	0.8	0.0	3.4	0.0	0.0	3.6
5645	426435.00	5409603.38	373.36	0	DEN	A	69.4	23.9	0.0	0.0	0.0	80.1	5.3	0.6	0.7	0.0	0.0	0.0	0.0	6.7

Line Source, ISO 9613, Name: "EO Aggregate Pit Truck Route", ID: "EO_TR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5699	425792.43	5409363.59	326.46	0	DEN	A	69.4	23.7	0.0	0.0	0.0	80.3	5.4	0.6	0.5	0.0	7.3	0.0	0.0	-1.0
5731	424859.74	5409603.46	356.03	0	DEN	A	69.4	24.9	0.0	0.0	0.0	82.4	6.3	0.6	0.6	0.0	3.2	0.0	0.0	1.1
5768	426642.31	5409616.20	380.50	0	DEN	A	69.4	22.4	0.0	0.0	0.0	79.9	5.2	0.6	0.7	0.0	3.3	0.0	0.0	2.1
5774	425585.85	5409327.03	337.73	0	DEN	A	69.4	22.8	0.0	0.0	0.0	80.6	5.5	0.6	0.4	0.0	10.4	0.0	0.0	-5.4
5786	423199.78	5411875.06	359.16	0	DEN	A	69.4	29.0	0.0	0.0	0.0	87.3	9.1	0.4	0.0	0.0	3.1	0.0	0.0	-1.5
5796	424426.43	5410109.22	356.23	0	DEN	A	69.4	25.4	0.0	0.0	0.0	83.8	7.0	0.6	0.6	0.0	0.0	0.0	0.0	2.8
5822	423948.39	5410776.29	359.04	0	DEN	A	69.4	26.6	0.0	0.0	0.0	85.3	7.9	0.6	0.5	0.0	3.1	0.0	0.0	-1.4
5860	426797.33	5409607.09	381.33	0	DEN	A	69.4	21.0	0.0	0.0	0.0	79.7	5.1	0.6	0.7	0.0	3.3	0.0	0.0	0.9
5879	425309.13	5409338.51	356.04	0	DEN	A	69.4	22.0	0.0	0.0	0.0	81.1	5.7	0.6	0.7	0.0	3.3	0.0	0.0	-0.0
5908	423662.25	5411616.62	357.86	0	DEN	A	69.4	27.0	0.0	0.0	0.0	86.6	8.6	0.5	0.0	0.0	3.1	0.0	0.0	-2.4
5935	425035.40	5409445.48	355.03	0	DEN	A	69.4	22.1	0.0	0.0	0.0	81.8	6.0	0.6	0.7	0.0	3.3	0.0	0.0	-0.8
5941	424113.03	5410432.85	359.04	0	DEN	A	69.4	24.8	0.0	0.0	0.0	84.7	7.5	0.6	0.6	0.0	0.0	0.0	0.0	0.9
5959	422538.38	5412043.38	361.30	0	DEN	A	69.4	27.8	0.0	0.0	0.0	88.0	9.6	0.3	0.0	0.0	3.2	0.0	0.0	-3.8
5970	425166.31	5409373.36	355.50	0	DEN	A	69.4	21.4	0.0	0.0	0.0	81.4	5.9	0.6	0.7	0.0	3.3	0.0	0.0	-1.1
5988	426199.13	5409423.64	349.76	0	DEN	A	69.4	19.5	0.0	0.0	0.0	79.8	5.2	0.6	0.8	0.0	4.2	0.0	0.0	-1.7
5996	424701.04	5409782.55	355.50	0	DEN	A	69.4	22.3	0.0	0.0	0.0	82.9	6.6	0.6	0.6	0.0	3.2	0.0	0.0	-2.3
6000	425439.62	5409323.21	351.51	0	DEN	A	69.4	20.3	0.0	0.0	0.0	80.9	5.6	0.6	0.7	0.0	3.3	0.0	0.0	-1.4
6016	424604.21	5409922.56	355.23	0	DEN	A	69.4	22.3	0.0	0.0	0.0	83.3	6.8	0.6	0.6	0.0	3.2	0.0	0.0	-2.8
6025	426236.11	5409496.00	356.95	0	DEN	A	69.4	18.9	0.0	0.0	0.0	80.0	5.3	0.6	0.7	0.0	3.3	0.0	0.0	-1.5
6054	423814.06	5411112.67	358.10	0	DEN	A	69.4	24.3	0.0	0.0	0.0	85.8	8.2	0.6	0.0	0.0	3.1	0.0	0.0	-4.1
6100	422167.72	5412339.23	363.20	0	DEN	A	69.4	25.6	0.0	0.0	0.0	88.6	10.0	0.2	0.0	0.0	3.2	0.0	0.0	-7.0
6102	426261.40	5409555.40	360.35	0	DEN	A	69.4	17.3	0.0	0.0	0.0	80.1	5.3	0.6	0.7	0.0	3.3	0.0	0.0	-3.4
6108	421879.42	5412552.90	365.12	0	DEN	A	69.4	25.9	0.0	0.0	0.0	89.0	10.2	0.2	0.0	0.0	3.2	0.0	0.0	-7.3
6112	424241.91	5410262.81	357.50	0	DEN	A	69.4	21.2	0.0	0.0	0.0	84.3	7.3	0.6	0.6	0.0	0.0	0.0	0.0	-2.1
6118	426294.34	5409594.72	364.62	0	DEN	A	69.4	17.0	0.0	0.0	0.0	80.2	5.3	0.6	0.5	0.0	7.1	0.0	0.0	-7.3
6152	426742.17	5409646.73	382.09	0	DEN	A	69.4	15.5	0.0	0.0	0.0	79.9	5.2	0.6	0.7	0.0	3.3	0.0	0.0	-4.8
6158	423747.65	5411306.00	357.60	0	DEN	A	69.4	21.5	0.0	0.0	0.0	86.1	8.4	0.5	0.0	0.0	3.1	0.0	0.0	-7.2

Line Source, ISO 9613, Name: "Truck Route-NPAG (Empty Truck)", ID: "TRE_NPAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5564	423589.38	5410424.95	357.09	0	DEN	A	71.4	28.0	0.0	0.0	0.0	85.3	8.1	-0.2	0.3	0.0	3.5	0.0	0.0	2.4
5581	424862.12	5409602.31	356.00	0	DEN	A	71.4	24.9	0.0	0.0	0.0	82.4	6.6	-0.2	0.5	0.0	3.6	0.0	0.0	3.4
5592	425632.16	5409578.97	272.50	0	DEN	A	71.4	23.6	0.0	0.0	0.0	81.1	6.1	-0.2	0.3	0.0	6.5	0.0	0.0	1.2
5600	424652.84	5409852.46	356.25	0	DEN	A	71.4	25.4	0.0	0.0	0.0	83.1	7.0	-0.2	0.5	0.0	0.0	0.0	0.0	6.3
5608	425556.47	5409447.71	294.40	0	DEN	A	71.4	23.2	0.0	0.0	0.0	80.9	6.0	-0.2	0.2	0.0	12.4	0.0	0.0	-4.8
5640	425590.88	5409327.62	337.15	0	DEN	A	71.4	22.6	0.0	0.0	0.0	80.6	5.8	-0.2	0.2	0.0	10.5	0.0	0.0	-3.0
5652	423851.43	5410040.49	357.26	0	DEN	A	71.4	26.3	0.0	0.0	0.0	84.5	7.7	-0.2	0.1	0.0	11.0	0.0	0.0	-5.5
5712	424210.84	5409812.70	355.71	0	DEN	A	71.4	25.0	0.0	0.0	0.0	83.7	7.3	-0.2	0.4	0.0	3.5	0.0	0.0	1.7
5718	425310.42	5409335.82	355.91	0	DEN	A	71.4	22.1	0.0	0.0	0.0	81.1	6.1	-0.2	0.5	0.0	3.6	0.0	0.0	2.3
5764	425039.36	5409442.94	355.00	0	DEN	A	71.4	22.2	0.0	0.0	0.0	81.8	6.4	-0.2	0.5	0.0	3.6	0.0	0.0	1.5
5773	425736.90	5409358.02	326.06	0	DEN	A	71.4	20.7	0.0	0.0	0.0	80.4	5.8	-0.2	0.3	0.0	8.2	0.0	0.0	-2.3
5782	425715.39	5409425.73	319.04	0	DEN	A	71.4	20.8	0.0	0.0	0.0	80.6	5.9	-0.2	0.5	0.0	3.8	0.0	0.0	1.5
5784	423963.84	5409775.37	360.36	0	DEN	A	71.4	24.0	0.0	0.0	0.0	84.0	7.4	-0.2	0.4	0.0	3.5	0.0	0.0	0.2
5788	424448.71	5409947.88	354.25	0	DEN	A	71.4	23.6	0.0	0.0	0.0	83.5	7.2	-0.2	0.4	0.0	3.5	0.0	0.0	0.5
5806	425168.16	5409370.27	355.50	0	DEN	A	71.4	21.3	0.0	0.0	0.0	81.4	6.2	-0.2	0.5	0.0	3.6	0.0	0.0	1.0
5825	425444.91	5409321.30	351.00	0	DEN	A	71.4	20.4	0.0	0.0	0.0	80.8	6.0	-0.2	0.5	0.0	3.6	0.0	0.0	1.0
5972	425395.34	5409583.21	272.50	0	DEN	A	71.4	19.5	0.0	0.0	0.0	81.5	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-2.1
5991	425422.22	5409491.23	273.76	0	DEN	A	71.4	18.9	0.0	0.0	0.0	81.2	6.1	-0.2	0.2	0.0	16.2	0.0	0.0	-13.4
5994	425478.06	5409587.36	272.50	0	DEN	A	71.4	18.9	0.0	0.0	0.0	81.4	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-2.6
6076	425790.28	5409416.53	324.40	0	DEN	A	71.4	16.2	0.0	0.0	0.0	80.5	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	-2.7
6077	425369.34	5409525.41	272.50	0	DEN	A	71.4	17.0	0.0	0.0	0.0	81.4	6.2	-0.2	0.2	0.0	12.1	0.0	0.0	-11.3
6146	425799.09	5409391.23	324.50	0	DEN	A	71.4	14.3	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.8	0.0	0.0	-4.6
6159	425351.11	5409558.34	272.50	0	DEN	A	71.4	15.0	0.0	0.0	0.0	81.5	6.2	-0.2	0.3	0.0	8.0	0.0	0.0	-9.5

Line Source, ISO 9613, Name: "Motor Grader Route Open Pit to Mill", ID: "MGR_OPMill"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5518	426040.12	5409390.47	335.25	0	DEN	A	71.1	24.2	0.0	0.0	0.0	80.0	7.2	0.1	0.7	0.0	14.5	0.0	0.0	-7.2
5612	425632.28	5409578.86	272.50	0	DEN	A	71.1	23.6	0.0	0.0	0.0	81.1	7.8	0.2	0.6	0.0	7.6	0.0	0.0	-2.4
5614	426345.87	5409644.29	366.78	0	DEN	A	71.1	22.9	0.0	0.0	0.0	80.3	7.4	0.1	0.7	0.0	3.8	0.0	0.0	1.7
5632	426538.83	5409923.32	385.70	0	DEN	A	71.1	23.3	0.0	0.0	0.0	80.8	7.7	0.1	0.8	0.0	0.0	0.0	0.0	4.9
5635	425561.17	5409447.20	295.36	0	DEN	A	71.1	23.2	0.0	0.0	0.0	80.9	7.7	0.2	0.4	0.0	14.2	0.0	0.0	-9.1

Line Source, ISO 9613, Name: "Motor Grader Route Open Pit to Mill", ID: "MGR_OPMill"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5736	425842.66	5409411.08	324.85	0	DEN	A	71.1	21.3	0.0	0.0	0.0	80.4	7.4	0.1	0.7	0.0	3.8	0.0	0.0	0.0
5749	426451.31	5409770.81	376.37	0	DEN	A	71.1	21.4	0.0	0.0	0.0	80.5	7.5	0.1	0.8	0.0	0.0	0.0	0.0	3.6
5809	425718.94	5409425.59	319.45	0	DEN	A	71.1	20.7	0.0	0.0	0.0	80.6	7.5	0.1	0.7	0.0	4.0	0.0	0.0	-1.1
5862	426198.86	5409424.30	349.80	0	DEN	A	71.1	19.5	0.0	0.0	0.0	79.9	7.1	0.0	0.9	0.0	4.9	0.0	0.0	-2.1
5912	426616.94	5410059.66	390.65	0	DEN	A	71.1	20.0	0.0	0.0	0.0	81.1	7.8	0.2	0.7	0.0	3.7	0.0	0.0	-2.4
5919	426236.26	5409496.49	356.92	0	DEN	A	71.1	18.8	0.0	0.0	0.0	80.0	7.2	0.1	0.8	0.0	3.8	0.0	0.0	-1.9
5979	425395.38	5409583.21	272.50	0	DEN	A	71.1	19.5	0.0	0.0	0.0	81.5	8.0	0.2	0.6	0.0	5.7	0.0	0.0	-5.4
5983	426703.70	5410166.27	393.25	0	DEN	A	71.1	19.4	0.0	0.0	0.0	81.4	8.0	0.2	0.7	0.0	3.7	0.0	0.0	-3.5
5987	425424.53	5409489.89	274.41	0	DEN	A	71.1	19.1	0.0	0.0	0.0	81.2	7.9	0.2	0.4	0.0	18.3	0.0	0.0	-17.8
6009	425478.21	5409587.42	272.50	0	DEN	A	71.1	18.9	0.0	0.0	0.0	81.4	7.9	0.2	0.6	0.0	5.7	0.0	0.0	-5.8
6048	426261.44	5409555.18	360.19	0	DEN	A	71.1	17.2	0.0	0.0	0.0	80.1	7.3	0.1	0.8	0.0	3.8	0.0	0.0	-3.7
6089	425369.19	5409524.43	272.50	0	DEN	A	71.1	17.1	0.0	0.0	0.0	81.4	8.0	0.2	0.4	0.0	14.1	0.0	0.0	-15.9
6110	426655.98	5410121.94	389.96	0	DEN	A	71.1	16.6	0.0	0.0	0.0	81.3	7.9	0.2	0.7	0.0	3.7	0.0	0.0	-6.1
6162	425351.20	5409558.11	272.50	0	DEN	A	71.1	15.0	0.0	0.0	0.0	81.5	8.0	0.2	0.5	0.0	9.3	0.0	0.0	-13.5

Line Source, ISO 9613, Name: "Truck Route-Overburden (Empty Truck)", ID: "TRE_OB"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5525	424847.12	5410617.13	365.01	0	D	A	71.0	28.4	0.0	0.0	0.0	84.1	7.5	-0.2	0.4	0.0	0.0	0.0	0.0	7.7
5525	424847.12	5410617.13	365.01	0	N	A	71.0	28.4	0.0	0.0	0.0	84.1	7.5	-0.2	0.4	0.0	0.0	0.0	0.0	7.7
5525	424847.12	5410617.13	365.01	0	E	A	71.0	28.4	0.0	0.0	0.0	84.1	7.5	-0.2	0.4	0.0	0.0	0.0	0.0	7.7
5615	425631.51	5409579.05	272.50	0	D	A	71.0	23.7	0.0	0.0	0.0	81.1	6.1	-0.2	0.3	0.0	6.5	0.0	0.0	0.9
5615	425631.51	5409579.05	272.50	0	N	A	71.0	23.7	0.0	0.0	0.0	81.1	6.1	-0.2	0.3	0.0	6.5	0.0	0.0	0.9
5615	425631.51	5409579.05	272.50	0	E	A	71.0	23.7	0.0	0.0	0.0	81.1	6.1	-0.2	0.3	0.0	6.5	0.0	0.0	0.9
5637	425555.68	5409447.77	294.14	0	D	A	71.0	23.3	0.0	0.0	0.0	80.9	6.0	-0.2	0.2	0.0	12.5	0.0	0.0	-5.1
5637	425555.68	5409447.77	294.14	0	N	A	71.0	23.3	0.0	0.0	0.0	80.9	6.0	-0.2	0.2	0.0	12.5	0.0	0.0	-5.1
5637	425555.68	5409447.77	294.14	0	E	A	71.0	23.3	0.0	0.0	0.0	80.9	6.0	-0.2	0.2	0.0	12.5	0.0	0.0	-5.1
5665	425590.26	5409327.63	337.22	0	D	A	71.0	22.7	0.0	0.0	0.0	80.6	5.8	-0.2	0.2	0.0	10.4	0.0	0.0	-3.2
5665	425590.26	5409327.63	337.22	0	N	A	71.0	22.7	0.0	0.0	0.0	80.6	5.8	-0.2	0.2	0.0	10.4	0.0	0.0	-3.2
5665	425590.26	5409327.63	337.22	0	E	A	71.0	22.7	0.0	0.0	0.0	80.6	5.8	-0.2	0.2	0.0	10.4	0.0	0.0	-3.2
5692	424426.85	5410109.31	356.24	0	D	A	71.0	25.4	0.0	0.0	0.0	83.8	7.3	-0.2	0.4	0.0	0.0	0.0	0.0	5.1
5692	424426.85	5410109.31	356.24	0	N	A	71.0	25.4	0.0	0.0	0.0	83.8	7.3	-0.2	0.4	0.0	0.0	0.0	0.0	5.1
5692	424426.85	5410109.31	356.24	0	E	A	71.0	25.4	0.0	0.0	0.0	83.8	7.3	-0.2	0.4	0.0	0.0	0.0	0.0	5.1
5732	424411.86	5410356.31	359.55	0	D	A	71.0	25.4	0.0	0.0	0.0	84.2	7.5	-0.2	0.4	0.0	3.5	0.0	0.0	1.1
5732	424411.86	5410356.31	359.55	0	N	A	71.0	25.4	0.0	0.0	0.0	84.2	7.5	-0.2	0.4	0.0	3.5	0.0	0.0	1.1
5732	424411.86	5410356.31	359.55	0	E	A	71.0	25.4	0.0	0.0	0.0	84.2	7.5	-0.2	0.4	0.0	3.5	0.0	0.0	1.1
5755	425307.41	5409338.58	355.98	0	D	A	71.0	22.0	0.0	0.0	0.0	81.1	6.1	-0.2	0.5	0.0	3.6	0.0	0.0	1.9
5755	425307.41	5409338.58	355.98	0	N	A	71.0	22.0	0.0	0.0	0.0	81.1	6.1	-0.2	0.5	0.0	3.6	0.0	0.0	1.9
5755	425307.41	5409338.58	355.98	0	E	A	71.0	22.0	0.0	0.0	0.0	81.1	6.1	-0.2	0.5	0.0	3.6	0.0	0.0	1.9
5762	424825.15	5409635.14	356.44	0	D	A	71.0	23.2	0.0	0.0	0.0	82.5	6.7	-0.2	0.5	0.0	0.0	0.0	0.0	4.7
5762	424825.15	5409635.14	356.44	0	N	A	71.0	23.2	0.0	0.0	0.0	82.5	6.7	-0.2	0.5	0.0	0.0	0.0	0.0	4.7
5762	424825.15	5409635.14	356.44	0	E	A	71.0	23.2	0.0	0.0	0.0	82.5	6.7	-0.2	0.5	0.0	0.0	0.0	0.0	4.7
5767	424625.17	5409892.14	355.24	0	D	A	71.0	23.9	0.0	0.0	0.0	83.2	7.0	-0.2	0.4	0.0	3.5	0.0	0.0	0.9
5767	424625.17	5409892.14	355.24	0	N	A	71.0	23.9	0.0	0.0	0.0	83.2	7.0	-0.2	0.4	0.0	3.5	0.0	0.0	0.9
5767	424625.17	5409892.14	355.24	0	E	A	71.0	23.9	0.0	0.0	0.0	83.2	7.0	-0.2	0.4	0.0	3.5	0.0	0.0	0.9
5794	425736.91	5409358.26	326.07	0	D	A	71.0	20.7	0.0	0.0	0.0	80.4	5.8	-0.2	0.3	0.0	8.1	0.0	0.0	-2.6
5794	425736.91	5409358.26	326.07	0	N	A	71.0	20.7	0.0	0.0	0.0	80.4	5.8	-0.2	0.3	0.0	8.1	0.0	0.0	-2.6
5794	425736.91	5409358.26	326.07	0	E	A	71.0	20.7	0.0	0.0	0.0	80.4	5.8	-0.2	0.3	0.0	8.1	0.0	0.0	-2.6
5813	425715.66	5409425.93	319.06	0	D	A	71.0	20.7	0.0	0.0	0.0	80.6	5.9	-0.2	0.5	0.0	3.8	0.0	0.0	1.2
5813	425715.66	5409425.93	319.06	0	N	A	71.0	20.7	0.0	0.0	0.0	80.6	5.9	-0.2	0.5	0.0	3.8	0.0	0.0	1.2
5813	425715.66	5409425.93	319.06	0	E	A	71.0	20.7	0.0	0.0	0.0	80.6	5.9	-0.2	0.5	0.0	3.8	0.0	0.0	1.2
5829	425046.70	5409438.38	354.50	0	D	A	71.0	21.6	0.0	0.0	0.0	81.8	6.4	-0.2	0.5	0.0	3.6	0.0	0.0	0.6
5829	425046.70	5409438.38	354.50	0	N	A	71.0	21.6	0.0	0.0	0.0	81.8	6.4	-0.2	0.5	0.0	3.6	0.0	0.0	0.6
5829	425046.70	5409438.38	354.50	0	E	A	71.0	21.6	0.0	0.0	0.0	81.8	6.4	-0.2	0.5	0.0	3.6	0.0	0.0	0.6
5838	425167.03	5409374.35	355.50	0	D	A	71.0	21.2	0.0	0.0	0.0	81.4	6.2	-0.2	0.5	0.0	3.6	0.0	0.0	0.6
5838	425167.03	5409374.35	355.50	0	N	A	71.0	21.2	0.0	0.0	0.0	81.4	6.2	-0.2	0.5	0.0	3.6	0.0	0.0	0.6
5838	425167.03	5409374.35	355.50	0	E	A	71.0	21.2	0.0	0.0	0.0	81.4	6.2	-0.2	0.5	0.0	3.6	0.0	0.0	0.6
5864	425442.63	5409322.08	351.13	0	D	A	71.0	20.5	0.0	0.0	0.0	80.8	6.0	-0.2	0.5	0.0	3.6	0.0	0.0	0.8
5864	425442.63	5409322.08	351.13	0	N	A	71.0	20.5	0.0	0.0	0.0	80.8	6.0	-0.2	0.5	0.0	3.6	0.0	0.0	0.8
5864	425442.63	5409322.08	351.13	0	E	A	71.0	20.5	0.0	0.0	0.0	80.8	6.0	-0.2	0.5	0.0	3.6	0.0	0.0	0.8
5936	424943.07	5409519.90	355.44	0	D	A	71.0	20.8	0.0	0.0	0.0	82.1	6.5	-0.2	0.5	0.0	3.6	0.0	0.0	-0.7
5936	424943.07	5409519.90	355.44	0	N	A	71.0	20.8	0.0	0.0	0.0	82.1	6.5	-0.2	0.5	0.0	3.6	0.0	0.0	-0.7
5936	424943.07	5409519.90	355.44	0	E	A	71.0	20.8	0.0	0.0	0.0	82.1	6.5	-0.2	0.5	0.0	3.6	0.0	0.0	-0.7

Line Source, ISO 9613, Name: "Truck Route-Overburden (Empty Truck)", ID: "TRE_OB"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5985	425394.30	5409583.13	272.50	0	D	A	71.0	19.5	0.0	0.0	0.0	81.5	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-2.5
5985	425394.30	5409583.13	272.50	0	N	A	71.0	19.5	0.0	0.0	0.0	81.5	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-2.5
5985	425394.30	5409583.13	272.50	0	E	A	71.0	19.5	0.0	0.0	0.0	81.5	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-2.5
6011	425476.38	5409587.61	272.50	0	D	A	71.0	18.9	0.0	0.0	0.0	81.4	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-2.9
6011	425476.38	5409587.61	272.50	0	N	A	71.0	18.9	0.0	0.0	0.0	81.4	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-2.9
6011	425476.38	5409587.61	272.50	0	E	A	71.0	18.9	0.0	0.0	0.0	81.4	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-2.9
6014	425420.93	5409490.49	273.48	0	D	A	71.0	18.7	0.0	0.0	0.0	81.2	6.1	-0.2	0.2	0.0	16.5	0.0	0.0	-14.1
6014	425420.93	5409490.49	273.48	0	N	A	71.0	18.7	0.0	0.0	0.0	81.2	6.1	-0.2	0.2	0.0	16.5	0.0	0.0	-14.1
6014	425420.93	5409490.49	273.48	0	E	A	71.0	18.7	0.0	0.0	0.0	81.2	6.1	-0.2	0.2	0.0	16.5	0.0	0.0	-14.1
6046	424722.88	5409750.81	355.50	0	D	A	71.0	20.0	0.0	0.0	0.0	82.8	6.9	-0.2	0.4	0.0	3.5	0.0	0.0	-2.5
6046	424722.88	5409750.81	355.50	0	N	A	71.0	20.0	0.0	0.0	0.0	82.8	6.9	-0.2	0.4	0.0	3.5	0.0	0.0	-2.5
6046	424722.88	5409750.81	355.50	0	E	A	71.0	20.0	0.0	0.0	0.0	82.8	6.9	-0.2	0.4	0.0	3.5	0.0	0.0	-2.5
6086	425790.23	5409416.55	324.40	0	D	A	71.0	16.2	0.0	0.0	0.0	80.5	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	-3.0
6086	425790.23	5409416.55	324.40	0	N	A	71.0	16.2	0.0	0.0	0.0	80.5	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	-3.0
6086	425790.23	5409416.55	324.40	0	E	A	71.0	16.2	0.0	0.0	0.0	80.5	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	-3.0
6090	425369.34	5409524.48	272.50	0	D	A	71.0	17.0	0.0	0.0	0.0	81.4	6.2	-0.2	0.2	0.0	12.2	0.0	0.0	-11.8
6090	425369.34	5409524.48	272.50	0	N	A	71.0	17.0	0.0	0.0	0.0	81.4	6.2	-0.2	0.2	0.0	12.2	0.0	0.0	-11.8
6090	425369.34	5409524.48	272.50	0	E	A	71.0	17.0	0.0	0.0	0.0	81.4	6.2	-0.2	0.2	0.0	12.2	0.0	0.0	-11.8
6157	425799.05	5409391.27	324.50	0	D	A	71.0	14.3	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.8	0.0	0.0	-4.9
6157	425799.05	5409391.27	324.50	0	N	A	71.0	14.3	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.8	0.0	0.0	-4.9
6157	425799.05	5409391.27	324.50	0	E	A	71.0	14.3	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.8	0.0	0.0	-4.9
6163	425350.90	5409558.06	272.50	0	D	A	71.0	15.0	0.0	0.0	0.0	81.5	6.2	-0.2	0.3	0.0	8.0	0.0	0.0	-9.8
6163	425350.90	5409558.06	272.50	0	N	A	71.0	15.0	0.0	0.0	0.0	81.5	6.2	-0.2	0.3	0.0	8.0	0.0	0.0	-9.8
6163	425350.90	5409558.06	272.50	0	E	A	71.0	15.0	0.0	0.0	0.0	81.5	6.2	-0.2	0.3	0.0	8.0	0.0	0.0	-9.8

Line Source, ISO 9613, Name: "OC3 Aggregate Pit Truck Route", ID: "OC3_TR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5638	428074.24	5409670.23	374.16	0	DEN	A	66.4	26.7	0.0	0.0	0.0	79.9	5.2	0.6	0.7	0.0	6.1	0.0	0.0	0.6
5714	428414.53	5409951.17	375.07	0	DEN	A	66.4	26.6	0.0	0.0	0.0	81.0	5.7	0.6	0.7	0.0	0.0	0.0	0.0	5.0
6167	428555.99	5410180.09	376.07	0	DEN	A	66.4	19.4	0.0	0.0	0.0	81.7	6.0	0.6	0.7	0.0	3.3	0.0	0.0	-6.4

Line Source, ISO 9613, Name: "Water Truck Route Stockpile", ID: "WTR_SP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5451	427525.13	5409591.57	387.26	0	DEN	A	71.9	25.7	0.0	0.0	0.0	79.4	8.9	-0.4	0.9	0.0	15.7	0.0	0.0	-6.9
5506	426435.67	5409603.46	373.34	0	DEN	A	71.9	23.9	0.0	0.0	0.0	80.1	9.4	-0.3	0.9	0.0	0.0	0.0	0.0	5.8
5569	426643.41	5409615.78	380.58	0	DEN	A	71.9	22.4	0.0	0.0	0.0	79.9	9.2	-0.3	0.9	0.0	4.1	0.0	0.0	0.6
5583	426799.68	5409678.92	385.50	0	DEN	A	71.9	22.2	0.0	0.0	0.0	80.0	9.3	-0.3	0.9	0.0	4.1	0.0	0.0	0.3
5639	427068.74	5409750.73	394.26	0	DEN	A	71.9	21.6	0.0	0.0	0.0	80.0	9.3	-0.3	0.9	0.0	0.0	0.0	0.0	3.6
5687	426936.24	5409723.09	390.54	0	DEN	A	71.9	21.1	0.0	0.0	0.0	80.0	9.3	-0.3	0.9	0.0	0.0	0.0	0.0	3.1
5734	427267.00	5409718.30	394.50	0	DEN	A	71.9	20.0	0.0	0.0	0.0	79.9	9.2	-0.3	0.9	0.0	4.5	0.0	0.0	-2.2
5834	427176.72	5409781.97	393.22	0	DEN	A	71.9	19.1	0.0	0.0	0.0	80.1	9.4	-0.3	0.9	0.0	4.1	0.0	0.0	-3.1
6045	427324.32	5409616.81	399.02	0	DEN	A	71.9	15.9	0.0	0.0	0.0	79.5	9.0	-0.4	1.0	0.0	4.1	0.0	0.0	-5.4
6087	427299.54	5409638.56	398.79	0	DEN	A	71.9	14.5	0.0	0.0	0.0	79.6	9.0	-0.4	0.9	0.0	0.0	0.0	0.0	-2.8
6091	427231.00	5409784.30	390.50	0	DEN	A	71.9	14.8	0.0	0.0	0.0	80.1	9.4	-0.3	0.9	0.0	4.1	0.0	0.0	-7.4
6133	427285.54	5409659.63	398.79	0	DEN	A	71.9	13.6	0.0	0.0	0.0	79.7	9.1	-0.4	0.9	0.0	0.0	0.0	0.0	-3.8
6172	427249.55	5409773.60	390.50	0	DEN	A	71.9	12.0	0.0	0.0	0.0	80.0	9.3	-0.3	0.9	0.0	4.1	0.0	0.0	-10.1

Line Source, ISO 9613, Name: "Motor Grader Route Stockpile", ID: "MGR_SP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5475	427525.13	5409591.57	387.26	0	DEN	A	71.1	25.7	0.0	0.0	0.0	79.4	6.9	0.0	0.7	0.0	13.9	0.0	0.0	-4.1
5539	426435.67	5409603.46	373.34	0	DEN	A	71.1	23.9	0.0	0.0	0.0	80.1	7.2	0.1	0.8	0.0	0.0	0.0	0.0	6.9
5636	426643.41	5409615.78	380.58	0	DEN	A	71.1	22.4	0.0	0.0	0.0	79.9	7.2	0.0	0.8	0.0	3.8	0.0	0.0	1.9
5643	426799.68	5409678.92	385.50	0	DEN	A	71.1	22.2	0.0	0.0	0.0	80.0	7.2	0.1	0.8	0.0	3.8	0.0	0.0	1.6
5706	427068.88	5409751.09	394.16	0	DEN	A	71.1	21.7	0.0	0.0	0.0	80.0	7.2	0.1	0.8	0.0	3.8	0.0	0.0	0.9
5739	426936.03	5409722.77	390.52	0	DEN	A	71.1	21.1	0.0	0.0	0.0	80.0	7.2	0.1	0.8	0.0	0.0	0.0	0.0	4.1
5792	427267.00	5409718.30	394.50	0	DEN	A	71.1	20.0	0.0	0.0	0.0	79.9	7.1	0.0	0.7	0.0	4.1	0.0	0.0	-0.8
5915	427177.06	5409782.65	393.14	0	DEN	A	71.1	19.0	0.0	0.0	0.0	80.1	7.3	0.1	0.8	0.0	3.8	0.0	0.0	-1.8
6066	427324.32	5409616.81	399.02	0	DEN	A	71.1	15.9	0.0	0.0	0.0	79.5	7.0	0.0	0.9	0.0	3.8	0.0	0.0	-4.2
6129	427299.54	5409638.56	398.79	0	DEN	A	71.1	14.5	0.0	0.0	0.0	79.6	7.0	0.0	0.8	0.0	0.0	0.0	0.0	-1.9
6137	427231.00	5409784.30	390.50	0	DEN	A	71.1	14.8	0.0	0.0	0.0	80.1	7.3	0.1	0.8	0.0	3.8	0.0	0.0	-6.1

Line Source, ISO 9613, Name: "Motor Grader Route Stockpile", ID: "MGR_SP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
6151	427285.54	5409659.63	398.79	0	DEN	A	71.1	13.6	0.0	0.0	0.0	79.7	7.0	0.0	0.8	0.0	0.0	0.0	0.0	-2.9
6185	427249.55	5409773.60	390.50	0	DEN	A	71.1	12.0	0.0	0.0	0.0	80.0	7.2	0.1	0.8	0.0	3.8	0.0	0.0	-8.8

Line Source, ISO 9613, Name: "Truck Route Open Pit to Mill (Empty Truck)", ID: "TRE_OPMill"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5703	426039.27	5409390.58	335.15	0	DEN	A	68.3	24.3	0.0	0.0	0.0	80.0	5.6	-0.2	0.6	0.0	12.3	0.0	0.0	-5.7
5817	425631.53	5409578.99	272.50	0	DEN	A	68.3	23.7	0.0	0.0	0.0	81.1	6.1	-0.2	0.3	0.0	6.5	0.0	0.0	-1.8
5826	426345.87	5409644.29	366.78	0	DEN	A	68.3	22.9	0.0	0.0	0.0	80.3	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	1.2
5832	426538.83	5409923.32	385.70	0	DEN	A	68.3	23.3	0.0	0.0	0.0	80.8	6.0	-0.2	0.6	0.0	0.0	0.0	0.0	4.5
5836	425559.43	5409446.22	295.04	0	DEN	A	68.3	23.3	0.0	0.0	0.0	80.9	6.0	-0.2	0.2	0.0	12.5	0.0	0.0	-7.8
5974	425841.43	5409411.18	324.75	0	DEN	A	68.3	21.3	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	-0.5
5976	426451.31	5409770.81	376.37	0	DEN	A	68.3	21.4	0.0	0.0	0.0	80.5	5.8	-0.2	0.6	0.0	0.0	0.0	0.0	3.0
6018	425718.41	5409424.81	319.50	0	DEN	A	68.3	20.7	0.0	0.0	0.0	80.6	5.9	-0.2	0.5	0.0	3.8	0.0	0.0	-1.5
6052	426198.89	5409424.31	349.80	0	DEN	A	68.3	19.5	0.0	0.0	0.0	79.9	5.5	-0.2	0.7	0.0	4.5	0.0	0.0	-2.5
6071	426616.94	5410059.66	390.65	0	DEN	A	68.3	20.0	0.0	0.0	0.0	81.1	6.1	-0.2	0.5	0.0	3.6	0.0	0.0	-2.8
6075	426236.26	5409496.49	356.92	0	DEN	A	68.3	18.8	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	-2.4
6113	425396.33	5409583.55	272.50	0	DEN	A	68.3	19.5	0.0	0.0	0.0	81.5	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-5.2
6115	426703.70	5410166.27	393.25	0	DEN	A	68.3	19.4	0.0	0.0	0.0	81.4	6.2	-0.2	0.5	0.0	3.6	0.0	0.0	-3.8
6119	425422.84	5409489.28	274.04	0	DEN	A	68.3	19.0	0.0	0.0	0.0	81.2	6.1	-0.2	0.2	0.0	16.5	0.0	0.0	-16.6
6134	425477.27	5409587.88	272.50	0	DEN	A	68.3	18.8	0.0	0.0	0.0	81.4	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-5.7
6141	426261.44	5409555.18	360.19	0	DEN	A	68.3	17.2	0.0	0.0	0.0	80.1	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	-4.2
6168	425368.73	5409523.74	272.50	0	DEN	A	68.3	17.1	0.0	0.0	0.0	81.4	6.2	-0.2	0.2	0.0	12.4	0.0	0.0	-14.6
6174	426655.98	5410121.94	389.96	0	DEN	A	68.3	16.6	0.0	0.0	0.0	81.3	6.2	-0.2	0.5	0.0	3.6	0.0	0.0	-6.4
6188	425351.54	5409557.98	272.50	0	DEN	A	68.3	15.1	0.0	0.0	0.0	81.5	6.2	-0.2	0.3	0.0	8.0	0.0	0.0	-12.3

Line Source, ISO 9613, Name: "Truck Route Stockpile (Empty Truck)", ID: "TRE_SP"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5604	427524.15	5409592.10	387.98	0	DEN	A	67.7	25.7	0.0	0.0	0.0	79.4	5.4	-0.2	0.6	0.0	9.5	0.0	0.0	-1.4
5748	426038.59	5409390.36	335.07	0	DEN	A	67.7	24.3	0.0	0.0	0.0	80.0	5.6	-0.2	0.6	0.0	12.5	0.0	0.0	-6.6
5780	426432.91	5409603.33	373.37	0	DEN	A	67.7	23.8	0.0	0.0	0.0	80.1	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	5.4
5878	425631.13	5409578.50	272.50	0	DEN	A	67.7	23.7	0.0	0.0	0.0	81.1	6.1	-0.2	0.3	0.0	6.5	0.0	0.0	-2.5
5897	425555.66	5409447.88	294.17	0	DEN	A	67.7	23.3	0.0	0.0	0.0	80.9	6.0	-0.2	0.2	0.0	12.4	0.0	0.0	-8.4
5900	426638.34	5409616.36	380.50	0	DEN	A	67.7	22.4	0.0	0.0	0.0	79.9	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	0.6
5916	426796.68	5409678.62	385.50	0	DEN	A	67.7	22.3	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	0.4
5977	427069.33	5409751.17	394.11	0	DEN	A	67.7	21.7	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	-0.3
6007	426935.43	5409722.42	390.52	0	DEN	A	67.7	21.1	0.0	0.0	0.0	80.0	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	2.8
6010	425840.18	5409410.87	324.63	0	DEN	A	67.7	21.3	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	-1.2
6055	427267.01	5409719.16	394.50	0	DEN	A	67.7	20.0	0.0	0.0	0.0	79.9	5.5	-0.2	0.5	0.0	3.8	0.0	0.0	-1.9
6057	425715.96	5409425.31	319.13	0	DEN	A	67.7	20.8	0.0	0.0	0.0	80.6	5.9	-0.2	0.5	0.0	3.8	0.0	0.0	-2.1
6069	426199.24	5409424.15	349.80	0	DEN	A	67.7	19.5	0.0	0.0	0.0	79.9	5.5	-0.2	0.7	0.0	4.5	0.0	0.0	-3.2
6093	426236.18	5409496.59	357.03	0	DEN	A	67.7	18.9	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	-3.1
6095	427177.51	5409782.91	393.09	0	DEN	A	67.7	19.0	0.0	0.0	0.0	80.1	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	-3.0
6139	425395.14	5409583.20	272.50	0	DEN	A	67.7	19.5	0.0	0.0	0.0	81.5	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-5.8
6144	425420.26	5409490.94	273.50	0	DEN	A	67.7	18.8	0.0	0.0	0.0	81.2	6.1	-0.2	0.2	0.0	16.4	0.0	0.0	-17.3
6147	425476.61	5409587.11	272.50	0	DEN	A	67.7	18.8	0.0	0.0	0.0	81.4	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-6.4
6155	426261.76	5409556.01	360.53	0	DEN	A	67.7	17.4	0.0	0.0	0.0	80.1	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	-4.7
6166	426294.77	5409595.16	364.77	0	DEN	A	67.7	16.9	0.0	0.0	0.0	80.2	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	-5.3
6169	427324.82	5409616.26	399.04	0	DEN	A	67.7	15.9	0.0	0.0	0.0	79.5	5.4	-0.2	0.8	0.0	3.7	0.0	0.0	-5.6
6178	425368.17	5409525.22	272.50	0	DEN	A	67.7	17.1	0.0	0.0	0.0	81.4	6.2	-0.2	0.2	0.0	12.1	0.0	0.0	-15.0
6186	427298.96	5409639.05	398.83	0	DEN	A	67.7	14.9	0.0	0.0	0.0	79.6	5.4	-0.2	0.6	0.0	0.0	0.0	0.0	-2.9
6187	427231.03	5409784.83	390.50	0	DEN	A	67.7	14.7	0.0	0.0	0.0	80.1	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	-7.3
6190	427284.95	5409661.13	398.83	0	DEN	A	67.7	13.4	0.0	0.0	0.0	79.7	5.5	-0.2	0.6	0.0	0.0	0.0	0.0	-4.5
6191	425350.77	5409558.82	272.50	0	DEN	A	67.7	14.9	0.0	0.0	0.0	81.5	6.2	-0.2	0.3	0.0	7.9	0.0	0.0	-13.2
6192	427249.50	5409774.00	390.50	0	DEN	A	67.7	11.9	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	-10.0

Line Source, ISO 9613, Name: "Roen Aggregate Pit Truck Route", ID: "Roen_TR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5469	426388.49	5411303.58	371.91	0	DEN	A	66.4	29.3	0.0	0.0	0.0	84.0	7.2	0.6	0.6	0.0	3.2	0.0	0.0	0.2
5471	426377.10	5410443.70	369.96	0	DEN	A	66.4	29.3	0.0	0.0	0.0	82.3	6.3	0.6	0.6	0.0	3.2	0.0	0.0	2.7
5682	425300.41	5411772.54	364.93	0	DEN	A	66.4	28.5	0.0	0.0	0.0	85.4	8.0	0.6	0.5	0.0	3.1	0.0	0.0	-2.7

Line Source, ISO 9613, Name: "Roen Aggregate Pit Truck Route", ID: "Roen_TR"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5684	426013.16	5411765.80	370.47	0	DEN	A	66.4	28.5	0.0	0.0	0.0	85.0	7.7	0.6	0.6	0.0	3.1	0.0	0.0	-2.1
5841	426038.88	5409389.89	335.07	0	DEN	A	66.4	24.3	0.0	0.0	0.0	80.0	5.3	0.6	0.6	0.0	13.7	0.0	0.0	-9.4
5855	425255.37	5411510.42	364.70	0	DEN	A	66.4	29.0	0.0	0.0	0.0	85.1	7.7	0.6	0.6	0.0	3.1	0.0	0.0	-1.7
5938	425791.92	5409362.56	326.48	0	DEN	A	66.4	23.7	0.0	0.0	0.0	80.3	5.4	0.6	0.5	0.0	7.4	0.0	0.0	-4.1
5944	426318.77	5409769.11	366.24	0	DEN	A	66.4	23.7	0.0	0.0	0.0	80.6	5.5	0.6	0.7	0.0	3.3	0.0	0.0	-0.7
5998	424652.94	5409851.38	356.21	0	DEN	A	66.4	25.3	0.0	0.0	0.0	83.1	6.7	0.6	0.6	0.0	0.0	0.0	0.0	0.7
6021	423204.42	5411872.47	358.94	0	DEN	A	66.4	29.0	0.0	0.0	0.0	87.3	9.1	0.4	0.0	0.0	3.1	0.0	0.0	-4.5
6022	425590.51	5409325.83	337.31	0	DEN	A	66.4	22.5	0.0	0.0	0.0	80.6	5.5	0.6	0.4	0.0	11.5	0.0	0.0	-9.7
6034	422037.26	5411766.76	372.50	0	DEN	A	66.4	27.1	0.0	0.0	0.0	88.2	9.7	0.3	0.0	0.0	0.0	0.0	0.0	-4.7
6040	421568.11	5411565.39	372.50	0	DEN	A	66.4	27.1	0.0	0.0	0.0	88.5	9.9	0.3	0.0	0.0	0.0	0.0	0.0	-5.2
6044	424427.00	5410108.00	356.21	0	DEN	A	66.4	25.4	0.0	0.0	0.0	83.8	7.0	0.6	0.6	0.0	0.0	0.0	0.0	-0.2
6049	423948.30	5410773.96	359.08	0	DEN	A	66.4	26.6	0.0	0.0	0.0	85.3	7.9	0.6	0.5	0.0	3.1	0.0	0.0	-4.4
6063	423673.19	5411583.93	357.85	0	DEN	A	66.4	27.5	0.0	0.0	0.0	86.5	8.6	0.5	0.0	0.0	3.1	0.0	0.0	-4.9
6065	426322.13	5409945.21	365.98	0	DEN	A	66.4	22.3	0.0	0.0	0.0	81.1	5.7	0.6	0.7	0.0	3.3	0.0	0.0	-2.7
6067	425308.53	5409336.85	356.01	0	DEN	A	66.4	22.0	0.0	0.0	0.0	81.1	5.7	0.6	0.7	0.0	3.3	0.0	0.0	-3.0
6070	424900.13	5409562.69	356.00	0	DEN	A	66.4	23.0	0.0	0.0	0.0	82.2	6.3	0.6	0.6	0.0	3.2	0.0	0.0	-3.6
6078	425038.73	5409443.21	355.00	0	DEN	A	66.4	22.2	0.0	0.0	0.0	81.8	6.0	0.6	0.7	0.0	3.3	0.0	0.0	-3.7
6083	424113.98	5410428.24	359.08	0	DEN	A	66.4	24.9	0.0	0.0	0.0	84.7	7.5	0.6	0.6	0.0	0.0	0.0	0.0	-2.1
6116	425167.68	5409370.33	355.50	0	DEN	A	66.4	21.2	0.0	0.0	0.0	81.4	5.9	0.6	0.7	0.0	3.3	0.0	0.0	-4.3
6117	425444.83	5409322.13	351.01	0	DEN	A	66.4	20.6	0.0	0.0	0.0	80.8	5.6	0.6	0.7	0.0	3.3	0.0	0.0	-4.0
6121	423801.02	5411149.17	358.00	0	DEN	A	66.4	25.4	0.0	0.0	0.0	85.9	8.2	0.6	0.0	0.0	3.1	0.0	0.0	-6.0
6122	426199.81	5409423.62	349.79	0	DEN	A	66.4	19.5	0.0	0.0	0.0	79.8	5.2	0.6	0.8	0.0	4.2	0.0	0.0	-4.7
6128	422539.50	5411878.60	366.10	0	DEN	A	66.4	27.3	0.0	0.0	0.0	87.8	9.5	0.4	0.0	0.0	3.2	0.0	0.0	-7.1
6130	425692.32	5411414.77	370.74	0	DEN	A	66.4	24.1	0.0	0.0	0.0	84.6	7.5	0.6	0.6	0.0	3.2	0.0	0.0	-5.9
6143	426236.92	5409496.84	356.99	0	DEN	A	66.4	18.9	0.0	0.0	0.0	80.0	5.3	0.6	0.7	0.0	3.3	0.0	0.0	-4.5
6160	426338.53	5409636.49	368.87	0	DEN	A	66.4	18.6	0.0	0.0	0.0	80.3	5.4	0.6	0.7	0.0	0.0	0.0	0.0	-1.9
6165	424789.26	5409672.09	356.50	0	DEN	A	66.4	20.5	0.0	0.0	0.0	82.6	6.4	0.6	0.6	0.0	0.0	0.0	0.0	-3.4
6176	426262.22	5409556.21	360.50	0	DEN	A	66.4	17.2	0.0	0.0	0.0	80.1	5.3	0.6	0.7	0.0	3.3	0.0	0.0	-6.4
6181	424243.35	5410259.78	357.50	0	DEN	A	66.4	21.1	0.0	0.0	0.0	84.3	7.3	0.6	0.6	0.0	0.0	0.0	0.0	-5.2
6183	426294.90	5409594.61	364.78	0	DEN	A	66.4	16.9	0.0	0.0	0.0	80.2	5.3	0.6	0.7	0.0	3.4	0.0	0.0	-6.9
6197	424908.35	5411724.09	360.59	0	DEN	A	66.4	16.8	0.0	0.0	0.0	85.7	8.1	0.6	0.5	0.0	3.1	0.0	0.0	-14.8
6201	424927.24	5411761.88	361.46	0	DEN	A	66.4	16.4	0.0	0.0	0.0	85.7	8.1	0.6	0.5	0.0	3.1	0.0	0.0	-15.2
6203	426379.05	5411757.85	373.26	0	DEN	A	66.4	13.2	0.0	0.0	0.0	84.8	7.6	0.6	0.6	0.0	3.2	0.0	0.0	-17.1
6208	426391.38	5411743.40	373.09	0	DEN	A	66.4	13.1	0.0	0.0	0.0	84.8	7.6	0.6	0.6	0.0	3.2	0.0	0.0	-17.2

Line Source, ISO 9613, Name: "Truck Route PAG (Loaded Truck)", ID: "TRL_PAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5150	427736.36	5409874.78	379.22	0	D	A	83.2	26.5	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.1	0.0	0.0	22.5
5150	427736.36	5409874.78	379.22	0	N	A	83.2	26.5	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.1	0.0	0.0	22.5
5150	427736.36	5409874.78	379.22	0	E	A	83.2	26.5	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.1	0.0	0.0	22.5
5180	426038.55	5409390.92	335.07	0	D	A	83.2	24.3	0.0	0.0	0.0	80.0	2.4	2.1	0.6	0.0	9.4	0.0	0.0	13.1
5180	426038.55	5409390.92	335.07	0	N	A	83.2	24.3	0.0	0.0	0.0	80.0	2.4	2.1	0.6	0.0	9.4	0.0	0.0	13.1
5180	426038.55	5409390.92	335.07	0	E	A	83.2	24.3	0.0	0.0	0.0	80.0	2.4	2.1	0.6	0.0	9.4	0.0	0.0	13.1
5184	426432.69	5409603.26	373.27	0	D	A	83.2	23.9	0.0	0.0	0.0	80.1	2.4	2.1	0.3	0.0	0.0	0.0	0.0	22.2
5184	426432.69	5409603.26	373.27	0	N	A	83.2	23.9	0.0	0.0	0.0	80.1	2.4	2.1	0.3	0.0	0.0	0.0	0.0	22.2
5184	426432.69	5409603.26	373.27	0	E	A	83.2	23.9	0.0	0.0	0.0	80.1	2.4	2.1	0.3	0.0	0.0	0.0	0.0	22.2
5199	427242.73	5409796.07	393.05	0	D	A	83.2	23.3	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	19.5
5199	427242.73	5409796.07	393.05	0	N	A	83.2	23.3	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	19.5
5199	427242.73	5409796.07	393.05	0	E	A	83.2	23.3	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	19.5
5206	425633.22	5409578.74	272.50	0	D	A	83.2	23.7	0.0	0.0	0.0	81.1	2.6	2.1	0.1	0.0	4.3	0.0	0.0	16.7
5206	425633.22	5409578.74	272.50	0	N	A	83.2	23.7	0.0	0.0	0.0	81.1	2.6	2.1	0.1	0.0	4.3	0.0	0.0	16.7
5206	425633.22	5409578.74	272.50	0	E	A	83.2	23.7	0.0	0.0	0.0	81.1	2.6	2.1	0.1	0.0	4.3	0.0	0.0	16.7
5208	426640.46	5409616.78	380.50	0	D	A	83.2	22.5	0.0	0.0	0.0	79.9	2.4	2.0	0.2	0.0	2.1	0.0	0.0	19.0
5208	426640.46	5409616.78	380.50	0	N	A	83.2	22.5	0.0	0.0	0.0	79.9	2.4	2.0	0.2	0.0	2.1	0.0	0.0	19.0
5208	426640.46	5409616.78	380.50	0	E	A	83.2	22.5	0.0	0.0	0.0	79.9	2.4	2.0	0.2	0.0	2.1	0.0	0.0	19.0
5209	425555.63	5409447.83	294.11	0	D	A	83.2	23.3	0.0	0.0	0.0	80.9	2.6	2.1	0.1	0.0	10.1	0.0	0.0	10.7
5209	425555.63	5409447.83	294.11	0	N	A	83.2	23.3	0.0	0.0	0.0	80.9	2.6	2.1	0.1	0.0	10.1	0.0	0.0	10.7
5209	425555.63	5409447.83	294.11	0	E	A	83.2	23.3	0.0	0.0	0.0	80.9	2.6	2.1	0.1	0.0	10.1	0.0	0.0	10.7
5216	426800.25	5409680.19	385.50	0	D	A	83.2	22.3	0.0	0.0	0.0	80.0	2.4	2.0	0.2	0.0	2.1	0.0	0.0	18.7
5216	426800.25	5409680.19	385.50	0	N	A	83.2	22.3	0.0	0.0	0.0	80.0	2.4	2.0	0.2	0.0	2.1	0.0	0.0	18.7
5216	426800.25	5409680.19	385.50	0	E	A	83.2	22.3	0.0	0.0	0.0	80.0	2.4	2.0	0.2	0.0	2.1	0.0	0.0	18.7
5224	427429.10	5409836.24	387.41	0	D	A	83.2	22.3	0.0	0.0	0.0	80.2	2.4	2.1	0.2	0.0	2.1	0.0	0.0	18.5

Line Source, ISO 9613, Name: "Truck Route PAG (Loaded Truck)", ID: "TRL_PAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5224	427429.10	5409836.24	387.41	0	N	A	83.2	22.3	0.0	0.0	0.0	80.2	2.4	2.1	0.2	0.0	2.1	0.0	0.0	18.5
5224	427429.10	5409836.24	387.41	0	E	A	83.2	22.3	0.0	0.0	0.0	80.2	2.4	2.1	0.2	0.0	2.1	0.0	0.0	18.5
5254	427069.39	5409750.84	394.06	0	D	A	83.2	21.7	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	18.1
5254	427069.39	5409750.84	394.06	0	N	A	83.2	21.7	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	18.1
5254	427069.39	5409750.84	394.06	0	E	A	83.2	21.7	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	18.1
5274	425839.72	5409411.72	324.57	0	D	A	83.2	21.3	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.1	0.0	0.0	17.3
5274	425839.72	5409411.72	324.57	0	N	A	83.2	21.3	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.1	0.0	0.0	17.3
5274	425839.72	5409411.72	324.57	0	E	A	83.2	21.3	0.0	0.0	0.0	80.4	2.5	2.1	0.2	0.0	2.1	0.0	0.0	17.3
5278	426936.78	5409723.25	390.51	0	D	A	83.2	21.0	0.0	0.0	0.0	80.0	2.4	2.1	0.3	0.0	0.0	0.0	0.0	19.5
5278	426936.78	5409723.25	390.51	0	N	A	83.2	21.0	0.0	0.0	0.0	80.0	2.4	2.1	0.3	0.0	0.0	0.0	0.0	19.5
5278	426936.78	5409723.25	390.51	0	E	A	83.2	21.0	0.0	0.0	0.0	80.0	2.4	2.1	0.3	0.0	0.0	0.0	0.0	19.5
5309	425715.83	5409425.84	319.09	0	D	A	83.2	20.7	0.0	0.0	0.0	80.6	2.5	2.1	0.2	0.0	2.2	0.0	0.0	16.3
5309	425715.83	5409425.84	319.09	0	N	A	83.2	20.7	0.0	0.0	0.0	80.6	2.5	2.1	0.2	0.0	2.2	0.0	0.0	16.3
5309	425715.83	5409425.84	319.09	0	E	A	83.2	20.7	0.0	0.0	0.0	80.6	2.5	2.1	0.2	0.0	2.2	0.0	0.0	16.3
5326	426198.97	5409423.50	349.74	0	D	A	83.2	19.5	0.0	0.0	0.0	79.8	2.4	2.0	0.6	0.0	2.6	0.0	0.0	15.1
5326	426198.97	5409423.50	349.74	0	N	A	83.2	19.5	0.0	0.0	0.0	79.8	2.4	2.0	0.6	0.0	2.6	0.0	0.0	15.1
5326	426198.97	5409423.50	349.74	0	E	A	83.2	19.5	0.0	0.0	0.0	79.8	2.4	2.0	0.6	0.0	2.6	0.0	0.0	15.1
5348	426236.40	5409495.89	356.85	0	D	A	83.2	18.9	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	15.3
5348	426236.40	5409495.89	356.85	0	N	A	83.2	18.9	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	15.3
5348	426236.40	5409495.89	356.85	0	E	A	83.2	18.9	0.0	0.0	0.0	80.0	2.4	2.1	0.2	0.0	2.1	0.0	0.0	15.3
5373	425395.07	5409583.04	272.50	0	D	A	83.2	19.5	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	3.1	0.0	0.0	13.2
5373	425395.07	5409583.04	272.50	0	N	A	83.2	19.5	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	3.1	0.0	0.0	13.2
5373	425395.07	5409583.04	272.50	0	E	A	83.2	19.5	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	3.1	0.0	0.0	13.2
5382	425477.97	5409587.51	272.50	0	D	A	83.2	19.0	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	3.1	0.0	0.0	12.8
5382	425477.97	5409587.51	272.50	0	N	A	83.2	19.0	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	3.1	0.0	0.0	12.8
5382	425477.97	5409587.51	272.50	0	E	A	83.2	19.0	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	3.1	0.0	0.0	12.8
5388	425420.99	5409490.77	273.43	0	D	A	83.2	18.7	0.0	0.0	0.0	81.2	2.6	2.1	0.1	0.0	14.2	0.0	0.0	1.6
5388	425420.99	5409490.77	273.43	0	N	A	83.2	18.7	0.0	0.0	0.0	81.2	2.6	2.1	0.1	0.0	14.2	0.0	0.0	1.6
5388	425420.99	5409490.77	273.43	0	E	A	83.2	18.7	0.0	0.0	0.0	81.2	2.6	2.1	0.1	0.0	14.2	0.0	0.0	1.6
5412	426293.15	5409593.86	364.37	0	D	A	83.2	17.2	0.0	0.0	0.0	80.2	2.4	2.1	0.2	0.0	2.1	0.0	0.0	13.3
5412	426293.15	5409593.86	364.37	0	N	A	83.2	17.2	0.0	0.0	0.0	80.2	2.4	2.1	0.2	0.0	2.1	0.0	0.0	13.3
5412	426293.15	5409593.86	364.37	0	E	A	83.2	17.2	0.0	0.0	0.0	80.2	2.4	2.1	0.2	0.0	2.1	0.0	0.0	13.3
5413	426260.95	5409554.66	360.11	0	D	A	83.2	17.0	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	13.3
5413	426260.95	5409554.66	360.11	0	N	A	83.2	17.0	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	13.3
5413	426260.95	5409554.66	360.11	0	E	A	83.2	17.0	0.0	0.0	0.0	80.1	2.4	2.1	0.2	0.0	2.1	0.0	0.0	13.3
5438	425369.28	5409524.87	272.50	0	D	A	83.2	17.1	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	9.9	0.0	0.0	4.1
5438	425369.28	5409524.87	272.50	0	N	A	83.2	17.1	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	9.9	0.0	0.0	4.1
5438	425369.28	5409524.87	272.50	0	E	A	83.2	17.1	0.0	0.0	0.0	81.4	2.7	2.1	0.1	0.0	9.9	0.0	0.0	4.1
5485	425350.93	5409558.03	272.50	0	D	A	83.2	14.9	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	5.7	0.0	0.0	6.0
5485	425350.93	5409558.03	272.50	0	N	A	83.2	14.9	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	5.7	0.0	0.0	6.0
5485	425350.93	5409558.03	272.50	0	E	A	83.2	14.9	0.0	0.0	0.0	81.5	2.7	2.1	0.1	0.0	5.7	0.0	0.0	6.0
6209	426553.92	5409594.59	378.50	0	D	A	83.2	-15.7	0.0	0.0	0.0	79.9	2.4	2.0	0.3	0.0	0.0	0.0	0.0	-17.1
6209	426553.92	5409594.59	378.50	0	N	A	83.2	-15.7	0.0	0.0	0.0	79.9	2.4	2.0	0.3	0.0	0.0	0.0	0.0	-17.1
6209	426553.92	5409594.59	378.50	0	E	A	83.2	-15.7	0.0	0.0	0.0	79.9	2.4	2.0	0.3	0.0	0.0	0.0	0.0	-17.1

Line Source, ISO 9613, Name: "Truck Route PAG (Empty Truck)", ID: "TRE_PAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5439	427736.36	5409874.78	379.22	0	D	A	72.2	26.5	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	8.6
5439	427736.36	5409874.78	379.22	0	N	A	72.2	26.5	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	8.6
5439	427736.36	5409874.78	379.22	0	E	A	72.2	26.5	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	8.6
5483	426038.88	5409390.91	335.10	0	D	A	72.2	24.3	0.0	0.0	0.0	80.0	5.6	-0.2	0.6	0.0	11.9	0.0	0.0	-1.4
5483	426038.88	5409390.91	335.10	0	N	A	72.2	24.3	0.0	0.0	0.0	80.0	5.6	-0.2	0.6	0.0	11.9	0.0	0.0	-1.4
5483	426038.88	5409390.91	335.10	0	E	A	72.2	24.3	0.0	0.0	0.0	80.0	5.6	-0.2	0.6	0.0	11.9	0.0	0.0	-1.4
5501	426432.69	5409603.26	373.27	0	D	A	72.2	23.9	0.0	0.0	0.0	80.1	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	10.0
5501	426432.69	5409603.26	373.27	0	N	A	72.2	23.9	0.0	0.0	0.0	80.1	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	10.0
5501	426432.69	5409603.26	373.27	0	E	A	72.2	23.9	0.0	0.0	0.0	80.1	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	10.0
5528	427242.46	5409796.07	393.09	0	D	A	72.2	23.3	0.0	0.0	0.0	80.1	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	5.7
5528	427242.46	5409796.07	393.09	0	N	A	72.2	23.3	0.0	0.0	0.0	80.1	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	5.7
5528	427242.46	5409796.07	393.09	0	E	A	72.2	23.3	0.0	0.0	0.0	80.1	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	5.7
5545	425632.54	5409579.12	272.50	0	D	A	72.2	23.7	0.0	0.0	0.0	81.1	6.1	-0.2	0.3	0.0	6.5	0.0	0.0	2.0
5545	425632.54	5409579.12	272.50	0	N	A	72.2	23.7	0.0	0.0	0.0	81.1	6.1	-0.2	0.3	0.0	6.5	0.0	0.0	2.0
5545	425632.54	5409579.12	272.50	0	E	A	72.2	23.7	0.0	0.0	0.0	81.1	6.1	-0.2	0.3	0.0	6.5	0.0	0.0	2.0

Line Source, ISO 9613, Name: "Truck Route PAG (Empty Truck)", ID: "TRE_PAG"																				
Nr.	X	Y	Z	Refl.	DEN	Freq.	Lw	l/a	Optime	K0	Di	Adiv	Aatm	Agr	Afol	Ahous	Abar	Cmet	RL	Lr
	(m)	(m)	(m)			(Hz)	dB(A)	dB	dB	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	(dB)	dB(A)
5551	426640.46	5409616.78	380.50	0	D	A	72.2	22.5	0.0	0.0	0.0	79.9	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	5.2
5551	426640.46	5409616.78	380.50	0	N	A	72.2	22.5	0.0	0.0	0.0	79.9	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	5.2
5551	426640.46	5409616.78	380.50	0	E	A	72.2	22.5	0.0	0.0	0.0	79.9	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	5.2
5552	425554.97	5409448.47	293.93	0	D	A	72.2	23.3	0.0	0.0	0.0	80.9	6.0	-0.2	0.3	0.0	21.3	0.0	0.0	-12.8
5552	425554.97	5409448.47	293.93	0	N	A	72.2	23.3	0.0	0.0	0.0	80.9	6.0	-0.2	0.3	0.0	21.3	0.0	0.0	-12.8
5552	425554.97	5409448.47	293.93	0	E	A	72.2	23.3	0.0	0.0	0.0	80.9	6.0	-0.2	0.3	0.0	21.3	0.0	0.0	-12.8
5567	426800.25	5409680.19	385.50	0	D	A	72.2	22.3	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	4.9
5567	426800.25	5409680.19	385.50	0	N	A	72.2	22.3	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	4.9
5567	426800.25	5409680.19	385.50	0	E	A	72.2	22.3	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	4.9
5575	427429.10	5409836.24	387.41	0	D	A	72.2	22.3	0.0	0.0	0.0	80.2	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	4.6
5575	427429.10	5409836.24	387.41	0	N	A	72.2	22.3	0.0	0.0	0.0	80.2	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	4.6
5575	427429.10	5409836.24	387.41	0	E	A	72.2	22.3	0.0	0.0	0.0	80.2	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	4.6
5603	427069.23	5409750.98	394.10	0	D	A	72.2	21.7	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	4.2
5603	427069.23	5409750.98	394.10	0	N	A	72.2	21.7	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	4.2
5603	427069.23	5409750.98	394.10	0	E	A	72.2	21.7	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	4.2
5657	425840.04	5409411.71	324.61	0	D	A	72.2	21.3	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	3.4
5657	425840.04	5409411.71	324.61	0	N	A	72.2	21.3	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	3.4
5657	425840.04	5409411.71	324.61	0	E	A	72.2	21.3	0.0	0.0	0.0	80.4	5.8	-0.2	0.5	0.0	3.7	0.0	0.0	3.4
5663	426936.88	5409723.39	390.51	0	D	A	72.2	21.0	0.0	0.0	0.0	80.0	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	7.2
5663	426936.88	5409723.39	390.51	0	N	A	72.2	21.0	0.0	0.0	0.0	80.0	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	7.2
5663	426936.88	5409723.39	390.51	0	E	A	72.2	21.0	0.0	0.0	0.0	80.0	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	7.2
5719	425715.61	5409425.90	319.05	0	D	A	72.2	20.7	0.0	0.0	0.0	80.6	5.9	-0.2	0.5	0.0	3.8	0.0	0.0	2.4
5719	425715.61	5409425.90	319.05	0	N	A	72.2	20.7	0.0	0.0	0.0	80.6	5.9	-0.2	0.5	0.0	3.8	0.0	0.0	2.4
5719	425715.61	5409425.90	319.05	0	E	A	72.2	20.7	0.0	0.0	0.0	80.6	5.9	-0.2	0.5	0.0	3.8	0.0	0.0	2.4
5769	426198.96	5409423.51	349.74	0	D	A	72.2	19.5	0.0	0.0	0.0	79.8	5.5	-0.2	0.7	0.0	4.5	0.0	0.0	1.2
5769	426198.96	5409423.51	349.74	0	N	A	72.2	19.5	0.0	0.0	0.0	79.8	5.5	-0.2	0.7	0.0	4.5	0.0	0.0	1.2
5769	426198.96	5409423.51	349.74	0	E	A	72.2	19.5	0.0	0.0	0.0	79.8	5.5	-0.2	0.7	0.0	4.5	0.0	0.0	1.2
5816	426236.40	5409495.89	356.85	0	D	A	72.2	18.9	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	1.5
5816	426236.40	5409495.89	356.85	0	N	A	72.2	18.9	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	1.5
5816	426236.40	5409495.89	356.85	0	E	A	72.2	18.9	0.0	0.0	0.0	80.0	5.6	-0.2	0.5	0.0	3.7	0.0	0.0	1.5
5880	425395.02	5409583.17	272.50	0	D	A	72.2	19.6	0.0	0.0	0.0	81.5	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-1.3
5880	425395.02	5409583.17	272.50	0	N	A	72.2	19.6	0.0	0.0	0.0	81.5	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-1.3
5880	425395.02	5409583.17	272.50	0	E	A	72.2	19.6	0.0	0.0	0.0	81.5	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-1.3
5943	425477.69	5409587.63	272.50	0	D	A	72.2	18.9	0.0	0.0	0.0	81.4	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-1.8
5943	425477.69	5409587.63	272.50	0	N	A	72.2	18.9	0.0	0.0	0.0	81.4	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-1.8
5943	425477.69	5409587.63	272.50	0	E	A	72.2	18.9	0.0	0.0	0.0	81.4	6.2	-0.2	0.4	0.0	5.1	0.0	0.0	-1.8
5946	425420.18	5409491.64	273.29	0	D	A	72.2	18.7	0.0	0.0	0.0	81.2	6.1	-0.2	0.2	0.0	16.3	0.0	0.0	-12.8
5946	425420.18	5409491.64	273.29	0	N	A	72.2	18.7	0.0	0.0	0.0	81.2	6.1	-0.2	0.2	0.0	16.3	0.0	0.0	-12.8
5946	425420.18	5409491.64	273.29	0	E	A	72.2	18.7	0.0	0.0	0.0	81.2	6.1	-0.2	0.2	0.0	16.3	0.0	0.0	-12.8
5980	426293.15	5409593.86	364.37	0	D	A	72.2	17.2	0.0	0.0	0.0	80.2	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	-0.5
5980	426293.15	5409593.86	364.37	0	N	A	72.2	17.2	0.0	0.0	0.0	80.2	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	-0.5
5980	426293.15	5409593.86	364.37	0	E	A	72.2	17.2	0.0	0.0	0.0	80.2	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	-0.5
5982	426260.95	5409554.66	360.11	0	D	A	72.2	17.0	0.0	0.0	0.0	80.1	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	-0.6
5982	426260.95	5409554.66	360.11	0	N	A	72.2	17.0	0.0	0.0	0.0	80.1	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	-0.6
5982	426260.95	5409554.66	360.11	0	E	A	72.2	17.0	0.0	0.0	0.0	80.1	5.7	-0.2	0.5	0.0	3.7	0.0	0.0	-0.6
6058	425369.10	5409525.28	272.50	0	D	A	72.2	17.0	0.0	0.0	0.0	81.4	6.2	-0.2	0.2	0.0	12.1	0.0	0.0	-10.5
6058	425369.10	5409525.28	272.50	0	N	A	72.2	17.0	0.0	0.0	0.0	81.4	6.2	-0.2	0.2	0.0	12.1	0.0	0.0	-10.5
6058	425369.10	5409525.28	272.50	0	E	A	72.2	17.0	0.0	0.0	0.0	81.4	6.2	-0.2	0.2	0.0	12.1	0.0	0.0	-10.5
6140	425350.94	5409558.34	272.50	0	D	A	72.2	14.9	0.0	0.0	0.0	81.5	6.2	-0.2	0.3	0.0	8.0	0.0	0.0	-8.7
6140	425350.94	5409558.34	272.50	0	N	A	72.2	14.9	0.0	0.0	0.0	81.5	6.2	-0.2	0.3	0.0	8.0	0.0	0.0	-8.7
6140	425350.94	5409558.34	272.50	0	E	A	72.2	14.9	0.0	0.0	0.0	81.5	6.2	-0.2	0.3	0.0	8.0	0.0	0.0	-8.7
6211	426553.92	5409594.59	378.50	0	D	A	72.2	-15.7	0.0	0.0	0.0	79.9	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	-29.3
6211	426553.92	5409594.59	378.50	0	N	A	72.2	-15.7	0.0	0.0	0.0	79.9	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	-29.3
6211	426553.92	5409594.59	378.50	0	E	A	72.2	-15.7	0.0	0.0	0.0	79.9	5.6	-0.2	0.6	0.0	0.0	0.0	0.0	-29.3

NEW GOLD RAINY RIVER MINE
APPENDIX F
2018 AIR QUALITY RESULTS

NEW GOLD INC.
RAINY RIVER MINE

AMBIENT AIR QUALITY MONITORING PROGRAM
FIRST QUARTER 2018 REPORT

Submitted by:

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited
160 Traders Blvd. E., Suite 110
Mississauga, Ontario
L4Z 3K7

May 2018
TC111504

wood.

Wood Environment & Infrastructure Solutions
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160 Traders Boulevard East
Suite 110
Mississauga, Ontario
Canada
T: 905.568.2929

May 10, 2018
TC111504

Sylvie St. Jean
Environmental Manager
New Gold Inc.
Rainy River Mine
5967 Hwy 11 / 71, P.O. Box 5
Emo, Ontario P0W 1E0

Dear Ms. St. Jean:

Re: Rainy River Mine
Ambient Air Quality Monitoring Program
First Quarter 2018 Report

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (hereinafter referred to as Wood), is a leading environment and infrastructure, engineering, consulting and project management organization. Our team of professionals provides a full range of services to clients in a wide range of sectors including government, industrial & commercial, water, transportation, minerals & metals, oil & gas clients and clean energy. Environment and Infrastructure's core competencies are in environmental assessments, health and environmental risk assessment, environmental geology (site investigation), remediation engineering, geotechnical engineering and testing, and water resource services.

Wood is pleased to submit to New Gold Inc. (New Gold) the attached summary report of the results for the ambient air quality monitoring program for the first quarter of 2018 at the Rainy River Mine. The monitoring program consists of two air quality monitoring stations that were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. The sampling stations are operated and maintained by New Gold staff; Wood staff performed quarterly calibrations, provided technical guidance to New Gold field staff, communicated with the laboratory staff as required, and prepared the data summary report.

Wood will supply the MOECC with raw and edited data per the Operations Manual for Air Quality Monitoring in Ontario (MOECC 2016b).

The key finding(s) of the Q1 2018 monitoring are as follows:

- There was a measured exceedance of the TSP and iron Ambient Air Quality Criteria (AAQC) at the Gallinger Station in Q1 2018; and
- There were no exceedances of the dustfall or metals/metalloids (excluding iron) AAQC, PM2.5 Canadian Ambient Air Quality Standard, or SO_2/NO_2 criteria measured in Q1 2018.

The measured TSP and $PM_{2.5}$ concentrations for the Q1 2018 are depicted in Figures CL-1 and CL-2.

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

Should you have any questions or wish to discuss the air monitoring program, please do not hesitate to contact the undersigned.

Sincerely,
Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited

<Original signed by>

Caleb Vandenberg, P.Eng.
Air Quality Engineer

<Original signed by>

Dan Russell, P.Geo.
Associate Geoscientist

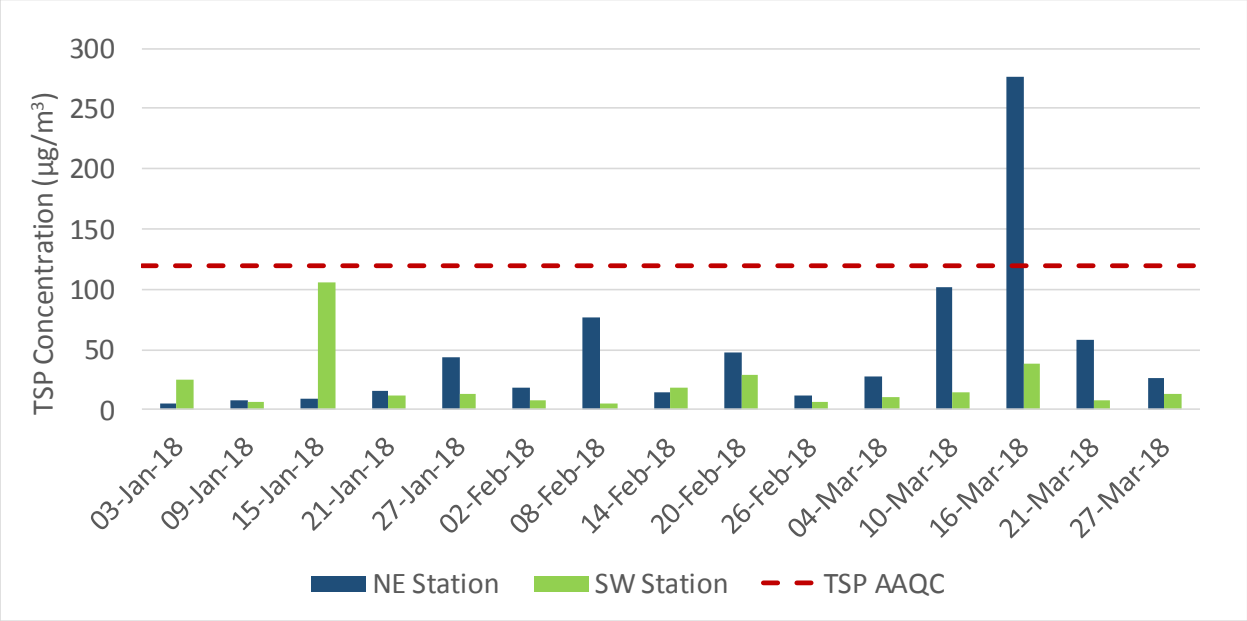

Figure CL-1: TSP Concentrations (Q1 2018)

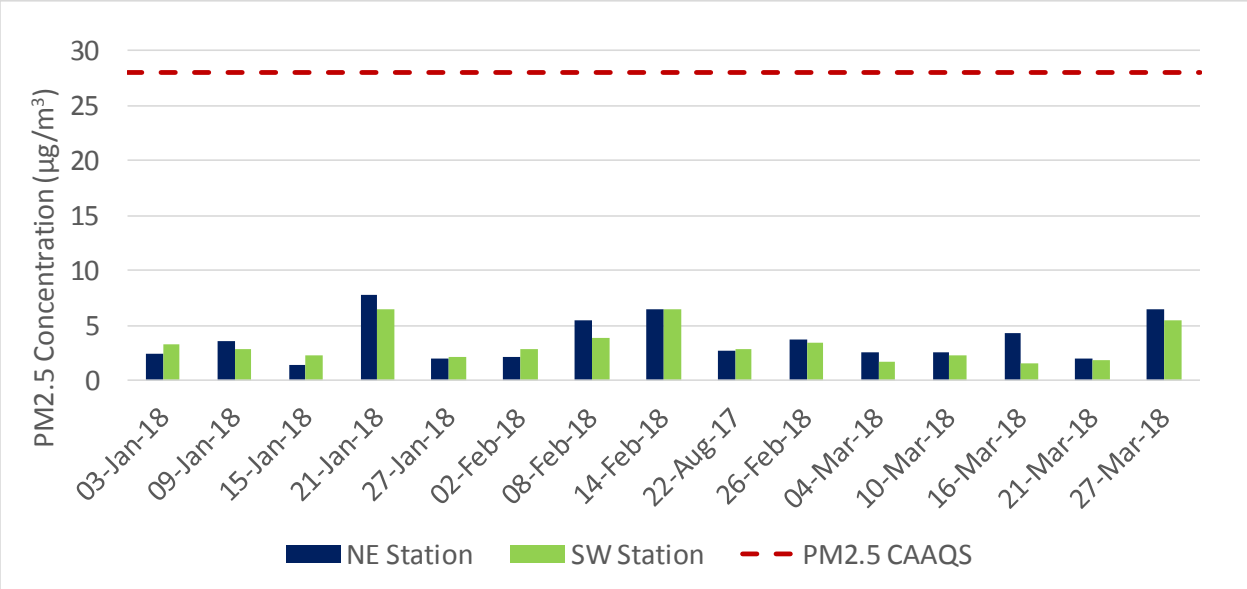

Figure CL-2: $PM_{2.5}$ Concentrations (Q1 2018)

Revision	Date	Revised By	Description
0	May 10, 2018	Caleb Vandenberg	Draft Report
1	May 10, 2018	Caleb Vandenberg	Final Report

ACRONYMS AND ABBREVIATIONS

AAQC	Ambient Air Quality Criteria
AAQO	Alberta Ambient Air Quality Objectives
ACFM	Cubic Feet Per Minute at Actual Conditions
AEP	Alberta Environment and Parks
ASTM	American Society for Testing and Materials
BCMOE	British Columbia Ministry of the Environment
CAAQS	Canadian Ambient Air Quality Standards
Hi-Vol	High Volume Sampler
ICP/AES	Inductively Coupled Plasma / Atomic Emission Spectroscopy
LPM	Litres Per Minute
MOECC	Ministry of the Environment and Climate Change
NIST	National Institute of Standards and Technology
TSP	Total Suspended Particulate
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
US EPA	United States Environmental Protection Agency
$\mu g/m^3$	Microgram per Cubic Metre

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1.0 INTRODUCTION

Wood is pleased to provide a summary of the First Quarter (Q1) 2018 results for the ambient air quality monitoring program undertaken at the Rainy River Mine located in northwestern Ontario. Two sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 realignment at Tait Road, and one to the east of the Site on Gallinger Road (Figures 2-1, 2-2 and 2-3).

New Gold Inc. (New Gold) staff operate and maintain the sampling stations. Wood staff performed quarterly calibrations, provided technical guidance to New Gold field staff, communicated with the laboratory staff as required, and prepared the data summary reports.

This Quarterly Ambient Air Quality Report addresses the required elements of a Quarterly Report defined in the *Operations Manual for Air Quality Monitoring in Ontario* (MOECC 2016b), hereafter referred to as the Operations Manual. Specifically, the following information is provided:

- Summary statistics;
- Sampling dates (start and end where applicable); and
- A summary of exceedances of an Ontario Standard, Ambient Air Quality Criterion (AAQC), or Canadian Ambient Air Quality Standard (CAAQS).

The purpose of the air monitoring program is to quantify potential air quality effects associated with activities related to the Mine. The monitoring program consists of:

- Two High Volume (Hi-Vol) samplers for discrete sampling of Total Suspended Particulate (TSP) and metals;
- Two PQ200 samplers for discrete sampling of respirable particulate matter ($PM_{2.5}$);
- Two standard passive dustfall collection units;
- Two passive sampling enclosures each measuring NO_2 and SO_2; and
- One meteorological station to obtain real-time site wind speed, wind direction, temperature, relative humidity, and precipitation.

2.0 MONITORING STATIONS

The ambient monitoring stations were sited in accordance with the criteria stipulated in the MOECC Operations Manual (MOECC 2018).

The general location for the two stations is shown in Figure 2-1. UTM co-ordinates for each station based upon NAD 83, are presented in Table 2-1. Photographs showing each station and the equipment installed are presented as Figures 2-2 and 2-3.

There were no changes to the stations or station locations in Q1 2018.

Table 2-1: Ambient Air Monitoring Stations

Station	UTM Co-ordinates			Parameters Monitored
	Easting (m)	Northing (m)	Zone	
Tait Road Station	426 072	5 406 996	15	TSP, metals, $PM_{2.5}$, NO_2, SO_2, total dustfall Meteorological data (wind speed and direction, ambient temperature, relative humidity, rainfall)
Gallinger Road Station	431 133	5 410 534	15	TSP, metals, $PM_{2.5}$, NO_2, SO_2, total dustfall

410000 415000 420000 425000 430000 435000 440000 445000 450000

5425000 5420000 5415000 5410000 5405000

Hwy 600
Hwy 600
Hwy 600
Hwy 600
Hwy 617
Hwy 71
Hwy 71
Hwy 615
Hwy 600
Hwy 404 East Rd
Burditt Lake
Beadle Lake
Preachers Lake
Spring Lake
Little Pine Lake
Boundary Lake
Pony Lake
Off Lake
Manomin Rd
Muskrat Lake
Finland
Korpi Road
Lampi Rd
Existing Transmission Line
Flaming Rd
Tailings Management Area
Marr Rd
Roen Rd
Clark Road
Overburden
West Mine Rock
Open Pit
East Mine Rock
Teeple Road
Dearlock
Pinewood River
Pinewood Lake
Heatwole Road
Northeast Monitoring Station (Gallinger Road)
Southwest Monitoring Station (Tait Road)
Tait Road
Black Hawk
Pump House

P:\EM\Projects\2011\TC111504 Rainy River\GIS\E\AA\MXD_Maps\RR_NG_Property Ambient_quality_monitoring7.mxd

LEGEND

- Ambient Air Quality Monitoring Stations
- New Gold - Rainy River Property Boundary
- New Gold Lands with No Current Access Control

Proposed Site Features

- Underground Portal
- Open Pit
- Plant Site / Ancillary Facilities
- Explosives Facilities
- Overburden / West Mine Rock Stockpile
- Ore / East Mine Rock Stockpile
- Proposed Pump House
- Tailings Management Area
- Aggregate Pit / Quarry
- Site Roads
- Roads
- Existing Transmission Line
- First Nation Land

NOTES:
- Road and Utility data and topographic data extracted from Land Information Ontario, Ontario Road Network, MNR Queen's Printer for Ontario, 2011-2012
- Land tenure information and parcels provided by NewGold, March 13, 2018.

Datum: NAD83
Projection: UTM Zone 15N

0 2 4 8 12 16 20 Kilometres

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring Stations

PROJECT N°: TC111504 | **FIGURE: 2-1**

SCALE: 1:100,000 | DATE: May 2018

425950 426000 426050 426100 426150 426200

5407000

5406950

5406900

69 m

TAIT ROAD

P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\a\MXD_Mapsl\RR_NG_Ambient_quality_monitoring_stationTait_3.mxd

LEGEND

- Southwest Monitoring Station (Tait Road)
- Highway Re-alignment

Notes:
- Aerial imagery provided by NewGold Plieades imagery (October 2017).

0 10 20 40 60 80 100 Meters

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring
Southwest Monitoring Station

PROJECT N°: TC111504 | **FIGURE: 2-2**

SCALE: 1:700 | DATE: May 2018

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LEGEND

- Northeast Monitoring Station (Gallinger Road)
- Gallinger Road

Notes:
- Aerial imagery provided by NewGold Plieades imagery (October 2017).

0 10 20 40 60 80 100 Meters

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring Northeast Monitoring Station

PROJECT N°: TC111504	**FIGURE: 2-3**
SCALE: 1:700	DATE: May 2018

3.0 ANALYTICAL AND MONITORING METHODS

3.1 TSP and Metals

The TSP concentrations were determined using the standard gravimetric reference methods approved by the United States Environmental Protection Agency (US EPA) and the Ontario Ministry of the Environment and Climate Change (MOECC); as described in the Operations Manual (MOECC 2016b). Measurements of 24-hour average TSP and metal concentrations were collected as specified in the Operations Manual (MOECC 2016b); particulate samples were collected every sixth day as per the North American schedule (US EPA 2017). Sampling was performed with Hi-Vol samplers (brush motor and mass flow controlled). Metals and metalloids analyzed included the following: arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), vanadium (V) and zinc (Zn). A metalloid is an element such as As that has both metallic and non-metallic properties.

The lowest detectable limit of total particulate on the filter is 2.3 milligrams (mg). A typical 24-hour sample volume of 1,630 m^3 results in a method detection limit of 1.4 micrograms per cubic metre ($\mu g/m^3$).

Metal concentrations were determined using standard Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP/AES) methodology. Method detection limits are as shown on the data sheets in Appendix A-1.

3.2 $PM_{2.5}$

Sampling was performed with PQ200 samplers. $PM_{2.5}$ concentrations were determined using the standard gravimetric reference methods approved by the US EPA and the MOECC; as described in the Operations Manual (MOECC 2016b). $PM_{2.5}$ measurements were collected over a 24-hour period to match the averaging time for the Canadian Ambient Air Quality Standard (CAAQS); particulate samples were collected every sixth day as per the North American schedule (US EPA 2017).

The lowest detectable limit of $PM_{2.5}$ on the Teflon filters is 1 µg. A typical 24-hour sample volume of 24 m^3 results in a method detection limit of 0.04 $\mu g/m^3$.

3.3 Total Dustfall

Water soluble and insoluble portions of dustfall were determined using ASTM method D-1739-98 and the British Columbia Ministry of Environment method outlined in Section G of Air Constituents – Inorganic (MOECC 2016c). Standard dustfall samplers were used to measure total dustfall deposition. The method detection limit for total dustfall is 0.3 g/m^2/30 days. Bird deterrents were added in Q3 2017 with the goal of reducing contamination.

3.4 Passive Sampling for SO_2 and NO_2

SO_2 and NO_2 concentrations were monitored with passive sampling devices. The exposed permeation filters were analyzed by the Maxxam Analytics Inc. laboratory (Edmonton, Alberta). Testing was performed using methodology developed, approved and validated by Alberta Environment with the support of the Alberta Research Council, the Clean Air Strategic Alliance of Alberta, and the National Research Council of Canada.

Sample uptake is dependent on temperature, relative humidity and wind speed. Analytical results are adjusted for these meteorological parameters measured during the exposure period (monthly averages). Required meteorological data were obtained from the Environment and Climate Change Canada website. Fort Frances meteorological station (Climate ID 6022474) is downloaded by Maxxam Analytics with each sample submission. For both SO_2 and NO_2, the analytical method detection limit is in the order of 0.1 parts per billion (ppb). Validation tests conducted in Alberta show that results from passive sampling are typically within 10% of those obtained from sampling with continuous analyzers for 30-day exposure periods.

Since there are no MOECC guidelines for monthly concentrations of SO_2 and NO_2 obtained from passive sampling, the data is only used for screening purposes. For NO_2, the monthly results were compared to the MOECC 24-hour AAQC converted to an equivalent 30-day average (78 µg/m^3) using the methodology outlined in the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MOECC 2017). For SO_2, the results were compared against the 30-day Alberta Ambient Air Quality Objective of 30 µg/m^3 (AEP 2016).

3.5 Field Operations

3.5.1 Hi-Vol Samplers

To meet the requirements of 1 in 6 day sampling schedule, stations were visited once every six days. The exposed filter was recovered and a pre-weighed filter installed for the subsequent sample run. Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

Wood staff performed flow, temperature, and barometric pressure calibrations using an electronic BGI flow calibrator. The flows were calibrated to 16.7 litres per minute (LPM) for each station. Q1 Calibrations were performed on:

- November 2, 2017 – All hi-vols calibrated; and
- February 21, 2018 – All hi-vols calibrated.

3.5.2 PQ200 Samplers

To meet the requirements of 1 in 6 day sampling schedule, stations were visited once every six days. The exposed filter was recovered and a pre-weighed filter installed for the subsequent sample run. Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

Wood staff performed flow, temperature, and barometric pressure calibrations using an electronic BGI flow calibrator. The flows were calibrated to 16.7 litres per minute (LPM) for each station. Q1 Calibrations were performed on:

- November 2, 2017 – All PQ200s calibrated; and
- February 21, 2018 – All PQ200s calibrated.

3.5.3 Dustfall Samplers

The dustfall samplers containing algaecide were changed every month, as required. Dustfall jars were provided by the laboratory with screw-on lids to prevent sample loss during transport.

3.5.4 Passive Samplers

The permeation filters in the passive samplers were changed every month, as required. Permeation filters were kept in filter cassettes inside Ziploc bags until deployed to prevent premature exposure. After the sample was collected, the filter was placed back in its cassette and into a Ziploc bag for shipment to the lab.

3.5.5 Performance and Site Audits

There were no MOECC audits conducted in Q1 2018.

3.5.6 Equipment and Sampling Issues

During Q1 2018, the ambient air monitoring program was successful in collecting sufficient valid data to fulfil the requirements of the MOECC Operations Manual. A number of invalid samples were collected and are discussed below:

- The sampling schedule for both stations was offset by one day for a period in Q1 due to a scheduling error however this is inconsequential to the validity of the results; and
- February 2: $PM_{2.5}$ sample at the Tait Road station was invalid due to too much sample volume collected.

4.0 RESULTS

Sampling program results for Q1 2018 are presented in Appendix A-1 for the particulate and metals data, Appendix A-2 for the dustfall data and Appendix A-3 for the passive SO_2 and NO_2 data. For the purpose of performing statistical analyses following MOECC protocol, a value of half the detection limit was substituted for concentrations less than the detection limit.

For comparative purposes, the MOECC AAQC and CAAQS values are presented, where available, noting that the AAQCs are numerically equivalent to the Ontario Regulation 419/05 standards.

Summaries of the statistical analyses for Q1 2018 for the TSP, metals, and $PM_{2.5}$ concentrations are presented in Tables 4-1, 4-2, and 4-3, respectively. During the quarter, the 1 in 6-day sampling schedule presented a possible 15 sampling days between January 1 and March 31, 2018.

A summary of the statistical analyses for Q1 2018 for the total dustfall data is presented in Table 4-4.

A summary of the statistical analysis for the Q1 2018 passive SO_2 and NO_2 results is presented in Table 4-5.

4.1 TSP and Metals

The Gallinger Road and Tait Road stations both collected 15 valid samples, respectively, resulting in 100% valid data for Q1 2018.

For the quarter, the geometric mean TSP concentrations were 14.3 µg/m^3 for the Tait Road station and 27.1 µg/m^3 for the Gallinger Road station. Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for TSP was 106.3 µg/m^3 at the Tait Road station (January 15, 2018), and 275.9 µg/m^3 at the Gallinger Road station (March 16, 2018).

The only exceedances of an MOECC AAQC measured for any of TSP, metals, or metalloids in Q1 2018 was at the Gallinger Road Station on March 16, 2018 where a TSP concentration of 275.9 µg/m^3 (230% of AAQC) and Fe concentration of 5.49 µg/m^3 (137% of AAQC) were measured.

The rolling 30-day average lead concentrations at both stations were at maximum 4% of the 30-day lead AAQC (0.2 µg/m^3) in Q1 2018.

Appendix A-1 and Figure 4-1 present individual sample data. The Q1 2018 TSP and metals summary statistics are summarized in Tables 4-1 and 4-2, respectively.

4.2 $PM_{2.5}$

The Gallinger Road and Tait Road stations both collected 15 and 14 valid samples, respectively, resulting in 93% and 100% valid data, respectively for Q1 2018. The February 2, 2018 sample at the Tait Road Station collected more than 110% of the required sample volume due to operator error and was invalidated.

Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for $PM_{2.5}$ was 6.49 µg/m^3 at the Tait Road station (February 14, 2018), and 7.75 µg/m^3 at the Gallinger Road station (January 21, 2018).

There were no $PM_{2.5}$ exceedances of the AAQC of 30 µg/m^3 or CAAQS (ECCC 2013) of 28 µg/m^3 measured in Q1 2018. Appendix A-1 and Figure 4-2 present individual sample data.

The Q1 2018 $PM_{2.5}$ summary statistics are summarized in Table 4-3.

4.3 Total Dustfall

In Q1 2018, three valid samples were collected at each station. Each dustfall jar was exposed for approximately 30-days to coincide with each calendar month in the quarter.

There were no dustfall exceedances of the 30-day AAQC of 7 g/m^2 measured in Q1 2018

A summary of the results is presented in Table 4-4 and the monthly results are presented in Appendix A-2.

4.4 Passive SO_2 and NO_2

In Q1 2018, 3 valid samples were collected at each station for each of SO_2 and NO_2.

There are no MOECC standards, guidelines or AAQCs for SO_2 or NO_2 for a 30-day averaging period. The 30-day measured average SO_2 or NO_2 concentrations allow for future analysis of trends in the ambient concentrations, to identify any notable increases, and for potential comparison with dispersion modelling results.

For NO_2, the monthly results were compared to the MOECC 24-hour AAQC converted to an equivalent 30-day average (78 µg/m^3) using the methodology outlined in the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MOECC 2017). For SO_2, the results were compared against the Alberta Ambient Air Quality Objective of 30 µg/m^3 (AEP 2017).

A summary of the passive results is presented in Table 4-5 and the monthly results are presented in Appendix A-3.

4.5 Evaluation of Effects of Abatement Measures on Monitored Concentrations

The Rainy River Mine has a comprehensive Best Management Practices Plan (BMPP) for Fugitive Dust approved by the MOECC as part of the ECA review process. This BMPP effectively controls the generation and dispersion of dust such that the particulate matter measured at the two ambient monitoring stations was below the AAQC for all Q1 2018 samples, with the exception of one TSP measurement and the Gallinger Road Station.

Table 4-1: Summary Statistics for Q1 2018 TSP Concentration Data

Statistics	Tait Road (SW)	Gallinger Road (NE)
Geometric Mean (µg/m^3)	14.3	27.1
Arithmetic Mean (µg/m^3)	20.9	49.2
January Maximum (µg/m^3)	106.3	43.2
February Maximum (µg/m^3)	28.6	76.4
March Maximum (µg/m^3)	38.0	275.9
Maximum 24-hr (µg/m^3)	106.3 (Jan.15)	275.9 (Mar.16)
90th percentile	34.2	91.6
95th percentile	58.5	153.9
24-hr AAQC	120	120
No. of valid samples	15	15
Valid data	100%	100%
No. samples > AAQC (particulate)	0	1
No. samples > AAQC (metals)	0	1
No. samples > AAQC (metalloids)	0	0

Table 4-2: Summary Statistics for Q1 2018 Metals Concentration Data

Metal	24-hr AAQC (µg/m^3)	Tait Road (SW)		Gallinger Road (NE)	
		Maximum 24-hr Concentration (µg/m^3)	% 24-hr AAQC	Maximum 24-hr Concentration (µg/m^3)	% 24-hr AAQC
As	0.3	9.89E-04	0.33%	2.75E-03	0.92%
Cd	0.025	2.81E-04	1.13%	6.51E-04	2.60%
Cr	0.5	6.14E-03	1.23%	2.20E-02	4.40%
Co	0.1	5.80E-04	0.58%	2.94E-03	2.94%
Cu	50	5.00E-02	0.10%	7.11E-01	1.42%
Fe	4	1.27E+00	31.7%	5.49E+00	137%
Pb	0.5	2.65E-02	5.29%	1.33E-02	2.67%
Mn	0.4	8.32E-02	20.8%	1.30E-01	32.5%
Ni	0.2	1.24E-03	0.62%	8.85E-03	4.43%
Se	10	4.29E-04	0.0043%	4.26E-04	0.0043%
V	2	1.65E-03	0.083%	1.24E-02	0.62%
Zn	120	7.00E-02	0.058%	1.50E-01	0.12%

Table 4-3: Summary Statistics for Q1 2018 $PM_{2.5}$ Concentration Data

Statistics	Tait Road (SW)	Gallinger Road (NE)
Arithmetic Mean (µg/m^3)	3.31	3.70
January Maximum (µg/m^3)	6.45	7.75
February Maximum (µg/m^3)	6.49	6.49
March Maximum (µg/m^3)	5.49	6.41
Maximum 24-hr (µg/m^3)	6.49 (Feb.14)	7.75 (Jan.21)
90th percentile	6.16	6.46
95th percentile	6.46	6.87
24-hr CAAQS	28	28
No. of valid samples	14	15
Valid data	93%	100%
No. samples > CAAQS	0	0

Table 4-4: Summary Statistics for Q1 2018 Total Dustfall Data

Statistic	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean (g/m^3/30d)	1.3	2.4
Maximum (g/m^3/30d)	1.5	3.8
30-day AAQC	7	7
No. > AAQC	0	0
No. valid samples	3	3
Valid Data	100%	100%

Table 4-5: Summary Statistics for Q1 2018 Passive SO_2 and NO_2 Concentration Data

Statistic	Tait Road (SW)		Gallinger Road (NE)	
	SO_2	NO_2	SO_2	NO_2
Mean (µg/m^3)	0.5	2.0	0.4	2.5
Maximum (µg/m^3)	0.8	3.6	0.5	3.8
AAQC 24-hr converted to 30-day (µg/m^3)	N/A	78	N/A	78
Alberta AAQO (µg/m^3)	30	N/A	30	N/A
No. valid samples	3	3	3	3
Valid data	100%	100%	100%	100%

Note: N/A: No applicable criterion

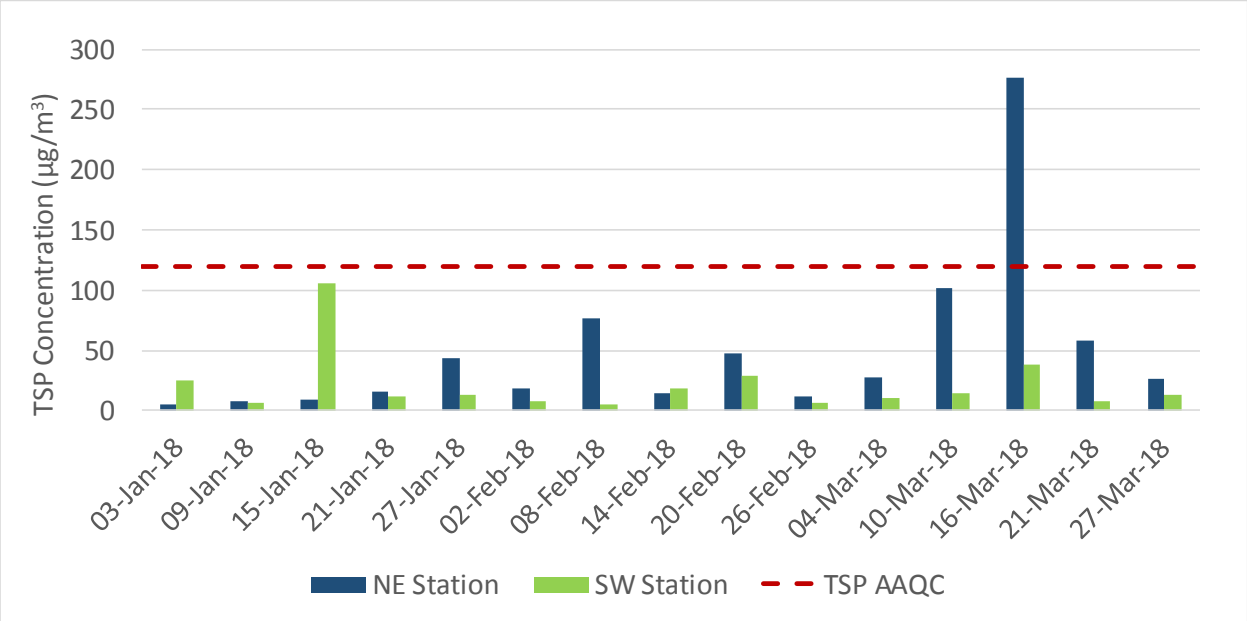

Figure 4-1: TSP Concentrations (Q1 2018)

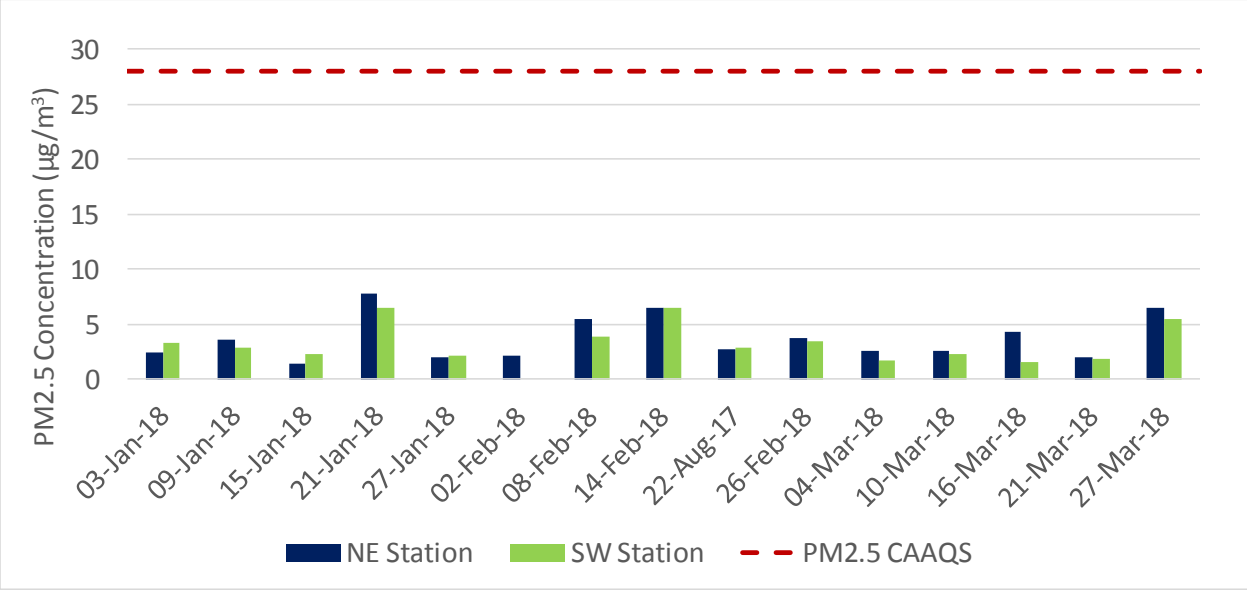

Figure 4-2: $PM_{2.5}$ Concentrations (Q1 2018)

5.0 CONCLUSIONS

This report summarizes the data collected in Q1 2018 for the ambient air quality monitoring program at the Rainy River Mine.

The monitoring program collects TSP, metals, $PM_{2.5}$, total dustfall, NO_2, and SO_2 ambient air quality data from two monitoring stations, that were installed and commissioned in May 2015.

A summary of the Q1 2018 ambient air quality monitoring program results is provided below:

- There were 15 valid TSP samples collected at both stations resulting in 100% sample validity. Metal and metalloid concentrations were measured on each of the TSP filters.
- The only measured exceedances of an MOECC AAQC for TSP, metals, or metalloids in Q1 2018 was at the Gallinger Road Station. On March 16, 2018 a TSP concentration of 275.9 µg/m^3 (230% of AAQC) and a Fe concentration of 5.49 µg/m^3 (137% of AAQC) were measured.
- There were 14 and 15 valid PM2.5 samples collected at the Tait and Gallinger Road stations, respectively (93% and 100% valid data, respectively). There were no exceedances of the 24-hour $PM_{2.5}$ CAAQS in Q1 2018.
- There were 3 valid dustfall samples collected at each station (100% sample validity). There were no exceedances of the 30-day dustfall AAQC in Q1 2018.
- There were 3 valid passive SO_2 and NO_2 samples collected at each of the two stations (100% sample validity). There were no exceedances of AEP Criterion for SO_2 or the 30-day equivalent AAQC for NO_2 in Q1 2018.

6.0 REFERENCES

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7.0 CLOSING

This *Rainy River Mine Ambient Air Quality Monitoring Program First Quarter 2018 Report* was prepared by Wood for the sole benefit of New Gold Inc. for specific application to the Rainy River Mine. The quality of information, conclusions and estimates contained herein are consistent with the level of effort involved in Wood's services and based on:

i) information available at the time of preparation;

ii) data supplied by outside sources; and

iii) the assumptions, conditions and qualifications set forth in this document.

This report is intended to be used by New Gold only, and its nominated representatives, subject to the terms and conditions of its contract with Wood. Any other use of, or reliance on, this report by any third party is at that party's sole risk. This report has been prepared in accordance with generally accepted industry-standard practices. No other warranty, expressed or implied, is made.

If you require further information regarding the above or the Mine in general, please contact the undersigned at (905) 568-2929. Thank you for the opportunity to be of service to New Gold Inc.

Yours truly,
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APPENDIX A

SAMPLING RESULTS

Appendix A-1 TSP, Metals and $PM_{2.5}$ Sampling Results
Appendix A-2 Total Dustfall Sampling Results
Appendix A-3 SO_2 and NO_2 Passive Sampling Results

APPENDIX A-1

TSP, METALS AND $PM_{2.5}$ SAMPLING RESULTS

NORTHEAST (GALLINGER ROAD) PARTICULATE/METALS CONCENTRATIONS														
Date	PM2.5	TSP	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Manganese (Mn)	Nickel (Ni)	Selenium (Se)	Vanadium (V)	Zinc (Zn)
3-Jan-18	2.46	4.6	*9.83E-04*	5.64E-05	4.20E-03	3.34E-05	4.84E-01	4.33E-02	1.25E-03	2.71E-03	3.67E-04	*4.26E-04*	*1.64E-03*	7.87E-03
9-Jan-18	3.62	8.3	*9.04E-04*	1.07E-04	4.22E-03	5.91E-05	3.00E-01	2.77E-01	1.65E-03	7.41E-03	4.52E-04	*3.92E-04*	*1.51E-03*	9.76E-03
15-Jan-18	1.37	9.4	*9.82E-04*	7.20E-05	4.12E-03	6.87E-05	2.72E-01	9.10E-02	3.54E-03	6.22E-03	5.04E-04	*4.26E-04*	*1.64E-03*	9.95E-03
21-Jan-18	7.75	15.2	*8.88E-04*	9.12E-05	4.44E-03	8.05E-05	5.25E-01	1.52E-01	3.94E-03	9.12E-03	5.03E-04	*3.85E-04*	*1.48E-03*	1.60E-02
27-Jan-18	2.04	43.20	*9.22E-04*	1.79E-04	4.30E-03	1.47E-04	1.53E-01	3.85E-01	8.85E-03	3.59E-02	6.70E-04	*3.99E-04*	*1.54E-03*	3.79E-02
2-Feb-18	2.08	18.86	*9.43E-04*	1.10E-04	5.03E-03	1.79E-04	5.37E-01	3.48E-01	2.89E-03	1.63E-02	7.04E-04	*4.09E-04*	*1.57E-03*	2.11E-02
8-Feb-18	5.41	76.36	2.75E-03	6.51E-04	5.38E-03	3.47E-04	4.16E-01	8.70E-01	1.33E-02	6.76E-02	1.14E-03	*4.07E-04*	*1.56E-03*	1.50E-01
14-Feb-18	6.49	14.6	*9.06E-04*	9.00E-05	4.89E-03	8.88E-05	1.46E-01	1.77E-01	1.82E-03	1.01E-02	5.74E-04	*3.92E-04*	*1.51E-03*	1.47E-02
20-Feb-18	2.71	47.8	*9.43E-04*	2.56E-04	5.47E-03	2.14E-04	2.51E-01	4.98E-01	1.06E-02	3.82E-02	1.28E-03	*4.09E-04*	*1.57E-03*	5.03E-02
26-Feb-18	3.8	11.5	*9.49E-04*	9.11E-05	5.25E-03	6.58E-05	6.07E-01	1.18E-01	1.48E-03	5.50E-03	5.19E-04	*4.11E-04*	*1.58E-03*	1.48E-02
4-Mar-18	2.50	27.1	*9.29E-04*	5.95E-05	6.13E-03	2.12E-04	7.31E-02	3.96E-01	2.11E-03	1.13E-02	9.60E-04	*4.03E-04*	*1.55E-03*	1.18E-02
10-Mar-18	2.50	101.7	*9.42E-04*	6.09E-05	1.02E-02	1.14E-03	6.20E-01	2.00E+00	2.35E-03	4.58E-02	3.56E-03	*4.08E-04*	4.14E-03	1.30E-02
16-Mar-18	4.33	**275.9**	*9.62E-04*	1.32E-04	2.20E-02	2.94E-03	5.94E-01	**5.49E+00**	6.09E-03	1.30E-01	8.85E-03	*4.17E-04*	1.24E-02	3.73E-02
21-Mar-18	2.04	57.7	*9.60E-04*	5.89E-05	7.36E-03	6.22E-04	7.11E-01	1.11E+00	1.24E-03	2.47E-02	1.94E-03	*4.16E-04*	*1.60E-03*	9.67E-03
27-Mar-18	6.41	26.6	*9.33E-04*	1.29E-04	4.98E-03	1.95E-04	3.29E-01	3.86E-01	3.14E-03	1.28E-02	8.28E-04	*4.04E-04*	*1.56E-03*	2.35E-02
Geometric mean	N/A	27.1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arithmetic mean	3.70	49.2	1.06E-03	1.43E-04	6.53E-03	4.26E-04	4.01E-01	8.23E-01	4.29E-03	2.83E-02	1.52E-03	4.07E-04	2.46E-03	2.85E-02
Max. concentration	7.75	275.9	2.75E-03	6.51E-04	2.20E-02	2.94E-03	7.11E-01	5.49E+00	1.33E-02	1.30E-01	8.85E-03	4.26E-04	1.24E-02	1.50E-01
Min. concentration	1.37	4.6	8.88E-04	5.64E-05	4.12E-03	3.34E-05	7.31E-02	4.33E-02	1.24E-03	2.71E-03	3.67E-04	3.85E-04	1.48E-03	7.87E-03
90th percentile	6.46	91.6	9.83E-04	2.25E-04	9.09E-03	9.31E-04	6.15E-01	1.65E+00	9.91E-03	5.89E-02	2.91E-03	4.22E-04	3.14E-03	4.54E-02
95th percentile	6.87	153.9	1.51E-03	3.75E-04	1.38E-02	1.68E-03	6.47E-01	3.05E+00	1.14E-02	8.64E-02	5.15E-03	4.26E-04	6.61E-03	8.01E-02
CAAQS	28.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value*	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AAQC	N/A	120	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	1	0	0	0	0	0	1	0	0	0	0	0	0
No. of valid samples	15	15	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	0	0	14	0	0	0	0	0	0	0	0	15	13	0
Detection limit (µg)	6	5	6	2	5	2	5	50	3	50	3	10	5	5
Half detection limit (µg)	3	2.5	3	1	2.5	1	2.5	25	1.5	25	1.5	5	2.5	2.5
% < detection limit	0	0	93	0	0	0	0	0	0	0	0	100	87	0
% valid data	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:

All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining

N/A: Not applicable

—: Invalid Sample

*Canadian Ambient Air Quality Standard, 24-hour standard

SOUTHWEST (TAIT ROAD) PARTICULATE/METALS CONCENTRATIONS														
Date	**PM2.5**	**TSP**	**Arsenic (As)**	**Cadmium (Cd)**	**Chromium (Cr)**	**Cobalt (Co)**	**Copper (Cu)**	**Iron (Fe)**	**Lead (Pb)**	**Manganese (Mn)**	**Nickel (Ni)**	**Selenium (Se)**	**Vanadium (V)**	**Zinc (Zn)**
3-Jan-18	3.33	25.2	*9.89E-04*	6.73E-05	4.75E-03	1.49E-04	4.43E-02	3.30E-01	7.12E-03	1.86E-02	6.53E-04	*4.29E-04*	*1.65E-03*	1.66E-02
9-Jan-18	2.83	6.0	*9.06E-04*	8.88E-05	3.93E-03	4.11E-05	1.23E-02	1.82E-01	9.55E-04	4.79E-03	3.50E-04	*3.93E-04*	*1.51E-03*	9.06E-03
15-Jan-18	2.33	106.3	*9.38E-04*	2.81E-04	4.44E-03	5.80E-04	2.65E-02	1.27E+00	2.65E-02	8.32E-02	1.24E-03	*4.06E-04*	*1.56E-03*	7.00E-02
21-Jan-18	6.45	11.6	*8.62E-04*	4.60E-05	3.97E-03	6.78E-05	4.01E-02	1.17E-01	1.23E-03	5.48E-03	3.62E-04	*3.74E-04*	*1.44E-03*	9.71E-03
27-Jan-18	2.08	13.5	*9.14E-04*	1.60E-04	4.82E-03	9.14E-05	4.72E-02	1.91E-01	3.32E-03	1.19E-02	5.30E-04	*3.96E-04*	*1.52E-03*	2.62E-02
2-Feb-18	—	8.5	*9.62E-04*	7.82E-05	4.62E-03	9.68E-05	3.75E-02	1.22E-01	1.42E-03	5.31E-03	4.94E-04	*4.17E-04*	*1.60E-03*	1.31E-02
8-Feb-18	3.83	5.5	*9.40E-04*	5.33E-05	4.45E-03	5.52E-05	5.00E-02	7.08E-02	1.16E-03	2.46E-03	4.26E-04	*4.07E-04*	*1.57E-03*	1.08E-02
14-Feb-18	6.49	18.7	*9.06E-04*	9.73E-05	5.20E-03	1.05E-04	2.60E-02	2.29E-01	2.66E-03	1.52E-02	6.16E-04	*3.93E-04*	*1.51E-03*	1.45E-02
20-Feb-18	2.83	28.6	*8.90E-04*	1.93E-04	4.81E-03	1.20E-04	2.42E-02	2.81E-01	7.42E-03	2.30E-02	9.32E-04	*3.86E-04*	*1.48E-03*	4.09E-02
26-Feb-18	3.41	5.8	*9.53E-04*	4.26E-05	5.21E-03	4.38E-05	2.92E-02	6.42E-02	8.00E-04	2.14E-03	4.51E-04	*4.13E-04*	*1.59E-03*	9.66E-03
4-Mar-18	1.71	10.1	*9.69E-04*	1.18E-04	6.14E-03	8.53E-05	2.39E-02	1.71E-01	1.39E-03	5.03E-03	6.98E-04	*4.20E-04*	*1.62E-03*	1.24E-02
10-Mar-18	2.21	14.9	*9.13E-04*	4.02E-05	3.89E-03	2.06E-04	2.02E-02	4.11E-01	8.21E-04	9.86E-03	8.33E-04	*3.95E-04*	*1.52E-03*	6.69E-03
16-Mar-18	1.54	38.0	*8.71E-04*	6.21E-05	4.53E-03	3.13E-04	3.01E-02	6.15E-01	1.94E-03	2.11E-02	1.09E-03	*3.77E-04*	*1.45E-03*	1.63E-02
21-Mar-18	1.79	7.4	*8.79E-04*	2.46E-05	3.99E-03	7.56E-05	2.54E-02	2.19E-01	8.61E-04	5.20E-03	5.74E-04	*3.81E-04*	*1.47E-03*	7.15E-03
27-Mar-18	5.49	13.3	*8.57E-04*	6.97E-05	4.00E-03	1.22E-04	2.51E-02	1.91E-01	2.09E-03	6.06E-03	5.89E-04	*3.71E-04*	*1.43E-03*	9.26E-03
Geometric mean	N/A	14.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arithmetic mean	3.31	20.9	9.17E-04	9.49E-05	4.58E-03	1.43E-04	3.08E-02	2.98E-01	3.98E-03	1.46E-02	6.56E-04	3.97E-04	1.53E-03	1.82E-02
Max. concentration	6.49	106.3	9.89E-04	2.81E-04	6.14E-03	5.80E-04	5.00E-02	1.27E+00	2.65E-02	8.32E-02	1.24E-03	4.29E-04	1.65E-03	7.00E-02
Min. concentration	1.54	5.5	8.57E-04	2.46E-05	3.89E-03	4.11E-05	1.23E-02	6.42E-02	8.00E-04	2.14E-03	3.50E-04	3.71E-04	1.43E-03	6.69E-03
90th percentile	6.16	34.2	9.66E-04	1.80E-04	5.20E-03	2.71E-04	4.60E-02	5.33E-01	7.30E-03	2.22E-02	1.03E-03	4.19E-04	1.61E-03	3.50E-02
95th percentile	6.46	58.5	9.75E-04	2.19E-04	5.49E-03	3.93E-04	4.80E-02	8.11E-01	1.31E-02	4.10E-02	1.14E-03	4.23E-04	1.63E-03	4.96E-02
CAAQS	28.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value*	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AAQC	N/A	120	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	14	15	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	0	0	15	0	0	0	0	0	0	0	0	15	15	0
Detection limit (µg)	6	5	6	2	5	2	5	50	3	50	3	10	5	5
Half detection limit (µg)	3	2.5	3	1	2.5	1	2.5	25	1.5	25	1.5	5	2.5	2.5
% < detection limit	0	0	100	0	0	0	0	0	0	0	0	100	100	0
% valid data	93	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/A: Not applicable
—: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

APPENDIX A-2

TOTAL DUSTFALL SAMPLING RESULTS

SW (Tait Road) Monitoring Results for Dustfall (Q1 2018)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
January	30	1.3	*0.15*	1.5
February	28	0.36	0.72	1.1
March	31	1.3	*0.15*	1.4

Arithmetic mean	1.3
Max. concentration	1.5
Min. concentration	1.1
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit*	0.30
Half detection limit	0.15

NE (Gallinger Road) Monitoring Results for Dustfall (Q1 2018)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
January	30	1.3	*0.15*	1.5
February	28	1.4	*0.17*	1.7
March	31	3.69	*0.15*	3.84

Arithmetic mean	2.4
Max. concentration	3.8
Min. concentration	1.5
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit*	0.30
Half detection limit	0.15

Notes:
All statistics were calculated using 1/2DL for values reported as <DL
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/A: Not applicable
N/R: No Results Available
—: Invalid Sample
*If samples had differing detection limits, the highest is displayed here
**Ontario Ambient Air Quality Criteria, 30-day standard

APPENDIX A-3

SO_2 AND NO_2 PASSIVE SAMPLING RESULTS

Monitoring Results for Passive SO_2 and NO_2 (Q1 2018)
(results expressed in $\mu g/m^3$)

	SW (Tait Road)		NE (Gallinger Road)	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
January	0.8	3.6	0.5	3.8
February	0.5	1.3	0.5	2.4
March	0.1	1.1	0.1	1.3
Arithmetic mean	0.5	2.0	0.4	2.5
Max. concentration	0.8	3.6	0.5	3.8
Min. concentration	0.1	1.1	0.1	1.3
AAQC* 24-hr converted to 30-day	N/A	78 $\mu g/m^3$	N/A	78 $\mu g/m^3$
Alberta Ambient Air Quality Objectives 2013	30 $\mu g/m^3$	N/A	30 $\mu g/m^3$	N/A
No. of valid samples	3	3	3	3
% Valid Data	100%	100%	100%	100%
No. samples < mdl	0	0	0	0
Detection limit	0.3	0.2	0.3	0.2
Half detection limit	0.15	0.1	0.15	0.1

Notes:
All statistics were calculated using 1/2DL for values reported as <DL
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
All results reported by the lab in parts per billion (ppb) and are converted to µg/m3 assuming 101.23kPA and 25C
N/A: Not applicable
N/R: No Results Available
—: Invalid Sample
*Ontario Ambient Air Quality Criteria

NEW GOLD INC.
RAINY RIVER MINE

AMBIENT AIR QUALITY MONITORING PROGRAM
SECOND QUARTER 2018 REPORT

Submitted by:

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited
160 Traders Blvd. E., Suite 110
Mississauga, Ontario
L4Z 3K7

August 2018
TC111504

wood.

Wood Environment & Infrastructure Solutions
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August 14, 2018
TC111504

Sylvie St. Jean
Environmental Manager
New Gold Inc.
Rainy River Mine
5967 Hwy 11 / 71, P.O. Box 5
Emo, Ontario P0W 1E0

Dear Ms. St. Jean:

Re: Rainy River Mine
Ambient Air Quality Monitoring Program
Second Quarter 2018 Report

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (hereinafter referred to as Wood), is a leading environment and infrastructure, engineering, consulting and project management organization. Our team of professionals provides a full range of services to clients in a wide range of sectors including government, industrial & commercial, water, transportation, minerals & metals, oil & gas clients and clean energy. Environment and Infrastructure's core competencies are in environmental assessments, health and environmental risk assessment, environmental geology (site investigation), remediation engineering, geotechnical engineering and testing, and water resource services.

Wood is pleased to submit to New Gold Inc. (New Gold) the attached summary report of the results for the ambient air quality monitoring program for the second quarter of 2018 at the Rainy River Mine. The monitoring program consists of two air quality monitoring stations that were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. The sampling stations are operated and maintained by New Gold staff; Wood staff performed quarterly calibrations, provided technical guidance to New Gold field staff, communicated with the laboratory staff as required, and prepared the data summary report.

Wood will supply the MECP with raw and edited data per the Operations Manual for Air Quality Monitoring in Ontario (MECP 2016b).

The key finding(s) of the Q2 2018 monitoring are as follows:

- There was a measured exceedance of the TSP and iron Ambient Air Quality Criteria (AAQC) at the Gallinger Station in Q2 2018 on April 8. Winds on this day were light and variable; and
- There were no exceedances of the dustfall or metals/metalloids (excluding iron) AAQC, $PM_{2.5}$ Canadian Ambient Air Quality Standard, or SO_2/NO_2 criteria measured in Q2 2018.

The measured TSP and $PM_{2.5}$ concentrations for the Q2 2018 are depicted in Figures CL-1 and CL-2.

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

Note that quarterly reports do not include interpretation of the data (i.e. exceedances); interpretation of results is included in the annual reporting. Should you have any questions or wish to discuss the air monitoring program, please do not hesitate to contact the undersigned.

Sincerely,
Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited

<Original signed by>

Caleb Vandenberg, P.Eng.
Air Quality Engineer

<Original signed by>

Linda Lattner, P.Eng., M.Eng.
Senior Air Quality Enginer

CC Dan Russel, Associate Geoscientist, Wood
Twila Griffith, Senior Environmental Coordinator, New Gold

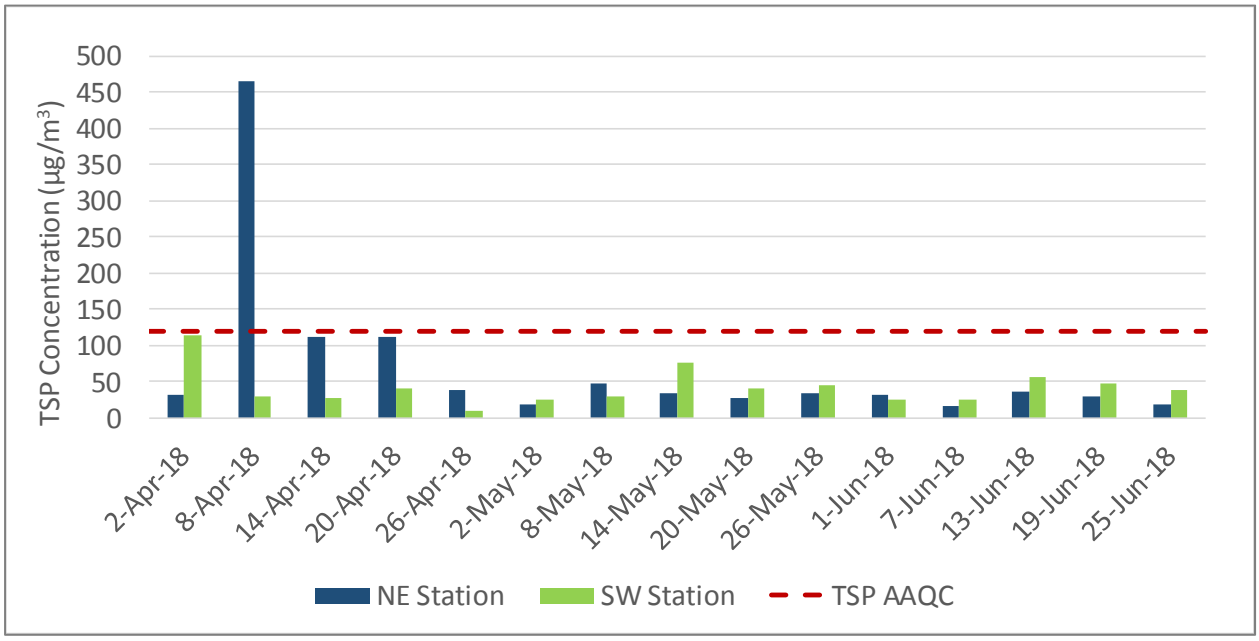

Figure CL-1: TSP Concentrations (Q2 2018)

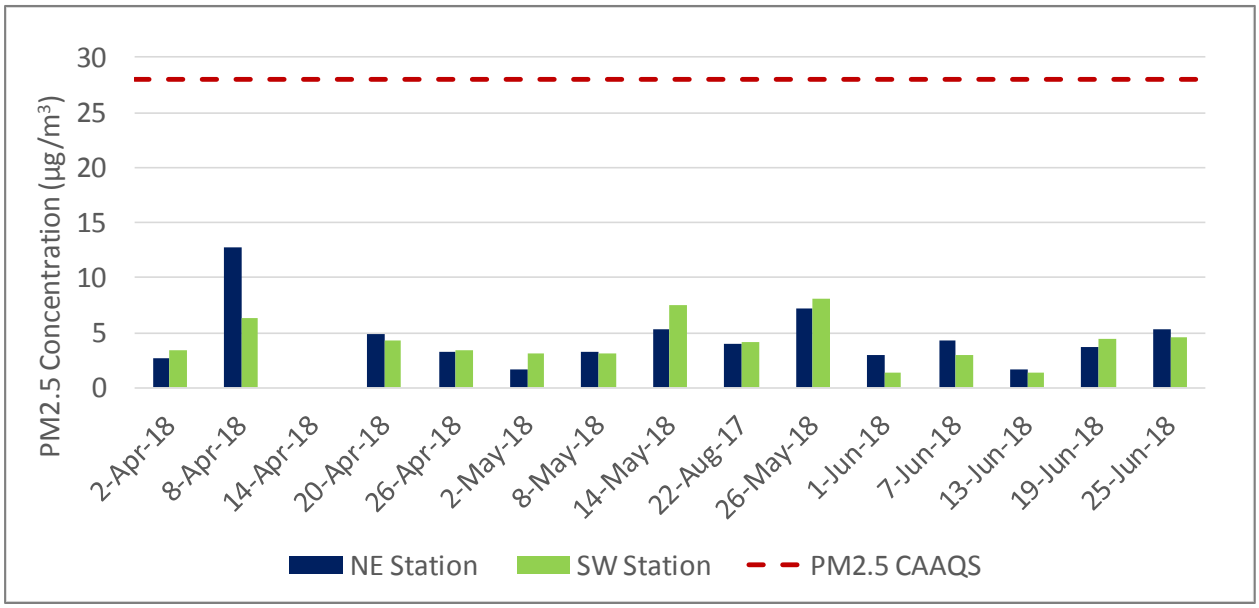

Figure CL-2: $PM_{2.5}$ Concentrations (Q2 2018)

Revision	Date	Revised By	Description
0	August 9, 2018	Ryan Fletcher	Draft Report
1	August 13, 2018	Caleb Vandenberg	Final Report

ACRONYMS AND ABBREVIATIONS

AAQC	Ambient Air Quality Criteria
AAQO	Alberta Ambient Air Quality Objectives
ACFM	Cubic Feet Per Minute at Actual Conditions
AEP	Alberta Environment and Parks
ASTM	American Society for Testing and Materials
BCMOE	British Columbia Ministry of the Environment
CAAQS	Canadian Ambient Air Quality Standards
Hi-Vol	High Volume Sampler
ICP/AES	Inductively Coupled Plasma / Atomic Emission Spectroscopy
LPM	Litres Per Minute
MECP	Ministry of the Environment, Conservation and Parks
NIST	National Institute of Standards and Technology
TSP	Total Suspended Particulate
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
US EPA	United States Environmental Protection Agency
$\mu g/m^3$	Microgram per Cubic Metre

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1.0 INTRODUCTION

Wood is pleased to provide a summary of the Second Quarter (Q2) 2018 results for the ambient air quality monitoring program undertaken at the Rainy River Mine located in northwestern Ontario. Two sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 realignment at Tait Road, and one to the east of the Site on Gallinger Road (Figures 2-1, 2-2 and 2-3).

New Gold Inc. (New Gold) staff operate and maintain the sampling stations. Wood staff performed quarterly calibrations, provided technical guidance to New Gold field staff, communicated with the laboratory staff as required, and prepared the data summary reports.

This Quarterly Ambient Air Quality Report addresses the required elements of a Quarterly Report defined in the *Operations Manual for Air Quality Monitoring in Ontario* (MECP 2016b), hereafter referred to as the Operations Manual. Specifically, the following information is provided:

- Summary statistics;
- Sampling dates (start and end where applicable); and
- A summary of exceedances of an Ontario Standard, Ambient Air Quality Criterion (AAQC), or Canadian Ambient Air Quality Standard (CAAQS).

The purpose of the air monitoring program is to quantify potential air quality effects associated with activities related to the Mine. The monitoring program consists of:

- Two High Volume (Hi-Vol) samplers for discrete sampling of Total Suspended Particulate (TSP) and metals;
- Two PQ200 samplers for discrete sampling of respirable particulate matter ($PM_{2.5}$);
- Two standard passive dustfall collection units;
- Two passive sampling enclosures each measuring NO_2 and SO_2; and
- One meteorological station to obtain real-time site wind speed, wind direction, temperature, relative humidity, and precipitation.

2.0 MONITORING STATIONS

The ambient monitoring stations were sited in accordance with the criteria stipulated in the MECP Operations Manual (MECP 2018).

The general location for the two stations is shown in Figure 2-1. UTM co-ordinates for each station based upon NAD 83, are presented in Table 2-1. Photographs showing each station and the equipment installed are presented as Figures 2-2 and 2-3.

There were no changes to the stations or station locations in Q2 2018.

Table 2-1: Ambient Air Monitoring Stations

Station	UTM Co-ordinates			Parameters Monitored
	Easting (m)	Northing (m)	Zone	
Tait Road Station	426 072	5 406 996	15	TSP, metals, $PM_{2.5}$, NO_2, SO_2, total dustfall Meteorological data (wind speed and direction, ambient temperature, relative humidity, rainfall)
Gallinger Road Station	431 133	5 410 534	15	TSP, metals, $PM_{2.5}$, NO_2, SO_2, total dustfall

410000 415000 420000 425000 430000 435000 440000 445000 450000

5425000 5420000 5415000 5410000 5405000

Hwy 600
Hwy 600
Hwy 600
Hwy 600
Hwy 617
Hwy 71
Hwy 71
Hwy 615
Hwy 600
Hwy 404 East Rd
Burditt Lake
Beadle Lake
Preachers Lake
Spring Lake
Little Pine Lake
Boundary Lake
Pony Lake
Off Lake
Manomin Rd
Muskrat Lake
Finland
Korpi Road
Lampi Rd
Existing Transmission Line
Flaming Rd
Tailings Management Area
Marr Rd
Roen Rd
Clark Road
Overburden
West Mine Rock
Open Pit
East Mine Rock
Teeple Road
Dearlock
Pinewood River
Pinewood Lake
Heatwole Road
Northeast Monitoring Station (Gallinger Road)
Southwest Monitoring Station (Tait Road)
Tait Road
Black Hawk
Pump House

P:\EM\Projects\2011\TC111504 Rainy River\GIS\E\AA\MXD_Maps\RR_NG_Property Ambient_quality_monitoring7.mxd

LEGEND

- Ambient Air Quality Monitoring Stations
- New Gold - Rainy River Property Boundary
- New Gold Lands with No Current Access Control

Proposed Site Features

- Underground Portal
- Open Pit
- Plant Site / Ancillary Facilities
- Explosives Facilities
- Overburden / West Mine Rock Stockpile
- Ore / East Mine Rock Stockpile
- Proposed Pump House
- Tailings Management Area
- Aggregate Pit / Quarry
- Site Roads
- Roads
- Existing Transmission Line
- First Nation Land

NOTES:
- Road and Utility data and topographic data extracted from Land Information Ontario, Ontario Road Network, MNR Queen's Printer for Ontario, 2011-2012
- Land tenure information and parcels provided by NewGold, March 13, 2018.

Datum: NAD83
Projection: UTM Zone 15N

0 2 4 8 12 16 20 Kilometres

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring Stations

PROJECT N°: TC111504 | **FIGURE: 2-1**

SCALE: 1:100,000 | DATE: May 2018

425950 426000 426050 426100 426150 426200

5407000

5406950

5406900

69 m

TAIT ROAD

P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\a\MXD_Mapsl\RR_NG_Ambient_quality_monitoring_stationTait_3.mxd

LEGEND

- Southwest Monitoring Station (Tait Road)
- Highway Re-alignment

Notes:
- Aerial imagery provided by NewGold Plieades imagery (October 2017).

0 10 20 40 60 80 100 Meters

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring
Southwest Monitoring Station

PROJECT N°: TC111504 | **FIGURE: 2-2**

SCALE: 1:700 | DATE: May 2018

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LEGEND

- Northeast Monitoring Station (Gallinger Road)
- Gallinger Road

Notes:
- Aerial imagery provided by NewGold Plieades imagery (October 2017).

0 10 20 40 60 80 100 Meters

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring Northeast Monitoring Station

PROJECT N°: TC111504	**FIGURE: 2-3**
SCALE: 1:700	DATE: May 2018

3.0 ANALYTICAL AND MONITORING METHODS

3.1 TSP and Metals

The TSP concentrations were determined using the standard gravimetric reference methods approved by the United States Environmental Protection Agency (US EPA) and the Ontario Ministry of the Environment, Conservation and Parks (MECP), as described in the Operations Manual (MECP 2016b). Measurements of 24-hour average TSP and metal concentrations were collected as specified in the Operations Manual (MECP 2016b); particulate samples were collected every sixth day as per the North American schedule (US EPA 2017). Sampling was performed with Hi-Vol samplers (brush motor and mass flow controlled). Metals and metalloids analyzed included the following: arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), vanadium (V) and zinc (Zn). A metalloid is an element such as As that has both metallic and non-metallic properties.

The lowest detectable limit of total particulate on the filter is 2.3 milligrams (mg). A typical 24-hour sample volume of 1,630 m^3 results in a method detection limit of 1.4 micrograms per cubic metre ($\mu g/m^3$).

Metal concentrations were determined using standard Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP/AES) methodology. Method detection limits are as shown on the data sheets in Appendix A-1.

3.2 $PM_{2.5}$

Sampling was performed with PQ200 samplers. $PM_{2.5}$ concentrations were determined using the standard gravimetric reference methods approved by the US EPA and the MECP, as described in the Operations Manual (MECP 2016b). $PM_{2.5}$ measurements were collected over a 24-hour period to match the averaging time for the Canadian Ambient Air Quality Standard (CAAQS); particulate samples were collected every sixth day as per the North American schedule (US EPA 2017).

The lowest detectable limit of $PM_{2.5}$ on the Teflon filters is 1 µg. A typical 24-hour sample volume of 24 m^3 results in a method detection limit of 0.04 $\mu g/m^3$.

3.3 Total Dustfall

Water soluble and insoluble portions of dustfall were determined using ASTM method D-1739-98 and the British Columbia Ministry of Environment method outlined in Section G of Air Constituents – Inorganic (MECP 2016c). Standard dustfall samplers were used to measure total dustfall deposition. The method detection limit for total dustfall is 0.3 g/m^2/30 days. Bird deterrents were added in Q3 2017 with the goal of reducing contamination.

3.4 Passive Sampling for SO_2 and NO_2

SO_2 and NO_2 concentrations were monitored with passive sampling devices. The exposed permeation filters were analyzed by the Maxxam Analytics Inc. laboratory (Edmonton, Alberta). Testing was performed using methodology developed, approved and validated by Alberta Environment with the support of the Alberta Research Council, the Clean Air Strategic Alliance of Alberta, and the National Research Council of Canada, and following the Standard Operating Procedures for Trace Gas Passive Sampling outlined in the Operations Manual (MECP 2016b).

Sample uptake is dependent on temperature, relative humidity and wind speed. Analytical results are adjusted for these meteorological parameters measured during the exposure period (monthly averages). Required meteorological data were obtained from the Environment and Climate Change Canada website. Fort Frances meteorological station (Climate ID 6022474) is downloaded by Maxxam Analytics with each sample submission. For both SO_2 and NO_2, the analytical method detection limit is in the order of 0.1 parts per billion (ppb). Validation tests conducted in Alberta show that results from passive sampling are typically within 10% of those obtained from sampling with continuous analyzers for 30-day exposure periods.

Since there are no MECP guidelines for monthly concentrations of SO_2 and NO_2 obtained from passive sampling, the data is only used for screening purposes. For NO_2, the monthly results were compared to the MECP 24-hour AAQC converted to an equivalent 30-day average (78 µg/m^3) using the methodology outlined in the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MECP 2017). For SO_2, the results were compared against the 30-day Alberta Ambient Air Quality Objective of 30 µg/m^3 (AEP 2016).

3.5 Field Operations

3.5.1 Hi-Vol Samplers

To meet the requirements of 1-in-6 day sampling schedule, stations were visited once every six days. The exposed filter was recovered and a pre-weighed filter installed for the subsequent sample run. Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

Wood staff performed flow, temperature, and barometric pressure calibrations using an electronic BGI flow calibrator. The flows were calibrated to 16.7 litres per minute (LPM) for each station. Q2 Calibrations were performed on:

- February 21, 2018 – All hi-vols calibrated; and
- May 24, 2018 – All hi-vols calibrated.

3.5.2 PQ200 Samplers

To meet the requirements of 1-in-6 day sampling schedule, stations were visited once every six days. The exposed filter was recovered and a pre-weighed filter installed for the subsequent sample run.

Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

Wood staff performed flow, temperature, and barometric pressure calibrations using an electronic BGI flow calibrator. The flows were calibrated to 16.7 litres per minute (LPM) for each station. Q2 Calibrations were performed on:

- February 21, 2018 – All PQ200s calibrated; and
- May 24, 2018 – All PQ200s calibrated.

3.5.3 Dustfall Samplers

The dustfall samplers containing algaecide were changed every month, as required. Dustfall jars were provided by the laboratory with screw-on lids to prevent sample loss during transport.

3.5.4 Passive Samplers

The permeation filters in the passive samplers were changed every month, as required. Permeation filters were kept in filter cassettes inside Ziploc bags until deployed to prevent premature exposure. After the sample was collected, the filter was placed back in its cassette and into a Ziploc bag for shipment to the lab.

3.5.5 Performance and Site Audits

There were no MECP audits conducted in Q2 2018.

3.5.6 Equipment and Sampling Issues

During Q2 2018, the ambient air monitoring program was successful in collecting sufficient valid data to fulfil the requirements of the MECP Operations Manual. A number of invalid samples were collected and are discussed below:

- April 14: $PM_{2.5}$ samples at the Gallinger and Tait Road stations were invalidated due a timer error with both samplers.
- The May 2018 dustfall Gallinger Road sample was invalidated due the sample being contaminated with foreign organic matter (decayed insects, etc.).

4.0 RESULTS

Sampling program results for Q2 2018 are presented in Appendix A-1 for the particulate and metals data, Appendix A-2 for the dustfall data and Appendix A-3 for the passive SO_2 and NO_2 data. For the purpose of performing statistical analyses following MECP protocol, a value of half the detection limit was substituted for concentrations less than the detection limit.

For comparative purposes, the MECP AAQC and CAAQS values are presented, where available, noting that the AAQCs are numerically equivalent to the Ontario Regulation 419/05 Standards and Air Contaminant Benchmarks (ACBs) where the averaging times are equivalent.

Summaries of the statistical analyses for Q2 2018 for the TSP, metals, and $PM_{2.5}$ concentrations are presented in Tables 4-1, 4-2, and 4-3, respectively. During the quarter, the 1 in 6-day sampling schedule presented a possible 15 sampling days between April 1 and June 30, 2018.

A summary of the statistical analyses for Q2 2018 for the total dustfall data is presented in Table 4-4.

A summary of the statistical analysis for the Q2 2018 passive SO_2 and NO_2 results is presented in Table 4-5.

4.1 TSP and Metals

The Gallinger Road and Tait Road stations both collected 15 valid samples, respectively, resulting in 100% valid data for Q2 2018.

For the quarter, the geometric mean TSP concentrations were 36.8 µg/m^3 for the Tait Road station and 42.2 µg/m^3 for the Gallinger Road station. Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for TSP was 115 µg/m^3 at the Tait Road station (April 2, 2018), and 464 µg/m^3 at the Gallinger Road station (April 8, 2018).

The only exceedances of an MECP AAQC measured for any of TSP, metals, or metalloids in Q2 2018 was at the Gallinger Road Station on April 8, 2018 where a TSP concentration of 464 µg/m^3 (387% of AAQC) and the iron (Fe) concentration of 8.35 µg/m^3 (209% of AAQC) were measured and conservatively assuming all of the iron present was metallic.

The rolling 30-day average lead concentrations at both stations were at maximum 2.13% of the 30-day lead AAQC (0.2 µg/m^3) in Q2 2018.

Appendix A-1 and Figure 4-1 present individual sample data. The Q2 2018 TSP and metals summary statistics are summarized in Tables 4-1 and 4-2, respectively.

4.2 $PM_{2.5}$

The Gallinger Road and Tait Road stations both collected 14 valid samples, respectively, resulting in 93% valid data for Q2 2018. A timer error occurred at both stations on April 14, 2018, resulting in no sample collection which is identified as an invalid sample in the summary tables.

Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for $PM_{2.5}$ was 8.12 µg/m^3 at the Tait Road station (May 26, 2018), and 12.7 µg/m^3 at the Gallinger Road station (April 8, 2018).

There were no $PM_{2.5}$ exceedances of the AAQC of 30 µg/m^3 or CAAQS (ECCC 2013) of 28 µg/m^3 measured in Q2 2018. Appendix A-1 and Figure 4-2 present individual sample data.

The Q2 2018 $PM_{2.5}$ summary statistics are summarized in Table 4-3.

4.3 Total Dustfall

In Q2 2018, three valid samples were collected at each station, with the exception of the March 2018 Gallinger Road sample which was invalidated due to contamination. Each dustfall jar was exposed for approximately 30-days to coincide with each calendar month in the quarter.

There were no dustfall exceedances of the 30-day AAQC of 7 g/m^2 measured in Q2 2018.

A summary of the results is presented in Table 4-4 and the monthly results are presented in Appendix A-2.

4.4 Passive SO_2 and NO_2

In Q2 2018, three valid samples were collected at each station for each of SO_2 and NO_2.

There are no MECP standards, guidelines or AAQCs for SO_2 or NO_2 for a 30-day averaging period. The 30-day measured average SO_2 or NO_2 concentrations allow for future analysis of trends in the ambient concentrations, to identify any notable increases, and for potential comparison with dispersion modelling results.

For NO_2, the monthly results were compared to the MECP 24-hour AAQC converted to an equivalent 30-day average (78 µg/m^3) using the methodology outlined in the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MECP 2017). For SO_2, the results were compared against the Alberta Ambient Air Quality Objective of 30 µg/m^3 (AEP 2017).

A summary of the passive results is presented in Table 4-5 and the monthly results are presented in Appendix A-3.

4.5 Evaluation of Effects of Abatement Measures on Monitored Concentrations

The Rainy River Mine has a comprehensive Best Management Practices Plan (BMPP) for Fugitive Dust approved by the MECP as part of the ECA review process. This BMPP effectively controls the generation and dispersion of dust such that the particulate matter measured at the two ambient monitoring stations was below the AAQC for all Q2 2018 samples, with the exception of one TSP and iron concentration measured on April 8, 2018 at the Gallinger Road Station.

Table 4-1: Summary Statistics for Q2 2018 TSP Concentration Data

Statistics	Tait Road (SW)	Gallinger Road (NE)
Geometric Mean (µg/m^3)	36.8	42.2
Arithmetic Mean (µg/m^3)	42.5	70.4
April Maximum (µg/m^3)	115.2	464.1
May Maximum (µg/m^3)	76.2	46.69
June Maximum (µg/m^3)	56.8	37.6
Maximum 24-hr (µg/m^3)	115.2 (April 2)	464.1 (April 8)
90th percentile	68.4	112.2
95th percentile	87.9	218.0
24-hr AAQC	120	120
No. of valid samples	15	15
Valid data	100%	100%
No. samples > AAQC (particulate)	0	1
No. samples > AAQC (metals)	0	1*
No. samples > AAQC (metalloids)	0	0

* This exceedance was based upon the conservative assumption that 100% of the iron present is in the metallic form, as the filters are analyzed for iron as Fe.

Table 4-2: Summary Statistics for Q2 2018 Metals Concentration Data

Metal	24-hr AAQC (µg/m^3)	Tait Road (SW)		Gallinger Road (NE)	
		Maximum 24-hr Concentration (µg/m^3)	% 24-hr AAQC	Maximum 24-hr Concentration (µg/m^3)	% 24-hr AAQC
As	0.3	9.76E-04	0.33%	9.77E-04	0.33%
Cd	0.025	4.16E-04	1.66%	1.74E-04	0.70%
Cr	0.5	8.85E-03	1.77%	3.64E-02	7.28%
Co	0.1	8.40E-04	0.84%	5.08E-03	5.08%
Cu	50	5.27E-02	0.11%	1.00E+00	2.00%
Fe	4	1.94E+00	48.5%	8.35E+00	208.6%*
Pb	0.5	1.08E-02	2.16%	8.79E-03	1.76%
Mn	0.4	8.52E-02	21.3%	2.32E-01	58.1%
Ni	0.2	2.29E-03	1.15%	1.53E-02	7.67%
Se	10	1.00E-03	0.010%	8.11E-04	0.0081%
V	2	1.63E-03	0.081%	1.57E-02	0.78%
Zn	120	8.33E-02	0.069%	5.03E-02	0.042%

* This exceedance was based upon the conservative assumption that 100% of the iron present is in the metallic form, as the filters are analyzed for iron as Fe.

Table 4-3: Summary Statistics for Q2 2018 $PM_{2.5}$ Concentration Data

Statistics	Tait Road (SW)	Gallinger Road (NE)
Arithmetic Mean (µg/m^3)	4.15	4.48
April Maximum (µg/m^3)	6.33	12.7
May Maximum (µg/m^3)	8.12	7.16
June Maximum (µg/m^3)	4.58	5.33
Maximum 24-hr (µg/m^3)	8.12 (May 26)	12.7 (April 8)
90th percentile	7.11	6.61
95th percentile	7.68	9.1
24-hr CAAQS	28	28
No. of valid samples	14	14
Valid data	93%	93%
No. samples > CAAQS	0	0

Table 4-4: Summary Statistics for Q2 2018 Total Dustfall Data

Statistic	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean (g/m^3/30d)	3.4	3.8
Maximum (g/m^3/30d)	4.1	4.7
30-day AAQC	7	7
No. > AAQC	0	0
No. valid samples	3	2
Valid Data	100%	67%

Table 4-5: Summary Statistics for Q2 2018 Passive SO_2 and NO_2 Concentration Data

Statistic	Tait Road (SW)		Gallinger Road (NE)	
	SO_2	NO_2	SO_2	NO_2
Mean (µg/m^3)	0.2	1.1	0.1	0.6
Maximum (µg/m^3)	0.3	1.7	0.1	0.6
AAQC 24-hr converted to 30-day (µg/m^3)	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta AAQO (µg/m^3)	30 µg/m^3	N/A	30 µg/m^3	N/A
No. valid samples	3	3	3	3
Valid data	100%	100%	100%	100%

Note: N/A: No applicable criterion

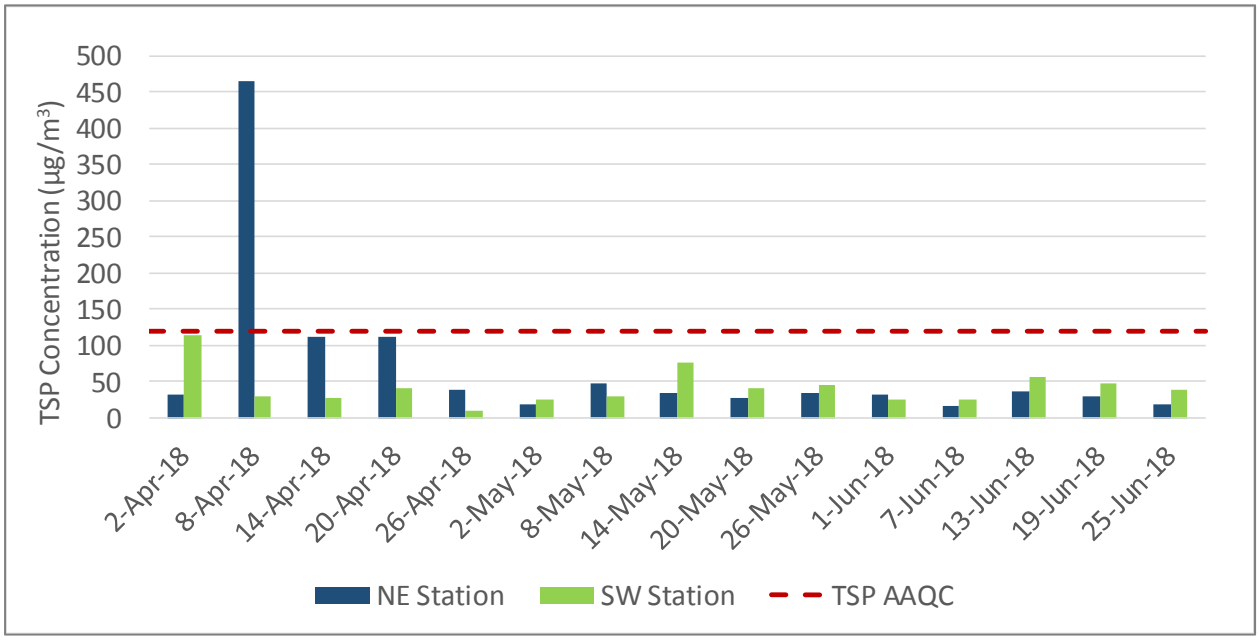

Figure 4-1: TSP Concentrations (Q2 2018)

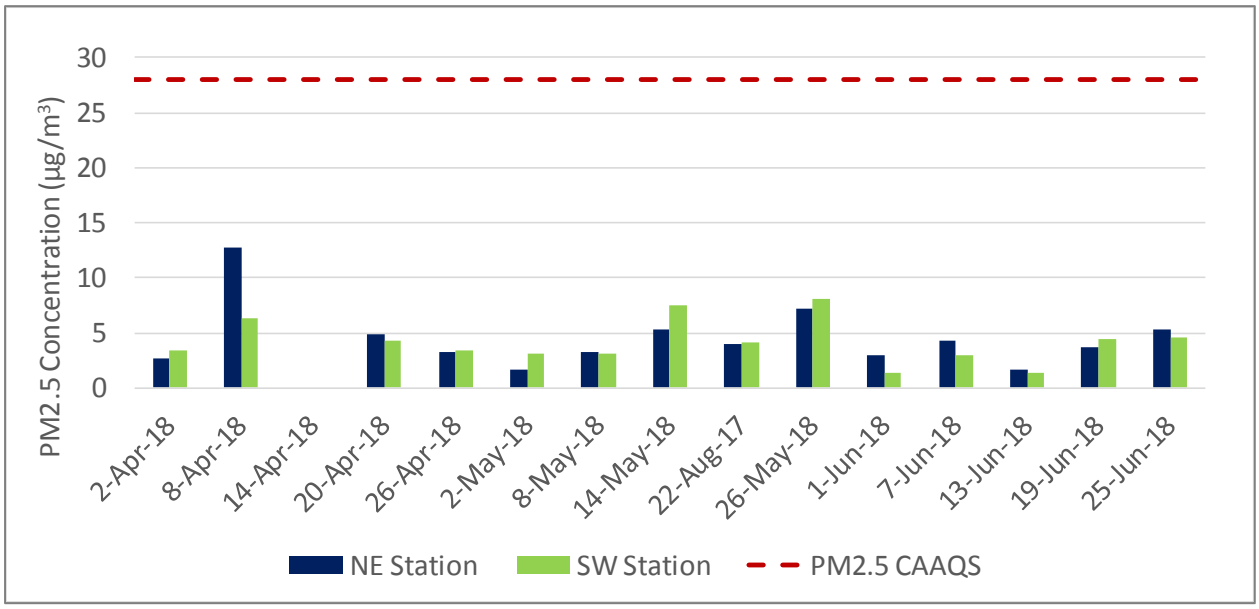

Figure 4-2: $PM_{2.5}$ Concentrations (Q2 2018)

5.0 CONCLUSIONS

This report summarizes the data collected in Q2 2018 for the ambient air quality monitoring program at the Rainy River Mine.

The monitoring program collects TSP, metals, $PM_{2.5}$, total dustfall, NO_2, and SO_2 ambient air quality data from two monitoring stations that were installed and commissioned in May 2015.

A summary of the Q2 2018 ambient air quality monitoring program results is provided below:

- There were 15 valid TSP samples collected at both stations resulting in 100% sample validity. Metal and metalloid concentrations were measured on each of the TSP filters.
- The only measured exceedances of an MECP AAQC for TSP, metals, or metalloids in Q2 2018 was at the Gallinger Road Station. On April 8, 2018 a TSP concentration of 464 µg/m^3 (387% of AAQC) and an iron (Fe) concentration of 8.35 µg/m^3 (209% of AAQC) were measured.
- There were 14 valid $PM_{2.5}$ samples collected at the Tait and Gallinger Road stations, (93% valid data). There were no exceedances of the 24-hour $PM_{2.5}$ CAAQS in Q2 2018.
- There were 3 valid dustfall samples collected at the Tait Road station (100% sample validity), and 2 valid dustfall samples collected at the Gallinger Road Station (67% validity). There were no exceedances of the 30-day dustfall AAQC in Q2 2018.
- There were 3 valid passive SO_2 and NO_2 samples collected at each of the two stations (100% sample validity). There were no exceedances of AEP Criterion for SO_2 or the 30-day equivalent AAQC for NO_2 in Q2 2018.

6.0 REFERENCES

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United States Environmental Protection Agency (USEPA). 2018. Sampling Schedule Calendar, https://www3.epa.gov/ttnamti1/calendar.html.

7.0 CLOSING

This *Rainy River Mine Ambient Air Quality Monitoring Program Second Quarter 2018 Report* was prepared by Wood for the sole benefit of New Gold Inc. for specific application to the Rainy River Mine. The quality of information, conclusions and estimates contained herein are consistent with the level of effort involved in Wood's services and based on:

i) information available at the time of preparation;

ii) data supplied by outside sources; and

iii) the assumptions, conditions and qualifications set forth in this document.

This report is intended to be used by New Gold only, and its nominated representatives, subject to the terms and conditions of its contract with Wood. Any other use of, or reliance on, this report by any third party is at that party's sole risk. This report has been prepared in accordance with generally accepted industry-standard practices. No other warranty, expressed or implied, is made.

If you require further information regarding the above or the Mine in general, please contact the undersigned at (905) 568-2929. Thank you for the opportunity to be of service to New Gold Inc.

Yours truly,
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APPENDIX A

SAMPLING RESULTS

Appendix A-1 TSP, Metals and $PM_{2.5}$ Sampling Results
Appendix A-2 Total Dustfall Sampling Results
Appendix A-3 SO_2 and NO_2 Passive Sampling Results

APPENDIX A-1

TSP, METALS AND $PM_{2.5}$ SAMPLING RESULTS

NORTHEAST (GALLINGER ROAD) PARTICULATE/METALS CONCENTRATIONS														
Date	**PM2.5**	**TSP**	**Arsenic (As)**	**Cadmium (Cd)**	**Chromium (Cr)**	**Cobalt (Co)**	**Copper (Cu)**	**Iron (Fe)**	**Lead (Pb)**	**Manganese (Mn)**	**Nickel (Ni)**	**Selenium (Se)**	**Vanadium (V)**	**Zinc (Zn)**
2-Apr-18	2.67	31.5	*9.77E-04*	1.26E-04	8.53E-03	2.96E-04	8.73E-01	5.60E-01	1.98E-03	1.83E-02	1.34E-03	*4.23E-04*	*1.63E-03*	1.73E-02
8-Apr-18	12.70	**464.1**	*9.63E-04*	1.74E-04	3.64E-02	5.08E-03	1.00E+00	**8.35E+00**	8.79E-03	2.32E-01	1.53E-02	*4.17E-04*	1.57E-02	5.03E-02
14-Apr-18	—	111.6	*9.25E-04*	5.80E-05	1.33E-02	1.11E-03	1.79E-01	2.04E+00	2.70E-03	5.11E-02	3.83E-03	*4.01E-04*	*1.54E-03*	1.57E-02
20-Apr-18	4.87	112.5	*9.48E-04*	1.08E-04	1.22E-02	1.30E-03	6.58E-01	2.29E+00	4.72E-03	6.58E-02	3.45E-03	*4.11E-04*	*1.58E-03*	2.42E-02
26-Apr-18	3.20	39.36	*9.36E-04*	1.18E-04	8.30E-03	3.09E-04	5.31E-01	6.36E-01	2.68E-03	2.19E-02	1.33E-03	*4.05E-04*	*1.56E-03*	2.26E-02
2-May-18	1.71	18.94	*9.56E-04*	6.76E-05	7.21E-03	1.46E-04	5.93E-01	3.19E-01	1.11E-03	1.43E-02	8.03E-04	*4.14E-04*	*1.59E-03*	7.40E-03
8-May-18	3.25	46.69	*9.61E-04*	1.09E-04	6.41E-03	4.36E-04	3.17E-01	7.69E-01	2.56E-03	2.75E-02	1.90E-03	*4.16E-04*	*1.60E-03*	2.04E-02
14-May-18	5.29	33.7	*9.43E-04*	1.03E-04	6.04E-03	2.42E-04	6.79E-01	4.45E-01	1.65E-03	1.81E-02	1.05E-03	*4.09E-04*	*1.57E-03*	1.19E-02
20-May-18	3.95	27.7	*9.03E-04*	9.51E-05	5.18E-03	2.23E-04	7.34E-01	4.33E-01	1.46E-03	1.37E-02	8.73E-04	*3.91E-04*	*1.51E-03*	1.01E-02
26-May-18	7.16	34.7	*9.35E-04*	1.14E-04	5.11E-03	1.39E-04	4.86E-01	2.52E-01	6.49E-04	8.92E-03	1.05E-03	8.11E-04	*1.56E-03*	8.98E-03
1-Jun-18	2.91	31.4	*9.18E-04*	5.57E-05	6.30E-03	2.05E-04	3.83E-01	3.31E-01	5.81E-04	1.14E-02	1.10E-03	*3.98E-04*	*1.53E-03*	8.81E-03
7-Jun-18	4.33	17.0	*8.88E-04*	5.86E-05	3.08E-03	8.05E-05	7.34E-01	1.22E-01	4.50E-04	3.04E-03	7.05E-04	*3.85E-04*	*1.48E-03*	6.16E-03
13-Jun-18	1.71	37.6	*9.02E-04*	7.93E-05	3.97E-03	2.07E-04	4.52E-01	4.17E-01	1.60E-03	1.59E-02	9.62E-04	*3.91E-04*	*1.50E-03*	1.22E-02
19-Jun-18	3.66	29.0	*8.84E-04*	8.84E-05	3.95E-03	1.76E-04	8.01E-01	3.00E-01	4.54E-04	7.48E-03	8.25E-04	*3.83E-04*	*1.47E-03*	5.89E-03
25-Jun-18	5.33	19.9	*8.74E-04*	9.03E-05	3.44E-03	8.56E-05	6.76E-01	2.23E-01	9.20E-04	5.80E-03	4.83E-04	*3.79E-04*	*1.46E-03*	6.47E-03
Geometric mean	N/A	42.2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arithmetic mean	4.48	70.4	9.28E-04	9.63E-05	8.62E-03	6.69E-04	6.07E-01	1.17E+00	2.15E-03	3.44E-02	2.34E-03	4.29E-04	2.49E-03	1.52E-02
Max. concentration	12.70	464.1	9.77E-04	1.74E-04	3.64E-02	5.08E-03	1.00E+00	8.35E+00	8.79E-03	2.32E-01	1.53E-02	8.11E-04	1.57E-02	5.03E-02
Min. concentration	1.71	17.0	8.74E-04	5.57E-05	3.08E-03	8.05E-05	1.79E-01	1.22E-01	4.50E-04	3.04E-03	4.83E-04	3.79E-04	1.46E-03	5.89E-03
90th percentile	6.61	112.2	9.62E-04	1.23E-04	1.28E-02	1.23E-03	8.44E-01	2.19E+00	3.91E-03	5.99E-02	3.68E-03	4.21E-04	1.62E-03	2.36E-02
95th percentile	9.10	218.0	9.67E-04	1.40E-04	2.02E-02	2.44E-03	9.11E-01	4.11E+00	5.94E-03	1.16E-01	7.28E-03	5.40E-04	5.86E-03	3.20E-02
CAAQS	28.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value*	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AAQC	N/A	120	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	1	0	0	0	0	0	1	0	0	0	0	0	0
No. of valid samples	14	15	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	0	0	15	0	0	0	0	0	0	0	0	14	14	0
Detection limit (µg)	6	5	6	2	5	2	5	50	3	50	3	10	5	5
Half detection limit (µg)	3	2.5	3	1	2.5	1	2.5	25	1.5	25	1.5	5	2.5	2.5
% < detection limit	0	0	100	0	0	0	0	0	0	0	0	93	93	0
% valid data	93	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
All results above their respective AAQC are bolded
N/A: Not applicable
—: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

SOUTHWEST (TAIT ROAD) PARTICULATE/METALS CONCENTRATIONS														
Date	**PM2.5**	**TSP**	**Arsenic (As)**	**Cadmium (Cd)**	**Chromium (Cr)**	**Cobalt (Co)**	**Copper (Cu)**	**Iron (Fe)**	**Lead (Pb)**	**Manganese (Mn)**	**Nickel (Ni)**	**Selenium (Se)**	**Vanadium (V)**	**Zinc (Zn)**
2-Apr-18	3.37	115.2	*9.76E-04*	4.16E-04	8.85E-03	7.68E-04	3.28E-02	1.94E+00	1.08E-02	8.52E-02	2.29E-03	*4.23E-04*	*1.63E-03*	8.33E-02
8-Apr-18	6.33	30.7	*9.74E-04*	7.40E-05	6.17E-03	2.72E-04	4.09E-02	5.79E-01	1.96E-03	1.76E-02	9.74E-04	*4.22E-04*	*1.62E-03*	1.40E-02
14-Apr-18	—	27.2	*9.64E-04*	7.01E-05	7.26E-03	1.95E-04	1.84E-02	3.76E-01	1.93E-03	1.25E-02	8.68E-04	*4.18E-04*	*1.61E-03*	1.19E-02
20-Apr-18	4.29	41.1	*9.71E-04*	7.51E-05	7.18E-03	3.84E-04	3.47E-02	8.15E-01	2.27E-03	2.36E-02	1.28E-03	*4.21E-04*	*1.62E-03*	1.51E-02
26-Apr-18	3.46	10.3	*9.07E-04*	3.02E-05	6.53E-03	1.36E-04	7.92E-03	2.41E-01	6.65E-04	6.90E-03	5.87E-04	*3.93E-04*	*1.51E-03*	8.53E-03
2-May-18	3.12	26.5	*9.43E-04*	7.48E-05	6.79E-03	2.15E-04	4.87E-02	4.58E-01	1.86E-03	1.78E-02	8.30E-04	*4.09E-04*	*1.57E-03*	1.35E-02
8-May-18	3.16	29.8	*9.26E-04*	5.86E-05	5.62E-03	2.98E-04	3.67E-02	5.83E-01	1.15E-03	1.83E-02	1.15E-03	*4.01E-04*	*1.54E-03*	9.88E-03
14-May-18	7.45	76.2	*9.00E-04*	9.18E-05	6.96E-03	8.40E-04	5.27E-02	1.70E+00	2.18E-03	5.11E-02	2.22E-03	*3.90E-04*	*1.50E-03*	2.02E-02
20-May-18	4.12	40.8	*9.16E-04*	3.91E-05	5.31E-03	3.68E-04	5.17E-02	6.23E-01	1.01E-03	1.61E-02	1.17E-03	*3.97E-04*	*1.53E-03*	8.18E-03
26-May-18	8.12	44.8	*8.36E-04*	6.80E-05	5.19E-03	3.46E-04	4.22E-02	5.50E-01	1.29E-03	1.62E-02	1.14E-03	1.00E-03	*1.39E-03*	1.27E-02
1-Jun-18	1.29	25.9	*9.13E-04*	8.22E-05	5.23E-03	1.36E-04	2.96E-02	1.88E-01	4.02E-04	5.62E-03	7.91E-04	*3.96E-04*	*1.52E-03*	8.28E-03
7-Jun-18	3.00	25.0	*9.48E-04*	3.10E-05	3.79E-03	2.48E-04	4.24E-02	3.62E-01	5.06E-04	7.78E-03	7.78E-04	*4.11E-04*	*1.58E-03*	8.28E-03
13-Jun-18	1.33	56.8	*9.13E-04*	4.87E-05	4.63E-03	6.15E-04	3.98E-02	9.99E-01	5.85E-04	2.35E-02	1.49E-03	*3.96E-04*	*1.52E-03*	7.98E-03
19-Jun-18	4.45	47.1	*8.80E-04*	4.40E-05	4.81E-03	4.49E-04	4.41E-02	7.57E-01	1.27E-03	1.87E-02	1.39E-03	*3.81E-04*	*1.47E-03*	1.30E-02
25-Jun-18	4.58	39.6	*8.93E-04*	4.46E-05	4.05E-03	3.46E-04	1.90E-02	6.37E-01	8.63E-04	1.32E-02	9.52E-04	*3.87E-04*	*1.49E-03*	6.55E-03
Geometric mean	N/A	36.8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arithmetic mean	4.15	42.5	9.24E-04	8.32E-05	5.89E-03	3.74E-04	3.61E-02	7.20E-01	1.92E-03	2.23E-02	1.19E-03	4.43E-04	1.54E-03	1.61E-02
Max. concentration	8.12	115.2	9.76E-04	4.16E-04	8.85E-03	8.40E-04	5.27E-02	1.94E+00	1.08E-02	8.52E-02	2.29E-03	1.00E-03	1.63E-03	8.33E-02
Min. concentration	1.29	10.3	8.36E-04	3.02E-05	3.79E-03	1.36E-04	7.92E-03	1.88E-01	4.02E-04	5.62E-03	5.87E-04	3.81E-04	1.39E-03	6.55E-03
90th percentile	7.11	68.4	9.73E-04	8.79E-05	7.23E-03	7.07E-04	5.05E-02	1.42E+00	2.23E-03	4.01E-02	1.93E-03	4.23E-04	1.62E-03	1.82E-02
95th percentile	7.68	87.9	9.75E-04	1.89E-04	7.74E-03	7.89E-04	5.20E-02	1.77E+00	4.83E-03	6.13E-02	2.24E-03	5.97E-04	1.62E-03	3.91E-02
CAAQS	28.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value*	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AAQC	N/A	120	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	14	15	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	0	0	15	0	0	0	0	0	0	0	0	14	15	0
Detection limit (µg)	6	5	6	2	5	2	5	50	3	50	3	10	5	5
Half detection limit (µg)	3	2.5	3	1	2.5	1	2.5	25	1.5	25	1.5	5	2.5	2.5
% < detection limit	0	0	100	0	0	0	0	0	0	0	0	93	100	0
% valid data	93	100	100	100	100	100	100	100	100	100	100	100	100	100

Notes:
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
All results above their respective AAQC are bolded
N/A: Not applicable
—: Invalid Sample
*Canadian Ambient Air Quality Standard, 24-hour standard

APPENDIX A-2

TOTAL DUSTFALL SAMPLING RESULTS

SW (Tait Road) Monitoring Results for Dustfall (Q2 2018)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
April	29	2.9	0.81	3.7
May	33	3.6	0.51	4.1
June	31	1.1	1.2	2.2

Arithmetic mean	3.4
Max. concentration	4.1
Min. concentration	2.2
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit*	0.30
Half detection limit	0.15

NE (Gallinger Road) Monitoring Results for Dustfall (Q2 2018)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
April	29	2.1	0.75	2.9
May	33	INV	INV	**INV**
June	31	1.9	2.9	4.7

Arithmetic mean	3.8
Max. concentration	4.7
Min. concentration	2.9
AAQC	7
No. > AAQC value**	0
No. of valid samples	2
% Valid data	67
No. samples < mdl	0
Detection limit*	0.30
Half detection limit	0.15

Notes:
All statistics were calculated using 1/2DL for values reported as <DL
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
N/A: Not applicable
N/R: No Results Available
—: Invalid Sample
*If samples had differing detection limits, the highest is displayed here
**Ontario Ambient Air Quality Criteria, 30-day standard

APPENDIX A-3

SO_2 AND NO_2 PASSIVE SAMPLING RESULTS

Monitoring Results for Passive SO_2 and NO_2 (Q2 2018)
(results expressed in µg/m^3)

	SW (Tait Road)		NE (Gallinger Road)	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
April	*0.1*	0.9	*0.1*	0.6
May	0.3	1.7	*0.1*	0.6
June	*0.1*	0.7	*0.1*	0.6
Arithmetic mean	0.2	1.1	0.1	0.6
Max. concentration	0.3	1.7	0.1	0.6
Min. concentration	0.1	0.7	0.1	0.6
AAQC* 24-hr converted to 30-day	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta Ambient Air Quality Objectives 2013	30 µg/m^3	N/A	30 µg/m^3	N/A
No. of valid samples	3	3	3	3
% Valid Data	100%	100%	100%	100%
No. samples < mdl	0	0	0	0
Detection limit	0.3	0.2	0.3	0.2
Half detection limit	0.15	0.1	0.15	0.1

Notes:
All statistics were calculated using 1/2DL for values reported as <DL
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
All results reported by the lab in parts per billion (ppb) and are converted to µg/m3 assuming 101.23kPA and 25C
N/A: Not applicable
N/R: No Results Available
—: Invalid Sample
*Ontario Ambient Air Quality Criteria

NEW GOLD INC.
RAINY RIVER MINE

AMBIENT AIR QUALITY MONITORING PROGRAM
THIRD QUARTER 2018 REPORT REVISION 1.1

Submitted by:

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited
160 Traders Blvd. E., Suite 110
Mississauga, Ontario
L4Z 3K7

December 2018
TC111504

wood.

Wood Environment & Infrastructure Solutions
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160 Traders Boulevard East
Suite 110
Mississauga, Ontario
Canada
T: 905.568.2929

December 5, 2018
TC111504

Sylvie St. Jean
Environmental Manager
New Gold Inc.
Rainy River Mine
5967 Hwy 11 / 71, P.O. Box 5
Emo, Ontario P0W 1E0

Dear Ms. St. Jean:

Re: Rainy River Mine
Ambient Air Quality Monitoring Program
Third Quarter 2018 Report

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (hereinafter referred to as Wood), is a leading environment and infrastructure, engineering, consulting and project management organization. Our team of professionals provides a full range of services to clients in a wide range of sectors including government, industrial & commercial, water, transportation, minerals & metals, oil & gas clients and clean energy.

Wood is submitting to New Gold Inc. (New Gold) the attached summary report of the results for the ambient air quality monitoring program for the third quarter of 2018 at the Rainy River Mine. The monitoring program consists of two air quality monitoring stations that were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. The sampling stations are operated and maintained by New Gold staff; Wood staff performed quarterly calibrations, provided technical guidance to New Gold field staff, communicated with the laboratory staff as required, and prepared the data summary report.

This report revision includes all laboratory data from Q3 2018.

Wood will supply the MECP with raw and edited data per the Operations Manual for Air Quality Monitoring in Ontario (MECP 2016b).

The key finding(s) of the Q3 2018 monitoring are as follows:

- There were no exceedances of the TSP, dustfall or metals/metalloids Ambient Air Quality Criteria AAQC, $PM_{2.5}$ Canadian Ambient Air Quality Standard CAAQS, or the SO_2, or NO_2 criteria measured in Q3 2018.

The measured TSP and $PM_{2.5}$ concentrations for the Q3 2018 are depicted in Figures CL-1 and CL-2.

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

Note that quarterly reports do not include interpretation of the data (i.e. exceedances); interpretation of results is included in the annual reporting. Should you have any questions or wish to discuss the air monitoring program, please do not hesitate to contact the undersigned.

Sincerely,

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited

<Original signed by>

Maha Vekar
Air Quality Technician

<Original signed by>

Linda Lattner, P.Eng., M.Eng.
Senior Air Quality Engineer

<Original signed by>

Ryan Fletcher, P.Eng
Air Quality Engineer

CC Dan Russell, Associate Geoscientist, Wood
Twila Griffith, Senior Environmental Coordinator, New Gold

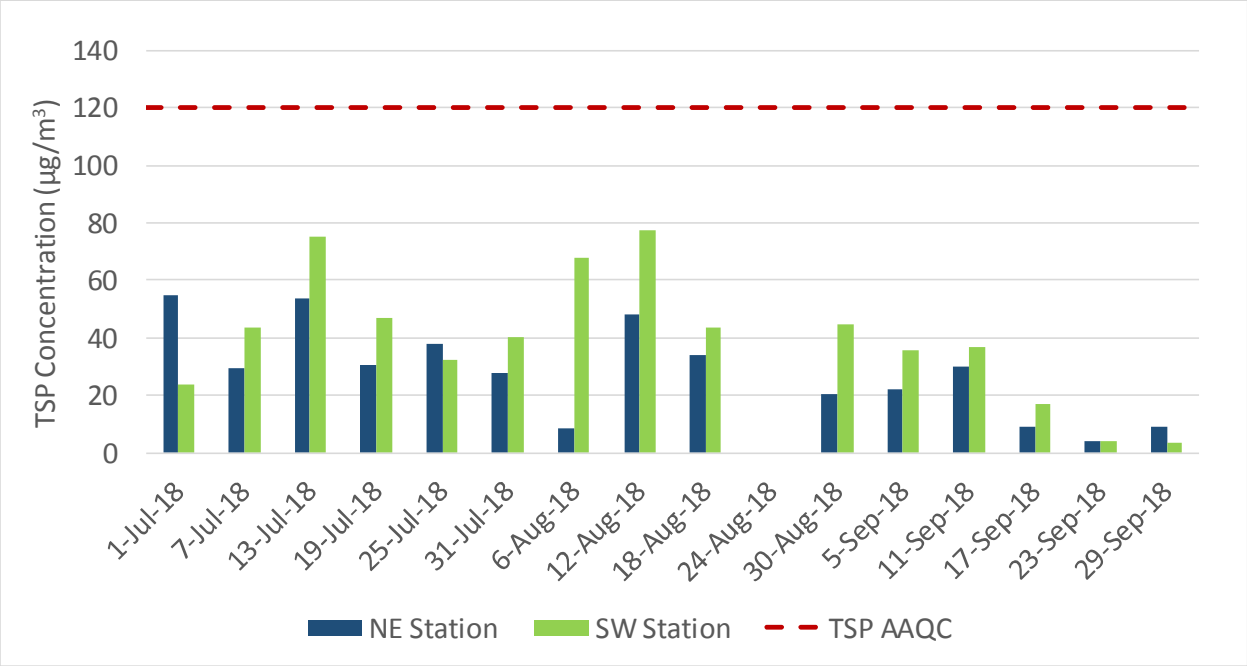

Figure CL-1: TSP Concentrations (Q3 2018)

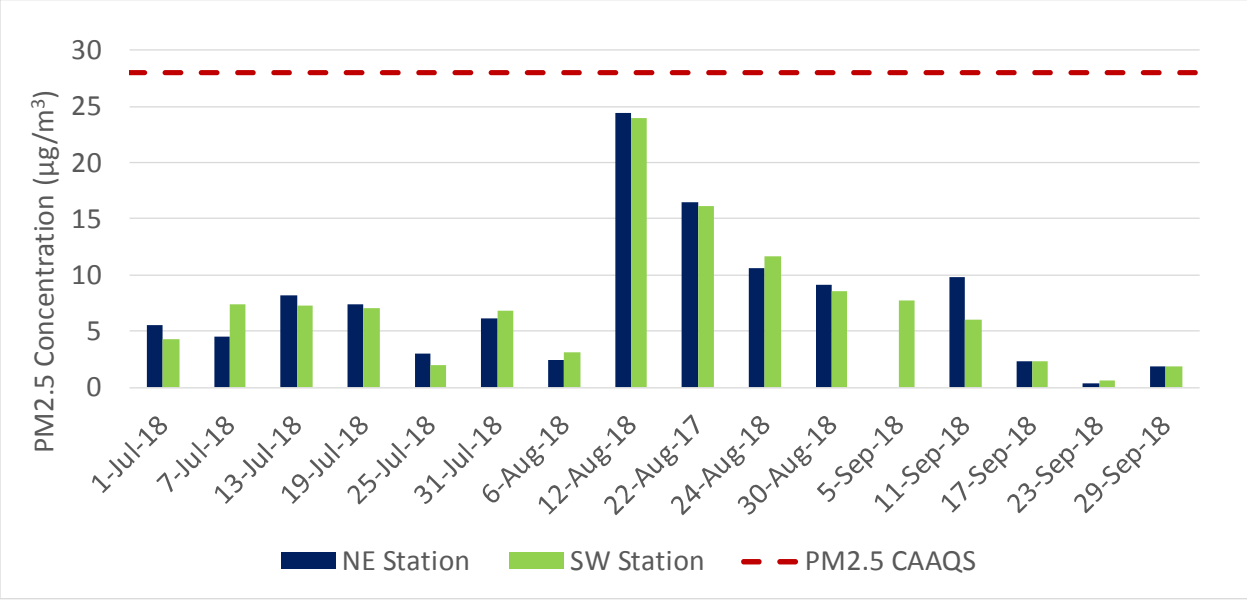

Figure CL-2: $PM_{2.5}$ Concentrations (Q3 2018)

Revision	Date	Revised By	Description
0	November 12, 2018	Ryan Fletcher	Draft Report
1	November 15, 2018	Ryan Fletcher	Final Report (Pending laboratory results)
1.1	December 5, 2018	Ryan Fletcher	Final Report

ACRONYMS AND ABBREVIATIONS

AAQC	Ambient Air Quality Criteria
AAQO	Alberta Ambient Air Quality Objectives
ACFM	Cubic Feet Per Minute at Actual Conditions
AEP	Alberta Environment and Parks
ASTM	American Society for Testing and Materials
BCMOE	British Columbia Ministry of the Environment
CAAQS	Canadian Ambient Air Quality Standards
Hi-Vol	High Volume Sampler
ICP/AES	Inductively Coupled Plasma / Atomic Emission Spectroscopy
LPM	Litres Per Minute
MECP	Ministry of the Environment, Conservation and Parks
NIST	National Institute of Standards and Technology
TSP	Total Suspended Particulate
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
US EPA	United States Environmental Protection Agency
$\mu g/m^3$	Microgram per Cubic Metre

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Appendix A-3 SO_2 and NO_2 Passive Sampling Results

1.0 INTRODUCTION

This report presents a summary of the Third Quarter (Q3) 2018 results for the ambient air quality monitoring program undertaken at the Rainy River Mine located in northwestern Ontario. Two sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 realignment at Tait Road, and one to the east of the Site on Gallinger Road (Figures 2-1, 2-2 and 2-3).

New Gold Inc. (New Gold) staff operate and maintain the sampling stations. Wood staff performed quarterly calibrations, provided technical guidance to New Gold field staff, communicated with the laboratory staff as required, and prepared the data summary reports. An extended completion date was issued by the laboratory for the final three samples in September, as well as the September dustfall samples. After consultation with the laboratory they agreed to try to meet our reporting deadline, which occurred for all parameters except metals. This report revision includes the complete laboratory dataset.

This Quarterly Ambient Air Quality Report addresses the required elements of a Quarterly Report defined in the *Operations Manual for Air Quality Monitoring in Ontario* (MECP 2016b), hereafter referred to as the Operations Manual. Specifically, the following information is provided:

- Summary statistics;
- Sampling dates (start and end where applicable); and
- A summary of exceedances of an Ontario Standard, Ambient Air Quality Criterion (AAQC), or Canadian Ambient Air Quality Standard (CAAQS).

The purpose of the air monitoring program is to quantify potential air quality effects associated with activities related to the Mine. The monitoring program consists of:

- Two High Volume (Hi-Vol) samplers for discrete sampling of Total Suspended Particulate (TSP) and metals;
- Two PQ200 samplers for discrete sampling of respirable particulate matter ($PM_{2.5}$);
- Two standard passive dustfall collection units;
- Two passive sampling enclosures each measuring NO_2 and SO_2; and
- One meteorological station to obtain real-time site wind speed, wind direction, temperature, relative humidity, and precipitation.

2.0 MONITORING STATIONS

The ambient monitoring stations were sited in accordance with the criteria stipulated in the MECP Operations Manual (MECP 2018).

The general location for the two stations is shown in Figure 2-1. UTM co-ordinates for each station based upon NAD 83, are presented in Table 2-1. Photographs showing each station and the equipment installed are presented as Figures 2-2 and 2-3.

There were no changes to the stations or station locations in Q3 2018.

Table 2-1: Ambient Air Monitoring Stations

Station	UTM Co-ordinates			Parameters Monitored
	Easting (m)	Northing (m)	Zone	
Tait Road Station – Southwest	426 072	5 406 996	15	TSP, metals, $PM_{2.5}$, NO_2, SO_2, total dustfall Meteorological data (wind speed and direction, ambient temperature, relative humidity, rainfall)
Gallinger Road Station - Northeast	431 133	5 410 534	15	TSP, metals, $PM_{2.5}$, NO_2, SO_2, total dustfall

410000 415000 420000 425000 430000 435000 440000 445000 450000

5425000 5420000 5415000 5410000 5405000

Hwy 600
Hwy 600
Hwy 600
Hwy 600
Hwy 617
Hwy 71
Hwy 71
Hwy 615
Hwy 600
Hwy 404 East Rd
Burditt Lake
Beadle Lake
Preachers Lake
Spring Lake
Little Pine Lake
Boundary Lake
Pony Lake
Off Lake
Manomin Rd
Muskrat Lake
Finland
Korpi Road
Lampi Rd
Existing Transmission Line
Flaming Rd
Tailings Management Area
Marr Rd
Roen Rd
Clark Road
Overburden
West Mine Rock
Open Pit
East Mine Rock
Teeple Road
Dearlock
Pinewood River
Pinewood Lake
Heatwole Road
Northeast Monitoring Station (Gallinger Road)
Southwest Monitoring Station (Tait Road)
Tait Road
Black Hawk
Pump House

P:\EM\Projects\2011\TC111504 Rainy River\GIS\E\AA\MXD_Maps\RR_NG_Property Ambient_quality_monitoring7.mxd

LEGEND

- Ambient Air Quality Monitoring Stations
- New Gold - Rainy River Property Boundary
- New Gold Lands with No Current Access Control

Proposed Site Features

- Underground Portal
- Open Pit
- Plant Site / Ancillary Facilities
- Explosives Facilities
- Overburden / West Mine Rock Stockpile
- Ore / East Mine Rock Stockpile
- Proposed Pump House
- Tailings Management Area
- Aggregate Pit / Quarry
- Site Roads
- Roads
- Existing Transmission Line
- First Nation Land

NOTES:
- Road and Utility data and topographic data extracted from Land Information Ontario, Ontario Road Network, MNR Queen's Printer for Ontario, 2011-2012
- Land tenure information and parcels provided by NewGold, March 13, 2018.

Datum: NAD83
Projection: UTM Zone 15N

0 2 4 8 12 16 20 Kilometres

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring Stations

PROJECT N°: TC111504 | **FIGURE: 2-1**

SCALE: 1:100,000 | DATE: May 2018

425950 426000 426050 426100 426150 426200

5407000

5406950

5406900

69 m

TAIT ROAD

P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\a\MXD_Mapsl\RR_NG_Ambient_quality_monitoring_stationTait_3.mxd

LEGEND

- Southwest Monitoring Station (Tait Road)
- Highway Re-alignment

Notes:
- Aerial imagery provided by NewGold Plieades imagery (October 2017).

0 10 20 40 60 80 100 Meters

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring
Southwest Monitoring Station

PROJECT N°: TC111504 | **FIGURE: 2-2**

SCALE: 1:700 | DATE: May 2018

P:\EM\Projects\2011\TC111504 Rainy River\GIS\ESIA\AirMXD_Maps\RR_NG_Ambient_quality_monitoring_station_Gallinger_3.mxd

LEGEND

- Northeast Monitoring Station (Gallinger Road)
- Gallinger Road

Notes:
- Aerial imagery provided by NewGold Plieades imagery (October 2017).

0 10 20 40 60 80 100 Meters

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring Northeast Monitoring Station

PROJECT N°: TC111504	**FIGURE: 2-3**
SCALE: 1:700	DATE: May 2018

3.0 ANALYTICAL AND MONITORING METHODS

3.1 TSP and Metals

The TSP concentrations were determined using the standard gravimetric reference methods approved by the United States Environmental Protection Agency (US EPA) and the Ontario Ministry of the Environment, Conservation and Parks (MECP), as described in the Operations Manual (MECP 2016b). Measurements of 24-hour average TSP and metal concentrations were collected as specified in the Operations Manual (MECP 2016b); particulate samples were collected every sixth day as per the North American schedule (US EPA 2017). Sampling was performed with Hi-Vol samplers (brush motor and mass flow controlled). Metals and metalloids analyzed included the following: arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), vanadium (V) and zinc (Zn). A metalloid is an element such that has both metallic and non-metallic properties.

The lowest detectable limit of total particulate on the filter is 2.3 milligrams (mg). A typical 24-hour sample volume of 1,630 m^3 results in a method detection limit of 1.4 micrograms per cubic metre ($\mu g/m^3$).

Metal concentrations were determined using standard Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP/AES) methodology. Method detection limits are as shown on the data sheets in Appendix A-1.

3.2 $PM_{2.5}$

Sampling was performed with PQ200 samplers. $PM_{2.5}$ concentrations were determined using the standard gravimetric reference methods approved by the US EPA and the MECP, as described in the Operations Manual (MECP 2016b). $PM_{2.5}$ measurements were collected over a 24-hour period to match the averaging time for the Canadian Ambient Air Quality Standard (CAAQS); particulate samples were collected every sixth day as per the North American schedule (US EPA 2017).

The lowest detectable limit of $PM_{2.5}$ on the Teflon filters is 1 µg. A typical 24-hour sample volume of 24 m^3 results in a method detection limit of 0.04 $\mu g/m^3$.

3.3 Total Dustfall

Water soluble and insoluble portions of dustfall were determined using ASTM method D-1739-98 and the British Columbia Ministry of Environment method outlined in Section G of Air Constituents – Inorganic (MECP 2016c). Standard dustfall samplers were used to measure total dustfall deposition. The method detection limit for total dustfall is 0.3 g/m^2/30 days. Bird deterrents were added in Q3 2017 with the goal of reducing contamination.

3.4 Passive Sampling for SO_2 and NO_2

SO_2 and NO_2 concentrations were monitored with passive sampling devices. The exposed permeation filters were analyzed by the Maxxam Analytics Inc. laboratory (Edmonton, Alberta). Testing was performed using methodology developed, approved and validated by Alberta Environment with the support of the Alberta Research Council, the Clean Air Strategic Alliance of Alberta, and the National Research Council of Canada, and following the Standard Operating Procedures for Trace Gas Passive Sampling outlined in the Operations Manual (MECP 2016b).

Sample uptake is dependent on temperature, relative humidity and wind speed. Analytical results are adjusted for these meteorological parameters measured during the exposure period (monthly averages). Required meteorological data were obtained from the Environment and Climate Change Canada website. Fort Frances meteorological station (Climate ID 6022474) is downloaded by Maxxam Analytics with each sample submission. For both SO_2 and NO_2, the analytical method detection limit is in the order of 0.1 parts per billion (ppb). Validation tests conducted in Alberta show that results from passive sampling are typically within 10% of those obtained from sampling with continuous analyzers for 30-day exposure periods.

Since there are no MECP guidelines for monthly concentrations of SO_2 and NO_2 obtained from passive sampling, the data is only used for screening purposes. For NO_2, the monthly results were compared to the MECP 24-hour AAQC converted to an equivalent 30-day average (78 µg/m^3) using the methodology outlined in the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MECP 2017). For SO_2, the results were compared against the 30-day Alberta Ambient Air Quality Objective of 30 µg/m^3 (AEP 2016).

3.5 Field Operations

3.5.1 Hi-Vol Samplers

To meet the requirements of 1-in-6 day sampling schedule, stations were visited once every six days. The exposed filter was recovered and a pre-weighed filter installed for the subsequent sample run. Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

Wood staff performed flow, temperature, and barometric pressure calibrations using an electronic BGI flow calibrator. The flows were calibrated to 16.7 litres per minute (LPM) for each station. Q3 Calibrations were performed on:

- May 24, 2018 – All hi-vols calibrated; and
- August 20, 2018 – All hi-vols calibrated.

3.5.2 PQ200 Samplers

To meet the requirements of 1-in-6 day sampling schedule, stations were visited once every six days. The exposed filter was recovered and a pre-weighed filter installed for the subsequent sample run. Additional visits were made to resolve instrumentation issues and perform flow calibration checks and preventative maintenance.

Wood staff performed flow, temperature, and barometric pressure calibrations using an electronic BGI flow calibrator. The flows were calibrated to 16.7 litres per minute (LPM) for each station. Q3 Calibrations were performed on:

- May 24, 2018 – All PQ200s calibrated; and
- August 20, 2018– All PQ200s calibrated.

3.5.3 Dustfall Samplers

The dustfall samplers containing algaecide were changed every month, as required. Dustfall jars were provided by the laboratory with screw-on lids to prevent sample loss during transport.

3.5.4 Passive Samplers

The permeation filters in the passive samplers were changed every month, as required. Permeation filters were kept in filter cassettes inside Ziploc bags until deployed to prevent premature exposure. After the sample was collected, the filter was placed back in its cassette and into a Ziploc bag for shipment to the lab.

3.5.5 Performance and Site Audits

There were no MECP audits conducted in Q3 2018.

3.5.6 Equipment and Sampling Issues

During Q3 2018, the ambient air monitoring program was successful in collecting sufficient valid data to fulfil the requirements of the MECP Operations Manual. Three samples were invalidated, as discussed below:

- August 24: TSP samples at the Gallinger and Tait Road stations were invalidated due to insufficient volume collection at both samplers.
- September 5: The $PM_{2.5}$ sample at the Gallinger Road station was invalidated due to a sampler error resulting in an approximately 60 hour run time.

4.0 RESULTS

Sampling program results for Q3 2018 are presented in Appendix A-1 for the particulate and metals data, Appendix A-2 for the dustfall data and Appendix A-3 for the passive SO_2 and NO_2 data. For the purpose of performing statistical analyses following MECP protocol, a value of half the detection limit was substituted for concentrations less than the detection limit.

For comparative purposes, the MECP AAQC and CAAQS values are presented, where available, noting that the AAQCs are numerically equivalent to the Ontario Regulation 419/05 Standards and Air Contaminant Benchmarks (ACBs) where the averaging times are equivalent.

Summaries of the statistical analyses for Q3 2018 for the TSP, metals, and $PM_{2.5}$ concentrations are presented in Tables 4-1, 4-2, and 4-3, respectively. During the quarter, the 1 in 6-day sampling schedule presented a possible 15 sampling days between July 1 and September 30, 2018.

A summary of the statistical analyses for Q3 2018 for the total dustfall data is presented in Table 4-4.

A summary of the statistical analysis for the Q3 2018 passive SO_2 and NO_2 results is presented in Table 4-5.

4.1 TSP and Metals

The Gallinger Road and Tait Road stations both collected 15 valid samples, respectively, resulting in 94% valid data for Q3 2018. A sampler error occurred at both stations on August 24th resulting in insufficient volume collection, thus invalidating the sample.

For the quarter, the geometric mean TSP concentrations were 30.3 µg/m^3 for the Tait Road station and 22.3 µg/m^3 for the Gallinger Road station. Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for TSP was 77.2 µg/m^3 at the Tait Road station (August 12, 2018), and 55.0 µg/m^3 at the Gallinger Road station (July 1, 2018).

The rolling 30-day average lead concentration at the Tait Road station and Gallinger Road stations was at maximum 0.80% and 1.05%, respectively, of the 30-day lead AAQC (0.2 µg/m^3) in Q3 2018.

Appendix A-1 and Figure 4-1 present individual sample data. The Q3 2018 TSP and metals summary statistics are summarized in Tables 4-1 and 4-2, respectively.

4.2 $PM_{2.5}$

The Gallinger Road station collected 15 valid samples resulting in 94% valid data for Q3 2018. The Tait Road station collected 16 valid samples resulting in 100% valid data. A sampler error occurred at the Gallinger Road station on September 5th resulting in an excessive sample run time, thus invalidating the sample.

Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for $PM_{2.5}$ was 24.0 µg/m³ at the Tait Road station (August 12, 2018), and 24.4 µg/m³ at the Gallinger Road station (August 12, 2018).

There were no $PM_{2.5}$ exceedances of the AAQC of 30 µg/m³ or CAAQS (ECCC 2013) of 28 µg/m³ measured in Q3 2018. Appendix A-1 and Figure 4-2 present individual sample data.

The Q3 2018 $PM_{2.5}$ summary statistics are summarized in Table 4-3.

4.3 Total Dustfall

In Q3 2018, three valid samples were collected at each station. Each dustfall jar was exposed for approximately 30-days to coincide with each calendar month in the quarter.

There were no dustfall exceedances of the 30-day AAQC of 7 g/m² measured in Q3 2018.

A summary of the results is presented in Table 4-4 and the monthly results are presented in Appendix A-2.

4.4 Passive SO_2 and NO_2

In Q3 2018, three valid samples were collected at each station for each of SO_2 and NO_2.

There are no MECP standards, guidelines or AAQCs for SO_2 or NO_2 for a 30-day averaging period. The 30-day measured average SO_2 or NO_2 concentrations allow for future analysis of trends in the ambient concentrations, to identify any notable increases, and for potential comparison with dispersion modelling results.

For NO_2, the monthly results were compared to the MECP 24-hour AAQC converted to an equivalent 30-day average (78 µg/m³) using the methodology outlined in the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MECP 2017). For SO_2, the results were compared against the Alberta Ambient Air Quality Objective of 30 µg/m³ (AEP 2017).

A summary of the passive results is presented in Table 4-5 and the monthly results are presented in Appendix A-3.

4.5 Evaluation of Effects of Abatement Measures on Monitored Concentrations

The Rainy River Mine has a comprehensive Best Management Practices Plan (BMPP) for Fugitive Dust approved by the MECP as part of the ECA review process. This BMPP effectively controls the generation and dispersion of dust such that the particulate matter measured at the two ambient monitoring stations was below the AAQC for all Q3 2018 samples.

Table 4-1: Summary Statistics for Q3 2018 TSP Concentration Data

Statistics	Tait Road (SW)	Gallinger Road (NE)
Geometric Mean (µg/m^3)	30.3	22.3
Arithmetic Mean (µg/m^3)	39.5	28.0
July Maximum (µg/m^3)	75.4	55.0
August Maximum (µg/m^3)	77.2	48.3
September Maximum (µg/m^3)	37.0	30.1
Maximum 24-hr (µg/m^3)	77.2	55.0
90th percentile	13.9	51.6
95th percentile	18.1	54.1
24-hr AAQC	120	120
No. of valid samples	15	15
Valid data	94%	94%
No. samples > AAQC (particulate)	0	0
No. samples > AAQC (metals)	0	0
No. samples > AAQC (metalloids)	0	0

Table 4-2: Summary Statistics for Q3 2018 Metals Concentration Data

Metal	24-hr AAQC (µg/m^3)	Tait Road (SW)		Gallinger Road (NE)	
		Maximum 24-hr Concentration (µg/m^3)	Fraction of 24-hr AAQC	Maximum 24-hr Concentration (µg/m^3)	Fraction of 24-hr AAQC
As	0.3	9.79E-04	0.3 %	9.44E-04	0.3 %
Cd	0.025	6.53E-04	2.6 %	5.99E-04	2.4 %
Cr	0.5	7.85E-03	1.6 %	6.54E-03	1.3 %
Co	0.1	8.50E-04	0.8 %	5.99E-04	0.6 %
Cu	50	1.12E-01	0.2 %	5.85E-01	1.2 %
Fe	4	1.19E+00	29.8 %	6.72E-01	16.8 %
Pb	0.5	2.80E-03	0.6 %	4.29E-03	0.9 %
Mn	0.4	4.09E-02	10.2 %	2.41E-02	6.0 %
Ni	0.2	2.00E-03	1.0 %	1.04E-03	0.5 %
Se	10	3.26E-03	0.04 %	2.99E-03	0.03 %
V	2	1.63E-03	0.09 %	1.57E-03	0.08 %
Zn	120	2.31E-02	0.02 %	3.09E-02	0.03 %

Table 4-3: Summary Statistics for Q3 2018 $PM_{2.5}$ Concentration Data

Statistics	Tait Road (SW)	Gallinger Road (NE)
Arithmetic Mean (µg/m^3)	7.30	7.48
July Maximum (µg/m^3)	7.41	8.25
August Maximum (µg/m^3)	24.0	24.4
September Maximum (µg/m^3)	7.79	9.78
Maximum 24-hr (µg/m^3)	24.0	24.4
90th percentile	13.9	14.2
95th percentile	18.1	18.9
24-hr CAAQS	28	28
No. of valid samples	16	15
Valid data	100%	93%
No. samples > CAAQS	0	0

Table 4-4: Summary Statistics for Q3 2018 Total Dustfall Data

Statistic	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean (g/m^2/30d)	3.4	2.7
Maximum (g/m^2/30d)	4.8	4.5
30-day AAQC	7	7
No. > AAQC	0	0
No. valid samples	3	3
Valid Data	100%	100%

Table 4-5: Summary Statistics for Q3 2018 Passive SO_2 and NO_2 Concentration Data

Statistic	Tait Road (SW)		Gallinger Road (NE)	
	SO_2	NO_2	SO_2	NO_2
Mean (µg/m^3)	0.2	1.1	0.1	1.0
Maximum (µg/m^3)	0.3	1.5	0.1	1.1
AAQC 24-hr converted to 30-day (µg/m^3)	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta AAQO (µg/m^3)	30 µg/m^3	N/A	30 µg/m^3	N/A
No. valid samples	3	3	3	3
Valid data	100%	100%	100%	100%

Note: N/A: No applicable criterion

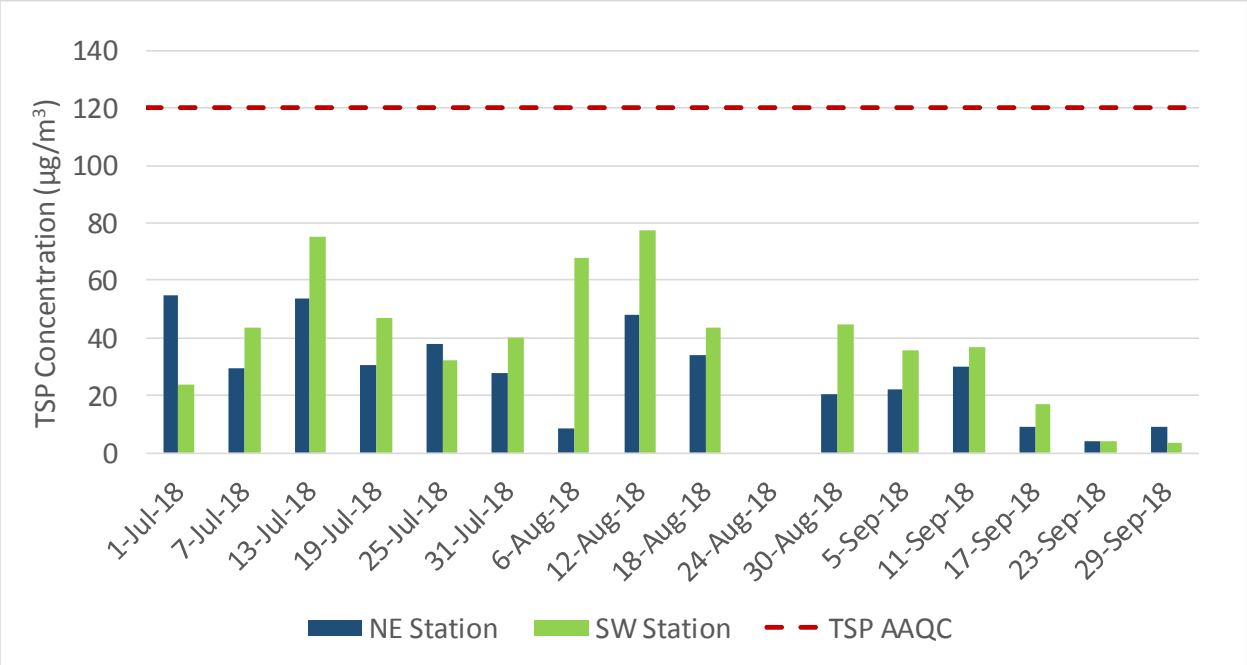

Figure 4-1: TSP Concentrations (Q3 2018)

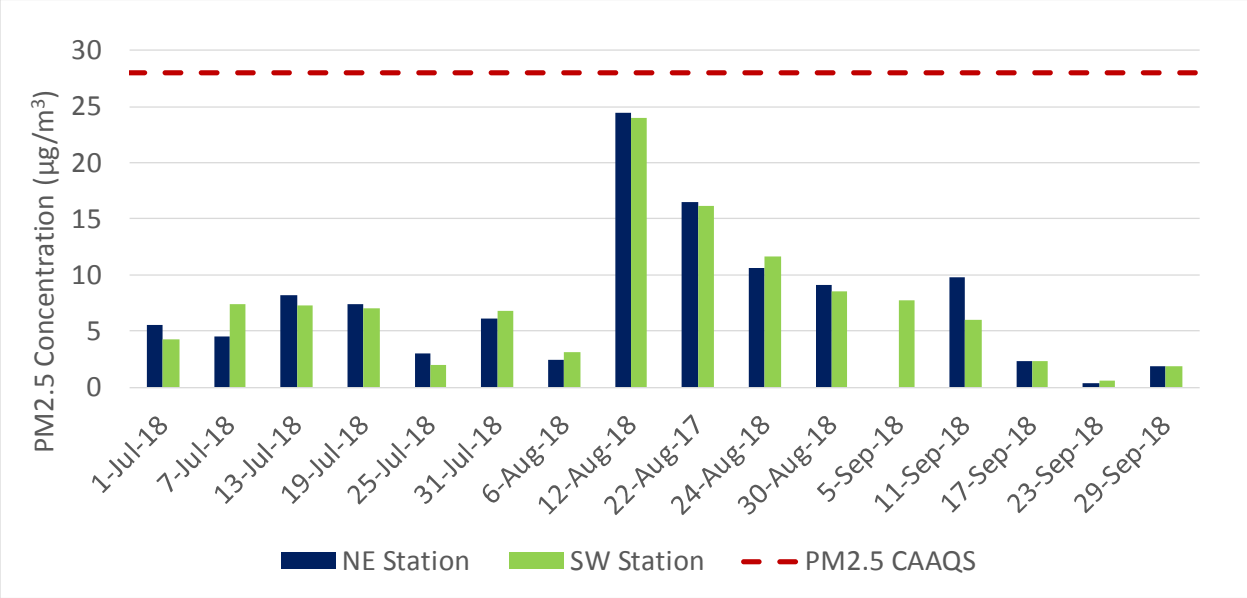

Figure 4-2: $PM_{2.5}$ Concentrations (Q3 2018)

5.0 CONCLUSIONS

This report summarizes the data collected in Q3 2018 for the ambient air quality monitoring program at the Rainy River Mine.

The monitoring program collects TSP, metals, $PM_{2.5}$, total dustfall, NO_2, and SO_2 ambient air quality data from two monitoring stations that were installed and commissioned in May 2015.

A summary of the Q3 2018 ambient air quality monitoring program results is provided below:

- There were 15 valid TSP samples collected at both stations, resulting in 94% sample validity. Metal and metalloid concentrations were measured on each of the TSP filters. There were no exceedances of the TSP or metals/metalloids AAQC;
- There were 15 valid $PM_{2.5}$ samples collected at the Gallinger Road station, (94% valid data) and 16 valid samples collected at the Tait Road Station, (100% valid data). There were no exceedances of the 24-hour $PM_{2.5}$ CAAQS;
- There were 3 valid dustfall samples collected at the Tait Road Station and Gallinger Road Station, resulting in 100% sample validity. There were no exceedances of the 30-day dustfall AAQC; and
- There were 3 valid passive SO_2 and NO_2 samples collected at each of the two stations, resulting in 100% sample validity. There were no exceedances of AEP Criterion for SO_2 or the 30-day equivalent AAQC for NO_2.

6.0 REFERENCES

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Ministry of the Environment, Conservation and Parks (MECP). 2016c. Determination of Total Dustfall in Air Particulate Matter by Gravimetry, E3043.

United States Environmental Protection Agency (USEPA). 2018. Sampling Schedule Calendar, https://www3.epa.gov/ttnamti1/calendar.html.

7.0 CLOSING

This *Rainy River Mine Ambient Air Quality Monitoring Program Third Quarter 2018 Report* was prepared by Wood for the sole benefit of New Gold Inc. for specific application to the Rainy River Mine. The quality of information, conclusions and estimates contained herein are consistent with the level of effort involved in Wood's services and based on:

i) information available at the time of preparation;

ii) data supplied by outside sources; and

iii) the assumptions, conditions and qualifications set forth in this document.

This report is intended to be used by New Gold only, and its nominated representatives, subject to the terms and conditions of its contract with Wood. Any other use of, or reliance on, this report by any third party is at that party's sole risk. This report has been prepared in accordance with generally accepted industry-standard practices. No other warranty, expressed or implied, is made.

If you require further information regarding the above or the Mine in general, please contact the undersigned at (905) 568-2929. Thank you for the opportunity to be of service to New Gold Inc.

Yours truly,

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APPENDIX A

SAMPLING RESULTS

Appendix A-1 TSP, Metals and $PM_{2.5}$ Sampling Results
Appendix A-2 Total Dustfall Sampling Results
Appendix A-3 SO_2 and NO_2 Passive Sampling Results

APPENDIX A-1

TSP, METALS AND $PM_{2.5}$ SAMPLING RESULTS

NORTHEAST (GALLINGER ROAD) PARTICULATE/METALS CONCENTRATIONS														
Date	PM2.5	TSP	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Manganese (Mn)	Nickel (Ni)	Selenium (Se)	Vanadium (V)	Zinc (Zn)
1-Jul-18	5.54	55.0	*8.69E-04*	1.47E-04	4.29E-03	2.87E-04	5.85E-01	6.72E-01	1.93E-03	2.18E-02	1.04E-03	*3.77E-04*	*1.45E-03*	2.12E-02
7-Jul-18	4.54	29.7	*8.60E-04*	9.63E-05	4.30E-03	1.16E-04	1.68E-01	2.66E-01	1.13E-03	1.07E-02	5.73E-04	*3.73E-04*	*1.43E-03*	1.05E-02
13-Jul-18	8.25	53.8	*8.63E-04*	1.02E-04	5.75E-03	2.00E-04	2.71E-01	3.73E-01	2.00E-03	2.17E-02	6.73E-04	*3.74E-04*	*1.44E-03*	1.94E-02
19-Jul-18	7.41	30.8	*8.76E-04*	8.76E-05	5.96E-03	1.76E-04	4.22E-01	3.84E-01	1.12E-03	1.99E-02	6.48E-04	*3.80E-04*	*1.46E-03*	9.87E-03
25-Jul-18	3.00	37.9	*8.88E-04*	1.27E-04	6.21E-03	1.70E-04	3.09E-01	3.76E-01	4.29E-03	2.34E-02	6.57E-04	*3.85E-04*	*1.48E-03*	3.09E-02
31-Jul-18	6.16	27.6	*9.44E-04*	6.23E-05	6.54E-03	1.52E-04	1.94E-01	2.83E-01	1.00E-03	1.75E-02	5.41E-04	*4.09E-04*	*1.57E-03*	9.00E-03
6-Aug-18	2.41	8.53	*9.08E-04*	4.12E-05	5.45E-03	2.18E-05	5.44E-01	3.51E-02	2.78E-04	2.20E-03	2.60E-04	*3.93E-04*	*1.51E-03*	4.12E-03
12-Aug-18	24.39	48.3	*8.63E-04*	*5.75E-04*	4.09E-03	*5.75E-04*	3.11E-01	3.40E-01	*8.63E-04*	2.41E-02	*8.63E-04*	*2.88E-03*	*1.44E-03*	1.87E-02
18-Aug-18	16.53	33.8	*8.87E-04*	*5.92E-04*	5.03E-03	*5.92E-04*	5.21E-01	3.30E-01	*8.87E-04*	2.08E-02	*8.87E-04*	*2.96E-03*	*1.48E-03*	1.32E-02
24-Aug-18	10.6	—	—	—	—	—	—	—	—	—	—	—	—	—
30-Aug-18	9.07	20.7	*8.66E-04*	*5.77E-04*	4.50E-03	*5.77E-04*	2.38E-01	1.14E-01	*8.66E-04*	6.24E-03	*8.66E-04*	*2.89E-03*	*1.44E-03*	1.34E-02
5-Sep-18	—	22.0	*8.61E-04*	*5.74E-04*	5.16E-03	*5.74E-04*	5.34E-01	3.31E-01	*8.61E-04*	1.18E-02	*8.61E-04*	*2.87E-03*	*1.43E-03*	9.30E-03
11-Sep-18	9.78	30.1	*8.74E-04*	*5.83E-04*	*1.46E-03*	*5.83E-04*	4.20E-01	2.88E-01	*8.74E-04*	1.58E-02	*8.74E-04*	*2.91E-03*	*1.46E-03*	1.31E-02
17-Sep-18	2.33	9.0	*8.69E-04*	*5.79E-04*	*1.45E-03*	*5.79E-04*	5.18E-01	5.73E-02	*8.69E-04*	2.09E-03	*8.69E-04*	*2.90E-03*	*1.45E-03*	5.21E-03
23-Sep-18	*0.31*	3.9	*8.92E-04*	*5.95E-04*	*1.49E-03*	*5.95E-04*	2.02E-01	2.32E-02	*8.92E-04*	1.19E-03	*8.92E-04*	*2.97E-03*	*1.49E-03*	4.10E-03
29-Sep-18	1.83	9.1	*8.98E-04*	*5.99E-04*	*1.50E-03*	*5.99E-04*	2.89E-01	1.02E-01	*8.98E-04*	5.27E-03	*8.98E-04*	*2.99E-03*	*1.50E-03*	9.10E-03
Geometric mean	N/A	22.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arithmetic mean	7.48	28.0	8.81E-04	3.56E-04	4.21E-03	3.86E-04	3.68E-01	2.65E-01	1.25E-03	1.36E-02	7.60E-04	1.74E-03	1.47E-03	1.27E-02
Max. concentration	24.4	55.0	9.44E-04	5.99E-04	6.54E-03	5.99E-04	5.85E-01	6.72E-01	4.29E-03	2.41E-02	1.04E-03	2.99E-03	1.57E-03	3.09E-02
Min. concentration	0.31	3.87	8.60E-04	4.12E-05	1.45E-03	2.18E-05	1.68E-01	2.32E-02	2.78E-04	1.19E-03	2.60E-04	3.73E-04	1.43E-03	4.10E-03
90th percentile	14.2	51.6	9.04E-04	5.93E-04	6.11E-03	5.93E-04	5.40E-01	3.80E-01	1.97E-03	2.28E-02	8.96E-04	2.97E-03	1.51E-03	2.05E-02
95th percentile	18.9	54.1	9.19E-04	5.96E-04	6.31E-03	5.96E-04	5.56E-01	4.70E-01	2.68E-03	2.36E-02	9.40E-04	2.98E-03	1.53E-03	2.41E-02
CAAQS	28.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value*	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AAQC	N/A	120	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	15	15	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	1	0	15	8	4	8	0	0	8	0	8	15	15	0
Detection limit (µg)	6	5	6	2	5	2	5	50	3	50	3	10	5	5
Half detection limit (µg)	3	2.5	3	1	2.5	1	2.5	25	1.5	25	1.5	5	2.5	2.5
% < detection limit	7	0	100	53	27	53	0	0	53	0	53	100	100	0
% valid data	94	94	94	94	94	94	94	94	94	94	94	94	94	94

Notes:

All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining

N/A: Not applicable

—: Invalid Sample

*Canadian Ambient Air Quality Standard, 24-hour standard

Detection limits may change from sample to sample

SOUTHWEST (TAIT ROAD) PARTICULATE/METALS CONCENTRATIONS														
Date	**PM2.5**	**TSP**	**Arsenic (As)**	**Cadmium (Cd)**	**Chromium (Cr)**	**Cobalt (Co)**	**Copper (Cu)**	**Iron (Fe)**	**Lead (Pb)**	**Manganese (Mn)**	**Nickel (Ni)**	**Selenium (Se)**	**Vanadium (V)**	**Zinc (Zn)**
1-Jul-18	4.29	23.7	*8.78E-04*	3.16E-05	3.57E-03	1.72E-04	4.62E-02	2.72E-01	6.44E-04	6.68E-03	5.92E-04	*3.81E-04*	*1.46E-03*	6.62E-03
7-Jul-18	7.41	43.8	*8.89E-04*	5.51E-05	4.68E-03	3.92E-04	2.62E-02	6.40E-01	9.36E-04	1.87E-02	1.11E-03	*3.85E-04*	*1.48E-03*	8.47E-03
13-Jul-18	7.32	75.4	*8.98E-04*	5.27E-05	7.84E-03	8.50E-04	5.20E-02	1.19E+00	7.60E-04	3.39E-02	2.00E-03	*3.89E-04*	*1.50E-03*	1.06E-02
19-Jul-18	6.99	47.0	*9.07E-04*	3.75E-05	6.89E-03	4.57E-04	3.95E-02	7.20E-01	8.89E-04	2.61E-02	1.25E-03	*3.93E-04*	*1.51E-03*	9.86E-03
25-Jul-18	1.96	32.2	*9.30E-04*	3.66E-05	7.56E-03	3.35E-04	4.66E-02	5.41E-01	8.37E-04	1.49E-02	9.36E-04	*4.03E-04*	*1.55E-03*	1.01E-02
31-Jul-18	6.78	40.1	*8.79E-04*	5.27E-05	6.44E-03	3.11E-04	2.98E-02	5.86E-01	1.65E-03	2.52E-02	8.67E-04	*3.81E-04*	*1.46E-03*	1.27E-02
6-Aug-18	3.16	67.7	*9.06E-04*	9.18E-05	7.85E-03	4.62E-04	5.11E-02	8.09E-01	2.80E-03	2.97E-02	1.19E-03	*3.93E-04*	*1.51E-03*	2.31E-02
12-Aug-18	24.0	77.2	*9.34E-04*	*6.23E-04*	5.54E-03	*6.23E-04*	3.31E-02	1.02E+00	*9.34E-04*	4.09E-02	*9.34E-04*	*3.11E-03*	*1.56E-03*	1.99E-02
18-Aug-18	16.1	43.5	*9.79E-04*	*6.53E-04*	5.88E-03	*6.53E-04*	4.15E-02	5.91E-01	*9.79E-04*	2.78E-02	*9.79E-04*	*3.26E-03*	*1.63E-03*	1.62E-02
24-Aug-18	11.65	—	—	—	—	—	—	—	—	—	—	—	—	—
30-Aug-18	8.58	44.8	*9.05E-04*	*6.03E-04*	5.85E-03	*6.03E-04*	3.75E-02	6.09E-01	*9.05E-04*	3.10E-02	*9.05E-04*	*3.02E-03*	*1.51E-03*	1.38E-02
5-Sep-18	7.79	35.4	*8.55E-04*	*5.70E-04*	4.90E-03	*5.70E-04*	6.55E-02	5.87E-01	*8.55E-04*	1.53E-02	*8.55E-04*	*2.85E-03*	*1.42E-03*	8.66E-03
11-Sep-18	5.95	37.0	*8.59E-04*	*5.72E-04*	*1.43E-03*	*5.72E-04*	1.08E-01	5.08E-01	*8.59E-04*	1.91E-02	*8.59E-04*	*2.86E-03*	*1.43E-03*	1.04E-02
17-Sep-18	2.37	17.1	*8.76E-04*	*5.84E-04*	*1.46E-03*	*5.84E-04*	1.12E-01	2.58E-01	*8.76E-04*	7.83E-03	*8.76E-04*	*2.92E-03*	*1.46E-03*	8.00E-03
23-Sep-18	0.62	4.2	*9.15E-04*	*6.10E-04*	*1.53E-03*	*6.10E-04*	6.41E-02	3.42E-02	*9.15E-04*	1.28E-03	*9.15E-04*	*3.05E-03*	*1.53E-03*	5.19E-03
29-Sep-18	1.83	3.7	*9.00E-04*	*6.00E-04*	*1.50E-03*	*6.00E-04*	5.49E-02	9.54E-02	*9.00E-04*	4.44E-03	*9.00E-04*	*3.00E-03*	*1.50E-03*	4.68E-03
Geometric mean	N/A	30.3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arithmetic mean	7.30	39.5	9.01E-04	3.45E-04	4.86E-03	5.20E-04	5.38E-02	5.64E-01	1.05E-03	2.02E-02	1.01E-03	1.79E-03	1.50E-03	1.12E-02
Max. concentration	24.0	77.2	9.79E-04	6.53E-04	7.85E-03	8.50E-04	1.12E-01	1.19E+00	2.80E-03	4.09E-02	2.00E-03	3.26E-03	1.63E-03	2.31E-02
Min. concentration	0.62	3.72	8.55E-04	3.16E-05	1.43E-03	1.72E-04	2.62E-02	3.42E-02	6.44E-04	1.28E-03	5.92E-04	3.81E-04	1.42E-03	4.68E-03
90th percentile	13.9	72.3	9.32E-04	6.18E-04	7.73E-03	6.41E-04	9.11E-02	9.36E-01	1.38E-03	3.27E-02	1.23E-03	3.09E-03	1.55E-03	1.84E-02
95th percentile	18.1	76.0	9.48E-04	6.32E-04	7.84E-03	7.12E-04	1.09E-01	1.07E+00	1.99E-03	3.60E-02	1.48E-03	3.16E-03	1.58E-03	2.08E-02
CAAQS	28.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value*	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AAQC	N/A	120	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	16	15	15	15	15	15	15	15	15	15	15	15	15	15
No. samples < mdl	0	0	15	8	4	8	0	0	8	0	8	15	15	0
Detection limit (µg)	6	5	6	2	5	2	5	50	3	50	3	10	5	5
Half detection limit (µg)	3	2.5	3	1	2.5	1	2.5	25	1.5	25	1.5	5	2.5	2.5
% < detection limit	0	0	100	53	27	53	0	0	53	0	53	100	100	0
% valid data	100	94	94	94	94	94	94	94	94	94	94	94	94	94

Notes:

All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining

N/A: Not applicable

—: Invalid Sample

*Canadian Ambient Air Quality Standard, 24-hour standard

Detection limits may change from sample to sample

APPENDIX A-2

TOTAL DUSTFALL SAMPLING RESULTS

SW (Tait Road) Monitoring Results for Dustfall (Q3 2018)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
July	29	2.0	1.80	3.8
August	31	2.91	1.86	4.8
September	30	1.1	0.45	1.5

Arithmetic mean	3.4
Max. concentration	4.8
Min. concentration	1.5
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit*	0.30
Half detection limit	0.15

NE (Gallinger Road) Monitoring Results for Dustfall (Q3 2018)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
July	29	0.8	1.47	2.3
August	31	3.1	1.38	4.5
September	30	0.54	0.66	1.2

Arithmetic mean	2.7
Max. concentration	4.5
Min. concentration	1.2
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit*	0.30
Half detection limit	0.15

Notes:

All statistics were calculated using 1/2DL for values reported as <DL

All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining

N/A: Not applicable

N/R: No Results Available

—: Invalid Sample

*If samples had differing detection limits, the highest is displayed here

**Ontario Ambient Air Quality Criteria, 30-day standard

APPENDIX A-3

SO_2 AND NO_2 PASSIVE SAMPLING RESULTS

Monitoring Results for Passive SO_2 and NO_2 (Q3 2018)
(results expressed in µg/m^3)

	SW (Tait Road)		NE (Gallinger Road)	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
July	0.1	0.7	0.1	1.1
August	0.3	1.5	0.1	0.9
September	0.1	0.9	0.1	0.9
Arithmetic mean	0.2	1.1	0.1	1.0
Max. concentration	0.3	1.5	0.1	1.1
Min. concentration	0.1	0.7	0.1	0.9
AAQC* 24-hr converted to 30-day	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta Ambient Air Quality Objectives 2013	30 µg/m^3	N/A	30 µg/m^3	N/A
No. of valid samples	3	3	3	3
% Valid Data	100%	100%	100%	100%
No. samples < mdl	0	0	0	0
Detection limit	0.3	0.2	0.3	0.2
Half detection limit	0.15	0.1	0.15	0.1

Notes:

All statistics were calculated using 1/2DL for values reported as <DL

All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining

All results reported by the lab in parts per billion (ppb) and are converted to µg/m3 assuming 101.23kPA and 25C

N/A: Not applicable

N/R: No Results Available

—: Invalid Sample

*Ontario Ambient Air Quality Criteria

NEW GOLD INC.
RAINY RIVER MINE

AMBIENT AIR QUALITY MONITORING PROGRAM
FOURTH QUARTER 2018 REPORT

Submitted by:

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited
160 Traders Blvd. E., Suite 110
Mississauga, Ontario
L4Z 3K7

February 2019
TC111504

wood.

Wood Environment & Infrastructure Solutions
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160 Traders Boulevard East
Suite 110
Mississauga, Ontario
Canada
T: 905.568.2929

February 13, 2019
TC111504

Sylvie St. Jean
Environmental Manager
New Gold Inc.
Rainy River Mine
5967 Hwy 11 / 71, P.O. Box 5
Emo, Ontario P0W 1E0

Dear Ms. St. Jean:

Re: Rainy River Mine
Ambient Air Quality Monitoring Program
Fourth Quarter 2018 Report

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (hereinafter referred to as Wood), is a leading environment and infrastructure, engineering, consulting and project management organization. Our team of professionals provides a full range of services to clients in a wide range of sectors including government, industrial & commercial, water, transportation, minerals & metals, oil & gas clients and clean energy.

Wood is submitting to New Gold Inc. (New Gold) the attached summary report of the results for the ambient air quality monitoring program for the fourth quarter of 2018 at the Rainy River Mine. The monitoring program consists of two air quality monitoring stations that were established in May 2015: one to the south of the Site near the beginning of the Highway 600 reroute on Tait Road, and one to the east of the Site on Gallinger Road. The sampling stations are operated and maintained by New Gold staff; Wood staff performed quarterly calibrations, provided technical guidance to New Gold field staff, communicated with the laboratory staff as required, and prepared the data summary report.

Wood will supply the MECP with raw and edited data per the Operations Manual for Air Quality Monitoring in Ontario (MECP 2018a).

The key finding(s) of the Q4 2018 monitoring are as follows:

- There were no exceedances of the TSP, dustfall or metals/metalloids Ambient Air Quality Criteria (AAQC), $PM_{2.5}$ Canadian Ambient Air Quality Standard CAAQS, or the SO_2, or NO_2 criteria measured in Q4 2018.

The measured TSP and $PM_{2.5}$ concentrations for the Q4 2018 are depicted in Figures CL-1 and CL-2.

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

Note that quarterly reports do not include interpretation of the data (i.e. exceedances); interpretation of results is included in the annual reporting. Should you have any questions or wish to discuss the air monitoring program, please do not hesitate to contact the undersigned.

Sincerely,

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited

<Original signed by>

Ryan Fletcher, P.Eng.
Air Quality Engineer

<Original signed by>

.Eng.
Senior Air Quality Engineer

CC Dan Russell, Associate Geoscientist, Wood
Twila Griffith, Senior Environmental Coordinator, New Gold

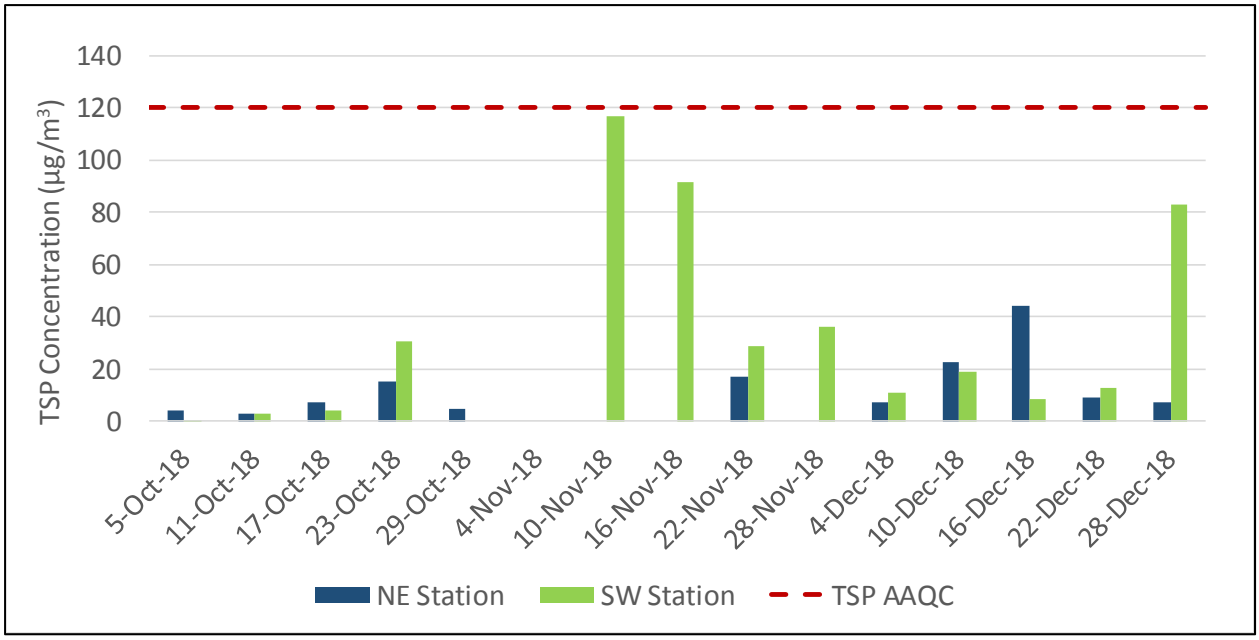

Figure CL-1: TSP Concentrations (Q4 2018)

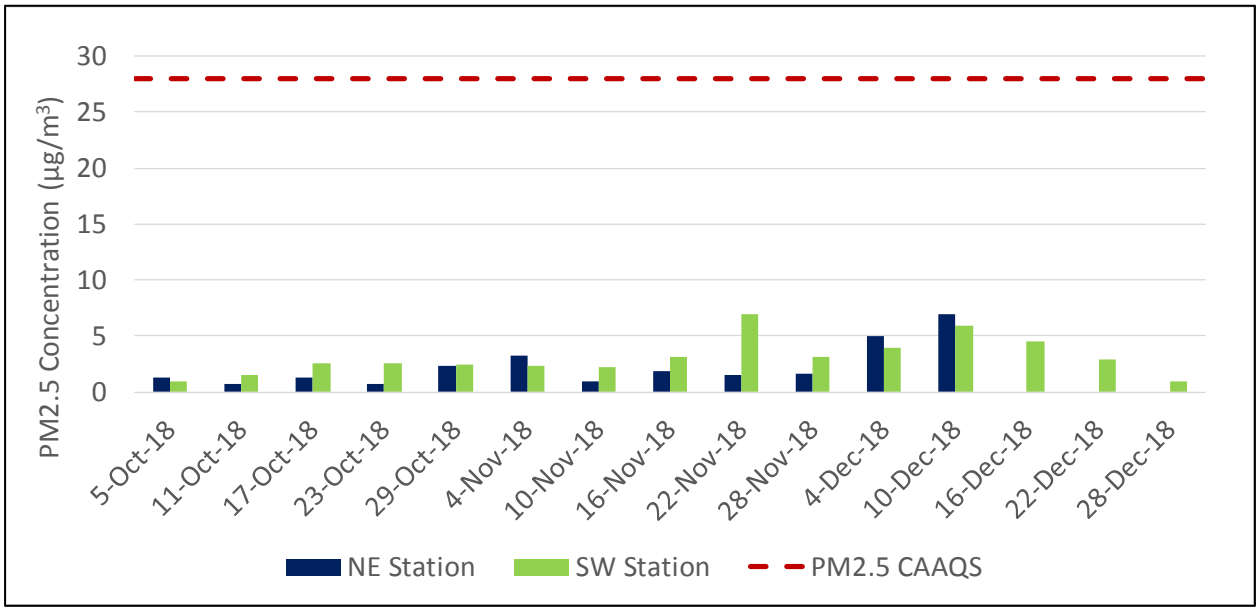

Figure CL-2: $PM_{2.5}$ Concentrations (Q4 2018)

Revision	Date	Prepared By / Revised By	Description
0	February 12, 2019	Ryan Fletcher Linda Lattner	Draft Report
1	February 13, 2019	Caleb Vandenberg	Final Report

ACRONYMS AND ABBREVIATIONS

AAQC	Ambient Air Quality Criteria
AAQO	Alberta Ambient Air Quality Objectives
ACFM	Cubic Feet Per Minute at Actual Conditions
AEP	Alberta Environment and Parks
ASTM	American Society for Testing and Materials
BCMOE	British Columbia Ministry of the Environment
CAAQS	Canadian Ambient Air Quality Standards
Hi-Vol	High Volume Sampler
ICP/AES	Inductively Coupled Plasma / Atomic Emission Spectroscopy
LPM	Litres Per Minute
MECP	Ministry of the Environment, Conservation and Parks
MOECC	Ministry of the Environment and Climate Change
NIST	National Institute of Standards and Technology
TSP	Total Suspended Particulate
$PM_{2.5}$	Particulate Matter less than 2.5 microns in diameter
US EPA	United States Environmental Protection Agency
$\mu g/m^3$	Microgram per Cubic Metre

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Appendix A-3 SO_2 and NO_2 Passive Sampling Results

1.0 INTRODUCTION

This report presents a summary of the Fourth Quarter (Q4) 2018 results for the ambient air quality monitoring program undertaken at the Rainy River Mine located in northwestern Ontario. Two sampling stations were established in May 2015: one to the south of the Site near the beginning of the Highway 600 realignment at Tait Road, and one to the east of the Site on Gallinger Road (Figures 2-1, 2-2 and 2-3).

New Gold Inc. (New Gold) staff operate and maintain the sampling stations. Wood staff performed quarterly calibrations, provided technical guidance to New Gold field staff, communicated with the laboratory staff as required, and prepared the data summary reports.

This Quarterly Ambient Air Quality Report addresses the required elements of a Quarterly Report defined in the *Operations Manual for Air Quality Monitoring in Ontario* (MECP 2018a), hereafter referred to as the Operations Manual. Specifically, the following information is provided:

- Summary statistics;
- Sampling dates (start and end where applicable); and
- A summary of exceedances of an Ontario Standard, Ambient Air Quality Criterion (AAQC), or Canadian Ambient Air Quality Standard (CAAQS).

The purpose of the air monitoring program is to quantify potential air quality effects associated with activities related to the Mine. The monitoring program consists of:

- Two High Volume (Hi-Vol) samplers for discrete sampling of Total Suspended Particulate (TSP) and metals;
- Two PQ200 samplers for discrete sampling of respirable particulate matter ($PM_{2.5}$);
- Two standard passive dustfall collection units;
- Two passive sampling enclosures each measuring NO_2 and SO_2; and
- One meteorological station to obtain real-time site wind speed, wind direction, temperature, relative humidity, and precipitation.

2.0 MONITORING STATIONS

The ambient monitoring stations were sited in accordance with the criteria stipulated in the MECP Operations Manual (MECP 2018a).

The general location for the two stations is shown in Figure 2-1. UTM co-ordinates for each station based upon NAD 83, are presented in Table 2-1. Photographs showing each station and the equipment installed are presented as Figures 2-2 and 2-3.

There were no changes to the stations or station locations in Q4 2018.

Table 2-1: Ambient Air Monitoring Stations

Station	UTM Co-ordinates			Parameters Monitored
	Easting (m)	Northing (m)	Zone	
Tait Road Station – Southwest	426 072	5 406 996	15	TSP, metals, $PM_{2.5}$, NO_2, SO_2, total dustfall Meteorological data (wind speed and direction, ambient temperature, relative humidity, rainfall)
Gallinger Road Station - Northeast	431 133	5 410 534	15	TSP, metals, $PM_{2.5}$, NO_2, SO_2, total dustfall

410000 415000 420000 425000 430000 435000 440000 445000 450000

5425000 5420000 5415000 5410000 5405000

Hwy 600
Hwy 600
Hwy 600
Hwy 600
Hwy 617
Hwy 71
Hwy 71
Hwy 615
Hwy 600
Hwy 404 East Rd
Burditt Lake
Beadle Lake
Preachers Lake
Spring Lake
Little Pine Lake
Boundary Lake
Pony Lake
Off Lake
Manomin Rd
Muskrat Lake
Finland
Korpi Road
Lampi Rd
Existing Transmission Line
Flaming Rd
Tailings Management Area
Marr Rd
Roen Rd
Clark Road
Overburden
West Mine Rock
Open Pit
East Mine Rock
Teeple Road
Dearlock
Pinewood River
Pinewood Lake
Heatwole Road
Northeast Monitoring Station (Gallinger Road)
Southwest Monitoring Station (Tait Road)
Tait Road
Black Hawk
Pump House

P:\EM\Projects\2011\TC111504 Rainy River\GIS\E\AA\MXD_Maps\RR_NG_Property Ambient_quality_monitoring7.mxd

LEGEND

- Ambient Air Quality Monitoring Stations
- New Gold - Rainy River Property Boundary
- New Gold Lands with No Current Access Control

Proposed Site Features

- Underground Portal
- Open Pit
- Plant Site / Ancillary Facilities
- Explosives Facilities
- Overburden / West Mine Rock Stockpile
- Ore / East Mine Rock Stockpile
- Proposed Pump House
- Tailings Management Area
- Aggregate Pit / Quarry
- Site Roads
- Roads
- Existing Transmission Line
- First Nation Land

NOTES:
- Road and Utility data and topographic data extracted from Land Information Ontario, Ontario Road Network, MNR Queen's Printer for Ontario, 2011-2012
- Land tenure information and parcels provided by NewGold, March 13, 2018.

Datum: NAD83
Projection: UTM Zone 15N

0 2 4 8 12 16 20 Kilometres

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring Stations

PROJECT N°: TC111504 | **FIGURE: 2-1**

SCALE: 1:100,000 | DATE: May 2018

425950 426000 426050 426100 426150 426200

5407000

5406950

5406900

69 m

TAIT ROAD

P:\EM\Projects\2011\TC111504 Rainy River\GIS\EA\a\MXD_Mapsl\RR_NG_Ambient_quality_monitoring_stationTait_3.mxd

LEGEND

- Southwest Monitoring Station (Tait Road)
- Highway Re-alignment

Notes:
- Aerial imagery provided by NewGold Plieades imagery (October 2017).

0 10 20 40 60 80 100 Meters

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring
Southwest Monitoring Station

PROJECT N°: TC111504 | **FIGURE: 2-2**

SCALE: 1:700 | DATE: May 2018

P:\EM\Projects\2011\TC111504 Rainy River\GIS\ESIA\AirMXD_Maps\RR_NG_Ambient_quality_monitoring_station_Gallinger_3.mxd

LEGEND

- Northeast Monitoring Station (Gallinger Road)
- Gallinger Road

Notes:
- Aerial imagery provided by NewGold Plieades imagery (October 2017).

0 10 20 40 60 80 100 Meters

Datum & Projection: NAD 1983 UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Ambient Air Monitoring Northeast Monitoring Station

PROJECT N°: TC111504	**FIGURE: 2-3**
SCALE: 1:700	DATE: May 2018

3.0 ANALYTICAL AND MONITORING METHODS

3.1 TSP and Metals

The TSP concentrations were determined using the standard gravimetric reference methods approved by the United States Environmental Protection Agency (US EPA) and the Ontario Ministry of the Environment, Conservation and Parks (MECP), as described in the Operations Manual (MECP 2018a). Measurements of 24-hour average TSP and metal concentrations were collected as specified in the Operations Manual (MECP 2018a); particulate samples were collected every sixth day as per the North American schedule (US EPA 2018). Sampling was performed with mass flow controlled Hi-Vol samplers (brush motor). All filters were analyzed for the following metals and metalloids: arsenic (As), cadmium (Cd), chromium (Cr), cobalt (Co), copper (Cu), iron (Fe), lead (Pb), manganese (Mn), nickel (Ni), selenium (Se), vanadium (V) and zinc (Zn). A metalloid is an element such that has both metallic and non-metallic properties.

The lowest detectable limit of total particulate on the filter is 2.3 milligrams (mg). A typical 24-hour sample volume of 1,630 m^3 results in a method detection limit of 1.4 micrograms per cubic metre ($\mu g/m^3$).

Metal concentrations were determined using standard Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP/AES). Method detection limits are as shown in the sampling summary in Appendix A-1.

3.2 $PM_{2.5}$

Sampling was performed with PQ200 samplers. $PM_{2.5}$ concentrations were determined using the standard gravimetric reference methods approved by the US EPA and the MECP, as described in the Operations Manual (MECP 2018a). $PM_{2.5}$ measurements were collected over a 24-hour period to match the averaging time for the Canadian Ambient Air Quality Standard (CAAQS); particulate samples were collected every sixth day as per the North American schedule (US EPA 2018).

The lowest detectable limit of $PM_{2.5}$ on the Teflon filters is 1 µg. A typical 24-hour sample volume of 24 m^3 results in a method detection limit of 0.04 $\mu g/m^3$.

3.3 Total Dustfall

Water soluble and insoluble portions of dustfall were determined using ASTM method D-1739-98 (MOECC 2016) and the British Columbia Ministry of Environment method outlined in Section G of Air Constituents – Inorganic (BCMOE 2007). Standard dustfall samplers were used to measure total dustfall deposition. The method detection limit for total dustfall is 0.3 g/m^2/30 days. Bird deterrents were added in Q3 2017 with the goal of reducing contamination.

3.4 Passive Sampling for SO_2 and NO_2

SO_2 and NO_2 concentrations were monitored with passive sampling devices. The exposed permeation filters were analyzed by the Maxxam Analytics Inc. laboratory (Edmonton, Alberta). Testing was performed using methodology developed, approved and validated by Alberta Environment with the support of the Alberta Research Council, the Clean Air Strategic Alliance of Alberta, and the National Research Council of Canada, and following the Standard Operating Procedures for Trace Gas Passive Sampling outlined in the Operations Manual (MECP 2018a).

Sample uptake is dependent on temperature, relative humidity and wind speed. Analytical results are adjusted for these meteorological parameters measured during the exposure period (monthly averages). Required meteorological data were obtained from the Environment and Climate Change Canada website. Fort Frances meteorological station (Climate ID 6022474) is downloaded by Maxxam Analytics with each sample submission. For both SO_2 and NO_2, the analytical method detection limit is in the order of 0.1 parts per billion (ppb). Validation tests conducted in Alberta show that results from passive sampling are typically within 10% of those obtained from sampling with continuous analyzers for 30-day exposure periods.

Since there are no MECP guidelines for monthly concentrations of SO_2 and NO_2 obtained from passive sampling, the data is only used for screening purposes. For NO_2, the monthly results were compared to the MECP 24-hour AAQC converted to an equivalent 30-day average (78 µg/m^3) using the methodology outlined in the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MECP 2018b). For SO_2, the results were compared against the 30-day Alberta Ambient Air Quality Objective of 30 µg/m^3 (AEP 2016).

3.5 Field Operations

3.5.1 Hi-Vol Samplers

To meet the requirements of 1-in-6 day sampling schedule, stations were visited once every six days. The exposed filter was recovered and a pre-weighed filter installed for the subsequent sample run.

Wood staff performed flow, temperature, and barometric pressure calibrations using an electronic BGI flow calibrator. The flows were calibrated to 16.7 litres per minute (LPM) for each station. Q4 Calibrations were performed on:

- November 21, 2018 – All Hi-Vols calibrated.

3.5.2 PQ200 Samplers

To meet the requirements of 1-in-6 day sampling schedule, stations were visited once every six days. The exposed filter was recovered and a pre-weighed filter installed for the subsequent sample run.

Wood staff performed flow, temperature, and barometric pressure calibrations using an electronic BGI flow calibrator. The flows were calibrated to 16.7 litres per minute (LPM) for each station. Q4 Calibrations were performed on:

- November 21, 2018 – All PQ200s calibrated.

3.5.3 Dustfall Samplers

The dustfall samplers, containing isopropanol in the winter to prevent freezing, were changed every month, as required. Dustfall jars were provided by the laboratory with screw-on lids to prevent sample loss during transport.

3.5.4 Passive Samplers

The permeation filters in the passive samplers were changed every month, as required. Permeation filters were kept in filter cassettes inside Ziploc bags until deployed to prevent premature exposure. After the sample was collected, the filter was placed back in its cassette and into a Ziploc bag for shipment to the lab.

3.5.5 Performance and Site Audits

There were no MECP audits conducted in Q4 2018.

3.5.6 Equipment and Sampling Issues

During Q4 2018, nine samples were invalidated, as discussed below:

- October 29: TSP sample at the Tait Road station was invalidated due to excessive run time.
- November 4: TSP samples at the Tait Road and Gallinger Road stations were invalidated due to excessive run times.
- November 10: TSP sample at the Gallinger Road station was invalidated due to excessive run time.
- November 16: TSP sample at the Gallinger Road station was invalidated due to excessive run time.
- November 28: TSP sample at the Gallinger Road station was invalidated due to insufficient run time.
- December 16: $PM_{2.5}$ sample at the Gallinger Road station was invalidated due to sampler failure.
- December 22: $PM_{2.5}$ sample at the Gallinger Road station was invalidated due to sampler failure.
- December 28: $PM_{2.5}$ sample at the Gallinger Road station was invalidated due to sampler failure.

4.0 RESULTS

Sampling program results for Q4 2018 are presented in Appendix A-1 for the particulate and metals data, Appendix A-2 for the dustfall data and Appendix A-3 for the passive SO_2 and NO_2 data. For the purpose of performing statistical analyses following MECP protocol, a value of half the detection limit was substituted for concentrations less than the detection limit.

For comparative purposes, the MECP AAQC and CAAQS values are presented, where available, noting that the AAQCs are numerically equivalent to the Ontario Regulation 419/05 Standards and Air Contaminant Benchmarks (ACBs) where the averaging times are equivalent.

Summaries of the statistical analyses for Q4 2018 for the TSP, metals, and $PM_{2.5}$ concentrations are presented in Tables 4-1, 4-2, and 4-3, respectively. During the quarter, the 1 in 6-day sampling schedule presented a possible 15 sampling days between October 1 and December 31, 2018.

A summary of the statistical analyses for Q4 2018 for the total dustfall data is presented in Table 4-4.

A summary of the statistical analysis for the Q4 2018 passive SO_2 and NO_2 results is presented in Table 4-5.

4.1 TSP and Metals

The Gallinger Road station collected 11 valid samples, respectively, resulting in 73% valid data for Q4 2018. The Tait Road station collected 13 valid samples, respectively, resulting in 87% valid data for Q4 2018. A list of issues that occurred is provided in Section 3.5.6.

For the quarter, the geometric mean TSP concentrations were 16.0 µg/m^3 for the Tait Road station and 9.4 µg/m^3 for the Gallinger Road station. Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for TSP was 116.9 µg/m^3 at the Tait Road station (November 10, 2018), and 44.3 µg/m^3 at the Gallinger Road station (December 16, 2018).

The rolling 30-day average lead concentration at the Tait Road station and Gallinger Road stations was at maximum 2% and 1%, respectively, of the 30-day lead AAQC (0.2 µg/m^3) in Q4 2018.

Appendix A-1 and Figure 4-1 present individual sample data. The Q4 2018 TSP and metals summary statistics are summarized in Tables 4-1 and 4-2, respectively.

4.2 $PM_{2.5}$

The Gallinger Road station collected 12 valid samples resulting in 80% valid data for Q4 2018. The Tait Road station collected 15 valid samples resulting in 100% valid data. Issues with the sampling pump occurred at the end of December, resulting in three invalid samples at the Gallinger Road station.

Values reported by the laboratory as below the detection limit were, by convention, substituted with one-half of the detection limit. The maximum 24-hour concentration for $PM_{2.5}$ was 6.91 µg/m^3 at the Tait Road station (November 22, 2018), and 6.99 µg/m^3 at the Gallinger Road station (December 10, 2018).

There were no $PM_{2.5}$ exceedances of the AAQC (MECP 2018b) of 30 µg/m^3 or CAAQS (ECCC 2013) of 28 µg/m^3 measured in Q4 2018. Appendix A-1 and Figure 4-2 present individual sample data. The Q4 2018 $PM_{2.5}$ summary statistics are summarized in Table 4-3.

4.3 Total Dustfall

In Q4 2018, three valid samples were collected at each station. Each dustfall jar was exposed for approximately 30-days to coincide with each calendar month in the quarter.

There were no dustfall exceedances of the 30-day AAQC of 7 g/m^2 measured in Q4 2018. A summary of the results is presented in Table 4-4 and the monthly results are presented in Appendix A-2.

4.4 Passive SO_2 and NO_2

In Q4 2018, three valid samples were collected at each station for each of SO_2 and NO_2.

There are no MECP standards, guidelines or AAQCs for SO_2 or NO_2 for a 30-day averaging period. The 30-day measured average SO_2 or NO_2 concentrations allow for future analysis of trends in the ambient concentrations, to identify any notable increases, and for potential comparison with dispersion modelling results.

For NO_2, the monthly results were compared to the MECP 24-hour AAQC converted to an equivalent 30-day average (78 µg/m^3) using the methodology outlined in the *Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MECP 2018b). For SO_2, the results were compared against the Alberta Ambient Air Quality Objective of 30 µg/m^3 (AEP 2017).

A summary of the passive results is presented in Table 4-5 and the monthly results are presented in Appendix A-3.

4.5 Evaluation of Effects of Abatement Measures on Monitored Concentrations

The Rainy River Mine has a comprehensive Best Management Practices Plan (BMPP) for Fugitive Dust approved by the MECP as part of the ECA review process. This BMPP effectively controls the generation and dispersion of dust such that the particulate matter measured at the two ambient monitoring stations was below the AAQC for all Q4 2018 samples.

Table 4-1: Summary Statistics for Q4 2018 TSP Concentration Data

Statistics	Tait Road (SW)	Gallinger Road (NE)
Geometric Mean (µg/m^3)	16.0	9.39
Arithmetic Mean (µg/m^3)	34.2	12.9
October Maximum (µg/m^3)	30.3	15.0
November Maximum (µg/m^3)	116.9	16.9
December Maximum (µg/m^3)	82.9	44.3
Maximum 24-hr (µg/m^3)	116.9	44.3
90th percentile	89.8	22.6
95th percentile	101.7	33.4
24-hr AAQC	120	120
No. of valid samples	13	11
Valid data	87%	73%
No. samples > AAQC (particulate)	0	0
No. samples > AAQC (metals)	0	0
No. samples > AAQC (metalloids)	0	0

Table 4-2: Summary Statistics for Q4 2018 Metals Concentration Data

Metal	24-hr AAQC (µg/m^3)	Tait Road (SW)		Gallinger Road (NE)	
		Maximum 24-hr Concentration (µg/m^3)	Fraction of 24-hr AAQC	Maximum 24-hr Concentration (µg/m^3)	Fraction of 24-hr AAQC
As	0.3	3.25E-03	1.1%	9.66E-04	0.3%
Cd	0.025	6.72E-04	2.7%	6.44E-04	2.6%
Cr	0.5	6.12E-03	1.2%	3.91E-03	0.8%
Co	0.1	1.73E-03	1.7%	6.44E-04	0.6%
Cu	50	7.58E-02	0.2%	6.64E-01	1.3%
Fe	4	2.62E+00	65.4%	5.41E-01	13.5%
Pb	0.5	1.74E-02	3.5%	4.16E-03	0.8%
Mn	0.4	6.95E-02	17.4%	3.46E-02	8.6%
Ni	0.2	3.52E-03	1.8%	9.66E-04	0.5%
Se	10	3.36E-03	0.03%	3.22E-03	0.03%
V	2	7.70E-03	0.4%	5.99E-03	0.3%
Zn	120	1.40E-01	0.1%	6.01E-02	0.1%

Table 4-3: Summary Statistics for Q4 2018 $PM_{2.5}$ Concentration Data

Statistics	Tait Road (SW)	Gallinger Road (NE)
Arithmetic Mean (µg/m^3)	3.08	2.32
October Maximum (µg/m^3)	2.58	2.33
November Maximum (µg/m^3)	6.91	3.25
December Maximum (µg/m^3)	5.95	6.99
Maximum 24-hr (µg/m^3)	6.91	6.99
90th percentile	5.40	4.82
95th percentile	6.24	5.89
24-hr CAAQS	28	28
No. of valid samples	15	12
Valid data	100%	80%
No. samples > CAAQS	0	0

Table 4-4: Summary Statistics for Q4 2018 Total Dustfall Data

Statistic	Tait Road (SW)	Gallinger Road (NE)
Arithmetic mean (g/m^2/30d)	1.5	1.3
Maximum (g/m^2/30d)	2.2	2.4
30-day AAQC	7	7
No. > AAQC	0	0
No. valid samples	3	3
Valid Data	100%	100%

Table 4-5: Summary Statistics for Q4 2018 Passive SO_2 and NO_2 Concentration Data

Statistic	Tait Road (SW)		Gallinger Road (NE)	
	SO_2	NO_2	SO_2	NO_2
Mean (µg/m^3)	0.3	1.8	0.3	1.4
Maximum (µg/m^3)	0.5	2.4	0.5	1.5
AAQC 24-hr converted to 30-day (µg/m^3)	N/A	78 µg/m^3	N/A	78 µg/m^3
Alberta AAQO (µg/m^3)	30 µg/m^3	N/A	30 µg/m^3	N/A
No. valid samples	3	3	3	3
Valid data	100%	100%	100%	100%

Note: N/A: No applicable criterion

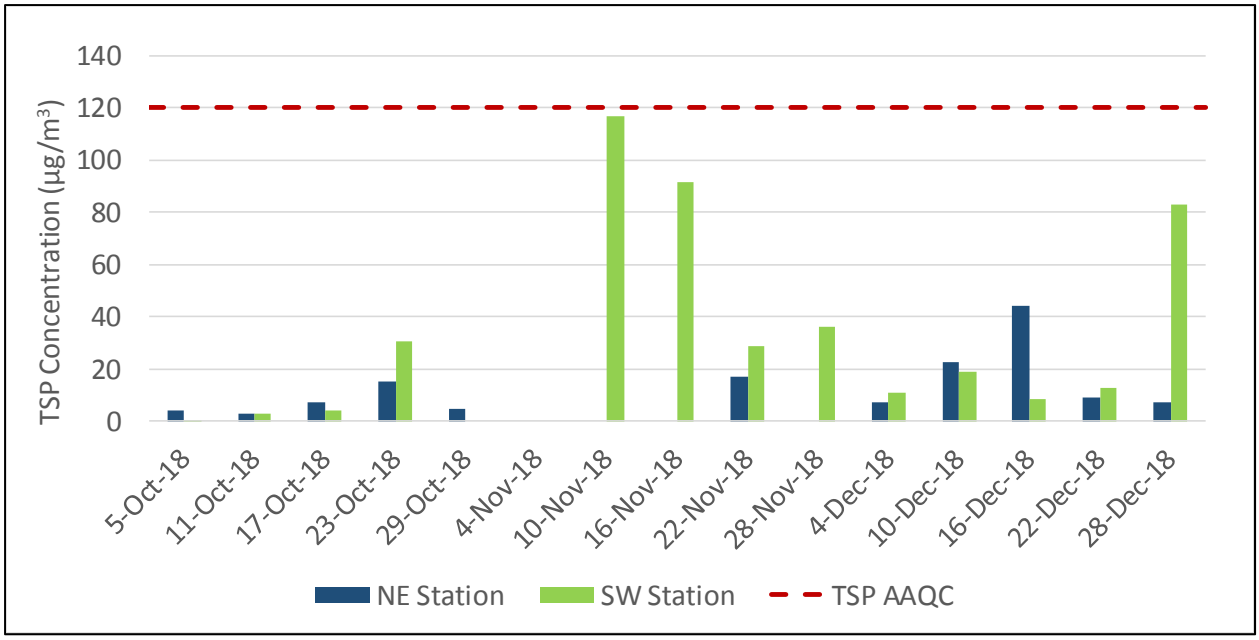

Figure 4-1: TSP Concentrations (Q4 2018)

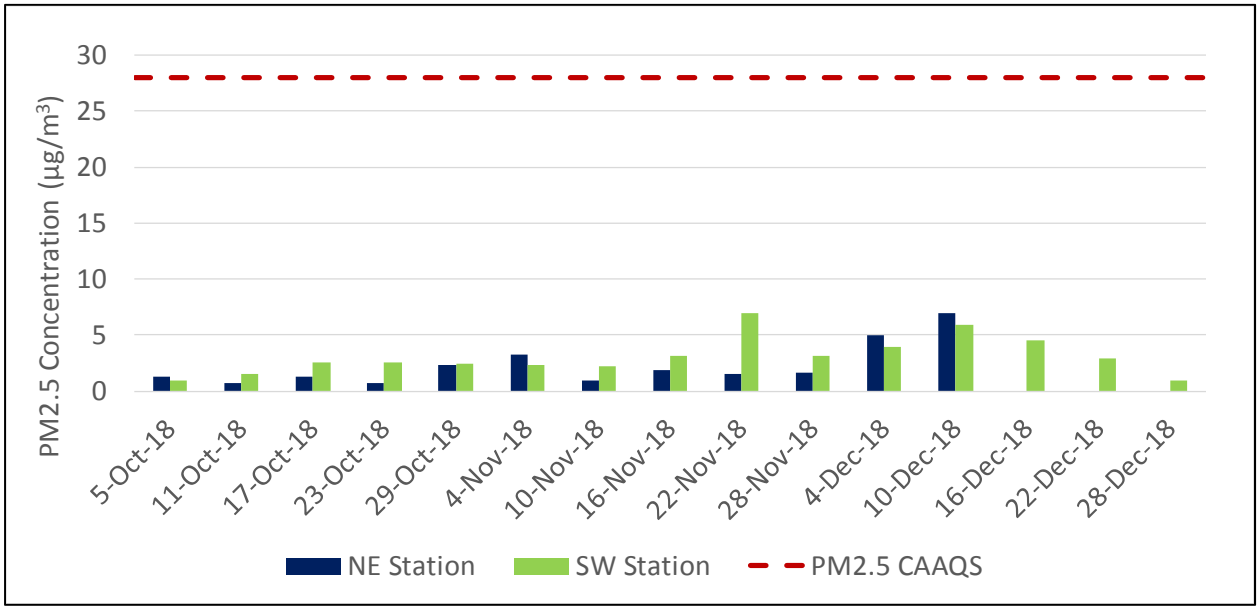

Figure 4-2: $PM_{2.5}$ Concentrations (Q4 2018)

5.0 CONCLUSIONS

This report summarizes the data collected in Q4 2018 for the ambient air quality monitoring program at the Rainy River Mine.

The monitoring program collects TSP, metals, $PM_{2.5}$, total dustfall, NO_2, and SO_2 ambient air quality data from two monitoring stations that were installed and commissioned in May 2015.

A summary of the Q4 2018 ambient air quality monitoring program results is provided below:

- There were 11 valid TSP samples collected at the Gallinger Road station, resulting in 73% sample validity. Metal and metalloid concentrations were measured on each of the TSP filters, with no exceedances of the 24-hour TSP AAQC in Q4 2018.
- There were 13 valid TSP samples collected at the Tait Road station, resulting in 87% sample validity. Metal and metalloid concentrations were measured on each of the TSP filters, with no exceedances of the 24-hour TSP AAQC in Q4 2018.
- There were 12 valid $PM_{2.5}$ samples collected at the Gallinger Road station, (80% valid data) and 15 valid samples collected at the Tait Road Station, (100% valid data), with no exceedances of the 24-hour AAQC or $PM_{2.5}$ CAAQS in Q4 2018.
- There were 3 valid dustfall samples collected at each of the Tait Road Station and Gallinger Road Station, resulting in 100% sample validity, with no exceedances of the 30-day dustfall AAQC in Q4 2018.
- There were 3 valid passive SO_2 and NO_2 samples collected at each of the two stations, resulting in 100% sample validity, and no exceedances of AEP Criterion for SO_2 or the 30-day equivalent AAQC for NO_2 in Q4 2018.

6.0 REFERENCES

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Ministry of the Environment, Conservation and Parks (MECP). 2018a. Operations Manual for Air Quality Monitoring in Ontario.

Ministry of the Environment, Conservation and Parks (MECP). 2018b. Ontario's Ambient Air Quality Criteria, PIBS # 6570e01.

Ministry of the Environment, Conservation and Parks (MECP). 2018b. Procedure for Preparing and Emission Summary and Dispersion Modelling Report.

United States Environmental Protection Agency (USEPA). 2018. Sampling Schedule Calendar, https://www3.epa.gov/ttnamti1/calendar.html.

7.0 CLOSING

This *Rainy River Mine Ambient Air Quality Monitoring Program Fourth Quarter 2018 Report* was prepared by Wood for the sole benefit of New Gold Inc. for specific application to the Rainy River Mine. The quality of information, conclusions and estimates contained herein are consistent with the level of effort involved in Wood's services and based on:

i) information available at the time of preparation;

ii) data supplied by outside sources; and

iii) the assumptions, conditions and qualifications set forth in this document.

This report is intended to be used by New Gold only, and its nominated representatives, subject to the terms and conditions of its contract with Wood. Any other use of, or reliance on, this report by any third party is at that party's sole risk. This report has been prepared in accordance with generally accepted industry-standard practices. No other warranty, expressed or implied, is made.

If you require further information regarding the above or the Mine in general, please contact the undersigned at (905) 568-2929. Thank you for the opportunity to be of service to New Gold Inc.

Yours truly,

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APPENDIX A

SAMPLING RESULTS

Appendix A-1 TSP, Metals and $PM_{2.5}$ Sampling Results
Appendix A-2 Total Dustfall Sampling Results
Appendix A-3 SO_2 and NO_2 Passive Sampling Results

APPENDIX A-1

TSP, METALS AND $PM_{2.5}$ SAMPLING RESULTS

NORTHEAST (GALLINGER ROAD) PARTICULATE/METALS CONCENTRATIONS														
Date	PM2.5	TSP	Arsenic (As)	Cadmium (Cd)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Manganese (Mn)	Nickel (Ni)	Selenium (Se)	Vanadium (V)	Zinc (Zn)
5-Oct-18	1.33	4.20	*9.40E-04*	*6.27E-04*	*1.57E-03*	*6.27E-04*	6.64E-01	3.32E-02	*9.40E-04*	1.94E-03	*9.40E-04*	*3.13E-03*	*1.57E-03*	5.33E-03
11-Oct-18	0.749	2.96	*8.53E-04*	*5.68E-04*	*1.42E-03*	*5.68E-04*	3.35E-01	2.90E-02	*8.53E-04*	1.48E-03	*8.53E-04*	*2.84E-03*	*1.42E-03*	8.87E-03
17-Oct-18	1.33	7.20	*9.31E-04*	*6.21E-04*	*1.55E-03*	*6.21E-04*	3.10E-01	1.02E-01	*9.31E-04*	3.35E-03	*9.31E-04*	*3.10E-03*	*1.55E-03*	6.70E-03
23-Oct-18	0.749	15.0	*8.96E-04*	*5.98E-04*	*1.49E-03*	*5.98E-04*	5.02E-01	2.80E-01	*8.96E-04*	7.95E-03	*8.96E-04*	*2.99E-03*	*1.49E-03*	7.89E-03
29-Oct-18	2.33	4.60	*8.95E-04*	*5.97E-04*	*1.49E-03*	*5.97E-04*	3.88E-01	3.46E-02	*8.95E-04*	1.67E-03	*8.95E-04*	*2.98E-03*	*1.49E-03*	5.97E-03
4-Nov-18	3.25	—	—	—	—	—	—	—	—	—	—	—	—	—
10-Nov-18	0.957	—	—	—	—	—	—	—	—	—	—	—	—	—
16-Nov-18	1.92	—	—	—	—	—	—	—	—	—	—	—	—	—
22-Nov-18	1.58	16.9	*9.26E-04*	*6.18E-04*	*1.54E-03*	*6.18E-04*	3.20E-01	3.53E-01	*9.26E-04*	1.02E-02	*9.26E-04*	*3.09E-03*	5.99E-03	1.69E-02
28-Nov-18	1.62	—	—	—	—	—	—	—	—	—	—	—	—	—
4-Dec-18	4.99	7.05	*9.44E-04*	*6.30E-04*	*1.57E-03*	*6.30E-04*	2.27E-01	9.00E-02	*9.44E-04*	3.02E-03	*9.44E-04*	*3.15E-03*	*1.57E-03*	8.82E-03
10-Dec-18	6.99	22.6	*9.46E-04*	*6.31E-04*	3.91E-03	*6.31E-04*	6.43E-01	4.35E-01	2.40E-03	1.75E-02	*9.46E-04*	*3.15E-03*	*1.58E-03*	2.90E-02
16-Dec-18	—	44.3	*8.92E-04*	*5.95E-04*	3.21E-03	*5.95E-04*	1.35E-01	5.41E-01	4.16E-03	3.46E-02	*8.92E-04*	*2.97E-03*	*1.49E-03*	6.01E-02
22-Dec-18	—	9.28	*9.66E-04*	*6.44E-04*	*1.61E-03*	*6.44E-04*	2.25E-01	1.49E-01	*9.66E-04*	4.83E-03	*9.66E-04*	*3.22E-03*	*1.61E-03*	1.24E-02
28-Dec-18	—	7.39	*9.40E-04*	*6.26E-04*	*1.57E-03*	*6.26E-04*	3.95E-01	9.33E-02	*9.40E-04*	3.76E-03	*9.40E-04*	*3.13E-03*	*1.57E-03*	1.22E-02
Geometric mean	N/A	9.39	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arithmetic mean	2.32	12.9	0.00	0.00	0.00	0.00	0.38	0.19	0.00	0.01	0.00	0.00	0.00	0.02
Max. concentration	6.99	44.3	0.0	0.0	0.0	0.0	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.1
Min. concentration	0.75	2.96	0.00	0.00	0.00	0.00	0.14	0.03	0.00	0.00	0.00	0.00	0.00	0.01
90th percentile	4.82	22.6	0.0	0.0	0.0	0.0	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0
95th percentile	5.89	33.4	0.0	0.0	0.0	0.0	0.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0
CAAQS	28.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value*	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AAQC	N/A	120	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	12	11	11	11	11	11	11	11	11	11	11	11	11	11
No. samples < mdl	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detection limit (µg)	6	5	6	2	5	2	5	50	3	50	3	10	5	5
Half detection limit (µg)	3	2.5	3	1	2.5	1	2.5	25	1.5	25	1.5	5	2.5	2.5
% < detection limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% valid data	80	73	73	73	73	73	73	73	73	73	73	73	73	73

Notes:

All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining

N/A: Not applicable

—: Invalid Sample

*Canadian Ambient Air Quality Standard, 24-hour standard

Detection limits may change from sample to sample

SOUTHWEST (TAIT ROAD) PARTICULATE/METALS CONCENTRATIONS														
Date	**PM2.5**	**TSP**	**Arsenic (As)**	**Cadmium (Cd)**	**Chromium (Cr)**	**Cobalt (Co)**	**Copper (Cu)**	**Iron (Fe)**	**Lead (Pb)**	**Manganese (Mn)**	**Nickel (Ni)**	**Selenium (Se)**	**Vanadium (V)**	**Zinc (Zn)**
5-Oct-18	0.916	0.700	*9.13E-04*	*6.08E-04*	*1.52E-03*	*6.08E-04*	2.65E-02	5.54E-02	*9.13E-04*	1.52E-03	*9.13E-04*	*3.04E-03*	*1.52E-03*	9.67E-03
11-Oct-18	1.50	2.62	*9.34E-04*	*6.23E-04*	*1.56E-03*	*6.23E-04*	5.75E-02	3.99E-02	*9.34E-04*	1.74E-03	*9.34E-04*	*3.11E-03*	*1.56E-03*	3.06E-02
17-Oct-18	2.58	4.26	*8.99E-04*	*5.99E-04*	*1.50E-03*	*5.99E-04*	3.99E-02	1.30E-01	*8.99E-04*	3.54E-03	*8.99E-04*	*3.00E-03*	*1.50E-03*	7.37E-03
23-Oct-18	2.54	30.3	*8.98E-04*	*5.99E-04*	*1.50E-03*	*5.99E-04*	5.44E-02	5.90E-01	*8.98E-04*	1.51E-02	*8.98E-04*	*2.99E-03*	*1.50E-03*	1.12E-02
29-Oct-18	2.46	—	—	—	—	—	—	—	—	—	—	—	—	—
4-Nov-18	2.29	—	—	—	—	—	—	—	—	—	—	—	—	—
10-Nov-18	2.25	116.9	*9.27E-04*	*6.18E-04*	6.12E-03	1.73E-03	3.37E-02	2.62E+00	*9.27E-04*	4.93E-02	3.52E-03	*3.09E-03*	5.50E-03	1.87E-02
16-Nov-18	3.16	91.6	*9.41E-04*	*6.27E-04*	4.52E-03	*6.27E-04*	4.21E-02	1.26E+00	1.88E-03	3.36E-02	2.01E-03	*3.14E-03*	*1.57E-03*	2.18E-02
22-Nov-18	6.91	28.6	*9.39E-04*	*6.26E-04*	*1.56E-03*	*6.26E-04*	4.11E-02	5.89E-01	2.38E-03	2.00E-02	*9.39E-04*	*3.13E-03*	5.95E-03	3.04E-02
28-Nov-18	3.16	36.0	*9.78E-04*	*6.52E-04*	*1.63E-03*	*6.52E-04*	4.67E-02	1.19E+00	*9.78E-04*	2.58E-02	1.96E-03	*3.26E-03*	7.70E-03	2.37E-02
4-Dec-18	3.96	10.9	*1.01E-03*	*6.72E-04*	*1.68E-03*	*6.72E-04*	4.63E-02	1.11E-01	*1.01E-03*	3.49E-03	*1.01E-03*	*3.36E-03*	*1.68E-03*	1.05E-02
10-Dec-18	5.95	18.7	*9.97E-04*	*6.65E-04*	4.19E-03	*6.65E-04*	7.58E-02	5.56E-01	*9.97E-04*	2.33E-02	*9.97E-04*	*3.32E-03*	*1.66E-03*	1.80E-02
16-Dec-18	4.58	8.46	*9.84E-04*	*6.56E-04*	*1.64E-03*	*6.56E-04*	5.05E-02	1.46E-01	*9.84E-04*	4.00E-03	*9.84E-04*	*3.28E-03*	*1.64E-03*	1.63E-02
22-Dec-18	2.91	12.5	*9.09E-04*	*6.06E-04*	3.21E-03	*6.06E-04*	4.31E-02	2.25E-01	2.36E-03	7.51E-03	*9.09E-04*	*3.03E-03*	*1.52E-03*	2.60E-02
28-Dec-18	1.00	82.9	3.25E-03	*6.38E-04*	3.44E-03	*6.38E-04*	6.34E-02	8.61E-01	1.74E-02	6.95E-02	*9.56E-04*	*3.19E-03*	*1.59E-03*	1.40E-01
Geometric mean	N/A	16.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Arithmetic mean	3.08	34.19	0.00	0.00	0.00	0.001	0.05	0.64	0.00	0.02	0.00	0.00	0.00	0.03
Max. concentration	6.91	116.9	0.0	0.0	0.0	0.0	0.1	2.6	0.0	0.1	0.0	0.0	0.0	0.1
Min. concentration	0.916	0.700	0.00	0.00	0.00	0.00	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.01
90th percentile	5.40	89.8	0.0	0.0	0.0	0.0	0.1	1.2	0.0	0.0	0.0	0.0	0.0	0.0
95th percentile	6.24	101.7	0.0	0.0	0.0	0.0	0.1	1.8	0.0	0.1	0.0	0.0	0.0	0.1
CAAQS	28.0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
No. > CAAQS value*	0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
AAQC	N/A	120	0.3	0.025	0.5	0.1	50	4	0.5	0.4	0.2	10	2	120
No. > AAQC	0	0	0	0	0	0	0	0	0	0	0	0	0	0
No. of valid samples	15	13	13	13	13	13	13	13	13	13	13	13	13	13
No. samples < mdl	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Detection limit (µg)	6	5	6	2	5	2	5	50	3	50	3	10	5	5
Half detection limit (µg)	3	2.5	3	1	2.5	1	2.5	25	1.5	25	1.5	5	2.5	2.5
% < detection limit	0	0	0	0	0	0	0	0	0	0	0	0	0	0
% valid data	100	87	87	87	87	87	87	87	87	87	87	87	87	87

Notes:

All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining

N/A: Not applicable

—: Invalid Sample

*Canadian Ambient Air Quality Standard, 24-hour standard

Detection limits may change from sample to sample

APPENDIX A-2

TOTAL DUSTFALL SAMPLING RESULTS

SW (Tait Road) Monitoring Results for Dustfall (Q4 2018)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
October	32	*0.15*	0.51	0.81
November	29	1.0	0.63	1.7
December	33	2.0	*0.15*	2.2

Arithmetic mean	1.5
Max. concentration	2.2
Min. concentration	0.8
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit*	0.30
Half detection limit	0.15

NE (Gallinger Road) Monitoring Results for Dustfall (Q4 2018)
(results expressed in g/m^2/30days)

Month	No. Exposure Days	Dustfall (insoluble)	Dustfall (soluble)	Dustfall (total)
October	32	0.87	1.5	2.4
November	29	0.51	0.30	0.84
December	33	0.54	*0.15*	0.66

Arithmetic mean	1.3
Max. concentration	2.4
Min. concentration	0.7
AAQC	7
No. > AAQC value**	0
No. of valid samples	3
% Valid data	100
No. samples < mdl	0
Detection limit*	0.30
Half detection limit	0.15

Notes:

All statistics were calculated using 1/2DL for values reported as <DL

All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining

N/A: Not applicable

N/R: No Results Available

—: Invalid Sample

*If samples had differing detection limits, the highest is displayed here

**Ontario Ambient Air Quality Criteria, 30-day standard

APPENDIX A-3

SO_2 AND NO_2 PASSIVE SAMPLING RESULTS

Monitoring Results for Passive SO_2 and NO_2 (Q4 2018)
(results expressed in $\mu g/m^3$)

	SW (Tait Road)		NE (Gallinger Road)	
Month	**SO_2**	**NO_2**	**SO_2**	**NO_2**
October	*0.1*	1.1	*0.1*	1.5
November	*0.1*	2.4	*0.1*	1.1
December	0.5	1.7	0.5	1.5

Arithmetic mean	0.3	1.8	0.3	1.4
Max. concentration	0.5	2.4	0.5	1.5
Min. concentration	0.1	1.1	0.1	1.1
AAQC* 24-hr converted to 30-day	N/A	78 µg/m³	N/A	78 µg/m³
Alberta Ambient Air Quality Objectives 2013	30 µg/m³	N/A	30 µg/m³	N/A
No. of valid samples	3	3	3	3
% Valid Data	100%	100%	100%	100%
No. samples < mdl	0	0	0	0
Detection limit	0.3	0.2	0.3	0.2
Half detection limit	0.15	0.1	0.15	0.1

Notes:
All statistics were calculated using 1/2DL for values reported as <DL
All non detectable results were reported as 1/2 detection limit and are denoted by italics and underlining
All results reported by the lab in parts per billion (ppb) and are converted to µg/m3 assuming 101.23kPA and 25C
N/A: Not applicable
N/R: No Results Available
—: Invalid Sample
*Ontario Ambient Air Quality Criteria

NEW GOLD RAINY RIVER MINE
APPENDIX G
2018 FISH TISSUE MONITORING REPORT

Rainy River Project 2018 Fish Tissue Quality Monitoring Program

Prepared for:
New Gold Inc.
Emo, Ontario

Prepared by:
Minnow Environmental Inc.
Georgetown, Ontario

March 2019

Rainy River Mine 2018 Fish Tissue Quality Monitoring Program

<Original signed by>

Tyrell Worrall, M.Sc.
Project Manager

<Original signed by>

Pierre Stecko, M.Sc., EP, R.P. Bio.
Senior Project Advisor

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ACRONYMS AND ABBREVIATIONS

ANCOVA – Analysis of Covariance

BCMOE – British Columbia Ministry of Environment

COPC – Contaminants of Potential Concern

CPUE – Catch-per-unit-effort

DQR – Data Quality Review

EA – Environmental Assessment

ECA – Environmental Compliance Approval

GPS – Global Position System

MECP – Ministry of the Environment, Conservation, and Parks

QA/QC – Quality Assurance/Quality Control

RRM – Rainy River Mine

TDI – Tolerable Daily Intake

TMA – Tailings Management Area

1 INTRODUCTION

1.1 Site Description

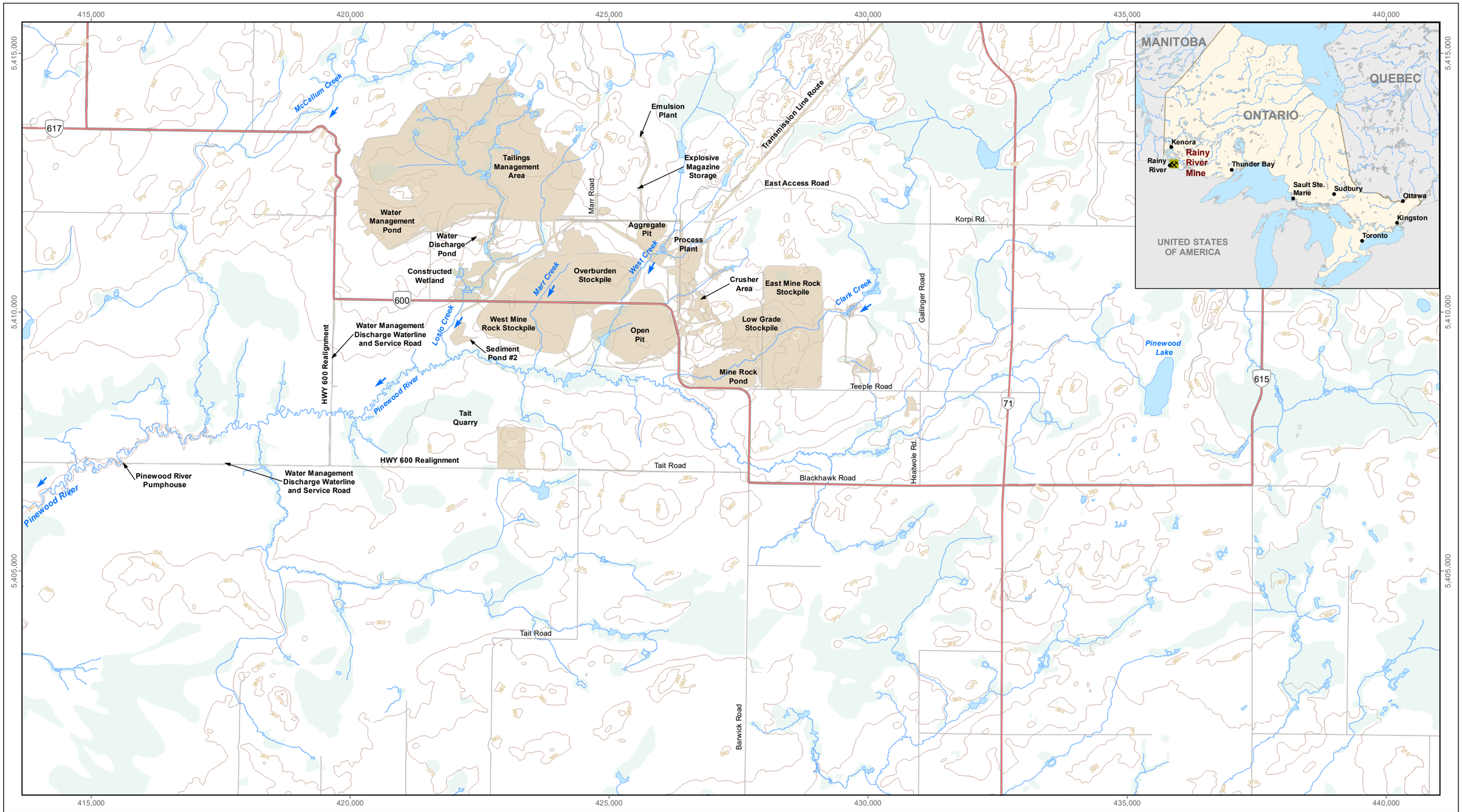
New Gold Inc. owns the Rainy River Mine (RRM), located in northwestern Ontario in the Township of Chapple and District of Rainy River, approximately 65 km northwest of Fort Frances, and approximately 420 km west of Thunder Bay (Figure 1.1). The RRM is located within the Pinewood River watershed. The Pinewood River flows past the RRM and drains into the Rainy River approximately 37 km downstream.

Earliest exploration of the RRM began in 1967. Rainy River Resources Ltd. acquired the project in 2005 and began conducting baseline studies in 2008. The RRM was acquired by New Gold Inc. in 2013 and an Environmental Assessment (EA) report was submitted in 2014 (AMEC 2014). Site construction began following provincial and federal EA approvals in 2015. In 2017, the RRM site construction was completed and the project transitioned to an operational mine which includes an open pit mine, ore storage facilities, a process plant, a Tailings Management Area (TMA), watercourse diversions, site drainage works, a fuel tank farm, explosives manufacturing facilities, explosives storage facilities, and plans for future underground operation. The Rainy River Mine was officially commissioned in September 2017.

Mine construction/operations have had only a moderate influence on surface water quality of the Pinewood River downstream of the RRM (Minnow 2018a). The influence of the RRM was evident in higher conductivity, hardness, calcium, potassium, and sodium in the Pinewood River downstream of the mine property relative to upstream (Minnow 2018a). No other analytes were significantly elevated in Pinewood River water downstream of effluent discharge compared to upstream while the effluent was discharging (September 2015 to December 2017; Minnow 2018a). However, RRM ceased effluent discharge in May 2018, and has no plans for effluent discharge until 2020 at earliest.

1.2 Project Background and Objective

The RRM fish tissue quality monitoring program is one part of RRM's comprehensive environmental monitoring activities and is a requirement of both the Federal EA Approval and provincial Environmental Compliance Approval (ECA). The ECA (Number 5178-9TUPD9) was issued by the Ministry of the Environment, Conservation, and Parks (MECP) on September 1, 2015. This requirement is comprised of two components, a large-bodied and a small-bodied fish tissue quality survey. The large-bodied fish survey is implemented on a three year cycle and the small-bodied fish survey is implemented annually. Due to logistical error, the large-bodied survey was implemented in 2018 and the small-bodied fish survey was not completed in 2018. The monitoring frequencies have been formalized and all stakeholders are



LEGEND

- Mine Infrastructure
- Contour (10 m)

0 1 2 4 km

N W E S

Projection: North American Datum 1983 UTM Zone 15

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Location and Layout, Rainy River Mine

Date: March 2019
Project 187202.0045

minnow environmental Inc.

Figure 1.1

Document Path: S:\Projects\187202\187202.0045 - RRP 2018 Fish Tissue\4 - GIS\Report\18-45 Figure 1 Location and Layout.mxd

aware of the requirements for future surveys with the next large-bodied survey scheduled for 2021 and the small-bodied survey scheduled for 2019.

The objective of the large-bodied fish tissue quality monitoring is to characterize concentrations of contaminants of potential concern (COPCs; arsenic, boron, cadmium, cobalt, copper, chromium, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc) in muscle, liver, and ovary tissues of two sentinel sport fish species, northern pike (*Esox lucius*) and walleye (*Sander vitreus*), collected in the Pinewood River downstream of historical effluent discharge. COPC concentration data are used to determine whether the RRM has affected these concentrations, and, if it has, to communicate any potential risk to human health from the consumption of the sentinel sport fish.

1.3 Study Design

The 2018 study included fish tissue quality assessment in the Pinewood River downstream of the RRM extending to approximately 500 m upstream of the confluence with the Rainy River. As required under ECA 5178-9TUPD9, tissue samples from fifteen individuals of two sentinel sport fish species, northern pike and walleye were collected. Three types of tissue were sampled: muscle, liver, and ovary. Data were compared to provincial, federal, and international criteria for the protection of human health (BCMOE 2012, Health Canada 2007, Health Canada 2010, MECP 2015, IRIS 2018) as well as to baseline concentrations (AMEC 2013).

2 METHODS

2.1 Overview

The RRM Fish Tissue Quality Monitoring Program was conducted from September 10th to 14th, 2018. The program focused on fish tissue quality assessment, targeting northern pike and walleye in the Pinewood River downstream of the RRM. All fish collection locations were recorded using a handheld Global Positioning System (GPS) and maps. The locations were chosen based on the results of previous fishing efforts, habitat characteristics preferred by the target species, and access.

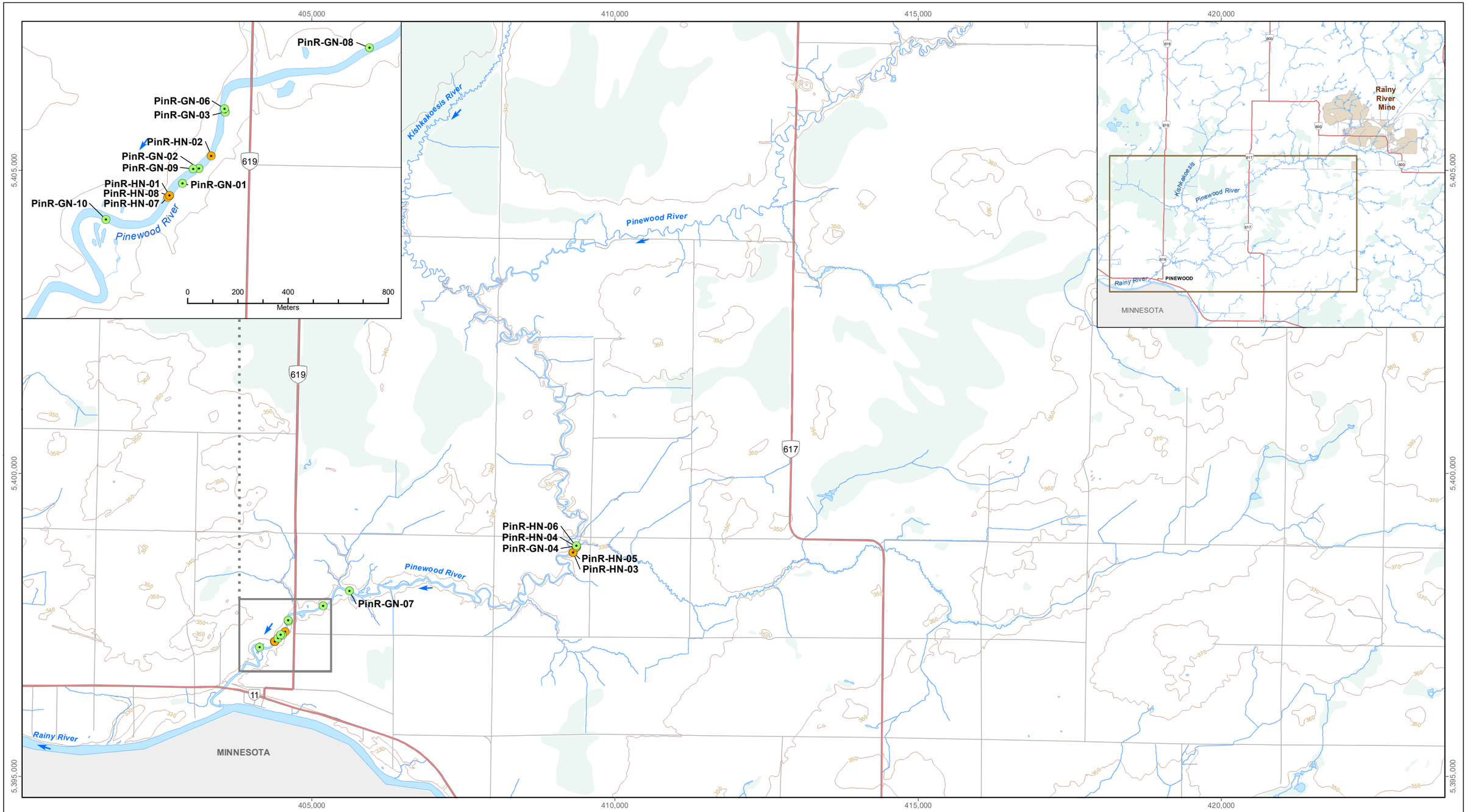
2.2 Field Data Collection

Fish sampling was performed under an Ontario Ministry of Natural Resources and Forestry License to Collect Fish for Scientific Purposes (Licence No. 1090759; Appendix B). Fishing was conducted in the Pinewood River downstream of the RRM using gill nets and hoop nets (Figure 2.1). Gill nets were standard 100-ft lengths with mesh sizes of 3", 4", and 5". Medium hoop nets (0.75 m diameter hoops, 2.5 cm stretched mesh) were used. Time of deployment and retrieval were recorded for every net set. Upon retrieval of each net, captured fish were identified and counted, and results were recorded on catch data sheets. Only northern pike and walleye of edible size were retained for sampling (>30 cm total length, based on MECP recommendations for the Rainy River; MECP 2015). A total of fifteen northern pike and fifteen walleye were retained for detailed assessment. Any live bycatch[1] or additional target species captured were released.

All retained northern pike and walleye were measured to determine length (fork and total) and weight. Lengths were measured to the nearest millimetre on a fish board. Weights were measured to the nearest 1 to 5% of total weight using Pesola™ spring scales. Two aging structures (scales and either cleithra [northern pike] or dorsal spines [walleye]) were collected from each sacrificed fish. Livers and gonads (if developed) were removed using clean implements (cutting boards, fillet knives, and tweezers) and weighed to the nearest 0.001 g (with ± 1% precision) using a Scout Pro balance. Tissue samples of boneless, skinless muscle tissue, whole livers, and whole ovaries (where present and developed) were collected from each fish, placed in clean, labeled Whirl-Pak™ bags, and frozen until analysis.

Upon completion of the sampling program, tissue samples were submitted to ALS Environmental in Thunder Bay, Ontario, along with a chain-of-custody record, a list of expected Lowest Detection Limits (LDLs), and laboratory QA/QC requirements (Appendix A). Aging structures were shipped

[1] Unwanted fish species caught while conducting targeted sampling for a different species (i.e., in this study, any fish species other than northern pike and walleye).



LEGEND

Fishing Method

- Gill Net
- Hoop Net

Mine Infrastructure

Contour (10 m)

0 1 2 4 km

N W E S

Projection: North American Datum 1983 UTM Zone 15

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Fishing Locations, Rainy River Mine, Fish Tissue Quality Monitoring, Fall 2018

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minnow environmental inc.

Figure 2.1

Document Path: S:\Projects\187202\187202.0045 - RRP 2018 Fish Tissue\4 - GIS\Report\18-45 Figure 2 Fishing Locations.mxd

to AAE Tech Services Inc. in Winnipeg, Manitoba, along with a chain-of-custody record for determination of fish ages.

2.3 Analysis of Catch and Meristic Data

Fish catch data were compiled and summarized. The catch compilations, along with data on the gill net and hoop net set durations were used to calculate total and species-specific catch-per-unit effort (CPUE) for each capture method in the Pinewood River.

2.4 Analysis of Chemical Data

Upon receipt of the chemical data from ALS, a data quality review (DQR) was performed. This included the assessment of laboratory precision and laboratory accuracy against data quality objectives (DQOs) established at the outset of the project (Appendix A). A minimum of 10% of the analyses represented quality control samples (e.g., laboratory duplicates and certified reference materials). After DQR, summary statistics were calculated for each analyte (i.e., mean, standard deviation, minimum, and maximum).

Mercury is the only metal[2] for which a commercial guideline and various consumption level advisories have been established for fish muscle tissue (Health Canada 2007, BCMOE 2012, MECP 2015). Health Canada has established a standard of 0.5 mg/kg wet weight (ww) as the maximum acceptable concentration of mercury in commercially sold fish, enforceable by the Canadian Food Inspection Agency (Health Canada 2007). Although this guideline is only applicable to commercially sold fish, 0.5 mg/kg ww is also the level at which the MOECP recommends a complete consumption restriction for vulnerable populations (i.e., women of child-bearing age and children under 15; Table 2.1; MECP 2015). In addition to evaluating mercury concentrations relative to health guidelines, relationships between mercury concentrations in fish muscle tissue and age were explored graphically. Mercury concentrations were also compared to previous studies including baseline data collected in 2012 (AMEC 2013).

Summary statistics were calculated for each parameter by year. Summary statistics included sample size, mean, standard deviation, minimum, and maximum values. Means and standard deviations were estimated used the Kaplan-Meier (K-M) method to most appropriately deal with less than laboratory reporting limit data (Helsel 2012). This method involves transforming left-censored data (i.e., data prefaced with a "<" symbol) to right-censored data (i.e., values prefaced with a ">" symbol), and then using the K-M estimator (used to estimate the mean survival time in survival analysis) to estimate the mean. The calculation was completed using the survfit() function in the survival package (Therneau 2017) in R software (R Core Team 2019) and involves

[2] Here and elsewhere in this document, "metal" includes metalloids, such as arsenic and selenium.

Table 2.1: Fish Consumption Advisories for Vulnerable Populations and for the General Population Based on Fish Tissue Mercury Concentrations (MECP 2015)

Advisory recommended maximum number of meals per month	Fish tissue mercury concentration (mg/kg w.w.)	
	As consumed by vulnerable populations [a]	As consumed by the general population
32	0	0
16	0.06	0.15
12	0.12	0.3
8	0.16	0.4
4	0.25	0.6
2	-	1.2
0	0.5	1.8

[a] i.e., women of child-bearing age and children under 15.
Note: w.w. - wet weight.

calculating the area under the K-M survival curve. The K-M method is non-parametric and can accommodate multiple laboratory reporting limits (LRLs). This method of estimating the mean is equivalent to using the distribution of detected values below the maximum LRL to represent values that are <LRL. For example, the mean of the data set {1, 2, <4, 5} is estimated as the mean of 1, 2, [½×1 + ½×2], and 5 which is 2.375. The value <4 is replaced by the distribution of values below 4 (i.e. 1 and 2 with equal weight of ½). Similarly, the mean of the data set {1, 1.6, 2, 2.1, <4, 5} is estimated as the mean of 1, 1.6, 2, 2.1, [¼×1 + ¼×1.6 + ¼×2 + ¼×2.1], and 5 which is 2.229. Again, the value <4 is replaced by the distribution of values below 4 (i.e., 1, 1.6, 2, and 2.1 with equal weight of ¼). If the minimum value in the data set is <LRL then it is replaced with the LRL. Therefore, if there is only one LRL and no detected values <LRL, then the K-M estimate of the mean is equivalent to replacing the value <LRL with the LRL (i.e., the best guess for the values <LRL is the LRL). If a standard deviation could not be estimated (e.g., all data <LRL), then one was not reported.

Concentrations of mercury in muscle, liver, and ovary tissue of northern pike and walleye were plotted versus fork length by species and year using scatterplots because mercury is known to bio-accumulate in fish tissue over time (e.g. Evers et al. 2011, Kidd and Batchelar 2012). Concentrations of mercury in muscle were plotted relative to the Health Canada guideline (Health Canada 2007) of 0.5 mg/kg ww. Statistical comparisons of concentrations of mercury among years (2012, 2015, 2016, 2017, and 2018) were conducted by species using analysis of

covariance (ANCOVA) with fork length as the covariate. An assumption of ANCOVA is that the range of covariate values (i.e., fork length) is similar among groups. The range of fork lengths was therefore truncated for statistical comparisons to provide a similar range of fish sizes among years and to remove the influence of small fish observed in 2012 (northern pike) and 2016 (walleye) on the regression coefficients. For northern pike, comparisons to 2012 were made on fish between 40 and 55 cm fork length, and comparisons among the other years (excluding 2012) were made on fish between 40 and 70 cm. For walleye, comparisons to 2016 were made on fish between 30 and 40 cm fork length, and comparisons among the other years (excluding 2016) were made on fish greater than 30 cm fork length. Fork length and concentrations of mercury were $\log_{10}$-transformed to meet the assumptions of normality of the model residuals.

The ANCOVA analyses were conducted using all data and then supported by comparisons of similar sized fish among years. The first step was to test the significance of the interaction between year and fork length in the ANCOVA interaction model (i.e., a test for equal regression slopes among years). If the regression slopes were significantly different, pairwise comparisons of slopes were conducted among years. In most cases, significant differences among slopes were driven by the range of fish sizes among years and the ANCOVA analyses proceeded on a subset of size or on two subsets of sizes as described above. For the subset analyses, when significantly different regression slopes were observed among years, the conclusion was that there is a difference among years in mean mercury concentration but the magnitude depends on the size of the fish. The magnitude of difference in mercury concentration among years was estimated based on the predicted means from the regression equations at the minimum and maximum values of the range of fork lengths that overlap among years.

For ANCOVA models with similar slopes, the ANCOVA parallel slope model was fit (i.e., the non-significant interaction term was dropped from the model). If fork length was not a significant predictor of mercury concentration in the ANCOVA parallel slope model, mercury concentration was compared among years using an ANOVA with post-hoc comparisons of least-squares means and Tukey's honestly significant differences method for multiple comparisons. If fork length was a significant predictor of mercury concentration in the ANCOVA parallel slope model, the differences in concentrations of mercury among years were assessed with post-hoc comparisons of least-squares means at the average fork length and Tukey's honestly significant differences method for multiple comparisons.

A meaningful ANCOVA analysis of ovary mercury concentrations versus size could not be conducted because too few of the walleye captured in 2018 were mature females and the range of fork lengths of those that were captured were not similar to previous years. Concentrations of mercury in ovary were therefore compared using a Kruskal-Wallis test on concentration between

years, with Dunn's test for pairwise differences. No adjustment was made for multiple comparisons because of the low power of non-parametric tests.

Significant differences were evaluated among years using a compact letter system. Capital letters were assigned to years (e.g., A,B,C) and lower case letters to slopes (e.g. a,b,c) such that years that share a letter are not significantly different. The letters were assigned such that the year with the highest mean (or slope) was assigned the letter "A" (or "a").

A magnitude of difference was calculated relative to the baseline year (defined as the minimum year used in the statistical comparison) as:

$$\text{Magnitude of Difference } \frac{\bar{x}_{\text{i}} - \bar{x}_{\text{baseline}}}{\bar{x}_{\text{baseline}}} \times 100\% ,$$

where $\bar{x}_i$ is the mean for year *i* , $\bar{x}_{baseline}$ is the mean for the baseline year. The magnitude of difference was calculated using length-adjusted means for ANCOVA with parallel slopes, predicted means from regressions by year for the ANCOVA with significantly different slopes, geometric means for the ANOVA, and medians for the Kruskal-Wallis test. All statistical comparisons were conducted using a significance level (α) of 0.05, in R 3.5.0 (R Core Team 2019) using custom functions and the R package emmeans 1.2.1 (Lenth 2018).

Concentrations of selenium in muscle of northern pike and walleye were plotted versus fork length by species and year using scatterplots and relative to the British Columbia Ministry of Environment (BCMOE) consumption guidelines. These guidelines were 1.8 mg/kg ww for a high intake diet and 3.6 mg/kg ww for a moderate intake diet (BCMOE 2012).

Concentrations of other metals in muscle, liver, and ovary tissue were evaluated relative to consumption benchmarks (Table 2.2). These benchmarks were derived based on the lowest reported tolerable daily intake (TDI; Health Canada 2010, IRIS 2018) and established consumption rates for fish eating populations (OHM 1990, Richardson 1997, USEPA 1997, Health Canada 2010), assuming a typical adult body weight of 70 kg, where:

Fish Consumption Limit Benchmark = TDI mg/kg x 70 kg / consumption rate (kg).

Investigations during the initial environmental assessment (EA) determined that the RRM area does not support a significant commercial or recreational fishery and that no traditional activities are currently undertaken within the RRM area by local First Nation and/or Métis people (AMEC 2014). Further discussion with local First Nations community members in August 2016 confirmed that the Pinewood River does not support a significant traditional fishery, and that it is only occasionally used for recreational fishing, with most fishing located near the mouth (Minnow 2017). In light of this, the consumption rate category of 21.8 g/d was used in deriving

Table 2.2: Consumption Benchmarks for Metals (including all COPCs) in Fish Tissue (mg/kg)

Analyte	Tolerable Daily Intake (mg/kg day)[a]	Fish Concentration Benchmarks (mg/kg) Based on		
		6.5 g/day[b]	21.8 g/day[c]	111 g/day[d]
Antimony	0.0004 [e]	4.3	1.3	0.3
Arsenic	0.0003 [e]	3.2	1.0	0.2
Barium	0.2 [e,f]	2,150	642	126
Beryllium	0.002 [e]	21.5	6.4	1.3
Boron	0.0175 [f]	188	56.2	11.0
Cadmium	0.001 [e,f]	10.8	3.2	0.6
Chromium	0.001 [f]	10.8	3.2	0.6
Cobalt	none available	-	-	-
Copper	0.091 [f,h]	980	292	57
Iron	none available	-	-	-
Lead	0.0036 [f]	38.8	11.6	2.3
Manganese	0.122 [f,h]	1,310	392	76.9
Molybdenum	0.005 [e]	53.8	16.1	3.2
Nickel	0.0011 [f,g]	11.8	3.5	0.7
Silver	0.005 [e]	53.8	16.1	3.2
Strontium	0.6 [e]	6,460	1,930	378
Uranium	0.0006 [f]	6.5	1.9	0.4
Zinc	0.3 [e]	3,230	963	189

Selected benchmark.

Note: COPC - Contaminants of Potential Concern.

[a] Where values were reported by both IRIS (2018) and Health Canada (2010), the lowest value was used to derive a conservative benchmark.

[b] USEPA (1997) mean consumption rate for general population; mean value for anglers is 8.0 g/day, 95th percentile for anglers is 25 g/day.

[c] Upper limit consumption rate for Canadian population based on high caloric intake (OHM 1990). Also the highest consumption level considered in development of fish advisories in Ontario.

[d] Health Canada (2010) consumption rate for screening level risk assessments, from Richardson (1997). Exceeds the average value for fishing subsistence populations (70 g/day; USEPA 1997).

[e] IRIS (2018).

[f] Health Canada (2010).

[g] Based on nickel chloride.

[h] Most conservative concentration (tolerable daily intakes are defined on an age-group specific basis).

the benchmarks, representing the upper limit consumption rate for Canadian population based on high caloric intake (Table 2.2; OHM 1990, Richardson 1997).

The consumption rate of 21.8 g/d still results in the derivation of conservative benchmarks, as it is more than double the mean consumption rate for anglers within a general population (8.0 g/d; USEPA 1997). Additionally, 21.8 g/d is the highest consumption level considered in development of fish advisories in Ontario. Benchmarks were derived for COPC for which health criteria or TDI values were available (Table 2.2): antimony, arsenic, barium, beryllium, boron, cadmium, chromium, copper, lead, manganese, molybdenum, nickel, silver, strontium, uranium, and zinc. Of the COPCs, only cobalt and iron do not have applicable health criteria or TDI values (i.e., benchmarks could not be calculated), so concentrations in fish tissues recorded in 2018 were only compared to baseline data.

3 RESULTS

3.1 Fish Communities and Catch-per-unit-effort

A total of seven fish species were captured in the Pinewood River using gill nets and hoop nets (Table 3.1). Walleye were the most abundant large bodied fish, followed by northern pike and black crappie (Table 3.1). Catch-per-unit-effort in 2018 was similar to previous years.

3.2 Northern Pike Tissue Quality

3.2.1 Muscle Tissue Chemistry

Up until May 2018 (when RRM ceased effluent discharge), there had been no detectable mercury concentrations in effluent and receiving water quality samples (Minnow 2018a), suggesting that effluent may not meaningfully contribute to mercury accumulation in Pinewood River fish. Naturally elevated mercury concentrations are often observed in predatory fish species in northern lakes and depositional rivers due to naturally elevated environmental mercury levels, atmospheric deposition of mercury, and biogeochemical conditions that favour mercury methylation (Evers et al. 2011, Kidd and Batchelar 2012). Methylated mercury is biomagnified through the food chain resulting in elevated concentrations in predatory fish species such as northern pike and walleye (Evers et al. 2011, Kidd and Batchelar 2012). In addition to this, methylated mercury has a long residence time in tissues and, with continued exposure, will bioaccumulate over the organism's lifetime (Evers et al. 2011, Kidd and Batchelar 2012). Bioaccumulation in northern pike in the Pinewood River is characterized by the relationship between mercury concentration in muscle tissue and fish size (i.e., fork length) and age (Figures 3.1 and 3.2; Appendix Table B.3).

Northern pike muscle tissue collected in 2018 contained an average mercury concentration below all consumption guidelines (Table 3.2). However, six large fish (ranging in size from 56.1 and 63.9 fork length) had mercury concentrations above consumption guidelines for vulnerable populations (0.5 mg/kg; Figures 3.1 and 3.2; Appendix Table C.5). Despite these exceptions, all mercury concentrations in muscle tissue were well below the complete consumption restriction level for the general population (1.8 mg/kg; Table 2.1, Figures 3.1 and 3.2; MECP 2015). All other metal concentrations in muscle tissue were below established guidelines (established in Section 2.4), including selenium concentrations that were much lower than British Columbia's consumption guidelines (Figure 3.3; BCMOE 2012).

The 2018 mercury concentrations in muscle were compared to 2017, 2016, 2015, and baseline data (2012). The assessment was made by comparing concentrations at length, due to the established relationship between mercury concentrations and fish size (Figures 3.1 and 3.2).

Table 3.1: Summary of Fishing Effort in the Pinewood River, Rainy River Mine Fish Monitoring, 2018

a) Fish catch numbers by sampling method.

Size Class	Species	Gill Nets	Hoop Nets	Total Catch
Large Body	Northern Pike	35	0	35
	Walleye	38	3	41
	Black Crappie	14	13	27
	Brown Bullhead	0	1	1
	Shorthead Redhorse	1	0	1
	White Sucker	0	2	2
	Yellow Perch	0	3	3

b) Catch-per-unit-effort (CPUE) by sampling method.

Size Class	Species	Gill Nets (fish per 100 m*hr)[a]	Hoop Nets (fish per trap*day)[b]
Large Body	Northern Pike	0.54	0.00
	Walleye	0.59	0.40
	Black Crappie	0.22	1.75
	Brown Bullhead	0.00	0.13
	Shorthead Redhorse	0.02	0.00
	White Sucker	0.00	0.27
	Yellow Perch	0.00	0.40
Total CPUE		1.36	2.95

[a] total effort = 64.7 (length*hours/100 m)
[b] total effort = 7.4 (trap * days)

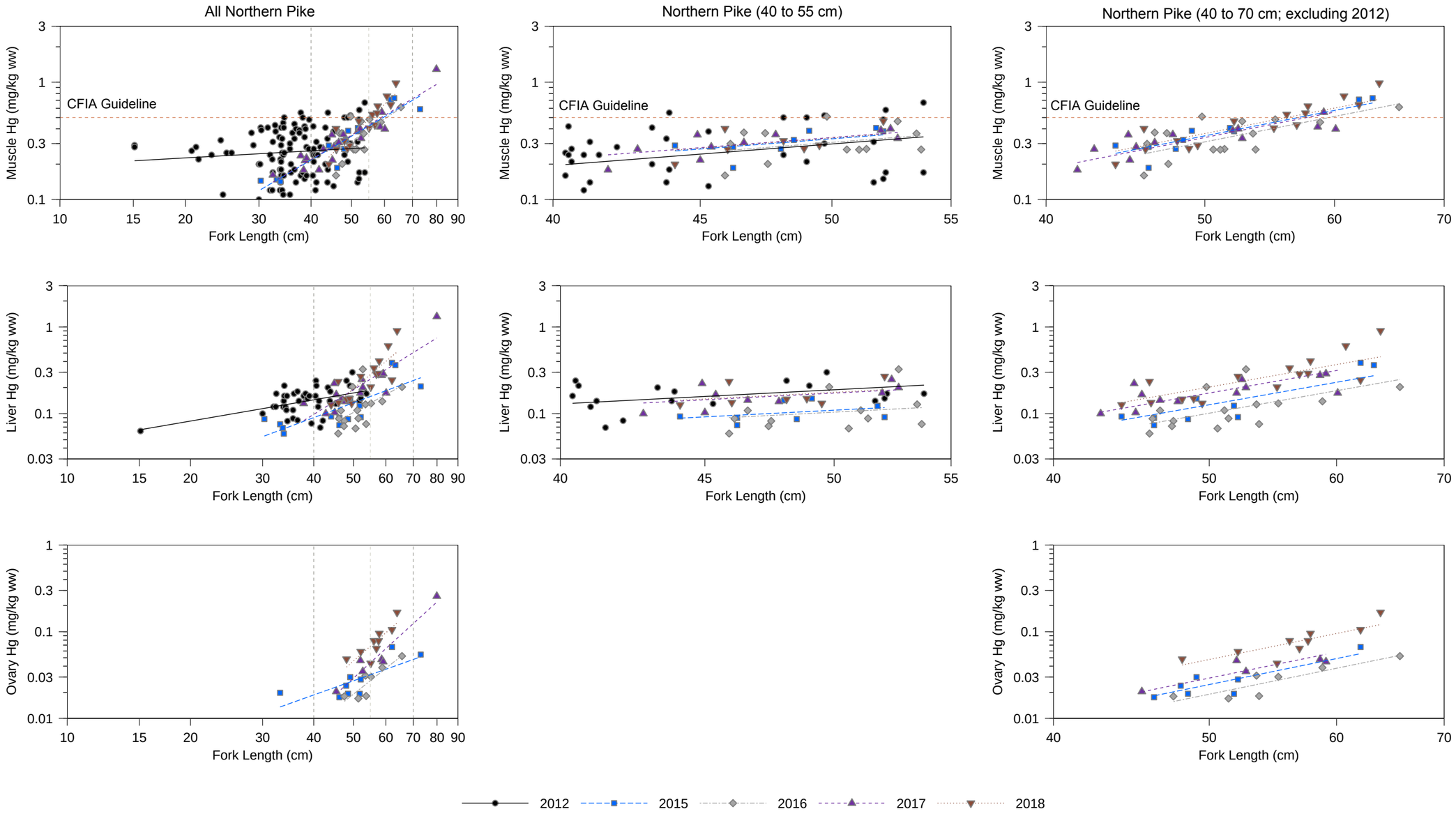

Figure 3.1: Scatterplots of Concentrations of Mercury (Hg) in Muscle, Liver, and Ovary of Northern Pike from Pinewood River, 2012 to 2018

Notes:
Left: all data; Middle: Fish between 40 and 55 cm fit to parallel slope ANCOVA model; Right: Fish > 40 cm (excluding 2012) fit to ANCOVA parallel slope model. Y and X axes are $\log_{10}$-scaled.
Dashed horizonal line = CFIA Guideline of 0.5 mg/kg ww
Dashed vertical lines = cut offs used for examining similar sized fish among years

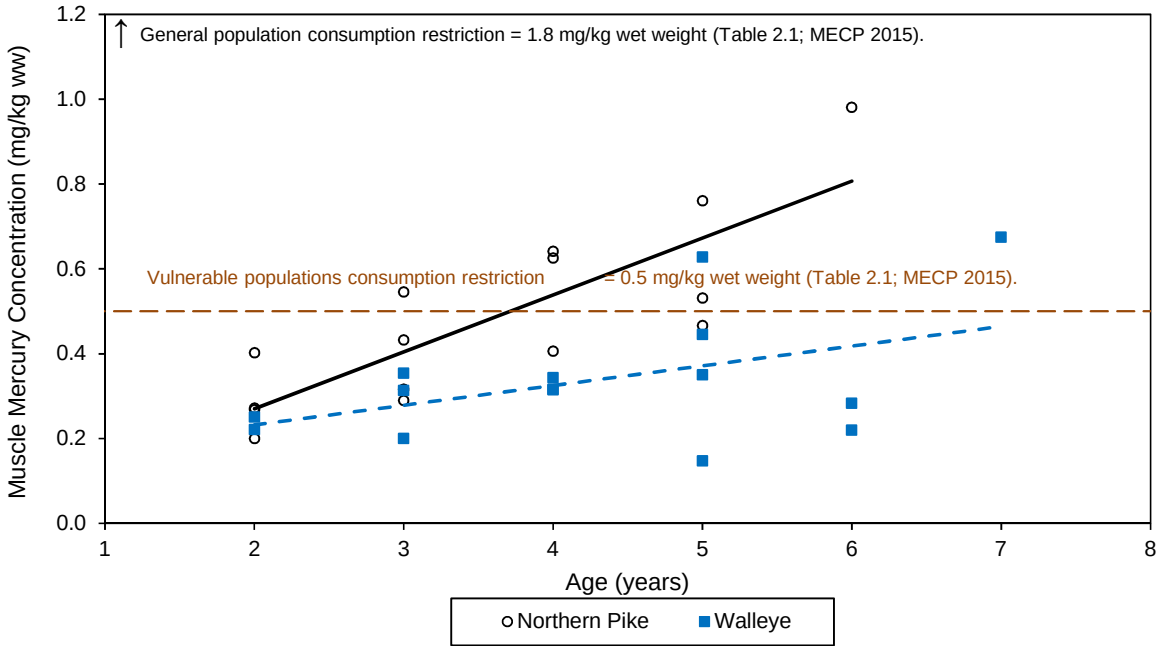

Figure 3.2: Scatterplot and Linear Regression of Muscle Mercury Concentration versus Age for Sentinel Fish from the Pinewood River, Rainy River Mine Fish Quality Tissue Monitoring, 2018

Table 3.2: Metal Concentrations in Northern Pike Muscle Tissue, Rainy River Mine Fish Tissue Quality Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Average (n=15)	SD	Minimum	Maximum
% Moisture	0.25	%	-	79.0	1.0	77.5	80.8
Aluminum (Al)	2.0	mg/kg ww	-	0.676	0.292	<0.400	1.32
Antimony (Sb)	0.010	mg/kg ww	1.3	<0.00200	-	<0.00200	<0.00200
Arsenic (As)	0.020	mg/kg ww	1.0	0.0485	0.0174	0.0276	0.0896
Barium (Ba)	0.050	mg/kg ww	642	0.0671	0.0459	<0.0100	0.182
Beryllium (Be)	0.010	mg/kg ww	6.4	<0.00200	-	<0.00200	<0.00200
Bismuth (Bi)	0.010	mg/kg ww	-	0.00285	0.000516	<0.00200	0.00400
Boron (B)	1.0	mg/kg ww	56.2	<0.200	-	<0.200	<0.200
Cadmium (Cd)	0.0050	mg/kg ww	3.2	0.00124	0.000526	0.000972	0.00257
Calcium (Ca)	20	mg/kg ww	-	313	224	99.7	708
Cesium (Cs)	0.0050	mg/kg ww	-	0.0108	0.00284	0.00577	0.0156
Chromium (Cr)	0.050	mg/kg ww	3.2	0.0104	0.00136	<0.0100	0.0152
Cobalt (Co)	0.020	mg/kg ww	-	0.00488	0.00128	<0.00400	0.00778
Copper (Cu)	0.10	mg/kg ww	292	0.171	0.0351	0.109	0.236
Iron (Fe)	3.0	mg/kg ww	-	3.11	1.06	1.37	4.68
Lead (Pb)	0.020	mg/kg ww	11.6	0.00690	0.00707	0.00396	0.0257
Lithium (Li)	0.50	mg/kg ww	-	<0.100	-	<0.100	<0.100
Magnesium (Mg)	2.0	mg/kg ww	-	305	23.6	263	346
Manganese (Mn)	0.050	mg/kg ww	392	0.366	0.212	0.144	0.733
Mercury (Hg)	0.0050	mg/kg ww	0.5	0.476	0.212	0.200	0.981
Molybdenum (Mo)	0.020	mg/kg ww	16.1	<0.00400	-	<0.00400	<0.00400
Nickel (Ni)	0.20	mg/kg ww	3.5	<0.0400	-	<0.0400	<0.0400
Phosphorus (P)	10	mg/kg ww	-	2,360	222	1,920	2,680
Potassium (K)	20	mg/kg ww	-	4,110	340	3,530	4,700
Rubidium (Rb)	0.050	mg/kg ww	-	6.20	1.14	4.61	8.41
Selenium (Se)	0.050	mg/kg ww	3.6	0.163	0.0167	0.140	0.196
Sodium (Na)	20	mg/kg ww	-	462	137	160	665
Strontium (Sr)	0.050	mg/kg ww	1,930	0.145	0.128	0.0214	0.391
Tellurium (Te)	0.020	mg/kg ww	-	<0.00400	-	<0.00400	<0.00400
Thallium (Tl)	0.0020	mg/kg ww	-	0.00216	0.000729	0.00121	0.00344
Tin (Sn)	0.10	mg/kg ww	-	0.0202	0.000116	<0.0200	0.0219
Uranium (U)	0.0020	mg/kg ww	1.9	<0.000400	-	<0.000400	<0.000400
Vanadium (V)	0.10	mg/kg ww	-	<0.0200	-	<0.0200	<0.0200
Zinc (Zn)	0.50	mg/kg ww	963	4.87	0.968	3.51	6.93
Zirconium (Zr)	0.20	mg/kg ww	-	<0.0400	-	<0.0400	<0.0400

Note: SD = Standard Deviation.
Value > Benchmark
[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).
[b] See Table 2.2 for Consumption Benchmark References.

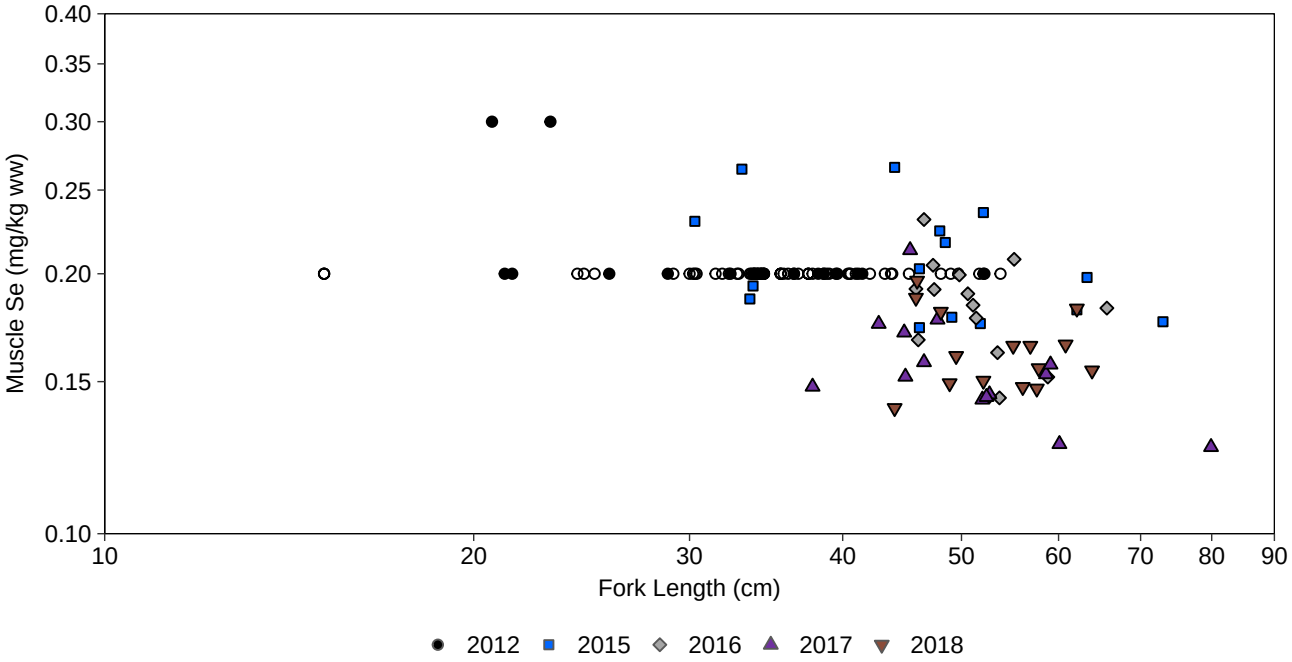

Figure 3.3: Scatterplot of Concentrations of Selenium (Se) in Muscle of Northern Pike from Pinewood River, 2012 to 2018

Notes:
Concentrations below the laboratory reporting limit (LRL) are plotted as open symbols at the LRL. BCMOE Guideline = 1.8 mg/kg ww (high intake) and 3.6 mg/kg ww (moderate intake).

Comparison with previous data showed that mercury concentrations in muscle have generally remained within the same range or lower, despite notably different maximum sizes/ages (Figure 3.1 and Table 3.3; AMEC 2013). Metal concentrations in northern pike muscle tissue in 2018 were within the range of baseline (2012), 2015, 2016, and 2017 concentrations (Table 3.3; AMEC 2013).

The relationship between mercury concentrations in muscle and length were compared statistically among baseline (2012) and the four Fish Tissue Monitoring Programs (2015, 2016, 2017, and 2018; Table 3.4). Mercury concentrations in muscle did not differ significantly among 2012, 2015, 2016, 2017, and 2018 fish (Table 3.4; Figure 3.1).

3.2.2 Liver and Ovary Tissue Chemistry

Fish liver tissue is not recommended for human consumption (MECP 2015). Discussion with local First Nations community members in August 2016 indicated that organs of fish caught in the Pinewood River are not regularly eaten by community members (Minnow 2017). It is unclear whether livers are included with canned northern pike, a process which includes 80% of the fish (Minnow 2017). However, since RRM has regulatory requirements to monitor for key contaminants in northern pike and walleye livers, concentrations of metals in livers were screened against benchmarks to provide perspective on whether this tissue is edible based on chemical quality. Many metals are known to accumulate to higher concentrations in liver tissue than in muscle tissue (e.g., chromium, lead), and liver is more likely to contain quantifiable chemical concentrations (AMEC 2013).

Northern pike liver tissue collected in 2018 contained an average mercury concentration that was well below human consumption benchmarks, however, two individual fish had liver mercury concentrations above consumption guidelines for vulnerable populations (0.5 mg/kg; Table 3.5; Appendix Table C.6). All other metal concentrations in liver tissue were below associated guidelines (Appendix Table C.6). Compared temporally, 2018 metal concentrations in liver were within the range of data from previous studies (2012, 2015, 2016, and 2017) for all metals (Table 3.6; AMEC 2013).

Similar to muscle, mercury concentrations in liver were compared statistically among the 2012, 2015, 2016, and 2018 data. As with muscle, liver mercury concentrations in 2018 were not statistically different than baseline (2012; Table 3.4; Figure 3.1). Additionally, 2018 mercury concentrations in liver were similar to those in 2015 and 2017, but greater than those in 2016 (Table 3.4).

Discussion with local First Nations community members in August 2016 indicated that roe of fish caught in the Pinewood River is not regularly eaten by community members (Minnow 2017).

Table 3.3: Concentrations (mean ± standard deviation) of Contaminants of Potential Concern (COPCs) in Northern Pike Muscle Tissue, Comparing Baseline (2012) and Construction/Operations (2015, 2016, 2017, 2018) Data, Rainy River Mine Fish Tissue Quality Monitoring

COPC	Units	Benchmark[a,b]	Baseline 2012 Data (n = 70; AMEC 2013)	2015 Data (n = 15; Minnow 2016)	2016 Data (n = 15; Minnow 2017)	2017 Data (n = 15; Minnow 2018)	2018 Data (n = 15; This Study)
Arsenic (As)	mg/kg w.w.	1.0	0.10 ± 0	0.0935 ± 0.0198	0.0829 ± 0.0378	0.0688 ± 0.0241	0.0485 ± 0.0174
Boron (B)	mg/kg w.w.	56.2	<0.50 ± 0	<0.200 ± -	<0.200 ± -	<0.200 ± -	<0.200 ± -
Cadmium (Cd)	mg/kg w.w.	3.2	<0.01 ± 0	0.00138 ± 0.00205	0.00118 ± -	0.00103 ± 0.000103	0.00124 ± 0.000526
Chromium (Cr)	mg/kg w.w.	3.2	<0.30 ± 0	0.0176 ± 0.0253	0.0204 ± 0.0227	0.0131 ± 0.00481	0.0104 ± 0.00136
Cobalt (Co)	mg/kg w.w.	-	0.01 ± 0.00051	0.00409 ± 0.000190	0.00411 ± 0.0000819	0.00416 ± -	0.00488 ± 0.00128
Copper (Cu)	mg/kg w.w.	292	0.51 ± 0.048	0.180 ± 0.0404	0.156 ± 0.0305	0.143 ± 0.0737	0.171 ± 0.0351
Iron (Fe)	mg/kg w.w.	-	3.23 ± 0.52	4.00 ± 5.76	1.71 ± 0.359	1.68 ± 0.552	3.11 ± 1.06
Lead (Pb)	mg/kg w.w.	11.6	0.03 ± 0	0.0105 ± 0.0174	0.00415 ± -	0.00432 ± -	0.00690 ± 0.00707
Manganese (Mn)	mg/kg w.w.	392	0.78 ± 0.73	0.417 ± 0.254	0.414 ± 0.303	0.518 ± 0.378	0.366 ± 0.212
Mercury (Hg)	mg/kg w.w.	0.5	0.34 ± 0.11	0.369 ± 0.208	0.364 ± 0.121	0.410 ± 0.248	0.476 ± 0.212
Molybdenum (Mo)	mg/kg w.w.	16.1	0.05 ± 0.012	0.00428 ± 0.000647	<0.00400 ± -	<0.00400 ± -	<0.00400 ± -
Nickel (Ni)	mg/kg w.w.	3.5	0.10 ± 0.44	<0.0400 ± -	<0.0400 ± -	<0.0400 ± -	<0.0400 ± -
Selenium (Se)	mg/kg w.w.	16.1	0.20 ± 0.017	0.205 ± 0.0303	0.181 ± 0.0256	0.157 ± 0.0210	0.163 ± 0.0167
Zinc (Zn)	mg/kg w.w.	963	5.0 ± 1.8	4.99 ± 3.30	4.14 ± 0.957	3.62 ± 0.566	4.87 ± 0.968

Note: w.w. - wet weight.

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1; MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

Table 3.4: Results of Statistical Comparisons of Concentrations of Mercury in Muscle, Liver, and Ovary of Northern Pike from Pinewood River, 2012 to 2018

Species	Tissue	Dataset	Test	Sample Size					ANCOVA Interaction Model	ANCOVA Parallel Slope Model	Covariate Value[a] Fork Length (cm)	Summary Statistic	Value of Statistic (Mean or Median) [b] Hg (mg/kg ww)					Test P-value	Pairwise Comparisons [c]					Magnitude of Difference Relative to Baseline/Earliest Year (%)				
				2012	2015	2016	2017	2018	Interaction P-value	Covariate P-value			2012	2015	2016	2017	2018		2012	2015	2016	2017	2018	Baseline Year[f]	2015	2016	2017	2018
Northern Pike	Muscle	All Data	ANCOVA	112	15	15	19	15	<0.001	-	-	-	-	-	-	-	-	-	slope (b)	slope (a)	slope (ab)	slope (a)	slope (a)	-	-	-	-	-
		40-55 cm [d]	ANCOVA	36	8	12	10	7	0.967	0.002	46.8	Adjusted Mean	0.264	0.292	0.272	0.300	0.296	0.895	A	A	A	A	A	2012	11	3.0	14	12
		40-70 cm (exlcuding 2012) [e]	ANCOVA	-	10	15	13	15	0.189	<0.001	51.4	Adjusted Mean	-	0.383	0.340	0.371	0.401	0.251	-	A	A	A	A	2015	-	-11	-3.2	4.7
	Liver	All Data	ANCOVA	42	15	15	14	15	<0.001	-	-	-	-	-	-	-	-	-	slope (c)	slope (b)	slope (abc)	slope (ab)	slope (a)	-	-	-	-	-
		40-55 cm [d]	ANCOVA	18	8	12	9	7	0.721	0.010	47.4	Adjusted Mean	0.173	0.101	0.0955	0.158	0.162	<0.001	A	BC	C	AB	AB	2012	-42	-45	-8.5	-6.5
		40-70 cm (exlcuding 2012) [e]	ANCOVA	-	10	15	12	15	0.216	<0.001	51.6	Adjusted Mean	-	0.143	0.114	0.196	0.229	<0.001	-	BC	C	AB	A	2015	-	-20	37	60
	Ovary	All Data	ANCOVA	-	9	7	6	9	0.010	-	-	-	-	-	-	-	-	-	-	slope (b)	slope (ab)	slope (a)	slope (ab)	-	-	-	-	-
		40-70 cm [e]	ANCOVA	-	8	7	6	9	0.298	<0.001	55.3	Adjusted Mean	-	0.0342	0.0287	0.0474	0.0726	<0.001	-	BC	C	B	A	2015	-	-16	39	112

P-value < 0.05
Covariate P-value > 0.05 (i.e., fork length is not a significant predictor of Hg concentration)
Year is significantly > baseline year
Year is significantly < baseline year

Notes:
[a] Covariate value that corresponds to the adjusted means or predicted means in the ANCOVA.
[b] Mean reported for t-test; length-adjusted mean or predicted mean reported for ANCOVA, median reported for Mann-Whitney test.
[c] Years that share a letter (A,B,C) are not significantly different (Tukey's honestly significant differences method; α = 0.05); Slopes that share a letter (a,b) are not significantly different (all pairwise comparisons of slopes; α = 0.05).
[d] Range of fork lengths that provides good overlap of fish sizes to compare 2018 to 2012.
[e] Range of fork lengths that provides good overlap of fish sizes to compare 2018 to 2015, 2016, and 2017.
[f] Baseline year denotes measurements prior to mine operatration, (i.e. 2012), for endpoints not collected during this time period (i.e. ovary tissue), baseline denotes the earliest year in the temporal comparisons.

Table 3.5: Metal Concentrations in Northern Pike Liver Tissue, Rainy River Mine Fish Tissue Quality Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Average (n=15)	SD	Minimum	Maximum
% Moisture	0.25	%	-	76.8	3.26	69.1	80.7
Aluminum (Al)	2.0	mg/kg ww	-	1.68	1.50	<0.400	5.15
Antimony (Sb)	0.010	mg/kg ww	1.3	0.00219	0.000739	<0.00200	0.00447
Arsenic (As)	0.020	mg/kg ww	1.0	0.0367	0.0119	0.0206	0.0589
Barium (Ba)	0.050	mg/kg ww	642	0.115	0.0882	0.0260	0.391
Beryllium (Be)	0.010	mg/kg ww	6.4	<0.00200	-	<0.00200	<0.00200
Bismuth (Bi)	0.010	mg/kg ww	-	0.00829	0.00366	0.00328	0.0173
Boron (B)	1.0	mg/kg ww	56.2	<0.200	-	<0.200	<0.200
Cadmium (Cd)	0.0050	mg/kg ww	3.2	0.129	0.117	0.0471	0.444
Calcium (Ca)	20	mg/kg ww	-	83.0	108	27.0	441
Cesium (Cs)	0.0050	mg/kg ww	-	0.00511	0.00134	0.00210	0.00786
Chromium (Cr)	0.050	mg/kg ww	3.2	0.0112	0.00114	<0.0100	0.0179
Cobalt (Co)	0.020	mg/kg ww	-	0.0628	0.0301	0.0333	0.133
Copper (Cu)	0.10	mg/kg ww	292	35.3	18.4	11.1	78.1
Iron (Fe)	3.0	mg/kg ww	-	192	145	18.7	484
Lead (Pb)	0.020	mg/kg ww	11.6	0.00431	0.000883	<0.00400	0.00736
Lithium (Li)	0.50	mg/kg ww	-	<0.100	-	<0.100	<0.100
Magnesium (Mg)	2.0	mg/kg ww	-	153	22.8	124	190
Manganese (Mn)	0.050	mg/kg ww	392	1.37	0.449	0.632	2.48
Mercury (Hg)	0.0050	mg/kg ww	0.5	0.297	0.210	0.126	0.903
Molybdenum (Mo)	0.020	mg/kg ww	16.1	0.220	0.0578	0.0842	0.311
Nickel (Ni)	0.20	mg/kg ww	3.5	0.0411	0.00332	<0.0400	0.0526
Phosphorus (P)	10	mg/kg ww	-	2,580	514	1,810	3,280
Potassium (K)	20	mg/kg ww	-	2,500	414	1,640	3,020
Rubidium (Rb)	0.050	mg/kg ww	-	6.17	1.71	3.27	10.1
Selenium (Se)	0.050	mg/kg ww	3.6	1.99	0.261	1.55	2.37
Sodium (Na)	20	mg/kg ww	-	962	220	607	1,480
Strontium (Sr)	0.050	mg/kg ww	1,930	0.0657	0.0813	<0.0100	0.333
Tellurium (Te)	0.020	mg/kg ww	-	0.00471	0.00169	<0.00400	0.00894
Thallium (Tl)	0.0020	mg/kg ww	-	0.00272	0.000794	0.00185	0.00471
Tin (Sn)	0.10	mg/kg ww	-	0.0420	0.0457	<0.0200	0.210
Uranium (U)	0.0020	mg/kg ww	1.9	0.000895	0.000800	<0.000400	0.00369
Vanadium (V)	0.10	mg/kg ww	-	0.394	0.299	0.0720	1.05
Zinc (Zn)	0.50	mg/kg ww	963	48.0	11.2	27.5	67.8
Zirconium (Zr)	0.20	mg/kg ww	-	<0.0400	-	<0.0400	<0.0400

Note: SD = Standard Deviation.
Value > Benchmark
[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).
[b] See Table 2.2 for Consumption Benchmark References.

Table 3.6: Concentrations (mean ± standard deviation) of Contaminants of Potential Concern (COPCs) in Northern Pike Liver Tissue, Comparing Baseline (2012) and Construction/Operations (2015, 2016, 2017, 2018) Data, Rainy River Mine Fish Tissue Quality Monitoring

COPC	Units	Benchmark[a,b]	Baseline 2012 Data (n = 70; AMEC 2013)	2015 Data (n = 15; Minnow 2016)	2016 Data (n = 15; Minnow 2017)	2017 Data (n = 15; Minnow 2018)	2018 Data (n = 15; This Study)
Arsenic (As)	mg/kg w.w.	1.0	0.10 ± 0.013	0.0424 ± 0.0202	0.0383 ± 0.0135	0.0358 ± 0.0174	0.0367 ± 0.0119
Boron (B)	mg/kg w.w.	56.2	<0.50 ± 0	<0.200 ± -	<0.200 ± -	<0.200 ± -	<0.200 ± -
Cadmium (Cd)	mg/kg w.w.	3.2	0.051 ± 0.050	0.0528 ± 0.0371	0.0697 ± 0.0485	0.0980 ± 0.0509	0.129 ± 0.117
Chromium (Cr)	mg/kg w.w.	3.2	<0.30 ± 0	0.0193 ± 0.0437	0.0109 ± -	0.0332 ± 0.0797	0.0112 ± 0.00114
Cobalt (Co)	mg/kg w.w.	-	0.056 ± 0.057	0.0425 ± 0.0166	0.0489 ± 0.0175	0.0579 ± 0.0208	0.0628 ± 0.0301
Copper (Cu)	mg/kg w.w.	292	13 ± 9.3	24.2 ± 12.4	23.7 ± 10.6	31.1 ± 9.13	35.3 ± 18.4
Iron (Fe)	mg/kg w.w.	-	112 ± 73	116 ± 111	197 ± 165	143 ± 110	192 ± 145
Lead (Pb)	mg/kg w.w.	11.6	0.031 ± 0.0075	0.0375 ± 0.129	0.00417 ± -	0.00474 ± 0.00145	0.00431 ± 0.000883
Manganese (Mn)	mg/kg w.w.	392	1.5 ± 0.49	1.49 ± 0.595	1.11 ± 0.360	1.23 ± 0.384	1.37 ± 0.449
Mercury (Hg)	mg/kg w.w.	0.5	0.18 ± 0.16	0.140 ± 0.101	0.126 ± 0.0688	0.253 ± 0.290	0.297 ± 0.210
Molybdenum (Mo)	mg/kg w.w.	16.1	0.17 ± 0.046	0.145 ± 0.0432	0.174 ± 0.0528	0.206 ± 0.0590	0.220 ± 0.0578
Nickel (Ni)	mg/kg w.w.	3.5	0.05 ± 0	<0.0400 ± -	0.0424 ± 0.0108	0.0472 ± -	0.0411 ± 0.00332
Selenium (Se)	mg/kg w.w.	16.1	1.3 ± 0.39	1.49 ± 0.381	1.70 ± 0.443	2.20 ± 0.675	1.99 ± 0.261
Zinc (Zn)	mg/kg w.w.	963	34 ± 13	45.6 ± 15.9	36.9 ± 9.63	44.3 ± 5.78	48.0 ± 11.2

Note: w.w. - wet weight.

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1; MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

Despite this, concentrations of metals in ovaries were screened against benchmarks to provide perspective on whether this tissue would be safe to eat based on chemical quality. Some metals are known to accumulate to higher concentrations in ovary tissue than in muscle tissue (e.g., selenium; Janz 2012).

Screening of 2018 ovary tissue results showed that ovaries contained metal concentrations that were below human consumption benchmarks for metals with established TDI values or a provincial/commercial guideline (Table 3.7; Appendix Table C.7). Average ovary concentrations of northern pike collected in 2018 were within the range of fish collected in 2015 and 2016 for all metals (Table 3.8).

As with muscle and liver, mercury concentrations in ovary tissue were compared statistically among the four Fish Tissue Monitoring Programs[3] (2015, 2016, 2017, and 2018). Mercury concentrations in ovary tissue in 2018 were significantly higher than in 2015, 2016, and 2017, (Table 3.4, Figure 3.1). This relationship cannot be explained by fish size or age, and should be monitored moving forward. It should be noted that this relationship was not observed in muscle or liver tissue where it would normally be expected (Evers et al. 2011, Kidd and Batchelar 2012), thereby making these findings equivocal.

3.3 Walleye Tissue Quality

3.3.1 Muscle Tissue Chemistry

Average mercury concentrations in walleye muscle for 2018 were below human consumption benchmarks, however two large individuals were above consumption guidelines for vulnerable populations (0.5 mg/kg; Table 3.9; Appendix Table C.5). Despite these higher mercury concentrations, all walleye muscle tissue were well below the complete consumption restriction level for the general population (1.8 mg/kg; Table 2.1, Figure 3.4; MECP 2015). Walleye muscle metal concentrations for all other metals were below associated guidelines (Appendix Table C.5). Metal concentrations in 2018 walleye muscle tissue were within the range of data for all previous studies (Table 3.10; AMEC 2013). Additionally, selenium concentrations in walleye muscle tissue were much lower than British Columbia's consumption guidelines (Figure 3.5; BCMOE 2012).

The 2018 mercury concentrations in muscle were compared to previous data (2017 and 2016; Figure 3.4). Similar to northern pike, the assessment was made by comparing concentrations at length. Comparison with previous data showed that concentrations have generally remained within the same range, despite notably different maximum sizes/ages (Figures 3.2 and 3.4; AMEC 2013). As with northern pike, the longest/oldest walleye captured in the 2018 study was

[3] Ovary tissue was not collected in 2012.

Table 3.7: Metal Concentrations in Northern Pike Ovary Tissue, Rainy River Mine Fish Tissue Quality Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Average (n=7)	SD	Minimum	Maximum
% Moisture	0.25	%	-	83.2	0.542	82.3	84.1
Aluminum (Al)	2.0	mg/kg ww	-	0.814	0.658	<0.400	2.43
Antimony (Sb)	0.010	mg/kg ww	1.3	0.00218	-	<0.00200	0.00365
Arsenic (As)	0.020	mg/kg ww	1.0	0.0252	0.00590	0.0152	0.0329
Barium (Ba)	0.050	mg/kg ww	642	0.0834	0.0683	0.0187	0.242
Beryllium (Be)	0.010	mg/kg ww	6.4	<0.00200	-	<0.00200	<0.00200
Bismuth (Bi)	0.010	mg/kg ww	-	0.00209	-	<0.00200	0.00284
Boron (B)	1.0	mg/kg ww	56.2	<0.200	-	<0.200	<0.200
Cadmium (Cd)	0.0050	mg/kg ww	3.2	0.0105	0.00465	0.00518	0.0202
Calcium (Ca)	20	mg/kg ww	-	137	58.5	77.9	277
Cesium (Cs)	0.0050	mg/kg ww	-	0.00848	0.00163	0.00642	0.0120
Chromium (Cr)	0.050	mg/kg ww	3.2	0.0104	0.00345	0.00811	0.0182
Cobalt (Co)	0.020	mg/kg ww	-	0.0699	0.0226	0.0444	0.107
Copper (Cu)	0.10	mg/kg ww	292	1.05	0.167	0.762	1.20
Iron (Fe)	3.0	mg/kg ww	-	43.2	14.8	21.0	67.6
Lead (Pb)	0.020	mg/kg ww	11.6	0.00503	-	<0.00400	0.0133
Lithium (Li)	0.50	mg/kg ww	-	<0.100	-	<0.100	<0.100
Magnesium (Mg)	2.0	mg/kg ww	-	202	32.0	127	234
Manganese (Mn)	0.050	mg/kg ww	392	26.9	9.47	12.0	40.4
Mercury (Hg)	0.0050	mg/kg ww	0.5	0.0822	0.0379	0.0432	0.167
Molybdenum (Mo)	0.020	mg/kg ww	16.1	0.0535	0.0141	0.0254	0.0772
Nickel (Ni)	0.20	mg/kg ww	3.5	<0.0400	-	<0.0400	<0.0400
Phosphorus (P)	10	mg/kg ww	-	2,780	362	2,020	3,130
Potassium (K)	20	mg/kg ww	-	3,540	465	2,760	4,000
Rubidium (Rb)	0.050	mg/kg ww	-	6.02	0.804	5.05	7.32
Selenium (Se)	0.050	mg/kg ww	3.6	0.649	0.177	0.514	1.08
Sodium (Na)	20	mg/kg ww	-	868	111	655	1,000
Strontium (Sr)	0.050	mg/kg ww	1,930	0.0756	0.0337	0.0451	0.144
Tellurium (Te)	0.020	mg/kg ww	-	<0.00400	-	<0.00400	<0.00400
Thallium (Tl)	0.0020	mg/kg ww	-	0.00288	0.000759	0.00187	0.00398
Tin (Sn)	0.10	mg/kg ww	-	0.0189	0.00139	0.0186	0.0217
Uranium (U)	0.0020	mg/kg ww	1.9	0.000408	-	<0.000400	0.000468
Vanadium (V)	0.10	mg/kg ww	-	0.0624	0.0345	<0.0200	0.113
Zinc (Zn)	0.50	mg/kg ww	963	59.6	8.93	39.7	67.2
Zirconium (Zr)	0.20	mg/kg ww	-	<0.0400	-	<0.0400	<0.0400

Note: SD = Standard Deviation.
Value > Benchmark
[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).
[b] See Table 2.2 for Consumption Benchmark References.

Table 3.8: Concentrations (mean ± standard deviation) of Contaminants of Potential Concern (COPCs) in Northern Pike Ovary Tissue, Comparing Construction/Operations (2015, 2016, 2017, 2018) Data, Rainy River Mine Fish Tissue Quality Monitoring

COPC	Units	Benchmark[a,b]	2015 Data (n = 9; Minnow 2016)	2016 Data (n = 7; Minnow 2017)	2017 Data (n = 7; Minnow 2018)	2018 Data (n = 9; This Study)
Arsenic (As)	mg/kg w.w.	1.0	0.0250 ± 0.00531	0.0201 ± 0.0121	0.0188 ± 0.00427	0.0252 ± 0.00590
Boron (B)	mg/kg w.w.	56.2	<0.200 ± -	<0.200 ± -	<0.200 ± -	<0.200 ± -
Cadmium (Cd)	mg/kg w.w.	3.2	0.00751 ± 0.00244	0.00552 ± 0.00271	0.00981 ± 0.00308	0.0105 ± 0.00465
Chromium (Cr)	mg/kg w.w.	3.2	0.0122 ± -	0.0206 ± 0.0178	<0.0100 ± -	0.0104 ± 0.00345
Cobalt (Co)	mg/kg w.w.	-	0.0653 ± 0.0159	0.0533 ± 0.0200	0.0545 ± 0.0161	0.0699 ± 0.0226
Copper (Cu)	mg/kg w.w.	292	1.17 ± 0.158	1.26 ± 0.128	0.936 ± 0.145	1.05 ± 0.167
Iron (Fe)	mg/kg w.w.	-	54.6 ± 10.5	50.2 ± 8.45	39.8 ± 11.0	43.2 ± 14.8
Lead (Pb)	mg/kg w.w.	11.6	0.00621 ± 0.00791	<0.00400 ± -	<0.00400 ± -	0.00503 ± -
Manganese (Mn)	mg/kg w.w.	392	34.1 ± 11.9	32.3 ± 7.41	22.0 ± 5.14	26.9 ± 9.47
Mercury (Hg)	mg/kg w.w.	0.5	0.0333 ± 0.0182	0.0304 ± 0.0126	0.0698 ± 0.0831	0.0822 ± 0.0379
Molybdenum (Mo)	mg/kg w.w.	16.1	0.0403 ± 0.00806	0.0532 ± 0.00955	0.0407 ± 0.0138	0.0535 ± 0.0141
Nickel (Ni)	mg/kg w.w.	3.5	<0.0400 ± -	0.0410 ± 0.00692	<0.0400 ± -	<0.0400 ± -
Selenium (Se)	mg/kg w.w.	16.1	1.17 ± 0.271	0.948 ± 0.330	1.17 ± 0.981	0.649 ± 0.177
Zinc (Zn)	mg/kg w.w.	963	78.4 ± 19.3	70.3 ± 11.6	69.3 ± 7.78	59.6 ± 8.93

Note: w.w. - wet weight.

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1; MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

Table 3.9: Metal Concentrations in Walleye Muscle Tissue, Rainy River Mine Fish Tissue Quality Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Average (n=15)	SD	Minimum	Maximum
% Moisture	0.25	%	-	78.8	0.621	77.8	80.2
Aluminum (Al)	2.0	mg/kg ww	-	0.690	0.657	<0.400	2.88
Antimony (Sb)	0.010	mg/kg ww	1.3	<0.00200	-	<0.00200	<0.00200
Arsenic (As)	0.020	mg/kg ww	1.0	0.0420	0.0110	0.0192	0.0670
Barium (Ba)	0.050	mg/kg ww	642	0.0579	0.0198	0.0402	0.104
Beryllium (Be)	0.010	mg/kg ww	6.4	<0.00200	-	<0.00200	<0.00200
Bismuth (Bi)	0.010	mg/kg ww	-	0.00251	0.000683	<0.00200	0.00469
Boron (B)	1.0	mg/kg ww	56.2	<0.200	-	<0.200	<0.200
Cadmium (Cd)	0.0050	mg/kg ww	3.2	<0.00100	-	<0.00100	<0.00100
Calcium (Ca)	20	mg/kg ww	-	167	107	79.1	519
Cesium (Cs)	0.0050	mg/kg ww	-	0.0119	0.00285	0.00721	0.0191
Chromium (Cr)	0.050	mg/kg ww	3.2	0.0112	0.00566	<0.0100	0.0270
Cobalt (Co)	0.020	mg/kg ww	-	<0.00400	-	<0.00400	<0.00400
Copper (Cu)	0.10	mg/kg ww	292	0.139	0.0288	0.114	0.228
Iron (Fe)	3.0	mg/kg ww	-	1.84	0.775	1.11	4.24
Lead (Pb)	0.020	mg/kg ww	11.6	0.00687	0.0107	<0.00400	0.0415
Lithium (Li)	0.50	mg/kg ww	-	<0.100	-	<0.100	<0.100
Magnesium (Mg)	2.0	mg/kg ww	-	335	23.1	301	377
Manganese (Mn)	0.050	mg/kg ww	392	0.139	0.0322	0.0867	0.204
Mercury (Hg)	0.0050	mg/kg ww	0.5	0.337	0.147	0.147	0.674
Molybdenum (Mo)	0.020	mg/kg ww	16.1	<0.00400	-	<0.00400	<0.00400
Nickel (Ni)	0.20	mg/kg ww	3.5	<0.0400	-	<0.0400	<0.0400
Phosphorus (P)	10	mg/kg ww	-	2,470	177	2,250	2,800
Potassium (K)	20	mg/kg ww	-	4,840	272	4,550	5,460
Rubidium (Rb)	0.050	mg/kg ww	-	11.0	2.43	8.06	18.0
Selenium (Se)	0.050	mg/kg ww	3.6	0.219	0.0381	0.167	0.304
Sodium (Na)	20	mg/kg ww	-	310	93.9	202	485
Strontium (Sr)	0.050	mg/kg ww	1,930	0.0386	0.0356	0.0148	0.152
Tellurium (Te)	0.020	mg/kg ww	-	<0.00400	-	<0.00400	<0.00400
Thallium (Tl)	0.0020	mg/kg ww	-	0.00337	0.000768	0.00240	0.00502
Tin (Sn)	0.10	mg/kg ww	-	<0.0200	-	<0.0200	<0.0200
Uranium (U)	0.0020	mg/kg ww	1.9	0.000424	-	<0.000400	0.000767
Vanadium (V)	0.10	mg/kg ww	-	<0.0200	-	<0.0200	<0.0200
Zinc (Zn)	0.50	mg/kg ww	963	3.20	0.353	2.63	3.65
Zirconium (Zr)	0.20	mg/kg ww	-	<0.0400	-	<0.0400	<0.0400

Note: SD = Standard Deviation.
Value > Benchmark
[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).
[b] See Table 2.2 for Consumption Benchmark References.

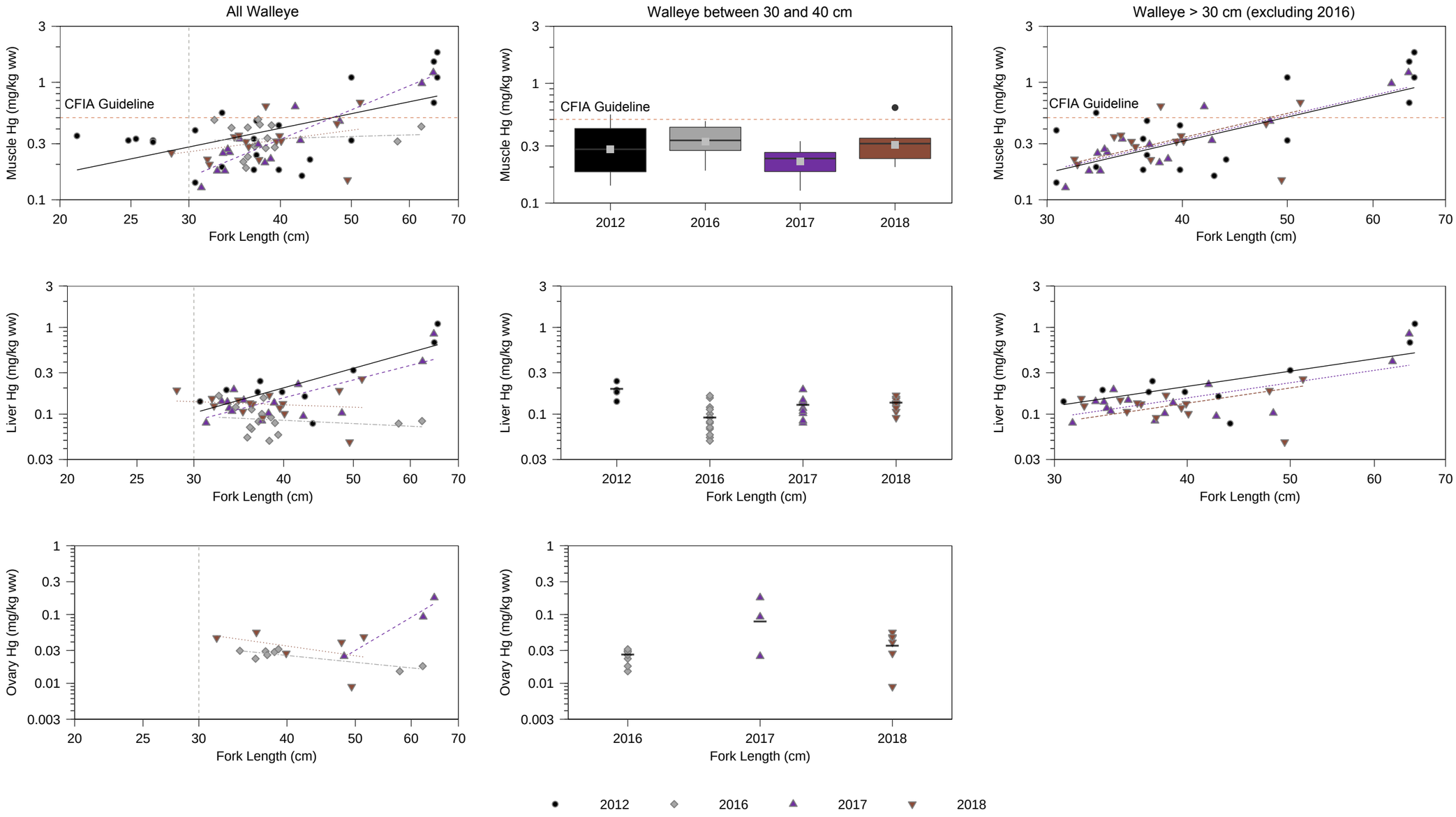

Figure 3.4: Scatterplots, Boxplots, or Individual Value Plots of Concentrations of Mercury (Hg) in Muscle, Liver, and Ovary of Walleye from Pinewood River, 2012 to 2018

Notes:
Left: All data; Middle: Fish between 30 and 40 cm used in ANOVA or Kruskal-Wallis comparisons; Right: Fish > 30 cm and excluding 2016, fit to ANCOVA parallel slope model
Boxplots: box represents the first quartile (Q1), the median, and Q3. Whiskers extend to the minimum and maximum values; however, values above Q3 + 1.5IQR or below Q1 − 1.5IQR are plotted as individual points (IQR = Q3 − Q1) and the whiskers are truncated to the next value in the dataset. The mean is plotted as a square.
Dashed horizonal line = CFIA Guidleine of 0.5 mg/kg ww
Dashed vertical line = cut off used for examining similar sized fish among years

Table 3.10: Concentrations (mean ± standard deviation) of Contaminants of Potential Concern (COPCs) in Walleye Muscle Tissue, Comparing Baseline (2012) and Construction/Operations (2015, 2016, 2017, 2018) Data, Rainy River Mine Fish Tissue Quality Monitoring

COPC	Units	Benchmark[a,b]	Baseline 2012 Data (n = 15; AMEC 2013)	2015 Data (n = 1; Minnow 2016)	2016 Data (n = 15; Minnow 2017)	2017 Data (n = 15; Minnow 2018)	2018 Data (n = 15; This Study)
Arsenic (As)	mg/kg w.w.	1.0	0.1 ± 0	0.102	0.0374 ± 0.0111	0.0476 ± 0.0217	0.0420 ± 0.0110
Boron (B)	mg/kg w.w.	56.2	<0.5 ± 0	<0.200	<0.200 ± -	<0.200 ± -	<0.200 ± -
Cadmium (Cd)	mg/kg w.w.	3.2	<0.01 ± 0	<0.00100	<0.00100 ± -	0.00104 ± -	<0.00100 ± -
Chromium (Cr)	mg/kg w.w.	3.2	<0.3 ± 0	<0.0100	0.0116 ± -	0.0101 ± 0.000576	0.0112 ± 0.00566
Cobalt (Co)	mg/kg w.w.	-	<0.005 ± 0	<0.00400	<0.00400 ± -	<0.00400 ± -	<0.00400 ± -
Copper (Cu)	mg/kg w.w.	292	0.54 ± 0.15	0.146	0.135 ± 0.0240	0.120 ± 0.0157	0.139 ± 0.0288
Iron (Fe)	mg/kg w.w.	-	3.2 ± 0.56	2.15	1.03 ± 0.344	1.60 ± 0.347	1.84 ± 0.775
Lead (Pb)	mg/kg w.w.	11.6	<0.03 ± 0	0.00669	<0.00400 ± -	0.00508 ± 0.00127	0.00687 ± 0.0107
Manganese (Mn)	mg/kg w.w.	392	0.31 ± 0.03	0.163	0.0906 ± 0.0162	0.118 ± 0.0454	0.139 ± 0.0322
Mercury (Hg)	mg/kg w.w.	0.5	0.57 ± 0.50	0.299	0.358 ± 0.0997	0.479 ± 0.384	0.337 ± 0.147
Molybdenum (Mo)	mg/kg w.w.	16.1	<0.05 ± 0	<0.00400	<0.00400 ± -	<0.00400 ± -	<0.00400 ± -
Nickel (Ni)	mg/kg w.w.	3.5	<0.05 ± 0	<0.0400	0.0500 ± 0.00640	0.0678 ± 0.146	<0.0400 ± -
Selenium (Se)	mg/kg w.w.	16.1	0.21 ± 0.04	0.295	0.207 ± 0.0226	0.219 ± 0.0399	0.219 ± 0.0381
Zinc (Zn)	mg/kg w.w.	963	3.5 ± 0.6	3.16	2.78 ± 0.280	2.59 ± 0.300	3.20 ± 0.353

Note: w.w. - wet weight.

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1; MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

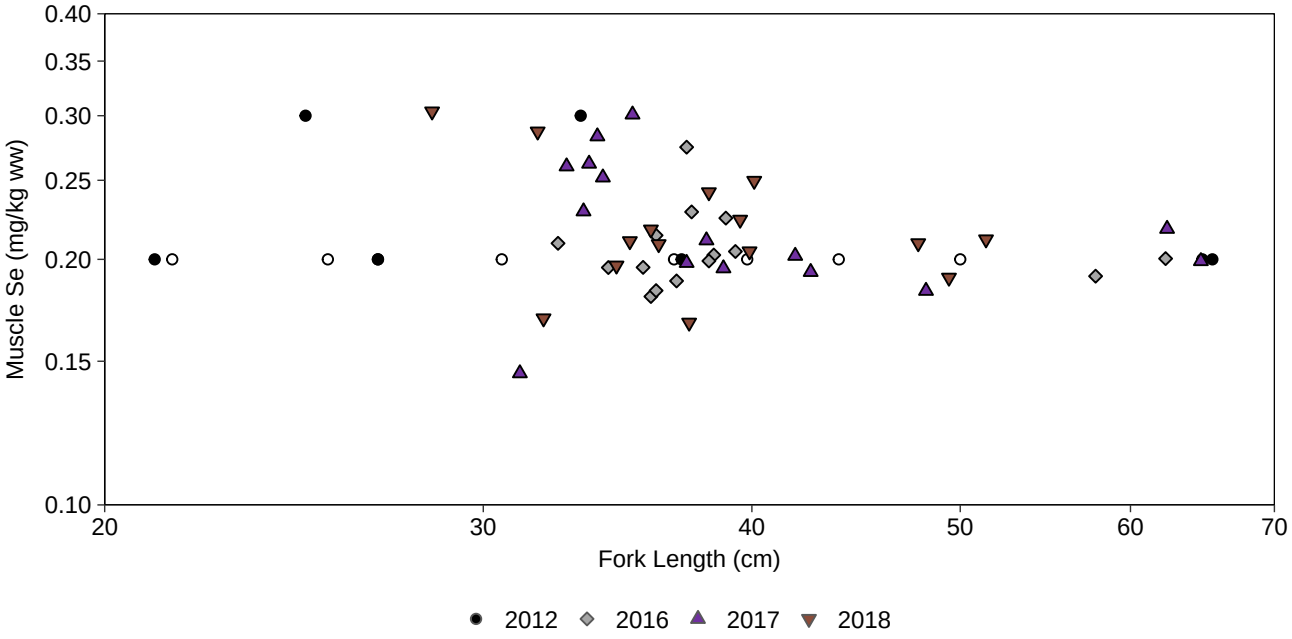

Figure 3.5: Scatterplot of Concentrations of Selenium (Se) in Muscle of Walleye from Pinewood River, 2012 to 2018

Notes:
Concentrations below the laboratory reporting limit (LRL) are plotted as open symbols at the LRL. BCMOE Guideline = 1.8 mg/kg ww (high intake) and 3.6 mg/kg ww (moderate intake).

within the range of fish captured during previous studies (2012, 2016, and 2017). As with northern pike, walleye muscle tissue mercury concentrations generally increased with increasing fish size (Figures 3.2 and 3.4; Appendix Table B.4).

The relationship between mercury concentrations in muscle and length were compared statistically among baseline data (2012) and the three subsequent years of monitoring[4] (2016, 2017, and 2018; Table 3.11). Mercury concentrations in walleye muscle tissue were similar between 2018 and baseline (Table 3.11, Figure 3.4). The relationship between muscle tissue mercury concentration and walleye size was notably different in 2016 than in 2018, 2017, and baseline, with no apparent increase in concentrations with size evident in 2016 (Figure 3.4). Examination of the data plots suggests similar mercury concentrations among years in smaller fish, but lower concentrations in larger fish in 2016 (leveraged by two large fish Figure 3.4).

3.3.2 Liver and Ovary Tissue Chemistry

Average 2018 liver tissue metal concentrations were below human consumption benchmarks for metals with established TDI values or commercial/provincial guidelines (Table 3.12, Appendix Tables B.4 and C.6). As with muscle, metal concentrations in liver for 2018 were within the range of 2017, 2016, and baseline (2012) data for all metals (Table 3.13; AMEC 2013).

Similar to northern pike, mercury concentrations in liver tissue were compared statistically among the three years of monitoring (2016, 2017, and 2018) and baseline (2012). Mercury concentrations in 2018 were statistically similar to those in baseline and 2017 but were significantly higher than 2016 (Table 3.11; Figure 3.4). As with walleye muscle, there was no apparent relationship between liver mercury concentration and fish size in 2016 (Figure 3.4).

Screening of 2018 ovary tissue results showed that ovaries contained average metal concentrations that were below human consumption benchmarks for metals with established TDI values or a provincial/commercial guideline (Table 3.14; Appendix Table C.7). Metal concentrations in walleye ovary tissue collected in 2018 were within the range of concentrations reported in previous studies for all metals (Table 3.15).

As with muscle and liver, mercury concentrations in ovaries were compared statistically among the three Fish Tissue Monitoring Programs (2016, 2017, and 2018). Mercury concentrations in ovary tissue did not differ significantly among 2018, 2017, and 2016 fish (Table 3.11, Figure 3.4).

[4] Only one walleye (male) was captured during the 2015 field survey, and therefore could not be compared statistically.

Table 3.11: Results of Statistical Comparisons of Concentrations of Mercury in Muscle, Liver, and Ovary of Walleye from Pinewood River, 2012 to 2018

Species	Tissue	Dataset	Test	Sample Size				ANCOVA Interaction Model	ANCOVA Parallel Slope Model	Covariate Value[a] Fork Length (cm)	Summary Statistic	Value of Statistic (Mean or Median) [b] Hg (mg/kg ww)				Test P-value	Pairwise Comparisons [c]				Magnitude of Difference Relative to Baseline/Earliest Year (%)			
				2012	2016	2017	2018	Interaction P-value	Covariate P-value			2012	2016	2017	2018		2012	2016	2017	2018	Baseline Year[g]	2016	2017	2018
Walleye	Muscle	All Data	ANCOVA	25	15	15	15	0.067	<0.001	38.4	Adjusted Mean	0.364	0.338	0.319	0.330	0.864	A	A	A	A	2012	-7.2	-12	-9.2
		30-40 cm [d]	ANCOVA	10	13	10	10	0.584	0.168	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			ANOVA	10	13	10	10	-	-	-	Geometric Mean	0.280	0.327	0.223	0.306	0.089	A	A	A	A	2012	17	-20	9.3
		>30 cm (excluding 2016) [e]	ANCOVA	19	-	15	14	0.298	<0.001	40.7	Adjusted Mean	0.344	-	0.357	0.370	0.923	A	-	A	A	2012	-	3.7	7.6
	Liver	All Data	ANCOVA	10	15	15	15	0.001	-	-	-	-	-	-	-	-	Slope (a)	Slope (b)	Slope (a)	Slope (b)	-	-	-	-
		30-40 cm [d]	ANCOVA	5	13	10	10	0.164	0.454	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
			ANOVA	5	13	10	10	-	-	-	Geometric Mean	0.183	0.0864	0.120	0.128	<0.001	A	B	A	A	2012	-53	-35	-30
		>30 cm (excluding 2016) [e]	ANCOVA	10	-	15	14	0.064	<0.001	40.1	Adjusted Mean	0.219	-	0.161	0.140	0.090	A	-	A	A	2012	-	-26	-36
	Ovary	All Data	ANCOVA	-	8	3	6	0.013	-	-	-	-	-	-	-	-	-	Slope (b)	Slope (a)	Slope (b)	-	-	-	-
		>30 cm [f]	K-W	-	8	3	6	-	-	-	Median	-	0.0271	0.0924	0.0426	0.152	-	A	A	A	2016	-	241	57

P-value < 0.05
Covariate P-value > 0.05 (i.e., fork length is not a significant predictor of Hg concentration)
Year is significantly > baseline year
Year is significantly < baseline year

Notes:

[a] Covariate value that corresponds to the adjusted means or predicted means in the ANCOVA.

[b] Mean reported for t-test; length-adjusted mean or predicted mean reported for ANCOVA, median reported for Mann-Whitney test.

[c] Years that share a letter (A,B,C) are not significantly different (Tukey's honestly significant differences method; α = 0.05); Slopes that share a letter (a,b) are not significantly different (all pairwise comparisons of slopes; α = 0.05).

[d] Range of fork lengths that provides good overlap of fish sizes to compare 2018 to 2016.

[e] Range of fork lengths that provides good overlap of fish sizes to compare 2018 to 2012 and 2017.

[f] Range of fork lengths that provides good overlap of fish sizes to compare 2018 to all other years.

[g] Baseline year denotes measurements prior to mine operatration, (i.e. 2012), for endpoints not collected during this time period (i.e. ovary tissue), baseline denotes the earliest year in the temporal comparisons.

Table 3.12: Metal Concentrations in Walleye Liver Tissue, Rainy River Mine Fish Tissue Quality Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Average (n=15)	SD	Minimum	Maximum
% Moisture	0.25	%	-	77.4	3.16	72.4	81.6
Aluminum (Al)	2.0	mg/kg ww	-	0.505	0.132	<0.400	1.06
Antimony (Sb)	0.010	mg/kg ww	1.3	<0.00200	-	<0.00200	<0.00200
Arsenic (As)	0.020	mg/kg ww	1.0	0.0758	0.0432	0.0275	0.156
Barium (Ba)	0.050	mg/kg ww	642	0.0382	0.0210	0.0141	0.0772
Beryllium (Be)	0.010	mg/kg ww	6.4	<0.00200	-	<0.00200	<0.00200
Bismuth (Bi)	0.010	mg/kg ww	-	0.00244	0.000655	<0.00200	0.00489
Boron (B)	1.0	mg/kg ww	56.2	<0.200	-	<0.200	<0.200
Cadmium (Cd)	0.0050	mg/kg ww	3.2	0.140	0.0761	0.0453	0.329
Calcium (Ca)	20	mg/kg ww	-	155	154	52.5	618
Cesium (Cs)	0.0050	mg/kg ww	-	0.00592	0.00216	0.00302	0.0104
Chromium (Cr)	0.050	mg/kg ww	3.2	0.0132	-	<0.0100	0.0580
Cobalt (Co)	0.020	mg/kg ww	-	0.159	0.0807	0.0545	0.333
Copper (Cu)	0.10	mg/kg ww	292	1.77	0.507	0.962	2.82
Iron (Fe)	3.0	mg/kg ww	-	118	47.9	33.8	190
Lead (Pb)	0.020	mg/kg ww	11.6	<0.00400	-	<0.00400	<0.00400
Lithium (Li)	0.50	mg/kg ww	-	<0.100	-	<0.100	<0.100
Magnesium (Mg)	2.0	mg/kg ww	-	175	31.8	122	217
Manganese (Mn)	0.050	mg/kg ww	392	1.59	0.449	1.00	2.44
Mercury (Hg)	0.0050	mg/kg ww	0.5	0.138	0.0483	0.0477	0.254
Molybdenum (Mo)	0.020	mg/kg ww	16.1	0.161	0.0419	0.0915	0.235
Nickel (Ni)	0.20	mg/kg ww	3.5	<0.0400	-	<0.0400	<0.0400
Phosphorus (P)	10	mg/kg ww	-	2,790	569	1,810	3,580
Potassium (K)	20	mg/kg ww	-	2,600	354	2,020	3,230
Rubidium (Rb)	0.050	mg/kg ww	-	6.84	2.06	3.76	11.6
Selenium (Se)	0.050	mg/kg ww	3.6	0.824	0.193	0.597	1.24
Sodium (Na)	20	mg/kg ww	-	1,130	182	792	1,430
Strontium (Sr)	0.050	mg/kg ww	1,930	0.0937	0.0867	0.0362	0.332
Tellurium (Te)	0.020	mg/kg ww	-	<0.00400	-	<0.00400	<0.00400
Thallium (Tl)	0.0020	mg/kg ww	-	0.00795	0.00240	0.00476	0.0134
Tin (Sn)	0.10	mg/kg ww	-	0.149	0.118	0.0352	0.391
Uranium (U)	0.0020	mg/kg ww	1.9	0.000415	-	<0.000400	0.000624
Vanadium (V)	0.10	mg/kg ww	-	0.0259	0.00890	<0.0200	0.0466
Zinc (Zn)	0.50	mg/kg ww	963	19.1	3.57	12.0	25.4
Zirconium (Zr)	0.20	mg/kg ww	-	0.0411	0.00370	<0.0400	0.0538

Note: SD = Standard Deviation.
Value > Benchmark
[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).
[b] See Table 2.2 for Consumption Benchmark References.

Table 3.13: Concentrations (mean ± standard deviation) of Contaminants of Potential Concern (COPCs) in Walleye Liver Tissue, Comparing Baseline (2012) and Construction/Operations (2015, 2016, 2017, 2018) Data, Rainy River Mine Fish Tissue Quality Monitoring

COPC	Units	Benchmark[a,b]	Baseline 2012 Data (n = 13; AMEC 2013)	2015 Data (n = 1; Minnow 2016)	2016 Data (n = 15; Minnow 2017)	2017 Data (n = 15; Minnow 2018)	2018 Data (n = 15; This Study)
Arsenic (As)	mg/kg w.w.	1.0	<0.10 ± 0	0.0603	0.0690 ± 0.0191	0.0452 ± 0.0190	0.0758 ± 0.0432
Boron (B)	mg/kg w.w.	56.2	<0.05 ± 0	<0.200	<0.200 ± -	<0.200 ± -	<0.200 ± -
Cadmium (Cd)	mg/kg w.w.	3.2	0.112 ± 0.055	0.581	0.0998 ± 0.102	0.389 ± 0.519	0.140 ± 0.0761
Chromium (Cr)	mg/kg w.w.	3.2	<0.30 ± 0	<0.0400	<0.0100 ± -	0.0194 ± 0.0162	0.0132 ± -
Cobalt (Co)	mg/kg w.w.	-	0.13 ± 0.088	0.234	0.124 ± 0.0915	0.196 ± 0.102	0.159 ± 0.0807
Copper (Cu)	mg/kg w.w.	292	2.0 ± 0.5	3.12	1.93 ± 1.65	1.62 ± 0.376	1.77 ± 0.507
Iron (Fe)	mg/kg w.w.	-	84 ± 24	120	68.2 ± 30.3	91.2 ± 48.5	118 ± 47.9
Lead (Pb)	mg/kg w.w.	11.6	0.030 ± 0	<0.0100	<0.00400 ± -	0.00608 ± 0.00224	<0.00400 ± -
Manganese (Mn)	mg/kg w.w.	392	1.9 ± 0.45	4.22	1.51 ± 0.571	1.67 ± 0.407	1.59 ± 0.449
Mercury (Hg)	mg/kg w.w.	0.5	0.33 ± 0.32	0.128	0.0898 ± 0.0332	0.247 ± 0.254	0.138 ± 0.0483
Molybdenum (Mo)	mg/kg w.w.	16.1	0.14 ± 0.046	0.132	0.120 ± 0.0380	0.138 ± 0.0385	0.161 ± 0.0419
Nickel (Ni)	mg/kg w.w.	3.5	<0.05 ± 0	<0.0400	0.0410 ± -	0.0423 ± 0.00898	<0.0400 ± -
Selenium (Se)	mg/kg w.w.	16.1	0.79 ± 0.16	1.13	0.673 ± 0.112	0.842 ± 0.145	0.824 ± 0.193
Zinc (Zn)	mg/kg w.w.	963	19 ± 2	45.6	15.7 ± 2.26	18.0 ± 2.02	19.1 ± 3.57

Note: w.w. - wet weight.

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1; MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

Table 3.14: Metal Concentrations in Walleye Ovary Tissue, Rainy River Mine Fish Tissue Quality Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Average (n=3)	SD	Minimum	Maximum
% Moisture	0.25	%	-	73.4	1.75	71.3	75.2
Aluminum (Al)	2.0	mg/kg ww	-	0.821	-	<0.400	2.93
Antimony (Sb)	0.010	mg/kg ww	1.3	0.00213	-	<0.00200	0.00278
Arsenic (As)	0.020	mg/kg ww	1.0	0.0332	0.0138	0.0195	0.0521
Barium (Ba)	0.050	mg/kg ww	642	0.221	0.332	0.0441	0.893
Beryllium (Be)	0.010	mg/kg ww	6.4	<0.00200	-	<0.00200	<0.00200
Bismuth (Bi)	0.010	mg/kg ww	-	<0.00200	-	<0.00200	<0.00200
Boron (B)	1.0	mg/kg ww	56.2	0.266	-	<0.200	0.595
Cadmium (Cd)	0.0050	mg/kg ww	3.2	0.00218	0.000485	<0.00100	0.00396
Calcium (Ca)	20	mg/kg ww	-	238	81.7	93.7	327
Cesium (Cs)	0.0050	mg/kg ww	-	0.0113	0.00256	0.00798	0.0143
Chromium (Cr)	0.050	mg/kg ww	3.2	0.0178	-	<0.0100	0.0570
Cobalt (Co)	0.020	mg/kg ww	-	0.0564	0.0110	0.0436	0.0696
Copper (Cu)	0.10	mg/kg ww	292	0.871	0.107	0.794	1.07
Iron (Fe)	3.0	mg/kg ww	-	27.5	8.95	19.6	39.7
Lead (Pb)	0.020	mg/kg ww	11.6	0.00544	-	<0.00400	0.0126
Lithium (Li)	0.50	mg/kg ww	-	<0.100	-	<0.100	<0.100
Magnesium (Mg)	2.0	mg/kg ww	-	314	42.1	253	367
Manganese (Mn)	0.050	mg/kg ww	392	3.73	2.81	0.402	8.14
Mercury (Hg)	0.0050	mg/kg ww	0.5	0.0373	0.0167	0.00894	0.0550
Molybdenum (Mo)	0.020	mg/kg ww	16.1	0.0182	0.00733	0.00934	0.0289
Nickel (Ni)	0.20	mg/kg ww	3.5	0.0445	-	<0.0400	0.0670
Phosphorus (P)	10	mg/kg ww	-	3,030	1,030	2,320	5,080
Potassium (K)	20	mg/kg ww	-	3,680	1,160	2,800	5,980
Rubidium (Rb)	0.050	mg/kg ww	-	9.43	2.26	6.88	13.3
Selenium (Se)	0.050	mg/kg ww	3.6	0.954	0.477	0.655	1.90
Sodium (Na)	20	mg/kg ww	-	833	133	703	1,010
Strontium (Sr)	0.050	mg/kg ww	1,930	0.0675	0.0210	0.0459	0.0990
Tellurium (Te)	0.020	mg/kg ww	-	<0.00400	-	<0.00400	<0.00400
Thallium (Tl)	0.0020	mg/kg ww	-	0.00690	0.00277	0.00416	0.0118
Tin (Sn)	0.10	mg/kg ww	-	0.0258	-	<0.0200	0.0546
Uranium (U)	0.0020	mg/kg ww	1.9	<0.000400	-	<0.000400	<0.000400
Vanadium (V)	0.10	mg/kg ww	-	<0.0200	-	<0.0200	<0.0200
Zinc (Zn)	0.50	mg/kg ww	963	57.6	51.7	31.0	163
Zirconium (Zr)	0.20	mg/kg ww	-	0.0424	-	<0.0400	0.0546

Note: SD = Standard Deviation.
Value > Benchmark
[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).
[b] See Table 2.2 for Consumption Benchmark References.

Table 3.15: Concentrations (mean ± standard deviation) of Contaminants of Potential Concern (COPCs) in Walleye Ovary Tissue, Construction/Operations (2016, 2017, 2018) Data, Rainy River Mine Fish Tissue Quality Monitoring

COPC	Units	Benchmark[a,b]	2016 Data (n = 8; Minnow 2017)	2017 Data (n = 3; Minnow 2018)	2018 Data (n = 6; This Study)
Arsenic (As)	mg/kg w.w.	1.0	0.0432 ± 0.00778	0.0124 ± 0.00552	0.0332 ± 0.0138
Boron (B)	mg/kg w.w.	56.2	<0.200 ± -	<0.200 ± -	0.266 ± -
Cadmium (Cd)	mg/kg w.w.	3.2	0.00163 ± 0.000948	0.00362 ± 0.00240	0.00218 ± 0.000485
Chromium (Cr)	mg/kg w.w.	3.2	<0.0100 ± -	<0.0100 ± -	0.0178 ± -
Cobalt (Co)	mg/kg w.w.	-	0.0596 ± 0.0127	0.0363 ± 0.00400	0.0564 ± 0.0110
Copper (Cu)	mg/kg w.w.	292	0.717 ± 0.0541	0.714 ± 0.0769	0.871 ± 0.107
Iron (Fe)	mg/kg w.w.	-	24.5 ± 4.22	24.9 ± 6.02	27.5 ± 8.95
Lead (Pb)	mg/kg w.w.	11.6	<0.00400 ± -	<0.00400 ± -	0.00544 ± -
Manganese (Mn)	mg/kg w.w.	392	4.20 ± 2.10	1.90 ± 0.222	3.73 ± 2.81
Mercury (Hg)	mg/kg w.w.	0.5	0.0250 ± 0.00598	0.0990 ± 0.0619	0.0373 ± 0.0167
Molybdenum (Mo)	mg/kg w.w.	16.1	0.0125 ± 0.00347	0.00875 ± 0.00140	0.0182 ± 0.00733
Nickel (Ni)	mg/kg w.w.	3.5	<0.0400 ± -	<0.0400 ± -	0.0445 ± -
Selenium (Se)	mg/kg w.w.	16.1	0.830 ± 0.154	0.500 ± 0.0611	0.954 ± 0.477
Zinc (Zn)	mg/kg w.w.	963	30.5 ± 4.35	26.0 ± 3.62	57.6 ± 51.7

Note: w.w. - wet weight.

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1; MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Conclusions

Conclusions of the fish assessment undertaken in the Pinewood River downstream of the Rainy River Mine in the fall of 2018 are listed below.

1. Fish communities and catchability (CPUE) were generally consistent with the results of previous sampling efforts, with higher CPUE for northern pike relative to walleye. CPUE for northern pike and walleye were similar to previous years.

2. Northern pike and walleye mean muscle, liver, and ovary tissue samples contained metal concentrations that were below available human consumption benchmarks and within the range of baseline for tissue concentrations. However, although mean mercury concentrations were below benchmarks, mercury concentrations in six northern pike and two walleye muscle samples, and in one northern pike liver tissue sample exceeded some consumption guidelines. This was associated with the large size of these fish. Mercury concentrations in tissue of larger predatory fish are often naturally high in northern environments (Evers et al. 2011) and these results do not indicate that the RRM has influenced fish tissue quality. Based on comparisons to human consumption benchmarks and baseline data, it appears that the RRM has not influenced metal concentrations in muscle tissues of exposed northern pike or walleye.

3. Statistical analysis of northern pike and walleye muscle, liver, and ovary tissue mercury concentrations as related to length compared among the 2012, 2015, 2016, and 2017 Fish Tissue Monitoring Studies show no major temporal trends. Notably, there is a slight increase of northern pike liver and ovary concentrations over time, however these concentrations are below the consumption guideline, and this trend is not seen in muscle mercury concentrations.

Overall, the data indicate that the Rainy River Mine has not influenced the concentrations of metals in muscle, liver, and ovary tissues of sentinel fish species (northern pike and walleye).

4.2 Recommendations

Based on information acquired during the 2018 fish tissue monitoring study, recommendations for future monitoring include:

1. Continued monitoring of metal concentrations in muscle, liver, and ovary tissues for both sentinel species. This will allow for consistent year to year comparisons.

2. Provide notification to solicit possible public participation in the collection of northern pike and walleye by angling (fall 2021), to foster community engagement.

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APPENDIX A
DATA QUALITY REVIEW

APPENDIX A DATA QUALITY REVIEW

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A1 INTRODUCTION

A1.1 Overview

The Data Quality Review (DQR) assessed data collected as part of the Rainy River Project 2018 Fish Tissue Quality Report. The DQR covers data collected in 2018. The objective of the DQR is to define the overall quality of the data presented in the report, and, by extension, the confidence with which the data can be used to derive conclusions.

A1.2 Background

A variety of factors can influence the chemical and biological measurements made in an environmental study and thus affect the accuracy and/or precision of the data. Inconsistencies in sampling or laboratory methods, use of instruments that are inadequately calibrated or which cannot measure to the desired level of accuracy or precision, and contamination of samples in the field or laboratory are just some of the potential factors that can lead to the reporting of data that do not accurately reflect actual environmental conditions. Depending on the magnitude of the problem, inaccuracy or imprecision have the potential to affect the reliability of any conclusions made from the data. Therefore, it is important to ensure that monitoring programs incorporate appropriate steps to control the non-natural sources of data variability (i.e., minimize the variability that does not reflect natural spatial and temporal variability in the environment) and thus assure the quality of the data.

Data quality as a concept is meaningful only when it relates to the intended use of the data. That is, one must know the context in which the data will be interpreted in order to establish a relevant basis for judging whether or not the data set is adequate. The DQR involves comparison of actual field and laboratory measurement performance to data quality objectives (DQOs) established for a particular study, such as evaluation of method detection limits, blank sample data, data precision (based on laboratory duplicate samples), and data accuracy (based on matrix spike recoveries and/or analysis of standards or certified reference materials).

DQOs were established either at the outset of the field program or by the laboratory and reflect reasonable and achievable performance expectations. The lowest detection limit (LDL) was set at the outset of the field program for tissue quality. Only samples that were below the laboratory detection limits were evaluated against target detection limits. Target detection limits should be at least as low as applicable guidelines, ideally ≤ 1/10th guideline values. Programs involving a large amount of samples and analytes usually result in some analytes that exceed the DQOs. This is particularly so for multi-element scans (e.g., ICP scans for

metals) since the analytical conditions are not necessarily optimal for every element included in the scan. Generally, scan results may be considered acceptable if no more than 20% of the parameters fail to meet the DQOs. Overall, the intent of comparing data to DQOs was not to reject any measurement that did not meet the DQO, but to ensure that any questionable data received more scrutiny to determine what effect, if any, this had on interpretation of results within the context of this project.

A1.3 Types of Quality Control Samples

Several types of quality control (QC) samples were assessed based on samples collected (or prepared) in the field and laboratory. These samples, and a description of each, include the following:

- **Blanks** are samples of de-ionized water and/or appropriate reagent(s) that are handled and analyzed the same way as regular samples. These samples will reflect any contamination that occurred in the field (in the case of field or travel blanks) or the laboratory (in the case of laboratory or method blanks). Analyte concentrations should be non-detectable although a DQO of twice the method detection limit allows for slight "noise" around the detection limit.
- **Laboratory Duplicates** are sub-sample pairs created in the laboratory from randomly selected field samples which are sub-sampled and then analyzed independently using identical analytical methods. The laboratory duplicate sample results reflect any variability introduced during laboratory sample handling and analysis and thus provide a measure of laboratory precision.
- **Certified Reference Materials** are samples containing known chemical concentrations that are processed and analyzed along with batches of environmental samples. The sample results are then compared to target results to provide a measure of analytical accuracy. The results are reported as the percent of the known amount that was recovered in the analysis.

A2 FISH TISSUE SAMPLES

A2.1 Holding Time and General Laboratory Flags

All tissue analyses were conducted within ALS Environmental's recommended hold times. There were no general laboratory flags associated with the analytical report (i.e., ALS Environmental Report L2173881; Appendix C).

A2.2 Lowest Detection Limits

All analytes were higher than target detection limits (benchmarks) indicating that the data for this project can be reliably interpreted (Appendix Table A.1).

A2.3 Laboratory Blank Sample Analysis

All blank samples contained non-detectable concentrations indicating no inadvertent contamination of samples within the laboratory during analysis (Appendix C).

A2.4 Data Precision

Data precision was evaluated based on results of laboratory duplicate samples (DUP; Appendix C). All DUP results (177 in total) met ALS Environmental's data quality objectives for precision (Appendix C). Laboratory precision achieved in this study is considered adequate.

A2.5 Data Accuracy

Data accuracy was evaluated based on results of certified reference materials (CRM), and laboratory control samples (LCS; Appendix C). All CRM and LCS results (327 in total) met ALS Environmental's data quality objectives for accuracy (Appendix C). Laboratory accuracy achieved in this study is considered adequate.

A3 DATA QUALITY STATEMENT

Data collected for the 2018 fish tissue monitoring at the Rainy River Project was of good quality as characterized by good detectability, negligible analyte concentrations in method blanks, good laboratory precision, and good laboratory accuracy. Therefore, associated data can be used with a high level of confidence in the derivation of conclusions.

Table A.1: Laboratory Lowest Detection limit (LDL) Evaluation for Tissue Chemistry Analyses Relative to Criteria

Analyte		Benchmark[a,b]	LDL Achieved	
			mg/kg dry weight	mg/kg wet weight
Total Metals	Aluminum (Al)	-	2.0	0.4
	Antimony (Sb)	1.3	0.010	0.002
	Barium (Ba)	642	0.050	0.010
	Beryllium (Be)	6.4	0.010	0.002
	Bismuth (Bi)	-	0.010	0.002
	Boron (B)	56	1.0	0.2
	Cadmium (Cd)	3.2	0.0050	0.0010
	Cesium (Cs)	-	0.0050	0.001
	Chromium (Cr)	3.2	0.050	0.010
	Cobalt (Co)	-	0.020	0.004
	Lead (Pb)	11.6	0.020	0.004
	Lithium (Li)	-	0.50	0.10
	Molybdenum (Mo)	16.1	0.020	0.004
	Nickel (Ni)	3.5	0.20	0.04
	Strontium (Sr)	1,930	0.050	0.010
	Tellurium (Te)	-	0.020	0.004
	Tin (Sn)	-	0.10	0.02
	Uranium (U)	1.9	0.0020	0.0004
	Vanadium (V)	-	0.10	0.02
	Zirconium (Zr)	-	0.20	0.04

Notes: Only Analytes With <LDL Values are Reported. Highlighted Values Indicate LDL Greater Than Benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

APPENDIX B
FISH CATCH AND MERISTIC DATA

Fish Catch Data
Fish Meristic Data
Fish Permit

FISH CATCH AND MERISTIC DATA

Fish Catch Data

Table B.1: Gill Net Records for Fish Caught in the Pinewood River, Rainy River Mine, September 2018

Area	Station ID	UTM (NAD83, 15 U)		Set Date	Lift Date	Set Time	Lift Time	Effort (Fishing Hours)	Depth Range (m)		Set			Black Crappie		Northern Pike		Shorthead Redhorse		Walleye	
		Easting	Northing								Length (ft)	Mesh (inches)	Description	Catch	CPUE[a]	Catch	CPUE[a]	Catch	CPUE[a]	Catch	CPUE[a]
Pinewood River	PinR-GN-01	404443	5397280	11-Sep-18	12-Sep-18	13:50	13:36	23.8	2	2.5	100	3	-	0	0.000	2	0.084	0	0.000	1	0.0421
	PinR-GN-02	404509	5397339	11-Sep-18	12-Sep-18	13:55	13:25	23.5	0.5	2.5	100	3	-	0	0.000	2	0.085	0	0.000	0	0.0000
	PinR-GN-03	404613	5397564	11-Sep-18	12-Sep-18	14:00	13:10	23.2	0.5	2	100	3	-	1	0.043	2	0.086	0	0.000	2	0.0863
	PinR-GN-04	409363	5398803	11-Sep-18	12-Sep-18	16:10	9:25	17.3	0.5	2.5	150	3-5	Exp.	1	0.058	0	0.000	0	0.000	0	0.0000
	PinR-GN-05	404852	5397701	12-Sep-18	13-Sep-18	13:00	10:35	21.6	1.5	1.5	150	3-5	Exp.	0	0.000	7	0.324	1	0.046	10	0.4633
	PinR-GN-06	404611	5397577	12-Sep-18	13-Sep-18	13:15	10:20	21.1	0.5	2	100	3	-	0	0.000	3	0.142	0	0.000	2	0.0949
	PinR-GN-07	405620	5398060	12-Sep-18	13-Sep-18	14:05	11:55	21.8	2	2.5	100	3	-	6	0.275	11	0.504	0	0.000	15	0.6870
	PinR-GN-08	405188	5397820	12-Sep-18	13-Sep-18	14:10	11:15	21.1	1.0	2	100	3	-	5	0.237	7	0.332	0	0.000	6	0.2846
	PinR-GN-09	404485	5397337	12-Sep-18	13-Sep-18	14:15	10:00	19.7	0.5	2	100	3		1	0.051	1	0.051	0	0.000	2	0.1013
	PinR-GN-10	404138	5397135	12-Sep-18	13-Sep-18	14:22	9:40	19.3	0.5	2	100	5	-	0	0.000	0	0.000	0	0.000	0	0.0000
							Total	**212.3167**						**14**	**0.0659**	**35**	**0.1648**	**1**	**0.0047**	**38**	**0.179**

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the gill net sets in one area.

Table B.2: Hoop Net Records for Fish Caught in the Pinewood River, Rainy River Mine, September 2018

Area	Station ID	Net Size (ft)	UTM (NAD83, 15 U)		Set Date	Lift Date	Set Time	Removal Time	Fishing Hours (hrs)	Depth Range (m)		Effort (Fishing days)	Bullhead		Black Crappie		Walleye		Walleye (Juvenile)		White Sucker		Yellow Perch	
			Easting	Northing									Catch	CPUE[a]	Catch	CPUE[a]	Catch	CPUE[a]	Catch	CPUE[a]	Catch	CPUE[a]	Catch	CPUE[a]
Pinewood River	PinR-HN-01	2.5	404391	5397232	11-Sep-18	12-Sep-18	13:10	12:11	23.02	1.5	2	0.959	1	1.043	0	0.000	0	0.000	1	1.043	0	0.000	0	0.000
	PinR-HN-02	2.5	404557	5397391	11-Sep-18	12-Sep-18	13:30	13:18	23.80	2	2.5	0.992	0	0.000	6	6.050	0	0.000	0	0.000	0	0.000	0	0.000
	PinR-HN-03	2.5	409307	5398696	11-Sep-18	12-Sep-18	15:35	9:11	17.60	1.2	1.5	0.733	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
	PinR-HN-04	2.5	409362	5398789	11-Sep-18	12-Sep-18	16:15	9:05	16.83	1	1.5	0.701	0	0.000	0	0.000	2	2.851	0	0.000	1	1.000	0	0.000
	PinR-HN-05	2.5	409307	5398696	12-Sep-18	13-Sep-18	9:10	13:00	27.83	1.0	2.5	1.160	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
	PinR-HN-06	2.5	409362	5398789	12-Sep-18	13-Sep-18	9:15	13:05	27.83	2	2.5	1.160	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000	0	0.000
	PinR-HN-07	2.5	404384	5397225	12-Sep-18	13-Sep-18	12:45	9:50	21.08	2	2.5	0.878	0	0.000	3	3.415	0	0.000	0	0.000	1	0.500	0	0.000
	PinR-HN-08	2.5	404391	5397232	12-Sep-18	13-Sep-18	13:25	10:10	20.75	1.5	2	0.865	0	0.000	4	4.627	0	0.000	0	0.000	0	0.000	3	3.470
											Total	**7.448**	**1**	**1.043**	**13**	**14.092**	**2**	**2.851**	**1**	**1.043**	**2**	**1.500**	**3**	**3.470**

[a] Total catch-per-unit-effort (CPUE) calculated as the total catch of a single species over the total effort for all the hoop net sets in one area.

FISH CATCH AND MERISTIC DATA

Fish Meristic Data

Table B.3: Fish Data Measurements for Northern Pike Caught in the Pinewood River, Rainy River Mine, September 2018

Area	Species	Processing Date	Fish ID	Total Length (cm)	Fork Length (cm)	Body Weight (g)	Age Structure Collected [a]	Age	Sex [b]	Liver Weight (g)	Gonad Weight (g)	Fulton's Condition Factor (K)	Tissue Collected [c]	Abnormalities
	Northern Pike	12-Sep-18	NP-01	47.5	44.1	650	Sc,Cl	2	M	4.892	17.170	0.76	M, L	-
		12-Sep-18	NP-02	55.6	52.1	870	Sc,Cl	5	F	9.640	13.949	0.62	M, L,O	slight black spot
		12-Sep-18	NP-03	52.8	48.9	750	Sc,Cl	2	M	7.041	17.861	0.64	M, L	-
		12-Sep-18	NP-04	48.5	46.0	700	Sc,Cl	2	M	5.409	13.973	0.72	M, L	cysts on liver
		13-Sep-18	NP-05	52.7	49.5	820	Sc,Cl	3	M	8.610	24.045	0.68	M, L	-
		13-Sep-18	NP-06	68.2	63.9	1180	Sc,Cl	6	F	6.546	6.525	0.45	M, L, O	-
		13-Sep-18	NP-07	61.3	57.6	1050	Sc,Cl	3	F	12.085	14.860	0.55	M, L, O	-
		13-Sep-18	NP-08	50.9	48.1	740	Sc,Cl	3	F	8.652	13.727	0.66	M, L, O	-
		13-Sep-18	NP-09	60.6	57.8	1100	Sc,Cl	4	F	11.372	14.335	0.57	M, L, O	-
		13-Sep-18	NP-10	65.6	62.1	1680	Sc,Cl	4	F	24.465	18.176	0.70	M, L, O	-
		13-Sep-18	NP-11	63.8	60.8	1200	Sc,Cl	5	M	9.829	16.787	0.53	M, L	-
		13-Sep-18	NP-12	59.6	56.9	1020	Sc,Cl	3	F	11.658	13.755	0.55	M, L, O	slight black spot
		13-Sep-18	NP-13	57.6	55.1	1,140	Sc,Cl	4	F	14.741	19.628	0.68	M, L, O	slight black spot
		13-Sep-18	NP-14	49.0	45.9	700	Sc,Cl	2	M	4.303	20.483	0.72	M, L	slight black spot
		13-Sep-18	NP-15	60.1	56.1	1,050	Sc,Cl	5	F	10.242	12.290	0.59	M, L, O	slight black spot
total sample size				**15**	**15**	**15**	**-**	**15**	**-**	**15**	**15**	**15**	**-**	**-**
average				**57**	**54**	**977**	**-**	**4**	**-**	**10**	**16**	**1**	**-**	**-**
median				**58**	**55**	**1020**	**-**	**3**	**-**	**10**	**15**	**1**	**-**	**-**
standard deviation				**6.5**	**6.3**	**273.0**	**-**	**1.3**	**-**	**5.0**	**4.1**	**0.1**	**-**	**-**
standard error				**1.68**	**1.64**	**70.49**	**-**	**0.34**	**-**	**1.28**	**1.06**	**0.02**	**-**	**-**
minimum				**48**	**44**	**650**	**-**	**2**	**-**	**4**	**7**	**0**	**-**	**-**
maximum				**68**	**64**	**1680**	**-**	**6**	**-**	**24**	**24**	**1**	**-**	**-**

[a] Age structures collected: sc - scales, oto - otoliths; ds - dorsal spine; pf - pectoral fin.
[b] Sex: F - Female, M - Male, U - Underdeveloped.
[c] Tissue collected: M - Muscle, L - Liver, O - Ovary.

Table B.4: Fish Data Measurements for Walleye Caught in the Pinewood River, Rainy River Mine, September 2018

Area	Species	Processing Date	Fish ID	Total Length (cm)	Fork Length (cm)	Body Weight (g)	Age Structure Collected [a]	Age	Sex [b]	Liver Weight (g)	Gonad Weight (g)	Fulton's Condition Factor (K)	Tissue Collected [c]	Abnormalities
Pinewood River	Walleye	12-Sep-18	WA-01	52.9	49.4	1410	Sc, oto, Ds	5	F	18.967	26.273	1.17	M, L, O	-
		12-Sep-18	WA-02	40.5	38.2	650	Sc, oto, Ds	5	M	9.035	13.202	1.17	M, L	-
		12-Sep-18	WA-03	39.7	37.4	520	Sc, oto, Ds	6	M	5.069	4.316	0.99	M, L	-
		12-Sep-18	WA-04	33.6	31.8	350	Sc, oto, Ds	2	F	2.738	0.799	1.09	M, L, O	immature
		12-Sep-18	WA-05	30.1	28.4	225	Sc, oto, Ds	2	U	1.659	-	0.98	M, L	immature
		13-Sep-18	WA-06	42.1	39.5	590	Sc, oto, Ds	4	M	4.005	2.384	0.96	M, L	cysts on liver
		13-Sep-18	WA-07	42.5	40.1	640	Sc, oto, Ds	4	M	6.723	2.334	0.99	M, L, O	immature
		13-Sep-18	WA-08	39.8	36.2	455	Sc, oto, Ds	6	F	5.392	8.603	0.96	M, L, O	-
		13-Sep-18	WA-09	34.9	51.4	1620	Sc, oto, Ds	7	F	21.159	35.375	1.19	M, L	-
		13-Sep-18	WA-10	34.6	32.0	425	Sc, oto, Ds	3	M	3.670	6.817	1.30	M, L, O	-
		13-Sep-18	WA-11	43.6	39.9	725	Sc, oto, Ds	5	F	8.326	14.643	1.14	M, L, O	-
		13-Sep-18	WA-12	50.5	47.8	1030	Sc, oto, Ds	5	F	9.817	17.907	0.94	M, L	cysts on liver
		13-Sep-18	WA-13	37.0	34.6	470	Sc, oto, Ds	4	M	4.180	9.226	1.13	M, L	-
		13-Sep-18	WA-14	37.1	35.9	540	Sc, oto, Ds	3	M	6.045	9.462	1.17	M, L	-
		13-Sep-18	WA-15	37.6	35.1	490	Sc, oto, Ds	3	M	6.608	9.029	1.13	M, L	-
total sample size				**15**	**15**	**15**	**-**	**15**	**-**	**15**	**14**	**15**	**-**	**-**
average				**40**	**39**	**676**	**-**	**4**	**-**	**8**	**11**	**1**	**-**	**-**
median				**40**	**37**	**540**	**-**	**4**	**-**	**6**	**9**	**1**	**-**	**-**
standard deviation				**6.1**	**6.6**	**388.1**	**-**	**1.5**	**-**	**5.6**	**9.7**	**0.1**	**-**	**-**
standard error				**1.57**	**1.70**	**100.20**	**-**	**0.38**	**-**	**1.44**	**2.59**	**0.03**	**-**	**-**
minimum				**30**	**28**	**225**	**-**	**2**	**-**	**2**	**1**	**1**	**-**	**-**
maximum				**53**	**51**	**1620**	**-**	**7**	**-**	**21**	**35**	**1**	**-**	**-**

[a] Age structures collected: sc - scales, oto - otoliths; ds - dorsal spine; pf - pectoral fin.
[b] Sex: F - Female, M - Male, U - Underdeveloped.
[c] Tissue collected: M - Muscle, L - Liver, O - Ovary.

FISH CATCH AND MERISTIC DATA

Fish Permit

Ontario

Ministry of Natural Resources

Ministère des Richesses naturelles

Licence to Collect Fish for Scientific Purposes

Permis pour faire la collecte de poissons à des fins scientifiques

Licence No. / N° de permis	1090759
Local Reference No. / N° de référence local	2018-0911
Issuer Account No. / N° de compte du délivreur de permis.	10002668

This licence is issued under Part I of the Fish Licensing Regulation made under the Fish and Wildlife Conservation Act, 1997 to:

Ce permis est délivré en vertu de la Partie I du règlement sur la délivrance de permis de pêche formulé conformément à la Loi sur la protection du poisson et de la faune de 1997 à:

	Last Name / Nom de famille	First Name / Prénom	Middle Name / Second Prénom
Name of Licencee / Nom du titulaire du permis	Mr. Worrall	Tyrell	

Name of Business/Organization/Affiliation (if applicable) / Nom de l'entreprise/de l'organisme/de l'affiliation (le cas échéant)

Minnow Enviroment

Mailing address of Licencee / *Adresse postale du titulaire du permis*

Street Name & No./PO Box/RR#/Gen. Del / N° rue/C.P /R R /poste restante

<Personal information removed>

City/Town/Municipality / Ville/village/municipalité	Province/State Province/État	Postal Code/Zip Code Code Postal/Zip
<Personal information removed>	ON	<Personal information

to collect the species, size and quantites of fish from the waters as set out below.
Pour faire la collecte des espèces suivantes (stade et nombre indiqués ci-dessous):

Species Espèces	Eggs Oeuf X	Juvenile Fretin X	Adults Adulte X	Numbers Nombre	Name of Waterbody Nom de l'étendue d'eau
Northern Pike			X	15	Pinewood River
Walleye			X	15	Pinewood River

Yes/Oui ☐ Additional species/Waterbody list attached / Liste d'espèces/d'étendue d'eau additionnelles ci-jointe

Purpose of collection / *But de la collecte*: To conduct fish tissue monitoring studies of New Gold's Rainy River Project.

Licence Dates / *Dates du permis*	Effective Date / Date d'entrée en vigueur (YYYY-MM-DD)	Expiry Date / Date d'expiration (YYYY-MM-DD)
	2018-09-01	2018-12-31

Licence conditions / *Conditions du permis*: This licence is subject to the conditions contained in Schedule A if included. / Ce permis doit respecter les conditions de l'annexe A si celle-ci est jointe.

Yes/Oui	No/Non	
☒	☐	Schedule A included. / Annexe A ci-jointe

Issued by (please print) / Délivré par (veuillez écrire en caractères d'imprimerie)	Signature of issuer / Signature du délivreur	Date of Issue/Date de délivrance (YYYY-MM-DD)
Matt Myers	<Original signed by>	2018-08-03

Signature of Licencee / Signature du titulaire du permis: <Original signed by>

Date (YYYY-MM-DD): 2018-09-04

Personal information contained on this form is collected under the authority of the Fish and Wildlife Conservation Act, 1997 and will be used for the purpose of licencing, identification, enforcement, resource management and customer service surveys. Please direct further inquiries to the District Manager of the MNR issuing district.

Les renseignements personnels dans ce formulaire sont recueillis conformément à la Loi sur la protection du poisson de la faune, 1997 , et ils seront utilisés aux fins de délivrance de permis, d'identification, d'application des règlements, de gestion des ressources et de sondage sur les services a la clientèle. Veuillez communiquer avec le chef du district du MRN qui délivré le permis si vous avez des questions.

FW0032 (04/00)

Ontario

Licence to Collect Fish for Scientific Purposes
Schedule A – Licence Conditions

Licence No. 1090759
Local Reference No. FF2018-0869
Issuer Account No. 10002668

This licence is subject to the conditions listed below.

1. Mandatory report forms documenting the sampling conducted under this licence must be submitted to the licence issuer within 30 days of the termination date, but in no case later than January 31 next following the year of issue. The digital Mandatory Report form (Part 1) must be completed for each Sampling Program and the digital Site Collection Reports (Part 2) must be completed for each collection site. A separate map clearly indicating the location of each collection site must be attached to the Site Collection Reports. Submit Mandatory Report forms to the Fort Frances District MNRF office. The submission of a satisfactory report is a prerequisite to any subsequent renewals.

2. Sampling locations must be reported using GPS location data using: Projection: Universal Transverse Mercator (UTM); Datum: North American 1983 (NAD83), Canadian Transformation (CNT); Zone: 15 N; Units: metres.

3. Before carrying out any operation under this licence, any person authorized under this licence is required to consult with the Fort Frances Ministry of Natural Resources District Manager at least one week prior to anticipated start of sampling and obtain approval from the respective Manager for the proposed sampling activity. Also, any person authorized under this licence must advise the respective Manager of the date, time and location of all sampling.

4. A copy of the signed original licence must be carried by the licenced person when working at the designated sites. An assistant of the licenced person who is carrying out activities under this licence during the absence of the licenced person shall carry the licence on his or her person.

5. All collection gear shall be clearly marked with the licenced person's and the organization's name.

6. This licence is not valid in Provincial Parks, park reserves, Conservation Authority property or National Parks without written permission from the authorized person in charge of the area concerned.
http://www.ontarioparks.com/email/research

7. Capture gear shall be inspected regularly and live holding traps must be inspected at least once daily.

8. This licence does not allow access to any property without permission of the landowner.

9. The licensee shall follow the best management practices for the collection, handling, transportation and holding of fish identified in **FPS Technical Bulletin (Dec. 15, 2011)** included with the licence in order to minimize the risk of spreading aquatic invasive species and diseases.

10. All field equipment must be de-contaminated prior to use on each water body in order to prevent the spread of exotic species and disease.

11. This licence does not authorize any activity that is prohibited under the federal ***Species at Risk Act*** or the provincial ***Endangered Species Act.***

12. All SAR fish and mussels must also be reported to the OMNR Natural Heritage Information Centre on the appropriate form at:
http://nhic.mnr.gov.on.ca/MNR/nhic/species/species_report.cfm

13. This licence does not authorize the possession of specially protected fish under the ***Ontario Fishery Regulations.***

14. This licence does not authorize the collection of any species of fish protected under the ***Species at Risk Act, Endangered Species Act, or Ontario Fishery Regulations***. If these species are accidentally captured they must be returned to the water immediately.

15. **This licence ONLY allows for the following capture gear to be used:**

    Hoop nets (2" and 3" stretched mesh), gill nets (3", 4", 5" mesh size), angling

16. **Persons authorized under this licence include the following:**

    Tyrell Worrall, Kevin Martens, Katharina Batchelar

17. ***The following MNRF Class Animal Care Protocols will be adhered to as appropriate for the project activity:***
    - ***Capture Methods- Electrofishing***
    - ***Capture Methods- Seining***
    - ***Capture Methods- Impounding Gear***
    - ***Handling and Marking- Biological Sampling***
    - ***Containment- Short term Containment***

Signature of Licensee
<Original signed by>

X _____

Date 4-Sep-18

APPENDIX C
FISH TISSUE QUALITY

Fish Tissue Chemistry
Laboratory Analysis Data Report

FISH TISSUE QUALITY

Fish Tissue Chemistry

Table C.1: Average Dry Weight (d.w.) Metal Concentrations in Fish Tissue, Rainy River Mine Fish Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Northern Pike											
			Muscle				Liver				Ovary			
			Average (n=15)	SD	Minimum	Maximum	Average (n=15)	SD	Minimum	Maximum	Average (n=9)	SD	Minimum	Maximum
Moisture	0.25	%	79.9	1.2	77.8	82.0	76.8	3.3	69.1	80.7	83.2	0.5	82.3	84.1
Aluminum (Al)	2.0	mg/kg d.w.	3.4	1.5	<2.0	6.9	8.4	5.8	2.8	23.3	5.5	3.8	2.4	14.9
Antimony (Sb)	0.010	mg/kg d.w.	<0.010	-	<0.010	<0.010	0.011	0.002	<0.010	0.017	0.011	0.004	<0.010	0.0220
Arsenic (As)	0.020	mg/kg d.w.	0.24	0.08	0.14	0.44	0.16	0.06	0.08	0.27	0.15	0.04	0.09	0.21
Barium (Ba)	0.050	mg/kg d.w.	0.34	0.24	<0.05	0.95	0.50	0.36	0.08	1.55	0.50	0.41	0.11	1.45
Beryllium (Be)	0.010	mg/kg d.w.	<0.010	-	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	-	<0.010	<0.010
Bismuth (Bi)	0.010	mg/kg d.w.	0.014	0.003	<0.010	0.018	0.037	0.018	0.013	0.080	0.011	0.002	<0.010	0.017
Boron (B)	1.0	mg/kg d.w.	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0
Cadmium (Cd)	0.0050	mg/kg d.w.	0.0064	0.0026	<0.0050	0.0133	0.565	0.489	0.173	1.690	0.063	0.028	0.031	0.121
Calcium (Ca)	20	mg/kg d.w.	1,569	1,135	499	3,670	348	420	107	1,750	810	328	478	1,600
Cesium (Cs)	0.0050	mg/kg d.w.	0.054	0.015	0.028	0.086	0.022	0.006	0.009	0.031	0.051	0.010	0.037	0.074
Chromium (Cr)	0.050	mg/kg d.w.	0.052	0.008	<0.050	0.079	0.135	0.073	<0.050	0.200	0.095	0.062	<0.050	0.200
Cobalt (Co)	0.020	mg/kg d.w.	0.024	0.006	<0.020	0.037	0.278	0.141	0.128	0.614	0.416	0.135	0.251	0.635
Copper (Cu)	0.10	mg/kg d.w.	0.85	0.16	0.60	1.11	158.7	90.3	44.5	355.0	6.23	1.00	4.56	7.49
Iron (Fe)	3.0	mg/kg d.w.	15.5	5.3	7.0	22.7	865	670	96	2,200	256	84	132	393
Lead (Pb)	0.020	mg/kg d.w.	0.035	0.035	<0.020	0.132	0.037	0.015	<0.020	0.028	0.033	0.022	<0.020	0.080
Lithium (Li)	0.50	mg/kg d.w.	<0.50	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Magnesium (Mg)	2.0	mg/kg d.w.	1,520	74	1,420	1,680	680	170	415	949	1,202	180	759	1,330
Manganese (Mn)	0.050	mg/kg d.w.	1.84	1.09	0.67	3.80	6.11	2.46	2.53	12.70	160.04	55.84	71.60	235.00
Mercury (Hg)	0.0050	mg/kg d.w.	2.40	1.16	1.04	5.39	1.32	0.96	0.48	4.18	0.5	0.2	0.3	1.0
Molybdenum (Mo)	0.020	mg/kg d.w.	<0.020	-	<0.020	<0.020	0.96	0.27	0.34	1.44	0.319	0.086	0.147	0.462
Nickel (Ni)	0.20	mg/kg d.w.	<0.20	-	<0.20	<0.20	<0.2	-	<0.20	0.2	<0.20	-	<0.20	<0.20
Phosphorus (P)	10	mg/kg d.w.	11,773	1,039	10,000	13,500	11,490	3,455	6,880	16,800	16,511	2,056	12,100	18,000
Potassium (K)	20	mg/kg d.w.	20,500	1,517	18,400	24,000	11,100	3,018	6,230	15,600	21,067	2,718	16,500	24,000
Rubidium (Rb)	0.050	mg/kg d.w.	30.9	5.2	22.4	40.6	27.0	8.01	13.7	40.5	35.8	4.90	29.9	44.9
Selenium (Se)	0.050	mg/kg d.w.	0.81	0.08	0.73	0.96	8.71	1.56	5.90	11.40	3.84	0.93	3.09	6.10
Sodium (Na)	20	mg/kg d.w.	2,318	736	815	3,360	4,235	1,144	2,410	6,220	5,170	704	3,920	5,990
Strontium (Sr)	0.050	mg/kg d.w.	0.72	0.63	0.11	1.81	0.28	0.31	0.09	1.32	0.45	0.19	0.27	0.83
Tellurium (Te)	0.020	mg/kg d.w.	<0.020	-	<0.020	<0.020	0.022	0.005	<0.020	0.037	<0.020	-	<0.020	<0.020
Thallium (Tl)	0.0020	mg/kg d.w.	0.011	0.004	0.006	0.018	0.012	0.003	0.008	0.018	0.017	0.004	0.011	0.023
Tin (Sn)	0.10	mg/kg d.w.	0.101	0.004	<0.10	0.11	0.18	0.19	<0.10	0.80	0.10	0.010	<0.10	0.13
Uranium (U)	0.0020	mg/kg d.w.	<0.0020	-	<0.0020	<0.0020	0.0042	0.0038	<0.0020	0.0171	0.0021	0.0003	<0.0020	0.0028
Vanadium (V)	0.10	mg/kg d.w.	<0.10	-	<0.10	<0.10	1.78	1.40	0.28	4.85	0.37	0.21	<0.10	0.68
Zinc (Zn)	0.50	mg/kg d.w.	24.2	4.2	17.3	32.6	212.0	61.8	110.0	314.0	354.2	51.2	238.0	412.0
Zirconium (Zr)	0.20	mg/kg d.w.	<0.20	-	<0.20	<0.20	<0.20	-	<0.20	<0.20	<0.20	-	<0.20	<0.20

Note: SD - Standard Deviation.

Table C.1: Average Dry Weight (d.w.) Metal Concentrations in Fish Tissue, Rainy River Mine Fish Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Walleye											
			Muscle				Liver				Ovary			
			Average (n=15)	SD	Minimum	Maximum	Average (n=15)	SD	Minimum	Maximum	Average (n=6)	SD	Minimum	Maximum
Moisture	0.25	%	78.8	0.6	77.8	80.2	77.4	3.2	72.4	81.6	73.4	1.7	71.3	75.2
Aluminum (Al)	2.0	mg/kg d.w.	3.3	3.0	<2.0	13.5	4.7	0.9	<2.0	5.4	4.6	3.8	<2.0	11.8
Antimony (Sb)	0.010	mg/kg d.w.	<0.010	-	<0.010	<0.010	<0.010	-	<0.010	<0.010	0.010	0.0004	<0.010	0.011
Arsenic (As)	0.020	mg/kg d.w.	0.20	0.05	0.09	0.32	0.33	0.18	0.12	0.74	0.13	0.05	0.07	0.21
Barium (Ba)	0.050	mg/kg d.w.	0.27	0.09	0.18	0.48	0.16	0.08	0.06	0.29	0.86	1.35	0.16	3.60
Beryllium (Be)	0.010	mg/kg d.w.	<0.010	-	<0.010	<0.010	<0.010	-	<0.010	<0.010	<0.010	-	<0.010	<0.010
Bismuth (Bi)	0.010	mg/kg d.w.	0.012	0.0036	<0.010	0.022	0.012	0.003	<0.010	0.021	<0.010	-	<0.010	<0.010
Boron (B)	1.0	mg/kg d.w.	<1.0	-	<1.0	<1.0	<1.0	-	<1.0	<1.0	1.2	0.6	<1.0	2.4
Cadmium (Cd)	0.0050	mg/kg d.w.	<0.0050	-	<0.0050	<0.0050	0.64	0.37	0.24	1.53	0.0106	0.0032	<0.0050	0.0140
Calcium (Ca)	20	mg/kg d.w.	786	485	373	2,370	690	706	261	3,000	893	306	378	1,200
Cesium (Cs)	0.0050	mg/kg d.w.	0.056	0.014	0.033	0.090	0.027	0.009	0.013	0.045	0.0427	0.0103	0.0290	0.0568
Chromium (Cr)	0.050	mg/kg d.w.	0.055	0.020	<0.050	0.128	0.161	0.069	<0.050	0.210	0.130	0.088	<0.050	0.230
Cobalt (Co)	0.020	mg/kg d.w.	<0.020	-	<0.020	<0.020	0.71	0.36	0.24	1.55	0.21	0.05	0.15	0.28
Copper (Cu)	0.10	mg/kg d.w.	0.65	0.13	0.54	1.07	7.81	1.81	5.23	12	3.30	0.56	2.83	4.27
Iron (Fe)	3.0	mg/kg d.w.	8.7	3.6	5.0	19.9	534	227	145	886	104	35	70	157
Lead (Pb)	0.020	mg/kg d.w.	0.03	0.04	<0.020	0.20	0.042	0.014	<0.020	0.050	0.035	0.017	<0.020	0.051
Lithium (Li)	0.50	mg/kg d.w.	<0.50	-	<0.50	<0.50	<0.50	-	<0.50	<0.50	<0.50	-	<0.50	<0.50
Magnesium (Mg)	2.0	mg/kg d.w.	1,579	84	1,450	1,750	777	106	598	995	1,189	221	883	1,480
Manganese (Mn)	0.050	mg/kg d.w.	0.65	0.15	0.41	0.96	6.99	1.38	5.19	9.8	13.7	10.0	1.6	29.6
Mercury (Hg)	0.0050	mg/kg d.w.	1.59	0.69	0.70	3.18	0.62	0.21	0.18	1.10	0.14	0.06	0.04	0.20
Molybdenum (Mo)	0.020	mg/kg d.w.	<0.020	-	<0.020	<0.020	0.72	0.17	0.40	1.02	0.07	0.03	0.03	0.11
Nickel (Ni)	0.20	mg/kg d.w.	<0.20	-	<0.20	<0.20	<0.20	-	<0.20	<0.20	0.21	0.03	<0.20	0.27
Phosphorus (P)	10	mg/kg d.w.	11,640	637	10,600	12,800	12,323	1,662	9,850	15,500	11,525	4,514	8,100	20,500
Potassium (K)	20	mg/kg d.w.	22,773	950	21,400	24,600	11,606	1,414	9,390	14,900	14,017	5,164	10,200	24,100
Rubidium (Rb)	0.050	mg/kg d.w.	51.8	12.0	36.8	85.5	30.5	8.4	18.2	42.8	35.9	10.33	25.0	52.9
Selenium (Se)	0.050	mg/kg d.w.	1.03	0.16	0.82	1.38	3.64	0.54	2.95	4.67	3.63	2.002	2.51	7.68
Sodium (Na)	20	mg/kg d.w.	1,460	444	911	2,300	5,074	1,087	3,940	7,750	3,135	488	2,520	3,840
Strontium (Sr)	0.050	mg/kg d.w.	0.181	0.163	0.070	0.695	0.415	0.386	0.180	1.610	0.255	0.082	0.160	0.360
Tellurium (Te)	0.020	mg/kg d.w.	<0.020	-	<0.020	<0.020	<0.020	-	<0.020	<0.020	<0.020	-	<0.020	<0.020
Thallium (Tl)	0.0020	mg/kg d.w.	0.016	0.004	0.011	0.024	0.035	0.010	0.025	0.056	0.026	0.012	0.015	0.047
Tin (Sn)	0.10	mg/kg d.w.	<0.10	-	<0.10	<0.10	0.66	0.51	0.13	1.90	0.12	0.05	<0.10	0.22
Uranium (U)	0.0020	mg/kg d.w.	0.0021	0.0004	<0.0020	0.0036	0.0021	0.0002	<0.0020	0.0029	<0.0020	-	<0.0020	<0.0020
Vanadium (V)	0.10	mg/kg d.w.	<0.10	-	<0.10	<0.10	0.12	0.04	<0.10	0.21	<0.10	-	<0.10	<0.10
Zinc (Zn)	0.50	mg/kg d.w.	15.1	1.5	12.4	17.3	84.6	9.3	65.1	103.0	223	213	108	657
Zirconium (Zr)	0.20	mg/kg d.w.	<0.20	-	<0.20	<0.20	0.20	0.01	<0.20	0.25	0.20	0.01	<0.20	0.22

Note: SD - Standard Deviation.

Table C.2: Dry Weight (d.w.) Metal Concentrations in Fish Muscle Tissue, Rainy River Mine Fish Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Northern Pike															
			PinR-EXP-2018-NP01 MUSCLE	PinR-EXP-2018-NP02 MUSCLE	PinR-EXP-2018-NP03 MUSCLE	PinR-EXP-2018-NP04 MUSCLE	PinR-EXP-2018-NP05 MUSCLE	PinR-EXP-2018-NP06 MUSCLE	PinR-EXP-2018-NP07 MUSCLE	PinR-EXP-2018-NP08 MUSCLE	PinR-EXP-2018-NP09 MUSCLE	PinR-EXP-2018-NP10 MUSCLE	PinR-EXP-2018-NP11 MUSCLE	PinR-EXP-2018-NP12 MUSCLE	PinR-EXP-2018-NP13 MUSCLE	PinR-EXP-2018-NP14 MUSCLE	PinR-EXP-2018-NP15 MUSCLE
			12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.50	%	80.8	80.5	79.4	79.4	78.7	81.8	82.0	80.1	79.3	77.8	80.7	78.4	79.7	80.4	80.1
Aluminum (Al)	2.0	mg/kg d.w.	6.9	4	4.3	2.8	2.7	4.2	2.4	2.3	3	2.1	2.7	3	<2.0	<2.0	6.5
Antimony (Sb)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic (As)	0.020	mg/kg d.w.	0.144	0.313	0.213	0.435	0.189	0.186	0.239	0.186	0.272	0.236	0.242	0.294	0.351	0.168	0.140
Barium (Ba)	0.050	mg/kg d.w.	0.949	0.476	0.464	0.420	0.261	0.386	0.296	0.256	0.588	<0.050	0.370	0.366	<0.050	<0.050	0.084
Beryllium (Be)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth (Bi)	0.010	mg/kg d.w.	<0.010	0.016	<0.010	0.013	<0.010	0.018	0.017	<0.010	0.014	0.018	0.013	0.017	0.018	0.013	0.017
Boron (B)	1.0	mg/kg d.w.	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)	0.0050	mg/kg d.w.	<0.0050	0.0056	<0.0050	<0.0050	<0.0050	0.0111	0.0054	<0.0050	0.0086	0.0067	0.0133	<0.0050	<0.0050	<0.0050	<0.0050
Calcium (Ca)	20	mg/kg d.w.	1,560	1,060	2,080	874	521	3,260	554	2,160	2,460	531	3,670	3,110	499	601	596
Cesium (Cs)	0.0050	mg/kg d.w.	0.0521	0.0463	0.0610	0.0280	0.0673	0.0857	0.0581	0.0415	0.0669	0.0563	0.0707	0.0410	0.0374	0.0448	0.0510
Chromium (Cr)	0.050	mg/kg d.w.	0.079	0.058	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt (Co)	0.020	mg/kg d.w.	0.026	0.037	<0.020	<0.020	<0.020	0.023	<0.020	<0.020	0.024	<0.020	0.022	0.036	0.025	<0.020	0.034
Copper (Cu)	0.10	mg/kg d.w.	0.83	1.09	0.78	0.94	1.11	0.60	0.80	0.60	0.65	0.92	0.93	0.77	0.82	0.93	0.98
Iron (Fe)	3.0	mg/kg d.w.	18.7	21.9	10.5	22.7	16.0	19.5	11.3	8.5	13.2	17.2	21.0	12.5	10.7	7.0	22.2
Lead (Pb)	0.020	mg/kg d.w.	0.109	0.132	0.026	<0.020	<0.020	0.026	0.022	<0.020	<0.020	<0.020	0.034	<0.020	<0.020	<0.020	0.023
Lithium (Li)	0.50	mg/kg d.w.	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium (Mg)	2.0	mg/kg d.w.	1,450	1,470	1,680	1,470	1,490	1,480	1,460	1,490	1,570	1,420	1,550	1,540	1,540	1,660	1,530
Manganese (Mn)	0.050	mg/kg d.w.	2.44	1.28	2.87	1.18	0.989	3.57	1.22	1.80	2.84	0.67	3.80	2.640	0.71	0.75	0.81
Mercury (Hg)	0.0050	mg/kg d.w.	1.04	2.39	1.32	1.30	1.36	5.39	3.03	1.590	3.020	2.89	3.94	2.00	2.00	2.05	2.67
Molybdenum (Mo)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nickel (Ni)	0.20	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus (P)	10	mg/kg d.w.	10,000	11,100	13,000	10,600	11,700	13,400	11,400	12,500	12,100	11,100	13,500	11,800	11,300	12,400	10,700
Potassium (K)	20	mg/kg d.w.	18,400	20,100	22,700	19,900	21,400	21,200	20,400	21,800	19,700	18,700	20,600	19,000	20,000	24,000	19,600
Rubidium (Rb)	0.050	mg/kg d.w.	37.0	28.3	40.6	22.4	39.5	32.0	27.6	30.5	34.5	30.1	30.3	23.5	27.2	31.5	28.8
Selenium (Se)	0.050	mg/kg d.w.	0.728	0.771	0.725	0.953	0.754	0.85	0.818	0.908	0.751	0.821	0.858	0.764	0.813	0.957	0.743
Sodium (Na)	20	mg/kg d.w.	3,360	2,560	1,890	1,800	1,760	2,640	3,350	1,260	2,300	2,240	2,510	2,490	2,450	815	3,340
Strontium (Sr)	0.050	mg/kg d.w.	0.74	0.480	1.060	0.299	0.117	1.440	0.264	0.737	1.540	0.163	1.730	1.810	0.159	0.109	0.221
Tellurium (Te)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Thallium (Tl)	0.0020	mg/kg d.w.	0.0179	0.0100	0.0140	0.0094	0.0155	0.0129	0.0078	0.0143	0.0082	0.0099	0.0076	0.0056	0.0075	0.0140	0.0074
Tin (Sn)	0.10	mg/kg d.w.	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	0.11
Uranium (U)	0.0020	mg/kg d.w.	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Vanadium (V)	0.10	mg/kg d.w.	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Zinc (Zn)	0.50	mg/kg d.w.	22.0	26.2	21.8	21.1	28.2	22.8	24.3	19.4	24.3	31.2	22.7	22.6	17.3	27.1	32.6
Zirconium (Zr)	0.20	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Table C.2: Dry Weight (d.w.) Metal Concentrations in Fish Muscle Tissue, Rainy River Mine Fish Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Walleye															
			PinR-EXP-2018-WA01 MUSCLE	PinR-EXP-2018-WA02 MUSCLE	PinR-EXP-2018-WA03 MUSCLE	PinR-EXP-2018-WA04 MUSCLE	PinR-EXP-2018-WA05 MUSCLE	PinR-EXP-2018-WA06 MUSCLE	PinR-EXP-2018-WA07 MUSCLE	PinR-EXP-2018-WA08 MUSCLE	PinR-EXP-2018-WA09 MUSCLE	PinR-EXP-2018-WA10 MUSCLE	PinR-EXP-2018-WA11 MUSCLE	PinR-EXP-2018-WA12 MUSCLE	PinR-EXP-2018-WA13 MUSCLE	PinR-EXP-2018-WA14 MUSCLE	PinR-EXP-2018-WA15 MUSCLE
			12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.50	%	78.9	78.8	79.7	78.1	78.0	78.9	79.2	78.7	78.8	80.2	78.4	78.4	78.8	77.8	78.8
Aluminum (Al)	2.0	mg/kg d.w.	5.5	<2.0	2	2.1	2.1	2.1	<2.0	13.5	<2.0	2.3	<2.0	2.6	4.6	<2.0	2.6
Antimony (Sb)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic (As)	0.020	mg/kg d.w.	0.181	0.259	0.209	0.227	0.227	0.164	0.322	0.090	0.190	0.160	0.192	0.208	0.199	0.184	0.157
Barium (Ba)	0.050	mg/kg d.w.	0.256	0.372	0.441	0.475	0.296	0.191	0.2	0.331	0.196	0.296	0.21	0.209	0.219	0.181	0.223
Beryllium (Be)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth (Bi)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	0.012	<0.010	0.022	<0.010	<0.010	<0.010	0.016	0.016	0.011	0.015
Boron (B)	1.0	mg/kg d.w.	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)	0.0050	mg/kg d.w.	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Calcium (Ca)	20	mg/kg d.w.	455	1,230	857	2,370	596	566	681	666	373	650	870	480	787	535	668
Cesium (Cs)	0.0050	mg/kg d.w.	0.0719	0.0576	0.0621	0.0329	0.0360	0.0522	0.0453	0.0521	0.0901	0.0590	0.0597	0.0617	0.0608	0.0523	0.0521
Chromium (Cr)	0.050	mg/kg d.w.	0.128	<0.050	<0.050	<0.050	<0.050	0.052	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Cobalt (Co)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Copper (Cu)	0.10	mg/kg d.w.	0.77	0.60	0.60	0.72	0.66	0.63	0.55	1.07	0.54	0.64	0.57	0.65	0.68	0.54	0.57
Iron (Fe)	3.0	mg/kg d.w.	11.6	7.1	7.9	8.0	6.9	7.6	6.4	19.9	6.5	7.4	6.6	9.7	12.1	5.0	7.6
Lead (Pb)	0.020	mg/kg d.w.	0.03	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	0.195	<0.020	<0.020	<0.020	0.033	<0.020	<0.020	<0.020
Lithium (Li)	0.50	mg/kg d.w.	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium (Mg)	2.0	mg/kg d.w.	1,550	1,560	1,600	1,650	1,660	1,590	1,600	1,750	1,470	1,520	1,490	1,450	1,540	1,700	1,560
Manganese (Mn)	0.050	mg/kg d.w.	0.547	0.861	0.555	0.871	0.649	0.606	0.620	0.957	0.409	0.698	0.534	0.525	0.718	0.626	0.605
Mercury (Hg)	0.0050	mg/kg d.w.	0.70	2.96	1.08	1.01	1.14	1.49	1.520	1.33	3.18	1.010	1.62	2.06	1.62	1.41	1.67
Molybdenum (Mo)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Nickel (Ni)	0.20	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus (P)	10	mg/kg d.w.	11,500	11,900	11,500	12,800	12,500	11,500	11,900	11,500	10,600	11,400	10,700	10,800	11,700	12,400	11,900
Potassium (K)	20	mg/kg d.w.	22,900	22,000	23,100	23,400	24,200	21,900	23,600	22,800	21,800	23,000	21,600	21,400	23,100	24,600	22,200
Rubidium (Rb)	0.050	mg/kg d.w.	85.5	51.9	65.8	36.8	41.1	50.8	41	47.7	61.4	56.8	48.8	51.3	48.0	45.4	44.9
Selenium (Se)	0.050	mg/kg d.w.	0.90	1.14	0.824	1.310	1.380	1.060	1.200	0.98	1.00	0.855	0.947	0.969	0.927	0.980	0.993
Sodium (Na)	20	mg/kg d.w.	997	1,600	1,760	1,100	1,210	2,300	1,070	2,100	1,150	1,020	1,460	1,880	1,420	911	1,920
Strontium (Sr)	0.050	mg/kg d.w.	0.098	0.380	0.204	0.695	0.076	0.101	0.138	0.138	0.070	0.138	0.206	0.072	0.184	0.073	0.143
Tellurium (Te)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Thallium (Tl)	0.0020	mg/kg d.w.	0.0238	0.0194	0.0202	0.0181	0.0184	0.0134	0.0117	0.0142	0.0114	0.0121	0.0133	0.0156	0.0164	0.0158	0.0138
Tin (Sn)	0.10	mg/kg d.w.	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium (U)	0.0020	mg/kg d.w.	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	0.0036	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Vanadium (V)	0.10	mg/kg d.w.	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Zinc (Zn)	0.50	mg/kg d.w.	17.3	14.9	14.2	16.6	16.6	15.3	16.7	17.0	12.4	13.9	13.0	15.6	14.7	13.8	14.0
Zirconium (Zr)	0.20	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Table C.3: Dry Weight (d.w.) Metal Concentrations in Fish Liver Tissue, Rainy River Mine Fish Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Northern Pike														
			PinR-EXP-2018-NP01	PinR-EXP-2018-NP02	PinR-EXP-2018-NP03	PinR-EXP-2018-NP04	PinR-EXP-2018-NP05	PinR-EXP-2018-NP06	PinR-EXP-2018-NP07	PinR-EXP-2018-NP08	PinR-EXP-2018-NP09	PinR-EXP-2018-NP10	PinR-EXP-2018-NP11	PinR-EXP-2018-NP12	PinR-EXP-2018-NP13	PinR-EXP-2018-NP14	PinR-EXP-2018-NP15
			12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.50	%	73.7	79.5	69.1	76.1	74.8	78.4	80.5	80.0	78.7	75.0	73.7	78.0	80.7	74.8	79.0
Aluminum (Al)	2.0	mg/kg d.w.	<5.0	7.8	<5.0	<5.0	<5.0	23.3	8.5	2.8	11.5	4.6	19.6	8.4	5.5	6.1	7.6
Antimony (Sb)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	<0.010	<0.010	<0.010	0.017	<0.010	<0.010	<0.010	<0.010
Arsenic (As)	0.020	mg/kg d.w.	0.098	0.186	0.089	0.186	0.094	0.198	0.272	0.103	0.193	0.084	0.224	0.205	0.235	0.117	0.159
Barium (Ba)	0.050	mg/kg d.w.	0.161	0.146	0.084	0.632	0.567	0.76	0.477	0.666	0.512	0.178	0.379	0.409	0.406	1.55	0.596
Beryllium (Be)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth (Bi)	0.010	mg/kg d.w.	0.017	0.043	0.017	0.026	0.013	0.080	0.048	0.019	0.044	0.025	0.045	0.051	0.041	0.035	0.050
Boron (B)	1.0	mg/kg d.w.	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)	0.0050	mg/kg d.w.	0.179	0.392	0.173	0.436	0.252	1.580	0.742	0.341	1.040	0.312	1.690	0.301	0.411	0.239	0.383
Calcium (Ca)	20	mg/kg d.w.	793	182	147	175	107	300	286	280	207	151	201	171	236	1750	238
Cesium (Cs)	0.0050	mg/kg d.w.	0.0186	0.0220	0.0170	0.0088	0.0312	0.0279	0.0247	0.0246	0.0311	0.0210	0.0233	0.0177	0.0210	0.0173	0.0284
Chromium (Cr)	0.050	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.083	<0.050	0.084	<0.050	0.055	<0.050	<0.050	<0.20	<0.20
Cobalt (Co)	0.020	mg/kg d.w.	0.128	0.226	0.132	0.160	0.132	0.614	0.378	0.170	0.319	0.136	0.417	0.371	0.330	0.295	0.369
Copper (Cu)	0.10	mg/kg d.w.	66.9	229	66	86	107.0	228.0	124.0	105.0	278.0	44.5	151	355.0	203	109	229.0
Iron (Fe)	3.0	mg/kg d.w.	142	879	459	1,560	98	1,720	96	894	1,290	207	847	2,200	1,340	145	1,100
Lead (Pb)	0.020	mg/kg d.w.	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	0.025	<0.020	0.021	<0.020	0.028	<0.020	<0.020	<0.050	<0.050
Lithium (Li)	0.50	mg/kg d.w.	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium (Mg)	2.0	mg/kg d.w.	472	760	415	541	503	733	949	877	726	521	525	801	894	754	723
Manganese (Mn)	0.050	mg/kg d.w.	4.19	6.08	3.10	4.30	4.59	7.47	12.70	6.23	5.92	2.53	7.12	5.31	8.44	7.15	6.54
Mercury (Hg)	0.0050	mg/kg d.w.	0.480	1.310	0.482	0.561	0.521	4.180	1.49	0.732	1.900	0.976	2.300	1.300	1.05	0.931	1.600
Molybdenum (Mo)	0.020	mg/kg d.w.	0.804	1.010	0.826	0.83	0.836	1.440	1.310	0.792	0.862	0.337	0.911	0.971	0.999	1.210	1.320
Nickel (Ni)	0.20	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	0.2	<0.20	<0.20	<0.20	<0.20	0.2	<0.20	<0.20	<0.20	<0.20
Phosphorus (P)	10	mg/kg d.w.	6,880	12,300	7,120	7,880	7,460	11,900	16,800	15,400	13,800	8,020	9,490	14,300	16,100	11,800	13,100
Potassium (K)	20	mg/kg d.w.	6,230	13,200	7,210	8,220	8,710	10,400	14,700	15,100	13,200	9,820	9,630	13,700	15,600	8,880	11,900
Rubidium (Rb)	0.050	mg/kg d.w.	19.4	40.5	24.0	13.7	40.0	27.9	25.8	26.7	38.4	21.2	22.8	25.2	32.8	18.1	29.0
Selenium (Se)	0.050	mg/kg d.w.	5.90	8.11	7.27	8.38	6.46	9.58	10.10	9.87	9.17	6.63	9.02	9.37	11.40	9.31	10.10
Sodium (Na)	20	mg/kg d.w.	2,790	4,430	3,110	2,920	2,410	5,220	6,220	4,920	4,460	3,100	4,350	4,390	4,840	5,870	4,490
Strontium (Sr)	0.050	mg/kg d.w.	0.630	0.200	0.140	0.120	<0.10	0.24	0.230	0.153	0.221	0.091	0.160	0.165	0.210	1.320	0.230
Tellurium (Te)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	0.023	<0.020	0.037	0.021	<0.020	<0.020	<0.020	0.034	<0.020	0.021	<0.020	<0.020
Thallium (Tl)	0.0020	mg/kg d.w.	0.0179	0.0133	0.0108	0.0119	0.0155	0.0141	0.0101	0.0151	0.0100	0.0089	0.0083	0.0084	0.0124	0.0098	0.0096
Tin (Sn)	0.10	mg/kg d.w.	0.80	0.32	0.37	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Uranium (U)	0.0020	mg/kg d.w.	<0.0020	0.004	<0.0020	<0.0020	<0.0020	0.0171	0.0060	<0.0020	0.0055	0.003	0.0044	0.0034	0.0032	<0.0020	0.0043
Vanadium (V)	0.10	mg/kg d.w.	0.28	3.15	0.47	1.42	0.36	4.85	1.71	0.36	1.76	1.28	2.29	4.21	1.97	0.60	1.96
Zinc (Zn)	0.50	mg/kg d.w.	152	224	175	173	140.0	314	279	195	280	110	150	276	267	233	212
Zirconium (Zr)	0.20	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

Table C.3: Dry Weight (d.w.) Metal Concentrations in Fish Liver Tissue, Rainy River Mine Fish Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Walleye															
			PinR-EXP-2018-WA01	PinR-EXP-2018-WA02	PinR-EXP-2018-WA03	PinR-EXP-2018-WA04	PinR-EXP-2018-WA05	PinR-EXP-2018-WA06	PinR-EXP-2018-WA07	PinR-EXP-2018-WA08	PinR-EXP-2018-WA09	PinR-EXP-2018-WA10	PinR-EXP-2018-WA11	PinR-EXP-2018-WA12	PinR-EXP-2018-WA13	PinR-EXP-2018-WA14	PinR-EXP-2018-WA15
			12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.50	%	72.9	81.5	78.5	72.4	72.9	76.5	80.9	76.7	76.9	79.4	79.9	78.3	74.1	79.0	81.6
Aluminum (Al)	2.0	mg/kg d.w.	<2.0	5.4	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	3.1	<5.0	<5.0	4.9	<5.0	<5.0	<5.0
Antimony (Sb)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Arsenic (As)	0.020	mg/kg d.w.	0.139	0.205	0.344	0.395	0.576	0.320	0.165	0.118	0.129	0.572	0.328	0.375	0.340	0.744	0.268
Barium (Ba)	0.050	mg/kg d.w.	0.268	0.127	0.17	0.181	0.285	0.261	0.135	0.193	0.061	0.275	0.083	0.071	0.115	0.132	0.114
Beryllium (Be)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth (Bi)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	0.011	<0.010	0.021	<0.010	0.016	<0.010	0.013	<0.010	0.014	<0.010
Boron (B)	1.0	mg/kg d.w.	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)	0.0050	mg/kg d.w.	0.242	0.687	1.530	0.363	0.315	0.678	1.240	0.325	0.870	0.556	0.436	0.935	0.62	0.537	0.25
Calcium (Ca)	20	mg/kg d.w.	1510	467	612	530	345	686	640	327	304	3000	261	364	444	382	473
Cesium (Cs)	0.0050	mg/kg d.w.	0.0384	0.0289	0.0238	0.0155	0.0134	0.0265	0.0158	0.0211	0.0397	0.0448	0.0285	0.0329	0.0187	0.0223	0.0272
Chromium (Cr)	0.050	mg/kg d.w.	<0.050	<0.050	<0.20	0.21	<0.20	<0.20	<0.20	<0.20	<0.050	<0.20	<0.20	<0.050	<0.20	<0.20	<0.20
Cobalt (Co)	0.020	mg/kg d.w.	0.244	1.190	1.550	0.723	0.939	0.81	0.763	0.689	0.283	0.748	0.271	0.609	0.901	0.472	0.41
Copper (Cu)	0.10	mg/kg d.w.	7.22	8.03	12.00	8.33	10.40	8.77	8.28	6.39	6.35	9.40	5.84	6.9	6.57	7.51	5.23
Iron (Fe)	3.0	mg/kg d.w.	269	596	886	494	432	795	655	145	543	828	204	760	456	379	569
Lead (Pb)	0.020	mg/kg d.w.	<0.020	<0.020	<0.050	<0.050	<0.050	<0.050	<0.050	<0.050	<0.020	<0.050	<0.050	<0.020	<0.050	<0.050	<0.050
Lithium (Li)	0.50	mg/kg d.w.	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium (Mg)	2.0	mg/kg d.w.	782	828	754	725	749	745	688	933	888	849	759	995	598	703	662
Manganese (Mn)	0.050	mg/kg d.w.	7.60	5.58	6.60	8.84	7.0	5.19	5.90	9.79	8.51	7.14	7.19	8.04	5.37	6.66	5.46
Mercury (Hg)	0.0050	mg/kg d.w.	0.176	0.891	0.423	0.548	0.696	0.503	0.530	0.562	1.100	0.604	0.656	0.861	0.560	0.640	0.582
Molybdenum (Mo)	0.020	mg/kg d.w.	0.480	0.540	0.761	0.758	0.868	0.594	0.940	0.755	0.396	1.020	0.699	0.814	0.685	0.861	0.603
Nickel (Ni)	0.20	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Phosphorus (P)	10	mg/kg d.w.	13,200	12,800	10,900	11,900	12,700	12,600	10,600	13,600	14,300	14,200	11,700	15,500	10,500	10,500	9,850
Potassium (K)	20	mg/kg d.w.	10,300	13,700	10,300	10,600	10,900	11,900	10,600	12,100	12,800	11,700	11,900	14,900	9,390	11,600	11,400
Rubidium (Rb)	0.050	mg/kg d.w.	42.8	33.5	33.0	18.2	20.8	28.1	19.7	31.4	42.6	40.1	31.8	40.4	22.2	25.1	27.8
Selenium (Se)	0.050	mg/kg d.w.	3.36	3.86	3.83	4.44	4.56	3.56	3.53	2.95	3.29	4.67	2.97	3.57	3.18	3.48	3.32
Sodium (Na)	20	mg/kg d.w.	3,950	7,750	6,540	4,350	3,980	5,360	6,030	4,360	5,700	4,860	3,940	4,980	4,680	4,210	5,420
Strontium (Sr)	0.050	mg/kg d.w.	1.000	0.317	0.380	0.270	0.24	0.450	0.340	0.210	0.191	1.610	0.180	0.241	0.240	0.260	0.290
Tellurium (Te)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Thallium (Tl)	0.0020	mg/kg d.w.	0.0340	0.0306	0.0403	0.0291	0.0494	0.0269	0.0249	0.0273	0.0250	0.0449	0.0385	0.0426	0.0289	0.0559	0.0304
Tin (Sn)	0.10	mg/kg d.w.	0.13	0.21	1.03	1.35	0.89	0.64	0.39	0.35	0.20	1.90	0.53	0.36	0.27	1.18	0.44
Uranium (U)	0.0020	mg/kg d.w.	<0.0020	<0.0020	0.0029	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Vanadium (V)	0.10	mg/kg d.w.	<0.10	0.12	0.21	<0.10	<0.10	0.14	<0.10	0.2	<0.10	<0.10	0.12	0.11	0.13	<0.10	<0.10
Zinc (Zn)	0.50	mg/kg d.w.	90.1	89.9	80.0	81.5	93.9	85.6	83.0	77.5	88.6	94.0	78.6	103.0	73.8	84.3	65.1
Zirconium (Zr)	0.20	mg/kg d.w.	<0.20	<0.20	0.25	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.21	<0.20	<0.20	<0.20	<0.20	<0.20

Table C.4: Dry Weight (d.w.) Metal Concentrations in Fish Ovaries, Rainy River Mine Fish Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Northern Pike									Walleye					
			PinR-EXP-2018-NP02 OVARY	PinR-EXP-2018-NP06 OVARY	PinR-EXP-2018-NP07	PinR-EXP-2018-NP08 OVARY	PinR-EXP-2018-NP09	PinR-EXP-2018-NP10 OVARY	PinR-EXP-2018-NP12 OVARY	PinR-EXP-2018-NP13 OVARY	PinR-EXP-2018-NP15 OVARY	PinR-EXP-2018-WA01 OVARY	PinR-EXP-2018-WA04 OVARY	PinR-EXP-2018-WA08 OVARY	PinR-EXP-2018-WA09 OVARY	PinR-EXP-2018-WA11 OVARY	PinR-EXP-2018-WA12 OVARY
			12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.25	%	83.4	83.3	84.1	82.3	83.7	82.7	83.1	82.8	83.3	74.9	75.2	72.5	71.7	71.3	74.7
Aluminum (Al)	2.0	mg/kg d.w.	6.2	<5.0	4.5	2.8	14.9	5.3	3.1	2.4	<5.0	<2.0	11.8	<5.0	<2.0	<5.0	<2.0
Antimony (Sb)	0.010	mg/kg d.w.	0.022	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.011
Arsenic (As)	0.020	mg/kg d.w.	0.163	0.150	0.207	0.086	0.169	0.122	0.178	0.173	0.109	0.090	0.097	0.121	0.069	0.167	0.206
Barium (Ba)	0.050	mg/kg d.w.	0.617	1.450	0.520	0.480	0.473	0.559	0.147	0.109	0.125	0.200	3.600	0.579	0.156	0.379	0.269
Beryllium (Be)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Bismuth (Bi)	0.010	mg/kg d.w.	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.017	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Boron (B)	1.0	mg/kg d.w.	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	2.4	<1.0	<1.0	<1.0	<1.0
Cadmium (Cd)	0.0050	mg/kg d.w.	0.0514	0.1210	0.0679	0.0566	0.0876	0.0715	0.0419	0.0370	0.0310	<0.0050	0.013	<0.010	0.014	<0.010	0.0114
Calcium (Ca)	20	mg/kg d.w.	906	583	661	924	478	1,600	751	715	676	973	378	1,190	787	832	1,200
Cesium (Cs)	0.0050	mg/kg d.w.	0.0503	0.0573	0.0493	0.0456	0.0735	0.0534	0.0421	0.0373	0.0463	0.0568	0.0376	0.0290	0.0497	0.0357	0.0472
Chromium (Cr)	0.050	mg/kg d.w.	0.057	<0.20	0.051	<0.050	0.052	0.105	0.06	0.076	<0.20	<0.050	0.23	<0.20	<0.050	<0.20	<0.050
Cobalt (Co)	0.020	mg/kg d.w.	0.372	0.476	0.305	0.251	0.518	0.277	0.635	0.553	0.359	0.235	0.177	0.243	0.197	0.152	0.275
Copper (Cu)	0.10	mg/kg d.w.	6.77	4.56	7.49	6.78	6.08	5.10	7.00	6.93	5.40	4.27	3.20	3.00	2.87	2.83	3.61
Iron (Fe)	3.0	mg/kg d.w.	307	148	132	304	258	231	311	393	217	78.1	89.4	136.0	69.7	91.4	157
Lead (Pb)	0.020	mg/kg d.w.	0.08	<0.050	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.050	<0.020	0.051	<0.050	<0.020	<0.050	<0.020
Lithium (Li)	0.50	mg/kg d.w.	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Magnesium (Mg)	2.0	mg/kg d.w.	1,310	759	1,260	1,320	1,240	1,220	1,330	1,280	1,100	1,190	1,480	1,060	1,120	883	1,400
Manganese (Mn)	0.050	mg/kg d.w.	179	72	204	176	118	89	206	235	162	6.1	1.6	29.6	10.2	19.3	15.4
Mercury (Hg)	0.0050	mg/kg d.w.	0.355	1.0000	0.494	0.2730	0.5860	0.610	0.379	0.251	0.471	0.0356	0.1840	0.2000	0.1670	0.0950	0.156
Molybdenum (Mo)	0.020	mg/kg d.w.	0.360	0.462	0.335	0.258	0.277	0.147	0.351	0.350	0.334	0.0440	0.0930	0.1050	0.0330	0.0620	0.0760
Nickel (Ni)	0.20	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.27	<0.20	<0.20	<0.20	<0.20
Phosphorus (P)	10	mg/kg d.w.	18,000	12,100	17,600	17,700	17,400	16,700	17,900	17,200	14,000	9,980	20,500	9,270	10,100	8,100	11,200
Potassium (K)	20	mg/kg d.w.	24,000	17,500	22,500	22,600	22,800	18,900	21,600	23,200	16,500	13,200	24,100	10,200	12,000	10,500	14,100
Rubidium (Rb)	0.050	mg/kg d.w.	41.3	33.8	34.5	37.7	44.9	32.8	29.9	36.9	30.8	52.9	42.0	25.0	33.2	26.9	35.1
Selenium (Se)	0.050	mg/kg d.w.	4.12	3.42	3.23	6.10	3.27	3.78	3.45	4.12	3.09	2.61	7.68	2.99	2.51	3.28	2.73
Sodium (Na)	20	mg/kg d.w.	5,350	5,990	5,710	4,100	5,340	5,630	5,330	5,160	3,920	2,800	2,980	3,110	3,560	2,520	3,840
Strontium (Sr)	0.050	mg/kg d.w.	0.714	0.270	0.332	0.361	0.311	0.834	0.468	0.376	0.370	0.214	0.270	0.360	0.188	0.160	0.340
Tellurium (Te)	0.020	mg/kg d.w.	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
Thallium (Tl)	0.0020	mg/kg d.w.	0.0224	0.0179	0.0123	0.0225	0.0162	0.0180	0.0132	0.0198	0.0112	0.0469	0.0330	0.0183	0.0147	0.0190	0.0269
Tin (Sn)	0.10	mg/kg d.w.	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.11	<0.10	0.13	<0.10	0.22	<0.10	<0.10	<0.10	<0.10
Uranium (U)	0.0020	mg/kg d.w.	<0.0020	0.0028	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Vanadium (V)	0.10	mg/kg d.w.	0.68	0.56	0.19	<0.10	0.24	0.26	0.64	0.44	0.22	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Zinc (Zn)	0.50	mg/kg d.w.	356	238	363	370	412	388	378	371	312	150.0	657.0	140.0	122.0	108	162
Zirconium (Zr)	0.20	mg/kg d.w.	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.22	<0.20	<0.20	<0.20	<0.20

Table C.5: Wet Weight (w.w.) Metal Concentrations in Fish Muscle Tissue, Rainy River Mine Fish Tissue Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Northern Pike														
				PinR-EXP-2018-NP01	PinR-EXP-2018-NP02	PinR-EXP-2018-NP03	PinR-EXP-2018-NP04	PinR-EXP-2018-NP05	PinR-EXP-2018-NP06	PinR-EXP-2018-NP07	PinR-EXP-2018-NP08	PinR-EXP-2018-NP09	PinR-EXP-2018-NP10	PinR-EXP-2018-NP11	PinR-EXP-2018-NP12	PinR-EXP-2018-NP13	PinR-EXP-2018-NP14	PinR-EXP-2018-NP15
				12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.25	%	-	80.8	80.5	79.4	79.4	78.7	81.8	82.0	80.1	79.3	77.8	80.7	78.4	79.7	80.4	80.1
Aluminum (Al)	0.4	mg/kg w.w.	-	1.32	0.78	0.89	0.58	0.58	0.76	0.43	0.46	0.62	0.47	0.52	0.65	<0.4	<0.4	1.29
Antimony (Sb)	0.002	mg/kg w.w.	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic (As)	0.004	mg/kg w.w.	1.0	0.03	0.06	0.04	0.09	0.04	0.03	0.04	0.04	0.06	0.05	0.05	0.06	0.07	0.03	0.03
Barium (Ba)	0.010	mg/kg w.w.	642	0.18	0.09	0.10	0.09	0.06	0.07	0.05	0.05	0.12	<0.01	0.07	0.08	<0.01	<0.01	0.02
Beryllium (Be)	0.002	mg/kg w.w.	6.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth (Bi)	0.002	mg/kg w.w.	-	<0.002	0.0031	<0.002	0.0027	<0.002	0.0033	0.0031	<0.002	0.0029	0.0040	0.0025	0.0037	0.0037	0.0025	0.0034
Boron (B)	0.2	mg/kg w.w.	56.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium (Cd)	0.0010	mg/kg w.w.	3.2	<0.001	0.0011	<0.001	<0.001	<0.001	0.0020	0.0010	<0.001	0.0018	0.0015	0.0026	<0.001	<0.001	<0.001	<0.001
Calcium (Ca)	4	mg/kg w.w.	-	300	207	428	180	111	593	100	430	509	118	708	672	101	118	119
Cesium (Cs)	0.0010	mg/kg w.w.	-	0.0100	0.0090	0.0126	0.0058	0.0143	0.0156	0.0105	0.0083	0.0138	0.0125	0.0136	0.0089	0.0076	0.0088	0.0101
Chromium (Cr)	0.010	mg/kg w.w.	3.2	0.015	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt (Co)	0.004	mg/kg w.w.	-	0.0050	0.0072	<0.004	<0.004	<0.004	0.0042	<0.004	<0.004	0.0050	<0.004	0.0042	0.0078	0.0051	<0.004	0.0068
Copper (Cu)	0.02	mg/kg w.w.	292	0.16	0.21	0.16	0.19	0.24	0.11	0.14	0.12	0.13	0.20	0.18	0.17	0.17	0.18	0.20
Iron (Fe)	0.6	mg/kg w.w.	-	3.6	4.3	2.2	4.7	3.4	3.5	2.0	1.7	2.7	3.8	4.1	2.7	2.2	1.4	4.4
Lead (Pb)	0.004	mg/kg w.w.	11.6	0.0209	0.0257	0.0054	<0.004	<0.004	0.0047	0.0040	<0.004	<0.004	<0.004	0.0066	<0.004	<0.004	<0.004	0.0046
Lithium (Li)	0.10	mg/kg w.w.	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Magnesium (Mg)	0.4	mg/kg w.w.	-	278	287	346	303	317	269	263	297	325	315	299	333	313	325	304
Manganese (Mn)	0.010	mg/kg w.w.	392	0.47	0.25	0.59	0.24	0.21	0.65	0.22	0.36	0.59	0.15	0.73	0.570	0.14	0.15	0.16
Mercury (Hg)	0.0010	mg/kg w.w.	0.5	0.20	0.47	0.27	0.27	0.29	0.98	0.55	0.32	0.63	0.64	0.76	0.43	0.41	0.40	0.53
Molybdenum (Mo)	0.004	mg/kg w.w.	16.1	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Nickel (Ni)	0.04	mg/kg w.w.	3.5	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Phosphorus (P)	2	mg/kg w.w.	-	1,920	2,165	2,678	2,184	2,492	2,439	2,052	2,488	2,505	2,464	2,606	2,549	2,294	2,430	2,129
Potassium (K)	4	mg/kg w.w.	-	3,533	3,920	4,676	4,099	4,558	3,858	3,672	4,338	4,078	4,151	3,976	4,104	4,060	4,704	3,900
Rubidium (Rb)	0.010	mg/kg w.w.	-	7.1	5.5	8.4	4.6	8.4	5.8	5.0	6.1	7.1	6.7	5.8	5.1	5.5	6.2	5.7
Selenium (Se)	0.010	mg/kg w.w.	3.6	0.14	0.15	0.15	0.20	0.16	0.15	0.15	0.18	0.16	0.18	0.17	0.17	0.17	0.19	0.15
Sodium (Na)	4	mg/kg w.w.	-	645	499	389	371	375	480	603	251	476	497	484	538	497	160	665
Strontium (Sr)	0.010	mg/kg w.w.	1,930	0.14	0.09	0.22	0.06	0.025	0.26	0.05	0.15	0.32	0.036	0.33	0.391	0.032	0.021	0.044
Tellurium (Te)	0.004	mg/kg w.w.	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thallium (Tl)	0.0004	mg/kg w.w.	-	0.0034	0.0020	0.0029	0.0019	0.0033	0.0023	0.0014	0.0028	0.0017	0.0022	0.0015	0.0012	0.0015	0.0027	0.0015
Tin (Sn)	0.02	mg/kg w.w.	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	0.02
Uranium (U)	0.0004	mg/kg w.w.	1.9	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium (V)	0.02	mg/kg w.w.	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc (Zn)	0.10	mg/kg w.w.	963	4.2	5.1	4.5	4.3	6.0	4.1	4.4	3.9	5.0	6.9	4.4	4.9	3.5	5.3	6.5
Zirconium (Zr)	0.04	mg/kg w.w.	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

Table C.5: Wet Weight (w.w.) Metal Concentrations in Fish Muscle Tissue, Rainy River Mine Fish Tissue Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Walleye														
				PinR-EXP-2018-WA01	PinR-EXP-2018-WA02	PinR-EXP-2018-WA03	PinR-EXP-2018-WA04	PinR-EXP-2018-WA05	PinR-EXP-2018-WA06	PinR-EXP-2018-WA07	PinR-EXP-2018-WA08	PinR-EXP-2018-WA09	PinR-EXP-2018-WA10	PinR-EXP-2018-WA11	PinR-EXP-2018-WA12	PinR-EXP-2018-WA13	PinR-EXP-2018-WA14	PinR-EXP-2018-WA15
				12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.25	%	-	78.9	78.8	79.7	78.1	78.0	78.9	79.2	78.7	78.8	80.2	78.4	78.4	78.8	77.8	78.8
Aluminum (Al)	0.4	mg/kg w.w.	-	1.16	<0.4	0.41	0.46	0.46	0.44	<0.4	2.88	<0.4	0.46	<0.4	0.56	0.98	<0.4	0.55
Antimony (Sb)	0.002	mg/kg w.w.	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic (As)	0.004	mg/kg w.w.	1.0	0.038	0.055	0.042	0.050	0.050	0.035	0.067	0.019	0.040	0.032	0.041	0.045	0.042	0.041	0.033
Barium (Ba)	0.010	mg/kg w.w.	642	0.054	0.079	0.090	0.104	0.065	0.040	0.042	0.071	0.042	0.059	0.045	<0.045	0.046	0.040	0.047
Beryllium (Be)	0.002	mg/kg w.w.	6.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth (Bi)	0.002	mg/kg w.w.	-	<0.002	<0.002	<0.002	<0.002	<0.002	0.0025	<0.002	0.0047	<0.002	<0.002	<0.002	0.0035	0.0034	0.0024	0.0032
Boron (B)	0.2	mg/kg w.w.	56.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium (Cd)	0.0010	mg/kg w.w.	3.2	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Calcium (Ca)	4	mg/kg w.w.	-	96	261	174	519	131	119	142	142	79	129	188	104	167	119	142
Cesium (Cs)	0.0010	mg/kg w.w.	-	0.0152	0.0122	0.0126	0.0072	0.0079	0.0110	0.0094	0.0111	0.0191	0.0117	0.0129	0.0133	0.0129	0.0116	0.0110
Chromium (Cr)	0.010	mg/kg w.w.	3.2	0.027	<0.01	<0.01	<0.01	<0.01	0.011	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt (Co)	0.004	mg/kg w.w.	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Copper (Cu)	0.02	mg/kg w.w.	292	0.16	0.13	0.12	0.16	0.15	0.13	0.11	0.23	0.11	0.13	0.12	0.14	0.14	0.12	0.12
Iron (Fe)	0.6	mg/kg w.w.	-	2.4	1.5	1.6	1.8	1.5	1.6	1.3	4.2	1.4	1.5	1.4	2.1	2.6	1.1	1.6
Lead (Pb)	0.004	mg/kg w.w.	11.6	0.0063	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0415	<0.004	<0.004	<0.004	0.0071	<0.004	<0.004	<0.004
Lithium (Li)	0.10	mg/kg w.w.	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Magnesium (Mg)	0.4	mg/kg w.w.	-	327	331	325	361	365	335	333	373	312	301	322	313	326	377	331
Manganese (Mn)	0.010	mg/kg w.w.	392	0.12	0.18	0.11	0.19	0.14	0.13	0.13	0.20	0.09	0.14	0.12	0.113	0.15	0.14	0.13
Mercury (Hg)	0.0010	mg/kg w.w.	0.5	0.15	0.63	0.22	0.22	0.25	0.31	0.32	0.28	0.67	0.20	0.35	0.44	0.34	0.31	0.35
Molybdenum (Mo)	0.004	mg/kg w.w.	16.1	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Nickel (Ni)	0.04	mg/kg w.w.	3.5	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Phosphorus (P)	2	mg/kg w.w.	-	2,427	2,523	2,335	2,803	2,750	2,427	2,475	2,450	2,247	2,257	2,311	2,333	2,480	2,753	2,523
Potassium (K)	4	mg/kg w.w.	-	4,832	4,664	4,689	5,125	5,324	4,621	4,909	4,856	4,622	4,554	4,666	4,622	4,897	5,461	4,706
Rubidium (Rb)	0.010	mg/kg w.w.	-	18.0	11.0	13.4	8.1	9.0	10.7	8.6	10.2	13.0	11.2	10.5	11.1	10.2	10.1	9.5
Selenium (Se)	0.010	mg/kg w.w.	3.6	0.190	0.242	0.167	0.287	0.304	0.22	0.250	0.209	0.212	0.169	0.205	0.209	0.197	0.218	0.211
Sodium (Na)	4	mg/kg w.w.	-	210	339	357	241	266	485	223	447	244	202	315	406	301	202	407
Strontium (Sr)	0.010	mg/kg w.w.	1,920	0.02	0.08	0.04	0.15	0.017	0.02	0.03	0.03	0.01	0.027	0.04	0.016	0.039	0.016	0.030
Tellurium (Te)	0.004	mg/kg w.w.	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thallium (Tl)	0.0004	mg/kg w.w.	-	0.0050	0.0041	0.0041	0.0040	0.0040	0.0028	0.0024	0.0030	0.0024	0.0024	0.0029	0.0034	0.0035	0.0035	0.0029
Tin (Sn)	0.02	mg/kg w.w.	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Uranium (U)	0.0004	mg/kg w.w.	1.9	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	0.0008	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium (V)	0.02	mg/kg w.w.	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc (Zn)	0.10	mg/kg w.w.	963	3.7	3.2	2.9	3.6	3.7	3.2	3.5	3.6	2.6	2.8	2.8	3.4	3.1	3.1	3.0
Zirconium (Zr)	0.04	mg/kg w.w.	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

Table C.6: Wet Weight (w.w.) Metal Concentrations in Fish Liver Tissue, Rainy River Mine Fish Tissue Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Northern Pike														
				PinR-EXP-2018-NP01	PinR-EXP-2018-NP02	PinR-EXP-2018-NP03	PinR-EXP-2018-NP04	PinR-EXP-2018-NP05	PinR-EXP-2018-NP06	PinR-EXP-2018-NP07	PinR-EXP-2018-NP08	PinR-EXP-2018-NP09	PinR-EXP-2018-NP10	PinR-EXP-2018-NP11	PinR-EXP-2018-NP12	PinR-EXP-2018-NP13	PinR-EXP-2018-NP14	PinR-EXP-2018-NP15
				12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.25	%	-	73.7	79.5	69.1	76.1	74.8	78.4	80.5	80.0	78.7	75.0	73.7	78.0	80.7	74.8	79.0
Aluminum (Al)	2.0	mg/kg w.w.	-	<0.4	1.60	<0.4	<0.4	<0.4	5.03	1.66	0.56	2.45	1.15	5.15	1.85	1.06	1.54	1.60
Antimony (Sb)	0.010	mg/kg w.w.	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	0.0024	<0.002	<0.002	<0.002	<0.002	0.0045	<0.002	<0.002	<0.002	<0.002
Arsenic (As)	0.020	mg/kg w.w.	1.0	0.026	0.038	0.028	0.044	0.024	0.043	0.053	0.021	0.041	0.021	0.059	0.045	0.045	0.029	0.033
Barium (Ba)	0.050	mg/kg w.w.	642	0.04	0.03	0.03	0.15	0.14	0.16	0.09	0.13	0.11	0.04	0.10	0.09	0.08	0.39	0.13
Beryllium (Be)	0.010	mg/kg w.w.	6.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth (Bi)	0.010	mg/kg w.w.	-	0.004	0.009	0.005	0.006	0.003	0.017	0.009	0.004	0.009	0.006	0.012	0.011	0.008	0.009	0.011
Boron (B)	1.0	mg/kg w.w.	56.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium (Cd)	0.0050	mg/kg w.w.	3.2	0.047	0.080	0.053	0.104	0.064	0.341	0.145	0.068	0.222	0.078	0.444	0.066	0.079	0.060	0.080
Calcium (Ca)	20	mg/kg w.w.	-	209	37	45	42	27	65	56	56	44	38	53	38	46	441	50
Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0049	0.0045	0.0053	0.0021	<0.0079	0.0060	0.0048	0.0049	0.0066	0.0053	0.0061	0.0039	0.0041	0.0044	0.0060
Chromium (Cr)	0.050	mg/kg w.w.	3.2	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.016	<0.01	0.018	<0.01	0.014	<0.01	<0.01	<0.01	<0.01
Cobalt (Co)	0.020	mg/kg w.w.	-	0.034	0.046	0.041	0.038	0.033	0.133	0.074	0.034	0.068	0.034	0.110	0.082	0.064	0.074	0.077
Copper (Cu)	0.10	mg/kg w.w.	292	17.6	46.9	20.3	20.6	27.0	49.2	24.2	21.0	59.2	11.1	39.7	78.1	39.2	27.5	48.1
Iron (Fe)	3.0	mg/kg w.w.	-	37	180	142	373	25	372	19	179	275	52	223	484	259	37	231
Lead (Pb)	0.020	mg/kg w.w.	11.6	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.0049	<0.004	0.0045	<0.004	0.0074	<0.004	<0.004	<0.004	<0.004
Lithium (Li)	0.50	mg/kg w.w.	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Magnesium (Mg)	2.0	mg/kg w.w.	-	124	156	128	129	127	158	185	175	155	130	138	176	173	190	152
Manganese (Mn)	0.050	mg/kg w.w.	392	1.10	1.25	0.96	1.03	1.16	1.61	2.48	1.25	1.26	0.63	1.87	1.17	1.63	1.80	1.37
Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.13	0.27	0.15	0.13	0.13	0.90	0.29	0.15	0.40	0.24	0.60	0.29	0.20	0.23	0.34
Molybdenum (Mo)	0.020	mg/kg w.w.	16.1	0.21	0.21	0.26	0.20	0.21	0.31	0.26	0.16	0.18	0.08	0.24	0.21	0.19	0.30	0.28
Nickel (Ni)	0.20	mg/kg w.w.	3.5	<0.04	<0.04	<0.04	<0.04	<0.04	0.04	<0.04	<0.04	<0.04	<0.04	0.05	<0.04	<0.04	<0.04	<0.04
Phosphorus (P)	10	mg/kg w.w.	-	1,809	2,522	2,200	1,883	1,880	2,570	3,276	3,080	2,939	2,005	2,496	3,146	3,107	2,974	2,751
Potassium (K)	20	mg/kg w.w.	-	1,638	2,706	2,228	1,965	2,195	2,246	2,867	3,020	2,812	2,455	2,533	3,014	3,011	2,238	2,499
Rubidium (Rb)	0.050	mg/kg w.w.	-	5.1	8.3	7.4	3.3	10.1	6.0	5.0	5.3	8.2	5.3	6.0	5.5	6.3	4.6	6.1
Selenium (Se)	0.050	mg/kg w.w.	3.6	1.6	1.7	2.2	2.0	1.6	2.1	2.0	2.0	2.0	1.7	2.4	2.1	2.2	2.3	2.1
Sodium (Na)	20	mg/kg w.w.	-	734	908	961	698	607	1,128	1,213	984	950	775	1,144	966	934	1,479	943
Strontium (Sr)	0.050	mg/kg w.w.	1,930	0.166	0.041	0.043	0.029	<0.01	0.052	0.045	0.031	0.047	0.023	0.042	0.036	0.041	0.333	0.048
Tellurium (Te)	0.020	mg/kg w.w.	-	<0.004	<0.004	<0.004	0.0055	<0.004	0.0080	0.0041	<0.004	<0.004	<0.004	0.0089	<0.004	0.0041	<0.004	<0.004
Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0047	0.0027	0.0033	0.0028	0.0039	0.0030	0.0020	0.0030	0.0021	0.0022	0.0022	0.0018	0.0024	0.0025	0.0020
Tin (Sn)	0.10	mg/kg w.w.	-	0.210	0.066	0.114	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Uranium (U)	0.0020	mg/kg w.w.	1.9	<0.0004	0.0008	<0.0004	<0.0004	<0.0004	0.0037	0.0012	<0.0004	0.0012	0.0008	0.0012	0.0007	0.0006	<0.0004	0.0009
Vanadium (V)	0.10	mg/kg w.w.	-	0.07	0.65	0.15	0.34	0.09	1.05	0.33	0.07	0.37	0.32	0.60	0.93	0.38	0.15	0.41
Zinc (Zn)	0.50	mg/kg w.w.	963	40	46	54	41	35.3	68	54	39	60	28	39	61	52	59	45
Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

Table C.6: Wet Weight (w.w.) Metal Concentrations in Fish Liver Tissue, Rainy River Mine Fish Tissue Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Walleye														
				PinR-EXP-2018-WA01	PinR-EXP-2018-WA02	PinR-EXP-2018-WA03	PinR-EXP-2018-WA04	PinR-EXP-2018-WA05	PinR-EXP-2018-WA06	PinR-EXP-2018-WA07	PinR-EXP-2018-WA08	PinR-EXP-2018-WA09	PinR-EXP-2018-WA10	PinR-EXP-2018-WA11	PinR-EXP-2018-WA12	PinR-EXP-2018-WA13	PinR-EXP-2018-WA14	PinR-EXP-2018-WA15
				12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.25	%	-	72.9	81.5	78.5	72.4	72.9	76.5	80.9	76.7	76.9	79.4	79.9	78.3	74.1	79.0	81.6
Aluminum (Al)	2.0	mg/kg w.w.	-	<0.4	1.00	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4	0.72	<0.4	<0.4	1.06	<0.4	<0.4	<0.4
Antimony (Sb)	0.010	mg/kg w.w.	1.3	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Arsenic (As)	0.020	mg/kg w.w.	1.0	0.038	0.038	0.074	0.109	0.156	0.075	0.032	0.027	0.030	0.118	0.066	0.081	0.088	0.156	0.049
Barium (Ba)	0.050	mg/kg w.w.	642	0.07	0.02	0.04	0.05	0.08	0.06	0.03	0.04	0.01	0.06	0.02	0.02	0.03	0.03	0.02
Beryllium (Be)	0.010	mg/kg w.w.	6.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth (Bi)	0.010	mg/kg w.w.	-	<0.002	<0.002	<0.002	<0.002	<0.002	0.0026	<0.002	0.0049	<0.002	0.0033	<0.002	0.0028	<0.002	0.0029	<0.002
Boron (B)	1.0	mg/kg w.w.	56.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Cadmium (Cd)	0.0050	mg/kg w.w.	3.2	0.07	0.13	0.33	0.10	0.09	0.16	0.24	0.08	0.20	0.11	0.09	0.20	0.16	0.11	0.05
Calcium (Ca)	20	mg/kg w.w.	-	409	86	132	146	93	161	122	76	70	618	52	79	115	80	87
Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0104	0.0053	0.0051	0.0043	0.0036	0.0062	0.0030	0.0049	0.0092	0.0092	0.0057	0.0071	0.0048	0.0047	0.0050
Chromium (Cr)	0.050	mg/kg w.w.	3.2	<0.01	<0.01	<0.01	0.058	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt (Co)	0.020	mg/kg w.w.	-	0.066	0.220	0.333	0.200	0.254	0.19	0.146	0.161	0.065	0.154	0.054	0.132	0.233	0.099	0.08
Copper (Cu)	0.10	mg/kg w.w.	292	1.96	1.49	2.58	2.30	2.82	2.06	1.58	1.49	1.47	1.94	1.17	1.49	1.70	1.58	0.96
Iron (Fe)	3.0	mg/kg w.w.	-	73	110	190	136	117	187	125	34	125	171	41	165	118	80	105
Lead (Pb)	0.020	mg/kg w.w.	11.6	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Lithium (Li)	0.50	mg/kg w.w.	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Magnesium (Mg)	2.0	mg/kg w.w.	-	212	153	162	200	203	175	131	217	205	175	153	216	155	148	122
Manganese (Mn)	0.050	mg/kg w.w.	392	2.06	1.03	1.42	2.44	1.90	1.22	1.13	2.28	1.97	1.47	1.45	1.74	1.39	1.40	1.00
Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.05	0.16	0.09	0.15	0.19	0.12	0.10	0.13	0.25	0.12	0.13	0.19	0.15	0.13	0.11
Molybdenum (Mo)	0.020	mg/kg w.w.	16.1	0.13	0.10	0.16	0.21	0.24	0.14	0.18	0.18	0.09	0.21	0.14	0.18	0.18	0.18	0.11
Nickel (Ni)	0.20	mg/kg w.w.	3.5	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04
Phosphorus (P)	10	mg/kg w.w.	-	3,577	2,368	2,344	3,284	3,442	2,961	2,025	3,169	3,303	2,925	2,352	3,364	2,720	2,205	1,812
Potassium (K)	20	mg/kg w.w.	-	2,791	2,535	2,215	2,926	2,954	2,797	2,025	2,819	2,957	2,410	2,392	3,233	2,432	2,436	2,098
Rubidium (Rb)	0.050	mg/kg w.w.	-	11.6	6.2	7.1	5.0	5.6	6.6	3.8	7.3	9.8	8.3	6.4	8.8	5.7	5.3	5.1
Selenium (Se)	0.050	mg/kg w.w.	3.6	0.91	0.71	0.82	1.23	1.24	0.84	0.67	0.69	0.76	0.96	0.60	0.77	0.82	0.73	0.61
Sodium (Na)	20	mg/kg w.w.	-	1,070	1,434	1,406	1,201	1,079	1,260	1,152	1,016	1,317	1,001	792	1,081	1,212	884	997
Strontium (Sr)	0.050	mg/kg w.w.	1,920	0.271	0.059	0.082	0.075	0.065	0.106	0.065	0.049	0.044	0.332	0.036	0.052	0.062	0.055	0.053
Tellurium (Te)	0.020	mg/kg w.w.	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0092	0.0057	0.0087	0.0080	0.0134	0.0063	0.0048	0.0064	0.0058	0.0092	0.0077	0.0092	0.0075	0.0117	0.0056
Tin (Sn)	0.10	mg/kg w.w.	-	0.04	0.04	0.22	0.37	0.24	0.15	0.07	0.08	0.05	0.39	0.11	<0.08	0.07	0.25	0.08
Uranium (U)	0.0020	mg/kg w.w.	1.9	<0.0004	<0.0004	0.0006	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium (V)	0.10	mg/kg w.w.	-	<0.02	0.02	0.05	<0.02	<0.02	0.03	<0.02	0.05	<0.02	<0.02	0.02	0.02	0.03	<0.02	<0.02
Zinc (Zn)	0.50	mg/kg w.w.	963	24.4	16.6	17.2	22.5	25.4	20.1	15.9	18.1	20.5	19.4	15.8	22.4	19.1	17.7	12.0
Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.04	<0.04	<0.05	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

Table C.7: Wet Weight (w.w.) Metal Concentrations in Fish Ovaries, Rainy River Mine Fish Tissue Monitoring, 2018

Parameter	Lowest Detection Limit	Units	Benchmark[a,b]	Northern Pike									Walleye					
				PinR-EXP-2018-NP02	PinR-EXP-2018-NP06	PinR-EXP-2018-NP07	PinR-EXP-2018-NP08	PinR-EXP-2018-NP09	PinR-EXP-2018-NP10	PinR-EXP-2018-NP12	PinR-EXP-2018-NP13	PinR-EXP-2018-NP15	PinR-EXP-2018-WA01	PinR-EXP-2018-WA04	PinR-EXP-2018-WA08	PinR-EXP-2018-WA09	PinR-EXP-2018-WA11	PinR-EXP-2018-WA12
				12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	12-Sep-2018	12-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018	13-Sep-2018
% Moisture	0.25	%	-	83.4	83.3	84.1	82.3	83.7	82.7	83.1	82.8	83.3	74.9	75.2	72.5	71.7	71.3	74.7
Aluminum (Al)	2.0	mg/kg w.w.	-	1.0	<0.4	0.7	0.5	2.4	0.9	0.52	<0.4	<0.4	<0.4	<2.9	<0.4	<0.4	<0.4	<0.4
Antimony (Sb)	0.010	mg/kg w.w.	1.3	0.004	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003
Arsenic (As)	0.020	mg/kg w.w.	1.0	0.027	0.025	0.033	0.015	0.028	0.021	0.030	0.030	0.018	0.023	0.024	0.033	0.020	0.048	0.052
Barium (Ba)	0.050	mg/kg w.w.	642	0.10	0.24	0.08	0.08	0.08	0.10	0.02	0.02	0.02	0.05	0.89	0.16	0.04	0.11	0.07
Beryllium (Be)	0.010	mg/kg w.w.	6.4	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Bismuth (Bi)	0.010	mg/kg w.w.	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Boron (B)	1.0	mg/kg w.w.	56.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2	<0.6	<0.2	<0.2	<0.2	<0.2
Cadmium (Cd)	0.0050	mg/kg w.w.	3.2	0.0085	0.0202	0.0108	0.0100	0.0143	0.0124	0.0071	0.0064	0.0052	<0.001	0.0032	<0.001	0.0040	<0.001	0.0029
Calcium (Ca)	20	mg/kg w.w.	-	150	97	105	164	78	277	127	123	113	244	94	327	223	239	304
Cesium (Cs)	0.0050	mg/kg w.w.	-	0.0083	0.0096	0.0078	0.0081	0.0120	0.0092	0.0071	0.0064	0.0077	0.0143	0.0093	0.0080	0.0141	0.0102	0.0119
Chromium (Cr)	0.050	mg/kg w.w.	3.2	0.009	<0.01	0.008	<0.01	0.008	0.018	<0.010	<0.013	<0.01	<0.01	<0.057	<0.01	<0.01	<0.01	<0.01
Cobalt (Co)	0.020	mg/kg w.w.	-	0.062	0.079	0.048	0.044	0.084	0.048	0.107	0.095	0.060	0.059	0.044	0.067	0.056	0.044	0.070
Copper (Cu)	0.10	mg/kg w.w.	292	1.12	0.76	1.19	1.20	0.99	0.88	1.18	1.19	0.90	1.07	0.79	0.83	0.81	0.81	0.91
Iron (Fe)	3.0	mg/kg w.w.	-	51	25	21	54	42	40	53	68	36	20	22	37	20	26	40
Lead (Pb)	0.020	mg/kg w.w.	11.6	0.013	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	0.013	<0.004	<0.004	<0.004	<0.004
Lithium (Li)	0.50	mg/kg w.w.	-	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Magnesium (Mg)	2.0	mg/kg w.w.	-	217	127	200	234	202	211	225	220	184	299	367	292	317	253	354
Manganese (Mn)	0.050	mg/kg w.w.	392	30	12	32	31	19	15	35	40	27	2	0	8	3	6	4
Mercury (Hg)	0.0050	mg/kg w.w.	0.5	0.059	0.167	0.079	0.048	0.096	0.106	0.064	0.043	0.079	0.009	0.046	0.055	0.047	0.027	0.039
Molybdenum (Mo)	0.020	mg/kg w.w.	16.1	0.060	0.077	0.053	0.046	0.045	0.025	0.059	0.060	0.056	0.011	0.023	0.029	0.009	0.018	0.019
Nickel (Ni)	0.20	mg/kg w.w.	3.5	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.21	<0.04	<0.04	<0.04	<0.04
Phosphorus (P)	10	mg/kg w.w.	-	2,988	2,021	2,798	3,133	2,836	2,889	3,025	2,958	2,338	2,505	5,084	2,549	2,858	2,325	2,834
Potassium (K)	20	mg/kg w.w.	-	3,984	2,923	3,578	4,000	3,716	3,270	3,650	3,990	2,756	3,313	5,977	2,805	3,396	3,014	3,567
Rubidium (Rb)	0.050	mg/kg w.w.	-	6.9	5.6	5.5	6.7	7.3	5.7	5.1	6.3	5.1	13.3	10.4	6.9	9.4	7.7	8.9
Selenium (Se)	0.050	mg/kg w.w.	3.6	0.7	0.6	0.5	1.1	0.5	0.7	0.6	0.7	0.5	0.7	1.9	0.8	0.7	0.9	0.7
Sodium (Na)	20	mg/kg w.w.	-	888	1,000	908	726	870	974	901	888	655	703	739	855	1,007	723	972
Strontium (Sr)	0.050	mg/kg w.w.	1,930	0.119	0.045	0.053	0.064	0.051	0.144	0.079	0.065	0.062	0.054	0.067	0.099	0.053	0.046	0.086
Tellurium (Te)	0.020	mg/kg w.w.	-	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Thallium (Tl)	0.0020	mg/kg w.w.	-	0.0037	0.0030	0.0020	0.0040	0.0026	0.0031	0.0022	0.0034	0.0019	0.0118	0.0082	0.0050	0.0042	0.0055	0.0068
Tin (Sn)	0.10	mg/kg w.w.	-	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02	0.02	<0.02	0.05	<0.02	<0.02	<0.02	<0.02
Uranium (U)	0.0020	mg/kg w.w.	1.9	<0.0004	0.0005	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
Vanadium (V)	0.10	mg/kg w.w.	-	<0.11	0.09	0.03	<0.02	<0.04	<0.04	<0.11	0.08	0.04	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Zinc (Zn)	0.50	mg/kg w.w.	963	59	40	58	65	67	67	64	64	52	38	163	39	35	31	41
Zirconium (Zr)	0.20	mg/kg w.w.	-	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.04	<0.05	<0.04	<0.04	<0.04	<0.04

Indicates value greater than benchmark.

[a] Mercury guideline for women of child-bearing age and children under 15 (see Table 2.1, MECP 2015).

[b] See Table 2.2 for Consumption Benchmark References.

FISH TISSUE QUALITY

Laboratory Analysis Data Report

MINNOW ENVIRONMENTAL INC.
ATTN: Jess Tester
2 Lamb Street
Georgetown ON L7G 3M9

Date Received: 01-OCT-18
Report Date: 04-JAN-19 08:43 (MT)
Version: FINAL

Client Phone: 905-873-3371

Certificate of Analysis

Lab Work Order #: L2173881

Project P.O. #: NOT SUBMITTED
Job Reference: 18-45
C of C Numbers:
Legal Site Desc:

<Original signed by>

Christine Paradis
Project Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-1 WA-01 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.9		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	5.5		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.181		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.256		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	455		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0719		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.128		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.77		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	11.6		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.030		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1550		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.547		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.699		0.0050	mg/kg	12-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11500		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	22900		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	85.5		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.900		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	997		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.098		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0238		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	17.3		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-2 WA-02 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.8		0.50	%		13-NOV-18	R4333030
Metals							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-2 WA-02 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.259		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.372		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	1230		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0576		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.60		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	7.1		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1560		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.861		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	2.96		0.030	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11900		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	22000		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	51.9		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	1.14		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1600		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.380		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0194		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	14.9		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-3 WA-03 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.7		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-3 WA-03 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Arsenic (As)-Total	0.209		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.441		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	857		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0621		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.60		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	7.9		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1600		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.555		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.08		0.0050	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11500		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	23100		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	65.8		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.824		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1760		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.204		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0202		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	14.2		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-4 WA-04 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.1		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.1		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.227		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.475		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-4 WA-04 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	2370		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0329		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.72		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	8.0		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1650		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.871		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.01		0.0050	mg/kg	12-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	12800		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	23400		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	36.8		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	1.31		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1100		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.695		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0181		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	16.6		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-5 WA-05 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.0		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.1		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.227		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.296		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-5 WA-05 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	596		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0360		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.66		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	6.9		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1660		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.649		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.14		0.0050	mg/kg	12-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	12500		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	24200		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	41.1		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	1.38		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1210		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.076		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0184		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	16.6		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-6 WA-06 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.9		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.1		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.164		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.191		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.012		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-6 WA-06 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Calcium (Ca)-Total	566		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0522		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.052		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.63		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	7.6		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1590		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.606		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.49		0.035	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11500		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	21900		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	50.8		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	1.06		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2300		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.101		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0134		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	15.3		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-7 WA-07 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.2		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.322		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.200		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	681		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0453		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-7 WA-07 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.55		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	6.4		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1600		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.620		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.52		0.035	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11900		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	23600		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	41.2		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	1.20		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1070		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.138		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0117		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	16.7		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-8 WA-08 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.7		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	13.5		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.090		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.331		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.022		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	666		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0521		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-8 WA-08 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Copper (Cu)-Total	1.07		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	19.9		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.195		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1750		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.957		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.33		0.035	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11500		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	22800		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	47.7		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.980		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2100		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.138		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0142		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	0.0036		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	17.0		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-9 WA-09 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.8		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.190		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.196		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	373		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0901		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.54		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	6.5		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-9 WA-09 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1470		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.409		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	3.18		0.025	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	10600		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	21800		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	61.4		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.998		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1150		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.070		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0114		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	12.4		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-10 WA-10 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.2		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.3		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.160		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.296		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	650		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0590		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.64		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	7.4		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-10 WA-10 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Magnesium (Mg)-Total	1520		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.698		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.01		0.0050	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11400		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	23000		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	56.8		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.855		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1020		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.138		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0121		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	13.9		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-11 WA-11 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.4		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.192		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.210		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	870		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0597		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.57		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	6.6		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1490		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.534		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-11 WA-11 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Mercury (Hg)-Total	1.62		0.025	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	10700		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	21600		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	48.8		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.947		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1460		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.206		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0133		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	13.0		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-12 WA-12 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.4		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.6		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.208		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.209		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.016		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	480		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0617		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.65		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	9.7		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.033		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1450		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.525		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	2.06		0.030	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-12 WA-12 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	10800		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	21400		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	51.3		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.969		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1880		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.072		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0156		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	15.6		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-13 WA-13 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.8		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	4.6		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.199		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.219		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.016		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	787		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0608		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.68		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	12.1		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1540		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.718		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.62		0.035	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11700		10	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-13 WA-13 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Potassium (K)-Total	23100		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	48.0		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.927		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1420		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.184		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0164		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	14.7		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-14 WA-14 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	77.8		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.184		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.181		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.011		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	535		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0523		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.54		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	5.0		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1700		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.626		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.41		0.035	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	12400		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	24600		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	45.4		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-14 WA-14 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Selenium (Se)-Total	0.980		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	911		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.073		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0158		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	13.8		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-15 WA-15 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.8		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.6		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.157		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.223		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.015		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	668		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0521		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.57		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	7.6		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1560		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.605		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.67		0.030	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11900		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	22200		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	44.9		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.993		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1920		20	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-15 WA-15 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Strontium (Sr)-Total	0.143		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0138		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	14.0		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-16 NP-01 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.8		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	6.9		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.144		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.949		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	1560		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0521		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.079		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.026		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.83		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	18.7		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.109		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1450		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	2.44		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.04		0.0050	mg/kg	12-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	10000		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	18400		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	37.0		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.728		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	3360		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.736		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-16 NP-01 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Thallium (Tl)-Total	0.0179		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	22.0		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-17 NP-02 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.5		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	4.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.313		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.476		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.016		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0056		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	1060		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0463		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.058		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.037		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	1.09		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	21.9		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.132		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1470		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	1.28		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	2.39		0.025	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11100		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	20100		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	28.3		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.771		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2560		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.480		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0100		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-17 NP-02 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	26.2		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-18 NP-03 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.4		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	4.3		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.213		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.464		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	2080		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0610		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.78		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	10.5		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.026		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1680		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	2.87		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.32		0.030	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	13000		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	22700		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	40.6		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.725		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1890		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	1.06		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0140		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-18 NP-03 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Zinc (Zn)-Total	21.8		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-19 NP-04 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.4		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.8		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.435		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.420		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.013		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	874		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0280		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.94		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	22.7		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1470		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	1.18		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.30		0.0050	mg/kg	12-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	10600		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	19900		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	22.4		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.953		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1800		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.299		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0094		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	21.1		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-19 NP-04 (MUSCLE) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
L2173881-20 NP-05 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.7		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.7		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.189		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.261		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	521		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0673		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	1.11		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	16.0		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1490		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.989		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.36		0.030	mg/kg	12-DEC-18	16-DEC-18	R4396742
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11700		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	21400		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	39.5		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.754		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1760		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.117		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0155		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	28.2		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-21 NP-06 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-21 NP-06 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	81.8		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	4.2		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.186		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.386		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.018		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0111		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	3260		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0857		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.023		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.60		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	19.5		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.026		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1480		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	3.57		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	5.39		0.040	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	13400		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	21200		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	32.0		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.849		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2640		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	1.44		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0129		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	22.8		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-22 NP-07 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	82.0		0.50	%		13-NOV-18	R4333030
Metals							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-22 NP-07 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Aluminum (Al)-Total	2.4		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.239		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.296		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.017		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0054		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	554		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0581		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.80		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	11.3		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.022		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1460		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	1.22		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	3.03		0.035	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11400		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	20400		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	27.6		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.818		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	3350		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.264		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0078		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	24.3		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-23 NP-08 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.1		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.3		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-23 NP-08 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Arsenic (As)-Total	0.186		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.256		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	2160		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0415		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.60		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	8.5		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1490		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	1.80		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.59		0.040	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	12500		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	21800		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	30.5		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.908		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	1260		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.737		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0143		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	19.4		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-24 NP-09 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.3		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	3.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.272		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.588		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-24 NP-09 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.014		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0086		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	2460		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0669		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.024		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.65		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	13.2		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1570		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	2.84		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	3.02		0.030	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	12100		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	19700		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	34.5		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.751		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2300		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	1.54		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0082		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	24.3		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-25 NP-10 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	77.8		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.1		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.236		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.018		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-25 NP-10 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0067		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	531		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0563		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.92		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	17.2		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1420		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.672		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	2.89		0.030	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11100		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	18700		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	30.1		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.821		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2240		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.163		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0099		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	31.2		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-26 NP-11 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.7		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	2.7		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.242		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.370		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.013		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0133		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-26 NP-11 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Calcium (Ca)-Total	3670		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0707		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.022		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.93		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	21.0		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.034		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1550		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	3.80		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	3.94		0.045	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	13500		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	20600		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	30.3		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.858		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2510		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	1.73		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0076		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	22.7		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-27 NP-12 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.4		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	3.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.294		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.366		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.017		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	3110		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0410		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-27 NP-12 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.036		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.77		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	12.5		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1540		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	2.64		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	2.00		0.050	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11800		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	19000		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	23.5		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.764		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2490		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	1.81		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0056		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	22.6		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-28 NP-13 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.7		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.351		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.018		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	499		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0374		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.025		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-28 NP-13 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Copper (Cu)-Total	0.82		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	10.7		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1540		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.710		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	2.00		0.045	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11300		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	20000		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	27.2		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.813		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2450		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.159		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0075		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	17.3		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-29 NP-14 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.4		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.168		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.013		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	601		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0448		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.93		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	7.0		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-29 NP-14 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1660		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.748		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	2.05		0.050	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	12400		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	24000		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	31.5		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.957		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	815		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.109		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0140		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	0.11		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	27.1		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-30 NP-15 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.1		0.50	%		13-NOV-18	R4333030
Metals							
Aluminum (Al)-Total	6.5		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.140		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.084		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.017		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	596		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0510		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.034		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	0.98		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	22.2		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.023		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-30 NP-15 (MUSCLE) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Magnesium (Mg)-Total	1530		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	0.808		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	2.67		0.060	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	10700		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	19600		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	28.8		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	0.743		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	3340		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.221		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0074		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	0.11		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	32.6		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-31 WA-01 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	72.9		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.139		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.268		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.242		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	1510		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0384		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.244		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	7.22		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	269		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	782		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	7.60		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-31 WA-01 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Mercury (Hg)-Total	0.176		0.0050	mg/kg	12-DEC-18	17-DEC-18	R4397087
Molybdenum (Mo)-Total	0.480		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	13200		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	10300		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	42.8		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	3.36		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	3950		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	1.00		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0340		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	0.13		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	90.1		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-32 WA-02 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	81.5		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	5.4		2.0	mg/kg	12-DEC-18	03-JAN-19	R4426250
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	03-JAN-19	R4426250
Arsenic (As)-Total	0.205		0.020	mg/kg	12-DEC-18	03-JAN-19	R4426250
Barium (Ba)-Total	0.127		0.050	mg/kg	12-DEC-18	03-JAN-19	R4426250
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	03-JAN-19	R4426250
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	03-JAN-19	R4426250
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	03-JAN-19	R4426250
Cadmium (Cd)-Total	0.687		0.0050	mg/kg	12-DEC-18	03-JAN-19	R4426250
Calcium (Ca)-Total	467		20	mg/kg	12-DEC-18	03-JAN-19	R4426250
Cesium (Cs)-Total	0.0289		0.0050	mg/kg	12-DEC-18	03-JAN-19	R4426250
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	03-JAN-19	R4426250
Cobalt (Co)-Total	1.19		0.020	mg/kg	12-DEC-18	03-JAN-19	R4426250
Copper (Cu)-Total	8.03		0.10	mg/kg	12-DEC-18	03-JAN-19	R4426250
Iron (Fe)-Total	596		3.0	mg/kg	12-DEC-18	03-JAN-19	R4426250
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	03-JAN-19	R4426250
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	03-JAN-19	R4426250
Magnesium (Mg)-Total	828		2.0	mg/kg	12-DEC-18	03-JAN-19	R4426250
Manganese (Mn)-Total	5.58		0.050	mg/kg	12-DEC-18	03-JAN-19	R4426250
Mercury (Hg)-Total	0.891		0.0050	mg/kg	12-DEC-18	17-DEC-18	R4397087
Molybdenum (Mo)-Total	0.540		0.020	mg/kg	12-DEC-18	03-JAN-19	R4426250

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-32 WA-02 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	03-JAN-19	R4426250
Phosphorus (P)-Total	12800		10	mg/kg	12-DEC-18	03-JAN-19	R4426250
Potassium (K)-Total	13700		20	mg/kg	12-DEC-18	03-JAN-19	R4426250
Rubidium (Rb)-Total	33.5		0.050	mg/kg	12-DEC-18	03-JAN-19	R4426250
Selenium (Se)-Total	3.86		0.050	mg/kg	12-DEC-18	03-JAN-19	R4426250
Sodium (Na)-Total	7750		20	mg/kg	12-DEC-18	03-JAN-19	R4426250
Strontium (Sr)-Total	0.317		0.050	mg/kg	12-DEC-18	03-JAN-19	R4426250
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	03-JAN-19	R4426250
Thallium (Tl)-Total	0.0306		0.0020	mg/kg	12-DEC-18	03-JAN-19	R4426250
Tin (Sn)-Total	0.21		0.10	mg/kg	12-DEC-18	03-JAN-19	R4426250
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	03-JAN-19	R4426250
Vanadium (V)-Total	0.12		0.10	mg/kg	12-DEC-18	03-JAN-19	R4426250
Zinc (Zn)-Total	89.9		0.50	mg/kg	12-DEC-18	03-JAN-19	R4426250
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	03-JAN-19	R4426250
L2173881-33 WA-03 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.5		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.344		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.170		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	1.53		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	612		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0238		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	1.55		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	12.0		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	886		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	754		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	6.60		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.423		0.010	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.761		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	10900		10	mg/kg	27-DEC-18	28-DEC-18	R4420889

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-33 WA-03 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Potassium (K)-Total	10300		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	33.0		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	3.83		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	6540		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.38		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0403		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	1.03		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	0.0029		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	0.21		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	80.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	0.25		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-34 WA-04 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	72.4		2.0	%		27-DEC-18	R4423636
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Antimony (Sb)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Arsenic (As)-Total	0.395		0.030	mg/kg	31-DEC-18	02-JAN-19	R4425197
Barium (Ba)-Total	0.181		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Beryllium (Be)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Boron (B)-Total	<1.0		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cadmium (Cd)-Total	0.363		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Calcium (Ca)-Total	530		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cesium (Cs)-Total	0.0155		0.0050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Chromium (Cr)-Total	0.21		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cobalt (Co)-Total	0.723		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Copper (Cu)-Total	8.33		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Iron (Fe)-Total	494		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lead (Pb)-Total	<0.050		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lithium (Li)-Total	<0.50		0.50	mg/kg	31-DEC-18	02-JAN-19	R4425197
Magnesium (Mg)-Total	725		2.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Manganese (Mn)-Total	8.84		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Mercury (Hg)-Total	0.548		0.0050	mg/kg	31-DEC-18	03-JAN-19	R4426348
Molybdenum (Mo)-Total	0.758		0.040	mg/kg	31-DEC-18	02-JAN-19	R4425197
Nickel (Ni)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Phosphorus (P)-Total	11900		10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Potassium (K)-Total	10600		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Rubidium (Rb)-Total	18.2		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-34 WA-04 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Selenium (Se)-Total	4.44		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Sodium (Na)-Total	4350		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Strontium (Sr)-Total	0.27		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tellurium (Te)-Total	<0.020		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Thallium (Tl)-Total	0.0291		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tin (Sn)-Total	1.35		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Uranium (U)-Total	<0.0020		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Vanadium (V)-Total	<0.10		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zinc (Zn)-Total	81.5		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
L2173881-35 WA-05 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	72.9		2.0	%		27-DEC-18	R4423636
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Antimony (Sb)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Arsenic (As)-Total	0.576		0.030	mg/kg	31-DEC-18	02-JAN-19	R4425197
Barium (Ba)-Total	0.285		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Beryllium (Be)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Boron (B)-Total	<1.0		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cadmium (Cd)-Total	0.315		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Calcium (Ca)-Total	345		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cesium (Cs)-Total	0.0134		0.0050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Chromium (Cr)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cobalt (Co)-Total	0.939		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Copper (Cu)-Total	10.4		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Iron (Fe)-Total	432		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lead (Pb)-Total	<0.050		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lithium (Li)-Total	<0.50		0.50	mg/kg	31-DEC-18	02-JAN-19	R4425197
Magnesium (Mg)-Total	749		2.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Manganese (Mn)-Total	7.01		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Mercury (Hg)-Total	0.696		0.0050	mg/kg	31-DEC-18	03-JAN-19	R4426348
Molybdenum (Mo)-Total	0.868		0.040	mg/kg	31-DEC-18	02-JAN-19	R4425197
Nickel (Ni)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Phosphorus (P)-Total	12700		10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Potassium (K)-Total	10900		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Rubidium (Rb)-Total	20.8		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Selenium (Se)-Total	4.56		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Sodium (Na)-Total	3980		20	mg/kg	31-DEC-18	02-JAN-19	R4425197

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-35 WA-05 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Strontium (Sr)-Total	0.24		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tellurium (Te)-Total	<0.020		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Thallium (Tl)-Total	0.0494		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tin (Sn)-Total	0.89		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Uranium (U)-Total	<0.0020		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Vanadium (V)-Total	<0.10		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zinc (Zn)-Total	93.9		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
L2173881-36 WA-06 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	76.5		2.0	%		27-DEC-18	R4423636
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Antimony (Sb)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Arsenic (As)-Total	0.320		0.030	mg/kg	31-DEC-18	02-JAN-19	R4425197
Barium (Ba)-Total	0.261		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Beryllium (Be)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Bismuth (Bi)-Total	0.011		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Boron (B)-Total	<1.0		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cadmium (Cd)-Total	0.678		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Calcium (Ca)-Total	686		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cesium (Cs)-Total	0.0265		0.0050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Chromium (Cr)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cobalt (Co)-Total	0.811		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Copper (Cu)-Total	8.77		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Iron (Fe)-Total	795		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lead (Pb)-Total	<0.050		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lithium (Li)-Total	<0.50		0.50	mg/kg	31-DEC-18	02-JAN-19	R4425197
Magnesium (Mg)-Total	745		2.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Manganese (Mn)-Total	5.19		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Mercury (Hg)-Total	0.503		0.010	mg/kg	31-DEC-18	03-JAN-19	R4426348
Molybdenum (Mo)-Total	0.594		0.040	mg/kg	31-DEC-18	02-JAN-19	R4425197
Nickel (Ni)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Phosphorus (P)-Total	12600		10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Potassium (K)-Total	11900		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Rubidium (Rb)-Total	28.1		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Selenium (Se)-Total	3.56		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Sodium (Na)-Total	5360		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Strontium (Sr)-Total	0.45		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tellurium (Te)-Total	<0.020		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-36 WA-06 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Thallium (Tl)-Total	0.0269		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tin (Sn)-Total	0.64		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Uranium (U)-Total	<0.0020		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Vanadium (V)-Total	0.14		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zinc (Zn)-Total	85.6		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
L2173881-37 WA-07 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.9		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.165		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.135		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	1.24		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	640		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0158		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.763		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	8.28		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	655		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	688		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	5.90		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.530		0.010	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.940		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	10600		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	10600		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	19.7		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	3.53		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	6030		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.34		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0249		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	0.39		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-37 WA-07 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	83.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-38 WA-08 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	76.7		2.0	%		27-DEC-18	R4423636
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Antimony (Sb)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Arsenic (As)-Total	0.118		0.030	mg/kg	31-DEC-18	02-JAN-19	R4425197
Barium (Ba)-Total	0.193		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Beryllium (Be)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Bismuth (Bi)-Total	0.021		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Boron (B)-Total	<1.0		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cadmium (Cd)-Total	0.325		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Calcium (Ca)-Total	327		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cesium (Cs)-Total	0.0211		0.0050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Chromium (Cr)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cobalt (Co)-Total	0.689		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Copper (Cu)-Total	6.39		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Iron (Fe)-Total	145		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lead (Pb)-Total	<0.050		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lithium (Li)-Total	<0.50		0.50	mg/kg	31-DEC-18	02-JAN-19	R4425197
Magnesium (Mg)-Total	933		2.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Manganese (Mn)-Total	9.79		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Mercury (Hg)-Total	0.562		0.010	mg/kg	31-DEC-18	03-JAN-19	R4426348
Molybdenum (Mo)-Total	0.755		0.040	mg/kg	31-DEC-18	02-JAN-19	R4425197
Nickel (Ni)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Phosphorus (P)-Total	13600		10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Potassium (K)-Total	12100		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Rubidium (Rb)-Total	31.4		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Selenium (Se)-Total	2.95		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Sodium (Na)-Total	4360		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Strontium (Sr)-Total	0.21		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tellurium (Te)-Total	<0.020		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Thallium (Tl)-Total	0.0273		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tin (Sn)-Total	0.35		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Uranium (U)-Total	<0.0020		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Vanadium (V)-Total	0.20		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-38 WA-08 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Zinc (Zn)-Total	77.5		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
L2173881-39 WA-09 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	76.9		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	3.1		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.129		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.061		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.870		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	304		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0397		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.283		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	6.35		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	543		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	888		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	8.51		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.10		0.035	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	0.396		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	14300		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	12800		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	42.6		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	3.29		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	5700		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.191		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0250		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	0.20		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	88.6		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-39 WA-09 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
L2173881-40 WA-10 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.4		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.572		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.275		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.016		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.556		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	3000		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0448		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.748		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	9.40		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	828		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	849		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	7.14		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.604		0.010	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	1.02		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	14200		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	11700		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	40.1		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	4.67		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	4860		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	1.61		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0449		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	1.90		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	94.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	0.21		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-41 WA-11 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-41 WA-11 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.9		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.328		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.083		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.436		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	261		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0285		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.271		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	5.84		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	204		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	759		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	7.19		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.656		0.0050	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.699		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	11700		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	11900		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	31.8		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	2.97		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	3940		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.18		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0385		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	0.53		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	0.12		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	78.6		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-42 WA-12 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.3		0.50	%		08-DEC-18	R4383673
Metals							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-42 WA-12 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Aluminum (Al)-Total	4.9		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.375		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.071		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.013		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.935		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	364		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0329		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.609		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	6.87		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	760		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	995		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	8.04		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.861		0.0050	mg/kg	12-DEC-18	17-DEC-18	R4397087
Molybdenum (Mo)-Total	0.814		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	15500		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	14900		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	40.4		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	3.57		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	4980		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.241		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0426		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	0.36		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	0.11		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	103		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-43 WA-13 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	74.1		2.0	%		27-DEC-18	R4423636
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Antimony (Sb)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-43 WA-13 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Arsenic (As)-Total	0.340		0.030	mg/kg	31-DEC-18	02-JAN-19	R4425197
Barium (Ba)-Total	0.115		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Beryllium (Be)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Boron (B)-Total	<1.0		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cadmium (Cd)-Total	0.624		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Calcium (Ca)-Total	444		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cesium (Cs)-Total	0.0187		0.0050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Chromium (Cr)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cobalt (Co)-Total	0.901		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Copper (Cu)-Total	6.57		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Iron (Fe)-Total	456		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lead (Pb)-Total	<0.050		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lithium (Li)-Total	<0.50		0.50	mg/kg	31-DEC-18	02-JAN-19	R4425197
Magnesium (Mg)-Total	598		2.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Manganese (Mn)-Total	5.37		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Mercury (Hg)-Total	0.560		0.0050	mg/kg	31-DEC-18	03-JAN-19	R4426348
Molybdenum (Mo)-Total	0.685		0.040	mg/kg	31-DEC-18	02-JAN-19	R4425197
Nickel (Ni)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Phosphorus (P)-Total	10500		10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Potassium (K)-Total	9390		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Rubidium (Rb)-Total	22.2		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Selenium (Se)-Total	3.18		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Sodium (Na)-Total	4680		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Strontium (Sr)-Total	0.24		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tellurium (Te)-Total	<0.020		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Thallium (Tl)-Total	0.0289		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tin (Sn)-Total	0.27		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Uranium (U)-Total	<0.0020		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Vanadium (V)-Total	0.13		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zinc (Zn)-Total	73.8		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
L2173881-44 WA-14 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.0		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.744		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.132		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-44 WA-14 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.014		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.537		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	382		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0223		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.472		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	7.51		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	379		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	703		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	6.66		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.640		0.0050	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.861		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	10500		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	11600		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	25.1		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	3.48		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	4210		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.26		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0559		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	1.18		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	84.3		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-45 WA-15 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	81.6		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.268		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.114		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-45 WA-15 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.246		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	473		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0272		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.412		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	5.23		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	569		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	662		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	5.46		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.582		0.010	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.603		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	9850		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	11400		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	27.8		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	3.32		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	5420		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.29		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0304		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	0.44		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	65.1		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-46 NP-01 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	73.7		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.098		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.161		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.017		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.179		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-46 NP-01 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Calcium (Ca)-Total	793		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0186		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.128		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	66.9		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	142		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	472		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	4.19		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.480		0.0050	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.804		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	6880		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	6230		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	19.4		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	5.90		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	2790		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.63		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0179		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	0.80		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	0.28		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	152		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-47 NP-02 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.5		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	7.8		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.186		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.146		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.043		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.392		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	182		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0220		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-47 NP-02 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.226		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	229		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	879		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	760		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	6.08		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	1.31		0.010	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	1.01		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	12300		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	13200		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	40.5		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	8.11		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	4430		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.20		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0133		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	0.32		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	0.0040		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	3.15		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	224		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-48 NP-03 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	69.1		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.089		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.084		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.017		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.173		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	147		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0170		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.132		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-48 NP-03 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Copper (Cu)-Total	65.6		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	459		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	415		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	3.10		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.482		0.0050	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.826		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	7120		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	7210		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	24.0		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	7.27		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	3110		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.14		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0108		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	0.37		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	0.47		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	175		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-49 NP-04 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	76.1		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.186		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.632		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.026		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.436		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	175		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0088		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.160		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	86.0		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	1560		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-49 NP-04 (LIVER) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	541		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	4.30		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.561		0.010	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.827		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	7880		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	8220		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	13.7		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	8.38		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	2920		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.12		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	0.023		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0119		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	1.42		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	173		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-50 NP-05 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	74.8		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.094		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.567		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.013		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.252		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	107		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0312		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.132		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	107		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	97.7		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-50 NP-05 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Magnesium (Mg)-Total	503		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	4.59		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.521		0.0050	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.836		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	7460		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	8710		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	40.0		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	6.46		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	2410		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0155		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	0.36		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	140		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-51 NP-06 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.4		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	23.3		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	0.011		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.198		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.760		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.080		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	1.58		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	300		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0279		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.614		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	228		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	1720		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	733		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	7.47		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-51 NP-06 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Mercury (Hg)-Total	4.18		0.10	mg/kg	27-DEC-18	02-JAN-19	R4421468
Molybdenum (Mo)-Total	1.44		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	11900		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	10400		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	27.9		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	9.58		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	5220		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.24		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	0.037		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0141		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	0.0171		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	4.85		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	314		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-52 NP-07 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.5		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	8.5		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.272		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.477		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.048		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.742		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	286		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0247		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.083		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.378		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	124		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	95.7		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.025		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	949		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	12.7		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.49		0.0050	mg/kg	12-DEC-18	17-DEC-18	R4397087
Molybdenum (Mo)-Total	1.31		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-52 NP-07 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	16800		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	14700		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	25.8		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	10.1		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	6220		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.230		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	0.021		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0101		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	0.0060		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	1.71		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	279		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-53 NP-08 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.0		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	2.8		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.103		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.666		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.019		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.341		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	280		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0246		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.170		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	105		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	894		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	877		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	6.23		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.732		0.0050	mg/kg	12-DEC-18	17-DEC-18	R4397087
Molybdenum (Mo)-Total	0.792		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	15400		10	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-53 NP-08 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Potassium (K)-Total	15100		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	26.7		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	9.87		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	4920		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.153		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0151		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	0.36		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	195		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-54 NP-09 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.7		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	11.5		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.193		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.512		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.044		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	1.04		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	207		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0311		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.084		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.319		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	278		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	1290		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.021		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	726		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	5.92		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.90		0.035	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	0.862		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	13800		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	13200		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	38.4		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-54 NP-09 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Selenium (Se)-Total	9.17		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	4460		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.221		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0100		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	0.0055		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	1.76		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	280		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-55 NP-10 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	75.0		0.50	%		08-DEC-18	R4383673
Metals							
Aluminum (Al)-Total	4.6		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.084		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.178		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.025		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.312		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	151		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0210		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.136		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	44.5		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	207		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	521		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	2.53		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.976		0.0050	mg/kg	12-DEC-18	17-DEC-18	R4397087
Molybdenum (Mo)-Total	0.337		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	8020		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	9820		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	21.2		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	6.63		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	3100		20	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-55 NP-10 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Strontium (Sr)-Total	0.091		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0089		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	0.0030		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	1.28		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	110		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-56 NP-11 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	73.7		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	19.6		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	0.017		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.224		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.379		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.045		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	1.69		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	201		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0233		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.055		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.417		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	151		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	847		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.028		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	525		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	7.12		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	2.30		0.040	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	0.911		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	9490		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	9630		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	22.8		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	9.02		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	4350		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.160		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	0.034		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-56 NP-11 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Thallium (Tl)-Total	0.0083		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	0.0044		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	2.29		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	150		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-57 NP-12 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	78.0		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	8.4		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.205		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.409		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.051		0.010	mg/kg	12-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.301		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	171		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0177		0.0050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.371		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	355		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	2200		3.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	801		2.0	mg/kg	12-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	5.31		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.30		0.040	mg/kg	12-DEC-18	18-DEC-18	R4397087
Molybdenum (Mo)-Total	0.971		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	14300		10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	13700		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	25.2		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	9.37		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	4390		20	mg/kg	12-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.165		0.050	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0084		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-57 NP-12 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Uranium (U)-Total	0.0034		0.0020	mg/kg	12-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	4.21		0.10	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	276		0.50	mg/kg	12-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	12-DEC-18	14-DEC-18	R4396096
L2173881-58 NP-13 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	80.7		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	5.5		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.235		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.406		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	0.041		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.411		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	236		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0210		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.330		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	203		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	1340		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	894		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	8.44		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	1.05		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.999		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	16100		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	15600		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	32.8		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	11.4		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	4840		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.210		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	0.021		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0124		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	0.0032		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	1.97		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-58 NP-13 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Zinc (Zn)-Total	267		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-59 NP-14 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	74.8		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	6.1		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.117		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	1.55		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.035		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.239		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	1750		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0173		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.295		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	109		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	145		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	754		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	7.15		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.931		0.0050	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	1.21		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	11800		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	8880		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	18.1		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	9.31		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	5870		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	1.32		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0098		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	0.60		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	233		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-59 NP-14 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
L2173881-60 NP-15 (LIVER) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	79.0		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	7.6		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.159		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.596		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.050		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.383		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	238		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0284		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.369		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	229		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	1100		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	723		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	6.54		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	1.60		0.0050	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	1.32		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	13100		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	11900		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	29.0		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	10.1		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	4490		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.23		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0096		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	0.0043		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	1.96		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	212		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-61 WA-01 (OVARY) Sampled By: GC/TW on 12-SEP-18 @ 00:01							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-61 WA-01 (OVARY) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	74.9		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.090		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.200		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	<0.0050		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	973		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0568		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.235		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	4.27		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	78.1		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1190		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	6.12		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.0356		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.044		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	9980		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	13200		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	52.9		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	2.61		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	2800		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.214		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0469		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	150		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-62 WA-04 (OVARY) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	75.2		2.0	%		27-DEC-18	R4423636
Metals							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-62 WA-04 (OVARY) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Aluminum (Al)-Total	11.8		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Antimony (Sb)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Arsenic (As)-Total	0.097		0.030	mg/kg	31-DEC-18	02-JAN-19	R4425197
Barium (Ba)-Total	3.60		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Beryllium (Be)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Boron (B)-Total	2.4		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cadmium (Cd)-Total	0.013		0.010	mg/kg	31-DEC-18	02-JAN-19	R4425197
Calcium (Ca)-Total	378		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cesium (Cs)-Total	0.0376		0.0050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Chromium (Cr)-Total	0.23		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Cobalt (Co)-Total	0.177		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Copper (Cu)-Total	3.20		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Iron (Fe)-Total	89.4		5.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lead (Pb)-Total	0.051		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Lithium (Li)-Total	<0.50		0.50	mg/kg	31-DEC-18	02-JAN-19	R4425197
Magnesium (Mg)-Total	1480		2.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Manganese (Mn)-Total	1.62		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Mercury (Hg)-Total	0.184		0.010	mg/kg	31-DEC-18	03-JAN-19	R4426348
Molybdenum (Mo)-Total	0.093		0.040	mg/kg	31-DEC-18	02-JAN-19	R4425197
Nickel (Ni)-Total	0.27		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Phosphorus (P)-Total	20500		10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Potassium (K)-Total	24100		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Rubidium (Rb)-Total	42.0		0.050	mg/kg	31-DEC-18	02-JAN-19	R4425197
Selenium (Se)-Total	7.68		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Sodium (Na)-Total	2980		20	mg/kg	31-DEC-18	02-JAN-19	R4425197
Strontium (Sr)-Total	0.27		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tellurium (Te)-Total	<0.020		0.020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Thallium (Tl)-Total	0.0330		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Tin (Sn)-Total	0.22		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Uranium (U)-Total	<0.0020		0.0020	mg/kg	31-DEC-18	02-JAN-19	R4425197
Vanadium (V)-Total	<0.10		0.10	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zinc (Zn)-Total	657		1.0	mg/kg	31-DEC-18	02-JAN-19	R4425197
Zirconium (Zr)-Total	0.22		0.20	mg/kg	31-DEC-18	02-JAN-19	R4425197
L2173881-63 WA-08 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	72.5		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-63 WA-08 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Arsenic (As)-Total	0.121		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.579		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	1190		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0290		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.243		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	3.00		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	136		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	1060		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	29.6		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.200		0.0050	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.105		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	9270		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	10200		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	25.0		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	2.99		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	3110		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.36		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0183		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	140		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-64 WA-09 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	71.7		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.069		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.156		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-64 WA-09 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0140		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	787		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0497		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.197		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	2.87		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	69.7		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1120		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	10.2		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.167		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.033		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	10100		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	12000		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	33.2		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	2.51		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	3560		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.188		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0147		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	122		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-65 WA-11 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	71.3		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.167		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.379		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-65 WA-11 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	832		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0357		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.152		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	2.83		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	91.4		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	883		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	19.3		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.0950		0.0050	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.062		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	8100		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	10500		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	26.9		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	3.28		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	2520		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.16		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0190		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	108		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-66 WA-12 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	74.7		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	<2.0		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	0.011		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.206		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.269		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0114		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096

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Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-66 WA-12 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Calcium (Ca)-Total	1200		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0472		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.275		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	3.61		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	157		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1400		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	15.4		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.156		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.076		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	11200		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	14100		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	35.1		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	2.73		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	3840		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.340		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0269		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	162		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-67 NP-02 (OVARY) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	83.4		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	6.2		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	0.022		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.163		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.617		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0514		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	906		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0503		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-67 NP-02 (OVARY) Sampled By: GC/TW on 12-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Chromium (Cr)-Total	0.057		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.372		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	6.77		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	307		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	0.080		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1310		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	179		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.355		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.360		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	18000		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	24000		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	41.3		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	4.12		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	5350		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.714		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0224		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	0.68		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	356		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-68 NP-06 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	83.3		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.150		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	1.45		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.121		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	583		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0573		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.476		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-68 NP-06 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Copper (Cu)-Total	4.56		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	148		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	759		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	71.6		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	1.00		0.010	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.462		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	12100		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	17500		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	33.8		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	3.42		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	5990		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Strontium (Sr)-Total	0.27		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0179		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	<0.10		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	0.0028		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	0.56		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	238		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
L2173881-69 NP-07 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	84.1		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	4.5		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.207		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.520		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0679		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	661		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0493		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.051		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.305		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	7.49		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	132		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-69 NP-07 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1260		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	204		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.494		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.335		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	17600		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	22500		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	34.5		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	3.23		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	5710		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.332		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0123		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	0.19		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	363		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-70 NP-08 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	82.3		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	2.8		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.086		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.480		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0566		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	924		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0456		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	<0.050		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.251		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	6.78		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	304		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-70 NP-08 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Magnesium (Mg)-Total	1320		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	176		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.273		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.258		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	17700		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	22600		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	37.7		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	6.10		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	4100		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.361		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0225		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	370		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-71 NP-09 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	83.7		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	14.9		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.169		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.473		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0876		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	478		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0735		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.052		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.518		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	6.08		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	258		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1240		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	118		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-71 NP-09 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Mercury (Hg)-Total	0.586		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.277		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	17400		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	22800		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	44.9		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	3.27		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	5340		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.311		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0162		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	0.24		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	412		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-72 NP-10 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	82.7		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	5.3		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.122		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.559		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0715		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	1600		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0534		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.105		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.277		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	5.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	231		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1220		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	88.8		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.610		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.147		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-72 NP-10 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	16700		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	18900		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	32.8		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	3.78		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	5630		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.834		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0180		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	0.26		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	388		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-73 NP-12 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	83.1		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	3.1		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.178		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.147		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0419		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	751		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0421		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.060		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.635		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	7.00		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	311		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1330		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	206		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.379		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.351		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	17900		10	mg/kg	13-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-73 NP-12 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Potassium (K)-Total	21600		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	29.9		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Selenium (Se)-Total	3.45		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	5330		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.468		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0132		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	0.11		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	0.64		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	378		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-74 NP-13 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	82.8		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	2.4		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Antimony (Sb)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Arsenic (As)-Total	0.173		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Barium (Ba)-Total	0.109		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Beryllium (Be)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Bismuth (Bi)-Total	<0.010		0.010	mg/kg	13-DEC-18	14-DEC-18	R4396096
Boron (B)-Total	<1.0		1.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cadmium (Cd)-Total	0.0370		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Calcium (Ca)-Total	715		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cesium (Cs)-Total	0.0373		0.0050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Chromium (Cr)-Total	0.076		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Cobalt (Co)-Total	0.553		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Copper (Cu)-Total	6.93		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Iron (Fe)-Total	393		3.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lead (Pb)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Lithium (Li)-Total	<0.50		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Magnesium (Mg)-Total	1280		2.0	mg/kg	13-DEC-18	14-DEC-18	R4396096
Manganese (Mn)-Total	235		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Mercury (Hg)-Total	0.251		0.0050	mg/kg	13-DEC-18	15-DEC-18	R4396536
Molybdenum (Mo)-Total	0.350		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Nickel (Ni)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Phosphorus (P)-Total	17200		10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Potassium (K)-Total	23200		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Rubidium (Rb)-Total	36.9		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-74 NP-13 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Selenium (Se)-Total	4.12		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Sodium (Na)-Total	5160		20	mg/kg	13-DEC-18	14-DEC-18	R4396096
Strontium (Sr)-Total	0.376		0.050	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tellurium (Te)-Total	<0.020		0.020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Thallium (Tl)-Total	0.0198		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Tin (Sn)-Total	<0.10		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Uranium (U)-Total	<0.0020		0.0020	mg/kg	13-DEC-18	14-DEC-18	R4396096
Vanadium (V)-Total	0.44		0.10	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zinc (Zn)-Total	371		0.50	mg/kg	13-DEC-18	14-DEC-18	R4396096
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	13-DEC-18	14-DEC-18	R4396096
L2173881-75 NP-15 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Physical Tests							
% Moisture	83.3		0.50	%		08-DEC-18	R4383686
Metals							
Aluminum (Al)-Total	<5.0		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Antimony (Sb)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Arsenic (As)-Total	0.109		0.030	mg/kg	27-DEC-18	28-DEC-18	R4420889
Barium (Ba)-Total	0.125		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Beryllium (Be)-Total	<0.010		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Bismuth (Bi)-Total	0.017		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Boron (B)-Total	<1.0		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cadmium (Cd)-Total	0.031		0.010	mg/kg	27-DEC-18	28-DEC-18	R4420889
Calcium (Ca)-Total	676		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cesium (Cs)-Total	0.0463		0.0050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Chromium (Cr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Cobalt (Co)-Total	0.359		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Copper (Cu)-Total	5.40		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Iron (Fe)-Total	217		5.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lead (Pb)-Total	<0.050		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Lithium (Li)-Total	<0.50		0.50	mg/kg	27-DEC-18	28-DEC-18	R4420889
Magnesium (Mg)-Total	1100		2.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Manganese (Mn)-Total	162		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Mercury (Hg)-Total	0.471		0.010	mg/kg	27-DEC-18	31-DEC-18	R4421468
Molybdenum (Mo)-Total	0.334		0.040	mg/kg	27-DEC-18	28-DEC-18	R4420889
Nickel (Ni)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Phosphorus (P)-Total	14000		10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Potassium (K)-Total	16500		20	mg/kg	27-DEC-18	28-DEC-18	R4420889
Rubidium (Rb)-Total	30.8		0.050	mg/kg	27-DEC-18	28-DEC-18	R4420889
Selenium (Se)-Total	3.09		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Sodium (Na)-Total	3920		20	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L2173881-75 NP-15 (OVARY) Sampled By: GC/TW on 13-SEP-18 @ 00:01 Matrix: Tissue							
Metals							
Strontium (Sr)-Total	0.37		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tellurium (Te)-Total	<0.020		0.020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Thallium (Tl)-Total	0.0112		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Tin (Sn)-Total	0.13		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Uranium (U)-Total	<0.0020		0.0020	mg/kg	27-DEC-18	28-DEC-18	R4420889
Vanadium (V)-Total	0.22		0.10	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zinc (Zn)-Total	312		1.0	mg/kg	27-DEC-18	28-DEC-18	R4420889
Zirconium (Zr)-Total	<0.20		0.20	mg/kg	27-DEC-18	28-DEC-18	R4420889

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
HG-DRY-CVAFS-N-VA	Tissue	Mercury in Tissue by CVAFS (DRY)	EPA 200.3, EPA 245.7

This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7.

HG-DRY-MICR-CVAF-VA	Tissue	Mercury in Tissue by CVAFS Micro (DRY)	EPA 200.3, EPA 245.7

This method is adapted from US EPA Method 200.3 "Sample Procedures for Spectrochemical Determination of Total Recoverable Elements in Biological Tissues" (1996). Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with repeated additions of hydrogen peroxide. Analysis is by atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7.

MET-DRY-CCMS-N-VA	Tissue	Metals in Tissue by CRC ICPMS (DRY)	EPA 200.3/6020A

This method is conducted following British Columbia Lab Manual method "Metals in Animal Tissue and Vegetation (Biota) - Prescriptive". Tissue samples are homogenized and sub-sampled prior to hotblock digestion with nitric and hydrochloric acids, in combination with addition of hydrogen peroxide. Instrumental analysis is by collision cell inductively coupled plasma - mass spectrometry (modified from EPA Method 6020A).

Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.

MET-DRY-MICR-HRMS-VA	Tissue	Metals in Tissue by HR-ICPMS Micro (DRY)	EPA 200.3/200.8

Trace metals in tissue are analyzed by high resolution inductively coupled plasma mass spectrometry (HR-ICPMS) modified from US EPA Method 200.8, (Revision 5.5). The sample preparation procedure is modified from US EPA 200.3. Analytical results are reported on dry weight basis.

Method Limitation: This method employs a strong acid/peroxide digestion, and is intended to provide a conservative estimate of bio-available metals. Near complete recoveries are achieved for most toxicologically important metals, but elements associated with recalcitrant minerals may be only partially recovered.

MOISTURE-MICR-VA	Tissue	Moisture in Tissue	Puget Sound WQ Authority, Apr 1997

This analysis is carried out gravimetrically by drying the sample at <60 deg. C.

MOISTURE-TISS-VA	Tissue	% Moisture in Tissues	Puget Sound WQ Authority, Apr 1997

This analysis is carried out gravimetrically by drying the sample at 105 C for a minimum of six hours.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
VA	ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-DRY-CVAFS-N-VA	**Tissue**							
Batch R4396536								
WG2952745-3 CRM		**VA-NRC-DORM4**						
Mercury (Hg)-Total			100.5		%		70-130	15-DEC-18
WG2952795-11 CRM		**VA-NRC-DORM4**						
Mercury (Hg)-Total			105.8		%		70-130	15-DEC-18
WG2952795-10 DUP		**L2173881-64**						
Mercury (Hg)-Total		0.167	0.155		mg/kg	7.2	40	15-DEC-18
WG2952745-4 LCS								
Mercury (Hg)-Total			97.3		%		70-130	15-DEC-18
WG2952795-12 LCS								
Mercury (Hg)-Total			100.8		%		70-130	15-DEC-18
WG2952745-1 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	15-DEC-18
WG2952795-9 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	15-DEC-18
Batch R4396742								
WG2952745-2 DUP		**L2173881-7**						
Mercury (Hg)-Total		1.52	1.47		mg/kg	3.7	40	16-DEC-18
Batch R4397087								
WG2952768-3 CRM		**VA-NRC-DORM4**						
Mercury (Hg)-Total			99.9		%		70-130	17-DEC-18
WG2952768-2 DUP		**L2173881-39**						
Mercury (Hg)-Total		1.10	1.04		mg/kg	5.6	40	18-DEC-18
WG2952768-4 LCS								
Mercury (Hg)-Total			104.3		%		70-130	17-DEC-18
WG2952768-1 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	17-DEC-18
HG-DRY-MICR-CVAF-VA	**Tissue**							
Batch R4421468								
WG2960876-7 CRM		**VA-NRC-DORM4**						
Mercury (Hg)-Total			118.2		%		70-130	31-DEC-18
WG2960876-6 DUP		**L2173881-60**						
Mercury (Hg)-Total		1.60	1.48		mg/kg	7.6	40	31-DEC-18
WG2960876-8 LCS								
Mercury (Hg)-Total			123.3		%		70-130	31-DEC-18
WG2960876-5 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	31-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
HG-DRY-MICR-CVAF-VA	**Tissue**							
Batch R4426348								
WG2960889-3 CRM		**VA-NRC-DORM4**						
Mercury (Hg)-Total			102.2		%		70-130	03-JAN-19
WG2960889-2 DUP		**L2173881-43**						
Mercury (Hg)-Total		0.560	0.543		mg/kg	3.1	40	03-JAN-19
WG2960889-4 LCS								
Mercury (Hg)-Total			107.1		%		70-130	03-JAN-19
WG2960889-1 MB								
Mercury (Hg)-Total			<0.0050		mg/kg		0.005	03-JAN-19
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952745-3 CRM		**VA-NRC-DORM4**						
Aluminum (Al)-Total			108.9		%		70-130	14-DEC-18
Arsenic (As)-Total			102.9		%		70-130	14-DEC-18
Barium (Ba)-Total			108.1		%		70-130	14-DEC-18
Beryllium (Be)-Total			0.017		mg/kg		0.005-0.025	14-DEC-18
Bismuth (Bi)-Total			0.011		mg/kg		0.002-0.022	14-DEC-18
Boron (B)-Total			107.2		%		70-130	14-DEC-18
Cadmium (Cd)-Total			106.9		%		70-130	14-DEC-18
Calcium (Ca)-Total			101.9		%		70-130	14-DEC-18
Cesium (Cs)-Total			105.2		%		70-130	14-DEC-18
Chromium (Cr)-Total			106.1		%		70-130	14-DEC-18
Cobalt (Co)-Total			105.3		%		70-130	14-DEC-18
Copper (Cu)-Total			101.8		%		70-130	14-DEC-18
Iron (Fe)-Total			106.6		%		70-130	14-DEC-18
Lead (Pb)-Total			110.6		%		70-130	14-DEC-18
Lithium (Li)-Total			1.16		mg/kg		0.71-1.71	14-DEC-18
Magnesium (Mg)-Total			104.8		%		70-130	14-DEC-18
Manganese (Mn)-Total			97.4		%		70-130	14-DEC-18
Molybdenum (Mo)-Total			98.3		%		70-130	14-DEC-18
Nickel (Ni)-Total			99.7		%		70-130	14-DEC-18
Phosphorus (P)-Total			100.3		%		70-130	14-DEC-18
Potassium (K)-Total			107.0		%		70-130	14-DEC-18
Rubidium (Rb)-Total			104.1		%		70-130	14-DEC-18
Selenium (Se)-Total			105.8		%		70-130	14-DEC-18
Sodium (Na)-Total			101.5		%		70-130	14-DEC-18
Strontium (Sr)-Total			92.8		%		70-130	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952745-3 CRM		**VA-NRC-DORM4**						
Thallium (Tl)-Total			122.4		%		70-130	14-DEC-18
Uranium (U)-Total			101.8		%		70-130	14-DEC-18
Vanadium (V)-Total			102.5		%		70-130	14-DEC-18
Zinc (Zn)-Total			114.3		%		70-130	14-DEC-18
Zirconium (Zr)-Total			0.24		mg/kg		0.05-0.45	14-DEC-18
WG2952768-3 CRM		**VA-NRC-DORM4**						
Aluminum (Al)-Total			104.5		%		70-130	14-DEC-18
Arsenic (As)-Total			101.6		%		70-130	14-DEC-18
Barium (Ba)-Total			107.3		%		70-130	14-DEC-18
Beryllium (Be)-Total			0.015		mg/kg		0.005-0.025	14-DEC-18
Bismuth (Bi)-Total			0.010		mg/kg		0.002-0.022	14-DEC-18
Boron (B)-Total			104.2		%		70-130	14-DEC-18
Cadmium (Cd)-Total			103.0		%		70-130	14-DEC-18
Calcium (Ca)-Total			105.2		%		70-130	14-DEC-18
Cesium (Cs)-Total			102.1		%		70-130	14-DEC-18
Chromium (Cr)-Total			103.0		%		70-130	14-DEC-18
Cobalt (Co)-Total			95.1		%		70-130	14-DEC-18
Copper (Cu)-Total			98.5		%		70-130	14-DEC-18
Iron (Fe)-Total			104.5		%		70-130	14-DEC-18
Lead (Pb)-Total			105.6		%		70-130	14-DEC-18
Lithium (Li)-Total			1.18		mg/kg		0.71-1.71	14-DEC-18
Magnesium (Mg)-Total			106.5		%		70-130	14-DEC-18
Manganese (Mn)-Total			94.4		%		70-130	14-DEC-18
Molybdenum (Mo)-Total			92.0		%		70-130	14-DEC-18
Nickel (Ni)-Total			91.9		%		70-130	14-DEC-18
Phosphorus (P)-Total			100.2		%		70-130	14-DEC-18
Potassium (K)-Total			103.8		%		70-130	14-DEC-18
Rubidium (Rb)-Total			109.0		%		70-130	14-DEC-18
Selenium (Se)-Total			113.4		%		70-130	14-DEC-18
Sodium (Na)-Total			103.4		%		70-130	14-DEC-18
Strontium (Sr)-Total			99.6		%		70-130	14-DEC-18
Uranium (U)-Total			100.1		%		70-130	14-DEC-18
Vanadium (V)-Total			97.8		%		70-130	14-DEC-18
Zinc (Zn)-Total			108.4		%		70-130	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952768-3 CRM		**VA-NRC-DORM4**						
Zirconium (Zr)-Total			0.29		mg/kg		0.05-0.45	14-DEC-18
WG2952795-11 CRM		**VA-NRC-DORM4**						
Aluminum (Al)-Total			106.1		%		70-130	14-DEC-18
Arsenic (As)-Total			91.6		%		70-130	14-DEC-18
Barium (Ba)-Total			102.3		%		70-130	14-DEC-18
Beryllium (Be)-Total			0.015		mg/kg		0.005-0.025	14-DEC-18
Bismuth (Bi)-Total			0.010		mg/kg		0.002-0.022	14-DEC-18
Boron (B)-Total			94.3		%		70-130	14-DEC-18
Cadmium (Cd)-Total			92.4		%		70-130	14-DEC-18
Calcium (Ca)-Total			99.8		%		70-130	14-DEC-18
Cesium (Cs)-Total			104.2		%		70-130	14-DEC-18
Chromium (Cr)-Total			98.5		%		70-130	14-DEC-18
Cobalt (Co)-Total			95.6		%		70-130	14-DEC-18
Copper (Cu)-Total			94.0		%		70-130	14-DEC-18
Iron (Fe)-Total			98.1		%		70-130	14-DEC-18
Lead (Pb)-Total			105.3		%		70-130	14-DEC-18
Lithium (Li)-Total			1.04		mg/kg		0.71-1.71	14-DEC-18
Magnesium (Mg)-Total			95.9		%		70-130	14-DEC-18
Manganese (Mn)-Total			92.2		%		70-130	14-DEC-18
Molybdenum (Mo)-Total			95.1		%		70-130	14-DEC-18
Nickel (Ni)-Total			86.7		%		70-130	14-DEC-18
Phosphorus (P)-Total			89.7		%		70-130	14-DEC-18
Potassium (K)-Total			94.2		%		70-130	14-DEC-18
Rubidium (Rb)-Total			94.7		%		70-130	14-DEC-18
Selenium (Se)-Total			103.0		%		70-130	14-DEC-18
Sodium (Na)-Total			90.0		%		70-130	14-DEC-18
Strontium (Sr)-Total			91.6		%		70-130	14-DEC-18
Thallium (Tl)-Total			127.5		%		70-130	14-DEC-18
Uranium (U)-Total			97.5		%		70-130	14-DEC-18
Vanadium (V)-Total			100.7		%		70-130	14-DEC-18
Zinc (Zn)-Total			104.8		%		70-130	14-DEC-18
Zirconium (Zr)-Total			0.28		mg/kg		0.05-0.45	14-DEC-18
WG2952745-2 DUP		**L2173881-7**						
Aluminum (Al)-Total		<2.0	<2.0	RPD-NA	mg/kg	N/A	40	14-DEC-18
Antimony (Sb)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952745-2 DUP		**L2173881-7**						
Arsenic (As)-Total		0.322	0.299		mg/kg	7.3	40	14-DEC-18
Barium (Ba)-Total		0.200	0.237		mg/kg	17	40	14-DEC-18
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	14-DEC-18
Bismuth (Bi)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	14-DEC-18
Boron (B)-Total		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	14-DEC-18
Cadmium (Cd)-Total		<0.0050	<0.0050	RPD-NA	mg/kg	N/A	40	14-DEC-18
Calcium (Ca)-Total		681	520		mg/kg	27	60	14-DEC-18
Cesium (Cs)-Total		0.0453	0.0446		mg/kg	1.5	40	14-DEC-18
Chromium (Cr)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	14-DEC-18
Cobalt (Co)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Copper (Cu)-Total		0.55	0.50		mg/kg	8.4	40	14-DEC-18
Iron (Fe)-Total		6.4	6.0		mg/kg	6.2	40	14-DEC-18
Lead (Pb)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Lithium (Li)-Total		<0.50	<0.50	RPD-NA	mg/kg	N/A	40	14-DEC-18
Magnesium (Mg)-Total		1600	1520		mg/kg	4.9	40	14-DEC-18
Manganese (Mn)-Total		0.620	0.584		mg/kg	5.9	40	14-DEC-18
Molybdenum (Mo)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Nickel (Ni)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	14-DEC-18
Phosphorus (P)-Total		11900	11400		mg/kg	4.6	40	14-DEC-18
Potassium (K)-Total		23600	22800		mg/kg	3.1	40	14-DEC-18
Rubidium (Rb)-Total		41.2	39.5		mg/kg	4.2	40	14-DEC-18
Selenium (Se)-Total		1.20	1.16		mg/kg	3.2	40	14-DEC-18
Sodium (Na)-Total		1070	1000		mg/kg	6.4	40	14-DEC-18
Strontium (Sr)-Total		0.138	0.085		mg/kg	48	60	14-DEC-18
Tellurium (Te)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Thallium (Tl)-Total		0.0117	0.0114		mg/kg	2.9	40	14-DEC-18
Tin (Sn)-Total		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	14-DEC-18
Uranium (U)-Total		<0.0020	<0.0020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Vanadium (V)-Total		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	14-DEC-18
Zinc (Zn)-Total		16.7	15.6		mg/kg	6.6	40	14-DEC-18
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	14-DEC-18
WG2952768-2 DUP		**L2173881-39**						
Aluminum (Al)-Total		3.1	2.4		mg/kg	25	40	14-DEC-18
Antimony (Sb)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952768-2 DUP		**L2173881-39**						
Arsenic (As)-Total		0.129	0.129		mg/kg	0.0	40	14-DEC-18
Barium (Ba)-Total		0.061	0.067		mg/kg	9.6	40	14-DEC-18
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	14-DEC-18
Bismuth (Bi)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	14-DEC-18
Boron (B)-Total		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	14-DEC-18
Cadmium (Cd)-Total		0.870	0.892		mg/kg	2.6	40	14-DEC-18
Calcium (Ca)-Total		304	319		mg/kg	4.7	60	14-DEC-18
Cesium (Cs)-Total		0.0397	0.0388		mg/kg	2.2	40	14-DEC-18
Chromium (Cr)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	14-DEC-18
Cobalt (Co)-Total		0.283	0.280		mg/kg	1.0	40	14-DEC-18
Copper (Cu)-Total		6.35	6.57		mg/kg	3.4	40	14-DEC-18
Iron (Fe)-Total		543	556		mg/kg	2.4	40	14-DEC-18
Lead (Pb)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Lithium (Li)-Total		<0.50	<0.50	RPD-NA	mg/kg	N/A	40	14-DEC-18
Magnesium (Mg)-Total		888	918		mg/kg	3.3	40	14-DEC-18
Manganese (Mn)-Total		8.51	8.86		mg/kg	4.0	40	14-DEC-18
Molybdenum (Mo)-Total		0.396	0.403		mg/kg	1.9	40	14-DEC-18
Nickel (Ni)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	14-DEC-18
Phosphorus (P)-Total		14300	15100		mg/kg	5.3	40	14-DEC-18
Potassium (K)-Total		12800	13400		mg/kg	4.4	40	14-DEC-18
Rubidium (Rb)-Total		42.6	43.5		mg/kg	2.1	40	14-DEC-18
Selenium (Se)-Total		3.29	3.32		mg/kg	0.9	40	14-DEC-18
Sodium (Na)-Total		5700	5860		mg/kg	2.7	40	14-DEC-18
Strontium (Sr)-Total		0.191	0.191		mg/kg	0.2	60	14-DEC-18
Tellurium (Te)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Thallium (Tl)-Total		0.0250	0.0255		mg/kg	2.0	40	14-DEC-18
Tin (Sn)-Total		0.20	0.21		mg/kg	2.8	40	14-DEC-18
Uranium (U)-Total		<0.0020	<0.0020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Vanadium (V)-Total		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	14-DEC-18
Zinc (Zn)-Total		88.6	89.9		mg/kg	1.4	40	14-DEC-18
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	14-DEC-18
WG2952795-10 DUP		**L2173881-64**						
Aluminum (Al)-Total		<2.0	<2.0	RPD-NA	mg/kg	N/A	40	14-DEC-18
Antimony (Sb)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952795-10 DUP		**L2173881-64**						
Arsenic (As)-Total		0.069	0.066		mg/kg	4.6	40	14-DEC-18
Barium (Ba)-Total		0.156	0.168		mg/kg	7.4	40	14-DEC-18
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	14-DEC-18
Bismuth (Bi)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	14-DEC-18
Boron (B)-Total		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	14-DEC-18
Cadmium (Cd)-Total		0.0140	0.0131		mg/kg	6.6	40	14-DEC-18
Calcium (Ca)-Total		787	783		mg/kg	0.5	60	14-DEC-18
Cesium (Cs)-Total		0.0497	0.0509		mg/kg	2.5	40	14-DEC-18
Chromium (Cr)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	14-DEC-18
Cobalt (Co)-Total		0.197	0.195		mg/kg	1.1	40	14-DEC-18
Copper (Cu)-Total		2.87	2.83		mg/kg	1.6	40	14-DEC-18
Iron (Fe)-Total		69.7	70.2		mg/kg	0.8	40	14-DEC-18
Lead (Pb)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Lithium (Li)-Total		<0.50	<0.50	RPD-NA	mg/kg	N/A	40	14-DEC-18
Magnesium (Mg)-Total		1120	1090		mg/kg	1.9	40	14-DEC-18
Manganese (Mn)-Total		10.2	9.87		mg/kg	3.6	40	14-DEC-18
Molybdenum (Mo)-Total		0.033	0.033		mg/kg	1.0	40	14-DEC-18
Nickel (Ni)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	14-DEC-18
Phosphorus (P)-Total		10100	9730		mg/kg	3.4	40	14-DEC-18
Potassium (K)-Total		12000	11700		mg/kg	2.2	40	14-DEC-18
Rubidium (Rb)-Total		33.2	32.8		mg/kg	0.9	40	14-DEC-18
Selenium (Se)-Total		2.51	2.44		mg/kg	2.8	40	14-DEC-18
Sodium (Na)-Total		3560	3500		mg/kg	1.8	40	14-DEC-18
Strontium (Sr)-Total		0.188	0.186		mg/kg	1.3	60	14-DEC-18
Tellurium (Te)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Thallium (Tl)-Total		0.0147	0.0144		mg/kg	1.9	40	14-DEC-18
Tin (Sn)-Total		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	14-DEC-18
Uranium (U)-Total		<0.0020	<0.0020	RPD-NA	mg/kg	N/A	40	14-DEC-18
Vanadium (V)-Total		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	14-DEC-18
Zinc (Zn)-Total		122	118		mg/kg	3.4	40	14-DEC-18
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	14-DEC-18
WG2952745-4 LCS								
Aluminum (Al)-Total			109.1		%		70-130	14-DEC-18
Antimony (Sb)-Total			112.0		%		70-130	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952745-4 LCS								
Arsenic (As)-Total			106.0		%		70-130	14-DEC-18
Barium (Ba)-Total			109.8		%		70-130	14-DEC-18
Beryllium (Be)-Total			107.0		%		70-130	14-DEC-18
Bismuth (Bi)-Total			101.8		%		70-130	14-DEC-18
Boron (B)-Total			109.6		%		70-130	14-DEC-18
Cadmium (Cd)-Total			104.4		%		70-130	14-DEC-18
Calcium (Ca)-Total			108.3		%		70-130	14-DEC-18
Cesium (Cs)-Total			115.0		%		70-130	14-DEC-18
Chromium (Cr)-Total			106.4		%		70-130	14-DEC-18
Cobalt (Co)-Total			108.1		%		70-130	14-DEC-18
Copper (Cu)-Total			104.9		%		70-130	14-DEC-18
Iron (Fe)-Total			108.6		%		70-130	14-DEC-18
Lead (Pb)-Total			103.9		%		70-130	14-DEC-18
Lithium (Li)-Total			108.0		%		70-130	14-DEC-18
Magnesium (Mg)-Total			108.9		%		70-130	14-DEC-18
Manganese (Mn)-Total			108.6		%		70-130	14-DEC-18
Molybdenum (Mo)-Total			111.0		%		70-130	14-DEC-18
Nickel (Ni)-Total			105.8		%		70-130	14-DEC-18
Phosphorus (P)-Total			109.7		%		70-130	14-DEC-18
Potassium (K)-Total			108.1		%		70-130	14-DEC-18
Rubidium (Rb)-Total			104.5		%		70-130	14-DEC-18
Selenium (Se)-Total			104.5		%		70-130	14-DEC-18
Sodium (Na)-Total			102.3		%		70-130	14-DEC-18
Strontium (Sr)-Total			106.1		%		70-130	14-DEC-18
Tellurium (Te)-Total			110.0		%		70-130	14-DEC-18
Thallium (Tl)-Total			101.9		%		70-130	14-DEC-18
Tin (Sn)-Total			106.8		%		70-130	14-DEC-18
Uranium (U)-Total			105.4		%		70-130	14-DEC-18
Vanadium (V)-Total			109.3		%		70-130	14-DEC-18
Zinc (Zn)-Total			103.5		%		70-130	14-DEC-18
Zirconium (Zr)-Total			110.1		%		70-130	14-DEC-18
WG2952768-4 LCS								
Aluminum (Al)-Total			115.3		%		70-130	14-DEC-18
Antimony (Sb)-Total			113.4		%		70-130	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952768-4 LCS								
Arsenic (As)-Total			111.8		%		70-130	14-DEC-18
Barium (Ba)-Total			112.0		%		70-130	14-DEC-18
Beryllium (Be)-Total			110.1		%		70-130	14-DEC-18
Bismuth (Bi)-Total			105.3		%		70-130	14-DEC-18
Boron (B)-Total			111.9		%		70-130	14-DEC-18
Cadmium (Cd)-Total			109.2		%		70-130	14-DEC-18
Calcium (Ca)-Total			109.9		%		70-130	14-DEC-18
Cesium (Cs)-Total			114.0		%		70-130	14-DEC-18
Chromium (Cr)-Total			112.4		%		70-130	14-DEC-18
Cobalt (Co)-Total			104.1		%		70-130	14-DEC-18
Copper (Cu)-Total			107.1		%		70-130	14-DEC-18
Iron (Fe)-Total			124.6		%		70-130	14-DEC-18
Lead (Pb)-Total			108.2		%		70-130	14-DEC-18
Lithium (Li)-Total			113.2		%		70-130	14-DEC-18
Magnesium (Mg)-Total			113.7		%		70-130	14-DEC-18
Manganese (Mn)-Total			110.3		%		70-130	14-DEC-18
Molybdenum (Mo)-Total			110.4		%		70-130	14-DEC-18
Nickel (Ni)-Total			109.2		%		70-130	14-DEC-18
Phosphorus (P)-Total			115.3		%		70-130	14-DEC-18
Potassium (K)-Total			105.5		%		70-130	14-DEC-18
Rubidium (Rb)-Total			112.7		%		70-130	14-DEC-18
Selenium (Se)-Total			112.9		%		70-130	14-DEC-18
Sodium (Na)-Total			112.0		%		70-130	14-DEC-18
Strontium (Sr)-Total			115.1		%		70-130	14-DEC-18
Tellurium (Te)-Total			111.8		%		70-130	14-DEC-18
Thallium (Tl)-Total			104.2		%		70-130	14-DEC-18
Tin (Sn)-Total			109.1		%		70-130	14-DEC-18
Uranium (U)-Total			105.0		%		70-130	14-DEC-18
Vanadium (V)-Total			112.5		%		70-130	14-DEC-18
Zinc (Zn)-Total			109.7		%		70-130	14-DEC-18
Zirconium (Zr)-Total			117.2		%		70-130	14-DEC-18
WG2952795-12 LCS								
Aluminum (Al)-Total			109.7		%		70-130	14-DEC-18
Antimony (Sb)-Total			113.1		%		70-130	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952795-12 LCS								
Arsenic (As)-Total			104.7		%		70-130	14-DEC-18
Barium (Ba)-Total			108.5		%		70-130	14-DEC-18
Beryllium (Be)-Total			105.1		%		70-130	14-DEC-18
Bismuth (Bi)-Total			101.9		%		70-130	14-DEC-18
Boron (B)-Total			115.0		%		70-130	14-DEC-18
Cadmium (Cd)-Total			103.7		%		70-130	14-DEC-18
Calcium (Ca)-Total			106.9		%		70-130	14-DEC-18
Cesium (Cs)-Total			115.9		%		70-130	14-DEC-18
Chromium (Cr)-Total			105.1		%		70-130	14-DEC-18
Cobalt (Co)-Total			105.2		%		70-130	14-DEC-18
Copper (Cu)-Total			102.9		%		70-130	14-DEC-18
Iron (Fe)-Total			106.1		%		70-130	14-DEC-18
Lead (Pb)-Total			103.9		%		70-130	14-DEC-18
Lithium (Li)-Total			108.9		%		70-130	14-DEC-18
Magnesium (Mg)-Total			105.4		%		70-130	14-DEC-18
Manganese (Mn)-Total			103.1		%		70-130	14-DEC-18
Molybdenum (Mo)-Total			113.1		%		70-130	14-DEC-18
Nickel (Ni)-Total			102.9		%		70-130	14-DEC-18
Phosphorus (P)-Total			107.2		%		70-130	14-DEC-18
Potassium (K)-Total			104.1		%		70-130	14-DEC-18
Rubidium (Rb)-Total			99.8		%		70-130	14-DEC-18
Selenium (Se)-Total			106.7		%		70-130	14-DEC-18
Sodium (Na)-Total			100.4		%		70-130	14-DEC-18
Strontium (Sr)-Total			108.8		%		70-130	14-DEC-18
Tellurium (Te)-Total			110.5		%		70-130	14-DEC-18
Thallium (Tl)-Total			103.3		%		70-130	14-DEC-18
Tin (Sn)-Total			104.7		%		70-130	14-DEC-18
Uranium (U)-Total			105.9		%		70-130	14-DEC-18
Vanadium (V)-Total			107.1		%		70-130	14-DEC-18
Zinc (Zn)-Total			100.9		%		70-130	14-DEC-18
Zirconium (Zr)-Total			113.3		%		70-130	14-DEC-18
WG2952745-1 MB								
Aluminum (Al)-Total			<2.0		mg/kg		2	14-DEC-18
Antimony (Sb)-Total			<0.010		mg/kg		0.01	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952745-1 MB								
Arsenic (As)-Total			<0.020		mg/kg		0.02	14-DEC-18
Barium (Ba)-Total			<0.050		mg/kg		0.05	14-DEC-18
Beryllium (Be)-Total			<0.010		mg/kg		0.01	14-DEC-18
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	14-DEC-18
Boron (B)-Total			<1.0		mg/kg		1	14-DEC-18
Cadmium (Cd)-Total			<0.0050		mg/kg		0.005	14-DEC-18
Calcium (Ca)-Total			<20		mg/kg		20	14-DEC-18
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	14-DEC-18
Chromium (Cr)-Total			<0.050		mg/kg		0.05	14-DEC-18
Cobalt (Co)-Total			<0.020		mg/kg		0.02	14-DEC-18
Copper (Cu)-Total			<0.10		mg/kg		0.1	14-DEC-18
Iron (Fe)-Total			<3.0		mg/kg		3	14-DEC-18
Lead (Pb)-Total			<0.020		mg/kg		0.02	14-DEC-18
Lithium (Li)-Total			<0.50		mg/kg		0.5	14-DEC-18
Magnesium (Mg)-Total			<2.0		mg/kg		2	14-DEC-18
Manganese (Mn)-Total			<0.050		mg/kg		0.05	14-DEC-18
Molybdenum (Mo)-Total			<0.020		mg/kg		0.02	14-DEC-18
Nickel (Ni)-Total			<0.20		mg/kg		0.2	14-DEC-18
Phosphorus (P)-Total			<10		mg/kg		10	14-DEC-18
Potassium (K)-Total			<20		mg/kg		20	14-DEC-18
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	14-DEC-18
Selenium (Se)-Total			<0.050		mg/kg		0.05	14-DEC-18
Sodium (Na)-Total			<20		mg/kg		20	14-DEC-18
Strontium (Sr)-Total			<0.050		mg/kg		0.05	14-DEC-18
Tellurium (Te)-Total			<0.020		mg/kg		0.02	14-DEC-18
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	14-DEC-18
Tin (Sn)-Total			<0.10		mg/kg		0.1	14-DEC-18
Uranium (U)-Total			<0.0020		mg/kg		0.002	14-DEC-18
Vanadium (V)-Total			<0.10		mg/kg		0.1	14-DEC-18
Zinc (Zn)-Total			<0.50		mg/kg		0.5	14-DEC-18
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	14-DEC-18
WG2952768-1 MB								
Aluminum (Al)-Total			<2.0		mg/kg		2	14-DEC-18
Antimony (Sb)-Total			<0.010		mg/kg		0.01	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952768-1 MB								
Arsenic (As)-Total			<0.020		mg/kg		0.02	14-DEC-18
Barium (Ba)-Total			<0.050		mg/kg		0.05	14-DEC-18
Beryllium (Be)-Total			<0.010		mg/kg		0.01	14-DEC-18
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	14-DEC-18
Boron (B)-Total			<1.0		mg/kg		1	14-DEC-18
Cadmium (Cd)-Total			<0.0050		mg/kg		0.005	14-DEC-18
Calcium (Ca)-Total			<20		mg/kg		20	14-DEC-18
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	14-DEC-18
Chromium (Cr)-Total			<0.050		mg/kg		0.05	14-DEC-18
Cobalt (Co)-Total			<0.020		mg/kg		0.02	14-DEC-18
Copper (Cu)-Total			<0.10		mg/kg		0.1	14-DEC-18
Iron (Fe)-Total			<3.0		mg/kg		3	14-DEC-18
Lead (Pb)-Total			<0.020		mg/kg		0.02	14-DEC-18
Lithium (Li)-Total			<0.50		mg/kg		0.5	14-DEC-18
Magnesium (Mg)-Total			<2.0		mg/kg		2	14-DEC-18
Manganese (Mn)-Total			<0.050		mg/kg		0.05	14-DEC-18
Molybdenum (Mo)-Total			<0.020		mg/kg		0.02	14-DEC-18
Nickel (Ni)-Total			<0.20		mg/kg		0.2	14-DEC-18
Phosphorus (P)-Total			<10		mg/kg		10	14-DEC-18
Potassium (K)-Total			<20		mg/kg		20	14-DEC-18
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	14-DEC-18
Selenium (Se)-Total			<0.050		mg/kg		0.05	14-DEC-18
Sodium (Na)-Total			<20		mg/kg		20	14-DEC-18
Strontium (Sr)-Total			<0.050		mg/kg		0.05	14-DEC-18
Tellurium (Te)-Total			<0.020		mg/kg		0.02	14-DEC-18
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	14-DEC-18
Tin (Sn)-Total			<0.10		mg/kg		0.1	14-DEC-18
Uranium (U)-Total			<0.0020		mg/kg		0.002	14-DEC-18
Vanadium (V)-Total			<0.10		mg/kg		0.1	14-DEC-18
Zinc (Zn)-Total			<0.50		mg/kg		0.5	14-DEC-18
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	14-DEC-18
WG2952795-9 MB								
Aluminum (Al)-Total			<2.0		mg/kg		2	14-DEC-18
Antimony (Sb)-Total			<0.010		mg/kg		0.01	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4396096								
WG2952795-9 MB								
Arsenic (As)-Total			<0.020		mg/kg		0.02	14-DEC-18
Barium (Ba)-Total			<0.050		mg/kg		0.05	14-DEC-18
Beryllium (Be)-Total			<0.010		mg/kg		0.01	14-DEC-18
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	14-DEC-18
Boron (B)-Total			<1.0		mg/kg		1	14-DEC-18
Cadmium (Cd)-Total			<0.0050		mg/kg		0.005	14-DEC-18
Calcium (Ca)-Total			<20		mg/kg		20	14-DEC-18
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	14-DEC-18
Chromium (Cr)-Total			<0.050		mg/kg		0.05	14-DEC-18
Cobalt (Co)-Total			<0.020		mg/kg		0.02	14-DEC-18
Copper (Cu)-Total			<0.10		mg/kg		0.1	14-DEC-18
Iron (Fe)-Total			<3.0		mg/kg		3	14-DEC-18
Lead (Pb)-Total			<0.020		mg/kg		0.02	14-DEC-18
Lithium (Li)-Total			<0.50		mg/kg		0.5	14-DEC-18
Magnesium (Mg)-Total			<2.0		mg/kg		2	14-DEC-18
Manganese (Mn)-Total			<0.050		mg/kg		0.05	14-DEC-18
Molybdenum (Mo)-Total			<0.020		mg/kg		0.02	14-DEC-18
Nickel (Ni)-Total			<0.20		mg/kg		0.2	14-DEC-18
Phosphorus (P)-Total			<10		mg/kg		10	14-DEC-18
Potassium (K)-Total			<20		mg/kg		20	14-DEC-18
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	14-DEC-18
Selenium (Se)-Total			<0.050		mg/kg		0.05	14-DEC-18
Sodium (Na)-Total			<20		mg/kg		20	14-DEC-18
Strontium (Sr)-Total			<0.050		mg/kg		0.05	14-DEC-18
Tellurium (Te)-Total			<0.020		mg/kg		0.02	14-DEC-18
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	14-DEC-18
Tin (Sn)-Total			<0.10		mg/kg		0.1	14-DEC-18
Uranium (U)-Total			<0.0020		mg/kg		0.002	14-DEC-18
Vanadium (V)-Total			<0.10		mg/kg		0.1	14-DEC-18
Zinc (Zn)-Total			<0.50		mg/kg		0.5	14-DEC-18
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	14-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-CCMS-N-VA	**Tissue**							
Batch R4399989								
WG2952768-3 CRM		**VA-NRC-DORM4**						
Thallium (Tl)-Total			107.1		%		70-130	17-DEC-18
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch R4420889								
WG2960876-7 CRM		**VA-NRC-DORM4**						
Aluminum (Al)-Total			85.4		%		70-130	28-DEC-18
Arsenic (As)-Total			84.7		%		70-130	28-DEC-18
Barium (Ba)-Total			119.4		%		70-130	28-DEC-18
Beryllium (Be)-Total			0.018		mg/kg		0.005-0.025	28-DEC-18
Bismuth (Bi)-Total			0.011		mg/kg		0.002-0.022	28-DEC-18
Boron (B)-Total			125.4		%		70-130	28-DEC-18
Cadmium (Cd)-Total			111.5		%		70-130	28-DEC-18
Calcium (Ca)-Total			111.3		%		70-130	28-DEC-18
Chromium (Cr)-Total			103.0		%		70-130	28-DEC-18
Cobalt (Co)-Total			88.8		%		70-130	28-DEC-18
Copper (Cu)-Total			93.2		%		70-130	28-DEC-18
Iron (Fe)-Total			87.2		%		70-130	28-DEC-18
Lead (Pb)-Total			122.6		%		70-130	28-DEC-18
Lithium (Li)-Total			1.38		mg/kg		0.71-1.71	28-DEC-18
Magnesium (Mg)-Total			88.1		%		70-130	28-DEC-18
Manganese (Mn)-Total			96.7		%		70-130	28-DEC-18
Molybdenum (Mo)-Total			110.0		%		70-130	28-DEC-18
Nickel (Ni)-Total			86.5		%		70-130	28-DEC-18
Phosphorus (P)-Total			88.6		%		70-130	28-DEC-18
Potassium (K)-Total			89.5		%		70-130	28-DEC-18
Rubidium (Rb)-Total			101.4		%		70-130	28-DEC-18
Selenium (Se)-Total			107.8		%		70-130	28-DEC-18
Sodium (Na)-Total			96.8		%		70-130	28-DEC-18
Strontium (Sr)-Total			99.9		%		70-130	28-DEC-18
Thallium (Tl)-Total			119.6		%		70-130	28-DEC-18
Uranium (U)-Total			110.3		%		70-130	28-DEC-18
Vanadium (V)-Total			92.9		%		70-130	28-DEC-18
Zinc (Zn)-Total			99.1		%		70-130	28-DEC-18
Zirconium (Zr)-Total			0.28		mg/kg		0.05-0.45	28-DEC-18
WG2960876-6 DUP		**L2173881-60**						

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch	**R4420889**							
WG2960876-6	**DUP**	**L2173881-60**						
Aluminum (Al)-Total		7.6	6.7		mg/kg	13	40	28-DEC-18
Antimony (Sb)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	28-DEC-18
Arsenic (As)-Total		0.159	0.136		mg/kg	15	40	28-DEC-18
Barium (Ba)-Total		0.596	0.545		mg/kg	9.0	40	28-DEC-18
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	28-DEC-18
Bismuth (Bi)-Total		0.050	0.050		mg/kg	0.7	40	28-DEC-18
Boron (B)-Total		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	28-DEC-18
Cadmium (Cd)-Total		0.383	0.401		mg/kg	4.7	40	28-DEC-18
Calcium (Ca)-Total		238	212		mg/kg	12	60	28-DEC-18
Cesium (Cs)-Total		0.0284	0.0301		mg/kg	5.7	40	28-DEC-18
Chromium (Cr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	28-DEC-18
Cobalt (Co)-Total		0.369	0.371		mg/kg	0.5	40	28-DEC-18
Copper (Cu)-Total		229	224		mg/kg	1.9	40	28-DEC-18
Iron (Fe)-Total		1100	1070		mg/kg	2.8	40	28-DEC-18
Lead (Pb)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	28-DEC-18
Lithium (Li)-Total		<0.50	<0.50	RPD-NA	mg/kg	N/A	40	28-DEC-18
Magnesium (Mg)-Total		723	741		mg/kg	2.5	40	28-DEC-18
Manganese (Mn)-Total		6.54	6.18		mg/kg	5.7	40	28-DEC-18
Molybdenum (Mo)-Total		1.32	1.27		mg/kg	4.3	40	28-DEC-18
Nickel (Ni)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	28-DEC-18
Phosphorus (P)-Total		13100	13500		mg/kg	3.2	40	28-DEC-18
Potassium (K)-Total		11900	11600		mg/kg	3.2	40	28-DEC-18
Rubidium (Rb)-Total		29.0	30.3		mg/kg	4.4	40	28-DEC-18
Selenium (Se)-Total		10.1	9.11		mg/kg	11	40	28-DEC-18
Sodium (Na)-Total		4490	4390		mg/kg	2.3	40	28-DEC-18
Strontium (Sr)-Total		0.23	0.19		mg/kg	15	60	28-DEC-18
Tellurium (Te)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	28-DEC-18
Thallium (Tl)-Total		0.0096	0.0099		mg/kg	2.9	40	28-DEC-18
Tin (Sn)-Total		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	28-DEC-18
Uranium (U)-Total		0.0043	0.0040		mg/kg	7.0	40	28-DEC-18
Vanadium (V)-Total		1.96	1.80		mg/kg	8.0	40	28-DEC-18
Zinc (Zn)-Total		212	194		mg/kg	9.1	40	28-DEC-18
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	28-DEC-18
WG2960876-8	**LCS**							

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch	**R4420889**							
WG2960876-8	**LCS**							
Aluminum (Al)-Total			83.9		%		70-130	28-DEC-18
Antimony (Sb)-Total			92.5		%		70-130	28-DEC-18
Arsenic (As)-Total			85.3		%		70-130	28-DEC-18
Barium (Ba)-Total			104.0		%		70-130	28-DEC-18
Beryllium (Be)-Total			84.9		%		70-130	28-DEC-18
Bismuth (Bi)-Total			101.2		%		70-130	28-DEC-18
Boron (B)-Total			95.7		%		70-130	28-DEC-18
Cadmium (Cd)-Total			91.1		%		70-130	28-DEC-18
Calcium (Ca)-Total			95.3		%		70-130	28-DEC-18
Cesium (Cs)-Total			96.7		%		70-130	28-DEC-18
Chromium (Cr)-Total			99.2		%		70-130	28-DEC-18
Cobalt (Co)-Total			93.2		%		70-130	28-DEC-18
Copper (Cu)-Total			91.3		%		70-130	28-DEC-18
Iron (Fe)-Total			90.9		%		70-130	28-DEC-18
Lead (Pb)-Total			104.4		%		70-130	28-DEC-18
Lithium (Li)-Total			92.6		%		70-130	28-DEC-18
Magnesium (Mg)-Total			89.1		%		70-130	28-DEC-18
Manganese (Mn)-Total			103.2		%		70-130	28-DEC-18
Molybdenum (Mo)-Total			94.6		%		70-130	28-DEC-18
Nickel (Ni)-Total			94.1		%		70-130	28-DEC-18
Phosphorus (P)-Total			90.9		%		70-130	28-DEC-18
Potassium (K)-Total			84.3		%		70-130	28-DEC-18
Rubidium (Rb)-Total			87.7		%		70-130	28-DEC-18
Selenium (Se)-Total			103.4		%		70-130	28-DEC-18
Sodium (Na)-Total			90.9		%		70-130	28-DEC-18
Strontium (Sr)-Total			92.4		%		70-130	28-DEC-18
Tellurium (Te)-Total			99.9		%		70-130	28-DEC-18
Thallium (Tl)-Total			97.3		%		70-130	28-DEC-18
Tin (Sn)-Total			91.7		%		70-130	28-DEC-18
Uranium (U)-Total			112.8		%		70-130	28-DEC-18
Vanadium (V)-Total			88.0		%		70-130	28-DEC-18
Zinc (Zn)-Total			85.6		%		70-130	28-DEC-18
Zirconium (Zr)-Total			100.0		%		70-130	28-DEC-18
WG2960876-5	**MB**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch R4420889								
WG2960876-5 MB								
Aluminum (Al)-Total			<5.0		mg/kg		5	28-DEC-18
Antimony (Sb)-Total			<0.010		mg/kg		0.01	28-DEC-18
Arsenic (As)-Total			<0.030		mg/kg		0.03	28-DEC-18
Barium (Ba)-Total			<0.050		mg/kg		0.05	28-DEC-18
Beryllium (Be)-Total			<0.010		mg/kg		0.01	28-DEC-18
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	28-DEC-18
Boron (B)-Total			<1.0		mg/kg		1	28-DEC-18
Cadmium (Cd)-Total			<0.010		mg/kg		0.01	28-DEC-18
Calcium (Ca)-Total			<20		mg/kg		20	28-DEC-18
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	28-DEC-18
Chromium (Cr)-Total			<0.20		mg/kg		0.2	28-DEC-18
Cobalt (Co)-Total			<0.020		mg/kg		0.02	28-DEC-18
Copper (Cu)-Total			<0.20		mg/kg		0.2	28-DEC-18
Iron (Fe)-Total			<5.0		mg/kg		5	28-DEC-18
Lead (Pb)-Total			<0.050		mg/kg		0.05	28-DEC-18
Lithium (Li)-Total			<0.50		mg/kg		0.5	28-DEC-18
Magnesium (Mg)-Total			<2.0		mg/kg		2	28-DEC-18
Manganese (Mn)-Total			<0.050		mg/kg		0.05	28-DEC-18
Molybdenum (Mo)-Total			<0.040		mg/kg		0.04	28-DEC-18
Nickel (Ni)-Total			<0.20		mg/kg		0.2	28-DEC-18
Phosphorus (P)-Total			<10		mg/kg		10	28-DEC-18
Potassium (K)-Total			<20		mg/kg		20	28-DEC-18
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	28-DEC-18
Selenium (Se)-Total			<0.10		mg/kg		0.1	28-DEC-18
Sodium (Na)-Total			<20		mg/kg		20	28-DEC-18
Strontium (Sr)-Total			<0.10		mg/kg		0.1	28-DEC-18
Tellurium (Te)-Total			<0.020		mg/kg		0.02	28-DEC-18
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	28-DEC-18
Tin (Sn)-Total			<0.10		mg/kg		0.1	28-DEC-18
Uranium (U)-Total			<0.0020		mg/kg		0.002	28-DEC-18
Vanadium (V)-Total			<0.10		mg/kg		0.1	28-DEC-18
Zinc (Zn)-Total			<1.0		mg/kg		1	28-DEC-18
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	28-DEC-18

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch **R4425197**								
WG2960889-3 **CRM**		**VA-NRC-DORM4**						
Aluminum (Al)-Total			90.7		%		70-130	02-JAN-19
Arsenic (As)-Total			85.5		%		70-130	02-JAN-19
Barium (Ba)-Total			100.7		%		70-130	02-JAN-19
Beryllium (Be)-Total			0.017		mg/kg		0.005-0.025	02-JAN-19
Bismuth (Bi)-Total			0.022		mg/kg		0.002-0.022	02-JAN-19
Boron (B)-Total			103.1		%		70-130	02-JAN-19
Cadmium (Cd)-Total			97.3		%		70-130	02-JAN-19
Calcium (Ca)-Total			99.6		%		70-130	02-JAN-19
Chromium (Cr)-Total			92.3		%		70-130	02-JAN-19
Cobalt (Co)-Total			86.1		%		70-130	02-JAN-19
Copper (Cu)-Total			82.3		%		70-130	02-JAN-19
Iron (Fe)-Total			89.4		%		70-130	02-JAN-19
Lead (Pb)-Total			97.2		%		70-130	02-JAN-19
Lithium (Li)-Total			1.18		mg/kg		0.71-1.71	02-JAN-19
Magnesium (Mg)-Total			87.4		%		70-130	02-JAN-19
Manganese (Mn)-Total			82.9		%		70-130	02-JAN-19
Molybdenum (Mo)-Total			90.2		%		70-130	02-JAN-19
Nickel (Ni)-Total			79.2		%		70-130	02-JAN-19
Phosphorus (P)-Total			89.9		%		70-130	02-JAN-19
Potassium (K)-Total			94.6		%		70-130	02-JAN-19
Rubidium (Rb)-Total			104.1		%		70-130	02-JAN-19
Selenium (Se)-Total			98.4		%		70-130	02-JAN-19
Sodium (Na)-Total			91.0		%		70-130	02-JAN-19
Strontium (Sr)-Total			89.0		%		70-130	02-JAN-19
Thallium (Tl)-Total			96.7		%		70-130	02-JAN-19
Uranium (U)-Total			100.4		%		70-130	02-JAN-19
Vanadium (V)-Total			88.7		%		70-130	02-JAN-19
Zinc (Zn)-Total			95.4		%		70-130	02-JAN-19
Zirconium (Zr)-Total			0.24		mg/kg		0.05-0.45	02-JAN-19
WG2960889-2 **DUP**		**L2173881-43**						
Aluminum (Al)-Total		<5.0	<5.0	RPD-NA	mg/kg	N/A	40	02-JAN-19
Antimony (Sb)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	02-JAN-19
Arsenic (As)-Total		0.340	0.343		mg/kg	0.8	40	02-JAN-19
Barium (Ba)-Total		0.115	0.172	J	mg/kg	0.058	0.1	02-JAN-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch **R4425197**								
WG2960889-2 **DUP**		**L2173881-43**						
Beryllium (Be)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	02-JAN-19
Bismuth (Bi)-Total		<0.010	<0.010	RPD-NA	mg/kg	N/A	40	02-JAN-19
Boron (B)-Total		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	02-JAN-19
Cadmium (Cd)-Total		0.624	0.705		mg/kg	12	40	02-JAN-19
Calcium (Ca)-Total		444	549		mg/kg	21	60	02-JAN-19
Cesium (Cs)-Total		0.0187	0.0217		mg/kg	15	40	02-JAN-19
Chromium (Cr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	02-JAN-19
Cobalt (Co)-Total		0.901	1.06		mg/kg	16	40	02-JAN-19
Copper (Cu)-Total		6.57	7.94		mg/kg	19	40	02-JAN-19
Iron (Fe)-Total		456	556		mg/kg	20	40	02-JAN-19
Lead (Pb)-Total		<0.050	<0.050	RPD-NA	mg/kg	N/A	40	02-JAN-19
Lithium (Li)-Total		<0.50	<0.50	RPD-NA	mg/kg	N/A	40	02-JAN-19
Magnesium (Mg)-Total		598	719		mg/kg	18	40	02-JAN-19
Manganese (Mn)-Total		5.37	6.68		mg/kg	22	40	02-JAN-19
Molybdenum (Mo)-Total		0.685	0.767		mg/kg	11	40	02-JAN-19
Nickel (Ni)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	02-JAN-19
Phosphorus (P)-Total		10500	12500		mg/kg	17	40	02-JAN-19
Potassium (K)-Total		9390	11200		mg/kg	17	40	02-JAN-19
Rubidium (Rb)-Total		22.2	25.8		mg/kg	15	40	02-JAN-19
Selenium (Se)-Total		3.18	3.84		mg/kg	19	40	02-JAN-19
Sodium (Na)-Total		4680	5510		mg/kg	16	40	02-JAN-19
Strontium (Sr)-Total		0.24	0.31		mg/kg	23	60	02-JAN-19
Tellurium (Te)-Total		<0.020	<0.020	RPD-NA	mg/kg	N/A	40	02-JAN-19
Thallium (Tl)-Total		0.0289	0.0321		mg/kg	11	40	02-JAN-19
Tin (Sn)-Total		0.27	0.35		mg/kg	27	40	02-JAN-19
Uranium (U)-Total		<0.0020	<0.0020	RPD-NA	mg/kg	N/A	40	02-JAN-19
Vanadium (V)-Total		0.13	0.18		mg/kg	32	40	02-JAN-19
Zinc (Zn)-Total		73.8	88.1		mg/kg	18	40	02-JAN-19
Zirconium (Zr)-Total		<0.20	<0.20	RPD-NA	mg/kg	N/A	40	02-JAN-19
WG2960889-4 **LCS**								
Aluminum (Al)-Total			93.1		%		70-130	02-JAN-19
Antimony (Sb)-Total			86.4		%		70-130	02-JAN-19
Arsenic (As)-Total			89.4		%		70-130	02-JAN-19
Barium (Ba)-Total			95.6		%		70-130	02-JAN-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch R4425197								
WG2960889-4 LCS								
Beryllium (Be)-Total			90.2		%		70-130	02-JAN-19
Bismuth (Bi)-Total			88.2		%		70-130	02-JAN-19
Boron (B)-Total			98.1		%		70-130	02-JAN-19
Cadmium (Cd)-Total			88.4		%		70-130	02-JAN-19
Calcium (Ca)-Total			93.3		%		70-130	02-JAN-19
Cesium (Cs)-Total			87.6		%		70-130	02-JAN-19
Chromium (Cr)-Total			96.4		%		70-130	02-JAN-19
Cobalt (Co)-Total			96.0		%		70-130	02-JAN-19
Copper (Cu)-Total			113.3		%		70-130	02-JAN-19
Iron (Fe)-Total			113.1		%		70-130	02-JAN-19
Lead (Pb)-Total			89.0		%		70-130	02-JAN-19
Lithium (Li)-Total			100.4		%		70-130	02-JAN-19
Magnesium (Mg)-Total			94.4		%		70-130	02-JAN-19
Manganese (Mn)-Total			100.4		%		70-130	02-JAN-19
Molybdenum (Mo)-Total			94.0		%		70-130	02-JAN-19
Nickel (Ni)-Total			96.6		%		70-130	02-JAN-19
Phosphorus (P)-Total			94.6		%		70-130	02-JAN-19
Potassium (K)-Total			97.9		%		70-130	02-JAN-19
Rubidium (Rb)-Total			94.5		%		70-130	02-JAN-19
Selenium (Se)-Total			88.1		%		70-130	02-JAN-19
Sodium (Na)-Total			94.2		%		70-130	02-JAN-19
Strontium (Sr)-Total			97.5		%		70-130	02-JAN-19
Tellurium (Te)-Total			88.9		%		70-130	02-JAN-19
Thallium (Tl)-Total			88.3		%		70-130	02-JAN-19
Tin (Sn)-Total			86.6		%		70-130	02-JAN-19
Uranium (U)-Total			94.6		%		70-130	02-JAN-19
Vanadium (V)-Total			95.2		%		70-130	02-JAN-19
Zinc (Zn)-Total			86.4		%		70-130	02-JAN-19
Zirconium (Zr)-Total			92.5		%		70-130	02-JAN-19
WG2960889-1 MB								
Aluminum (Al)-Total			<5.0		mg/kg		5	02-JAN-19
Antimony (Sb)-Total			<0.010		mg/kg		0.01	02-JAN-19
Arsenic (As)-Total			<0.030		mg/kg		0.03	02-JAN-19
Barium (Ba)-Total			<0.050		mg/kg		0.05	02-JAN-19

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-DRY-MICR-HRMS-VA	**Tissue**							
Batch **R4425197**								
WG2960889-1 **MB**								
Beryllium (Be)-Total			<0.010		mg/kg		0.01	02-JAN-19
Bismuth (Bi)-Total			<0.010		mg/kg		0.01	02-JAN-19
Boron (B)-Total			<1.0		mg/kg		1	02-JAN-19
Cadmium (Cd)-Total			<0.010		mg/kg		0.01	02-JAN-19
Calcium (Ca)-Total			<20		mg/kg		20	02-JAN-19
Cesium (Cs)-Total			<0.0050		mg/kg		0.005	02-JAN-19
Chromium (Cr)-Total			<0.20		mg/kg		0.2	02-JAN-19
Cobalt (Co)-Total			<0.020		mg/kg		0.02	02-JAN-19
Copper (Cu)-Total			<0.20		mg/kg		0.2	02-JAN-19
Iron (Fe)-Total			<5.0		mg/kg		5	02-JAN-19
Lead (Pb)-Total			<0.050		mg/kg		0.05	02-JAN-19
Lithium (Li)-Total			<0.50		mg/kg		0.5	02-JAN-19
Magnesium (Mg)-Total			<2.0		mg/kg		2	02-JAN-19
Manganese (Mn)-Total			<0.050		mg/kg		0.05	02-JAN-19
Molybdenum (Mo)-Total			<0.040		mg/kg		0.04	02-JAN-19
Nickel (Ni)-Total			<0.20		mg/kg		0.2	02-JAN-19
Phosphorus (P)-Total			<10		mg/kg		10	02-JAN-19
Potassium (K)-Total			<20		mg/kg		20	02-JAN-19
Rubidium (Rb)-Total			<0.050		mg/kg		0.05	02-JAN-19
Selenium (Se)-Total			<0.10		mg/kg		0.1	02-JAN-19
Sodium (Na)-Total			<20		mg/kg		20	02-JAN-19
Strontium (Sr)-Total			<0.10		mg/kg		0.1	02-JAN-19
Tellurium (Te)-Total			<0.020		mg/kg		0.02	02-JAN-19
Thallium (Tl)-Total			<0.0020		mg/kg		0.002	02-JAN-19
Tin (Sn)-Total			<0.10		mg/kg		0.1	02-JAN-19
Uranium (U)-Total			<0.0020		mg/kg		0.002	02-JAN-19
Vanadium (V)-Total			<0.10		mg/kg		0.1	02-JAN-19
Zinc (Zn)-Total			<1.0		mg/kg		1	02-JAN-19
Zirconium (Zr)-Total			<0.20		mg/kg		0.2	02-JAN-19
MOISTURE-MICR-VA	**Tissue**							
Batch **R4423636**								
WG2960892-3 **DUP**		**L2173881-43**						
% Moisture		74.1	75.3		%	1.5	20	27-DEC-18
WG2960892-2 **LCS**								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MOISTURE-MICR-VA	**Tissue**							
Batch R4423636								
WG2960892-2 LCS								
% Moisture			100.0		%		90-110	27-DEC-18
WG2960892-1 MB								
% Moisture			<2.0		%		2	27-DEC-18
MOISTURE-TISS-VA	**Tissue**							
Batch R4333030								
WG2929746-3 DUP		**L2173881-1**						
% Moisture		78.9	78.9		%	0.0	20	13-NOV-18
WG2929746-6 DUP		**L2173881-30**						
% Moisture		80.1	80.1		%	0.0	20	13-NOV-18
WG2929746-2 LCS								
% Moisture			100.4		%		90-110	13-NOV-18
WG2929746-5 LCS								
% Moisture			100.2		%		90-110	13-NOV-18
WG2929746-1 MB								
% Moisture			<0.50		%		0.5	13-NOV-18
WG2929746-4 MB								
% Moisture			<0.50		%		0.5	13-NOV-18
Batch R4383673								
WG2949291-3 DUP		**L2173881-55**						
% Moisture		75.0	74.7		%	0.5	20	08-DEC-18
WG2949291-2 LCS								
% Moisture			94.7		%		90-110	08-DEC-18
WG2949291-1 MB								
% Moisture			<0.50		%		0.5	08-DEC-18
Batch R4383686								
WG2949351-3 DUP		**L2173881-64**						
% Moisture		71.7	72.5		%	1.1	20	08-DEC-18
WG2949351-2 LCS								
% Moisture			99.8		%		90-110	08-DEC-18
WG2949351-1 MB								
% Moisture			<0.50		%		0.5	08-DEC-18

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
J	Duplicate results and limits are expressed in terms of absolute difference.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2173881-COFC

COC Number: 15 -

Report To	Contact and company name below will appear on the final report
Company:	Minnow Environmental Inc.
Contact:	Tyrell Worrall
Phone:	905-873-3371 ext 234
	Company address below will appear on the final report
Street:	2 Lamb Street
City/Province:	Georgetown, ON
Postal Code:	L7G 3M9
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax tworrall@minnow.ca

Email 2

Email 3

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☑ MAIL ☐ FAX

Email 1 or Fax tworrall@minnow.ca

Email 2

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
	4 day [P4] ☐		1 Business day [E1] ☐
	3 day [P3] ☐		Same Day, Weekend or Statutory holiday [E0] ☐
	2 day [P2] ☐		

* Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	Q62002
Job #:	18-45
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L2173881

ALS Contact: Selam Worku **Sampler:** GC, TW

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	WA-01 (Muscle)	12-Sep-18		Tissue	R	R	R	1
	WA-02 (Muscle)	12-Sep-18		Tissue	R	R	R	1
	WA-03 (Muscle)	12-Sep-18		Tissue	R	R	R	1
	WA-04 (Muscle)	12-Sep-18		Tissue	R	R	R	1
	WA-05 (Muscle)	12-Sep-18		Tissue	R	R	R	1
	WA-06 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	WA-07 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	WA-08 (muscle)	13-Sep-18		Tissue	R	R	R	1
	WA-09 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	WA-10 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	WA-11 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	WA-12 (Muscle)	13-Sep-18		Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
-3.2					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: <Original signed by>	Date: 2018 Oct 1	Time: 420	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2173881-COFC

COC Number: 15 -

Report To	Contact and company name below will appear on the final report
Company:	Minnow Environmental Inc.
Contact:	Tyrell Worrall
Phone:	905-873-3371 ext 234
	Company address below will appear on the final report
Street:	2 Lamb Street
City/Province:	Georgetown, ON
Postal Code:	L7G 3M9
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax tworrall@minnow.ca
Email 2
Email 3

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax tworrall@minnow.ca
Email 2

Project Information

ALS Account # / Quote #:	Q62002
Job #:	18-45
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L2173881 **ALS Contact:** Selam Worku **Sampler:** GC, TW

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
4 day [P4]	☐	1 Business day [E1]	☐
3 day [P3]	☐	Same Day, Weekend or Statutory holiday [E0]	☐
2 day [P2]	☐		

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	WA-13 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	WA-14 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	WA-15 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-01 (Muscle)	12-Sep-18		Tissue	R	R	R	1
	NP-02 (Muscle)	12-Sep-18		Tissue	R	R	R	1
	NP-03 (Muscle)	12-Sep-18		Tissue	R	R	R	1
	NP-04 (Muscle)	12-Sep-18		Tissue	R	R	R	1
	NP-05 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-06 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-07 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-08 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-09 (Muscle)	13-Sep-18		Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
-3.2					

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by: <Original signed by>	Date: Oct 1 2018	Time: 420

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L2173881-COFC

COC Number: 15 -

Report To	Contact and company name below will appear on the final report	Report Format / Distribution	
Company:	Minnow Environmental Inc.	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	
Contact:	Tyrell Worrall	Quality Control (QC) Report with Report ☑ YES ☐ NO	
Phone:	905-873-3371 ext 234	☐ Compare Results to Criteria on Report - provide details below if box checked	
	Company address below will appear on the final report	Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Street:	2 Lamb Street	Email 1 or Fax tworrall@minnow.ca	
City/Province:	Georgetown, ON	Email 2	
Postal Code:	L7G 3M9	Email 3	
Invoice To	Same as Report To ☑ YES ☐ NO	**Invoice Distribution**	
	Copy of Invoice with Report ☐ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX	
Company:		Email 1 or Fax tworrall@minnow.ca	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q62002	AFE/Cost Center:	PO#
Job #:	18-45	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2173881 **ALS Contact:** Selam Worku **Sampler:** GC, TW

Select Service Level: E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4] ☐ | 3 day [P3] ☐ | 2 day [P2] ☐

EMERGENCY: 1 Business day [E1] ☐ | Same Day, Weekend or Statutory holiday [E0] ☐

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	NP-10 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-11 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-12 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-13 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-14 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	NP-15 (Muscle)	13-Sep-18		Tissue	R	R	R	1
	WA-01 (Liver)	12-Sep-18		Tissue	R	R	R	1
	WA-02 (Liver)	12-Sep-18		Tissue	R	R	R	1
	WA-03 (liver)	12-Sep-18		Tissue	R	R	R	1
	WA-04 (Liver)	12-Sep-18		Tissue	R	R	R	1
	WA-05 (Liver)	12-Sep-18		Tissue	R	R	R	1
	WA-06 (Liver)	13-Sep-18		Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
-3.2					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: <Original signed by>	Date: Oct 1 2018	Time: 920	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2173881-COFC

COC Number: 15 -

Report To	Contact and company name below will appear on the final report
Company:	Minnow Environmental Inc.
Contact:	Tyrell Worrall
Phone:	905-873-3371 ext 234
	Company address below will appear on the final report
Street:	2 Lamb Street
City/Province:	Georgetown, ON
Postal Code:	L7G 3M9
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	tworrall@minnow.ca
Email 2	
Email 3	
Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	tworrall@minnow.ca
Email 2	

Select Service Level Below - Please contact your AM to confirm all E&P TATs

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
4 day [P4]	☐	1 Business day [E1]	☐
3 day [P3]	☐	Same Day, Weekend or Statutory holiday [E0]	☐
2 day [P2]	☐		

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q62002	AFE/Cost Center:	PO#:
Job #:	18-45	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2173881 **ALS Contact:** Selam Worku **Sampler:** GC, TW

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	WA-07 (Liver)	13-Sep-18		Tissue	R	R	R	1
	WA-08 (Liver)	13-Sep-18		Tissue	R	R	R	1
	WA-09 (Liver)	13-Sep-18		Tissue	R	R	R	1
	WA-10 (Liver)	13-Sep-18		Tissue	R	R	R	1
	WA-11 (Liver)	13-Sep-18		Tissue	R	R	R	1
	WA-12 (Liver)	13-Sep-18		Tissue	R	R	R	1
	WA-13 (Liver)	13-Sep-18		Tissue	R	R	R	1
	WA-14 (Liver)	13-Sep-18		Tissue	R	R	R	1
	WA-15 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-01 (Liver)	12-Sep-18		Tissue	R	R	R	1
	NP-02 (Liver)	12-Sep-18		Tissue	R	R	R	1
	NP-03 (Liver)	12-Sep-18		Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
-3.20					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: <Original signed by>	Date: Oct 1 2016	Time: 920	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2173881-COFC

COC Number: 15 -

Report To	Contact and company name below will appear on the final report
Company:	Minnow Environmental Inc.
Contact:	Tyrell Worrall
Phone:	905-873-3371 ext 234
	Company address below will appear on the final report
Street:	2 Lamb Street
City/Province:	Georgetown, ON
Postal Code:	L7G 3M9
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax tworrall@minnow.ca

Email 2

Email 3

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax tworrall@minnow.ca

Email 2

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
	4 day [P4] ☐		1 Business day [E1] ☐
	3 day [P3] ☐		Same Day, Weekend or Statutory holiday [E0] ☐
	2 day [P2] ☐		

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	Q62002
Job #:	18-45
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only) L2173881 **ALS Contact:** Selam Worku **Sampler:** GC, TW

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	NP-04 (Liver)	12-Sep-18		Tissue	R	R	R	1
	NP-05 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-06 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-07 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-08 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-09 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-10 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-11 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-12 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-13 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-14 (Liver)	13-Sep-18		Tissue	R	R	R	1
	NP-15 (Liver)	13-Sep-18		Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
-3.2					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: <Original signed by>	Date: OCT 1 2018	Time: 420	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

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1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L2173881-COFC

COC Number: 15 -

Report To	Contact and company name below will appear on the final report
Company:	Minnow Environmental Inc.
Contact:	Tyrell Worrall
Phone:	905-873-3371 ext 234
	Company address below will appear on the final report
Street:	2 Lamb Street
City/Province:	Georgetown, ON
Postal Code:	L7G 3M9
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	tworrall@minnow.ca
Email 2	
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	tworrall@minnow.ca
Email 2	

Project Information	
ALS Account # / Quote #:	Q62002
Job #:	18-45
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)	
AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L2173881 **ALS Contact:** Selam Worku **Sampler:** GC, TW

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
4 day [P4]	☐	1 Business day [E1]	☐
3 day [P3]	☐	Same Day, Weekend or Statutory holiday [E0]	☐
2 day [P2]	☐		

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	WA-01 (Ovary)	12-Sep-18		Tissue	R	R	R	1
	WA-04 (Ovary)	12-Sep-18		Tissue	R	R	R	1
	WA-08 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	WA-09 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	WA-11 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	WA-12 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	NP-02 (Ovary)	12-Sep-18		Tissue	R	R	R	1
	NP-06 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	NP-07 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	NP-08 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	NP-09 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	NP-10 (Ovary)	13-Sep-18		Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
-3.2					

SHIPMENT RELEASE (client use)		
Released by:	Date:	Time:

INITIAL SHIPMENT RECEPTION (lab use only)		
Received by: <Original signed by>	Date: Oct 1 2016	Time: 420

FINAL SHIPMENT RECEPTION (lab use only)		
Received by:	Date:	Time:

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ALS Environmental

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Canada Toll Free: 1 800 668 9878

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COC Number: 15 -

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Company:	Minnow Environmental Inc.
Contact:	Tyrell Worrall
Phone:	905-873-3371 ext 234
	Company address below will appear on the final report
Street:	2 Lamb Street
City/Province:	Georgetown, ON
Postal Code:	L7G 3M9
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report	☑ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	tworrall@minnow.ca
Email 2	
Email 3	

Invoice Distribution	
Select Invoice Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	tworrall@minnow.ca
Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	Q62002	AFE/Cost Center:	PO#
Job #:	18-45	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	

ALS Lab Work Order # (lab use only): L2173881 **ALS Contact:** Selam Worku **Sampler:** GC, TW

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
4 day [P4]	☐	1 Business day [E1]	☐
3 day [P3]	☐	Same Day, Weekend or Statutory holiday [E0]	☐
2 day [P2]	☐		

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	ICPMS Metals (Dry)	Total Mercury (Dry)	Moisture Content	Number of Containers
	NP-12 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	NP-13 (Ovary)	13-Sep-18		Tissue	R	R	R	1
	NP-15 (Ovary)	13-Sep-18		Tissue	R	R	R	1

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☐ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
-3.2					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by:	Date:	Time:	Received by: <Original signed by>	Date: Oct 1 2018	Time: 1420	Received by:	Date:	Time:

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WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

L2173881-COFC

Client: Minnow

Verified By	Date	Time	Sample Integrity, Issues: Enter information on back page
Sample Layout Verification:			
Labels Verification:	Verified By: LM		Do any samples require prep? NO P F/P

		Sample #:	L-75														
1L	Plastic																
500mL	Plastic																
250mL	Plastic																
145mL	Plastic																
60mL	Plastic																
Micro																	
Toxicity Pail																	
1L	Glass																
500mL	Glass																
250mL	Glass																
120mL	Glass																
60mL	Glass																
40mL	Vial (Glass)																
40mL	Methanol Vials																
Soil Jar (120, 250 or 500mL)																	
Other:	Fish		1														
Other:																	
Total Number of Bottles																	

Trip/Travel/Field Blank Information

Solids Batch#:	Metals Batch#:	T:	D:
Routine Batch#:	Mercury Batch#:	T:	D:
BOD Batch#:	Cyanide Batch#:	T:	D:
Nutrients Batch#:	OGG Batch#:		
DOC/Carbon Batch#:	Phenols Batch#:		
VOC Batch#:			
Other:			

COOLER TRACKING

EPP		Coleman	
Small		Micro (5QT)	
Med		Sm(9QT)	
Lrg		Med(16QT)	
Micro Box		Lrg(28QT)	1
		Lrg(48QT)	

NEW GOLD RAINY RIVER MINE
APPENDIX H
SPILL REPORTING PROCEDURE

newgold™ Rainy River Project		ENV-PRO-001-15A Site Wide Spill Reporting Procedure	
Owner: Environmental Specialist	**Approver**: Darrell Martindale Chris McGoldrick	Status: **Draft**	**Date Created:** July 11, 2015
		Review Frequency: **3 Years**	**Effective Date:** October 19, 2016

1. Purpose

The purpose of the following document is to clarify spill reporting requirements and responsibilities for those working on the Rainy River Project site including spill tracking and external required reporting.

This document is designed to be consistent with Federal and Provincial Reporting Regulations, Corporate Standards for spill reporting (EMS Standard 008.01) and aligned with additional agreements New Gold has entered into.

2. Scope

This procedure is an outline of the spill reporting responsibilities for anyone working on the Project Site.

3. Definitions

Spill

A spill is defined as a “spill”, when used with reference to a pollutant, and means a discharge:

(a) into or onto the natural environment,

(b) from or out of a structure, vehicle or other container, and

(c) is abnormal in quality or quantity in light of all the circumstances of the discharge.

Spills requiring reporting under this requirement do not include approved discharges such as discharges to air, water and land approved under the Environmental Protection Act (EPA) or other regulatory approval provided the discharge is compliant with the approval. Further exempt from this reporting requirement are any other areas exempted by the Regulation e.g., planned spills.

Spill volume is the amount of material that contacted the environment (ground, water or air). The Project Site is defined as;

- All project components plus approximately 100 m zone;
- Highway 600 from Hwy 71 to Seven Bends;
- Teeple Road from Hwy 71 to Hwy 600;
- Municipal roads used for access including but not limited to Teeple Road, Roen Road, Korpi Road and Eluik Road; or

As designated by the Construction Director as the Project progresses

4. Responsibilities and Accountabilities

Construction Management and General Manager

- Support implementation of the Reporting Procedures
- Conduct follow up investigation

Department and Area Managers

- Support the Procedure and ensure respective areas support the plan and all of its components
- Lead follow up investigation

Environmental Department

- Provide support on reporting and clean up including sampling where necessary
- Support the root cause analysis process
- Provide external reporting guidance
- Maintain a registry of all spills
- Distribute spill information to authorized internal and external stakeholders

Supervisors (of the crew reporting the spill)

- Spill is reported consistent with this procedure based on size of spill and location
- Spill is cleaned up properly and contaminated waste management disposed of appropriately, with records of disposal included with the Spill Report
- Spill kits are restocked after any products used
- Record of removal of spilled material is sent to the Environmental Dept.
- Any contaminated material is sent to a location approved for this purpose by the Environmental Department
- Support follow up investigation

Employees and Contractors

- Report spills and respond appropriately, consistent with spill response requirements

5. Guidelines & Instructions

- **Reporting Requirements**

All spill reporting must meet general requirements (see Appendix 1)

- All spills to be reported immediately to crew supervisors.
- Crew supervisors to determine immediate response.
- All spills to be documented using the Spill Reporting Form (Appendix 2) by the person first observing the spill or their supervisor or designate familiar with the spill within the timelines set out in this procedure before the end of shift consistent with site HSE reporting and communication.
- The detailed Spill Report to be copied to the following emails: RainyRiver.Enviro@newgold.com and RainyRiver.Incident@newgold.com
- For New Gold Departments only, the incident details will be entered into InControl software within 24 hours of the occurrence by the supervisor or designate.

Additional requirements for externally reportable spills exceeding mandatory reporting thresholds of O. Reg 675/98 (Table 1) and spills on third party property

within the project site (e.g., municipal roads, Hwy 600, Table 2):

- Supervisor to contact site Environment Team via site radio
- In the event the spill is outside 0700hrs to 1730hrs the initial contact should be directed to:

  i. the H&S team and
  ii. the nominated site Regulatory Contact – Chris McGoldrick or designate and
  iii. Environmental On-Call (Environmental Manager or designate)

Additional requirements for spills that pose an immediate threat to human life/health and sustained and ongoing threat to the environment (e.g., bulk fuels, sediment dam breach, truck roll over):

- Initiate Emergency Response Plan through site radios and indicate environmental emergency
- The Environment On-Call (Environment Manager or designate) will be contacted immediately.

Table 1: Reportable Levels for Different Substances (off municipal/provincial roads) (O.Reg 675/98)

Substance Spilled	Reporting Threshold
Refrigerants (as listed in O Reg 189/94)	100 Kg
Hydrocarbons • Gasoline • Petroleum products	100 L, any if into water
Electrical utilities (excluding PCB's) • Oil from Transformers	100 L, any if into water
Dangerous goods (as listed in TDG act)	*See TDG Act Schedule 1 for complete list*
Class 1, Explosives	10 kg, any quantity that poses a public risk
Class 2, Gases • SO2	Any release of 10 + minutes, any quantity that poses a public risk
Class 3, Flammable Liquids	200 L, any if into water
Class 4, Flammable Solids/Water-Reactive Substances	25 kg, any if into water
Class 5.1, Oxidizing Substances • O2	50 kg/ 50 L
Class 5.2, Organic Peroxides	1 kg/ 1
Class 6, Toxic Substances • Cyanide, Copper Sulfate, Sodium Metabisulfite	5 kg/ 5 L
Class 6.2, Infectious Substances • N/A	Any quantity
Class 7, Radioactive Materials • Nuclear Devices	Any quantity that poses a public risk
Class 8, Corrosives • Hydrochloric Acid, Sodium Hydroxide, Lime	5 kg/ 5 L
• Class 9, Miscellaneous Products, Substances or Organisms such as fertilizer, tailings and contaminated water	25 kg/ 25 L

Table 2: Exemptions for spill reporting on Highways	
ID	**Description**
(a)	Less than 100 L of fluid other than other than fluid transported as cargo, from the fuel system or other operating system of a motor vehicle.
(b)	the spill does not enter and is not likely to enter any waters, as defined in the Ontario Water Resources Act, directly or through drainage structures
(c)	the spill does not cause and is not likely to cause any adverse effects, other than those that are readily remediated through cleanup and restoration of surfaces that are prepared for vehicular traffic or paved, graveled, sodded areas adjacent to those surfaces
(d)	Arrangements for the remediation referred to in clause (c) are made and carried out immediately.

- **Documentation**

The Spill Report Form will be used as the investigation report. The report must be completed prior to the end of shift. The Supervisor or Area Manager for that area of works is responsible for ensuring its completion and submission prior to the end of shift.

All records must be maintained for 5 years in New Gold's incident reporting system, InControl.

Spills

- The Spill Report is to be produced as above and is the responsibility of the Supervisor or Area Manager before the end of shift.
- New Gold Environment Team will update site spill log consistent with O.Reg 675/98
- Every quarter an internal spill will have a follow up investigation, for the purpose of spill prevention, by the Environmental Department.

Where spills are externally reportable

- Contact the Environment On-Call immediately
- The Environment Manager or designate will contact the Management Group and any external reporting requirements.
- The Spill Report is to be produced as above and is the responsibility of the Supervisor or Area Manager before the end of shift
- Spill reporting to be entered into InControl software by the H&S team and ranked in InControl based on Consequence/Severity table as defined by 002.06_Corporate ESR Incident Reporting Guidelines.
- Follow up investigations may be required.

6. References

7. Appendix

Appendix 1: Site Spill Response Flow Chart

Appendix 2: Spill Reporting Form

CONTROLLED DOCUMENT
Printed copies are uncontrolled within 24 hours
Information within is privileged and not for redistribution

Appendix 1

SITE SPILL RESPONSE

Communicate spill to supervisor

Cease flow from source, If Safe To Do So

Contain spill from spreading, If Safe To Do So

Does spill pose immediate threat to human life/health and sustained and ongoing threat to the environment?

YES

Initiate emergency response plan through site radios and indicate environmental emergency.

- Supervisor to contact site Environmental Team via site radio Channel 4.
- Complete spill report (Attachment 2) and submit to RainyRiver.Enviro@newgold.com and RainyRiver.Incident@newgold.com
- A preliminary spill investigation to be completed **before end of shift** using documentation as for a safety incident.
- A final spill investigation report to be completed **within 24 hours** following a meeting to review the outcome of the preliminary report.

- Clean up spill properly and contaminated waste management disposed of appropriately.
- Restock spill kits after any product is used.

NO

Is the spill externally reportable…?

- A hydrocarbon over 100 L?
- An in water spill of any amount of any product?
- On third party property?
- A gas release of 10+ minutes?
- An explosive spill over 25 kg?
- A flammable liquid over 200 L?
- A refrigerant over 100 kg?

NO

- Clean up spill properly and contaminated waste management disposed of appropriately.
- Restock spill kits after any product is used.
- Complete spill report and submit to RainyRiver.Enviro@newgold.com and RainyRiver.Incident@newgold.com

Appendix 2

newgold™ Rainy River Project

SPILL REPORTING FORM

Date of reporting:		Time of reporting:
Person first observing spill/witness;		Weather:
Employer/Contractor associated with spill;		
Date of spill:	Time of Spill:	Duration of spill:
Type of spilled material:		
Volume spilled:		
Spill location and address:		
Distance to, and nature of, nearest sensitive receptors (watercourse, 3rd party, residence):		
Did any spill flow into watercourse or drainage? Yes No :		
Action taken, status of clean up and success of clean up:		
Volume of contaminated material removed from site:		
Type of contaminated material removed from site:		
Method of disposal (attach copy of documentation):		
Description of spill/Activity at time of spill:		
Equipment or source of spill (make/model/ID):		
Preliminary assessment of cause: Mechanical Failure Impact/Collision Procedural error MVA Other (describe) :		
Items used from spill kit:		kit replenished: ☐ Y ☐ N
Preliminary corrective actions/mitigation:		
Report completed by:		Contact information:
Title/Company:		Date:

Please email to: RainyRiver.Enviro@newgold.com and RainyRiver.Incident@newgold.com

newgold™ Rainy River Project

Operating Procedure

Document Title: Environmental Department Spill Reporting Procedure	**Document Number:** ENV-SOP-0002
Owner: Environmental Manager	

Review Coding	
☐	Code 1 – Reviewed with No Comments
☐	Code 2 – Reviewed with Minor Comments
☐	Code 3 – Reviewed with Major Comments
☐	Code 4 – Not Accepted
☐	Code 5 – Information Only

Rev	Rev Date	Issued For	Prepared By	Reviewed By	Approved By
A	Oct 26th, 2017	Review	Carolyn Winik	Darrell Martindale	
1	Jan 31st, 2018	Approval	Carolyn Winik	Sylvie St. Jean	
2	February 12th, 2018	Approval	Jono Irwin	Sylvie St Jean	

newgold™ Rainy River		ENV-SOP-0002 Environmental Department Spill Reporting Procedure	
Owner: Senior Environmental Specialist	**Approver:** Manager Environment	Status: **Approved**	**Date Created:** July 11, 2015
		Review Frequency: **1 Year**	**Effective Date: February 1st, 2018**

1. Purpose

The purpose of the following document is to clarify spill reporting responsibilities of the Environmental Department for the Rainy River Mine including spill tracking and external required reporting. This document is designed to be consistent with Federal and Provincial Reporting Regulations, Corporate Standards for spill reporting (EMS Standard 008.01) and aligned with additional agreements New Gold has entered into. Spill response requirements and responsibilities for those working on the Rainy River Mine can be found in ENV-SOP-0001.

2. Scope

This procedure is an outline of the spill reporting responsibilities for the Environmental Department.

3. Definitions

Spill	A spill is defined as a "spill", when used with reference to a pollutant, and means a discharge: (a) into or onto the natural environment, (b) from or out of a structure, vehicle or other container, and (c) that is abnormal in quality or quantity in light of all the circumstances of the discharge. Spills requiring reporting under this requirement do not include approved discharges such as discharges to air, water and land approved under the Environmental Protection Act (EPA) or other regulatory approval provided the discharge is compliant with the approval. Spill volume is the amount of material that contacted the environment (ground, water or air).
Project Site	The Project Site is defined as; • All project components plus approximately 100 m zone; • Highway 600 from Hwy 71 to Seven Bends; • Teeple Road from Hwy 71 to Hwy 600; • Municipal roads used for access including but not limited to Teeple Road, Roen Road, Korpi Road and Eluik Road; or • As designated by the Construction Director as the Project progresses.

4. Responsibilities and Accountabilities

Rainy River Manager Environment

- Approves this policy and ensures its communication to site personnel
- Oversees the Environmental Department to ensure compliance with this procedure
- Is responsible to ensure reportable spills are communicated appropriately to regulatory bodies in line with approvals and reporting requirements

Environmental Department

- Provide support to Rainy River personnel and contractors in regards to spill response and reporting, including sampling where necessary
- Maintains an on call schedule to ensure support is provided to mine personnel 24 hours a day
- Contacts the Spill Action Centre as a first contact after a reportable spill
- Compiles incident details and composes follow up letters detailing incidents to regulators
- Maintain a registry of all spills
- Distribute spill information to authorized internal and external stakeholders

Department and Area Managers

- Support the procedure and ensure departmental staff follow its expectations
- Ensure departmental Supervisors are trained to lead the spill response within their crews and are famillure with the external reporting thresholds
- Support any follow up investigations as required

Supervisors (of the crew reporting the spill)

- Ensure that the spill incident procedure is managed effectively and limits impact to the environment as much as possible
- Report all spills consistent with ENV-SOP-0001 and determine if spills are externally reportable
- Lead any follow up investigations

Employees and Contractors

- Report all spills and respond appropriately, consistent with spill response requirements as detailed further in ENV-SOP-0001

5. Guidelines & Instructions

Spills that pose an immediate threat to human life/health and sustained and ongoing threat to the environment (e.g., bulk fuels, sediment dam breach, truck roll over):

- Initiate Emergency Response Plan through site radios and indicate Environmental emergency
    - The Environment On-Call (Environment Manager or designate) will be contacted immediately.

5.1 Spill Response

- The Environmental Department will be called as soon as possible following an Externally Reportable Spill as outlined in ENV-SOP-0001
    - via radio Channel 4 or phone 1-807-632-6152
- The main function of the Environmental Department during the initial spill responde is to provide immediate assistance to site personnel in relation to the containment of the spill and remedial actions necessary

5.2 Regulatory Reporting

Externally reportable spills exceeding mandatory reporting thresholds of O. Reg 675/98 (Table 1) and spills on third party property within the project site (e.g., municipal roads, Hwy 600, Table 2):

- Environmental Manager or designate to follow "Environmental Reportable Incident Call List" Appendix 3.
- The Manager or designate will contact the Spills Action Center at 1-800-268-6060 and report:
    - your name and phone number
    - name and phone number of the person or company in control of the product spilled
    - date, time and location of the spill
    - duration of the spill (if known) and whether the spill is ongoing
    - type and quantity of pollutant spilled, including hazard level or toxicity information
    - source of the spill and information on the cause
    - description of adverse effects
    - environmental conditions that affect the spill (weather, traffic, etc.)
    - actions being taken to respond
    - other agencies and parties responding
- A follow-up report detailing the incident must be submitted via a transmittal to regulatory bodies within the time frames detailed below. The report must include:
    - The measures that were taken to mitigate the effects of the occurrence;
    - If an emergency response plan was implemented, details concerning its implementation; and
    - Changes made to avoid a subsequent occurrence of the accident or malfunction.
        - MOECC within 7 days of incident.
        - MNRF within 7 days of incident, if TSS or Fisheries related.
        - DFO within 30 days of incident.
        - ECCC within 30 days of incident, Adam Scheepers and Dan McDonell.
        - CEAA within 30 days of incident.
- New Gold Environmental Department will update the spill incident in InControl consistent with O.Reg 675/98 when Spill Report Form is received.
    - Classify incidents according to the NG Risk Consequence categories (Level 1, 2 or 3) as per 008.04 Incident Assessment and Response Matrix

5.3 Follow up Investigation

- Following the initial incident and once clean up has been completed, an initial investigation of the incident should take place. This will be lead by the Supervisor responsible for the area in which the spill occurred with the support of The Environmental Department.

    - The investigation should include all information required for the follow up report as detailed above and focus on implementing measures to reduce the chance of reoccurance

- Root cause analysis is required for all significant incidents. Spills which require this as per 002.06_CORPORATE ESR INCIDENT REPORTING GUIDELINES are:
    - Cyanide spills outside of normal processing area.
    - Hydrocarbon spills that trigger requirement to report to regulatory authorities.
    - Other spills that trigger requirement to report to regulatory authorities.

Table 1: Reportable Levels for Different Substances (off municipal/provincial roads) (O.Reg 675/98)	
Substance Spilled	**Reporting Threshold**
Refrigerants (as listed in O Reg 189/94)	100 Kg
Hydrocarbons • Gasoline • Petroleum products	100 L, any if into water
Electrical utilities (excluding PCB's) • Oil from Transformers	100 L, any if into water
Dangerous goods (as listed in TDG act)	*See TDG Act Schedule 1 for complete list*
Class 1, Explosives	10 kg, any quantity that poses a public risk
Class 2, Gases • SO2	Any release of 10 + minutes, any quantity that poses a public risk
Class 3, Flammable Liquids	200 L, any if into water
Class 4, Flammable Solids/Water-Reactive Substances	25 kg, any if into water
Class 5.1, Oxidizing Substances • O2	50 kg/ 50 L
Class 5.2, Organic Peroxides	1 kg/ 1
Class 6, Toxic Substances • Cyanide, Copper Sulfate, Sodium Metabisulfite	5 kg/ 5 L
Class 6.2, Infectious Substances • N/A	Any quantity
Class 7, Radioactive Materials • Nuclear Devices	Any quantity that poses a public risk
Class 8, Corrosives • Hydrochloric Acid, Sodium Hydroxide, Lime	5 kg/ 5 L
Class 9, Miscellaneous Products, Substances or Organisms	25 kg/ 25 L
Tailings	Any Amount is reportable
Emulsion	Any Amount is reportable

Table 2: Exemptions for spill reporting on Highways	
ID	**Description**
(a)	Less than 100 L of fluid other than other than fluid transported as cargo, from the fuel system or other operating system of a motor vehicle.
(b)	the spill does not enter and is not likely to enter any waters, as defined in the Ontario Water Resources Act, directly or through drainage structures
(c)	the spill does not cause and is not likely to cause any adverse effects, other than those that are readily remediated through cleanup and restoration of surfaces that are prepared for vehicular traffic or paved, graveled, sodded areas adjacent to those surfaces
(d)	Arrangements for the remediation referred to in clause (c) are made and carried out immediately.

6. Documentation

The Spill Report Form is to be completed by Supervisor or Designate of the area in which the spill occurs.

For New Gold Departments only, the incident details are to be entered into InControl software by the supervisor or designate as soon as possible and before shift end.

The Environment Department will update INControl consistent with O. Reg 675/98.

A follow up report is to be sent to the following agencies within the time frames specified below:
Ministry of the Environment and Climate Change (MOECC) - Within 7 Days

Ministry of Natural Resources and Forestry (MNRF) – Within 7 Days

EnvironmentCanada (EC) – Within 30 Days

Department of Fisheries and Oceans (DFO) – Within 30 Days

Canadian Environmental Assessment Agency (CEAA) – Within 30 Days

Every quarter the Environmental Department will review all spills on site and conduct Spill Audits on 10% of reported spills as per ENV-SOP-0006

Root Cause Analysis completed on all externally reportable spills as per EMStd-008.1 Incident and Crisis Management.

7. Reference Table

Ontario Pollution and Spills Reporting
https://www.ontario.ca/page/report-pollution-and-spills

O. Reg 675/98: Classification and Exemption of Spills and Reporting of Discharges:
https://www.ontario.ca/laws/regulation/980675

002.06_CORPORATE ESR INCIDENT REPORTING GUIDELINES

8. Appendix

Appendix 1: Environmental Department Spill Response Flow Chart

Appendix 2: Spill Reporting Form

Appendix 3: Environmental Reportable Call List

Appendix 1: Environmental Department Spill Response Flow Chart

newgold™

ENVIRONMENTAL DEPT. SPILL RESPONSE

Spill reported to Environmental Department via radio, phone or Rainy River Enviro mailbox

Is spill externally reportable?

Is the spill...

- A hydrocarbon over 100 L?
- Sediment release causing TSS greater than 30mg/L?
- Spilled substance into a water body (i.e. a stream, pond, swamp)?
- On third party property?
- A gas (SO2) release of 10+ minutes?
- An explosive spill over 25 kg?
- A flammable liquid over 200 L?
- A refrigerant over 100 kg?

- Ensure Spill Reporting Form, Attachment 2, is completed and sent to rainyriver.enviro@newgold.com and rainyriver.incident@newgold.com.
- Update Site Spill Log in INControl.

YES

Follow Environmental Reportable Incident Call List Attachment 3

- Draft Spill Report Letter (follow previous letter templates)
- Have letter reviewed by Enviro team member and Environmental Manager or designate

- Email letter to Matt Hoffmeister (MOECC) within 7 days matt.hoffmeister@ontario.ca
- If TSS/Fisheries related, email letter to Karli Allen (MNRF) within 7 days karli.allen@ontario.ca
- Email letter to Andrea Doherty (DFO) within 30 days andrea.doherty@dfo-mpo.gc.ca
- Email letter to Adam Scheepers and Dan McDonell (ECCC) within 30 days adam.scheepers@canada.ca and dan.mcdonell@canada.ca
- Email letter to CEAA within 30 days compliance.conformite@ceaa-

October 26, 2017

Appendix 2: Spill Reporting Form

newgold Rainy River

SPILL REPORTING FORM

Date of reporting:		Time of reporting:
Person first observing spill/witness;		Weather:
Employer/Contractor associated with spill;		
Date of spill:	Time of Spill:	Duration of spill:
Type of spilled material:		
Volume spilled:		
Spill location and address:		
Distance to, and nature of, nearest sensitive receptors (watercourse, 3rd party, residence):		
Did any spill flow into watercourse or drainage? Yes ☐ No ☐:		
Action taken, status of clean up and success of clean up:		
Volume of contaminated material removed from site:		
Type of contaminated material removed from site:		
Method of disposal (attach copy of documentation):		
Description of spill/Activity at time of spill:		
Equipment or source of spill (make/model/ID):		
Preliminary assessment of cause: Mechanical Failure ☐ Impact/Collision ☐ Procedural error ☐ MVA ☐ Other (describe) ☐:		
Items used from spill kit:		kit replenished: ☐ Y ☐ N
Preliminary corrective actions/mitigation:		
Report completed by:		Contact information:
Title/Company:		Date:

REPORT ALL SPILLS IMMEDIATELY TO CREW SUPERVISOR

CREW SUPERVISOR TO ASSESS REPORTING REQUIREMENTS CONSISTENT WITH SPILL REPORTING PROCEDURE

CONTACT NEWGOLD ENVIRONMENT IMMEDIATLY IF SPILL IS EXTERNALLY REPORTABLE

1-807-632-6152

Email completed to rainyriver.enviro@newgold.com and rainyriver.incident@newgold.com

ENV-FORM-001 Revision 06 2018-02-02 By: JI

Appendix 3: Environmental Reportable Call List

Environmental Reportable Call List

Person Reporting: _____

Date: _____

Time: _____

Contact Group: Regulatory Point of Contact: Greg Bowkett C- 807-456-3668 Yes_____ No_____ Environmental Manager, Sylvie St. Jean C- 807-707-3497 Yes_____ No_____ Enviro Manager will contact Corporate Office if required Community Relations Manager, Stacey Jack C- 807-456-3780 Yes_____ No_____ Call and email stacey.jack@newgold.com If Stacey is not available, contact Alyson Bisson at C-807-708-3844 alyson.bisson@newgold.com *Community Dept will notify Chappie and designated Communities.* Area Manager of Location of Spill Manager Contacted: _____ Yes_____ No_____ Corporate CSR Director, Dennis Wilson Contact via email dennis.wilson@newgold.com Corporate VP Operations, Cory Atiyeh Contact via email cory.atiyeh@newgold.com
Spills Action Center (SAC) 1-800-268-6060 Yes_____ No_____ (Within 24 hours of spill/exceedance) SAC Reference # _____ Matt Hoffmeister (MOECC) 1-807-468-2703 Yes_____ No_____
Only call if necessary: Adam Scheepers (EC) 1-613-990-9744 Yes_____ No_____ Department of Fisheries and Oceans (DFO) Fisheries Protection 1-855-852-8320 Yes_____ No_____
CANUTEC (TDG) 1-613-996-6666 Yes_____ No_____
Canadian Nuclear Safety Commission 1-613-995-0479 Yes_____ No_____
Company Information: New Gold, Rainy River Project 24 Marr Road Barwick, Ontario P0W 1A0 Rainy River District
* Use the information from the Spill or Exceedance Reporting Form

Revised October 26, 2017

NEW GOLD RAINY RIVER MINE
APPENDIX I
EXCEEDANCE TABLE

newgold™ Rainy River

2018 Regulatory Reportable Exceedances, Complains and Spills

Incident	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Reported	Transmittal #
Spill	New Gold	Mill Operations	2018-01-03	Reclaim Water	Land	500 L	Conveyor transfer tower fire suppression system activated and extinguished by a false alarm (which was a frozen pipe) spilling 500 L of reclaim water.	Reclaim water that travelled outside of west access door froze. Ice material was scraped up and returned to mill process. Reject sump filled and was pumped back onto mill process.	Yes	IFI-0048
Spill	New Gold	Warehouse	2018-03-16	Gear Lubricant	Land	136L	During movement of 45 Gallon drums of Vultrex Gearshield, the telehandler punched a hole in a drum causing 3/4 of the contents to leak out onto the snow and ice surface in the laydown yard at Barron warehouse.	Hydrocarbon, snow, ice, sand and spill pads collected and placed into 40 Gallon drums for removal from site by GFL.	Yes	IFI-0058
Spill	Contractor	TMA North Dam	2018-04-21	Chemical	Land	450L	Loader operator punctured propylene glycol tote with forks causing glycol to spill onto frost protection sand.	Equipment and operators assisted in cleanup. Glycol contaminated sand was dug up and placed into contaminated soil bin for removal from site. Area inspected by New Gold Environment.	Yes	IFI-0069
Exceedance	New Gold	Operations	2018-04-27	24-hr Total Suspended Particulates and Iron	Air	N/A	Laboratory results for March air quality monitoring at Gallinger Road air quality station indicated exceedance of total suspended particulates (TSP) and iron. Exceedances caused by increased vehicle traffic along Gallinger Road.	Remediation includes immediate closure of Gallinger Road to all mine employees travelling to and from the site and regular patrolling by New Gold Management to enforce closure.	Yes	IFI-0072
Spill	New Gold	Mill Processing Plant	2018-05-13	Chemical	Land	26 kg	Transport driver was transferring high calcium lime from tanker truck to the lime silo on the plant site. During the transfer, the delivery hose ruptured spilling approximately 26 kg of granular lime onto the ground.	Granular lime, gravel and dirt collected by mini Bobcat excavator and shoveled into the mill for disposal. Contractor required to replace hose and maintain inspection records on site.	Yes	IFI-0040 Rev B
Spill	New Gold	Open Pit	2018-05-23	Hydrocarbon	Land	3000 liters	Return hydraulic line ruptured releasing 3000 liters onto pit floor.	Hydrocarbons on pit floor were removed by GFL vac truck and taken to Thunder Bay for disposal.	Yes	IFI-0074
Exceedance	New Gold	NORTH AIR QUALITY MONITORING STATION	2018-06-06	DUST	Air	464 micro grams	On April 8 the North air quality monitoring station detected higher than normal levels of dust due to dryer than normal conditions and increased traffic use.	Traffic was restricted and mitigation plan is to cap all on site roads with calcium chloride.	Yes	IFI-0072 Rev C
Spill	New Gold	Processing Plant	2018-06-09	Process Water	Land	500 Liter	Process water overflowed a collection tank. A pump was disconnected causing water to spill out into the truck alley. Excess water overflowed outside the building.	Water transfers stopped until area is clear of water and there was no further risk of water leaving building. Sandbags berm was constructed to stop flow of water outside the building. The event occurred within the immediate area of the mill process building with no impact to any water bodies. Gravel saturated by the spill was dug up and placed inside the mill for processing.	Yes	IFI-0034 Rev D
Spill	New Gold	Tailings Corridor	2018-06-15	Tailings	Land	10 Liters	A pin hole leak in the tailings pipeline resulted in a release of slurry into the tailings containment corridor area.	Mill was shutdown and vacuum truck successfully cleaned spill and disposed of slurry into TMA cell #1	Yes	IFI-0035 Rev B
Spill	Contractor	Borrow Pit	2018-07-15	Hydrocarbon	Land	115 Liters	Excavator blew hydraulic line while loading clay into rock truck in Borrow Pit.	Spill kit was used and area was scraped clean and 40 tons of clay material was placed in certified contamination bin for removal from site.	Yes	IFI-0074 REV B

Spill	New Gold	Process Plant	2018-08-20	Process Water	Land	57 Liters	During pumping of water from inside the process mill pump discard line flipped back over secondary containment wall spilling 57 L of process water onto the access road of door 17W.	Water and mud scrapped up from in front of 17W door and deposited into leach tank secondary containment area. Spill successfully cleaned up by 18:00 hours.	Yes	IFI-0034 Rev E
Spill	New Gold	Process Plant	2018-08-31	Process Water	Land	20 Liters	Water from the grinding circuit migrated out the door 11E.	Water and mud scraped up and deposited into leach tank secondary containment area. Spill successfully cleaned.	Yes	IFI-0034 Rev F
Spill	New Gold	Process Plant	2018-09-13	Tailings Slurry	Land	1000 Liters	A tailings pump kicked out and slurry overflowed the containment and flowed outside doors 9E and 4N.	Grinding operator had a loader operator dump sand at the effected doors to limit the spill out the doors. The spill was cleaned up during the night shift.	Yes	IFI-0078
Spill	New Gold	Plant Site	2018-09-15	Hydrocarbon	Land	100 Liters	Heavy rains during night of September 15th caused flooding of plant site ditching system. Water flooded mill fuel storage laydown area, causing gear oil tote to topple over and spill contents.	All totes and barrels were removed from area. A skid steer excavator scrapped up mud, water, sand, gravels and vegetation. All contaminated materials were deposited into 20 yd3 bin. The bin was removed from site and contaminated material deposited in the Richardson Landfill.	Yes	IFI-0079
Vibration Complaint	New Gold	Land	2018-09-25	Vibration Complaint	Land	n/a	Vibration complaint received from neighbor regarding the 11:00 am blast on September 25, 2018 for the East mine rock stockpile.	Investigation is underway.	Yes	IFI-0020 Rev G
Spill	New Gold	Land	2018-09-27	Chemical	Land	264 gallons	264 gallons of Tris Sulphate spilled at the north end of the mill due to a punctured tote when employee was unloading the tote off of a delivery truck.	Area was bermed off and contained. Chemical was neutralized during the rain event on the day. Contaminated soil was transferred to cell 1 for further treatment.	Yes	IFI-0082
Spill	New Gold	Land	2018-10-01	Hydrocarbon	Land	200 L	While moving totes operator punctured a tote of gear oil.	Leak was contained using spill pads. Soil was placed in certified containment bins for removal from site.	Yes	IFI-0083
Spill	New Gold	Air	2018-11-22	Dust	Land		Due to lack of water in cell 1 of the TMA dust was created	Water was placed on cell 1 to prevent dust from forming.	Yes	IFI-0087
Spill	New Gold	Land	2018-11-27	Tailings	Land		Leak in tailings corridor	Tailings were dumped into tailings spill ponds where the mill tailings lines go to.	Yes	IFI- 0078 Rev B
Spill	New Gold	East Outcrop	2018-12-20	Hydrocarbon	Land	450 Liters	Punctured fuel tank on drill	Vacuum truck was utilized and material was placed in certified containment bin for removal from site	Yes	IFI-0015 Rev D
Exceedance	New Gold	Noise	2018-06-03	Sound Threshold Exceedance	Noise	51 to 54 dBA	Monitoring stations picked up sound threshold levels of 51 to 54 dBA. Upon investigation it was determined these sound thresholds were caused by weather events (wind).	Reported to MNRF - Natural event no remediation required.	Yes	IPT-0097 Rev B
Potential Exceedance	New Gold	Noise	2018-05-05	Monitoring equipment recorded sound levels exceeding a 50 dBA sound threshold	Noise	>50 dBA	Acoustic audit monitoring equipment in Whip-poor-will habitat areas recorded noise levels exceeding permitted limits on two occasions. Monitoring equipment recorded sound levels of 60 dBA at 3 am on May 1st and 52 dBA at 11 pm on May 3rd.	Reported to MNRF - Natural event no remediation required.	Yes	IPT-0097
Exceedance	New Gold	Noise	2018-06-06	Sound Threshold Exceedance	Noise	51 to 52 dBA	Monitoring stations picked up sound threshold levels of 51 to 52 dBA. Upon investigation it was determined these sound thresholds were caused by weather events (wind).	Reported to MNRF - Natural event no remediation required.	Yes	IPT-0099

NEW GOLD RAINY RIVER MINE
APPENDIX J
DMBPP MONITORING RESULTS

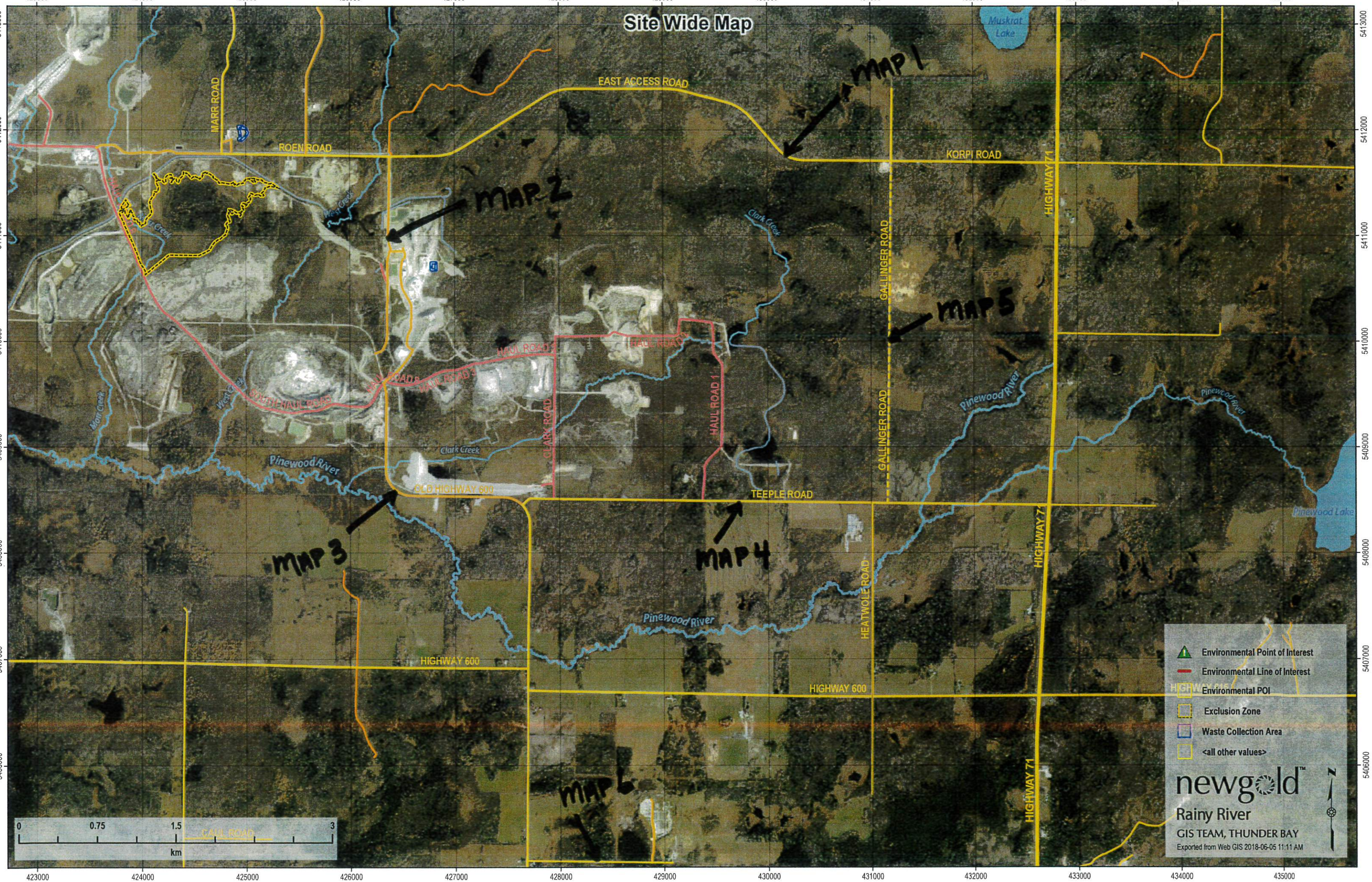
802
CR20000K
07/06/2018

816
816
07/12/2018

802
802
07/12/2018

KLEIN
K-500
08/23/2018

Site Wide Map



MAP 1

East Access Road Map

8.4Kms

To Highway

MARR ROAD

ROEN ROAD

EAST ACCESS ROAD

KORPI ROAD

GALLINGER ROAD

HAUL ROAD 1

HAUL ROAD 2

HAUL ROAD 3

CLARK ROAD

SOUTHERN ACCESS ROAD

West Creek

Clark Creek

Muskrat Lake

Environmental Point of Interest
Environmental Line of Interest
Environmental POI
Exclusion Zone
Waste Collection Area
<all other values>

newgold™
Rainy River
GIS TEAM, THUNDER BAY
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0 0.5 1 2
km

424500 425000 425500 426000 426500 427000 427500 428000 428500 429000 429500 430000 430500 431000 431500 432000 432500

5414000 5413500 5413000 5412500 5412000 5411500 5411000 5410500 5410000 5409500

BACK TO EAST ACCESS ROAD

MAP 2

Plant Site Road Map

2.9Km's.

ROEN ROAD

HAUL ROAD 11

425800 426000 426200 426400 426600 426800 427000 427200 427400 427600 427800 428000

5411600 5411400 5411200 5411000 5410800 5410600 5410400 5410200

0 0.15 0.3 0 km

Environmental Point of Interest
Environmental Line of Interest
Environmental POI
Exclusion Zone
Waste Collection Area
<all other values>

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BACK TO OLD HIGHWAY ROAD

MAP 3

Old Highway 600 Road Map

424500 425000 425500 426000 426500 427000 427500 428000 428500 429000 429500 430000 430500 431000 431500 432000

5410000 5409500 5409000 5408500 5408000 5407500 5407000 5406500 5406000 5405500

HAUL ROAD 2
HAUL ROAD 1
ROBY ROAD
CLARK ROAD
GALLINGER ROAD
TEEPLE ROAD
HEATWOLE ROAD
HIGHWAY 600
MCMILLAN ROAD
CAHILL ROAD
Clark Creek
Pinewood River

6Km's

0 0.5 1 2
km

Environmental Point of Interest
Environmental Line of Interest
Environmental POI
Exclusion Zone
Waste Collection Area
<all other values>

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Map 4

Teeple Road Map

HAUL ROAD 2

HAUL ROAD 3

HAUL ROAD 1

C8

CLARK ROAD

Haul Road 3

Teeple Drain

Clark Creek

TEEPLE ROAD

GALLINGER ROAD

Pinewood River

HEATWOLE ROAD

5.8 Km's

Back to Highway

Environmental Point of Interest
Environmental Line of Interest
Environmental POI
Exclusion Zone
Waste Collection Area
<all other values>

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0 0.3 0.6 1.2
km

427600 427800 428000 428200 428400 428600 428800 429000 429200 429400 429600 429800 430000 430200 430400 430600 430800 431000 431200 431400 431600 431800 432000 432200

5410000 5409800 5409600 5409400 5409200 5409000 5408800 5408600 5408400 5408200 5408000 5407800 5407600 5407400 5407200

MAP 5

Gallinger Road Map

EAST ACCESS ROAD

PI ROAD

GALLINGER ROAD

HIGHWAY 71

3.3 Kms.

Clark Creek

HAUL ROAD 2

HAUL ROAD 1

TEEPLE ROAD

HEADWOLF ROAD

Pinewood River

428500 429000 429500 430000 430500 431000 431500 432000 432500 433000 433500 434000 434500

5411500 5411000 5410500 5410000 5409500 5409000 5408500 5408000

0 0.4 0.8 1.6
km

- Environmental Point of Interest
- Environmental Line of Interest
- Environmental POI
- Exclusion Zone
- Waste Collection Area
- <all other values>

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Rainy River

GIS TEAM, THUNDER BAY

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MAP 6

Atkinson Camp Road Map

1.9Km's

Barwick Road

Atkinson Road

Atkinson Road

BARWICK ROAD

BARWICK ROAD

427400 427600 427800 428000 428200 428400 428600 428800 429000 429200 429400 429600

5405800 5405600 5405400 5405200 5405000 5404800 5404600 5404400

0 0.15 0.3 0.6
km

Environmental Point of Interest
Environmental Line of Interest
Environmental POI
Exclusion Zone
Waste Collection Area
<all other values>

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Ross Cooper **Date: 18-07-01**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-01	BP9D	3	Haul Road 13
		1	South Dam clay core and surrounding haul roads
		1	BP9E entrance and hauls roads, culvert cove, Georgeson road, laydown 16

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Blaine Ponton **Date: 18-07-01**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-01	BP9D	1	Haul Road 8-13

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☐ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Blaine Ponton **Date: 18-07-02**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-02	BP9D	6	Haul Road 8-13
		1	West Creek Diversion Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☐ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Ross Cooper **Date: 18-07-03**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-03	BP9D	2	South Dam Clay Core and surrounding haul road
		2	Haul Road #13

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Ross Cooper **Date: 18-07-04**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-04	BP9D	1	Haul Road 13
		3	Haul Road 8
		2	South Dam clay core

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Blaine Ponton **Date: 18-07-04**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-04	BP9D	4	Haul Road 8-13
		1	Sigfusson mechanic tent road
		1	West Creek Diversion Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☐ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
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Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Ross C **Date: July 5th,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 5th,2018	BP9D Water Tree	4	Haul Road 8
July 5th,2018	BP9D Water Tree	1	Haul Road 13
July 5th,2018	BP9D Water Tree	2	South Dam Core
July 5th,2018	BP9D Water Tree	1	South Dam Area
July 5th,2018	BP9D Water Tree	1	South Dam Laydown

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Lloyd J **Date: July 5, 2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 5th,2018	BP9D Water Tree	2	Haul Road 8 BP9E Haul Road
July 5th,2018	BP9D Water Tree	5	Haul Road 13 Mechanics Tent - Crusher
July 5th,2018	BP9D Water Tree	1	Mechanics Laydown
July 5th,2018	BP9D Water Tree	1	New Haul Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:

New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin V **Date: July 5, 2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 5th,2018	BP9D Water Tree	2	Haul Road 8
July 5th,2018	BP9D Water Tree	1	Haul Road 13
July 5th,2018	BP9D Water Tree	1	South Dam Core
July 5th,2018	BP9D Water Tree	1	South Dam Area
July 5th,2018	BP9D Water Tree	1/2	South Dam Laydown
July 5th,2018	BP9D Water Tree	1	BP9E Haul Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
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Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Blaine P **Date: July 5th,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 5th,2018	BP9D	4	Haul Road 8 & 13
July 5th,2018	BP9D	1	Georgeson Road
July 5th,2018	BP9D	1	Dam 1/Dam 3

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
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On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: ____25000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-07-06**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-06	BP9D	2	South Dam Core
		.5	Downstream Zone 4/5 Filter
		2	South Dam surrounding Area
		5	Haul Rd 8
		6	Haul Rd 13
		3	BP9E Haul Rd

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
❑ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
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Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 10-027	Truck Capacity: ____15000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Don Smith **Date: 18-07-06**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-06	**Laydown 5**	**2**	**MCL Drill Area**

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
❑ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:

New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: ____25000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Mike Klippenstein **Date: 18-07-06**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-06	BP9D	6	Haul Rd 8 &13
		3	South Dam
		3	BP9E

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
❑ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: ____25000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Don Smith **Date: 18-07-06**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-06	BP9E water tree	5	Haul Rd 8 to Dam Core
		1	Laydown 16

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
❑ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: _____25000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date:18-07-07**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-07	BP9D	3	Haul Road 8
		3	Haul Road 13
		3	South Dam Core
		2	Relief Trench
		1	Downstream Filters & Clay Face
		4	South Dam surrounding area
		3	BP9E Haul Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
❑ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: _____25000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date:18-07-07**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-07	BP9D	3	Haul Road 8
		1	BP9E Haul Rd
		3	South Dam surrounding area
		3	Haul Rd 13
		1	South Dam Key Trench
		1	South Dam Core

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
❑ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: _____25000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Mike Klippenstein **Date:18-07-07**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-07-07	BP9D	4	Haul Road 8
		4	Haul Road 13
		4	South Dam surrounding area

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
❑ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: July 9th,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 9,2018	BP9D Water Tree	12	Haul Road 8
July 9,2018	BP9D Water Tree	1	Haul Road 13
July 9,2018	BP9D Water Tree	1	Bp9E Road
July 9,2018	BP9D Water Tree	1	South Dam
July 9,2018	BP9D Water Tree	1	Georgeson Road
July 9,2018	BP9D Water Tree	1	South Dam Core Loslo Creek (Clay Core)
July 9,2018	BP9D Water Tree	1	South Dam Horizontal Filter

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: July 9th,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 9,2018	BP9D Water Tree	5	Haul Road 8
July 9,2018	BP9D Water Tree	2	Haul Road 13
July 9,2018	BP9D Water Tree	2	Key Trench
July 9,2018	BP9D Water Tree	5	South Dam
July 9,2018	BP9D Water Tree	2	BP9E Haul Road
July 9,2018	BP9D Water Tree	1/2	Loslo Creek (Clay Core)
July 9,2018	BP9D Water Tree	1/2	South Dam Horizontal Filter

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Mike Klippenstein **Date: July 9th,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 9,2018	BP9D Water Tree	5	Haul Road 8
July 9,2018	BP9D Water Tree	5	Haul Road 13
July 9,2018	BP9D Water Tree	3	South Dam
July 9, 2018	BP9D Water Tree	2	BP9E Haul Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: July 10th,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 10,2018	BP9D Water Tree	2.5	South Dam/Clay Core
July 10,2018	BP9D Water Tree	3	Haul Road 8
July 10,2018	BP9D Water Tree	2	Haul Road 13
July 10,2018	BP9D Water Tree	4	South Dam Roads
July 10,2018	BP9D Water Tree	1.5	South Dam Core

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:

New Gold RRP Environment Department

Rainyriver.enviro@newgold.com

On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris jackson **Date: July 10th,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 10,2018	BP9D Water Tree	3	South Dam
July 10,2018	BP9D Water Tree	3	Haul Road 13
July 10,2018	BP9D Water Tree	2	BP9E Haul Road
July 10,2018	BP9D Water Tree	7	Haul Road 8
July 10,2018	BP9D Water Tree	1	Maintenance Tent

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Mike Klippenstein **Date: July 10th,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 10,2018	BP9D Water Tree	3	South Dam/Clay Core
July 10,2018	BP9D Water Tree	4	Haul Road 8
July 10,2018	BP9D Water Tree	4	Haul Road 13

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
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Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: July 8,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 8,2018	BP9D	3	South Dam
July 8,2018	BP9D	3	Haul Road 13
July 8,2018	BP9D	2	BP9E Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: July 8,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 8,2018	BP9D	1	Key Trench
July 8,2018	BP9D	2	Clay Core South Dam
July 8,2018	BP9D	½	Horizontal sand filter
July 8,2018	BP9D	2	Haul Road 13
July 8,2018	BP9D	3	South Dam Roads
July 8,2018	BP9D	1	Haul Road 8

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
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Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Mike Klippenstein **Date: July 8,2018**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
July 8,2018	**BP9D**	**8**	**Haul Road 8 & 13 South Dam**

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☑ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
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Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
April 19,2018	**Spring Run Off**	**3 Loads of Water**	**North Dam Water Tree**

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**
April 19,2018	**Check current fluids, document in Equipment inspection.**

Submit completed forms to:

New Gold RRP Environment Department

Rainyriver.enviro@newgold.com

On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504 Volvo	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
April 20,2018	**Spring Run Off**	**5**	**Dewatering Haul Roads**

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**
April 20,2018	**Daily Equipment Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504 Volvo	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
April 21,2018	Spring Run Off	6 Days	North Dam/ Haul Routes
April 21,2018	Spring Run Off	8 Nights	North Dam/ Haul Routes
April 22, 2018	Spring Run Off	6 Days	North Dam/ Haul Routes

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**
April 21,2018	Daily Equipment Inspection
April 21,2018	Daily Equipment Inspection
April 22,2018	Daily Equipment Inspection

Submit completed forms to:

New Gold RRP Environment Department

Rainyriver.enviro@newgold.com

On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504 Volvo	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
April 22,2018	**Spring Run Off**	**14**	**North/South Dam & Haul Roads**

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**
April 22,2018	**Daily Equipment inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504 Volvo	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
April 23,2018	**Spring Run Off**	**6 Nights**	**Haul Roads/ Laydowns**
April 24, 2018	**Spring Run Off**	**9 Days**	**Haul Roads/ Laydowns**

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**
April 24, 2018	**Daily Truck Inspection**

Submit completed forms to:

New Gold RRP Environment Department

Rainyriver.enviro@newgold.com

On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504 Volvo	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
April 23,2018	**Spring Run Off**	**9**	**North Dam & haul Roads**

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**
April 23,2018	**Daily Equipment Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
April 25,2018	**Spring Run Off**	**10**	**Haul Roads/ Lay down 3**

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**
April 24,2018	**Daily equipment Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-04-25	Spring Run off	**1**	N/S Dam

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**

Submit completed forms to:

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On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-04-26	Spring run off	1	Road Maintenance
	Spring run off	2	Road Maintenance
	Spring run off	3	Road Maintenance
	Spring run off	4	Road Maintenance
	Spring run off	5	Spray North Dam
	Spring run off	6	Road Maintenance
	Spring run off	7	Road Maintenance
	Spring run off	8	Spray North Dam
	Spring run off	9	Road Maintenance

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**

Submit completed forms to:

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Rainyriver.enviro@newgold.com

On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-04-26	Spring run off	**9**	N/S Dam

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**

Submit completed forms to:
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Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-04-28	Spring run off	1	Road Maintenance
		2	Road Maintenance
		3	Road Maintenance
		4	Spray North Dam
		5	Road Maintenance
		6	Road Maintenance
		7	Road Maintenance
		8	Road Maintenance

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**

Submit completed forms to:

New Gold RRP Environment Department

Rainyriver.enviro@newgold.com

On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Liters	Contractor: Sigfusson Northern Ltd

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-04-29	Settlement Dam	1	Road Maintenance
		2	Road Maintenance
		3	North Dam Clay-Zone 5
		4	Road Maintenance
		5	North Dam Clay-Zone 5
		6	Road Maintenance
		7	North Dam Clay-Zone 5
		8	Road Maintenance

Water Truck Maintenance and Repair Record	
Date	**Description of Repair, Servicing or Routine Maintenance**
18-04-29	**Daily Equipment Inspection**

Submit completed forms to:

New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vanderkerckhove **Date: 18-08-01**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-01	Dam 5	4	Clay Core
		1	TSP Dam
		5	Haul Road #8
		5	Haul Road #13
		2	BP9E
		1	Culvert Cove
		1	South Dam Surrounding Area

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Corey McArthur **Date: 18-08-01**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-01	Dam 5	1	Clay Core
		1	BP9E Haul Roads
		1	TSP
		1	Clay Core Dam 4
		1	Haul Roads & TSP Claycore
		1	Franks Pad
		1	TSP Laydown

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☐ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 6-29	Truck Capacity: 15,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Lloyd Johnson **Date: 18-08-02**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-02	Dam 5	6	Haul Road #8 from Crusher to Open Pit for Mine
	Sump 4	7	Haul Road #8 from Crusher to Open Pit for Mine
	Sump 4	3	Haul Road bottom of Pit

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-02**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-02	Dam 5	6	Clay Core
		3	TSP
		4	Haul Road #8
		4	Haul Road #13
		1	Culvert Cove
		1	Filters & Clay Face
		1	BP9E Haul Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Corey McArthur **Date: 18-08-02**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-02	Dam 5	1	BP9E Haul Roads
		1	Clay Core
		1	Dam 4 TSP
		1	Haul Road #13
		1	Clay Core
		1	Filters & Clay Face
		1	BP9E Haul Roads

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 6-29	Truck Capacity: ___15000__ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Lloyd Johnson **Date: 18-08-03**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-03	**Dam 5**	4	Haul Rd 8 crusher to open pit
		2	Open pit ramps
		1	West open pit ramps
		6	Haul Rd 13 crusher to Dam 5

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
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Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: ___25000__ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Ross Cooper **Date: 18-08-03**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-03	**Dam 5**	7	South Dam Core
		4	Haul Rd 13
		3	Haul Rd 8
		2	Culvert Core to Laydoen 16
		2	TSP

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
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On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: ___25000__ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-03**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-03	**Dam 5**	1	Core
		1	TSP
		1	Culvert Cove
		3	BP9E Haul Rd
		1	Haul Rd 8
		1	Haul Rd 13
		1	South Dam surrounding Area
		1	Sigfusson Laydown

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
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On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: ___25000__ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Corey McArthur **Date: 18-08-03**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-03	**Dam 5**	1	BP9E Haul Rd
		1	Crusher to Culvert Cove
		1	TSP
		1	Horizontal Filters

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

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On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: ___25000__ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Ross Cooper **Date: 18-08-04**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-04	**Dam 5**	5	Haul Rd 8
		3	Haul Rd 13

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
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Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: ___25000__ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-04**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-04	**Dam 5**	4	Core
		2	BP9D Haul Rd
		2	BP9E Haul Rd
		4	Haul Rd 8
		4	Haul Rd 13
		2	Culvert Cove
		1	Dam 5
		1	South Dam Surrounding area
		.5	Sigfusson Laydown

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

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Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: ___25000__ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-05**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-05	**Dam 5**	2	Copper Dump
		1	South Dam surrounding Area
		1	Haul Rd 13
		1	Haul Rd 8

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

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On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: ___25000__ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-05**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-05	**Dam 5**	4	Core
		1	Dam 4
		2	BP9D Haul Rd
		2	Dam 5
		5	Haul Rd 8
		4	Haul Rd 13
		2	Culvert Cove
		1	TSP
		.5	Sigfusson Laydown

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
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On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: ___25000__ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-05**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-05	**Dam 5**	6	South Dam Clay Core
		7	BP9E
		5	Dam 4 to Mechanic Tent
		10	Haul Rd 13
		3	Haul Rd 8

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
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On-call Phone: 807-632-6152

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: __20000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerkhove **Date:18-08-06**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-06	Dam 5	3	Core
		2	TSP
		2	Culvert Cove
		2	BP9E Haul Rd
		3	Haul Rd 8
		3	Haul Rd 13
		1	Dam 5
		1	Dam 4
		.5	Sigfusson Laydown

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: __20000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date:18-08-06**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-06	Mine Water Tree	5	Copper Dump to East Out Crop
	Dam 5 Water Tree	7	Haul Rd 8
		4	TMA
		3	Dam 4/5
		3	Haul Rd 15

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: __25000_____ Liters	Contractor: Sigfusson Northern Ltd

Drivers Name: Justin Picco **Date:18-08-06**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-06	Dam 5	1	South Dam Clay Core
		9	BP9E Haul Rd
		10	Haul Rd 13
		6	Culvert Corner & Hay Bale Rd to Haul Rd
		8	South Dam Access Upstream & Downstream
		8	Dam 4 to Mechanics Tent

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
✓ Yes ❑ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com
On-call Phone: 807-632-6152

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-07**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-07	Dam 5	1	Core
		5	Haul Road #8
		6	Haul Road #13
		3	BP9E Haul Road
		2	Culvert Cove
		2	TSP
		2	Dam #5 & SNL Laydown

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-07**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-07	Dam 5	2	Haul Road #8
	Mine Ops Water Tree	3	East Outcrop
	Mine Ops Water Tree	2	Copper Dump
	Mine Ops Water Tree	1	Haul Road #8

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Justin Picco **Date: 18-08-07**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-07	Dam 5	4	South Dam Clay Core
		7	BP9E Road West
		6	BP9E Road East
		5	Dam 4 to Mechanics Tent
		12	Haul Road #13
		6	Culvert Cove & West Creek Diversion Road to Haul Road
		10	South Dam Upstream & Downstream Access

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-08**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-08	Dam 5	2	Core
		3	Culvert Cove
		5	Haul Road #8
		5	Haul Road #13
		2	Dam #5
		2	BP9E Haul Road
		1	TSP & SNL Laydown

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-08**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-08	Dam 5	4	Haul Road #13
		4	Dam 4/5 Road
		1	BP9E Road
		3	South Dam
		3	Haul Road #8
		3	South Dam Surrounding Area

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Justin Picco **Date: 18-08-08**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-08	Dam 5	2	Clay Core South Dam
		3	BP9E Road East
		4	BP9E Road West
		6	Dam #4 to SNL Laydown
		6	South Dam Upstream & Downstream Access
		10	Haul Road
		3	Culvert Cove to Haul Road
		3	Mechanic Tent Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-09**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-09	Dam 5	2	Zone #5 Pile
		5	Core
		4	Haul Road #8
		3	Haul Road #13
		2	Culvert Cove
		2	BP9E Haul Road
		1	Dam #4
		2	South Dam Surrounding Area

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-09**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-09	Dam 5	2	South Dam Clay Core
		5	Haul Road #13
		5	Dam #4/5 Road
		1	BP9E
		3	Haul Road #8
		4	Surrounding South Dam Area
		1	Dam #4

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☐ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Justin Picco **Date: 18-08-09**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-09	Dam 5	4	South Dam Clay Core
		8	BP9E West Road
		8	BP9E East Road & Culvert Corner
		7	SNL Laydown to Dam #4 & Mechanic Tent
		3	South Dam Zones, Horizontal Filters
		9	South Dam Access, Upstream & Downstream
		11	Haul Roads
		5	Zone 5 Stockpile, Crusher Pad

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-10**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-10	Dam 5	2	Core
		3	Culvert Cove
		1	Zone #5
		5	Haul Road #8
		5	Haul Road #13
		3	BP9E Haul Road
		2	Dam #4

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-10**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-10	Dam 5	1	South Dam
		3	Haul Road #8
		6	Haul Road #13
		3	Surrounding South Dam Area
		1	BP9E
		5	Dam #5 Road
		1	Red Dump
		1	North Dam

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Justin Picco **Date: 18-08-10**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-10	Dam 5	8	BP9E Road West
		6	BP9E Road East & Culvert Cove
		2	South Dam Clay Core
		7	SNL Laydown to Dam 4
		6	TSP Dam Road to Frank's Pad (Haul Road #8)
		10	South Dam Access Upstream & Downstream
		11	Haul Road #13

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-11**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-11	Dam 5	3	South Dam Core
		1	BP9E
		1	Culvert Cove
		4	Haul Road #8
		4	Haul Road #13
		2	Dam #5
		1	Dam #4
		1	Laydown #4

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-11**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-11	Dam 5	3	South Dam Core
		2	Haul Road #8
		6	Haul Road #13
		5	Dam #4/5 Road
		2	North Dam
		2	Red Dump
		2	Laydown #4
		1	BP9E

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☐ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Justin Picco **Date: 18-08-11**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-11	Dam 5	9	Haul Road #8 to TSP
		8	BP9E West Road
		7	BP9E East Road & Culvert Corner
		8	South Dam Access Upstream & Downstream
		7	SNL Laydown to Dam #4
		11	Haul Road #13
		2	South Dam Clay Core
		1	Zone 5 Stockpile

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-12**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-12	Dam 5	1	Red Dump
		1	Laydown #4
		2	Haul Road #8
		5	Haul Road #13
		5	Surrounding South Dam Road
		3	South Dam Clay Core
		3	BP9E Road
		3	Dam #4 Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-12**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-12	Dam 5	4	South Dam Clay Core
		5	Haul Road #8
		5	Haul Road #13
		2	Culvert Cove
		2	BP9E Haul Road
		2	Dam #4

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Justin Picco **Date: 18-08-12**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-12	Dam 5	6	BP9E Road West
		6	BP9E Road East & Culvert Cove
		3	South Dam Clay Core
		8	Haul Road #8 to TSP
		5	SNL Laydown to Dam #4
		2	Crusher Pad
		5	South Dam Access, Upstream & Downstream
		8	Haul Road #13

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☐ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-13**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-13	Dam 5	7	Haul Road #13
		3	South Dam Clay Core
		1	BP9D Road
		1	BP9E
		4	Culvert Cove & Surrounding Area
		5	Haul Road #8

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Kevin Vandekerckhove **Date: 18-08-13**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-13	Dam 5	4	South Dam Clay Core
		5	Haul Road #8
		5	Haul Road #13
		2	BP9E Haul Road
		2	Culvert Cove
		2	Dam #5

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Justin Picco **Date: 18-08-13**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-13	Dam 5	8	South Dam Clay Core
		6	BP9E West Road
		6	BP9E East Road & Culvert Cove
		4	SNL Laydown to Dam #4
		4	Haul Road #8 to TSP
		9	Haul Road #13
		2	Crusher Pad
		3	South Dam Access, Upstream and Downstream

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Ross Cooper **Date: 18-08-14**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-14	Dam 5	5	Haul Road #8
		2	Laydown #4 Road
		5	Haul Road #13
		2	BP9E East Access
		2	South Dam Clay Vertical Filters
		1	South Dam Clay Core

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-14**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-14	Dam 5	2	BP9D Road
	Dam 5	4	Haul Road #13
	Dam 5	2	BP9E
	Mine Ops Water Tree	3	Haul Road #8
	Dam 5	3	East End of Dam Road
	Dam 5	3	Culvert Corner
	Dam 5	3	Dam #5 Road
	Mine Ops Water Tree	5	Mine Roads & Pit

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Jordan Johnson **Date: 18-08-14**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-14	Dam 5	1	Upstream South Dam & Veert Crusher
		1	Upstream Shell & Haul Road #13
		1	Haul Road #13 & BP9E Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Corey McArthur **Date: 18-08-14**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-14	Dam 5	1	Clay Core & BP9E Road
		1	BP9E Road & Haul Roads
		1	Haul Roads
		1	Haul Roads & Crusher Pad

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Corey McArthur **Date: 18-08-14**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-14	Dam 5	1	Open Pit
		1	Haul Roads
		1	Haul Roads
		1	Haul Roads
		1	Haul Roads
		1	Haul Roads
		1	Open Pit

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-500	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Jordan Johnson **Date: 18-08-14**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-14	Dam 5	1	Veert Crusher to TSP & Haul Road #8
		1	BP9E Road, TSP Entrance & South Dam Clay Core
		1	Section of Marr Road & Haul Road #13
		1	Downstream Filters, Haul Road #8 to TSP & BP9E Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Chris Jackson **Date: 18-08-15**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-15	Dam 5	5	South Dam Core
		2	Haul Road #8
		5	Haul Road #13
		1	BP9D Road
		5	BP9E Road
		3	Red Dump
		2	Laydown #4

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

Submit completed forms to:
New Gold RRP Environment Department
Rainyriver.enviro@newgold.com

newgold™ Rainy River Project

Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Ross Cooper **Date: 18-08-15**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-15	Dam 5	4	Haul Road #13
		5	Haul Road #8
		1	BP9E East & West Access, South Dam Clay Core
		5	Open Pit
		5	Open Pit

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

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Rainyriver.enviro@newgold.com

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Corey McArthur **Date: 18-08-15**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-15	Dam 5	1	BP9D & BP9E Haul Roads
		1	Haul Roads
		1	Haul Roads
		1	Haul Roads
		1	TSP Haul Roads

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

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Water Application and Truck Maintenance Form

Truck ID: 4-503	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Corey McArthur **Date: 18-08-15**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-15	Dam 5	1	Haul Roads
		1	Haul Roads
		1	Haul Roads
		1	Haul Roads
		1	Haul Roads
		1	Haul Roads
		1	Haul Roads

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

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Water Application and Truck Maintenance Form

Truck ID: 4-504	Truck Capacity: 25,000 Litres	Contractor: Sigfusson Northern Ltd

Drivers Name: Jordan Johnson **Date: 18-08-15**

Please circle one **Day Shift** **Night Shift**

Water Application Record			
Date	**Water Source**	**Number of Full Loads**	**Watering Locations**
18-08-15	Dam 5	1	BP9D Road
		1	BP9E Road, South Dam Filters Down Stream & BP9D Road
		1	Haul Road #13, South Dam Clay Core & BP9D Road
		1	Haul Road #13
		1	Haul Road #8
		1	Haul Road #13 & South Dam Upstream
		1	BP9E Road & BP9D Road
		1	Haul Road #13, SNL Laydown & BP9D Road

Water Truck Maintenance and Repair Record	
Please Check	**Description of Repair, Servicing or Routine Maintenance**
☒ Yes ☐ No	**Daily Truck Inspection**

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Rainyriver.enviro@newgold.com

NEW GOLD RAINY RIVER MINE
APPENDIX K
COMPLAINTS REPORTS TO FIRST NATIONS AND COMMUNITIES

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period November 26 - December 2, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MECP
207931	SPILL	New Gold	Land	11/26/18 12:00 AM	Hydrocarbon	Land	70 Liters	Fuel escaped from the low flow hose while equipment was parked. The handle had been removed and not properly capped off.	Spill pads were used and contaminated material was removed and placed in a certifed containment bin for removal from site.	NO	NO
208024	SPILL	New Gold	Land	11/27/18 12:00 AM	Tailings	Land	30 Liters	The collar that was installed onto the tailings line came loose and sprayed from the side. Most of the spray was contained but some sprayed onto the tailings line roadway.	The spray was located quickly and maintenance tightened the collar. Soil was scooped up and placed in the tailings spill pond.	YES	YES

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period October 29 - November 4, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
206151	Spill	Contractor	Land	10/31/18 11:57 AM	Hydrocarbon	Land	3 Liters	While working, dozer operator noticed hydraulic oil leaking from machine.	Equipment was shut down, spill pads were placed. 1/2 cubic meter of material was removed and placed in certified containment bin for removal from site.	No	No

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period November 19 - 25, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MECP
207632	Spill	Contractor	Land	11/21/18 12:00 AM	Hydrocarbon	Land	3 Liters	Oil was observed leaking from an idling dozer.	Equipment was shutdown immediately, spill tray was placed under dozer. Contaminated material was scraped up and placed in a certified containment bin for removal from site.	No	No
207671	Spill	New Gold	Air	11/22/18 12:00 AM	Dust	Air		Due to lack of water in cell 1 of the TMA and windy conditions, dust was created and blew outside the mine footprint.	Water was placed In cell 1 to prevent dust from forming.	Yes	Yes
207831	Spill	New Gold	Land	11/25/18 12:00 AM	Hydrocarbon	Land	20 Liters	Leak from Fuel Supply Truck	Dirt and gravel were scraped from the spill area and placed in certified containment bin for removal from site.	No	No

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period May 14 to 20, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	Contractor	4A Stockpile West side of Georgeson Road	17/05/2018 6:30 AM	Hydrocarbon	Land	10 L	While 350 excavator was operating on top of sand stockpile a hydraulic hose ruputred and sprayed 10 liters of hydraulic oil onto the pile	Excavator shut down. Spill tray and pads in place. Supervisor and Safety notified. Maintenance on scene to repair failed hose. Clean up was successful.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period Jan 1st - 7th, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	New Gold	Mill Operations	2018.01.03 08:30	Reclaim Water	Land	500 L	Conveyor transfer tower fire suppression system activated and extinguised by a false alarm (which was a frozen pipe) spilling 500 L of reclaim water.	Reclaim water that travelled outside of west access door froze. Ice material was scraped up and returned to mill process. Reject sump filled and was pumped back onto mill process.	Yes	Yes

New Gold Rainy River Mine Weekly Spill Report for Period Jan 8th to 14th, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	New Gold	Contractors	2018.01.09 22:00	Diesel	Land	0.75 L	An overflow of fuel tank on service truck resulted in 0.75 L of diesel fuel spilled on ground at Marr site fueling facility.	Approximately 0.75 L of diesel fuel mixed with snow was removed and placed into containment bin for removal from site. Equipment was cleaned and all materials disposed of properly.	No	No
Spill	New Gold	Construction	2018.01.10 15:00	Motor Oil	Land	30 L	Excavator working on breaking materials at Dam 4/5 lost it's environmental plug and spilled 30 L of motor oil on the ground.	Engine alarm was triggered and equipment immediately shut down. Spill pads were placed, scene frozen and mechanic called for repair. Environmental drain plug re-installed, excavator oil replaced. Approximately 2 m2 of materials (rock and spill pads) placed into contamination bin for removal from site.	No	No
Spill	New Gold	Construction	2018.01.12 11:15	Gylycol	Land	1.5 L	Preset-Piling Loader operator drove over glycol line which punctured hose causing ~1.5L spill	Contained spill with pads. Glycol line shut off and contractor notified to remove/repair the line. Glycol fluid leaked out of the line onto a poly sheet which contained the spill from expanding out on the ground. Glycol line was under a tarp which was covered and right beside route where equipment travels. Mitigation includes placing delineators along outside edge of glycol lines around work area. Locate edge of tarp and glycol line. Poly sheet, spill pads and snow placed into hazardous material bag for removal from site.	No	No
Spill	New Gold	Construction	2018.01.13 00:00	Motor Oil	Land	2.5 L	Excavator cooler coupler fitting shrunk in cold temperature and caused oil leak.	Scene frozen. Labor crew called in for cleanup. Mechanic called to assess and repair excavator, spill tray placed under area to prevent further contamination. Mechanical assessment was the cooler coupler rubber shrank due to extreme temperatures (-35 deg C or below). All containments have been successfully removed and disposed of. Approximately 1/8 of contamination bag placed into bin for removal from site.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period Jan 15th to 21st, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	New Gold	Site Services	2018.01.15 12:30	Hydraulic Oil	Land	12 L	Sand truck was plowing snow at Barron site and blew a hydraulic hose, spilling 12 L of hydraulic oil. Operator shut off truck and used spill kit to contain leak.	Contaminated oil and snow was scraped up and placed into two barrels. Barrels were moved to containment area for removal from site. Mechanic replaced hydraulic hose on truck.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period Jan 22nd to 28th, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	New Gold	Contractors	2018.01.24 0915	Hydrocarbon	Land	10 L	Dozer operator working in Borrow Pit 9E noticed hydraulic oil dripping onto ground.	Equipment shut down and spill tray placed under spill. Dozer was repaired and moved. Spill was successfully cleaned up. Ice, snow and spill pads were collected in 4 five gallon pails and placed in bins for removal from site.	No	No
Spill	New Gold	Contractors	2018.01.27 0253	Hydrocarbon	Land	20 L	Operator loading material into articulated rock truck noticed hydraulic oil leaking from hydraulic hose.	Equipment was shut down immediately by operator and spill pads were placed. Supervisor & Safety dept. notified. 3 m2 of contaminated rock removed and placed into containment bin for removal from site.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period Jan 29th to Feb 4th, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	New Gold	Contractors	2018.02.03 23:13	Hydrocarbon	Land	3 L	The turbo line broke on a haul truck causing a motor oil leak.	Equipment shut down and spill tray placed under spill. Mechanic noticed spill originated from turbo line break and repaired it. Three litres of motor oil spilled on snow pack. It was removed and placed into contaminated waste bin for disposal off site site.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period Feb 19th to 25th, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	New Gold	Mill Operations	21.02.2018 10:20	Pebble Lime	Land	<5 L	Lime truck driver noticed lime coming out of top of fill pipe on lime silo at top elbow. Shut down the transfer process right away, small amount of pebble lime fell down from hole in pipe covering snow around lime silo.	Operations grabbed skid steer and scraped up affected snow and brought inside mill to floor sump to put lime into mill process. Maintenance to patch the transfer pipe until a replacement pipe arrives.	No	No
Spill	Contractor	Construction	21.02.2018 10:05	Antifreeze	Land	5L	Operator was pushing debris off access road to collection ditch when he noticed an antifreeze leak on the right side of the dozer	Dozer was shut down immediately. Spill tray and diapers put in place. Supervisor and Safety notified. Clean up successful. Maintenance on scene to replace split radiator hose.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period Mar 5th to 11th, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	Contractor	Construction	05.03.2018 14:30	Hydraulic Fluid	Land	4L	Excavator was walking from North Dam to reclaim well on road by Dam 4.Operator felt controls were slow and stopped the equipment. He discovered oil leaking from the line leading to the final drive.	Excavator was shut down immediately. Spill pads and spill snakes put in place. Supervisor and Safety notified. Maintenance replaced hose line leading to final drive. Clay, rock, soiled spill pads and snakes placed into contaminated soil bin for removal from site. Clean up was successful.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period Mar 12th to 18th, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	Contractor	Construction	12.03.2018 14:30	Hydrocarbons	Land	25L	Hydro-carbons noticed floating on top of water during spring thaw event. Hydrocarbons had accumulated on snow from equipment parked in laydown area over the winter months.	Approximately 1 m3 of contaminated material consisting of snow, sand and gravel plus spill pads and noodles was collected and placed into containment bin for removal from site.	No	No
Spill	New Gold	Warehouse	16.03.2018 14:50	Gear Lubricant	Land	136L	During movement of 45 Gallon drums of Vultrex Gearshield, the telehandler punched a hole in a drum causing 3/4 of the contents to leak out onto the snow and ice surface in the laydown yard at Barron warehouse.	Hydrocarbon, snow, ice, sand and spill pads collected and placed into 40 Gallon drums for removal from site by GFL.	Yes	Yes

New Gold Rainy River Mine Weekly Spill Report for Period Mar 26th to April 1st, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	Contractor	Fueling Facility	28.03.2018 10:00	Hydrocarbons	Land	40L	Fuel tanker overfilled clear diesel fuel tank as high level alarm did not sound. Majority of spill was contained with secondary containment catchment area. Approximately 40 L of clear diesel overflowed onto ground surface beside containment area.	Fueling facility closed. Clear diesel tank emptied and moved out of secondary containment area. Hydrocarbon contaminated gravel, sand and soil removed and placed into containers for removal from site by GFL. New secondary containment liner placed. Clean fill added and pad leveled out. Fuel tank positioned back into place.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period April 2nd to 8th, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	Contractor	Roen Road	07.04.2018 09:00	Hydrocarbons	Land	1L	Ambulance (EV01) on route to fuel at Marr Site stalled on the road. Another guard arrived on the scene in the morning and noticed motor oil had been leaking from the engine.	Security guard used spill pads and placed a spill tray under the vehicle. The ground was cleaned and contaminated materials placed into pails for removal from site. Ambulance was towed to main plant site for maintenance.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period April 9th to 15th, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	Contractor	TMA Cell 1 south Laydown	13.04.2018 17:31	Hydrocarbons	Land	<50 L	Excavator undergoing repairs leaked unknown quantity of hydrocarbons onto ground surface in equipment laydown yard.	Spill discovered and contained. Excavator to be repaired and moved off site. Spill report with disposal documentation will be provided once cleanup is completed.	No	No

New Gold Rainy River Mine Weekly Spill Report for Period April 16 to 22, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	New Gold	Open Pit	21.04.2018 030:20	Hydrocarbons	Land	30 L	Fuel truck filling excavator at primary crusher pad had a rupture in the fuel line. Spill tray overflowed with 30 L leaking onto crusher pad.	Spill pads were placed. Main fuel valve shut off. Labourers cleaned up 15 gallons of crushed rock and spill contaminated pads into a 45 gallon barrel. Spill tray cleaned out by Lube truck. Barrel transported to Laydown 7 for pickup by GFL.	No	No
Spill	Contractor	TMA North Dam	21.04.2018 18:15	Chemical	Land	450L	Loader operator punctured propylene glycol tote with forks causing glycol to spill onto frost protection sand.	Equipment and operators assisted in cleanup. Glycol contaminated sand was dug up and placed into contaminated soil bin for removal from site. Area inspected by New Gold Environment.	Yes	Yes

New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period April 22 to 29, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	Contractor	Sediment Pond 1 Construction Area	27.04.2018 15:21	Hydrocarbon	Land	4 L	Komatsu 400 rock truck waiting to be loaded began to leak hydraulic fluid which was noticed by another driver. Driver informed rock truck driver, who immediately stopped the truck and began to control the spill.	Spill trays and spill diapers used to control spill and clean up ground surface. Two 20 Litre pails of contaminated rock and soil were collected. Pails of contaminated materials stored at MCL Laydown area and will be removed from site by certified hazardous waste carrier.	No	No
Exceedence	New Gold	Operations	27.04.2018 10:30	24-hr Total Suspended Particulates and Iron	Air	N/A	Laboratory results for March air quality monitoring at Gallinger Road air quality station indicated exceedance of total suspended particulates (TSP) and iron. Exceedences caused by increased vehicle traffic along Gallinger Road.	Remediation includes immediate closure of Gallinger Road to all mine employees travelling to and from the site and regular patrolling by New Gold Management to enforce closure.	Yes	Yes

New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period April 30 to May 06, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	Contractor	Haul Road 8	06.05.2018 12:25	Hydrocarbon	Land	10 L	Komatsu 400 rock truck driving to wqste dump blew right front tire. Operator attempted to move truck to a safe location when hose ruptured leaking hydraulic fluid on the road. Driver placed spill tray, spill pads and absorbent socks on ground underneath truck to control the spill.	Two bags of used spill pads and socks were collected along with three 5-gallon pails of rock and gravel. These materials are stored at MCL Laydown area and will be removed from site by certified hazardous waste carrier.	No	No
Potential Exceedence	New Gold	Operations	05.05.2018 17:30	Monitoring equipment recorded sound levels exceeding a 50 dBA sound threshold	Noise	>50 dBA	Acoustic audit monitoring equipment in Whip-poor-will habitat areas recorded noise levels exceeding permited limits on two occasions. Monitoring equipment recorded sound levels of 60 dBA at 3 am on May 1st and 52 dBA at 11 pm on May 3rd.	A review of sound recordings found thunderstorm activities and wildlife sounds (birds chirping and frogs croaking) to be sources of noise. As the noise was unrelated to operations or construction activities, permit conditions were not exceeded and mitigation was not required. Consistent with permit conditions, the MNRF was notified about the event.	No	No

New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period May 07 to 13, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	New Gold	Mill Processing Plant	13.05.2018 18:10	Chemical	Land	26 kg	Transport driver was transferring high calcium lime from tanker truck to the lime silo on the plant site. During the transfer, the delivery hose ruptured spilling approximately 26 kg of granular lime onto the ground.	Granular lime, gravel and dirt collected by mini Bobcat excavator and shoveled into the mill for disposal. Contractor required to replace hose and maintain inspection records on site.	Yes	Yes

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New Gold Rainy River Mine Weekly Exceedance and Spill Report

for Period May 28 to June 3, 2018

Spill Report	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill Report	New Gold - Operations	Plant site, haul truck shop	5/28/2018 8:40 AM	Hydrocarbon	Land	20 Liters	Operator was loading up GFL truck with waste oil totes behind the Haul Truck Shop. He had a spotter on both sides assisting him to line up the forks properly under the tote As he approached the tote the wheels of the loader went over a small hump in the road causing the forks to raise enough to puncture the bottom of the tote As soon as the spotter saw it happen he had the operator tip the tote on its side to minimize the oil loss he had made sure the lid was tight on the tote a few minutes before they were going to load it so he was confident it was not going to spill out	Spill was successfully cleaned up	No	No

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period June 18 - 24, 2018

SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
Spill	New Gold	TMA	6/19/2018 17:30	Hydrocarbon	Land	15 Liters	Loader experienced a puncture to its fuel tank due to a rock rolling down the face of the stockpile.	The operator noticed the puncture quickly and took action with a spill kit and 5 gallon pail. The machine was taken out off service immediately. A site assessment was completed once the spill was contained. Approximately 0.04m3 of rock were excavated up and contained in certified contamination bin for removal from site.	No	No
Spill	New Gold	Haul Road	6/21/2018 12:45	Chemical	Land	2 Liters	Spill occurred when drill engine overheated causing reservoir to over top.	Spill pads used to clean up area. Contaminated materials collected and disposed of in contaminated materials bin for removal from site.	No	No

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period June 25 to July 1, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
196676	Spill	Contractor	TMA	6/26/2018 20:00	Hydrocarbon	Land	2 Liters	While moving to push gravel, a hydraulic hose ruptured on a 850 Dozer.	Equipment was shutdown immediately. Spill kit was used to contain the spill. Contaminated material (less than 1 cubic meter) of gravel was placed in certified containment bin for removal from site.	No	No

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period July 2 - 8, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
197414	Spill	New Gold	Pit	7/3/2018 4:00	Hydrocarbon	Land	40 Liters	While changing filters on shovel, the valve closing off the fuel line to the filter was not closed all the way and when the filter was removed oil spilled from the line. Leak was the result of a procedural error.	Area was cleaned and material was placed in a certifed contamination bin for removal from site.Discussed with Technicians to ensure valves were to closed properly.	No	No
197572	Spill	Contractor	TMA	7/5/2018 9:00	Hydrocarbon	Land	10 Liters	While operating a dozer, operator notice hydraulic oil on the ground. Leak was due to mechanical failure	Dozer was moved to a safe location and shut down. Spill pads were placed on spill. Hydraulic oil and approximately 1 cubic meter of zone 4 sand were removed and taken to certified contamination bin for removal from site.	No	No
197770	Spill	Contractor	Haul Road 8	7/5/2018 18:00	Hydrocarbon	Land	1 Liter	Hydraulic fluid leak was noticed while moving drill. Equipment was shut down.	Spill pads were used to clean the area. Spill pads were placed in certified contamination bin for removal from site.	No	No

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period July 9 - 15, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
197940	Spill	Contractor	Haul Road	7/11/2018 12:30	Hydrocarbon	Land	9 Liters	While driving down haul road, operator noticed oil spray on window.	Machine was moved to a safe location and shut down immediately. Absorbent pads were used to clean up the spill. Approximately 1 cubic meter of clay and 4" rock were taken to certified contamination bin for removal from site.	No	No
198261	Spill	Contractor	TMA	7/14/2018 16:30	Hydrocarbon	Land	1 Liter	Water pump tipped over causing motor oil leak.	Spill was contained and cleaned. Contaminated material removed from location and taken to certified contamination bin for removal from site.	No	No
198301	Spill	Contractor	Borrow Pit	7/15/2018 17:00	Hydrocarbon	Land	115 Liters	Excavator blew hydraulic line while loading clay into rock truck in Borrow Pit.	Spill kit was used and area was scraped clean and 40 tons of clay material was placed in certified contamination bin for removal from site.	Yes	Yes

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period July 16 - 22, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
198306	Spill	Contractor	TMA	7/16/2018 18:45	Hydrocarbon	Land	2.5 Liters	Approximately 2.5 liters of hydraulic oil sprayed to the ground due to o-ring failure.	O-ring immediately replaced. Crew cleaned up approximately 1 cubic meter of gravel, and spill pads taking them to certified containment bin for removal from site.	No	No
198362	Spill	Contractor	Outcrop 3	7/18/2018 10:30	Hydrocarbon	Land	.5 Liter	Approximately .5 liter of hydraulic oil spilled from loose cap on excavator.	Cap was replaced. Workers absorbed spill with pads. A 5 gallon pail of material was removed to certified contaimnet bin for removal from site.	No	No

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New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period July 23 - 29, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
198710	Spill	Contractor	TMA	7/23/2018 16:50	Hydrocarbon	Land	3 Liters	Operator noticed a hose failure on adjacent rock truck resulting in 3 liter spill of hydraulic oil.	Equipment was shut down, spill tray and spill pads deployed. Maintenance called to attend. Clean up crew dispatched. Final clean up has been completed and repairs to truck finished. Approximately 50 Liters of zone 5 gravel was removed and placed in certified contaminated bin for removal from site.	No	No
199177	Spill	Contractor	TMA	7/29/2018 10:00	Hydrocarbon	Land	3 Liters	Operator noticed a leak on an excavator.	Equipment was shut down. Rock was cleaned. Approximately 1/4 cubic meter of blast rock and clay was placed in certifed containment bin for removal from site. Equipment was repaired and put back into service.	No	No

newgold™ Rainy River

New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period July 30 - August 5, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
199826	Spill	Contractor	TMA	8/3/2018 10:55	Hydrocarbon	Land	16 Liters	Hydraulic oil spill caused by hose connection failure after being changed out on excavator.	Excavator was shut off immedicately. Spill trays and kits were used. Approximately 1 cubic meter of blast rock was placed in certified containment for removal from site.	No	No

newgold™ Rainy River

New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period August 13 - 19, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
200337	Spill	Contractor	TMA	8/13/2018 2:50	Hydrocarbon	Land	4 Litres	Approximately 2 to 4 liters of Hydraulic oil spilled when hose became snagged causing the fitting to detach.	Excavator was shut down, spill pads/socks & absorbent granule materials spread out. Clean up crew called to attend scene. Mechanic removed damaged hose to conduct repair to fitting. 3 cubic feet of clay was removed. Contaminated materials placed into bags and placed in certified disposal bin for removal from site.	No	No

newgold™ Rainy River

New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period August 20 - 26, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
200812	Spill	New Gold	Process Plant	8/20/2018 4:00	Process Water	Land	57 Liters	During pumping of water from inside the process mill pump discard line flipped back over secondary containment wall spilling 57 L of process water onto the access road of door 17W.	Water and mud scrapped up from in front of 17W door and deposited into leach tank secondary containment area. Spill successfully cleaned up by 18:00 hours.	Yes	Yes
201227	Spill	Contractor	WMRS	8/25/2018 8:20	Chemical	Land	10 Liters	Radiator hose clamp loosened on a rock truck and approximately 10 liters of engine coolant spilled.	Equipment was shut down and spill pads placed. Maintenance dispatched to affect repairs. Grader was used to smooth road surface. Approximately 0.5 m3 of loose gravel and clay was placed in certified containment bin for removal from site.	No	No

newgold™ Rainy River

New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period August 27 - September 2, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
201916	Spill	New Gold	Process Plant	8/31/2018 10:30	Process Water	Land	20 Liters	Water from the grinding circuit migrated out the door 11E.	Water and mud scraped up and deposited into leach tank secondary containment area. Spill successfully cleaned.	YES	YES

newgold™ Rainy River

New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period September 10 - 16, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
202571	Spill	New Gold	Process Plant	9/13/2018 0:15	Tailings Slurry	Land	1000 Liters	A tailings pump kicked out and slurry overflowed the containment and flowed outside doors 9E and 4N.	Grinding operator had a loader operator dump sand at the effected doors to limit the spill out the doors. The spill was cleaned up during the night shift.	YES	YES

Twila Griffith

From: Twila Griffith
Sent: Wednesday, March 7, 2018 11:58 AM
To: Daryl Ellis; Hubert Schimann; Stacey Jack; Sylvie St.Jean
Cc: Alyson Bisson; Carolyn Winik; Darrol VanDeventer; Don Emms; Leo Faykes; Mitch Lepage; Russ McMahon; Tammy Grinsell; Thomas Waters; Tim Friesen; Will McGinnis
Subject: New Gold Rainy River Mine Spill Report for period Feb. 26 - Mar. 04, 2018

Hello,

There were no reported spills during the period of February 26 to March 04, 2018.

Kindest regards,

Twila Griffith M.Sc.
Senior Environmental Specialist

New Gold Inc.
Rainy River Mine
5967 Highway 11/71, P.O. Box 5, Emo
Ontario, Canada, P0W IE0
P: +1 (807) 482-0900 ext 8064
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TSX/NYSE MKT:NGD

newgold™ Rainy River

New Gold Rainy River Mine Weekly Exceedance and Spill Report for Period June 25 to July 1, 2018

INX #	SPILL REPORT	New Gold or Contractor	Spill Origin	Date and Time Reported	Product Spilled	Impact	Quantity	Description & Cause	Remediation & Disposal	Externally Reportable SAC	Externally Reportable MOECC
196676	Spill	Contractor	TMA	6/26/2018 20:00	Hydrocarbon	Land	2 Liters	While moving to push gravel, a hydraulic hose ruptured on a 850 Dozer.	Equipment was shutdown immediately. Spill kit was used to contain the spill. Contaminated material (less than 1 cubic meter) of gravel was placed in certified containment bin for removal from site.	No	No

NEW GOLD RAINY RIVER MINE
APPENDIX L
WILDLIFE MORTALITY LOG

newgold™ Rainy River

2018 Wildlife Mortality Log

Date	Location Description	Wildlife Sighted	Number Sighted	Behaviour	Dead or Alive	Comments	Sighted_By	Hour	Minute	x	y
1/14/2018	Copper dump	Fox	1	dead	Dead	dead-hit by haul truck	Matt Desando	12	0	428082.5051	5409856.45
1/16/2018	East access road	Deer	1	dead	Dead	dead, had to be dispatched	Security, dispatched by Nathan Baird	5	30	430562.4886	5411719.429
2/28/2018	Haul rd to peg dump	Grouse	1	Dead hit by haul truck	Dead	Dead Hit by haul truck	205 driver	6	0	427308.2632	5409822.291
6/5/2018	7 bends	Grouse	1	crossing rd	Dead	dead	CEAA	18	0	419543.6034	5413505.762
7/8/2018	korpi rd	Owl	1	dead	Dead	called enviro for instructions	security	1	20	430442.7456	5411719.796
8/25/2018	Southwest corner of TMA Cell 2 and Cell 1	Deer	1	Deceased	Dead	Situated within tailing mud	Scott from DST	13	55	422359.1417	5412106.356
8/4/2018	Korpi rd	Grouse	1	Dead	Dead	dead	Security	9	0	428702.7759	5412412.691
9/11/2018	East Access Road	Snake	7	1 live, 6 dead	Dead	Report received of snakes run over on East Access between hydro corridor and Gallinger Rd	Amanda Jacobs	12	0	427718.3	5412222.497
9/13/2018	East Access Road in front of Korpi Laydown	Grouse	1	Deceased	Dead	Headless and lyingon the northern side of the road	Twila Griffith	10	45	431134.7027	5411705.248
7/6/2018	Located on the south shoulder of the road	Turtle	1	Dead	Dead	Spotted turtle on side of road, I stopped to remove from road, but it had been dead for several days.	Amy Shute	16	35	428108.5929	5412386.737
9/28/2018	Across from Nielson house	Deer	1	dead	Dead	dead	Mill maintenace	6	30	421057.3218	5410234.997
11/15/2018	Eluik rd	Rabbit	1	dead	Dead	being eaten by crows, removed from road	Nathan Baird	8	15	421552.5587	5411044.354
12/11/2018	South of roen rd	Deer	1	dead	Dead	only bones remain, no need to remove and well enough off road	Garnet Cornell	12	0	425662.4107	5411768.855

NEW GOLD RAINY RIVER MINE
APPENDIX M
EXCEEDANCE LETTER SUBMITTED TO MECP

newgold™
Rainy River

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment, Conservation and Parks
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE:1000L Ferrous Sulfate Spill – SAC Reference #2157-B4ZRSU

On September 27th at approximately 1600, ferrous sulfate was discharged onto the ground, north west of the mill.

This reagent was new onsite as it is being tested for possible use. The spill was caused by a forklift puncturing a tote containing ferrous sulphate while unloading the tote. (See photo below)

The ferrous sulphate was found immediately after the spill occurred, by the forklift operator.

There was no impact to any water bodies as the spill was discharged in a gravel parking lot and was contained by berms. The spill was caught quickly by the operator and work ceased. The spill was collected by a vac truck and pumped into the tailings management area on site. Also, it is worth noting that during the spill it was raining, and water is a neutralizing agent for ferrous sulphate.

Forklift operations procedures will be reviewed. If ferrous sulphate is used permanently it will be kept in a structure that will help mitigate the risk of any future spill.

Once you have had the opportunity to review this information please feel free to contact the undersigned or Sylvie St.Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions.

Regards,

<Original signed by>

Matthew Wilson
Environmental Specialist
New Gold Rainy River
Matthew.Wilson@newgold.com
807 482 0900 x8233

cc:
Michael Bell. (Michael.bell@canada.ca)
Andrea Doherty, DFO; andrea.doherty@dfo-mpo.gc.ca
CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca

newgold™ Rainy River

June 7, 2018

John Vandenbroeck

Management Biologist, Fort Frances District
Ministry of Natural Resources and Forestry
922 Scott Street
Fort Frances, ON
P9A 1J4

Dear Mr. Vandenbroeck,

RE: 2018 ESA ACOUSTIC AUDIT – EXCEEDANCE OF SOUND THRESHOLD

As per Endangered Species Act (ESA) Permit FF-C-001-14 conditions 4.1 (g) and 4.2 (b), New Gold is providing notification to the Ministry of Natural Resources and Forestry (MNRF) that sound level thresholds were exceeded during the ongoing acoustic audit.
The source of noise resulting in the exceedance, however, appears unrelated to construction or operations activities and as such, no immediate mitigation is proposed.

The following preliminary results received from sound recording equipment on June 2nd, 3rd and 4th 2018 exceeded the 50 dBA sound level threshold:

- At 00:00, 1:00, 2:00 and 7:00 on June 2, 2018, monitoring equipment recorded sound levels of 54, 51, 53 and 51 dBA at the North Receptor Habitat and 51, 51 and 51 dBA at the South Receptor Habitat. Recorded sound levels indicate that the exceedances were likely due to strong winds.
  Please refer to attached sound files NRM June.02.2018_0007-0017, NRM June.02.2018_0107-0117, NRM June.02.2018_0207-0217, NRM June.02.2018_0707-0717, SRM June.02.2018_0011-0021, SRM June.02.2018_0111-0121 and SRM June.02.2018_0211-0221.

- At 11:00, 12:00, 14:00, 15:00, 16:00 and 17:00 on June 3, 2018, monitoring equipment recorded sound levels of 53, 55, 53 and 51 dBA at the North Receptor Habitat and 51, 51, 54, 54, and 53 dBA at the South Receptor Habitat. Recorded sound levels indicate that the exceedances were likely due to strong winds.
  Please refer to attached sound files NRM June.03.2018_1419-1429, NRM June.03.2018_1519-1529, NRM June.03.2018_1619-1629, NRM June.03.2018_1719-1729, SRM June.03.2018_1120-1130, SRM June.03.2018_1220-1230, SRM June.03.2018_1420-1430, SRM June.03.2018_1520-1530 and SRM June.03.2018_1620-1630.

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newgold™ Rainy River

- At 13:00 on June 4, 2018, monitoring equipment recorded a sound level of 52 dBA at the South Receptor Habitat. Recorded sound levels indicate that the exceedances were likely due to strong winds.
  Please refer to attached sound file SRM June.04.2018_1320-1330.

As per ESA Permit conditions 4.1 (g) and 4.2 (b), acoustic audit measurements conducted by a Qualified Professional will continue in the North and South EWPW Receptor Habitat areas until June 8th.

Please contact me with any questions or concerns.

Best Regards,

<Original signed by>

Carolyn Winik
Senior Environmental Specialist

cc. Sylvie St. Jean (New Gold)
Stacey Jack (New Gold)
Nigel Fisher (New Gold)

newgold™ Rainy River

October 4, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of Environment, Conservation and Parks
80 Robertson St.
Kenora, ON
P9N 1X9

Dear Mr. Hoffmeister,

RE: GEAR OIL SPILL - SAC REFERENCE # 5225-B562KD

Further to the notification to the Spills Action Center (SAC) Reference # 5225-B562KD regarding a spill of gear oil on October 1, 2018, the following report is submitted to the Ministry of the Environment, Conservation and Parks (MECP) as per Condition 11(4) of ECA 5178-9TUPD9.

While moving oil totes at Laydown Area 7 with a Telehandler, the operator punctured a tote of gear oil. The spill duration of 1 minute resulted in approximately 200 L of gear oil spilled to the ground.

The event occurred within the confines of a Laydown area with no impact to any water bodies. Spill pads were used to soak up the spilled oil and the affected ground was scraped up and placed into a contaminated soil bin, with final disposal by contracted hazardous waste management company, Green For Life (GFL).

Figure 1 shows Telehandler puncture in the tote of gear oil.

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As a result, training for spotters when moving totes, will be reviewed. As well as a re-organization of the oil storage area will occur.

Please feel free to contact the undersigned or Sylvie St. Jean (Sylvie.St.Jean@newgold.com or 807-707-3497) with any questions.

Regards,

<Original signed by>

Garnet Cornell
Environmental Specialist
New Gold Rainy River
garnet.cornell@newgold.com

cc:
Michael Bell, ECCC; michael.bell@canada.ca
Andrea Doherty, DFO; andrea.doherty@dfo-mpo.gc.ca
CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca

newgold™ Rainy River Project

January 10, 2018

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment and Climate Change
808 Roberston Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 500L Reclaim Water Spill – SAC Reference #5737-AUNLBS

Further to the notification to the Spills Action Centre (SAC) Reference #5737-AUNLBS regarding a spill of reclaim water on January 3, 2018, the following report is submitted to the Ministry of the Environment and Climate Change (MOECC).

Discovery

- A fire alarm was activated in the transfer tower at approximately 0830 hours on January 3, 2018
- Water was found to be escaping the west door of the transfer tower and reporting to a small depression in the ground outside the door.
- This was caused by a pipe associated with the fire suppression system bursting. The fire suppression system is supplied with reclaim water.

Cause

- The dry sprinkler system had activated previously and when the system was reset, all the water did not drain from the system causing a valve to freeze and crack. When the system thawed, the valve that was damaged from the expansion of water freezing began to leak.
- Temperature was -26 degrees Celsius as the time of event.

Clean Up and Recovery

- There was no impact to any water body, water drained to a small depression in the ground.
- Reclaim water did not escape the small depression outside the door.
- The spill was left to freeze in the small excavation and then collected with a loader.
- The material gathered was returned to the mill process.

Preventative Measures

- Standard Operating Procedures (SOP) will be reviewed to include proper drainage of equipment.
- Short term mitigation consisted of placing two (2) sand bag barricades with plastic. Long term mitigation consist of strategically engineered barriers (speed bumps) to be positioned at each door.

Once you have had the opportunity to review this information please feel free to contact the undersigned with any additional questions.

Regards,
<Original signed by>

Nathan Baird
Environmental Technician
New Gold Rainy River
Nathan.Baird@newgold.com
807-271-3190

cc: Adam Scheepers, EC; adam.scheepers@canada.ca
Andrea Doherty, DFO; andrea.doherty@dof-mpo.gc.ca
CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonnell, EC; dan.mcdonell@canada.ca

newgold™
Rainy River

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment, Conservation and Parks
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

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This reagent was new onsite as it is being tested for possible use. The spill was caused by a forklift puncturing a tote containing ferrous sulphate while unloading the tote. (See photo below)

The ferrous sulphate was found immediately after the spill occurred, by the forklift operator.

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Regards,

<Original signed by>

Matthew Wilson
Environmental Specialist
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CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca

newgold™ Rainy River

June 7, 2018

John Vandenbroeck

Management Biologist, Fort Frances District
Ministry of Natural Resources and Forestry
922 Scott Street
Fort Frances, ON
P9A 1J4

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- At 11:00, 12:00, 14:00, 15:00, 16:00 and 17:00 on June 3, 2018, monitoring equipment recorded sound levels of 53, 55, 53 and 51 dBA at the North Receptor Habitat and 51, 51, 54, 54, and 53 dBA at the South Receptor Habitat. Recorded sound levels indicate that the exceedances were likely due to strong winds.
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As per ESA Permit conditions 4.1 (g) and 4.2 (b), acoustic audit measurements conducted by a Qualified Professional will continue in the North and South EWPW Receptor Habitat areas until June 8th.

Please contact me with any questions or concerns.

Best Regards,

<Original signed by>

Carolyn Winik
Senior Environmental Specialist

cc. Sylvie St. Jean (New Gold)
Stacey Jack (New Gold)
Nigel Fisher (New Gold)

newgold™ Rainy River

October 4, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of Environment, Conservation and Parks
80 Robertson St.
Kenora, ON
P9N 1X9

Dear Mr. Hoffmeister,

RE: GEAR OIL SPILL - SAC REFERENCE # 5225-B562KD

Further to the notification to the Spills Action Center (SAC) Reference # 5225-B562KD regarding a spill of gear oil on October 1, 2018, the following report is submitted to the Ministry of the Environment, Conservation and Parks (MECP) as per Condition 11(4) of ECA 5178-9TUPD9.

While moving oil totes at Laydown Area 7 with a Telehandler, the operator punctured a tote of gear oil. The spill duration of 1 minute resulted in approximately 200 L of gear oil spilled to the ground.

The event occurred within the confines of a Laydown area with no impact to any water bodies. Spill pads were used to soak up the spilled oil and the affected ground was scraped up and placed into a contaminated soil bin, with final disposal by contracted hazardous waste management company, Green For Life (GFL).

Figure 1 shows Telehandler puncture in the tote of gear oil.

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As a result, training for spotters when moving totes, will be reviewed. As well as a re-organization of the oil storage area will occur.

Please feel free to contact the undersigned or Sylvie St. Jean (Sylvie.St.Jean@newgold.com or 807-707-3497) with any questions.

Regards,

<Original signed by>

Garnet Cornell
Environmental Specialist
New Gold Rainy River
garnet.cornell@newgold.com

cc:
Michael Bell, ECCC; michael.bell@canada.ca
Andrea Doherty, DFO; andrea.doherty@dfo-mpo.gc.ca
CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca

newgold™ Rainy River Project

January 10, 2018

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment and Climate Change
808 Roberston Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 500L Reclaim Water Spill – SAC Reference #5737-AUNLBS

Further to the notification to the Spills Action Centre (SAC) Reference #5737-AUNLBS regarding a spill of reclaim water on January 3, 2018, the following report is submitted to the Ministry of the Environment and Climate Change (MOECC).

Discovery

- A fire alarm was activated in the transfer tower at approximately 0830 hours on January 3, 2018
- Water was found to be escaping the west door of the transfer tower and reporting to a small depression in the ground outside the door.
- This was caused by a pipe associated with the fire suppression system bursting. The fire suppression system is supplied with reclaim water.

Cause

- The dry sprinkler system had activated previously and when the system was reset, all the water did not drain from the system causing a valve to freeze and crack. When the system thawed, the valve that was damaged from the expansion of water freezing began to leak.
- Temperature was -26 degrees Celsius as the time of event.

Clean Up and Recovery

- There was no impact to any water body, water drained to a small depression in the ground.
- Reclaim water did not escape the small depression outside the door.
- The spill was left to freeze in the small excavation and then collected with a loader.
- The material gathered was returned to the mill process.

Preventative Measures

- Standard Operating Procedures (SOP) will be reviewed to include proper drainage of equipment.
- Short term mitigation consisted of placing two (2) sand bag barricades with plastic. Long term mitigation consist of strategically engineered barriers (speed bumps) to be positioned at each door.

Once you have had the opportunity to review this information please feel free to contact the undersigned with any additional questions.

Regards,
<Original signed by>

Nathan Baird
Environmental Technician
New Gold Rainy River
Nathan.Baird@newgold.com
807-271-3190

cc: Adam Scheepers, EC; adam.scheepers@canada.ca
Andrea Doherty, DFO; andrea.doherty@dof-mpo.gc.ca
CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonnell, EC; dan.mcdonell@canada.ca

newgold™ Rainy River Project

March 23, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora ON P9N 1X9
Via email: (matt.hoffmeister@ontario.ca)

Dear Mr. Hoffmeister,

RE: SAC REF# 5627- AWWVWT HYDROCARBON SPILL AT WAREHOUSE LAYDOWN

In accordance with ECA 5178-9TUPD9, notification was made to the Spills Action Centre (SAC Ref. # 5627-AWWVWT) regarding a 136 L spill of gear lubricant in the laydown yard of the Barron Warehouse on March 16, 2018. The following report is submitted to the Ministry of Environment and Climate Change (MOECC) as per condition 11(4) of ECA 5178-9TUPD9.

Discovery

- During the afternoon of March 16th, warehouse employees were moving 45 gallon barrels of gear lubricant.
- A warehouse employee noticed black viscous hydrocarbon seeping out of bottom of one of the 45 gallon barrels.
- Inspection of the spill area by warehouse supervisor estimated ¾ of the barrel contents had leaked out onto the frozen ground surface.
- The barrel was inverted into a spill tray to stop the leak.
- Employees immediately contained the spill using absorbent pads, booms and sand.
- New Gold Environment was called to inspect the spill.
- The Spills Action Centre was notified at 18:48 hours and an investigation initiated.

Cause

- Puncture of the barrel by one of the forks on the telehandler.
- Secondary containment not in place.

Clean Up and Recovery

- Gear lubricant is composed of 60% asphalt and 40 % petroleum distillates and highly viscous. Spill was fully contained within a 2 m^2 area using pill pads, spill booms and sand.
- Contaminated material was collected in two 45 gallons drums for removal from site by a registered hazardous waste carrier.

Preventative measures and schedule of implementation

- Review with all warehouse employees proper procedures for loading and unloading of barrels containing hydrocarbons and liquids using a telehander before March 31, 2018.
- Establish secondary containment under all containers, barrels, pails that contain hydrocarbons in the laydown area before April 16, 2018
- Maintain minimal quantities of hydrocarbons in the warehouse laydown yard. Expedite shipment to storage areas on site before April 30, 2018.

Should you have any questions after reviewing this letter, please contact the undersigned at (807) 708-2407.

Regards,
<Original signed by>

Twila Griffith
Sr. Environmental Specialist
twila.griffith@newgold.com

New Gold Inc.
Rainy River Project
5967 Highway 11/71, P.O. Box 5, Emo
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cc: Gordon Moore (Environment Canada)
Karli Allen (Ministry of Natural Resources and Forestry)
Canadian Environmental Assessment Agency (CEAA)

newgold™ Rainy River

May 02, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change 808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: AIR QUALITY EXCEEDANCES OF 24-HOUR TOTAL SUSPENDED PARTICULATE-MONITORING LIMITS - SAC REFERENCE #3444-AY8S75

On April 27, the air quality engineer consultant responsible for reporting the site air quality monitoring results, informed New Gold Environment of elevated laboratory results, indicating total suspended particulates (TSP) and iron exceedances at Gallinger Road air quality station. The consultant stated that these values were uncharacteristically high for this particular location and nearby roadwork activities may have contributed to these results.

New Gold notified the Spills Action Centre (SAC) Reference #3444-AY8S75 of the exceedance of the ministry approved limits for Total Suspended Particulate Matter and Iron (metallic) concentrations on April 27th. The exceedance occurred on March 16, 2018 at the Gallinger Air Quality Monitoring Station, and was reported to New Gold on the 27th of April, as per the procedures. The following letter report accompanies a copy of the notification of exceedance (NOE) as per ECA #0412-A2LR4V.

Gallinger Road air quality station is located approximately 4.5 km due east of the primary crusher on the Rainy River Mine Site. Gallinger Road itself passes by the air quality station in a north-south direction at approximately 50 metres east.

TSP samples were collected during a 24-hr period on March 16, 2018 as per Rainy River Project Ambient Air Quality Monitoring Plan, accepted by MOECC on November 9th, 2016. During this 24-hour period, predominate wind direction varied from east to southeast with an average wind speed of 6 km/hr. The wind direction that day, makes it unlikely that the source of the dust would be coming from the crusher which is situated to the west of the air monitoring station, and suggests that the exceedance was related to the road dust.

newgold™ Rainy River

New Gold's dust abatement plan calls for the application of Calcium Chloride to reduce the road dust. However, one of the requirements for the application of this product, or of the application of water, is that it should not be done under frozen conditions. The spring of 2018 has been dry and cold to date with temperatures well below freezing at night and often during the day until the second week of April. On March 16th, temperatures reached 6°C during daylight hours and dropped to -10°C at night. As such the abatement program could not be implemented at that time due to freezing temperatures at night. No precipitation was recorded during the same 24-hour period making road conditions very dry and prone to dust.

New Gold noticed the above average usage of Gallinger road in early April and reminded staff of the mitigation measures which include restricting access of all motor vehicles along Gallinger Road. On April 15th, New Gold posted managers at the corner of Gallinger and Korpi to stop each driver and remind them personally of the road usage restriction. Traffic on Gallinger was reduced from above 75 vehicles between 6 and 7 am to 3 (non-New Gold) in 5 working days. Physical monitoring will remain in place until the end of May. Mitigation measures including watering of Gallinger Road and placing Calcium Chloride on the road surface to reduce road dust will be applied should dust continue to be an issue

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,
<Original signed by>

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cc. Sylvie St.Jean (Sylvie.st.jean@newgold.com)
Stacey Jack (Stacey.jack@newgold.com)

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June 13, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change 808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: AIR QUALITY EXCEEDANCES OF 24-HOUR TOTAL SUSPENDED PARTICULATE-MONITORING LIMITS - SAC REFERENCE #3476-AZKQWK

On June 6th, the air quality engineer consultant responsible for reporting the site air quality monitoring results, informed New Gold Environment of elevated laboratory results, indicating total suspended particulates (TSP) and iron exceedances at Gallinger Road air quality station. The consultant stated that these values were higher than normal for this particular location and questioned whether nearby activities contributed to these results.

New Gold notified the Spills Action Centre (SAC) Reference #3476-AZKQWK of the exceedance of the ministry approved limits for Total Suspended Particulate Matter and Iron (metallic) concentrations on June 6th. The exceedance occurred on April 8th, 2018 at the Gallinger Air Quality Monitoring Station, and was reported to New Gold on the 6th of June, as per the procedures. The following letter report accompanies a copy of the notification of exceedance (NOE) as per ECA #0412-A2LR4V.

Gallinger Road air quality station is located approximately 4.5 km due east of the primary crusher on the Rainy River Mine Site. Gallinger Road itself passes by the air quality station in a north-south direction at approximately 50 metres east.

TSP samples were collected during a 24-hr period on April 8th, 2018 as per Rainy River Project Ambient Air Quality Monitoring Plan, accepted by MOECC on November 9th, 2016. During this 24-hour period, predominate wind direction varied from northeast to south-southwest with an average wind speed of 11 km/hr. The wind direction that day, makes it unlikely that the source of the dust would be coming from the crusher which is situated to the west of the air monitoring station, and suggests that the exceedance was related to the road dust.

newgold™ Rainy River

New Gold's dust abatement plan calls for the application of Calcium Chloride to reduce the road dust. However, one of the requirements for the application of this product, or of the application of water, is that it should not be done under frozen conditions. The spring of 2018 has been dry and cold to date with temperatures well below freezing at night. On April 8th, temperatures reached 15.5°C during daylight hours and dropped to -7°C at night. As such the abatement program could not be implemented at that time due to freezing temperatures at night. No precipitation was recorded during the 72-hour period from April 6th to April 8th making road conditions very dry and prone to dust.

As discussed in the air quality exceedance letter report of May 03rd, 2018; New Gold noticed the above average usage of Gallinger road in early April and immediately undertook mitigation measures. Motor vehicle access along Gallinger Road was restricted to local traffic only. On April 15th, New Gold managers, positioned at the corner of Gallinger and Korpi, stopped and reminded each driver of the road usage restriction. Over 5 working days, traffic on Gallinger was reduced from above 15 vehicles between 6 and 7 am to 3 (non-New Gold) vehicles. Physical monitoring continued until the end of May, when all traffic from New Gold had ceased.

New Gold is proceeding with the application of Calcium Chloride along all its roads, including Gallinger. The application should be completed by the end of June.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,
<Original signed by>

Twila Griffith
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Stacey Jack (Stacey.jack@newgold.com)

newgold™ Rainy River

June 13, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change 808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

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Gallinger Road air quality station is located approximately 4.5 km due east of the primary crusher on the Rainy River Mine Site. Gallinger Road itself passes by the air quality station in a north-south direction at approximately 50 metres east.

TSP samples were collected during a 24-hr period on April 8th, 2018 as per Rainy River Project Ambient Air Quality Monitoring Plan, accepted by MOECC on November 9th, 2016. During this 24-hour period, predominate wind direction varied from northeast to south-southwest with an average wind speed of 11 km/hr. The wind direction that day, makes it unlikely that the source of the dust would be coming from the crusher which is situated to the west of the air monitoring station, and suggests that the exceedance was related to the road dust.

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As discussed in the air quality exceedance letter report of May 03rd, 2018; New Gold noticed the above average usage of Gallinger road in early April and immediately undertook mitigation measures. Motor vehicle access along Gallinger Road was restricted to local traffic only. On April 15th, New Gold managers, positioned at the corner of Gallinger and Korpi, stopped and reminded each driver of the road usage restriction. Over 5 working days, traffic on Gallinger was reduced from above 15 vehicles between 6 and 7 am to 3 (non-New Gold) vehicles. Physical monitoring continued until the end of May, when all traffic from New Gold had ceased.

New Gold is proceeding with the application of Calcium Chloride along all its roads, including Gallinger. The application should be completed by the end of June.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,
<Original signed by>

Twila Griffith
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Stacey Jack (Stacey.jack@newgold.com)

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Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment, Conservation and Parks
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 20L Process Water Spill – SAC Reference #2021-B46NNP

On August 31st at approximately 1200, process water was found to be backing up into the Millwright shop from the mill floor. This water was found to have escaped the man door of the Millwright shop and made contact with the ground outside the mill. (See photo below)

The mill was in upset conditions which caused a great deal of process slurry to settle in the works. When the mill was restarted various filter screens, cyclones and sumps were clogged and overtopped onto the mill floor. The process water separated from the slurry and backed up into the Millwright shop then spilled out door 11E. There was no impact to any water body as the process water only migrated about 5 meters outside the door resulting in 20L exiting the mill.
This spill was caught quickly by the operators and work ceased. The gravel containing the process water was placed inside the mill and returned into the process, this was completed by the end of the day shift.

Changes will be made to the mill start up procedure to include monitoring and mitigating the level of process water on the mill floor in the interim. In the longer term, work continues within the mill to ensure proper sloping is in place to direct any process water/slurry to internal sumps.

Once you have had the opportunity to review this information please feel free to contact the undersigned or Sylvie St.Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions.

Regards,

<Original signed by>

Nathan Baird
Environmental Specialist-Wildlife
New Gold Rainy River
Nathan.Baird@newgold.com
807-271-3190

cc:
Michael Bell. (Michael.bell@canada.ca)
Andrea Doherty, DFO; andrea.doherty@dfo-mpo.gc.ca
CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca

newgold™ Rainy River Project

September 19, 2018

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment, Conservation and Parks
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 1000L Tailings Spill – SAC Reference #3763-B4KHDD

On September 13th at approximately 1215 am, tailings was found to be exiting door 3N from the tailings sump pump box and migrated 55 meters to the northeast. See photo below (clean-up was well underway at time of photo)

The spill only lasted a few minutes and quick action by the operators placing sand over the existing berm (speed bump) in front of door 3N stopped 80-90% of the tails from escaping. See photo below.

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Clean-up began right away and finished around 5 pm that day. There was no impact to any water body and all contaminated materials were collected and put back into the mill process.

The cause of this event was a combination of power failures along with process software updates which caused upset conditions in the mill, resulting in failed alarms and pumps operating incorrectly. An internal investigation is on-going.

Once you have had the opportunity to review this information please feel free to contact the undersigned or Sylvie St. Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions.

Regards,

<Original signed by>

Nathan Baird
Environmental Specialist-Wildlife
New Gold Rainy River
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Michael Bell; michael.bell@canada.ca
Andrea Doherty; andrea.doherty@dfo-mpo.gc.ca
CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca

December 21, 2018

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment and Climate Change
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 450L Dyed Diesel Spill Drill 903 – SAC Reference #5120-B7MMFB

At 0300 hours the operator of drill 903 noticed an unexpected drop in fuel level well drilling blast holes in the East Outcrop. (See photo 1 below)

Photo 1: Map of site denoting spill location.

Photo 2: Drill 903

The operator called maintenance for assistance and dismounted to look for a leak. He discovered that he had backed over a large rock and punctured the fuel tank, he then moved the drill off the rock and tilted the drill back to mitigate further spillage (as can be seen in photo 2 above).

At surface, the spill did not appear to be significant but upon further inspection it was noticed that a large amount of fuel had seeped into the shattered rock (see photos 3 and 4 below). Three drill holes were found to be contaminated with dyed diesel.

Photo 3: Spill site

Photo 4: Drill hole

By mid-day a vacuum truck had collected as much fuel as possible from the drill holes and placed it in used oil totes for pick up by Green For Life, a licensed hazardous waste disposal company.

The blasting agent used on site is an emulsion product that contains a significant component of diesel. It is expected that when these holes are loaded and blasted most, if not all, of the residual diesel will be consumed. This will occur by mid-January. At that time the rock will be inspected for contamination.

If the rock is found to be contaminated, it will be sent through the mill as a treatment. If the rock is found to be clean, it will be used onsite to build required infrastructure.

Once you have had the opportunity to review this information please feel free to contact the undersigned or Sylvie St.Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions.

<Original signed by>

Environmental Specialist –Wildlife

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newgold™ Rainy River Project

April 26, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 450L Propylene Glycol Spill - SAC Reference #7150-AY33FE

Further to the notification to the Spills Action Centre (SAC) Reference #7150-AY33FE regarding a spill of propylene glycol on April 21st , 2018, the following report is submitted to the Ministry of Environment and Climate Change (MOECC).

Discovery

- Loader operator went to remove a partially emptied tote of propylene glycol while completing cleanup duties at the end of his shift on the TMA North Dam.
- When attempting to pick up the tote, he discovered the loader forks had punctured the plastic tote.
- The operator immediately called his supervisor and stopped all work in the affected area.

Cause

- Puncturing the base of the plastic tote caused the contents to spill onto the ground surface.
- Loader operator performed the task alone without authorization from Supervisor.

Clean Up and Recovery

- Approximately 450 liters of propylene glycol spilled onto the downstream sand seam of TMA North Dam where it was 100% contained. There was no impact to any nearby water sources.

- An estimated 7 m^3 of contaminated sand was scraped up and loaded into a contaminated soil bin.
- Spill pads and boom socks, used during the containment and clean-up process, were collected into barrels.
- Contaminated materials, removed from the immediate area, are stored in a laydown area; awaiting removal from site by a registered hazardous waste carrier.

Preventative Measures

- Implement re-training with team members to understand the importance of a using a spotter when performing all tasks with limited visibility.
- Increase supervisor participation with crews in work areas and reviewing task assignments.

Once you have had the opportunity to review this information, please feel free to contact the undersigned or Sylvie St. Jean at (sylvie.st.jean@newgold.com or 807-707-3497) with any additional questions you may have.

Regards,

<Original signed by>

Garnet Cornell
Environmental Technician
New Gold Rainy River Project
Email: garnet.cornell@newgold.com
Cell: (807) 276-0106

cc: Gordon Moore, EC; (gordon.moore@canada.ca)
Andrea Doherty, DFO; (andrea.doherty@dfo-mpo.gc.ca)
CEAA; (compliance.conformite@ceaa-acee.gc.ca)
Dan McDonnell, EC; (dan.mcdonell@canada.ca)

newgold™ Rainy River

May 03, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change 808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: AIR QUALITY EXCEEDANCES OF 24-HOUR TOTAL SUSPENDED PARTICULATE-MONITORING LIMITS - SAC REFERENCE #3444-AY8S75

On April 27, the air quality engineer consultant responsible for reporting the site air quality monitoring results, informed New Gold Environment of elevated laboratory results, indicating total suspended particulates (TSP) and iron exceedances at Gallinger Road air quality station. The consultant stated that these values were uncharacteristically high for this particular location and nearby roadwork activities may have contributed to these results.

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Gallinger Road air quality station is located approximately 4.5 km due east of the primary crusher on the Rainy River Mine Site. Gallinger Road itself passes by the air quality station in a north-south direction at approximately 50 metres east.

TSP samples were collected during a 24-hr period on March 16, 2018 as per Rainy River Project Ambient Air Quality Monitoring Plan, accepted by MOECC on November 9th, 2016. During this 24-hour period, predominate wind direction varied from east to southeast with an average wind speed of 6 km/hr. The wind direction that day, makes it unlikely that the source of the dust would be coming from the crusher which is situated to the west of the air monitoring station, and suggests that the exceedance was related to the road dust.

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New Gold noticed the above average usage of Gallinger road in early April and reminded staff of the mitigation measures which include restricting access of all motor vehicles along Gallinger Road. On April 15th, New Gold posted managers at the corner of Gallinger and Korpi to stop each driver and remind them personally of the road usage restriction. Traffic on Gallinger Road was reduced from more than 15 vehicles travelling between 6 and 7 am to zero New Gold employees using the road in 5 working days. Physical monitoring will remain in place until the end of May. Mitigation measures including watering of Gallinger Road and placing Calcium Chloride on the road surface to reduce road dust will be applied should dust continue to be an issue.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,
<Original signed by>

Twila Griffith
Sr. Environmental Specialist
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cc. Sylvie St.Jean (Sylvie.st.jean@newgold.com)
Stacey Jack (Stacey.jack@newgold.com)

newgold™ Rainy River

May 8, 2018

John Vandenbroeck
Management Biologist, Fort Frances District
Ministry of Natural Resources and Forestry
922 Scott Street
Fort Frances, ON P9A 1J4
Via email; john.vandenbroeck@ontario.ca

RE: 2018 ESA Acoustic Audit – Exceedance of Sound Threshold

Dear Mr. Vandenbroeck,

Consistent with Endangered Species Act (ESA) Permit FF-C-001-14 condition 4.1 and 4.2 New Gold Inc (New Gold) is providing notification to the Ministry of Natural Resources and Forestry (MNRF) that sound threshold was exceeded during the ongoing acoustic audit. However, the source of noise resulting in the exceedance appears unrelated to construction or operations activities and as such no immediate mitigation is proposed.

Preliminary results received from sound recording equipment on May 1st and May 3rd exceeded the 50 dBA sound level threshold;

- At 0300 on May 1, 2018, monitoring equipment recorded sound levels of 61 dBA at the North Receptor Habitat and 60 dBA at the South Receptor Habitat. Recorded sound levels were almost identical indicating a global source, such as a thunderstorm. This exceedance was weather related, not produced by construction activities. Please refer to attached sound files NRM 05.01.2018.3AM and SRM05.01.2018.3AM.

- At 2100 on May 2, 2018, monitoring equipment recorded sound levels of 52 dBA at the North Receptor Habitat. A review of the audio recordings found wildlife activities (birds chirping, frogs croaking) overprinting intermittent equipment noise. Please refer to attached sound file SR62.

These occurrences appear isolated and related to natural phenomena, not construction or operation activities. Therefore, implementation of immediate mitigations measures related to operations or construction activities stipulated in condition 4.1 is not proposed at this time.

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As per compliance condition 4.1 and 4.2 of ESA Permit FF-C-001-14 acoustic audit measurements, conducted by a qualified professional, will continue in the North and South WPW Receptor Habitat areas until May 8th, and again during June 2018.

Once you have had the opportunity to review this letter, please contact me with any questions or concerns at (807) 708-2407.

Regards,

<Original signed by>

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Stacey Jack (Stacey.jack@newgold.com)
Nigel Fisher (nigel.fisher@newgold.com)

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May 18, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: - SAC REFERENCE #0415-AYR2B6

On May 13, a Mill Supervisor informed New Gold Environment of a spill beside the Lime Silo on the northeast side of the mill process building. Initial reports estimated that 1,000 kg of granular High Calcium Quicklime was spread across the ground surface between the mill and silo.

New Gold notified the Spills Action Centre (SAC) Reference #0415-AYR2B6 of the reportable spill as defined in Ontario Regulation 675/98, condition 11(4) of Environmental Compliance Approval No. 5178-9TUPD9 and the internal spill reporting procedure. The estimated amount of the spill exceeded the Federal Transportation of Dangerous Good (TDG) Act Schedule 1 approved limits of 5 kg for Class 8, Corrosive substances. TDG Act classifies Lime as a Class 8 substance.

During the regular unloading process, a contractor supplied delivery hose was connected between the tanker truck and lime silo. Compressed air, used to move the granular lime from the tanker truck to the silo, blew lime out of a rupture in the delivery hose and covered the ground around mill doors 8e and 9e and the Lime silo. West Creek Diversion, the closest fish bearing waterbody located approximately 300 m north of the lime silo, was not impacted. Reclamation trial berms and natural ground contours north of the mill process building provide a natural barrier to any offsite movement of deleterious substances. During this 24-hour period, predominate wind direction was from northeast with an average wind speed of 19 km/hr. Wind direction and speed at the time of the event, confined the spill to a 10 m^2 radius between the lime silo, mill building and tanker truck.

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Further investigation of the event confirmed that initial reports of the spill quantity were overestimated. In total, only 26 kg of High Calcium Quicklime was lost during the rupture of the delivery hose. Cleanup of the affected area was completed before midnight on May 13, 2018. Granular Quicklime and gravel were collected by a mini Bobcat and placed into the Mill for disposal.

New Gold will be implementing preventative measures to ensure this type of event does not reoccur. These measures include immediate replacement of the delivery hose by the contractor. Going forward, all contractors providing delivery and unloading of Quicklime will be required to provide inspection reports of the delivery hose and delivery system. Reports will be reviewed and signed off by New Gold Mill Supervisor before unloading. Defective hoses will be tagged and removed from the site by the contractor. Additional mitigation measures include the mandatory use of spill trays at the connection points to capture any spillage.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,

<Original signed by>

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May 30, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email: Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 3000 L Hydraulic Fluid Spill - SAC Reference #2600-AZ2V8F

Further to the notification to the Spills Action Centre (SAC) Reference #2600-AZ2V8F regarding a spill of hydraulic fluid on May 23rd, the following report is submitted to the Ministry of Environment and Climate Change (MOECC) as per condition 11(4) of ECA 5178-9TUPD9.

Discovery

- During routine removal of ore, a PC5500 Komatsu Shovel (unit number 603) lost power to the boom arm.
- The operator then shut the shovel down, noticed the leaking hydraulic fluid and called the Mine Shift Supervisor to inform him of the situation and request a clean-up crew.

Cause

- A rupture in the hydraulic line caused 3,000 litres of hydraulic fluid to flow onto the rocky surface of the open pit.
- The line had failed in the past, but had been patched and a replacement line was on order.

Clean Up and Recovery

- The event occurred within the confines of the open pit with no impact to any water bodies.
- Due to the speed at which the leak occurred, a berm was immediately built to contain and stop the hydraulic fluid from spreading.
- The hydraulic fluid did not penetrate into the ground, as the area is composed of blast rock sitting atop bedrock.
- Green for Life (GFL) arrived on site with a vacuum truck to remove the spilled hydraulic fluid from the pit floor.
- GFL removed approximately 13,500 litres of contaminated hydraulic fluid, water and mud. The vacuum truck transported the contaminated waste back to Thunder Bay for proper disposal.
- All contaminated rock remaining on the pit floor was cleaned, then processed through the primary crusher into the mill.
- Contaminated spill pads, booms and brooms were collected, then placed in appropriate containers and stored at the plant site truck shop for pick up by GFL.

Preventative Measures

- Effective immediately, patched hydraulic hoses will no longer be used under any circumstances.
- The New Gold Mobile Maintenance standard operating procedure (MOP-SOP-0011) will be updated to incorporate this change.

Once you have had the opportunity to review this information, please feel free to contact the undersigned or Sylvie St.Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions you may have.

Regards,

<Original signed by>

Nathan Baird
Environmental Technician
New Gold Rainy River Project
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(807) 271-3190

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CEAA, compliance.conformite@ceaa-acee.gc.ca
Dan McDonnell, EC; dan.mcdonell@canada.ca

newgold™ Rainy River

June 15, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email: Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 300L Process Water Spill - SAC Reference #3476-AZKQWK

Further to the notification to the Spills Action Centre (SAC) Reference #3476-AZKQWK regarding a process water spill on June 9th, the following report is submitted to the Ministry of Environment and Climate Change (MOECC) as per condition 11(4) of ECA 5178-9TUPD9.

Discovery

- During regular operation of the Mill, an employee discovered process water spilling over from the carbon collection tank, flooding the secondary containment area, flowing into the truck ally then exiting out Door 8E.
- Transfer of carbon and excess process water immediately ceased.

Cause

- The carbon safety screen plugged causing the carbon collection tank to fill with a mixture of carbon, slurry and process water.
- A sump pump situated in the collection tank was disconnected and failed to activate.
- Mill doors remain open to provide additional ventilation during summer operations.

Clean Up and Recovery

- The event occurred within the immediate area of the mill process building and Door 8E access with no impact to any water bodies.

- An estimated 300L of process water was lost during the event. Only 76L left the building and spilled outside onto the gravel surface within a 20 meter radius of Door 8E.
- Pooled water near Door 8E was pushed back into the mill. A sandbag berm barrier was constructed to stop flow of water outside of the building.
- Gravel saturated by the spill was dug up and placed inside the mill for processing.

Preventative Measures

- A sump collection project has been approved and will be constructed during June, 2018.
- Sandbag barriers and water collection berms will remain in place until then.

Once you have had the opportunity to review this information, please feel free to contact the undersigned or Sylvie St.Jean (Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions you may have.

Regards,

<Original signed by>

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newgold™ Rainy River

June 15, 2018

John Vandenbroeck
Management Biologist, Fort Frances District
Ministry of Natural Resources and Forestry
922 Scott Street
Fort Frances, ON
P9A 1J4
Via email: john.vandenbroeck@ontario.ca

Dear Mr. Vandenbroeck,

RE: 2018 ESA Acoustic Audit – Exceedance of Sound Threshold

As per Endangered Species Act (ESA) Permit FF-C-001-14 conditions 4.1 (g) and 4.2 (b), New Gold is providing notification to the Ministry of Natural Resources and Forestry (MNRF) that sound level thresholds were exceeded during the ongoing acoustic audit. However, the source of noise resulting in the exceedance appears unrelated to construction or operations activities and no immediate mitigation is proposed.

Preliminary results received from sound recording equipment on June 6, 2018 exceeded the 50 dBA sound level threshold:

- Between 11:00 and 13:00 hours on June 6, 2018, monitoring equipment recorded sound levels of 51 and 51 dBA at the North Receptor Habitat also 51 and 52 dBA at the South Receptor Habitat. Recorded sound levels indicate that the exceedances were weather related, likely due to strong winds. Please refer to attached sound files NRM June.06.2018_1120-1130, NRM June.06.2018_1234-1244, SRM June.06.2018_1120-1130, and SRM June.06.2018_1311-1321.

As per ESA Permit conditions 4.1 (g) and 4.2 (b), acoustic audit measurements in the North and South EWPW Receptor Habitat areas were completed on June 7, 2018.

Please contact me with any questions or concerns at (807) 708-2407.

Best Regards,
<Original signed by>

Twila Griffith
Senior Environmental Specialist
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Email: twila.griffith@newgold.com

cc. Sylvie St. Jean (sylvie.st.jean@newgold.com)
Stacey Jack (stacey.jack@newgold.com)
Nigel Fisher (nigel.fisher@newgold.com)

newgold™ Rainy River

June 25, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: TAILINGS SLURRY SPILL 8L - SAC REFERENCE #1728-AZUQ67

On June 15, a contract employee called his area manager at 18:00 hours to inform him of a leak on a fusion coupling on the tailing corridor line at the curve, due north of where the line passes under Roen Road, west of the Marr site. The mill crew had previously completed a visual inspection of the entire tailings line at 17:30 hours and did not report any irregularities. Spray from the leak was covered by a spill tray held in place with a wooden pallet to prevent spreading by evening wind. The mill was shut down and a vacuum truck mobilized onto site to initiate cleanup. New Gold Environment Manager was informed at 20:51 hours and visited the area to assess the spill at 22:00 hours. At that time, it was observed that the Tailings slurry had leaked into the secondary containment area, with some material accumulated on the berm. Clean up continued during the night. A vacuum truck removed slurry from the containment area and disposed of it in Cell 2 of the Tailings Management Area (TMA).

During the morning of June 16th, a New Gold Environmental Technician went out to inspect the cleanup efforts and noticed that approximately 8 L of Tailings Slurry had sprayed over the containment berm onto vegetation. Immediately, the area manager was contacted to organize another cleanup. A vacuum truck returned to site and removed the Tailings Slurry, contaminated vegetation and topsoil in the spill area. Slurry and contaminated vegetation/topsoil mixture were disposed of into Cell 2 of the TMA.

The New Gold internal Environmental Standard Operating Procedure (ENV-SOP-0002) states all Tailings Slurry spills are to be externally reported.

Notification was made to the Ministry of the Environment and Climate Change as well as to the Spills Action Centre (SAC) (Reference #1728-AZUQ67) as defined in Ontario Regulation 675/98, condition 11(4) of Environmental Compliance Approval No. 5178-9TUPD9 and the above cited internal spill reporting procedure.

New Gold has implemented preventative measures to ensure this type of event does not reoccur. These measures include removal of the leaking fusion coupling and replacement with a flanged coupling.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,

<Original signed by>

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Stacey Jack (Stacey.jack@newgold.com)

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July 19, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment, Conservation and Parks
80 Robertson St
Kenora, ON P9N 1X9
Via email: Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 115L Hydraulic Fluid Spill – SAC Reference #8246-B2PV5U

Further to the notification to the Spills Action Centre (SAC) Reference #8246-2PV5U regarding a spill of hydraulic fluid on July 15, 2018, the following report is submitted to the Ministry of the Environment, Conservation and Parks (MOECP) as per Condition 11(4) of ECA 5178-9TUPD9.

Discovery

- While loading clay into a rock truck, a Komatsu PC650 excavator (unit #653) had a hydraulic line failure (Photo 1).
- The operator shut down the equipment when the line had failed, deployed a spill kit kept in the excavator, and notified the Contractor supervisor and Contractor HSE advisor.

Cause

- A suspected defective hose caused the failure of the hydraulic line resulting in 115 litres of hydraulic fluid spilling to the ground at a clay borrow pit within the footprint of the Tailings Management Area (TMA) (Map 1).

Clean Up and Recovery

- The event occurred within the confines of a clay borrow pit in the TMA footprint, with no impact to any water bodies.
- The hydraulic fluid did not penetrate into the ground, as the spill occurred in a clay borrow pit.
- A spill kit kept in the equipment was deployed by the operator.
- The affected clay was scraped up by bulldozer (Photo 2), loaded into a rock truck and transported to a contaminated soil bin for pick up and proper disposal by the Contractor's hazardous waste management company, Asselin Transportation. The used spill kit materials were deposited in a hazardous waste bin for pick up and proper disposal by Asselin Transportation.

Preventative Measures

- A daily machine inspection was completed and no leaks were observed at the start of shift. Daily inspections and regular maintenance are required by New Gold for all mobile equipment.

Please feel free to contact the undersigned or Sylvie St. Jean (Sylvie.St.Jean@newgold.com or 807-707-3497) with any questions.

Kind Regards,

<Original signed by>

Amanda Jacobs
Environmental Specialist
New Gold Rainy River Mine
Amanda.Jacobs@newgold.com
204-307-1857

Encl: Map 1 – Location of spill in the TMA footprint
Photo 1 – Photograph of clay affected by hydraulic line failure.
Photo 2 – Photograph of spill location after removal of affected clay.

cc: Gordon Moore, ECCC; gordon.moore@canada.ca
Andrea Doherty, DFO; andrea.doherty@dfo-mpo.gc.ca
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Dan McDonell; dan.mcdonell@canada.ca

Map 1 – Location of spill in the Tailings Management Area footprint

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Photo 1 – Clay affected by hydraulic line failure

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Photo 2 – Spill location after removal of affected clay

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newgold™ Rainy River

August 22, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment, Conservation and Parks
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: PROCESS WATER SPILL 57L - SAC REFERENCE #2504-B3TQR2

During the early morning hours on August 20, while checking a pump and hose line into the secondary containment area around the thickener and leach tanks, a mill employee discovered the line laying on the ground and process water flowing into the truck alleyway in front of Door 18W (Photo 1). Mill Door 18W is located on the west side of the process building, adjacent to the thickener and leach tank secondary containment area.

Photo 1. Extent of process water spill into truck alleyway of Door 18W.

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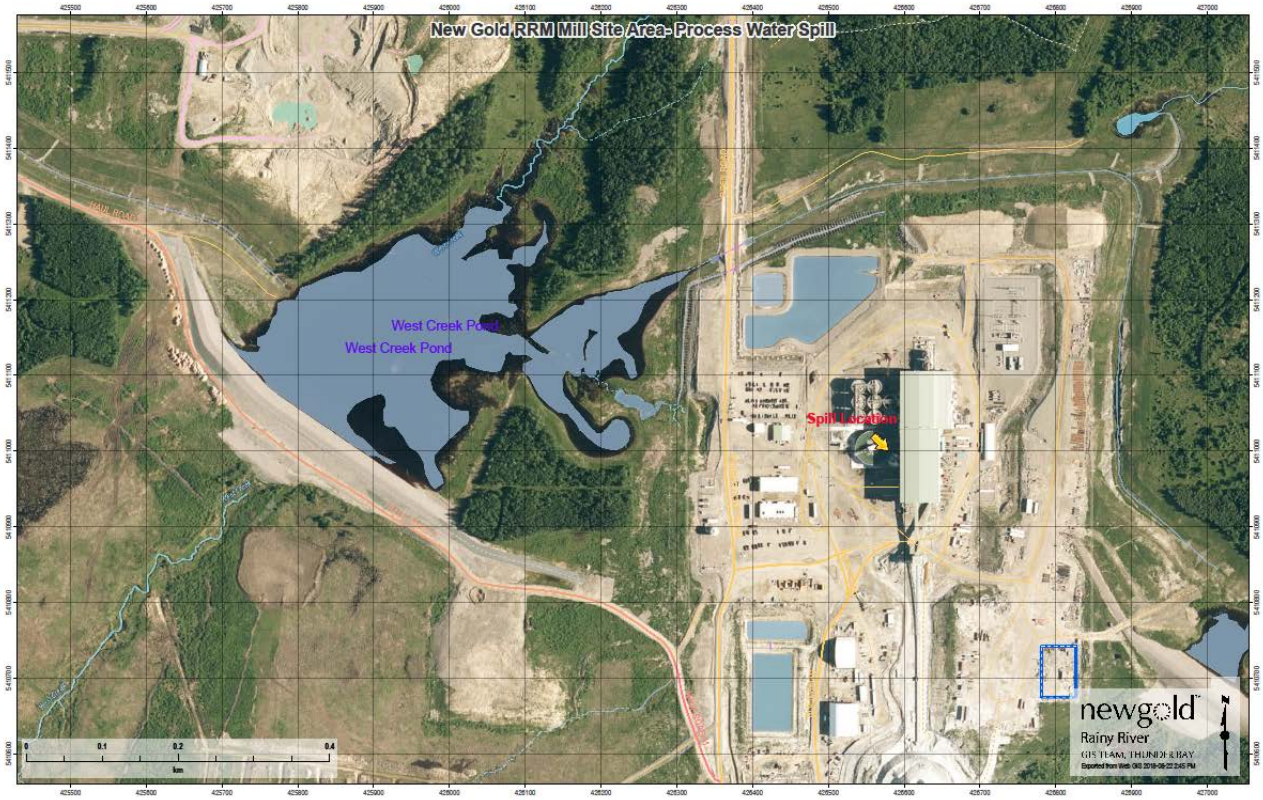

Photo 2. New Gold Rainy River Mine Process Plant site. Spill location denoted in red.

The pump was immediately shut off. Approximately 57L of process water ponded within 25 meters of the door, where it was 100% contained. Mill Door 18W is located 300 to 400 m west of the West Creek Pond and Diversion waterway (Photo 2). Natural topography and man-made features prevented the spill from reaching any further than the alleyway.

At that time of the event, it was observed that the green hose line connected to the pump and positioned over the wall into the containment area was too short. When the pump surged, the force knocked the line back over the wall and onto the ground surface. The green hose line was replaced with a longer black hose line which reached onto the containment area floor (Photo 3).

Photo 3. Black replacement hose on floor of containment area. Green hose line along containment wall.

Spill clean-up of the alleyway took place in the afternoon. Ponded process water and mud was scraped up and deposited into the thickener secondary containment area, where it washed into a floor sump back through the plant. Clean up was completed by 18:00 hours on August 20th (Photo 4).

The New Gold Internal Environmental Standard Operating Procedure (ENV-SOP-0002) states all Process water spills exceeding 25L are to be externally reported.

Notification was made to the Ministry of the Environment, Conservation and Parks as well as to the Spills Action Centre (SAC) (Reference #2504-B3TQR2) as defined in Ontario Regulation 675/98, condition 11(4) of Environmental Compliance Approval No. 5178-9TUPD9 and the above cited internal spill reporting procedure.

Photo 4. Alleyway of Door 18W showing the area after cleaned up was completed.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,

<Original signed by>

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cc. Sylvie St.Jean (Sylvie.st.jean@newgold.com)
Mitch Lepage (Mitch.lepage@newgold.com)

newgold™ Rainy River

September 21, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment, Conservation and Parks
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: VULTREX GEAR LUBRICANT 100L SPILL - SAC REFERENCE #3400-B4PU2N

During the night of September 15, a short and intense storm deposited 29.8 mm of precipitation over the plant site area within a 5-hour period. Precipitation from this storm temporarily overwhelmed the capacity of the east plant site drainage system, located along the toe of the upper bench due east of the mill process building. Run-off water migrated into a laydown area between the mill storage tent and propane tank, which was used to store hydrocarbon totes and barrels. The force of water flowing through the drainage system partially eroded the base under a secondary containment tub which supported a 1000L tote of Vultrex gear lubricant (Photo 1). The tote slid off the secondary containment tub and tipped over, dislodging the bung allowing 100L of gear lubricant to escape onto ground surface (Photo 2).

Photo 1. Tote of Vultrex Gear Lubricant supported on secondary containment tub.

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Photo 2. Extent of the gear oil spill into laydown area east of Mill Process building.

The spill occurred approximately 100 m east of mill process building in a laydown area which borders the plant site east drainage ditch system. Runoff water collects in the ditch and is channeled south through the site into the South Pond (Photo 3). All runoff water from the spill area was contained by this internal drainage system the South Pond. Water from the South Pond is used by the mill for processing ore. Any overflow is routed to the Mine Rock Pond via a 20-inch pipeline. New Gold will monitor the South Pond for evidence of hydrocarbon sheen.

Photo 3. GIS image of spill area (pink) and location of contact water drainage ditch (blue hatch).

Photo 4. View of area after cleaned up was completed.

Once all totes and barrels were removed from the area, a skid steer loader was utilized to remove all the hydrocarbon contaminated clays, gravels and vegetation. Contaminated materials were loaded into a 20 yd^3 contaminated soil bin for disposal at the Richardson Landfill. Clean up efforts commenced on Monday, September 16 and were completed by Thursday, September 20, 2018 (Photo 4).

Corrective actions include establishing a new hydrocarbon laydown area on the plant site upper east bench. The laydown will contain a clay and gravel lined secondary containment area used for storage of totes and barrels containing hydrocarbons. All totes/barrels stored outside the secondary containment area will be placed on yellow secondary containment tubs. Construction is scheduled to commence during the week of October 01 – 04, 2018.

Notification was made to the Ministry of the Environment, Conservation and Parks as well as to the Spills Action Centre (SAC) (Reference #3400-B4PU2N) as defined in Ontario Regulation 675/98, condition 11(4) of Environmental Compliance Approval No. 5178-9TUPD9 and in the New Gold Internal Environmental Standard Operating Procedure (ENV-SOP-0002).

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,
<Original signed by>

Twila Griffith
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cc. Sylvie St.Jean (Sylvie.st.jean@newgold.com)
Ginger Bragg (ginger.bragg@newgold.com)

newgold™ Rainy River

December 4, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of Environment, Conservation and Parks
808 Robertson St.
Kenora, ON
P9N 1X9

Dear Mr. Hoffmeister,

RE: TREATED TAILINGS 30L SPILL - SAC REFERENCE # 5504-BFXLNJ

Further to the notification to the Spills Action Center (SAC) Reference # 5504-BFXLNJ, on November 27, 2018 at 16:33, a tailings line corridor inspection at Emergency Dump Pond #6 noted a tailings line leak at a previously patched line of pipe. The mill was contacted, and shutdown began to take place at 16:36. The treated tailings started to spray onto the access road as the mill commenced shutdown.

Figure 1 shows tailings leak location at 16:50. Tailings spilled onto access road to Emergency Dump Pond 6. Tailings also pooling inside containment due to ice build under WMP reclaim line.

Once the tailings line was depressurized, the previous sleeve patch was inspected, adjusted, and retightened to stop the leak. More spigots were opened to reduce pressure on the tailings line and frequency of inspections increased through out the evening, to ensure the sleeve patch held.

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Figure 2 shows where the tailings sprayed out of the sleeve patch (lighter grey area along pipe) and ice build-up within the tailings corridor containment as a result of the spill.

Clean up began the morning of November 28, 2018 once the treated tailings froze. This allowed for the equipment to scrape up the spill without fear of the tailings flowing away from the impacted area. 1m^3 of frozen tailings and contaminated material was removed from the location.

Figure 3 Shows removal of tailings and contaminated material as well as recapped road once clean-up was complete.

The new tailings pipe section is planned to be installed during a maintenance shutdown for the mill. This portion of pipe will be put together in the maintenance shop and fused during the shutdown. In the interim, a portion of belt will be used to cover the sleeve patch and monitored during dayshift and nightshift. The drain to Emergency Dump Pond #6 will also be maintained free of ice to allow drainage in case of emergency.

Figure 4 shows Allmond heater and insulated tarp being used to thaw the frozen tailings from the bottom of the containment as well as thaw ice dam underneath WMP Reclaim line.

Once you have had the opportunity to review this information please feel free to contact the undersigned or Sylvie St. Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions.

Regards,

<Original signed by>

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Dan McDonell; dan.mcdonell@canada.ca
Michael Bell; michael.bell@canada.ca

newgold™ Rainy River

November 29, 2018

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment and Climate Change
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: Tailings Dusting Event – SAC Reference #2502-B6RUM5

On November 22, 2018 a fugitive dust event was reported coming off of the Cell 1 pond in the Tailings Management Area at approximately 14:00 (See photo 1).

Photo 1: Tailings dust from Cell # 1

Winds were gusting up to 35 km/h out of the south and it was evident at the time that the plume was travelling outside of the Environmentally Sensitive Area (ESA) boundary. Samples of snow were taken from Cell 1 north dam and from the northern most tip of the ESA boundary to assess the level of impact. (See Photo 2).

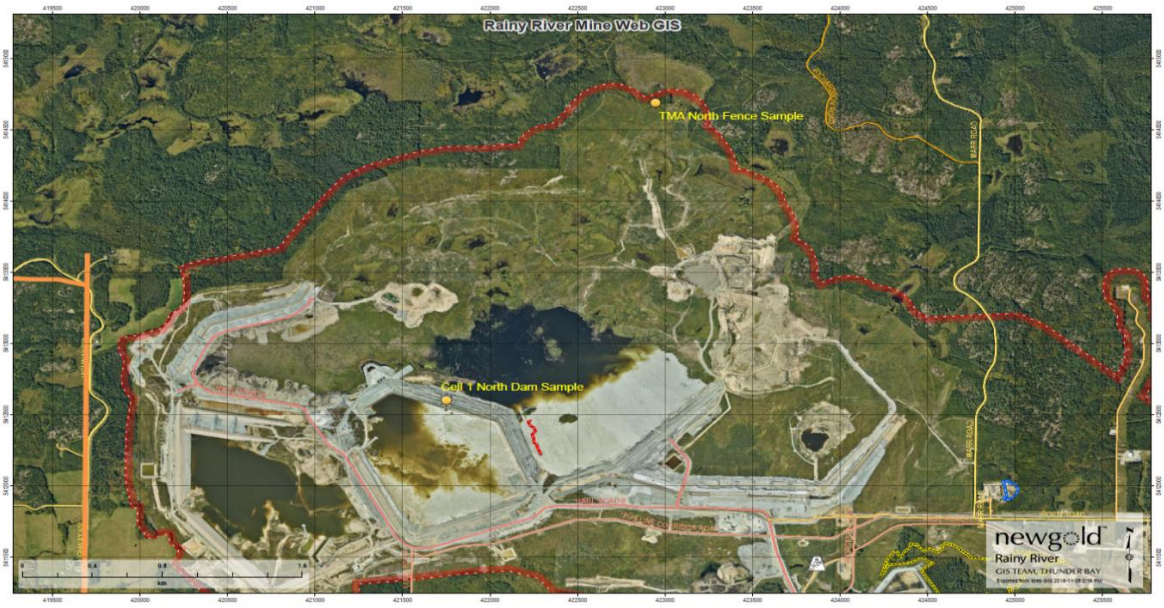

Photo 2: Map showing ESA Boundary

The samples taken were analyzed by ALS Environmental Laboratories in Thunder Bay, indicate there was little to no impact at that time. Tests show the three most prevalent elements on Cell 1 dam to be calcium, iron and sulfur at 38,200 mg/L, 10,600 mg/L and 17,300 mg/L, respectively. Tests results from the TMA North Fences samples showed levels of these elements to be lower by a factor of one thousand times or more (See appendix A).

The following day the weather conditions improved, and no fugitive dust event was seen at that time. However, from November 24th onwards moderate to high winds have persisted from the northwest and the dusting event is continuing at varying intensities. On Sunday November 26th, New Gold updated the Spills Action Center with this information.

New Gold began taking steps to control the fugitive dust on November 23rd which included adding water to Cell 1 in an effort to cover the exposed tailings and installing sprinklers along the banks of Cell 1 to form an ice sheet to keep the dust down. Several other options are currently being investigated in order to find a more permanent solution to the fugitive dust issue.
One option is to cover the exposed tailings with a product known as soil cement to provide a final cap. The soil cement requires constant reapplication, as rain will dilute it and the winter application contains glycerin which would be difficult to treat.
A second option is to apply a mix of hay, overburden and PAG/waste rocks to the exposed tailings. This solution is the most favorable, as it would promote vegetation growth and stabilize the material until subsequent lift will overprint it. Overburden cover should commence when the tailings are frozen enough to support a 40t truck (wiggle wagon).

If you have any further questions, please contact the undersigned.

Respectfully submitted,

<Original signed by>

Environmental Manager
(807) 707-3497
sylvie.st.jean@newgold.com

newgold™ Rainy River Project

September 26, 2018

District Manager,
c/o Matt Hoffmeister
Senior Environmental Officer, Kenora Area
Ministry of the Environment, Conservation and Parks
808 Robertson Street
Kenora, Ontario P9N 1X9

Dear Sir,

VIBRATION COMPLAINT – SAC# 3165-B4XRMG

On September 25, 2018 at 1:07 pm New Gold Rainy River Project (RRP) Community Relations received a complaint regarding vibrations felt from a blast on the New Gold Rainy River Project site on Wednesday, September 25 at 11:00 am. As per ECA #0412-A2LR4V terms and conditions section 7.1 and 7.2 please accept this letter as notification;

a) Message from Lisa Teeple stated that the blast caused the floor in the shop, situated 300 ft west of the house, to lift and crack. House and shop are located approximately 2.3 km south-southwest from the blast source. See attached map for reference.

b) A blast was detonated at approximately 11:00 am, September 25, 2018 in the New Gold RRM East Mine Rock Stockpile drainage ditch area, located approximately 3.2 km southeast of the RRM open pit center.

c) Climatic conditions at the time were wind direction 309 degrees (northwest), wind speed 11 km/hr., average relative humidity 83%, average temperature 7.3 degrees C., with cloudy and overcast skies.

d) Ginger Bragg, Supervisor for New Gold RRM Community Relations, received the complaint shortly after the blast.

e) New Gold RRM community personnel communicated to the neighbors and Chapple township that blasting would take place in this area for a period of 8 weeks, from September to October of 2018. Vibration and concussion (air overpressure) readings monitored at 6 locations did not exceed Ministry Publication NPC-119 cautionary values of 10 mm/s and 120 dB respectively.

Vibration and Overpressure Monitoring Stations for Sep 25, 2018			
Station No.	**Station Location**	**Vibration Levels (mm/s)**	**Concussion Levels (dB)**
1	24 Marr	0.317	101.1
2	4298 Hwy 71	0.104	100.4
3	1340 Hwy 600	0.243	95.18
4	2899 Hwy 600	0.196	88.68
5	1050 Teeple	0.790	93.92
6	Barron Site	0.176	111.7

Should you require additional information, please contact the undersigned at carolyn.winik@newgold.com or telephone (807) 482-0900 ext. 8046.

Sincerely,
<Original signed by>

Carolyn Winik
Senior Environmental Specialist

cc.
Sylvie St. Jean, Environmental Manager (sylvie.st.jean@newgold.com)
Ginger Bragg, Supervisor Community Relations (ginger.bragg@newgold.com)

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newgold™ Rainy River Project

March 23, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora ON P9N 1X9
Via email: (matt.hoffmeister@ontario.ca)

Dear Mr. Hoffmeister,

RE: SAC REF# 5627- AWWVWT HYDROCARBON SPILL AT WAREHOUSE LAYDOWN

In accordance with ECA 5178-9TUPD9, notification was made to the Spills Action Centre (SAC Ref. # 5627-AWWVWT) regarding a 136 L spill of gear lubricant in the laydown yard of the Barron Warehouse on March 16, 2018. The following report is submitted to the Ministry of Environment and Climate Change (MOECC) as per condition 11(4) of ECA 5178-9TUPD9.

Discovery

- During the afternoon of March 16th, warehouse employees were moving 45 gallon barrels of gear lubricant.
- A warehouse employee noticed black viscous hydrocarbon seeping out of bottom of one of the 45 gallon barrels.
- Inspection of the spill area by warehouse supervisor estimated ¾ of the barrel contents had leaked out onto the frozen ground surface.
- The barrel was inverted into a spill tray to stop the leak.
- Employees immediately contained the spill using absorbent pads, booms and sand.
- New Gold Environment was called to inspect the spill.
- The Spills Action Centre was notified at 18:48 hours and an investigation initiated.

Cause

- Puncture of the barrel by one of the forks on the telehandler.
- Secondary containment not in place.

Clean Up and Recovery

- Gear lubricant is composed of 60% asphalt and 40 % petroleum distillates and highly viscous. Spill was fully contained within a 2 m^2 area using pill pads, spill booms and sand.
- Contaminated material was collected in two 45 gallons drums for removal from site by a registered hazardous waste carrier.

Preventative measures and schedule of implementation

- Review with all warehouse employees proper procedures for loading and unloading of barrels containing hydrocarbons and liquids using a telehander before March 31, 2018.
- Establish secondary containment under all containers, barrels, pails that contain hydrocarbons in the laydown area before April 16, 2018
- Maintain minimal quantities of hydrocarbons in the warehouse laydown yard. Expedite shipment to storage areas on site before April 30, 2018.

Should you have any questions after reviewing this letter, please contact the undersigned at (807) 708-2407.

Regards,
<Original signed by>

Twila Griffith
Sr. Environmental Specialist
twila.griffith@newgold.com

New Gold Inc.
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cc: Gordon Moore (Environment Canada)
Karli Allen (Ministry of Natural Resources and Forestry)
Canadian Environmental Assessment Agency (CEAA)

newgold™ Rainy River

May 02, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change 808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: AIR QUALITY EXCEEDANCES OF 24-HOUR TOTAL SUSPENDED PARTICULATE-MONITORING LIMITS - SAC REFERENCE #3444-AY8S75

On April 27, the air quality engineer consultant responsible for reporting the site air quality monitoring results, informed New Gold Environment of elevated laboratory results, indicating total suspended particulates (TSP) and iron exceedances at Gallinger Road air quality station. The consultant stated that these values were uncharacteristically high for this particular location and nearby roadwork activities may have contributed to these results.

New Gold notified the Spills Action Centre (SAC) Reference #3444-AY8S75 of the exceedance of the ministry approved limits for Total Suspended Particulate Matter and Iron (metallic) concentrations on April 27th. The exceedance occurred on March 16, 2018 at the Gallinger Air Quality Monitoring Station, and was reported to New Gold on the 27th of April, as per the procedures. The following letter report accompanies a copy of the notification of exceedance (NOE) as per ECA #0412-A2LR4V.

Gallinger Road air quality station is located approximately 4.5 km due east of the primary crusher on the Rainy River Mine Site. Gallinger Road itself passes by the air quality station in a north-south direction at approximately 50 metres east.

TSP samples were collected during a 24-hr period on March 16, 2018 as per Rainy River Project Ambient Air Quality Monitoring Plan, accepted by MOECC on November 9th, 2016. During this 24-hour period, predominate wind direction varied from east to southeast with an average wind speed of 6 km/hr. The wind direction that day, makes it unlikely that the source of the dust would be coming from the crusher which is situated to the west of the air monitoring station, and suggests that the exceedance was related to the road dust.

newgold™ Rainy River

New Gold's dust abatement plan calls for the application of Calcium Chloride to reduce the road dust. However, one of the requirements for the application of this product, or of the application of water, is that it should not be done under frozen conditions. The spring of 2018 has been dry and cold to date with temperatures well below freezing at night and often during the day until the second week of April. On March 16th, temperatures reached 6°C during daylight hours and dropped to -10°C at night. As such the abatement program could not be implemented at that time due to freezing temperatures at night. No precipitation was recorded during the same 24-hour period making road conditions very dry and prone to dust.

New Gold noticed the above average usage of Gallinger road in early April and reminded staff of the mitigation measures which include restricting access of all motor vehicles along Gallinger Road. On April 15th, New Gold posted managers at the corner of Gallinger and Korpi to stop each driver and remind them personally of the road usage restriction. Traffic on Gallinger was reduced from above 75 vehicles between 6 and 7 am to 3 (non-New Gold) in 5 working days. Physical monitoring will remain in place until the end of May. Mitigation measures including watering of Gallinger Road and placing Calcium Chloride on the road surface to reduce road dust will be applied should dust continue to be an issue

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,

<Original signed by>

Twila Griffith
Sr. Environmental Specialist
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cc. Sylvie St.Jean (Sylvie.st.jean@newgold.com)
Stacey Jack (Stacey.jack@newgold.com)

newgold™ Rainy River

June 13, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change 808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: AIR QUALITY EXCEEDANCES OF 24-HOUR TOTAL SUSPENDED PARTICULATE-MONITORING LIMITS - SAC REFERENCE #3476-AZKQWK

On June 6th, the air quality engineer consultant responsible for reporting the site air quality monitoring results, informed New Gold Environment of elevated laboratory results, indicating total suspended particulates (TSP) and iron exceedances at Gallinger Road air quality station. The consultant stated that these values were higher than normal for this particular location and questioned whether nearby activities contributed to these results.

New Gold notified the Spills Action Centre (SAC) Reference #3476-AZKQWK of the exceedance of the ministry approved limits for Total Suspended Particulate Matter and Iron (metallic) concentrations on June 6th. The exceedance occurred on April 8th, 2018 at the Gallinger Air Quality Monitoring Station, and was reported to New Gold on the 6th of June, as per the procedures. The following letter report accompanies a copy of the notification of exceedance (NOE) as per ECA #0412-A2LR4V.

Gallinger Road air quality station is located approximately 4.5 km due east of the primary crusher on the Rainy River Mine Site. Gallinger Road itself passes by the air quality station in a north-south direction at approximately 50 metres east.

TSP samples were collected during a 24-hr period on April 8th, 2018 as per Rainy River Project Ambient Air Quality Monitoring Plan, accepted by MOECC on November 9th, 2016. During this 24-hour period, predominate wind direction varied from northeast to south-southwest with an average wind speed of 11 km/hr. The wind direction that day, makes it unlikely that the source of the dust would be coming from the crusher which is situated to the west of the air monitoring station, and suggests that the exceedance was related to the road dust.

newgold™ Rainy River

New Gold's dust abatement plan calls for the application of Calcium Chloride to reduce the road dust. However, one of the requirements for the application of this product, or of the application of water, is that it should not be done under frozen conditions. The spring of 2018 has been dry and cold to date with temperatures well below freezing at night. On April 8th, temperatures reached 15.5°C during daylight hours and dropped to -7°C at night. As such the abatement program could not be implemented at that time due to freezing temperatures at night. No precipitation was recorded during the 72-hour period from April 6th to April 8th making road conditions very dry and prone to dust.

As discussed in the air quality exceedance letter report of May 03rd, 2018; New Gold noticed the above average usage of Gallinger road in early April and immediately undertook mitigation measures. Motor vehicle access along Gallinger Road was restricted to local traffic only. On April 15th, New Gold managers, positioned at the corner of Gallinger and Korpi, stopped and reminded each driver of the road usage restriction. Over 5 working days, traffic on Gallinger was reduced from above 15 vehicles between 6 and 7 am to 3 (non-New Gold) vehicles. Physical monitoring continued until the end of May, when all traffic from New Gold had ceased.

New Gold is proceeding with the application of Calcium Chloride along all its roads, including Gallinger. The application should be completed by the end of June.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,

<Original signed by>

Twila Griffith
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Stacey Jack (Stacey.jack@newgold.com)

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June 13, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change 808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

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newgold™ Rainy River

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As discussed in the air quality exceedance letter report of May 03rd, 2018; New Gold noticed the above average usage of Gallinger road in early April and immediately undertook mitigation measures. Motor vehicle access along Gallinger Road was restricted to local traffic only. On April 15th, New Gold managers, positioned at the corner of Gallinger and Korpi, stopped and reminded each driver of the road usage restriction. Over 5 working days, traffic on Gallinger was reduced from above 15 vehicles between 6 and 7 am to 3 (non-New Gold) vehicles. Physical monitoring continued until the end of May, when all traffic from New Gold had ceased.

New Gold is proceeding with the application of Calcium Chloride along all its roads, including Gallinger. The application should be completed by the end of June.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,
<Original signed by>

Twila Griffith
Sr. Environmental Specialist
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Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment, Conservation and Parks
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 20L Process Water Spill – SAC Reference #2021-B46NNP

On August 31st at approximately 1200, process water was found to be backing up into the Millwright shop from the mill floor. This water was found to have escaped the man door of the Millwright shop and made contact with the ground outside the mill. (See photo below)

The mill was in upset conditions which caused a great deal of process slurry to settle in the works. When the mill was restarted various filter screens, cyclones and sumps were clogged and overtopped onto the mill floor. The process water separated from the slurry and backed up into the Millwright shop then spilled out door 11E. There was no impact to any water body as the process water only migrated about 5 meters outside the door resulting in 20L exiting the mill.
This spill was caught quickly by the operators and work ceased. The gravel containing the process water was placed inside the mill and returned into the process, this was completed by the end of the day shift.

Changes will be made to the mill start up procedure to include monitoring and mitigating the level of process water on the mill floor in the interim. In the longer term, work continues within the mill to ensure proper sloping is in place to direct any process water/slurry to internal sumps.

Once you have had the opportunity to review this information please feel free to contact the undersigned or Sylvie St.Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions.

newgold™ Rainy River Project

Regards,

<Original signed by>

Nathan Baird
Environmental Specialist-Wildlife
New Gold Rainy River
Nathan.Baird@newgold.com
807-271-3190

cc:
Michael Bell. (Michael.bell@canada.ca)
Andrea Doherty, DFO; andrea.doherty@dfo-mpo.gc.ca
CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca

newgold™ Rainy River Project

September 19, 2018

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment, Conservation and Parks
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 1000L Tailings Spill – SAC Reference #3763-B4KHDD

On September 13th at approximately 1215 am, tailings was found to be exiting door 3N from the tailings sump pump box and migrated 55 meters to the northeast. See photo below (clean-up was well underway at time of photo)

The spill only lasted a few minutes and quick action by the operators placing sand over the existing berm (speed bump) in front of door 3N stopped 80-90% of the tails from escaping. See photo below.

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Clean-up began right away and finished around 5 pm that day. There was no impact to any water body and all contaminated materials were collected and put back into the mill process.

The cause of this event was a combination of power failures along with process software updates which caused upset conditions in the mill, resulting in failed alarms and pumps operating incorrectly. An internal investigation is on-going.

Once you have had the opportunity to review this information please feel free to contact the undersigned or Sylvie St. Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions.

Regards,

<Original signed by>

Nathan Baird
Environmental Specialist-Wildlife
New Gold Rainy River
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Michael Bell; michael.bell@canada.ca
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CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca

December 21, 2018

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment and Climate Change
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 450L Dyed Diesel Spill Drill 903 – SAC Reference #5120-B7MMFB

At 0300 hours the operator of drill 903 noticed an unexpected drop in fuel level well drilling blast holes in the East Outcrop. (See photo 1 below)

Photo 1: Map of site denoting spill location.

Photo 2: Drill 903

The operator called maintenance for assistance and dismounted to look for a leak. He discovered that he had backed over a large rock and punctured the fuel tank, he then moved the drill off the rock and tilted the drill back to mitigate further spillage (as can be seen in photo 2 above).

At surface, the spill did not appear to be significant but upon further inspection it was noticed that a large amount of fuel had seeped into the shattered rock (see photos 3 and 4 below). Three drill holes were found to be contaminated with dyed diesel.

Photo 3: Spill site

Photo 4: Drill hole

By mid-day a vacuum truck had collected as much fuel as possible from the drill holes and placed it in used oil totes for pick up by Green For Life, a licensed hazardous waste disposal company.

The blasting agent used on site is an emulsion product that contains a significant component of diesel. It is expected that when these holes are loaded and blasted most, if not all, of the residual diesel will be consumed. This will occur by mid-January. At that time the rock will be inspected for contamination.

If the rock is found to be contaminated, it will be sent through the mill as a treatment. If the rock is found to be clean, it will be used onsite to build required infrastructure.

Once you have had the opportunity to review this information please feel free to contact the undersigned or Sylvie St.Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions.

<Original signed by>

Environmental Specialist –Wildlife

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newgold™ Rainy River Project

April 26, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 450L Propylene Glycol Spill - SAC Reference #7150-AY33FE

Further to the notification to the Spills Action Centre (SAC) Reference #7150-AY33FE regarding a spill of propylene glycol on April 21st , 2018, the following report is submitted to the Ministry of Environment and Climate Change (MOECC).

Discovery

- Loader operator went to remove a partially emptied tote of propylene glycol while completing cleanup duties at the end of his shift on the TMA North Dam.
- When attempting to pick up the tote, he discovered the loader forks had punctured the plastic tote.
- The operator immediately called his supervisor and stopped all work in the affected area.

Cause

- Puncturing the base of the plastic tote caused the contents to spill onto the ground surface.
- Loader operator performed the task alone without authorization from Supervisor.

Clean Up and Recovery

- Approximately 450 liters of propylene glycol spilled onto the downstream sand seam of TMA North Dam where it was 100% contained. There was no impact to any nearby water sources.

- An estimated 7 m^3 of contaminated sand was scraped up and loaded into a contaminated soil bin.
- Spill pads and boom socks, used during the containment and clean-up process, were collected into barrels.
- Contaminated materials, removed from the immediate area, are stored in a laydown area; awaiting removal from site by a registered hazardous waste carrier.

Preventative Measures

- Implement re-training with team members to understand the importance of a using a spotter when performing all tasks with limited visibility.
- Increase supervisor participation with crews in work areas and reviewing task assignments.

Once you have had the opportunity to review this information, please feel free to contact the undersigned or Sylvie St. Jean at (sylvie.st.jean@newgold.com or 807-707-3497) with any additional questions you may have.

Regards,

<Original signed by>

Garnet Cornell
Environmental Technician
New Gold Rainy River Project
Email: garnet.cornell@newgold.com
Cell: (807) 276-0106

cc: Gordon Moore, EC; (gordon.moore@canada.ca)
Andrea Doherty, DFO; (andrea.doherty@dfo-mpo.gc.ca)
CEAA; (compliance.conformite@ceaa-acee.gc.ca)
Dan McDonnell, EC; (dan.mcdonell@canada.ca)

newgold™ Rainy River

May 03, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change 808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: AIR QUALITY EXCEEDANCES OF 24-HOUR TOTAL SUSPENDED PARTICULATE-MONITORING LIMITS - SAC REFERENCE #3444-AY8S75

On April 27, the air quality engineer consultant responsible for reporting the site air quality monitoring results, informed New Gold Environment of elevated laboratory results, indicating total suspended particulates (TSP) and iron exceedances at Gallinger Road air quality station. The consultant stated that these values were uncharacteristically high for this particular location and nearby roadwork activities may have contributed to these results.

New Gold notified the Spills Action Centre (SAC) Reference #3444-AY8S75 of the exceedance of the ministry approved limits for Total Suspended Particulate Matter and Iron (metallic) concentrations on April 27th. The exceedance occurred on March 16, 2018 at the Gallinger Air Quality Monitoring Station, and was reported to New Gold on the 27th of April, as per the procedures. The following letter report accompanies a copy of the notification of exceedance (NOE) as per ECA #0412-A2LR4V.

Gallinger Road air quality station is located approximately 4.5 km due east of the primary crusher on the Rainy River Mine Site. Gallinger Road itself passes by the air quality station in a north-south direction at approximately 50 metres east.

TSP samples were collected during a 24-hr period on March 16, 2018 as per Rainy River Project Ambient Air Quality Monitoring Plan, accepted by MOECC on November 9th, 2016. During this 24-hour period, predominate wind direction varied from east to southeast with an average wind speed of 6 km/hr. The wind direction that day, makes it unlikely that the source of the dust would be coming from the crusher which is situated to the west of the air monitoring station, and suggests that the exceedance was related to the road dust.

newgold™ Rainy River

New Gold's dust abatement plan calls for the application of Calcium Chloride to reduce the road dust. However, one of the requirements for the application of this product, or of the application of water, is that it should not be done under frozen conditions. The spring of 2018 has been dry and cold to date with temperatures well below freezing at night and often during the day until the second week of April. On March 16th, temperatures reached 6°C during daylight hours and dropped to -10°C at night. As such the abatement program could not be implemented at that time due to freezing temperatures at night. No precipitation was recorded during the same 24-hour period making road conditions very dry and prone to dust.

New Gold noticed the above average usage of Gallinger road in early April and reminded staff of the mitigation measures which include restricting access of all motor vehicles along Gallinger Road. On April 15th, New Gold posted managers at the corner of Gallinger and Korpi to stop each driver and remind them personally of the road usage restriction. Traffic on Gallinger Road was reduced from more than 15 vehicles travelling between 6 and 7 am to zero New Gold employees using the road in 5 working days. Physical monitoring will remain in place until the end of May. Mitigation measures including watering of Gallinger Road and placing Calcium Chloride on the road surface to reduce road dust will be applied should dust continue to be an issue.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,
<Original signed by>

Twila Griffith
Sr. Environmental Specialist
New Gold Inc.
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cc. Sylvie St.Jean (Sylvie.st.jean@newgold.com)
Stacey Jack (Stacey.jack@newgold.com)

newgold™ Rainy River

May 8, 2018

John Vandenbroeck
Management Biologist, Fort Frances District
Ministry of Natural Resources and Forestry
922 Scott Street
Fort Frances, ON P9A 1J4
Via email; john.vandenbroeck@ontario.ca

RE: 2018 ESA Acoustic Audit – Exceedance of Sound Threshold

Dear Mr. Vandenbroeck,

Consistent with Endangered Species Act (ESA) Permit FF-C-001-14 condition 4.1 and 4.2 New Gold Inc (New Gold) is providing notification to the Ministry of Natural Resources and Forestry (MNRF) that sound threshold was exceeded during the ongoing acoustic audit. However, the source of noise resulting in the exceedance appears unrelated to construction or operations activities and as such no immediate mitigation is proposed.

Preliminary results received from sound recording equipment on May 1st and May 3rd exceeded the 50 dBA sound level threshold;

- At 0300 on May 1, 2018, monitoring equipment recorded sound levels of 61 dBA at the North Receptor Habitat and 60 dBA at the South Receptor Habitat. Recorded sound levels were almost identical indicating a global source, such as a thunderstorm. This exceedance was weather related, not produced by construction activities. Please refer to attached sound files NRM 05.01.2018.3AM and SRM05.01.2018.3AM.

- At 2100 on May 2, 2018, monitoring equipment recorded sound levels of 52 dBA at the North Receptor Habitat. A review of the audio recordings found wildlife activities (birds chirping, frogs croaking) overprinting intermittent equipment noise. Please refer to attached sound file SR62.

These occurrences appear isolated and related to natural phenomena, not construction or operation activities. Therefore, implementation of immediate mitigations measures related to operations or construction activities stipulated in condition 4.1 is not proposed at this time.

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As per compliance condition 4.1 and 4.2 of ESA Permit FF-C-001-14 acoustic audit measurements, conducted by a qualified professional, will continue in the North and South WPW Receptor Habitat areas until May 8th, and again during June 2018.

Once you have had the opportunity to review this letter, please contact me with any questions or concerns at (807) 708-2407.

Regards,

<Original signed by>

Twila Griffith
Sr. Environmental Specialist
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Stacey Jack (Stacey.jack@newgold.com)
Nigel Fisher (nigel.fisher@newgold.com)

newgold™ Rainy River

May 18, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: - SAC REFERENCE #0415-AYR2B6

On May 13, a Mill Supervisor informed New Gold Environment of a spill beside the Lime Silo on the northeast side of the mill process building. Initial reports estimated that 1,000 kg of granular High Calcium Quicklime was spread across the ground surface between the mill and silo.

New Gold notified the Spills Action Centre (SAC) Reference #0415-AYR2B6 of the reportable spill as defined in Ontario Regulation 675/98, condition 11(4) of Environmental Compliance Approval No. 5178-9TUPD9 and the internal spill reporting procedure. The estimated amount of the spill exceeded the Federal Transportation of Dangerous Good (TDG) Act Schedule 1 approved limits of 5 kg for Class 8, Corrosive substances. TDG Act classifies Lime as a Class 8 substance.

During the regular unloading process, a contractor supplied delivery hose was connected between the tanker truck and lime silo. Compressed air, used to move the granular lime from the tanker truck to the silo, blew lime out of a rupture in the delivery hose and covered the ground around mill doors 8e and 9e and the Lime silo. West Creek Diversion, the closest fish bearing waterbody located approximately 300 m north of the lime silo, was not impacted. Reclamation trial berms and natural ground contours north of the mill process building provide a natural barrier to any offsite movement of deleterious substances. During this 24-hour period, predominate wind direction was from northeast with an average wind speed of 19 km/hr. Wind direction and speed at the time of the event, confined the spill to a 10 m^2 radius between the lime silo, mill building and tanker truck.

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Further investigation of the event confirmed that initial reports of the spill quantity were overestimated. In total, only 26 kg of High Calcium Quicklime was lost during the rupture of the delivery hose. Cleanup of the affected area was completed before midnight on May 13, 2018. Granular Quicklime and gravel were collected by a mini Bobcat and placed into the Mill for disposal.

New Gold will be implementing preventative measures to ensure this type of event does not reoccur. These measures include immediate replacement of the delivery hose by the contractor. Going forward, all contractors providing delivery and unloading of Quicklime will be required to provide inspection reports of the delivery hose and delivery system. Reports will be reviewed and signed off by New Gold Mill Supervisor before unloading. Defective hoses will be tagged and removed from the site by the contractor. Additional mitigation measures include the mandatory use of spill trays at the connection points to capture any spillage.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,

<Original signed by>

Twila Griffith
Sr. Environmental Specialist
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cc. Sylvie St.Jean (Sylvie.st.jean@newgold.com)
Stacey Jack (Stacey.jack@newgold.com)

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May 30, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email: Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 3000 L Hydraulic Fluid Spill - SAC Reference #2600-AZ2V8F

Further to the notification to the Spills Action Centre (SAC) Reference #2600-AZ2V8F regarding a spill of hydraulic fluid on May 23rd, the following report is submitted to the Ministry of Environment and Climate Change (MOECC) as per condition 11(4) of ECA 5178-9TUPD9.

Discovery

- During routine removal of ore, a PC5500 Komatsu Shovel (unit number 603) lost power to the boom arm.
- The operator then shut the shovel down, noticed the leaking hydraulic fluid and called the Mine Shift Supervisor to inform him of the situation and request a clean-up crew.

Cause

- A rupture in the hydraulic line caused 3,000 litres of hydraulic fluid to flow onto the rocky surface of the open pit.
- The line had failed in the past, but had been patched and a replacement line was on order.

Clean Up and Recovery

- The event occurred within the confines of the open pit with no impact to any water bodies.
- Due to the speed at which the leak occurred, a berm was immediately built to contain and stop the hydraulic fluid from spreading.
- The hydraulic fluid did not penetrate into the ground, as the area is composed of blast rock sitting atop bedrock.
- Green for Life (GFL) arrived on site with a vacuum truck to remove the spilled hydraulic fluid from the pit floor.
- GFL removed approximately 13,500 litres of contaminated hydraulic fluid, water and mud. The vacuum truck transported the contaminated waste back to Thunder Bay for proper disposal.
- All contaminated rock remaining on the pit floor was cleaned, then processed through the primary crusher into the mill.
- Contaminated spill pads, booms and brooms were collected, then placed in appropriate containers and stored at the plant site truck shop for pick up by GFL.

Preventative Measures

- Effective immediately, patched hydraulic hoses will no longer be used under any circumstances.
- The New Gold Mobile Maintenance standard operating procedure (MOP-SOP-0011) will be updated to incorporate this change.

Once you have had the opportunity to review this information, please feel free to contact the undersigned or Sylvie St.Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions you may have.

Regards,

<Original signed by>

Nathan Baird
Environmental Technician
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CEAA, compliance.conformite@ceaa-acee.gc.ca
Dan McDonnell, EC; dan.mcdonell@canada.ca

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June 15, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email: Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 300L Process Water Spill - SAC Reference #3476-AZKQWK

Further to the notification to the Spills Action Centre (SAC) Reference #3476-AZKQWK regarding a process water spill on June 9th, the following report is submitted to the Ministry of Environment and Climate Change (MOECC) as per condition 11(4) of ECA 5178-9TUPD9.

Discovery

- During regular operation of the Mill, an employee discovered process water spilling over from the carbon collection tank, flooding the secondary containment area, flowing into the truck ally then exiting out Door 8E.
- Transfer of carbon and excess process water immediately ceased.

Cause

- The carbon safety screen plugged causing the carbon collection tank to fill with a mixture of carbon, slurry and process water.
- A sump pump situated in the collection tank was disconnected and failed to activate.
- Mill doors remain open to provide additional ventilation during summer operations.

Clean Up and Recovery

- The event occurred within the immediate area of the mill process building and Door 8E access with no impact to any water bodies.

- An estimated 300L of process water was lost during the event. Only 76L left the building and spilled outside onto the gravel surface within a 20 meter radius of Door 8E.
- Pooled water near Door 8E was pushed back into the mill. A sandbag berm barrier was constructed to stop flow of water outside of the building.
- Gravel saturated by the spill was dug up and placed inside the mill for processing.

Preventative Measures

- A sump collection project has been approved and will be constructed during June, 2018.
- Sandbag barriers and water collection berms will remain in place until then.

Once you have had the opportunity to review this information, please feel free to contact the undersigned or Sylvie St.Jean (Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions you may have.

Regards,

<Original signed by>

Nathan Baird
Environmental Technician
New Gold Rainy River Project
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(807) 271-3190

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Dan McDonnell, EC; dan.mcdonell@canada.ca

newgold™ Rainy River

June 15, 2018

John Vandenbroeck
Management Biologist, Fort Frances District
Ministry of Natural Resources and Forestry
922 Scott Street
Fort Frances, ON
P9A 1J4
Via email: john.vandenbroeck@ontario.ca

Dear Mr. Vandenbroeck,

RE: 2018 ESA Acoustic Audit – Exceedance of Sound Threshold

As per Endangered Species Act (ESA) Permit FF-C-001-14 conditions 4.1 (g) and 4.2 (b), New Gold is providing notification to the Ministry of Natural Resources and Forestry (MNRF) that sound level thresholds were exceeded during the ongoing acoustic audit. However, the source of noise resulting in the exceedance appears unrelated to construction or operations activities and no immediate mitigation is proposed.

Preliminary results received from sound recording equipment on June 6, 2018 exceeded the 50 dBA sound level threshold:

- Between 11:00 and 13:00 hours on June 6, 2018, monitoring equipment recorded sound levels of 51 and 51 dBA at the North Receptor Habitat also 51 and 52 dBA at the South Receptor Habitat. Recorded sound levels indicate that the exceedances were weather related, likely due to strong winds. Please refer to attached sound files NRM June.06.2018_1120-1130, NRM June.06.2018_1234-1244, SRM June.06.2018_1120-1130, and SRM June.06.2018_1311-1321.

As per ESA Permit conditions 4.1 (g) and 4.2 (b), acoustic audit measurements in the North and South EWPW Receptor Habitat areas were completed on June 7, 2018.

Please contact me with any questions or concerns at (807) 708-2407.

Best Regards,
<Original signed by>

Twila Griffith
Senior Environmental Specialist
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Email: twila.griffith@newgold.com

cc. Sylvie St. Jean (sylvie.st.jean@newgold.com)
Stacey Jack (stacey.jack@newgold.com)
Nigel Fisher (nigel.fisher@newgold.com)

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June 25, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment and Climate Change
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: TAILINGS SLURRY SPILL 8L - SAC REFERENCE #1728-AZUQ67

On June 15, a contract employee called his area manager at 18:00 hours to inform him of a leak on a fusion coupling on the tailing corridor line at the curve, due north of where the line passes under Roen Road, west of the Marr site. The mill crew had previously completed a visual inspection of the entire tailings line at 17:30 hours and did not report any irregularities. Spray from the leak was covered by a spill tray held in place with a wooden pallet to prevent spreading by evening wind. The mill was shut down and a vacuum truck mobilized onto site to initiate cleanup. New Gold Environment Manager was informed at 20:51 hours and visited the area to assess the spill at 22:00 hours. At that time, it was observed that the Tailings slurry had leaked into the secondary containment area, with some material accumulated on the berm. Clean up continued during the night. A vacuum truck removed slurry from the containment area and disposed of it in Cell 2 of the Tailings Management Area (TMA).

During the morning of June 16th, a New Gold Environmental Technician went out to inspect the cleanup efforts and noticed that approximately 8 L of Tailings Slurry had sprayed over the containment berm onto vegetation. Immediately, the area manager was contacted to organize another cleanup. A vacuum truck returned to site and removed the Tailings Slurry, contaminated vegetation and topsoil in the spill area. Slurry and contaminated vegetation/topsoil mixture were disposed of into Cell 2 of the TMA.

The New Gold internal Environmental Standard Operating Procedure (ENV-SOP-0002) states all Tailings Slurry spills are to be externally reported.

Notification was made to the Ministry of the Environment and Climate Change as well as to the Spills Action Centre (SAC) (Reference #1728-AZUQ67) as defined in Ontario Regulation 675/98, condition 11(4) of Environmental Compliance Approval No. 5178-9TUPD9 and the above cited internal spill reporting procedure.

New Gold has implemented preventative measures to ensure this type of event does not reoccur. These measures include removal of the leaking fusion coupling and replacement with a flanged coupling.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,

<Original signed by>

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July 19, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment, Conservation and Parks
80 Robertson St
Kenora, ON P9N 1X9
Via email: Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: 115L Hydraulic Fluid Spill – SAC Reference #8246-B2PV5U

Further to the notification to the Spills Action Centre (SAC) Reference #8246-2PV5U regarding a spill of hydraulic fluid on July 15, 2018, the following report is submitted to the Ministry of the Environment, Conservation and Parks (MOECP) as per Condition 11(4) of ECA 5178-9TUPD9.

Discovery

- While loading clay into a rock truck, a Komatsu PC650 excavator (unit #653) had a hydraulic line failure (Photo 1).
- The operator shut down the equipment when the line had failed, deployed a spill kit kept in the excavator, and notified the Contractor supervisor and Contractor HSE advisor.

Cause

- A suspected defective hose caused the failure of the hydraulic line resulting in 115 litres of hydraulic fluid spilling to the ground at a clay borrow pit within the footprint of the Tailings Management Area (TMA) (Map 1).

Clean Up and Recovery

- The event occurred within the confines of a clay borrow pit in the TMA footprint, with no impact to any water bodies.
- The hydraulic fluid did not penetrate into the ground, as the spill occurred in a clay borrow pit.
- A spill kit kept in the equipment was deployed by the operator.
- The affected clay was scraped up by bulldozer (Photo 2), loaded into a rock truck and transported to a contaminated soil bin for pick up and proper disposal by the Contractor's hazardous waste management company, Asselin Transportation. The used spill kit materials were deposited in a hazardous waste bin for pick up and proper disposal by Asselin Transportation.

Preventative Measures

- A daily machine inspection was completed and no leaks were observed at the start of shift. Daily inspections and regular maintenance are required by New Gold for all mobile equipment.

Please feel free to contact the undersigned or Sylvie St. Jean (Sylvie.St.Jean@newgold.com or 807-707-3497) with any questions.

Kind Regards,

<Original signed by>

Amanda Jacobs
Environmental Specialist
New Gold Rainy River Mine
Amanda.Jacobs@newgold.com
204-307-1857

Encl: Map 1 – Location of spill in the TMA footprint
Photo 1 – Photograph of clay affected by hydraulic line failure.
Photo 2 – Photograph of spill location after removal of affected clay.

cc: Gordon Moore, ECCC; gordon.moore@canada.ca
Andrea Doherty, DFO; andrea.doherty@dfo-mpo.gc.ca
CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca

Map 1 – Location of spill in the Tailings Management Area footprint

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Photo 1 – Clay affected by hydraulic line failure

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Photo 2 – Spill location after removal of affected clay

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August 22, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment, Conservation and Parks
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: PROCESS WATER SPILL 57L - SAC REFERENCE #2504-B3TQR2

During the early morning hours on August 20, while checking a pump and hose line into the secondary containment area around the thickener and leach tanks, a mill employee discovered the line laying on the ground and process water flowing into the truck alleyway in front of Door 18W (Photo 1). Mill Door 18W is located on the west side of the process building, adjacent to the thickener and leach tank secondary containment area.

Photo 1. Extent of process water spill into truck alleyway of Door 18W.

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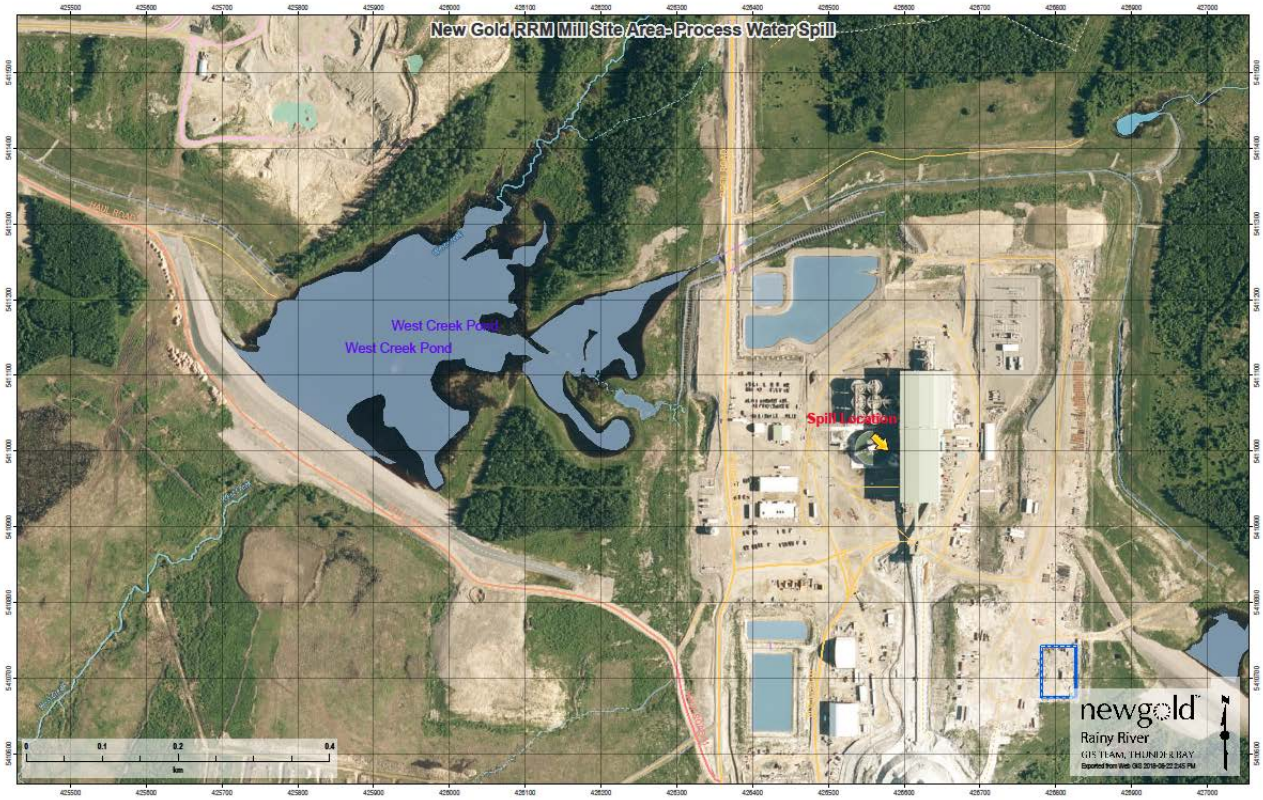

Photo 2. New Gold Rainy River Mine Process Plant site. Spill location denoted in red.

The pump was immediately shut off. Approximately 57L of process water ponded within 25 meters of the door, where it was 100% contained. Mill Door 18W is located 300 to 400 m west of the West Creek Pond and Diversion waterway (Photo 2). Natural topography and man-made features prevented the spill from reaching any further than the alleyway.

At that time of the event, it was observed that the green hose line connected to the pump and positioned over the wall into the containment area was too short. When the pump surged, the force knocked the line back over the wall and onto the ground surface. The green hose line was replaced with a longer black hose line which reached onto the containment area floor (Photo 3).

Photo 3. Black replacement hose on floor of containment area. Green hose line along containment wall.

Spill clean-up of the alleyway took place in the afternoon. Ponded process water and mud was scraped up and deposited into the thickener secondary containment area, where it washed into a floor sump back through the plant. Clean up was completed by 18:00 hours on August 20th (Photo 4).

The New Gold Internal Environmental Standard Operating Procedure (ENV-SOP-0002) states all Process water spills exceeding 25L are to be externally reported.

Notification was made to the Ministry of the Environment, Conservation and Parks as well as to the Spills Action Centre (SAC) (Reference #2504-B3TQR2) as defined in Ontario Regulation 675/98, condition 11(4) of Environmental Compliance Approval No. 5178-9TUPD9 and the above cited internal spill reporting procedure.

Photo 4. Alleyway of Door 18W showing the area after cleaned up was completed.

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,

<Original signed by>

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cc. Sylvie St.Jean (Sylvie.st.jean@newgold.com)
Mitch Lepage (Mitch.lepage@newgold.com)

newgold™ Rainy River

September 21, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of the Environment, Conservation and Parks
808 Robertson St.
Kenora, ON P9N 1X9
Via email; Matt.hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: VULTREX GEAR LUBRICANT 100L SPILL - SAC REFERENCE #3400-B4PU2N

During the night of September 15, a short and intense storm deposited 29.8 mm of precipitation over the plant site area within a 5-hour period. Precipitation from this storm temporarily overwhelmed the capacity of the east plant site drainage system, located along the toe of the upper bench due east of the mill process building. Run-off water migrated into a laydown area between the mill storage tent and propane tank, which was used to store hydrocarbon totes and barrels. The force of water flowing through the drainage system partially eroded the base under a secondary containment tub which supported a 1000L tote of Vultrex gear lubricant (Photo 1). The tote slid off the secondary containment tub and tipped over, dislodging the bung allowing 100L of gear lubricant to escape onto ground surface (Photo 2).

Photo 1. Tote of Vultrex Gear Lubricant supported on secondary containment tub.

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Photo 2. Extent of the gear oil spill into laydown area east of Mill Process building.

The spill occurred approximately 100 m east of mill process building in a laydown area which borders the plant site east drainage ditch system. Runoff water collects in the ditch and is channeled south through the site into the South Pond (Photo 3). All runoff water from the spill area was contained by this internal drainage system the South Pond. Water from the South Pond is used by the mill for processing ore. Any overflow is routed to the Mine Rock Pond via a 20-inch pipeline. New Gold will monitor the South Pond for evidence of hydrocarbon sheen.

Photo 3. GIS image of spill area (pink) and location of contact water drainage ditch (blue hatch).

Photo 4. View of area after cleaned up was completed.

Once all totes and barrels were removed from the area, a skid steer loader was utilized to remove all the hydrocarbon contaminated clays, gravels and vegetation. Contaminated materials were loaded into a 20 yd^3 contaminated soil bin for disposal at the Richardson Landfill. Clean up efforts commenced on Monday, September 16 and were completed by Thursday, September 20, 2018 (Photo 4).

Corrective actions include establishing a new hydrocarbon laydown area on the plant site upper east bench. The laydown will contain a clay and gravel lined secondary containment area used for storage of totes and barrels containing hydrocarbons. All totes/barrels stored outside the secondary containment area will be placed on yellow secondary containment tubs. Construction is scheduled to commence during the week of October 01 – 04, 2018.

Notification was made to the Ministry of the Environment, Conservation and Parks as well as to the Spills Action Centre (SAC) (Reference #3400-B4PU2N) as defined in Ontario Regulation 675/98, condition 11(4) of Environmental Compliance Approval No. 5178-9TUPD9 and in the New Gold Internal Environmental Standard Operating Procedure (ENV-SOP-0002).

Once you have had the opportunity to review this document, please contact me at (807) 708-2407 with any questions or concerns.

Regards,
<Original signed by>

Twila Griffith
Sr. Environmental Specialist
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cc. Sylvie St.Jean (Sylvie.st.jean@newgold.com)
Ginger Bragg (ginger.bragg@newgold.com)

newgold™ Rainy River

December 4, 2018

Matt Hoffmeister
Senior Environmental Officer
Ministry of Environment, Conservation and Parks
808 Robertson St.
Kenora, ON
P9N 1X9

Dear Mr. Hoffmeister,

RE: TREATED TAILINGS 30L SPILL - SAC REFERENCE # 5504-BFXLNJ

Further to the notification to the Spills Action Center (SAC) Reference # 5504-BFXLNJ, on November 27, 2018 at 16:33, a tailings line corridor inspection at Emergency Dump Pond #6 noted a tailings line leak at a previously patched line of pipe. The mill was contacted, and shutdown began to take place at 16:36. The treated tailings started to spray onto the access road as the mill commenced shutdown.

Figure 1 shows tailings leak location at 16:50. Tailings spilled onto access road to Emergency Dump Pond 6. Tailings also pooling inside containment due to ice build under WMP reclaim line.

Once the tailings line was depressurized, the previous sleeve patch was inspected, adjusted, and retightened to stop the leak. More spigots were opened to reduce pressure on the tailings line and frequency of inspections increased through out the evening, to ensure the sleeve patch held.

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Figure 2 shows where the tailings sprayed out of the sleeve patch (lighter grey area along pipe) and ice build-up within the tailings corridor containment as a result of the spill.

Clean up began the morning of November 28, 2018 once the treated tailings froze. This allowed for the equipment to scrape up the spill without fear of the tailings flowing away from the impacted area. 1m^3 of frozen tailings and contaminated material was removed from the location.

Figure 3 Shows removal of tailings and contaminated material as well as recapped road once clean-up was complete.

The new tailings pipe section is planned to be installed during a maintenance shutdown for the mill. This portion of pipe will be put together in the maintenance shop and fused during the shutdown. In the interim, a portion of belt will be used to cover the sleeve patch and monitored during dayshift and nightshift. The drain to Emergency Dump Pond #6 will also be maintained free of ice to allow drainage in case of emergency.

Figure 4 shows Allmond heater and insulated tarp being used to thaw the frozen tailings from the bottom of the containment as well as thaw ice dam underneath WMP Reclaim line.

Once you have had the opportunity to review this information please feel free to contact the undersigned or Sylvie St. Jean (at Sylvie.St.Jean@newgold.com or 807-707-3497) with any additional questions.

Regards,

<Original signed by>

Garnet Cornell
Environmental Specialist
New Gold Rainy River
Garnet.Cornell@newgold.com
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CEAA; compliance.conformite@ceaa-acee.gc.ca
Dan McDonell; dan.mcdonell@canada.ca
Michael Bell; michael.bell@canada.ca

newgold™ Rainy River

November 29, 2018

Matt Hoffmeister
Senior Environment Officer, Kenora Area
Ministry of the Environment and Climate Change
808 Robertson Street
Kenora, ON P9N 1X9
Via email; Matt.Hoffmeister@ontario.ca

Dear Mr. Hoffmeister,

RE: Tailings Dusting Event – SAC Reference #2502-B6RUM5

On November 22, 2018 a fugitive dust event was reported coming off of the Cell 1 pond in the Tailings Management Area at approximately 14:00 (See photo 1).

Photo 1: Tailings dust from Cell # 1

Winds were gusting up to 35 km/h out of the south and it was evident at the time that the plume was travelling outside of the Environmentally Sensitive Area (ESA) boundary. Samples of snow were taken from Cell 1 north dam and from the northern most tip of the ESA boundary to assess the level of impact. (See Photo 2).

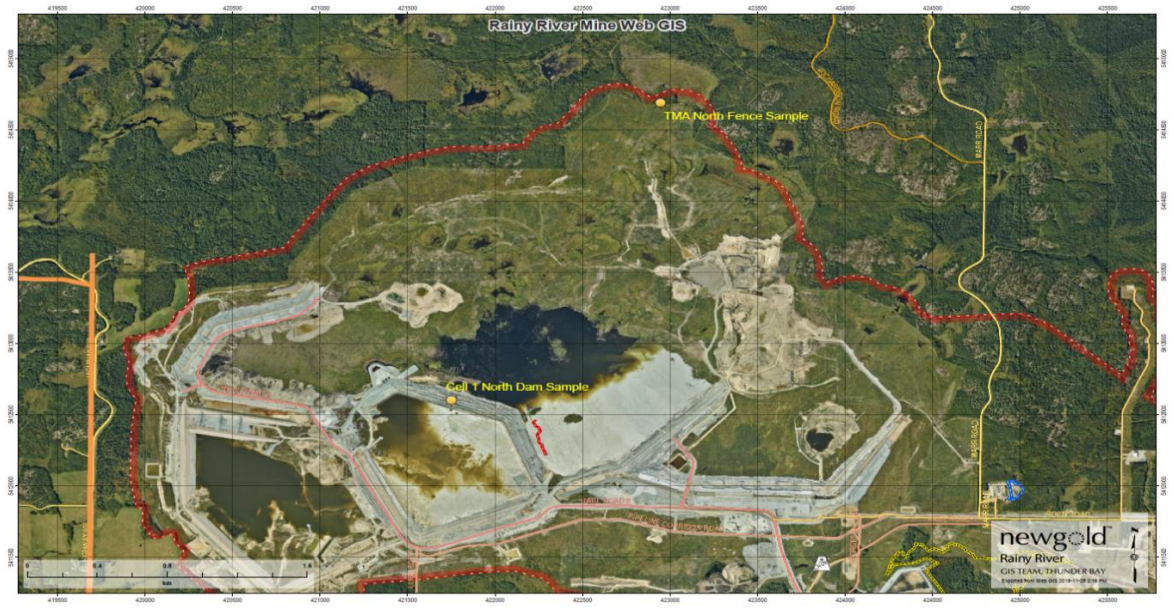

Photo 2: Map showing ESA Boundary

The samples taken were analyzed by ALS Environmental Laboratories in Thunder Bay, indicate there was little to no impact at that time. Tests show the three most prevalent elements on Cell 1 dam to be calcium, iron and sulfur at 38,200 mg/L, 10,600 mg/L and 17,300 mg/L, respectively. Tests results from the TMA North Fences samples showed levels of these elements to be lower by a factor of one thousand times or more (See appendix A).

The following day the weather conditions improved, and no fugitive dust event was seen at that time. However, from November 24th onwards moderate to high winds have persisted from the northwest and the dusting event is continuing at varying intensities. On Sunday November 26th, New Gold updated the Spills Action Center with this information.

New Gold began taking steps to control the fugitive dust on November 23rd which included adding water to Cell 1 in an effort to cover the exposed tailings and installing sprinklers along the banks of Cell 1 to form an ice sheet to keep the dust down. Several other options are currently being investigated in order to find a more permanent solution to the fugitive dust issue.
One option is to cover the exposed tailings with a product known as soil cement to provide a final cap. The soil cement requires constant reapplication, as rain will dilute it and the winter application contains glycerin which would be difficult to treat.
A second option is to apply a mix of hay, overburden and PAG/waste rocks to the exposed tailings. This solution is the most favorable, as it would promote vegetation growth and stabilize the material until subsequent lift will overprint it. Overburden cover should commence when the tailings are frozen enough to support a 40t truck (wiggle wagon).

If you have any further questions, please contact the undersigned.

Respectfully submitted,

<Original signed by>

Environmental Manager
(807) 707-3497
sylvie.st.jean@newgold.com

newgold™ Rainy River Project

September 26, 2018

District Manager,
c/o Matt Hoffmeister
Senior Environmental Officer, Kenora Area
Ministry of the Environment, Conservation and Parks
808 Robertson Street
Kenora, Ontario P9N 1X9

Dear Sir,

VIBRATION COMPLAINT – SAC# 3165-B4XRMG

On September 25, 2018 at 1:07 pm New Gold Rainy River Project (RRP) Community Relations received a complaint regarding vibrations felt from a blast on the New Gold Rainy River Project site on Wednesday, September 25 at 11:00 am. As per ECA #0412-A2LR4V terms and conditions section 7.1 and 7.2 please accept this letter as notification;

a) Message from Lisa Teeple stated that the blast caused the floor in the shop, situated 300 ft west of the house, to lift and crack. House and shop are located approximately 2.3 km south-southwest from the blast source. See attached map for reference.

b) A blast was detonated at approximately 11:00 am, September 25, 2018 in the New Gold RRM East Mine Rock Stockpile drainage ditch area, located approximately 3.2 km southeast of the RRM open pit center.

c) Climatic conditions at the time were wind direction 309 degrees (northwest), wind speed 11 km/hr., average relative humidity 83%, average temperature 7.3 degrees C., with cloudy and overcast skies.

d) Ginger Bragg, Supervisor for New Gold RRM Community Relations, received the complaint shortly after the blast.

e) New Gold RRM community personnel communicated to the neighbors and Chapple township that blasting would take place in this area for a period of 8 weeks, from September to October of 2018. Vibration and concussion (air overpressure) readings monitored at 6 locations did not exceed Ministry Publication NPC-119 cautionary values of 10 mm/s and 120 dB respectively.

Vibration and Overpressure Monitoring Stations for Sep 25, 2018			
Station No.	**Station Location**	**Vibration Levels (mm/s)**	**Concussion Levels (dB)**
1	24 Marr	0.317	101.1
2	4298 Hwy 71	0.104	100.4
3	1340 Hwy 600	0.243	95.18
4	2899 Hwy 600	0.196	88.68
5	1050 Teeple	0.790	93.92
6	Barron Site	0.176	111.7

Should you require additional information, please contact the undersigned at carolyn.winik@newgold.com or telephone (807) 482-0900 ext. 8046.

Sincerely,
<Original signed by>

Carolyn Winik
Senior Environmental Specialist

cc.
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NEW GOLD RAINY RIVER MINE
APPENDIX N
2018 ANNUAL MONITORING REPORT-OFFSET PLAN FOR FISHERIES ACT

Rainy River Mine

2018 Annual Monitoring Report – Offset Plan for Fisheries Act Section 35(2)(b) Authorization
Emo, Ontario
TC111504

Prepared for:

New Gold Inc.

5967 Highway 11/71, P.O. Box 5, Emo, Ontario P0W 1E0

December 2018

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December 22, 2018

Ms. Sylvie St-Jean, Environmental Manager
Rainy River Mine
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Dear Ms. St-Jean:

Re: 2018 Annual Monitoring Report
Offset Plan for Fisheries Act Section 35(2)(b) Authorization, Rainy River Mine
Emo, Ontario

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) was retained by New Gold Inc. (New Gold) to complete the year-two annual performance monitoring of the *Fisheries Act* Authorization (the Authorization) No. 15-HCAA-00039 Offset Plan at the Rainy River Mine in Emo, Ontario. Teeple Pond and outlet channel are the offset measures constructed as per the Offset Plan. The purpose of this 2018 annual monitoring report is to summarize the second year of performance monitoring for the Teeple Pond and outlet channel as per condition 3.1 where it relates to measures and standards in condition 3, and condition 5.2.2 of the Authorization. Recommendations to improve future annual performance monitoring programs are outlined in the enclosed report.

Sincerely,
Wood Environment & Infrastructure
a Division of Wood Canada Limited

Prepared by:

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Reviewed by:

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'Wood' is a trading name for John Wood Group PLC and its subsidiaries

Rainy River Mine

2018 Annual Monitoring Report – Offset Plan for Fisheries Act Section 35(2)(b) Authorization
Emo, Ontario
TC111504

Prepared for:

New Gold Inc.
5967 Highway 11/71, P.O. Box 5, Emo, Ontario P0W 1E0

Prepared by:

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December 22, 2018

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Executive Summary

The construction and development of New Gold Inc's (New Gold) Rainy River Mine (RRM) resulted in the unavoidable, but planned, serious harm to a commercial, recreational, or aboriginal fishery, or to fish that support such a fishery. This serious harm to fish required an Authorization from Fisheries and Oceans Canada (DFO) as per Section 35(2)(b) of the Fisheries Act. In order for DFO to authorize the serious harm to fish, development and implementation of fishery offset measures was necessary to ensure that overall fish production is maintained or enhanced (no reduction of fisheries productivity). In the case of the RRM, the impacted fishery, and therefore target fishery of the offset measures are baitfish (primarily minnow) species that inhabit the small creek systems associated with the site. A detailed No Net Loss Plan for the Section 35 fishery impacts (AMEC 2014) was prepared for the Mine and circulated to stakeholders during the Environmental Assessment process. The final Offset Plan (New Gold 2015) for monitoring the performance and measuring success of the offsetting measures was accepted by DFO, and Fisheries Act Authorization No. 15-HCAA-00039 was issued June 4, 2015. The purpose of this document is to summarize the 2018 monitoring results for the offsetting measures and provide comparison to the success criteria and conditions of the Authorization.

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) was retained by New Gold to conduct the year-two performance monitoring to evaluate the success of the offsetting measures implemented under the Offset Plan and the Authorization. Implementation and effectiveness of the measures are determined by confirming that Teeple Pond and outlet channel have been constructed as per the approved plans and are functioning as intended using the success criteria in the Offset Plan.

The 2018 performance monitoring results showed the physical construction of offset measures achieved the required success criteria (due December 31, 2016) as follows:

- As-built survey demonstrates the offset measures are constructed as per the approved plans; and
- The area of replacement habitat is greater than the required 8.41 hectares;

Achieving the success criteria related to the physical function/structure stability and fisheries components of the Offset Plan are anticipated in 2019 and by 2021, the final year for the currently proposed monitoring. The 2018 performance monitoring results for these components are ahead of schedule and are on track for this monitoring period as described below:

- The outlet channel allows for fish passage under normal and high flow conditions and the Teeple Pond water levels are consistent with those specified in the design;
- Constructed habitat remains stable and in place. Shorelines and graded offset features are stable, and riparian vegetation cover and plantings have achieved good coverage and are greater than the success criteria of 80%;
- Eight fish species were present in the offset measures during the year-two monitoring period; however, two new species were encountered, and one previously documented species was not found. An inferred species richness of nine has been achieved in Teeple Pond, but not in the outlet channel. The fish community survey results show this metric is on track;
- Multiple year classes of several species, and many young-of-the year fish were encountered in the offset measures demonstrating full fish life cycle usage; and,

- Overall catch-per-unit-effort for all species combined was highest for seine netting; and meeting all gear-specific success criteria targets are on target to be met before 2021.

Biological systems such as Teeple Pond outlet channel are dynamic and will likely require several years to develop biological communities that meet the success criteria; however, the year-two monitoring results show very good progress toward these targets.

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1.0 Introduction

The construction and development of New Gold Inc's (New Gold) Rainy River Mine (RRM) resulted in the unavoidable, but planned, serious harm to a commercial, recreational, or aboriginal fishery, or to fish that support such a fishery. This serious harm to fish required an Authorization from Fisheries and Oceans Canada (DFO) as per Section 35(2)(b) of the Fisheries Act. In order for DFO to authorize the serious harm to fish, development and implementation of fishery offset measures was necessary to ensure that overall fish production is maintained or enhanced (no reduction of fisheries productivity). In the case of the RRM, the impacted fishery, and therefore target fishery of the offset measures are baitfish (primarily minnow) species that inhabit the small creek systems associated with the site. A detailed No Net Loss Plan for the Section 35 fishery impacts (AMEC 2014) was prepared for the RRM and circulated to stakeholders during the Environmental Assessment process. The final Offset Plan (New Gold 2015) for monitoring the performance and measuring success of the offsetting measures was accepted by DFO and Fisheries Act Authorization No. 15-HCAA-00039 was issued June 4, 2015.

Teeple Pond and outlet channel are the offset measures constructed per the Offset Plan. Construction of Teeple Pond was completed in early 2016 and construction of the Teeple Pond outlet channel was completed between the fall of 2015 and early winter 2016. The Teeple Pond and outlet channel As-Constructed report (condition 5.2.1 of the Authorization) was submitted December 2016 (Amec Foster Wheeler 2016a). The Year 1 annual performance monitoring report was submitted in December 2017. The purpose of this 2018 annual monitoring report is to summarize the second year of performance monitoring for the Teeple Pond and outlet channel per condition 3.1 where it relates to measures and standards in condition 3, and condition 5.2.2 of the Authorization.

2.0 Monitoring Criteria to Avoid or Mitigate Serious Harm to Fish

Condition 3.1 of the Authorization states:

> *Monitoring of avoidance and mitigation measures: The Proponent shall monitor the implementation of avoidance and mitigation measures referred to in condition 2 of this authorization and report to DFO, by March 31 following the year being reported on and indicated whether the measures and standards to avoid and mitigate serious harm to fish were conducted according to the conditions of this authorization.*

The As-Constructed report for Teeple Pond and outlet channel (as per condition 5.2.1 of the Authorization) issued December 19, 2016 (Amec Foster Wheeler 2016a) describes many of the measures and standards required per condition 3.1 of the Authorization. A summary of the As-Constructed report contents is provided in Section 4.0 of this document.

Monitoring criteria that relate to measures or standards to avoid or mitigate serious harm to fish not described in the Teeple Pond and outlet channel As-Constructed report are as follows:

- "Ramp up and down" flow takings in Pinewood River at intake and monitor and adjust water takings to avoid stranding of fish (condition 2.2.3 of the Authorization);
- Implement plan to monitor fish community in Pinewood River between the existing West Creek and Loslo Creek to confirm that the fish community and fish passage are maintained (condition 2.2.4 of the Authorization); and

- Screen or use other deterrents at any water intakes or outlet pipes to prevent entrainment or impingement of fish (condition 2.2.5 of the Authorization).

Further to the above, PTTW #8776-9W2QN2 Condition 4.1.3 issued on August 31, 2015, required that a biological monitoring plan be prepared for the Pinewood River:

> *The Permit Holder shall submit a Biological Monitoring plan to the Director for approval within 180 days of issuance of this permit and prior to direct water taking from the Pinewood River. The plan shall include, at minimum, the following:*
>
> a) Methods for monitoring and identifying fish kills and fish stranding that are acceptable to the Director.
>
> b) A contingency plan to address adverse conditions defined in Condition 4.1.3 a), including investigation into the adequacy of minimum flow thresholds to minimize impacts to aquatic communities.

The 2018 monitoring results and associated monitoring plans for the RRM related to the above measures or standards to avoid or mitigate serious harm to fish are described below:

- New Gold followed flow ramping protocols established to avoid stranding of fish during water taking from the Pinewood River as follows:
  - Immediately after the water taking pumps were energized, the recorded water level at the permanent hydrometric station was monitored to evaluate the rate of reduction;
  - A number of accessible locations downstream of the intake with broad floodplain-type riparian areas (susceptible to forming isolated pool conditions) were inspected for evidence of fish standing or death; and
  - Periodic monitoring of these locations continued until the pumps were ramped up to a steady level and the Pinewood River water level had adducted to the reduced flow, as determined by the hydrometric station instruments, during the water taking activities.
- The pump house intake structure includes fine-mesh screen around the intake channel to deter and prevent entrainment or impingement of fish as discussed in the hydraulics analysis technical memorandum (Amec Foster Wheeler 2015); and
- Monitoring of the Pinewood River fish community between the existing West Creek and Loslo Creek to confirm that the fish community and fish passage are maintained is addressed under the Pinewood River Biological Monitoring Plan per Environmental Compliance Approval (ECA) #5781-9VJQ2J, condition 10(5) and ECA #5178-6TUPD9, condition 8(7) (Amec Foster Wheeler 2016b). The 2018 results from the above biological monitoring plan will be submitted to the Ministry of Environment, Conservation and Parks (MECP) and DFO by March 31, 2019 per condition 3.1 of this Authorization.

3.0 Monitoring Criteria to Assess Offsetting Measures

Condition 5.2 of the Authorization was modified to align the RRM offsetting measures construction and commissioning schedule with the DFO Fisheries Protection Program monitoring (DFO 2016), which states;

List of reports to be provided to DFO: The Proponent shall report to DFO on whether the offsetting measures were conducted according to the conditions of this authorization by providing the following

5.2.1 As-constructed report due on or before March 31, 2016.

5.2.2 Annual monitoring report due on or before December 31 for 5 year post construction (2017-2021).

Implementation and effectiveness of the offset measures is determined by confirming that Teeple Pond and its outlet channel have been constructed as per the approved plans and are functioning as intended using the prescribed monitoring criteria presented below.

Criteria and Dates to Assess Offsetting Measures Implementation and Effectiveness Success

Attribute	Success Criteria	Date
Physical construction of offset measures	• As-built survey demonstrates that measures are constructed as per the approved plans • Area of replacement habitat is equal to or greater than 8.41 ha	December 31, 2016
Physical function of offset measures	• Water levels are consistent with those specified in the design • The outlet channel and pond allows for passage of fish	December 31, 2019
Stability of structures	• Constructed habitat features remain in place (log and boulder structures in place) • Shorelines and graded offset features are stable and not eroding (greater than 80% of features are considered stable) • Riparian vegetation cover and plantings achieve 80% coverage of area, and or survival of planted stock	December 31, 2019
Species presence	• Minimum of 9 species of fish are present in the offset measure.	December 31, 2021
Full life cycle usage	• Multiple year classes including young of the year fish are present in the offset feature.	December 31, 2021

Fish abundance	• Overall Catch per Unit Effort (CPUE) for all species combined, for at least two of following capture methods (electrofishing, Minnow Traps, Seine Nets). Minimum success criteria are:
	  • Minnow Trap CPUE ≥ 2 fish per trap hour
	  • Seine Net CPUE ≥ to 16 fish per 15 m net pull
	  • Electrofishing CPUE ≥ 44 fish per 1000 seconds
		December 31, 2021

Source: Table 5, New Gold 2015; includes revision of success criteria due dates per DFO 2016.

The 2018 monitoring results to assess offsetting measures are presented in the following sections as described below:

- Physical construction of offset measures;
- Physical function of offset measures;
- Stability of structures; and
- Fish community metrics including species presence, abundance, and full life cycle usage.

4.0 Physical Construction of Offset Measures

An As-Constructed report for Teeple Pond and outlet channel (as per condition 5.2.1 of the Authorization) was issued December 19, 2016 (Amec Foster Wheeler). The As-Constructed report provides the following:

- A summary of upset conditions and contingency response associated with the DFO Authorization;
- Comparisons between design parameters and as-constructed conditions of Teeple Pond;
- Comparisons between design parameters and as-constructed depths of Teeple Pond;
- A summary of deviations from design and recommended monitoring for Teeple Pond outlet channel; and
- Comparisons between design areas and as-constructed habitat area of Teeple Pond and outlet channel.

Comparison of the constructed habitat to the approved plan confirmed that 9.86 hectares (ha) area of replacement habitat was constructed, which is greater than the proposed minimum area of 8.41 ha of offsetting measures. The As-Constructed report demonstrated that the offset structures (pond and outlet channel) specified in DFO in Authorization 15-HCAA-00039 and the associated Offset Plan were met, in that minor deviations noted were not expected to impact the overall success of the plan.

5.0 Physical Function of Offset Measures

5.1 Physical Function of Teeple Pond

Teeple Pond was built to include permanent deeper water refuge pools, log and boulder structures, and highly productive emergent wetland margins with a normal water level of 378.50 metres above sea level (masl). The overwintering and summer refuge habitat were constructed to provide between 2.0 and 2.5 m of total water depth at static pond water level design elevation. Monitoring the physical function of Teeple Pond included:

- Installation of a Solinst 3001 LT Levelogger Edge, M10 water level logger with a direct read cable on June 10, 2017 (Figure 1, Appendix A);
- Installation of a Reconyx PC800 Hyperfire Professional Semi-Covert Camera with security enclosure to document Teeple Pond and outlet channel conditions using time lapse photo series (Figure 1, Appendix B); and
- Manual water depth measurements of the overwintering and summer refuge habitat during the summer (Table 1).

In 2017, the Teeple Pond water level logger pressure sensor malfunctioned shortly after installation and the recorded data were unusable. As noted in the 2017 Annual Monitoring Report, Clark Creek Pond is connected via the Clark Creek Diversion Channel that flows approximately 1.2 kilometers (km) with an elevation difference of approximately 1.25 m to its outlet into Teeple Pond, and as such provided a suitable proxy to represent the Teeple Pond water level during the 2017 period of record.

Wood field staff re-installed the Teeple Pond water level logger pressure sensor on April 24, 2018 near the beginning of spring freshet while only the nearshore margins of Teeple Pond were open water (>90% ice cover). The 2018 level logger data show Teeple Pond is functioning as intended (Figure 2), and survey data show the pond is maintaining adequate water depths per the design and providing overwinter refuge habitat for the resident fish community.

The time-lapse camera was programmed to store one image at 06:00, 09:00, 12:00, 15:00, 18:00 and 21:00 each day throughout the year, and was positioned at the edge of tree line near the pond outlet into the constructed outlet channel and fan area. Appendix B contains a photo record for the 2017 and 2018 monitoring seasons, illustrating weekly water level and vegetation growth conditions in the Teeple Pond and outlet fan (June to September 2017 and April to July 2018). The photo record primarily includes photos taken at 15:00 and 18:00, as these times appeared to be most consistent with regard to brightness, clarity and ability to distinguish changes in site conditions with minimal influence from shadows and light intensity. This time lapse photo record confirms static water levels were maintained within Teeple Pond throughout the observation period.

As specified in the Offset Plan, water depth measurements of the pond area are to be conducted once per year during the monitoring period to confirm refuge areas are maintained. The Offset Plan As-Constructed report for Teeple Pond (Amec Foster Wheeler 2016a) confirmed refuge areas were established per the design and in-field water depth checks during the 2018 summer field studies confirmed these areas maintained appropriate water depths within the refuge pool and connecting channels (Tables 1a and 1b; Appendix C). Handheld GPS location accuracy is approximately ±3.0 metres (m); therefore, comparisons of some 2018 field depth measurements to design depths varied. In general, the 2018 station measurements were shallower than the stations visited in 2017. Consequently, the measurement results suggest the deep areas were not visited in 2018. Water levels between 2017 and 2018 were not appreciably different, meaning Teeple Pond maintained sufficient water levels; however, subsequent annual performance monitoring (years three to five post-construction) will revisit the 2017 measurement locations to ensure depths are confirmed at consistent deep-water habitat locations.

Teeple Pond performance monitoring results show pond water levels were maintained per design throughout the 2018 monitoring period as documented by the water level logger data, manually surveyed water levels, time lapse photo documentation and manually measured water depths throughout the pond.

5.2 Physical Function of Teeple Outlet Channel

The Offset Plan physical function performance monitoring criteria require that water depth and velocity measurements in the outlet channel are collected in pools, flats and riffles during at least one low flow period and one high flow period each year (for 3yrs). Teeple Pond outlet channel high flow conditions measurements were conducted by Wood biological field staff April 24 to 27, 2018 and represented the spring freshet condition.

The observed conditions during April 2018 (Table 2b) show sufficient water depth existed during spring freshet to maintain fish passage between Teeple Pond and the outlet channel. The measured velocities with the outlet channel ranged from 0.001 to 0.871 metres per second (m/s) which is within the sustained swimming speeds for the resident species relative to body size and swim distance (Gervais & Katopodis 2013). The photo record provided in Appendix A.2 (Plate A.2-1) illustrates water level conditions throughout the channel during April 2018.

The low flow monitoring event on July 27, 2018 was also conducted by Wood biological field staff. Wetted widths, total depths and water velocity (Table 2a) in pools, flats and riffles were measured (where possible) throughout the pre-determined channel stability stations shown on Figure 1. Due to intermittent flow conditions, flat and pool morphology stations maintained sufficient water depth to provide fish habitat; while riffle areas were dry. This represents a temporary barrier to fish passage which is natural to the system during periods of intermittency, and 2018 represented drier than average conditions. Figure 3 shows a comparison between the 2017 and 2018 Barwick, Ontario monthly precipitation records to the 1981 to 2010 Canadian climate normal for this area, demonstrating the 2018 period of record was drier than 2017 and both years were drier than the normal values. Fish were found in all sampled pools, demonstrating the fish are passing through the channel during periods of higher flow. Similar isolated pool conditions were observed further downstream in the remnant Teeple Drain channel as discussed in Section 6.2. The in-field channel stability station measurements are presented in Tables 2a and 2b, with photo examples of these observations provided in Appendix A (Plate A.2-2 to A.2-5).

General monitoring events throughout the year were conducted by Wood ESC site staff and aquatic studies field staff. The ESC staff documented some areas of erosion in the low flow channel and inlet fan immediately downstream of the Teeple Pond outlet in 2017 (Amec Foster Wheeler 2017a). Observations from June 1, 2018 showed vegetation establishment had progressed, including areas along the low flow channel which was repaired in the summer/fall of 2017.

Beaver activity within Teeple Pond temporarily impacted function of the outlet by reducing flow into the outlet channel. The pond outlet was periodically monitored, and beaver debris was removed to maintain connectivity. Initially the beaver activity is being managed to ensure the channel and habitats stabilize and naturalize according to plan, but over time it is expected that beaver activity will be allowed to persist as it does in any natural system. Representative photos of the blocked outlet and removed debris are provided in Appendix A.

5.3 Physical Function Monitoring Recommendations

The following action items and recommendations from 2017 were implemented and followed during the 2018 period to improve physical function monitoring of Teeple Pond and outlet channel:

- Reinstallation of the Teeple Pond water level logger occurred after ice-off conditions (April 24th, 2018) to ensure open water conditions are monitored per the Offset Plan criteria. Reinstallation of the logger during winter was not recommended as it is likely that the level data recorded during the winter under ice conditions will not be reliable (New Gold 2016)

- The water level logger data were downloaded more frequently following installation of the new sensor and no equipment/instrument failures were detected;

- The 2017 hydraulic habitat monitoring transects/stations (wetted width, total depth and velocity) were utilized where possible for consistency among monitoring events to assess conditions in the outlet under high and low flow conditions.

The following recommendations are provided to improve physical function monitoring of Teeple Pond:

- Download the water level logger and barometric pressure sensors at Teeple Pond once every 30 days during the open water period (April to November);

- Survey the water level relative to the temporary benchmarks at least three times during the open water period (e.g., April, July, September) for comparison to the logger data; and

- Utilize consistent locations for annually monitoring water depths within Teeple Pond for comparison to design depths among monitoring years (utilize 2017 monitoring locations for future measurements).

6.0 Stability of Structures

The stability of structures monitoring took place from July 24 to 29, 2018, which included retrieval of time lapse camera photos in order to monitor long-term water level conditions, as well as opportunistic observations throughout the year to document vegetation cover and plantings, repair activities and general condition. Observations of the offset measures stability were also conducted during the low flow monitoring period, as this timing provided the best visibility to assess whether the constructed features were in place and functional. Photo vantage points were established along the perimeter of Teeple Pond and along the outlet channel to document stability of these features at consistent locations (Figure 1). Three channel stability stations were also established within the constructed outlet channel to further assess and document channel condition. Two additional channel stability stations were established downstream of Teeple Road in natural channel reaches to document channel condition further afield.

6.1 Teeple Pond

Photo stations P1, P2 and P3 were established to document the nearshore areas and open-water habitat of Teeple Pond (Figure 1). Appendix B (Plates B.1-1 to B.1-2) provides a photo record of these stations and the constructed habitat features.

The shoreline, as well as the observed constructed habitat features (tree piles and boulder clusters) appeared (where visible) to remain in place as identified in the As-Constructed report i.e., stable. The boulder clusters and most tree piles were submerged, with the exception of two tree piles positioned near the southwest corner of the pond. The exposed tree piles are meant to provide fish habitat subsurface, as well as perching areas for avian wildlife and basking structures suitable for turtles and other herptiles. Shorelines and graded offset features were stable and not eroding. Riparian vegetation was well established at most areas surrounding Teeple Pond, with the lowest percent ground coverage observed near the outlet fan area discussed in Section 5.2. Overall, these areas have greater than 80% coverage, which meets the success criteria (80% coverage) and will continue to improve over time.

6.2 Teeple Pond Outlet Channel

Photo stations P5, P6 and P7 and channel stability stations CSS-1, CSS-2 and CSS-3 were established to document stability of the outlet channel and immediately downstream of the constructed channel (Figure 1). Photo stations P8 to P11, as well as channel stability station CSS-4 and CSS-5 were established to document channel conditions further downstream of the constructed outlet channel in the original Teeple Channel. Appendix B (Plates B.1-3 to B.1-9) contain a photo record of these stations and constructed habitat features. Overall these areas have greater than 80% riparian vegetation coverage, with plantings showing good survival which meets the success criteria (80% vegetative coverage).

Photo station P7 was positioned immediately downstream of the constructed outlet channel and remnant Teeple Drain channel confluence. During the dry summer conditions little to no flow was observed from either the constructed outlet or remnant channel.

As noted in section 5.2, the shallow conditions under very low flow are considered typical during periods of intermittency, and 2018 represented drier than average conditions (Figure 2). Photo station P8 was positioned immediately upstream of the Teeple Road culvert crossing and includes two bedrock controls within the natural channel alignment. These features had no flow over the rocks at the time of assessment, thereby posing a barrier to fish passage. Again, isolated pools are expected during intermittent flows such as those observed during the summer of 2018. No evidence of erosion was observed between the constructed outlet channel confluence with the original Teeple Drain and photo station P8.

The original Teeple Drain, downstream of Teeple Road, is in an actively used cattle pasture. Consequently, the cattle have destabilized the channel near station P9 and P10 causing severe bank erosion and degradation. The flow path transitions to a broad wet meadow downgradient of this location. Station P10 was located in the wet meadow with surface drainage through the grasses, and no defined central channel. These wet meadow conditions exist further downstream until a channelized flow path enters a woodlot at station P11. No observable channel erosion or instability from the realigned channel flows were noted.

6.3 Contingency Measures for Structure Stability

The Offset Plan (Section 8.4; New Gold 2015) and condition 3.1.2 of the Authorization requires that New Gold will implement contingency measures and associated monitoring if the offsetting measures are not constructed or do not function according to the success criteria.

The following structural stability metrics were identified as not yet meeting their specified success criteria:

- Riparian vegetation throughout the constructed outlet channel was well established, but with small areas of sparse cover in the constructed Teeple outlet fan area. However, substantive improvements in vegetation cover and establishment can be seen between July of 2017 and July of 2018 (Plate B.1-4); and

- The Teeple Pond outlet and sections of the channel experienced bank erosion and some displacement of riffle cobble after spring freshet flow.

In the case of both metrics described above, the observed conditions are in-line with the expected ongoing development of the realigned channel. No additional contingency measures are recommended at this time.

7.0 Fish Community Metrics

Fish community sampling was conducted during July 2018, meeting or exceeding the minimum gear-specific effort specified in Table 7 of the Offset Plan performance monitoring criteria for pond and channel habitats (New Gold 2015). These sampling activities documented species presence, relative abundance and confirmed presence of multiple fish life stages for some species. Fish community results are discussed below for each offset measure habitat type. The comparison of year-one and year-two monitoring results to the success criteria are presented in Tables 3a and 3b, with detailed gear-specific results discussed below and presented in Tables 4 and 5.

7.1 Teeple Pond Fish Community Monitoring Results

Teeple Pond was sampled using the prescribed non-lethal fish collection methods including; minnow traps, seine net and a backpack electrofishing, with gear-specific and catch-per-unit effort (CPUE) results presented in Table 4. Eight fish species were documented in Teeple Pond during the 2018 studies, compared to seven species in 2017. The presence of two new species (Brassy Minnow and Creek Chub) were detected

in 2018, but Common Shiner were not found (previously caught in 2017). These results suggest that nine fish species exist within Teeple Pond, and the low abundance of Common Shiner in 2017 (n=11) may mean they are still present but were not caught during the 2018 field studies. Many young-of-the-year (YOY) individuals were encountered, which were likely members of the Phoxinus genus but were too small to non-lethally confirm species. Most fish were captured by the fine mesh seine net, the majority of which were YOY individuals. Consequently, the high proportion of YOY individuals within Teeple Pond influenced the CPUE of the gear-specific catch results since those smaller individuals were only catchable using seine netting.

A subsample of individuals from each species and from each gear type were measured for fork or total length for those species with rounded caudal fins (e.g., Brook Stickleback and Central Mudminnow). Species-specific results of these measurements, where a minimum of 100 individuals were measured, are presented in Figure 4 illustrating multiple age classes of Brook Stickleback, Fathead Minnow, Northern Redbelly Dace and Brassy Minnow were found in the pond. The abundant presence of YOY Phoxinus sp. indicates a high likelihood that multiple age classes of Finescale Dace are also present. These results confirm that Teeple Pond functions as overwintering and summer refuge, spawning, rearing and foraging habitat for these species.

The 2018 year-two performance monitoring results do not meet all success criteria targets (See Table 4) but show the physical habitat supports all life history stages for the fish species present; and, indicates that the offsetting measures are progressing as expected for achieving all success criteria by year-five of the monitoring program.

7.2 Teeple Pond Outlet Channel Fish Community Monitoring Results

All available habitat within the Teeple outlet channel was sampled using baited minnow traps and backpack electrofishing methods, with most effort concentrated in pools and flats where sufficient depth allowed sampling. Low water levels during this sampling event concentrated fish into these refuges, but also reduced the overall sampling area. The relatively small sample area required that both fish collection gear types were used throughout the entire outlet channel to satisfy the minimum sampling efforts per the Offset Plan. Gear-specific and catch-per-unit effort (CPUE) results for the outlet channel are presented in Table 5 along with the success criteria CPUE values expected by year-five of monitoring.

Minnow trapping was conducted first, and the captured individuals were released into Teeple Pond to avoid re-capture of those individuals using electrofishing. Electrofishing was conducted after minnow trapping and captured far fewer fish. This was expected due to the removal of fish by minnow trapping thereby understating the actual electrofishing CPUE. The electrofished individuals were also released into Teeple Pond, since low water conditions were likely to persist through August and further limit available habitat within the outlet channel (as observed in the natural Teeple Drain channel).

A total of six fish species were encountered in Teeple outlet channel during the 2018 studies, compared to seven in 2017. Two fish species encountered in 2017 that were not captured in 2018 were Northern Redbelly Dace and Pearl Dace. Additionally, Brassy Minnow were encountered in the outlet channel and was not previously encountered in 2017. The changes in species occurrence could be attributed to extremely dry conditions which resulted in isolated pools offering the only refuge for fish trapped within the outlet channel.

8.0 Performance Summary

Implementation and effectiveness of the compensation measures are determined by confirming that the pond and outlet channel have been constructed as per the approved plans and are functioning as intended using the success criteria and dates in Table 5 of the Offset Plan (New Gold 2015). Biological systems such as Teeple Pond and the outlet channel are dynamic and will likely require several years to develop full biological communities that meet the success criteria; however, the year-one and year-two monitoring results show very good progress toward these targets.

The physical construction of offset measures, as well as the physical function and stability of structures post monitoring success criteria have been achieved for Teeple Pond and outlet channel. Presence of multiple year classes of fish have been demonstrated within these offset measures and the inferred richness of nine fish species within Teeple Pond, thereby achieving those success criteria. The remaining species presence (richness) within the outlet channel and abundance (overall CPUE) success criteria are not yet achieved.

Further to the above, the fish catch results show thousands of YOY cyprinid individuals (seine netting catch), which will likely substantively improve the species-specific CPUE for each gear type in future studies as these individuals grow and mature into larger, spawning individuals within the population. It is anticipated that the majority of these fish will survive overwinter in refuge pools, and as such will help the population sooner attain the carrying capacity and productivity of this habitat. The performance monitoring results comparison to success criteria for Teeple Pond and outlet channel are summarized in Tables 6a and 6b, respectively.

9.0 Closing

We trust the information provided in this report meets the performance monitoring obligations with respect to Offset Plan. Should you require further details or wish to discuss any aspect of this information, please do not hesitate to contact us at your convenience.

Sincerely,
Wood Environment & Infrastructure Solutions
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10.0 References

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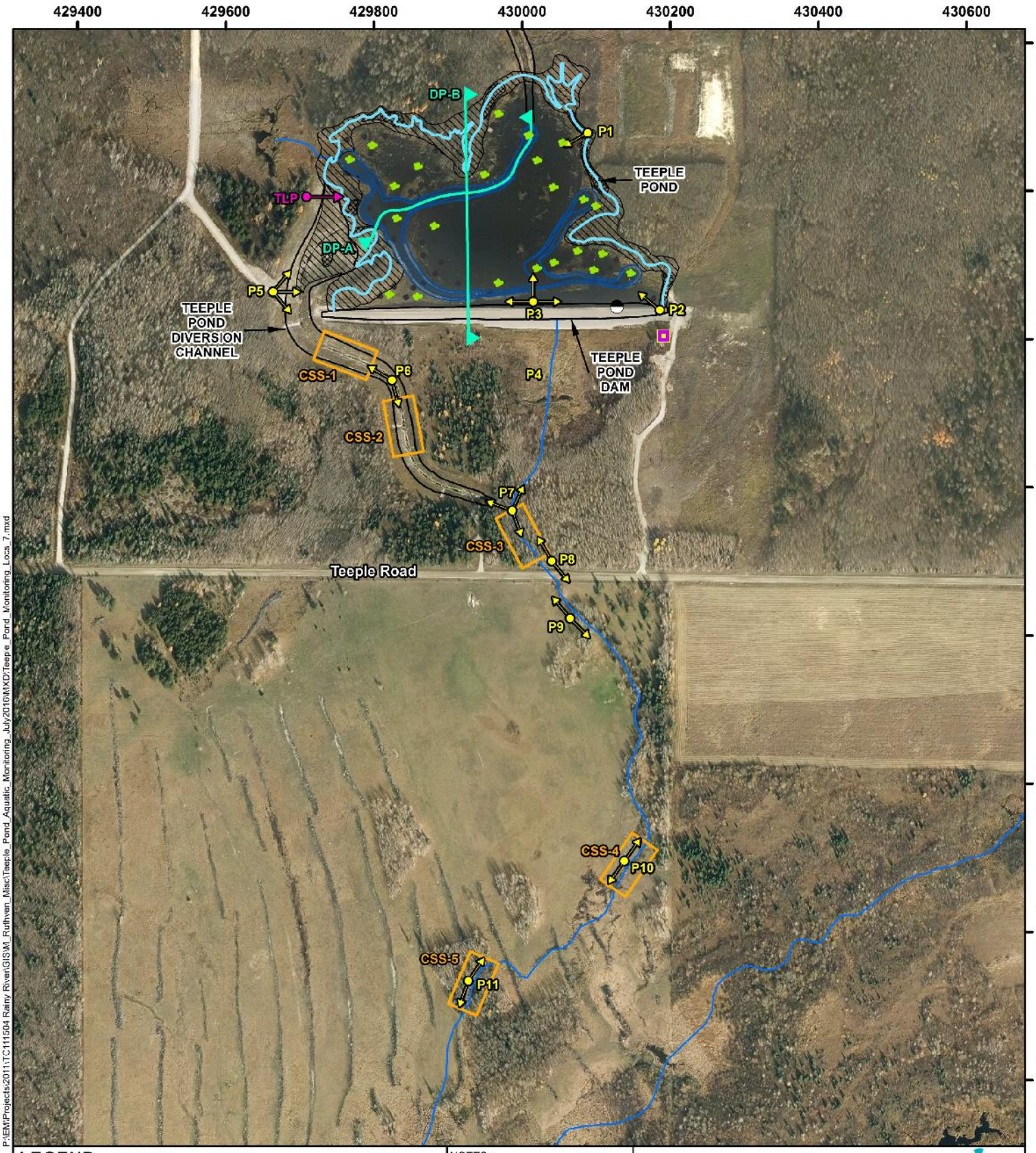

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LEGEND

- TLP — Time Lapse Photo Station
- P5 — Photo Station
- Depth Profiles
- CSS-# — Channel Stability Station
- Teeple Pond Extent
- Dam / Diversion Channel
- In Pond Channels
- Tree Pile
- Boulder Clusters
- Emergent Wetland
- Scrub / Shrub Wetland
- Water Level Logger
- Barometric Pressure Logger
- Watercourse

0 50 100 200 300 400 500 Metres

NOTES:
- Aerial imagery - October 2017

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER MINE

Teeple Pond and Outlet Channel Monitoring Locations

PROJECT N°: TC111504 | **FIGURE: 1**

SCALE: 1:7,000 | DATE: December 2017

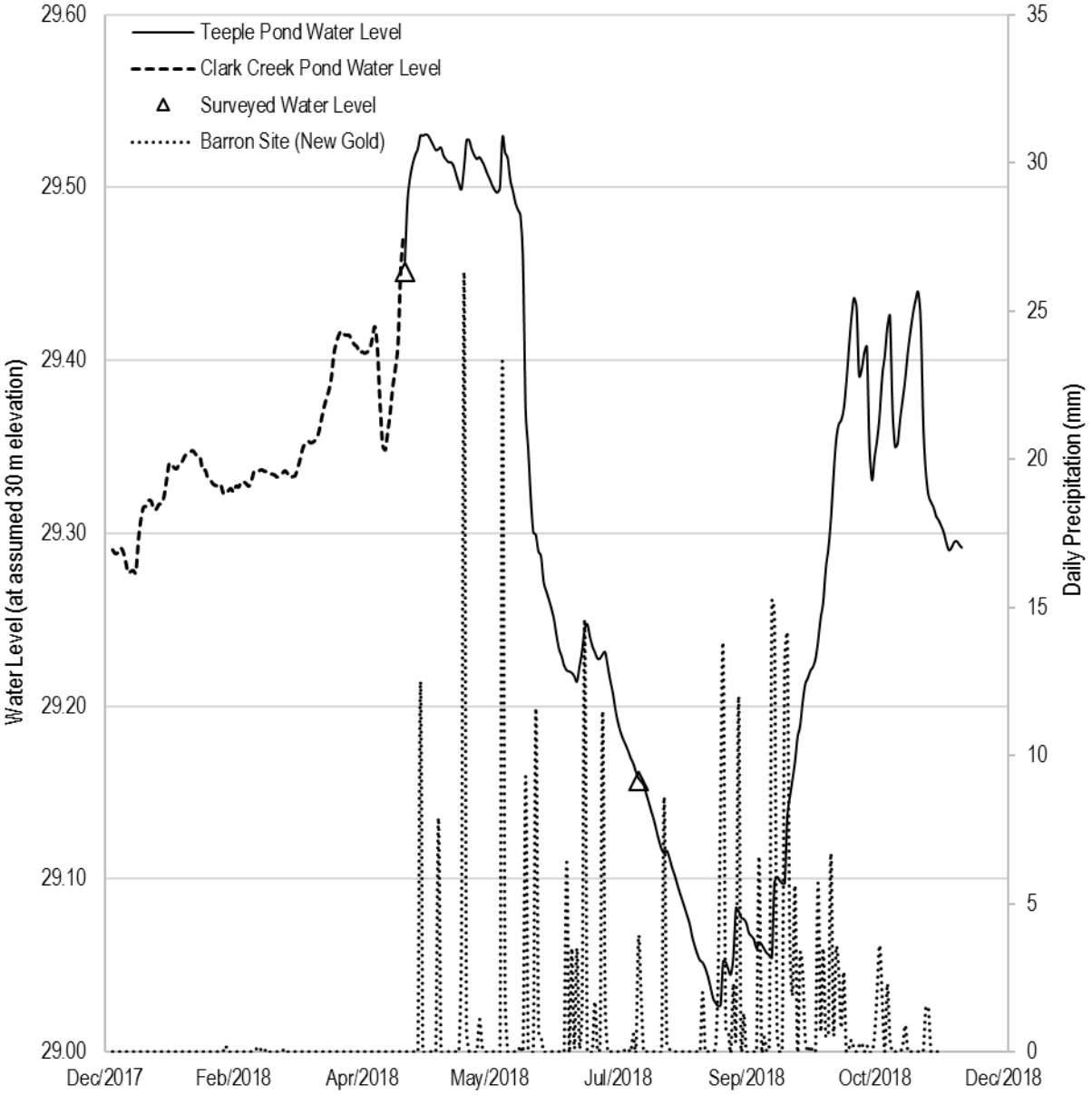


Figure 2: Teeple Pond Water Level and Manual Survey Data

Notes:

1. Clark Creek Pond daily water level data shown for 2018 period prior to Teeple Pond water level logger sensor reinstallation.
2. Teeple Pond water level data show a maximum difference between high and low water levels of 50.3 cm during the 2018 period of record.
3. Environment and Climate Change Canada, Barwick Climate Station ID 6020559 daily precipitation period of record shown in relation to water level fluctuations.

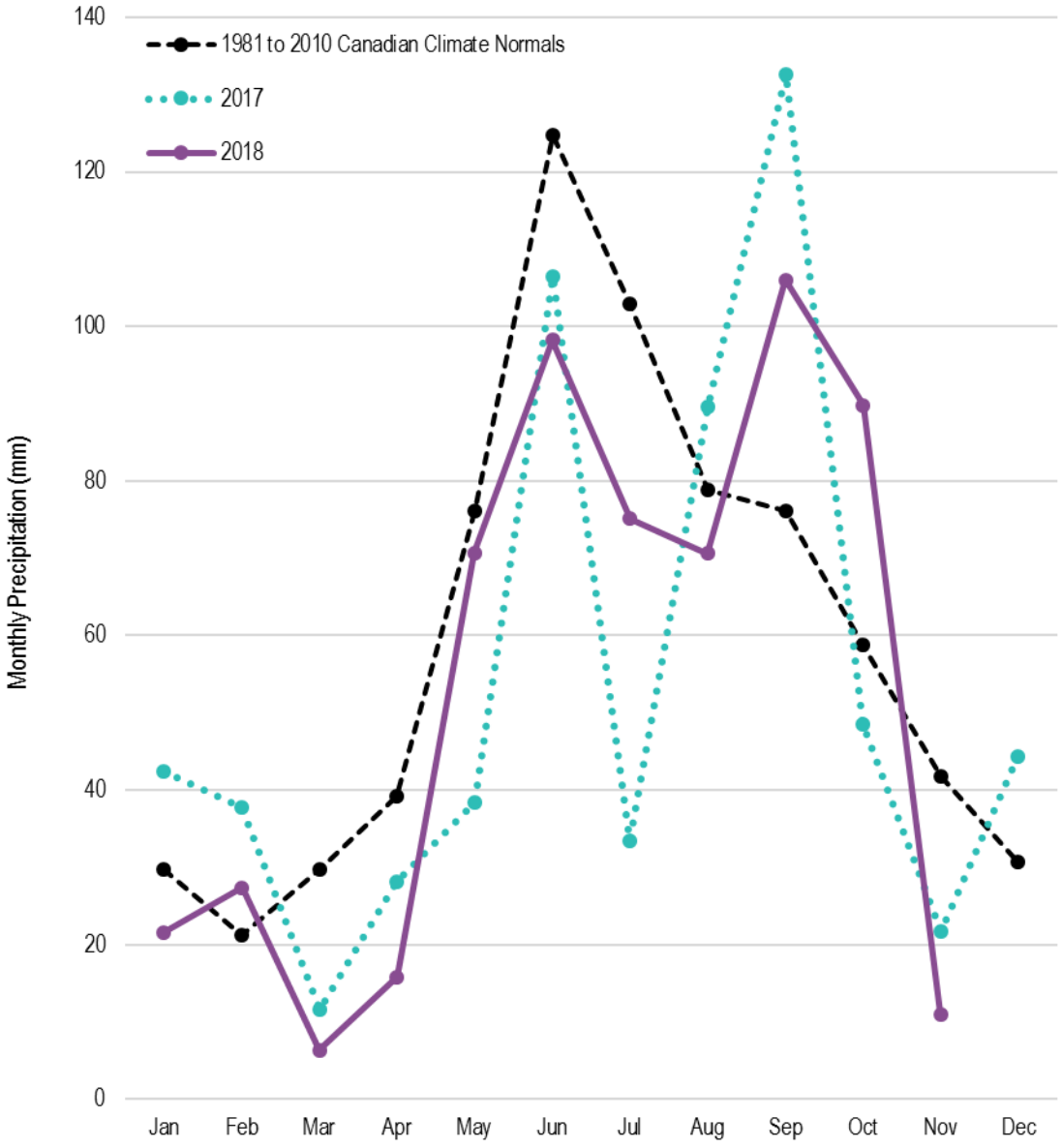


Figure 3: Barwick Monthly Precipitation Record

Notes:

1. Environment and Climate Change Canada, Barwick Climate Station ID 6020559 monthly precipitation records for 2017, 2018 and the 1981 to 2010 Canadian Climate Normals shown to demonstrate 2017 and 2018 were generally drier than average during the open water period.
2. Partial data for November 2018 (ending 26-Nov) shown and December 2018 data were unavailable for inclusion in this report.

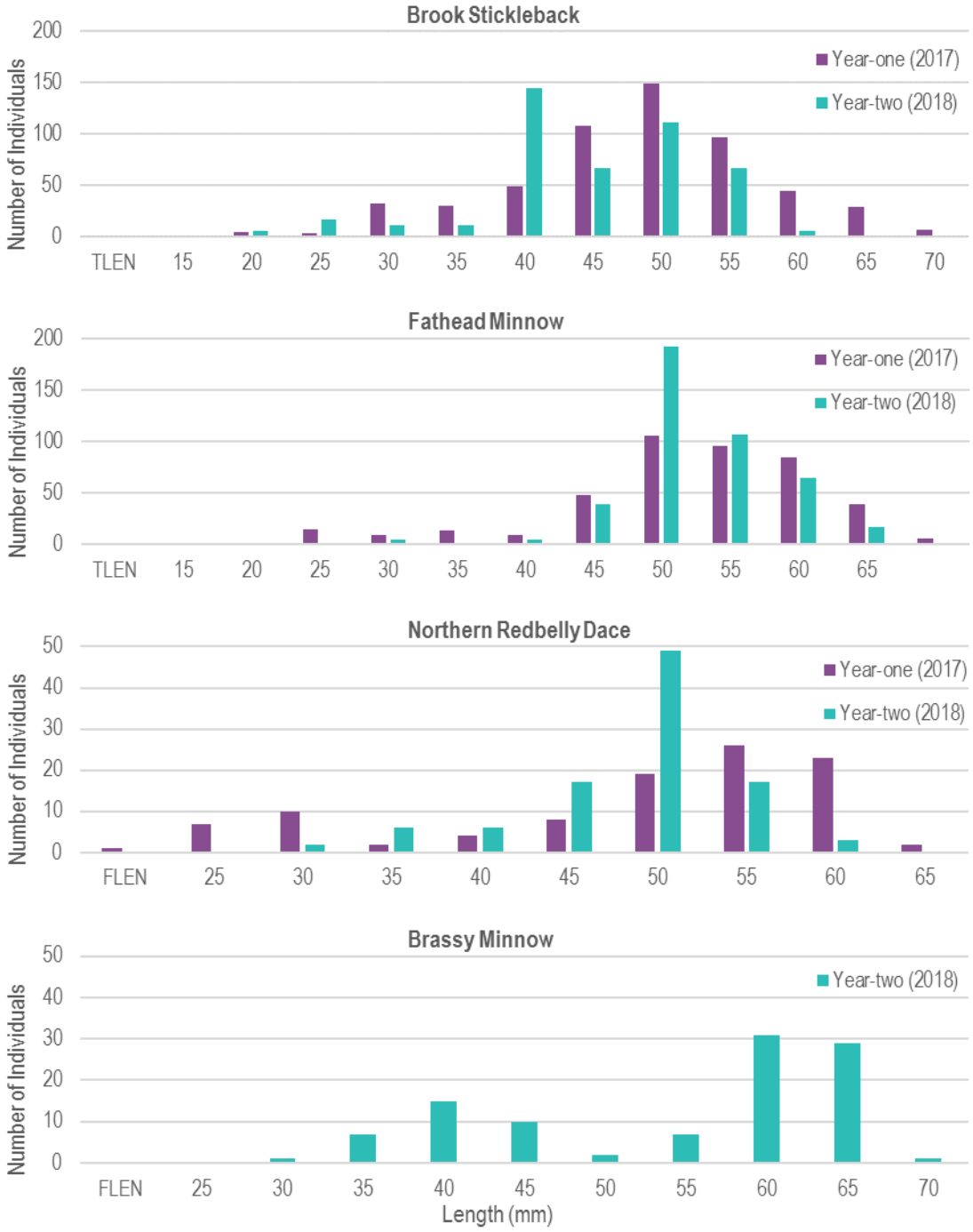


Figure 4: Teeple Pond Species-Specific Length-Frequency Summary

Notes:

1. Brook Stickleback values are total length, all other species values are fork lengths.
2. 2018 Brook Stickleback and Fathead Minnow catch numbers were standardized to represent proportion of individuals caught relative to the number of individuals caught during the 2017 studies.

Table 1a. Teeple Pond 2017 Water Depth Measurement Summary

Location No.	Design Water Depth	Total Water Depth (m)	UTM Easting (m)	UTM Northing (m)	Location/ Observations
1	1.5-2.0	1.55	429,795	5,409,016	NW channel, abundant macrophyte nearshore
2	2.0	2.05	429,769	5,409,036	NW refuge pool
3	2.0-2.5	2.32	429,802	5,408,984	W refuge pool, abundant macrophytes nearshore
4	2.0-2.5	2.45	429,810	5,408,966	W refuge pool
5	2.0-2.5	2.40	429,828	5,408,978	W refuge pool
6	1.5-2.0	2.37	429,904	5,408,994	NE channel
7	1.5-2.0	2.28	429,958	5,409,003	NE channel
8	1.5-2.0	1.60	429,985	5,409,028	NE channel, tree piles observed
9	2.0-2.5	2.15	430,013	5,409,080	NE refuge pool
10	1.5-2.0	2.28	429,836	5,408,919	SW channel
11	2.0-2.5	2.60	430,017	5,408,896	SE refuge pool
12	2.0-2.5	1.95	430,146	5,408,887	E refuge pool

Notes:

1. Data collected June 15, 2017 by Amec Foster Wheeler field staff
2. UTM – Universal Transverse Mercator, Zone 15U, NAD 83
3. Locations accurate to approximately 3 metres, design water depth ranges provided per relative sample location within design drawings
4. Appendix C includes the as-built conditions of Teeple Pond

Table 1b. Teeple Pond 2018 Water Depth Measurement Summary

Location No.	Design Water Depth (m)	Total Water Depth (m)	UTM Easting (m)	UTM Northing (m)
DP-B-01	1.1	1.1	429945	5408850
DP-B-02	1.2	1.2	429948	5408870
DP-B-03	1.1	1.2	429946	5408886
DP-B-04	1.1	1.8	429945	5408900
DP-B-05	1.1	1.1	429944	5408914
DP-B-06	1.1	1.5	429944	5408927
DP-B-07	1.1	0.8	429942	5408941
DP-B-08	1.1	0.9	429941	5408953
DP-B-09	1.0	0.8	429939	5408967
DP-B-10	1.0	0.6	429938	5408976
DP-B-11	0.9	0.5	429936	5408987
DP-B-12	0.8	0.4	429937	5408994
DP-B-13	0.7	0.8	429931	5409004
DP-A-14	0.9	0.6	430010	5409100
DP-A-15	0.9	1.5	430007	5409076
DP-A-16	0.9	1.2	430001	5409053
DP-A-17	0.8	1.3	429987	5409036
DP-A-18	0.8	1.3	429977	5409017
DP-A-19	0.8	1.4	429968	5409006
DP-A-20	0.8	1.6	429946	5409000
DP-A-21	0.8	1.6	429930	5408997
DP-A-22	0.8	1.5	429906	5408994
DP-A-23	0.9	1.7	429884	5408989
DP-A-24	0.8	1.8	429857	5408985
DP-A-25	0.8	1.9	429840	5408978
DP-A-26	0.8	1.6	429823	5408980
DP-A-27	0.7	1.7	429813	5408975
DP-A-28	0.5	1.7	429808	5408966
DP-A-29	0.1	0.8	429798	5408954

Notes:

1. Data collected July 28, 2018 by Wood field staff
2. UTM – Universal Transverse Mercator, Zone 15U, NAD 83
3. Locations accurate to approximately 3 metres, design water depth ranges provided per relative sample location within design drawings
4. Appendix C includes the as-built conditions of Teeple Pond

Table 2a. Teeple Outlet Channel 2017 Low Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-1	Flat	1.20	0.095	0.170	0.110	0	0	0	downstream extent
	Pool	1.56	0.195	0.250	0.230	0	0	0	mid-downstream pool
	Pool	1.72	0.135	0.180	0.180	0	0	0	mid-upstream pool
	Pool	1.70	0.050	0.235	0.195	0	0	0	upstream extent
	Riffle	N/A	0.000	0.020	0.000	N/A	N/A	N/A	water depth <0.02 m; too shallow for velocity measurement
CSS-2	Flat	0.87	0.080	0.100	0.100	0	0	0	downstream extent of CSS
	Riffle	N/A	0.000	0.020	0.000	N/A	N/A	N/A	water depth <0.02 m; too shallow for velocity measurement
	Pool	2.04	0.195	0.210	0.200	0	0	0	upstream of boulder in downstream pool
	Pool	2.93	0.215	0.210	0.195	0	0	0	pool at bottom of rock
	Flat	1.30	0.075	0.090	0.080	0	0	0	upstream extent, immediately upstream of riffle
	Riffle	N/A	0.000	0.020	0.000	N/A	N/A	N/A	water depth <0.02 m; too shallow for velocity measurement
	Flat	1.36	0.100	0.130	0.110	0	0	0	upstream extent
CSS-3	Flat	0.20	0.058	0.037	0.037	N/A	0.045	N/A	upstream of remnant channel confluence
	Pool	0.97	0.300	0.295	0.155	0.015	N/A	N/A	first pool downstream of confluence
	Flat	0.75	0.120	0.110	0.050	0	0.025	0.08	mid-upstream flat
	Pool	1.30	0.160	0.220	0.190	0	0.003	0	mid-downstream pool

Notes:

1. Data collected June 10, 2017 by Amec Foster Wheeler field staff
2. N/A – value not able to be recorded
3. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter
4. Pool and flat stream morphology was only encountered throughout the CSS-3 station reach

Table 2b. Teeple Outlet Channel 2018 High Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)		
			Left	Centre	Right	Left	Centre	Right
CSS-1	Riffle	1.30	0.090	0.080	0.080	0.323	0.315	0.155
	Run	3.30	0.100	0.180	0.140	0.011	0.149	0.041
	Run	2.45	0.230	0.260	0.200	0.183	0.127	0.016
	Riffle	0.73	0.040	0.100	0.090	0.673	0.546	0.394
	Pool	1.80	0.210	0.330	0.220	0.141	0.083	0.034
	Pool	2.25	0.190	0.380	0.240	0.182	0.037	-0.010
CSS-2	Riffle	1.33	0.070	0.100	0.080	0.608	0.871	0.278
	Run	2.17	0.170	0.200	0.080	0.026	0.158	0.120
	Pool	2.40	0.310	0.340	0.290	0.096	0.063	0.037
	Riffle	0.23	0.050	0.060	0.040	0.332	0.657	0.303
	Pool	2.70	0.320	0.360	0.250	0.138	-0.004	0.040
	Run	3.00	0.110	0.320	0.150	0.001	0.012	0.125
CSS-3	Run	0.88	0.150	0.200	0.230	0.119	0.220	0.189
	Pool	1.18	0.270	0.395	0.980	0.065	0.079	0.142
	Run	0.99	0.220	0.350	0.280	0.111	0.126	0.155
	Pool	1.08	0.430	0.430	0.340	0.123	0.079	0.076
	Riffle	0.94	0.090	0.140	0.040	-0.015	0.479	0.313

Notes:

1. Data collected April 25, 2018 by Wood field staff
2. N/A – value not able to be recorded
3. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter
4. Pool and flat stream morphology was only encountered throughout the CSS-3 station reach

Table 2c. Teeple Outlet Channel 2018 Low Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-1	Pool	0.87	0.080	0.110	0.060	0.000	0.000	0.000	Stagnant pool - no flow
	Pool	0.73	0.055	0.110	0.090	0.000	0.000	0.000	
CSS-2	Pool	1.39	0.125	0.190	0.150	0.000	0.000	0.000	
	Pool	1.47	0.140	0.170	0.085	0.000	0.000	0.000	
CSS-3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Station dry=no water/flow

Notes:

1. Data collected July 27, 2018 by Wood field staff
2. N/A – value not able to be recorded
3. Velocity measurements attempted using a Marsh McBirney FloMate Model 2000 portable velocity meter
4. Pool stream morphology were only encountered throughout CSS-1 and CSS-2

Table 3a. Teeple Pond Fish Species Presence Summary 2017 to 2018

Expected Species[1] Clark Creek (Teeple Drain) Sub-watershed	Success Target of 9 Species	
	Year-One (2017)	Year-Two (2018)
Blacknose Dace		
Blackside Darter		
Brassy Minnow		X
Brook Stickleback	X	X
Central Mudminnow	X	X
Common Shiner [3]	X	X
Creek Chub		X
Emerald Shiner		
Fathead Minnow [2]	X	X
Finescale Dace	X	X
Golden Shiner		
Lake Chub		
Northern Redbelly Dace	X	X
Pearl Dace	X	X
Spottail Shiner		
White Sucker		
Species Richness [4]	**7**	**9**

Notes:

1. List of expected species from the Fish Habitat No Net Loss Plan Section 35(2) Waterbodies, Table 3-3 (AMEC 2015)
2. Fathead Minnow were not previously listed to occur within the sub-watershed but were encountered during the year-one and year-two performance monitoring studies.
3. Common Shiner were not caught during the 2018 studies; however, the low abundance in 2017 (n=11) suggested they are likely still present and can be considered "present" for the purposes of this monitoring.
4. The 2018 species richness includes the inferred presence of Common Shiner, therefore, the inferred species richness satisfies the success target identified in the Offset Plan.

Table 3b. Teeple Pond Outlet Channel Fish Species Presence Summary 2017 to 2018

Expected Species[1] Clark Creek (Teeple Drain) Sub-watershed	Success Target of 9 Species	
	Year-One (2017)	Year-Two (2018)
Blacknose Dace		
Blackside Darter		
Brassy Minnow		X
Brook Stickleback	X	X
Central Mudminnow	X	X
Common Shiner	X	
Creek Chub		X
Emerald Shiner		
Fathead Minnow[2]	X	X
Finescale Dace	X	X
Golden Shiner		
Lake Chub		
Northern Redbelly Dace	X	
Pearl Dace	X	
Spottail Shiner		
White Sucker		
Species Richness	**7**	**6**

Notes:
1. List of expected species from the Fish Habitat No Net Loss Plan Section 35(2) Waterbodies, Table 3-3 (AMEC 2015)
2. Fathead Minnow were not previously listed to occur within the sub-watershed but were encountered during the year-one and year-two performance monitoring studies.

Table 4. Teeple Pond Fish Community Monitoring Results Summary

Gear	Sample ID	Sample Date (DD/MM/YY)	No. of Gear	Total Effort	Species Specific Catch and CPUE												
					Brassy Minnow	Brook Stickleback	Central Mudminnow	Common Shiner	Creek Chub	Fathead Minnow	Finescale Dace	Northern Redbelly Dace	Pearl Dace	YOY Cyprinid	Catch Total (n)	Catch CPUE	Ultimate (5-year) Target CPUE
Minnow Trap	TCP-MT1	12/07/17	75	1,550	0	243	26	0	0	413	14	84	1	0			**>2**
	Gear-Specific Total			**1,550**	**0**	**243**	**26**	**0**	**0**	**413**	**14**	**84**	**1**	**0**	**781**	**0.5**	
	TCP-MT1	26/07/18	75	1,763	514	74	22	0	29	418	525	1,463	173	0			
	Gear-Specific Totals			**1,763**	**514**	**74**	**22**	**0**	**29**	**418**	**525**	**1,463**	**173**	**0**	**3218**	**1.8**	
Seine Net	TCP-SN1	12/07/17	1	3	0	72	0	2	0	0	1	9	8	320			**>16**
	TCP-SN2	13/07/17	1	7	0	8	1	9	0	5	17	8	0	1,700			
	Gear-Specific Total			10	**0**	**80**	**1**	**11**	**0**	**5**	**18**	**17**	**8**	**2,020**	**2,160**	**216**	
	TCP-SN1	13/07/18	1	10	8	9	1	0	0	0	22	0	0	940			
	Gear-Specific Totals			10	**8**	**9**	**1**	**0**	**0**	**0**	**22**	**0**	**0**	**940**	**980**	**98**	
Electrofishing	TCP-EF1	13/07/17	1	5,018	0	2	2	0	0	3	5	1	0	32			**>44**
	TCP-EF2	14/07/17	1	5,005	0	3	2	0	0	0	5	0	1	2			
	Gear-Specific Total			**10,023**	**0**	**5**	**4**	**0**	**0**	**3**	**10**	**1**	**1**	**34**	**58**	**5.8**	
	TCP-EF1	14/07/18	1	10,117	0	6	16	0	0	4	15	7	7	0			
	Gear-Specific Totals			**10,117**	**0**	**6**	**16**	**0**	**0**	**4**	**15**	**7**	**7**	**0**	**55**	**5.4**	
	2017 All-Gear Catch Total				**0**	**328**	**31**	**11**	**0**	**421**	**42**	**102**	**10**	**2,054**	**2,999**	**-**	**-**
	2018 All-Gear Catch Total				**522**	**89**	**39**	**0**	**29**	**422**	**562**	**1,470**	**180**	**940**	**4,253**	**-**	**-**

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. Minnow trap effort presented as the number of fish caught per minnow trap hour; Offset Plan minimum effort required for monitoring (1,500 hours)
3. Seine net effort presented as the number of fish caught per 15 metre net haul; Offset Plan minimum effort required for monitoring (10 individual 15 m net hauls)
4. Backpack electrofishing effort presented as the number of fish caught per 1,000 electrofishing seconds; Offset Plan minimum effort required for monitoring (10,000 seconds)
5. All gear-specific minimum required efforts were met or exceeded

Table 5. Teeple Pond Outlet Channel Fish Community Monitoring Results Summary

Gear	Sample ID	Sample Date (DD/MM/YY)	No. of Gear	Total Effort	Species Specific Catch and CPUE												
					Brassy Minnow	Brook Stickleback	Central Mudminnow	Common Shiner	Creek Chub	Fathead Minnow	Finescale Dace	Northern Redbelly Dace	Pearl Dace	YOY Cyprinid	Catch Total (n)	Catch CPUE	Ultimate (5-year) Target CPUE
Minnow Trap	TCD-MT1	13/07/17	13	374.8	0	109	4	0	0	1	0	4	3	0			>2
	Gear-Specific Total			**374.8**	**0**	**109**	**4**	**0**	**0**	**1**	**0**	**4**	**3**	**0**	**121**	**0.32**	
	TP-DC-MT1	25/07/18	13	283	0	10	0	0	0	2	3	0	0	**0**			
	Gear-Specific Total			**283**	**0**	**10**	**0**	**0**	**0**	**2**	**3**	**0**	**0**	**0**	**15**	**0.05**	
Electrofishing	TCD-EF1	14/07/17	1	1,036	0	16	10	1	0	0	1	0	0	15			>44
	Gear-Specific Total			**1,036**	**0**	**16**	**10**	**1**	**0**	**0**	**1**	**0**	**0**	**15**	**43**	**41.5**	
	TP-DC-EF1	26/07/18	1	1,082	6	5	3	0	9	1	4	0	0	0			
	Gear-Specific Total			**1,082**	**6**	**5**	**3**	**0**	**9**	**1**	**4**	**0**	**0**	**0**	**28**	**25.9**	
2017 All-Gear Catch Total					**0**	**125**	**14**	**1**	**0**	**1**	**1**	**4**	**3**	**15**	**164**	**-**	**-**
2018 All-Gear Catch Total					**6**	**15**	**3**	**0**	**9**	**3**	**7**	**0**	**0**	**0**	**43**	**-**	**-**

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type.
2. Minnow trap effort presented as the number of fish caught per minnow trap hour; Offset Plan minimum effort required for monitoring (250 hours).
3. Backpack electrofishing effort presented as the number of fish caught per 1,000 electrofishing seconds; Offset Plan minimum effort required for monitoring (1,000 seconds).
4. All gear-specific minimum required efforts were exceeded.

Table 6a. Comparison of Performance Monitoring Results to Success Criteria for Teeple Pond

Attribute and Due Date	Success Criteria	Year-one	Year-two	Ultimate (5-year) Post Monitoring Success Criteria
Physical Construction of Offset measures (December 31, 2016)	As-built survey demonstrates that measures are constructed as per the approved plans	Yes	Yes	**Achieved**
	Area of replacement habitat is equal to or greater than 8.41 ha	Yes	Yes	**Achieved**
Physical Function of Offset Measures (December 31, 2019)	Water levels are consistent with those specified in the design	Yes	Yes	**Achieved**
	The outlet channel and pond allows for passage of fish	Yes	Yes	**Achieved**
Stability of Structures (December 31, 2019)	Constructed habitat features remain in place (log and boulder structures in place)	Yes	Yes	**Achieved**
	Shorelines and graded offset features are stable and not eroding (greater than 80% of features are considered stable)	>80%	>80%	**Achieved**
	Riparian vegetation cover and plantings achieve 80% coverage of area, and or survival of planted stock	Approx.70%	>80%	**Achieved**
Species Presence (December 31, 2021)	Minimum of 9 species of fish are present in the offset measure.	7	9*	**Achieved**
Full Life Cycle Usage (December 31, 2021)	Multiple year classes including young of the year fish are present in the offset feature.	Yes	Yes	**Achieved**
Fish Abundance (December 31, 2021)	Overall Catch per Unit Effort (CPUE) for all species combined, for at least two of following capture methods (electrofishing, Minnow Traps, Seine Nets). Minimum success criteria are:			
	Minnow Trap CPUE ≥ 2 fish per trap hour	0.5	1.8	On track
	Seine Net CPUE ≥ to 16 fish per 15 m net pull	216	98	**Achieved**
	Electrofishing CPUE ≥ 44 fish per 1,000 seconds	5.8	5.4	On track

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. Achieved = planned success criteria already achieved
3. On track = within the expected progress for the performance monitoring period
4. High proportion of YOY individuals within Teeple Pond influenced CPUE of gear-specific results since those fish were only catchable using seine netting
5. (*) Species richness includes inferred presence of Common Shiner previously encountered in low abundance during the 2017 studies.

Table 6b. Comparison of Performance Monitoring Results to Success Criteria for Teeple Outlet Channel

Attribute and Due Date	Success Criteria	Year-one	Year-two	Ultimate (5-year) Post Monitoring Success Criteria
Physical Construction of Offset measures (December 31, 2016)	As-built survey demonstrates that measures are constructed as per the approved plans	Yes	Yes	**Achieved**
	Area of replacement habitat is equal to or greater than 8.41 ha	Yes	Yes	**Achieved**
Physical Function of Offset Measures (December 31, 2019)	Water levels are consistent with those specified in the design	Yes	Yes	**Achieved**
	The outlet channel and pond allows for passage of fish	Yes	Yes	**Achieved**
Stability of Structures (December 31, 2019)	Constructed habitat features remain in place (log and boulder structures in place)	Yes	Yes	**Achieved**
	Shorelines and graded offset features are stable and not eroding (greater than 80% of features are considered stable)	>80%	>80%	**Achieved**
	Riparian vegetation cover and plantings achieve 80% coverage of area, and or survival of planted stock	Approx.70%	>80%	**Achieved**
Species Presence (December 31, 2021)	Minimum of 9 species of fish are present in the offset measure.	7	6	On track
Full Life Cycle Usage (December 31, 2021)	Multiple year classes including young of the year fish are present in the offset feature.	Yes	Yes	**Achieved**
Fish Abundance (December 31, 2021)	Overall Catch per Unit Effort (CPUE) for all species combined, for at least two of following capture methods (electrofishing, Minnow Traps, Seine Nets). Minimum success criteria are:			
	Minnow Trap CPUE ≥ 2 fish per trap hour	0.32	0.05	On track
	Electrofishing CPUE ≥ 44 fish per 1,000 seconds	41.5	25.9*	On track

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. (*) Electrofishing CPUE artificially reduced due to removal of fish during minnow trapping effort conducted prior to electrofishing.
3. Achieved = planned success criteria already achieved
4. On track = within the expected progress for the performance monitoring period

Appendix A

Physical Function of Offset Measures Photograph Record

A.1 Teeple Pond

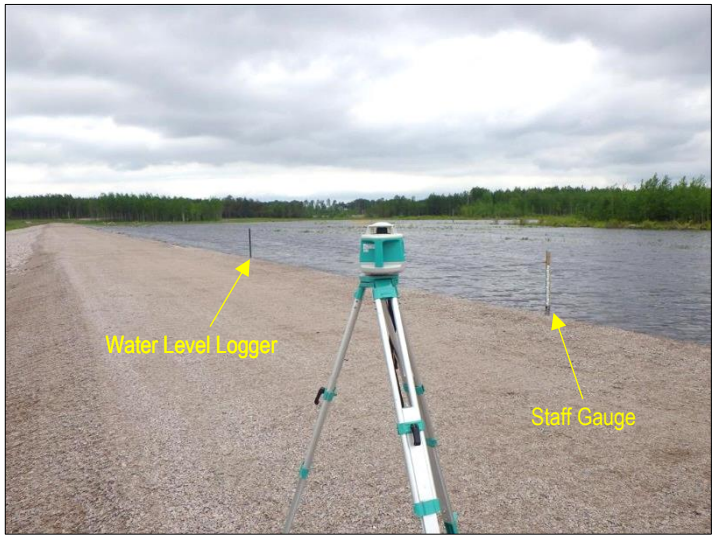
A.2 Teeple Outlet Channel

Appendix A.1

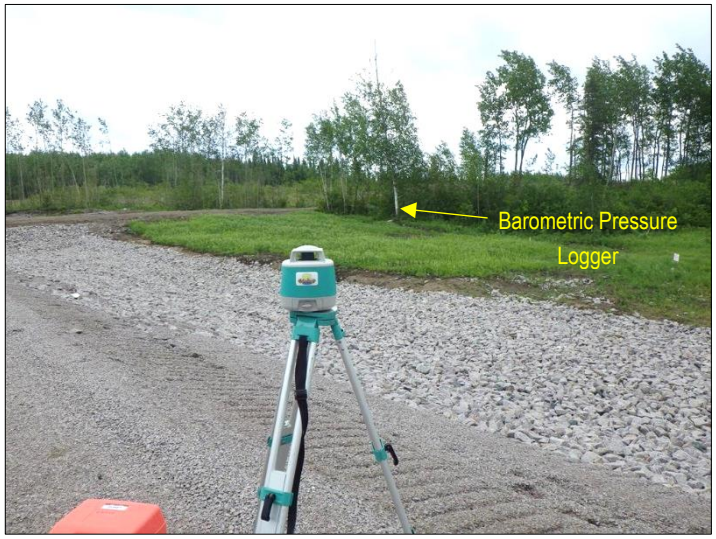
Teeple Pond

Water level logger facing west on dam (June 10, 2017)

Water level logger facing east on dam (June 10, 2017)



Water level logger facing northwest (June 10, 2017)



Barometric pressure logger mounted on tree (June 10, 2017)

Plate A.1-1: Teeple Pond Water Level Logger Installation

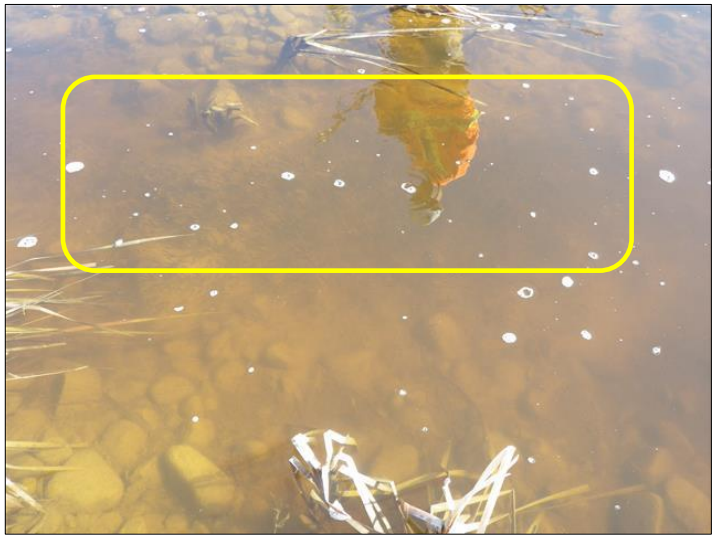
Appendix A.2

Teeple Outlet Channel

CSS-1, facing upstream during high flow conditions (April 25, 2018)

CSS-1 run during high flow conditions (April 25, 2018)

CSS-2, facing downstream toward remnant channel (April 25, 2018)



Large school of juvenile cyprinids in CSS-2 pool (April 25, 2018)

Plate A.2-1: Teeple Outlet Channel – High Flow Monitoring

CSS-1, facing upstream during low flow conditions (July 27, 2018)

CSS-1, facing downstream (July 27, 2018)

Dry riffle/run in CSS-1 (July 27, 2018)

Dry run/pool in CSS-1 (July 27, 2018)

Plate A.2-2: Teeple Outlet Channel – Low Flow Monitoring

CSS-2, facing upstream (July 27, 2018)

CSS-2 facing downstream (July 27, 2018)

Refuge pool in CSS-2, during low flow conditions (July 27, 2018)

Dry run in CSS-2 (July 27, 2018)

Plate A.2-3: Teeple Outlet Channel – Low Flow Monitoring

Dry plunge pool in CSS-3 (July 27, 2018)

Erosion from cattle destabilization and exposed soil; CSS-3 (July 27, 2018)

Undefined channel from cattle destabilization; CSS-3 (July 27, 2018)

Dry channel at CSS-11 (July 27, 2018)

Plate A.2-4: Teeple Drain – Low Flow Monitoring

Appendix B

Stability of Structures Photograph Record

B.1 Photo Stations
B.2 Time Lapse Photo Series (2018)
B.3 Time Lapse Photo Series (2017)

Appendix B.1

Photo Stations

Station P1 facing southwest (July 7 27, 2018)

Station P1 facing southwest (April 25, 2018)

Station P2 facing west (April 25, 2018)

Station P2 facing west (July 25, 2018)

Plate B.1-1: Stability of Structures Photo Stations P1 and P2

Station P3 facing west from stake (July 25, 2018)

Station P3 facing north (July 25, 2018)

Station P3 facing east from stake (July 25, 2018)

Station P4 facing northwest to dam (July 25, 2018)

Plate B.1-2: Stability of Structures Photo Stations P3 and P4

Station P4 facing northeast (July 25, 2018)

Station P4 facing northeast to dam (April 25, 2018)

Station P4, facing south (July 25, 2018)

Station P4, facing south (April 25, 2018)

Plate B.1-3: Stability of Structures Photo Station P4

Station P5 facing northeast; low flow condition (July 8, 2017)

Station P5 facing northeast; note vegetation progress (July 27, 2018)

Station P5 facing north; high flow condition (April 25, 2018)

Station P5 facing east; low flow condition (July 27, 2018)

Plate B.1-4: Stability of Structures Photo Station P5

Station P5 facing southeast; high flow condition (April 25, 2018)

Station P5 facing southeast; low flow condition (July 27, 2018)

Station P6 facing northwest; upstream (April 25, 2018)

Station P6 facing northwest; upstream (July 27, 2018)

Plate B.1-5: Stability of Structures Photo Stations P5 and P6

Station P6 facing south; downstream (April 25, 2018)

Station P6 facing south; downstream (July 27, 2018)

Station P7, natural channel facing north; upstream (April 25, 2018)

Station P7, natural channel facing north; upstream (July 29, 2018)

Plate B.1-6: Stability of Structures Photo Stations P6 and P7

Station P8 facing south; downstream (April 25, 2018)

Station P8 facing south; downstream (July 29, 2018)

Station P8, natural channel, during high flow (April 25, 2018)

Station P8, natural channel during low flow (July 29, 2018)

Plate B.1-7: Stability of Structures Photo Station P8

Station P9 facing northwest; upstream (April 25, 2018)

Station P9 facing northwest; upstream – no flow (July 29, 2018)

Station P9 facing southeast, during high flow (April 25, 2018)

Station P9 facing southeast, during low flow (July 29, 2018)

Plate B.1-8: Stability of Structures Photo Station P9

Station P10 facing north; upstream (April 25, 2018)

Station P10 facing northeast; upstream (July 29, 2018)

Station P10 facing southwest; downstream (April 25, 2018)

Station P10 facing southwest; downstream (July 29, 2018)

Plate B.1-9: Stability of Structures Photo Station P10

Station P11 facing northeast; upstream (April 25, 2018)

Station P11 facing northeast; upstream (July 29, 2018)

Station P11 facing southwest; downstream (April 25, 2018)

Station P11 facing southwest; downstream (July 29, 2018)

Plate B.1-9: Stability of Structures Photo Station P11

Appendix B.2

Time Lapse Photo Series (2018)

Teeple Pond outlet; ice still present on pond (April 25, 2018)

Teeple Pond outlet; ice absent from pond next day (April 26, 2018)

May 4, 2018

May 6, 2018

Plate B.2-1: Time Lapse Photo Series (April and May 2018)

May 11, 2018

May 18, 2018

May 25, 2018

May 30, 2018

Plate B.2-2: Time Lapse Photo Series (May 2018)

June 6, 2018

June 13, 2018

June 27, 2018

July 4, 2018

Plate B.2-3: Time Lapse Photo Series (June and July 2018)

July 4, 2018

July 10, 2018

July 18, 2018

July 23, 2018

Plate B.2-4: Time Lapse Photo Series (July 2018)

Large white bird on pond (July 31, 2018)

August 4, 2018

August 15, 2018

August 28, 2018

Plate B.2-5: Time Lapse Photo Series (July and August 2018)

September 5, 2018

Large congregation of birds on pond (September 10, 2018)

Large white birds on pond (September 18, 2018)

September 30, 2018

Plate B.2-6: Time Lapse Photo Series (September 2018)

October 4, 2018

First observed snowfall occurred one day prior (October 11, 2018)

October 20, 2018

October 30, 2018

Plate B.2-7: Time Lapse Photo Series (October 2018)

Ice forming on pond since Nov. 2 (November 4, 2018)

Ice cover absent from pond since November 5 (November 7, 2018)

Continuous ice cover documented (November 9, 2018)

Ice coverage remained unchanged since Nov. 9 (November 30, 2018)

Plate B.2-8: Time Lapse Photo Series (November 2018)

Appendix B.3

Time Lapse Photo Series (2017)

June 11, 2017

June 16, 2017

June 23, 2017

June 30, 2017

Plate B.3-1: Time Lapse Photo Series June 2017

July 7, 2016

July 14, 2017

July 21, 2017

July 28, 2017

Plate B.3-2: Time Lapse Photo Series July 2017

August 4, 2017

August 11, 2017

Note debris mound removed; August 18, 2017

August 24, 2017

Plate B.3-3: Time Lapse Photo Series August 2017

September 2, 2017

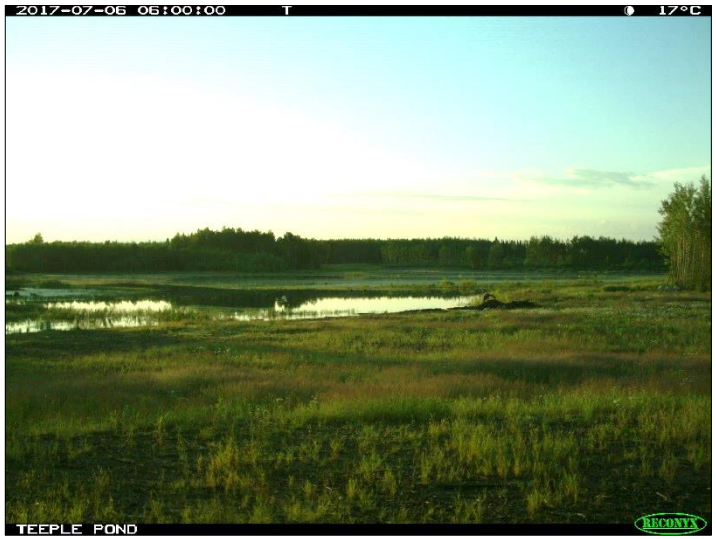
Note large white birds on pond; September 8, 2017

September 15, 2017

September 21, 2017

Plate B.3-4: Time Lapse Photo Series September 2017

Note geese in foreground; June 12, 2017



Unknown animal/object at outlet; July 6, 2017

Water level before 22 mm rain; June 13, 2017

Water level after 22 mm rain; June 14, 2017

Plate B.3-5: Time Lapse Photo Series Other Supporting Photos

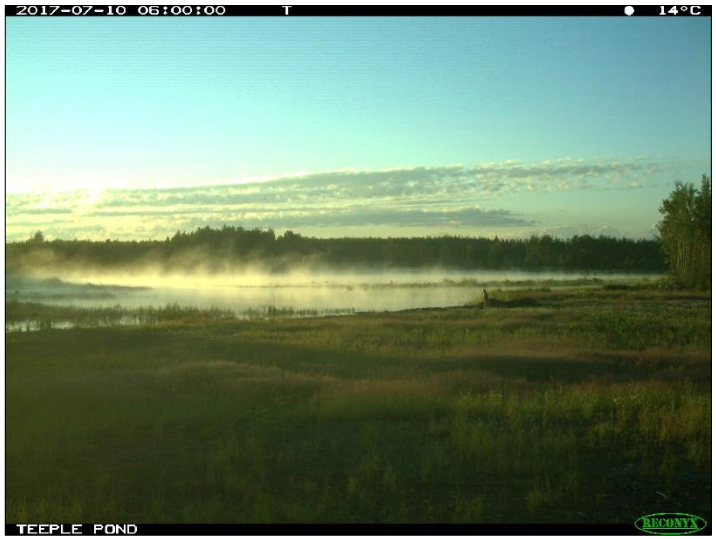
Rain in distance; June 25, 2017

Example of shadow/lighting influence; June 25, 2017

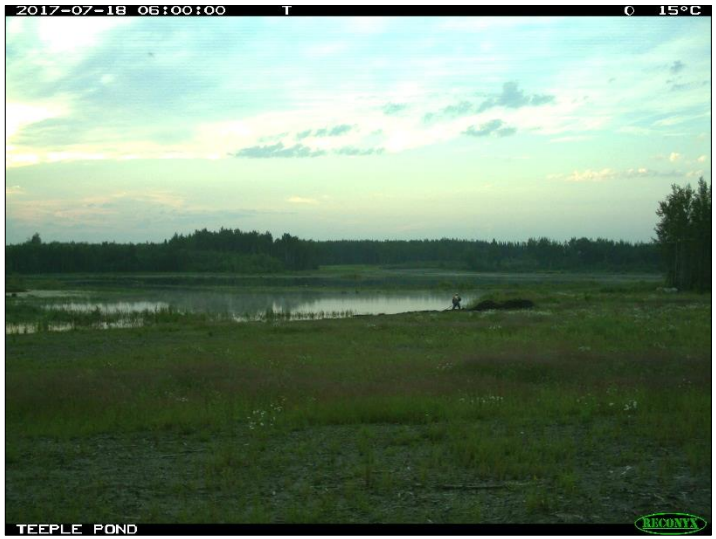
Water level before 33 mm rain; July 4, 2017

Water level after 33 mm rain; July 5, 2017

Plate B.3-6: Time Lapse Photo Series Other Supporting Photos

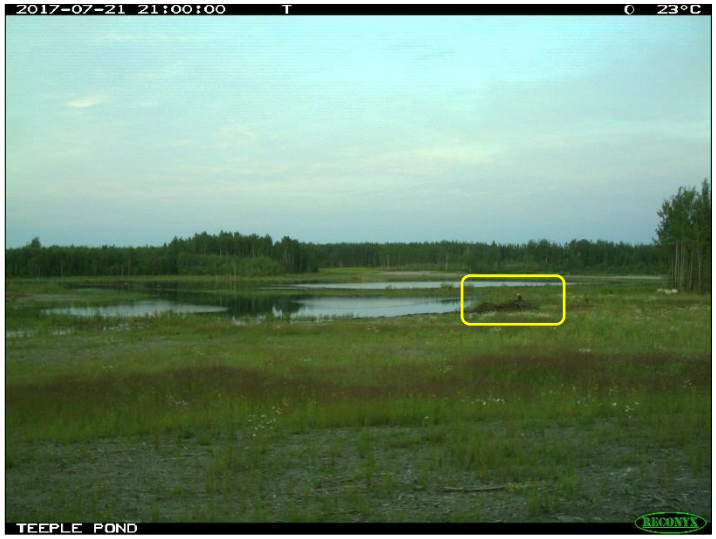


Trapper onsite managing beaver in pond; July 10, 2017



Trapper working near outlet; July 18, 2017

Teeple Pond outlet repairs, note machinery; August 18, 2017



Bald Eagle on outlet debris mound; July 21, 2017

Plate B.3-7: Time Lapse Photo Series Other Supporting Photos

Appendix C

Attachments

LEGEND

BOULDER CLUSTER

TREE PILE

NWL NORMAL WATER LEVEL

ZONE A - SCRUB-SHRUB WETLAND - 3,248 m²

ZONE B - EMERGENT WETLAND - 34,693 m²

2017 MANUAL WATER DEPTH MEASUREMENTS					
LOCATION NO.	DESIGN WATER DEPTH (m)	TOTAL WATER DEPTH (m)	UTM EASTING (m)	UTM NORTHING (m)	LOCATION/OBSERVATION
1	1.5-2.0	1.55	429,795	5,409,016	NW CHANNEL, ABUNDANT MACROPHYTE NEARSHORE
2	2.0	2.05	429,769	5,409,036	NW REFUGE POOL
3	2.0-2.5	2.32	429,802	5,408,984	W REFUGE POOL, ABUNDANT MACROPHYTES NEARSHORE
4	2.0-2.5	2.45	429,810	5,408,966	W REFUGE POOL
5	2.0-2.5	2.40	429,828	5,408,978	W REFUGE POOL
6	1.5-2.0	2.37	429,904	5,408,994	NE CHANNEL
7	1.5-2.0	2.28	429,958	5,408,003	NE CHANNEL
8	1.5-2.0	1.60	429,985	5,409,028	NE CHANNEL, TREE PILES OBSERVED
9	2.0-2.5	2.15	430,013	5,409,080	NE REFUGE POOL
10	1.5-2.0	2.28	429,836	5,408,919	SW CHANNEL
11	2.0-2.5	2.60	430,017	5,408,896	SE REFUGE POOL
12	2.0-2.5	1.95	430,146	5,408,887	E REFUGE POOL

TEEPLE ROAD POND INLET FROM CLARK CREEK DIVERSION CHANNEL

EXISTING UNNAMED TRIBUTARY 8 CHANNEL

EXISTING BEAVER POND

TEEPLE ROAD POND OUTLET TO EXISTING UNNAMED TRIBUTARY 8

REFUGE POOL BTM. ELEV. 376.50

LOC. NO. 1 DEPTH: 1.55m

LOC. NO. 2 DEPTH: 2.05m

LOC. NO. 3 DEPTH: 2.32m

LOC. NO. 4 DEPTH: 2.45m

LOC. NO. 5 DEPTH: 2.40m

LOC. NO. 6 DEPTH: 2.37m

LOC. NO. 7 DEPTH: 2.28m

LOC. NO. 8 DEPTH: 1.6m

LOC. NO. 9 DEPTH: 2.15m

LOC. NO. 10 DEPTH: 2.28m

LOC. NO. 11 DEPTH: 2.6m

LOC. NO. 12 DEPTH: 1.95m

TYPICAL TREE PILE (SEE DRAWING NO. 3098004-004400-A1-D50-0001-AB)

TYPICAL BOULDER CLUSTER (SEE DRAWING NO. 3098004-004400-A1-D50-0001-AB)

NWL 378.50

TOTAL WETTED AREA UNDER NORMAL WATER LEVEL 9.22 HECTARES

TOP OF DAM (CREST ELEV. 379.00)

ARMOURED SEGMENT SEE DRAWING 3098004-004400-A1-D70-0003

TEEPLE ROAD DAM SEE DRAWING 3098004-004400-A1-D70-0003

TEEPLE ROAD POND PLAN VIEW

SCALE : 1:1000

0m 10 20 30 40

1 : 1000

3098004-004400-A1-D50-0006

REV	D	M	Y	ISSUE/REVISION DESCRIPTION	DES.	APPR.
A	18	12	2017	AS-BUILT	NSH	MCR

Client Logo: newgold™ Rainy River Project

Client: NEW GOLD INC.

AMEC Foster Wheeler Environment & Infrastrature
160 Traders Boulevard East
Mississauga, Ontario, Canada L4Z 3K7

amec foster wheeler

DRAWN BY:	NSH
DESIGNED BY:	NSH
CHECKED BY:	MCR
REVIEWED BY:	MCR
APPROVED BY:	MCR

PROJECT: RAINY RIVER PROJECT DETAILED DESIGN

TITLE: TEEPLE ROAD POND PLAN VIEW

PROJECT NO.:	TC133921
REVISION NO.	A
DATE:	DEC. 2017
SCALE:	AS SHOWN
ATTACHMENT NO.:	1

C:\Working Folders\RRPLCAD\As Built\Teeple Pond\211_212 - TP - Pond_Attachment1_10.dwg — Overview — Dec. 19, 2017 4:44pm — nathan.dellings

NEW GOLD RAINY RIVER MINE
APPENDIX O
SCHEDULE 2 MDMER FISH HABITAT COMPENSATION PLAN

Rainy River Mine

2018 Annual Monitoring Report – Schedule 2 MDMER Fish Habitat Compensation Plan
Emo, Ontario
TC111504

Prepared for:

New Gold Inc.

5967 Highway 11/71, P.O. Box 5, Emo, Ontario P0W 1E0

December 2018

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited
110-160 Traders Blvd. E., Mississauga, ON L4Z 3K7
www.woodplc.com

December 22, 2018

Ms. Sylvie St-Jean, Environmental Manager
Rainy River Mine
5967 Highway 11/71
P.O. Box 5
Emo, Ontario, Canada P0W IE0
Telephone: (807) 482-2501
Facsimile: (807) 482-2834

Dear Ms. St-Jean:

Re: 2018 Annual Monitoring Report
Schedule 2 MDMER Fish Habitat Compensation Plan, Rainy River Mine
Emo, Ontario

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood) was retained by New Gold Inc. (New Gold) to complete the year-one annual performance monitoring of the Schedule 2 Metal and Diamond Mining Effluent Regulations Fish Habitat Compensation Plan at the Rainy River Mine in Emo, Ontario. The compensation waterbodies included Clark Creek, Stockpile and West Creek ponds and diversion channels. The purpose of this 2018 annual monitoring report is to summarize the first year of performance monitoring for the compensation measures and to provide recommendations to improve future annual performance monitoring programs.

Sincerely,
Wood Environment & Infrastructure
a Division of Wood Canada Limited

Prepared by:

Dale Klodnicki, M.E.Sc., C.E.T.
Senior Aquatic Ecologist

Reviewed by:

<Original signed by>

Mark Ruthven, C.E.T.
Head, Environmental Assessment

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

Rainy River Mine

2018 Annual Monitoring Report – Schedule 2 MDMER Fish Habitat Compensation Plan
Emo, Ontario
TC111504

Prepared for:

New Gold Inc.
5967 Highway 11/71, P.O. Box 5, Emo, Ontario P0W 1E0

Prepared by:

Wood Environment & Infrastructure Solutions
a Division of Wood Canada Limited
110-160 Traders Blvd. E., Mississauga, ON L4Z 3K7
Date December 14, 2018

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Executive Summary

The New Gold Inc. (New Gold) Rainy River Mine is situated in the Township of Chapple, approximately 65 kilometres northwest of Fort Frances in Northwestern Ontario. This report provides findings of the year-one post-construction performance monitoring as per commitments made in the regulatory amendment to Schedule 2 of the Metal and Diamond Mining Effluent Regulations listing and associated Fish Habitat Compensation Plan (FHCP). The FHCP requires monitoring for the construction and post construction phases of development and the two primary commitments include:

1. As-Constructed report which was submitted December 2017; and

2. Annual performance monitoring studies to confirm the physical function, structural stability and fish community ecological success metrics.

Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited was retained by New Gold to conduct the year-one performance monitoring to evaluate the success of the compensation measures implemented under the FHCP. Implementation and effectiveness of the measures are determined by confirming that Clark Creek Diversion (includes Clark Creek Pond and Diversion Channel) and West Creek Diversion (includes Stockpile Pond and Diversion Channel, and the West Creek Pond and Diversion Channel) have been constructed as per the approved plans and are functioning as intended using the success criteria in the FHCP.

The 2017 As-Constructed report showed the physical construction of compensation measures achieved the required success criteria. The year-one perfomance monitoring of ecological success criteria related to the physical function, structure stability and fisheries components of the FHCP were generally achieved in 2018 as described below:

- The Clark Creek Pond and West Creek Pond diversion channels allowed for fish passage under normal and high flow conditions and the Clark Creek and West Creek pond water levels are consistent with those specified in the design;
- Constructed habitat remains stable and in place for all Schedule 2 Amendment waterbodies. Shorelines and graded offset features are stable, and riparian vegetation cover and plantings have achieved moderate to good coverage, greater than the 80% success criteria;
- Seven fish species are present in the Clark Creek Diversion, whereas 12 species are present within the West Creek Diversion (success criteria target nine species);
- Multiple year classes of several species, and many young-of-the year fish were encountered in the compensation measures demonstrating full fish life cycle usage; and,
- Overall catch-per-unit-effort for seine netting achieved fish abundance success criteria, with the remaining gear-specific results showing the fish community is on track to meet the success criteria targets before 2021.

The success criteria related to the physical function of Stockpile Pond and the portion of the Stockpile Diversion Channel, between the pond outlet and confluence with West Creek Tributary 2, did not perform as expected. The pond water level decreased during the summer and water was not flowing in the above noted section of the diversion channel. Consequently, approximately 75% of the West Creek Diversion achieved the FHCP performance criteria. However, the function of the Stockpile Pond is still largely effective at providing a permanent habitat for small bodied fish. The observed maximum depth of

Stockpile Pond in 2018 is more than sufficient to provide overwintering refuge areas for all resident fish species and therefore is serving the intended function but connectivity between Stockpile Pond, Stockpile Diversion and West Creek Pond will be monitored.

Biological systems such as Clark Creek, Stockpile and the West Creek ponds and diversion channels are dynamic and will likely require several years to develop biological communities that meet the success criteria; however, the year-one monitoring results show very good progress toward these targets.

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Limitations

1.0 Introduction

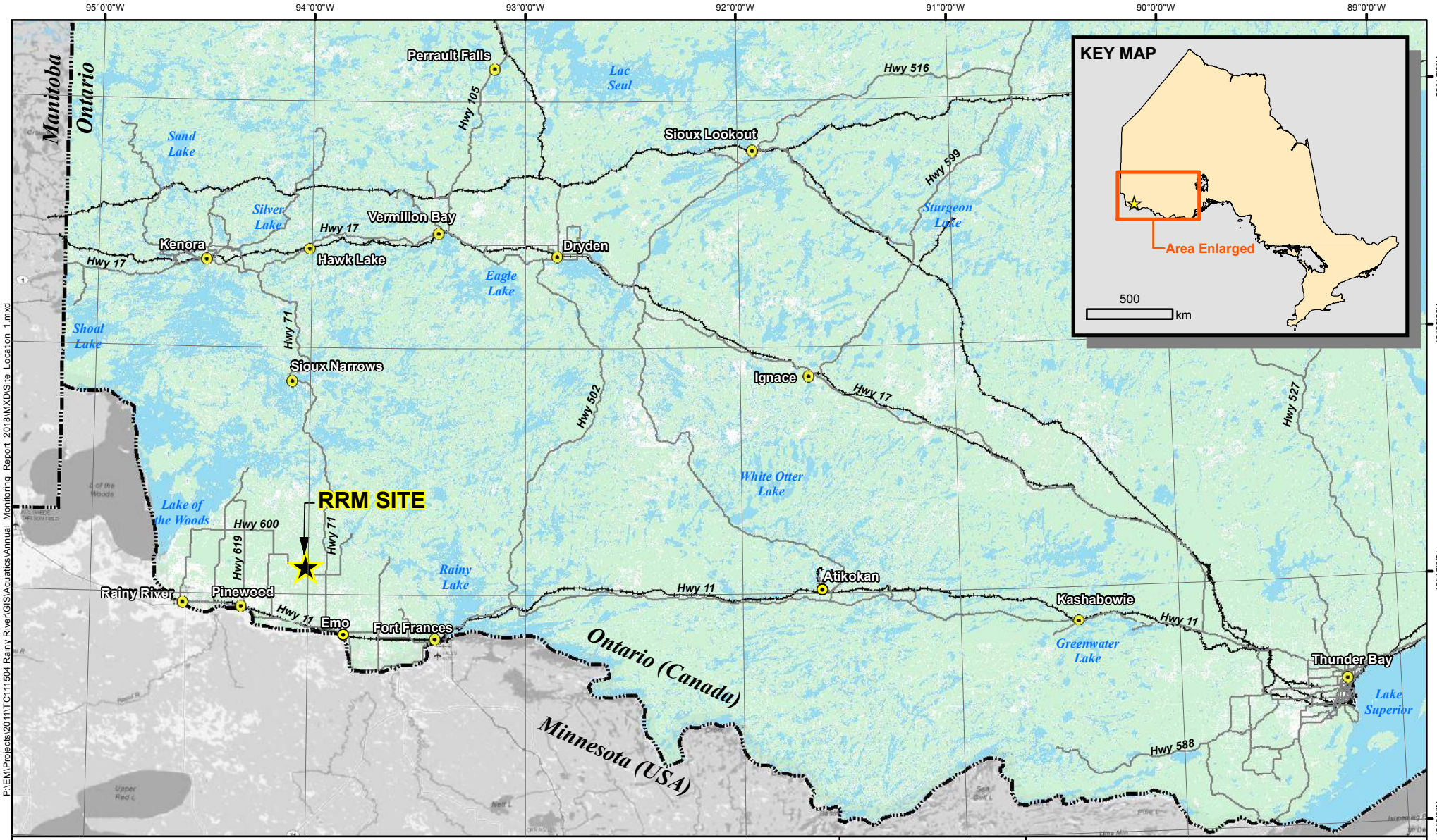
The New Gold Inc. (New Gold) Rainy River Mine (RRM) is situated in the Township of Chapple, approximately 65 kilometres (km) northwest of Fort Frances in Northwestern Ontario (Figure1-1). This Fish Habitat Compensation Plan (FHCP) annual monitoring report is provided for compliance with the commitments of the FHCP pursuant to the Schedule 2 Metal and Diamond Mining Effluent Regulations (MDMER) amendments associated with the project. This is the first year of a specified five year monitoring cycle.

Construction and development of the RRM required the deposition of mine waste (overburden, rock and mine water / effluent) in waterbodies that are frequented by fish. This deposition required a regulatory amendment to Schedule 2 of the MDMER. In order for the Government of Canada to complete the regulatory amendment, an approved FHCP was provided to offset losses of fisheries associated with the deposits. Previously, a detailed No Net Loss Plan (NNLP) for the MDMER Schedule 2 Amendment Waterbodies (AMEC 2014a,b) had been prepared for the RRM and circulated to stakeholders during the Environmental Assessment process. A subsequent detailed FHCP was submitted to Department of Fisheries and Oceans Canada (DFO) in May 2015 which was intended to summarize the impacts and compensation measures described in the NNLP and provide additional details of the associated monitoring commitments (Amec Foster Wheeler 2015). Schedule 2 waterbody listings do not have formal DFO authorizations and monitoring conditions associated with them as do Section 35 *Fisheries Act* approvals. Instead, the approved FHCP, as per Section 27 of the MDMER becomes the agreed upon and contractual commitment for the construction and monitoring of the compensation measures.

A revised FHCP to address changes to the site design and Project schedule was submitted in January 2017 (Amec Foster Wheeler 2017a). The Schedule 2 amendment process was completed in fall 2017 (as published in Canada Gazette vol 151(20), October 4, 2017).

The impacted fish community, and corresponding target fishery of the FHCP are baitfish (primarily minnow) species that inhabit the small creek systems associated with the site. The compensation waterbodies include Clark Creek, Stockpile and West Creek ponds and diversion channels. Construction of Clark Creek Pond was completed in early 2016 and construction of the Clark Creek diversion channel was completed by late 2016. The Stockpile Pond and diversion channel were constructed by early 2016, whereas the West Creek Pond and Diversion Channel construction was completed by late 2017. An As-Constructed monitoring report was submitted December 2017 (Amec Foster Wheeler 2017b) as per Section 8.3, Table 5 of the approved FHCP.

The As- Constructed report confirmed that overall the compensation measures were constructed and functioning as per the approved plans. The purpose of this 2018 annual performance monitoring report is to summarize the first year of performance monitoring; which includes biological and habitat stability indicators, for the constructed ponds and diversion channels.



P:\EM\Projects\2011\TC111504 Rainy River\GIS\Aquatics\Annual_Monitoring_Report_2018\MXD\Site_Location_1.mxd

LEGEND

- RRM Site
- Regional Communities
- Provincial / National Border
- Regional Road / Highway
- Railway

0 25 50 100 150 200 250 Kilometres

NOTES:
- Ontario base data extracted from Land Information Ontario (MNR) data warehouse, Queen's Printer for Ontario, 2011-2012
- Base data outside of Ontario extracted from ESRI DeLorme World Basemap

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold Rainy River Project wood.

RAINY RIVER MINE

Site Location

PROJECT N°: TC111504	**FIGURE: 1-1**
SCALE: 1:1,800,000	DATE: December 2018

2.0 Schedule 2 Listed Waterbodies and Monitoring Requirements

The RRM works listed to Schedule 2 are as follows:

1. Development of the Tailings Management Area (TMA) which will impound tailings in the upper reaches of Loslo Creek and Marr Creek;

2. Construction of the Water Discharge Pond and Constructed Wetland in the mid and lower reach of Loslo Creek. These ponds will receive treated mine effluent and seepage from the TMA dam; and

3. Construction of the West Mine Rock and Overburden Stockpiles in the lower reach of Marr Creek.

The delineation of mine works and approved Schedule 2 waterbodies associated with the RRM, as well as the performance monitoring locations discussed in the following sections are shown on Figures 2-1 and 2-2.

The FHCP requires monitoring for the construction and post construction phases of development. The two primary commitments include:

3. As-Constructed report which was submitted December 22, 2017 (Amec Foster Wheeler 2017b) and included the following measures:

    a. An As-Constructed survey to confirm the physical construction of compensation measures were as per the approval FHCP design. The survey included areas of wetted and frequently flooded habitats, all constructed habitat features, water depths, vegetation zones, and channels;

    b. Photo documentation record during construction to document that mitigation and avoidance measures were implemented, and that all structures were constructed as per the approved FHCP design; and

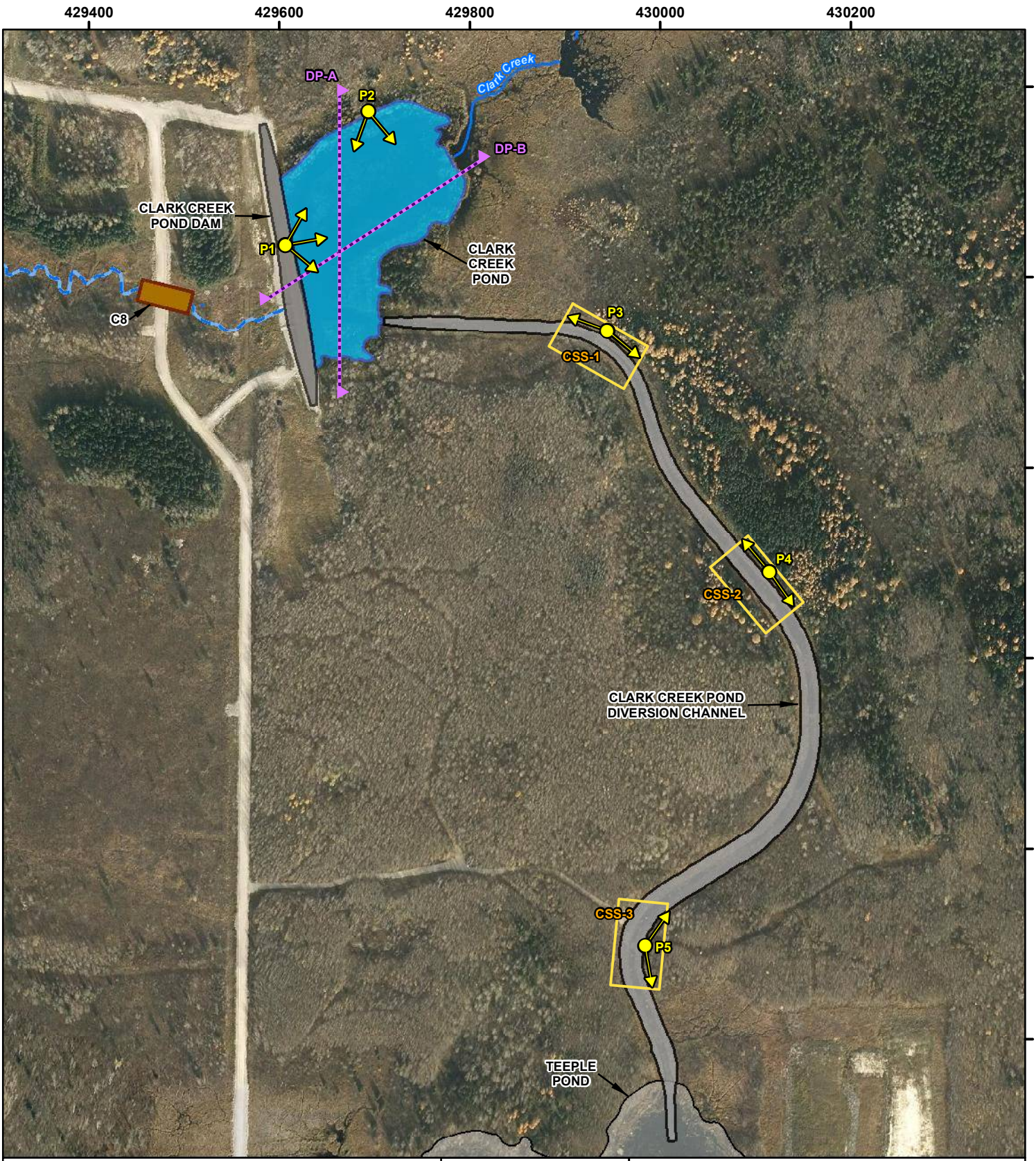
    c. A comparison of the constructed habitat to the approved FHCP to confirm that the area of replacement habitat is equal to or greater than 25.7 hectares (ha).

4. This annual performance monitoring report to show ecological success, including;

    a. Physical function of compensation measures;

    b. Structural stability of compensation measures; and

    c. Fish community metrics including species richness, full life cycle usage of created habitat and standardized fish abundance targets.



P:\EM\Projects\2011\TC111504 Rainy River\GIS\Aquatics\Annual_Monitoring_Report_2018\MXD\Clark_Pond_Monitoring_Locs_2018_1.mxd

LEGEND

- P# — Photo Station
- DP-A — Depth Profiles
- CSS-# — Channel Stability Station/Biological Monitoring
- Clark Creek Pond Extent
- Dam / Diversion Channel
- Teeple Pond
- Culverts (Not to scale)
- Remnant Channel
- Watercourse

0 50 100 200 300 400 500 Metres

NOTES:
- Aerial imagery - Pleiades October 2017.

Datum: NAD83
Projection: UTM Zone 15N

newgold Rainy River Project wood.

RAINY RIVER MINE

Clark Creek Pond and Diversion Channel Monitoring Locations

PROJECT N°: TC111504 | **FIGURE: 2-1**

SCALE: 1:5,500 | DATE: December 2018

422000 423000 424000 425000 426000 427000

5412000 5411000 5410000 5409000

TAILINGS MANAGEMENT AREA DAM
WATER DISCHARGE POND
WEST CREEK DIVERSION CHANNEL
CONSTRUCTED WETLAND
SEDIMENT POND #1
SEDIMENT POND #2
OVERBURDEN STOCKPILE
WEST MINE ROCK STOCKPILE
OVERFLOW DIVERSION STRUCTURE
BOX CULVERT
WEST CREEK POND
WEST CREEK POND DAM
ROEN RD. BOX CULVERT
PROCESS PLANT
STOCKPILE DIVERSION CHANNEL
STOCKPILE POND
STOCKPILE POND DAM
OPEN PIT
LOW GRADE ORE STOCKPILE
MINE ROCK POND
Roen Road
Marr Creek
West Creek
Losb Creek
Pinewood River
Clark Creek
C2 C10 C12 C13 C14 C15 C16
P1 P2 P3 P4 P5 P6 P7 P8 P9 P10 P11 P12 P13 P14
CSS-1 CSS-2 CSS-3 CSS-4 CSS-5 CSS-6 CSS-7 CSS-8
DP-A DP-B

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Aquatics\Annual_Monitoring_Report_2018\MXD\West_Creek_Pond_Monitoring_Locs_1.mxd

LEGEND

- Passive Flow
- Overflow Route
- P# Photo Station
- DP# Depth Profiles
- CSS# Channel Stability Station/Biological Monitoring
- Culverts (Not to scale)
- Diversion Channel
- Dam
- Pond
- Construction Haul Road
- Mine Infrastucture
- Remnant Watercourse
- Existing Watercourse
- Existing Waterbody

0 0.25 0.5 1 1.5 2 Kilometres

NOTES:
- Aerial imagery - Pleiades October 2017.

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold Rainy River Project wood.

RAINY RIVER MINE

Stockpile Pond, West Creek Pond and Diversion Channel Monitoring Locations

PROJECT N°: TC111504 | **FIGURE: 2-2**

SCALE: 1:16,000 | DATE: December 2018

3.0 Criteria to Assess Performance of the Compensation Measures

Implementation and effectiveness of the compensation measures are determined by confirming that Clark Creek Diversion (includes Clark Creek Pond and Diversion Channel) and West Creek Diversion (includes Stockpile Pond, West Creek Pond and associated diversion channels) have been constructed as per the approved FHCP and are functioning as intended using the prescribed monitoring criteria. The FHCP performance monitoring success criteria and corresponding section within this report are presented in Table 3-1.

Table 3-1: Performance Monitoring Success Criteria for Compensation Measures

Attribute	Report / Section	Success Criteria
Physical construction of compensation measures	Compensation Plan for MMER Schedule 2 Amendment Waterbodies As-Constructed Report; submitted December 22, 2017 Summary provided in Section 4.0.	• As-built survey demonstrated that measures were constructed as per the approved FHCP • Area of replacement habitat was equal to or greater than 25.7 ha
Physical function of compensation measures	Section 5.0	• Water levels are consistent with those specified in the design • The outlet channel and pond allow for passage of fish
Stability of structures	Section 6.0	• Constructed habitat features remain in place (log and boulder structures in place) • Shorelines and graded offset features are stable and not eroding (greater than 80% of features are considered stable) • Riparian vegetation cover and plantings achieve 80% coverage of area, and/or survival of planted stock
Species presence	Section 7.0	• Minimum of 9 species of fish are present in each of the two (2) diversion areas (Clark Creek and West Creek Diversion).
Full life cycle usage		• Multiple year classes including young of the year fish are present in the compensation features.

Fish abundance		• Overall Catch per Unit Effort (CPUE) for all species combined, for at least two of following capture methods (electrofishing, Minnow Traps, Seine Nets). Minimum success criteria are:
		  ◦ Minnow Trap CPUE ≥ 2 fish per trap hour
		  ◦ Seine Net CPUE ≥ 16 fish per 15 m net pull
		  ◦ Electrofishing CPUE ≥ 44 fish per 1,000 seconds

4.0 Physical Construction of Compensation Measures

An As-Constructed report for the Schedule 2 Amendment Waterbody Compensation meaures was issued December 22, 2017 (Amec Foster Wheeler 2017b). The As-Constructed report provided the following:

- A summary of upset conditions and contingency responses;
- Comparisons between design parameters and as-constructed conditions of the compensation measures;
- Comparisons between design parameters and as-constructed depths of the compensation measures;
- A summary of deviations from design and recommended monitoring for the compensation measures; and
- Comparisons between design areas and as-constructed habitat areas of the compensation measures.

Comparison of the constructed habitat to the approved plan confirmed the as-constructed compensation measures generally exceeded the design area committed to in the FHCP as follows:

Compensation Measure	Design Area (ha)	Actual Constructed Area (2017)(ha)	Observerved Areas (2018) (ha)
Clark Creek Pond and Diversion Channel	3.86	3.99	maintained
Stockpile Pond and Diversion Channel	5.64	5.67	1.69
West Creek Pond and Diversion Channel	16.08	16.07	maintained
Combined Areas	**25.6**	**25.7**	**21.7**

A total of 25.7 hectares (ha) of replacement habitat was constructed, which is greater than the proposed minimum area of 21.3 ha of compensation measures. The 2017 As-Constructed report demonstrated that the compensation structures (ponds and diversion channels) specified in the FHCP were met, and that the minor deviations from design were not expected to impact the overall success of the Plan.

The 2018 performance monitoring data show Stockpile Pond did not fill as anticipated, and the static pond water level measured during July 2018 field studies was used to calculate an approximate surface area of 16,902 m^2. This lower surface water elevation at the time of pond water depth measurements means Stockpile Pond was providing approximately 30% of the intended replacement habitat specificed in the approved design for Stockpile Pond. The year-one performance monitoring studies observed that the habitat areas provided more than the minimum area specified in the approved FHCP, and the following sections discuss this difference in existing conditions relative to the physical function, structure stability and fish community performance monitoring success criteria.

5.0 Physical Function of Compensation Measures

The surrounding waterbodies and watercourse near the RRM naturally experience periods of low precipitation and dry conditions that can temporarily limit fish passage and physical function of these habitats. The 2018 precipitation records from the Environment and Climate Change Canada (ECCC) Barwick, Ontario climate station and records from the onsite New Gold meteorological station (Barron Site) data were compared to the 1981 to 2010 Canadian climate normals. The recent data confirms 2018, particularly the Barron Site data during the open water period between April and August, was generally drier than the normal values (Figure 5-1). The 2017 ECCC data are also shown, which suggest a recent trend in higher than average amounts of precipitation are occurring in September with drier than average conditions during the summer months. Consequently, these drier conditions have potential implications to the physical function and performance of the compensation measures as discussed below.

The approved FHCP physical function performance monitoring criteria discussed in the following sections include:

- Water depth measurement, water level monitoring and photo documentation of pond conditions; and
- Water depth and velocity measurements in the diversion channels to be collected in pools, flats and riffles during at least one low flow period and one high flow period each year (for 5 years).

5.1 Physical Function of Clark Creek Diversion

The physical function of Clark Creek Diversion performance monitoring results show Clark Creek Pond water levels were maintained as per the approved design throughout the 2018 monitoring period as documented by the water level logger data, manually surveyed water levels, and manually measured water depths throughout the pond. The physical function of Clark Creek Diverion Channel performance monitoring results show channel water levels were maintained per design throughout the spring high flow period and intermittent flow was observed during the low flow period as expected. As such, the Clark Creek Diversion has achieved the physical function success criteria as specified in the approved FHCP, and discussed in further detail below.

5.1.1 Physical Function of Clark Creek Pond

Clark Creek Pond was built to include permanent deeper water refuge pools, log and boulder structures, and highly productive emergent wetland margins with a normal water level of 378.7 metres above sea level (masl). The overwintering and summer refuge habitat were constructed to provide between 1.5 and 2.75 metres (m) of total water depth at static pond water level design elevation. Performance monitoring the physical function of Clark Creek Pond included:

- Photo documentation of pond water levels and stability monitoring stations discussed in Section 7.0 (Appendix A and B, respectively);
- Installation of a Solinst 3001 LT Levelogger Edge, M10 water level logger adjacent to the dam with a direct read cable on June 10, 2017 (Figure 5-2 and Appendix A); and
- Manual water depth measurements of the overwintering and summer refuge habitat during the summer for comparison to design water depths (Table 5-1).

The Clark Creek Pond water level logger pressure sensor data, as well as the manually surveyed water level data shown on Figure 5-2 confirm the pond maintained water levels throughout 2018, with a maximum seasonal fluctuation of 0.39 m during the open water period (April to November).

As specified in the FHCP, water depth measurements of the pond area were conducted once per year during the monitoring period to confirm refuge areas are maintained. The FHCP As-Constructed report (Amec Foster Wheeler 2017b) confirmed refuge areas were established per the design and in-field water depth measurements during the 2018 summer field studies confirmed that these areas maintained appropriate water depths of 1.5 to 2.8 m within the refuge pool and connecting channels (Table 5-1). The Clark Creek Pond as-constructed drawings, showing the maunual depth measurement locations are provided in Appendix C.

5.1.2 Physical Function of Clark Creek Diversion Channel

Clark Creek Diversion Channel high flow performance monitoring was initiated on April 25, 2018 by Wood field staff. The observed high flow conditions show sufficient water depth existed during spring freshet to maintain fish passage between Clark Creek Pond and the diversion channel (Table 5-2). The total depths of riffles ranged between 0.02 and 0.50 m, with measured velocities ranging from 0.004 to 1.313 metres per second (m/s) which is within the sustained swimming speeds for the resident species relative to body size and the short swim distances through the riffle areas with higher velocity (Gervais & Katopodis 2013, Di Rocco 2018). The photograph record provided in Appendix A.2 illustrates water level conditions within the channel during April and July 2018.

The low flow monitoring event on July 24, 2018 was also conducted by Wood field staff. Diversion channel wetted widths, total depths and water velocity in pools, flats and riffles were measured where possible (Table 5-3) throughout the channel stability stations shown on Figure 2-1. The low gradient of Clark Creek Diversion Channel provided pool and flat habitat throughout most of the channel; however, no measureable flow was observed within the channel due to intermitent flow conditions. Total depths ranged from 0.04 to 0.61 m within all habitat types (Table 5-3). Figure 5-1 shows a comparison between the 2017 and 2018 Barwick, Ontario monthly precipitation records to the 1981 to 2010 Canadian climate normal for this area, demonstrating the 2018 period of record was drier than 2017 and both years were drier than the normal values. Fish were found in all sampled channel habitats, demonstrating the fish are passing through the channel and connectivity is maintained with Teeple Pond downstream even between periods when the outlet of Clark Creek Pond is not actively flowing.

5.2 Physical Function of West Creek Diversion

The West Creek Diversion achieved the physical function success criteria as specified in the approved FHCP for West Creek Pond and Diversion Channel. Stockpile Pond did not function as intended, with the static water level elevation approximately 2.8 m less than the design thereby providing approximately 30% of the replacement habitat specified in the design. The low pond water level meant the section of Stockpile Diversion Channel between the pond outlet and West Creek Tributary 2 did not receive outflow water in 2018. Consequently, Stockpile Pond and Stockpile Diversion Channel did not achieve the physical area success criteria as discussed in further detail below.

5.2.1 Physical Function of Stockpile Pond

Stockpile Pond was built to include permanent deeper water refuge pools, log and boulder structures, and highly productive emergent wetland margins with a normal water level of 372.3 masl. The overwintering

and summer refuge habitat were constructed to provide between 2.0 and 6.3 m of total water depth at static pond water level design elevation. Monitoring the physical function of Stockpile Pond included:

- Photo documentation of pond water levels and stability monitoring stations discussed in Section 7.0 (Appendix A and B, respectively);
- Installation of a Solinst 3001 LT Levelogger Edge, M10 water level logger adjacent to the diversion channel, opposite the dam in dry conditions, with a direct read cable on June 15, 2017 (Figure 5-3 and Appendix A); and
- Manual water depth measurements of the overwintering and summer refuge habitat during the summer for comparison to design water depths (Table 6-4).

The Stockpile Pond water level logger pressure sensor data on Figure 5-3 show the water level increased during spring freshet conditions and the transducer was submerged from approximately March 21 to July 25, 2018. The most recent peak in water level occured on approximately May 25, 2018, afterwhich water levels steadily decreased until the transducer was above the water level on July 25, 2018. The period of record between July 25 and November 28, 2018 indicates water levels were below the transducer and Stockpile Pond was not maintaining a normal water level per the approved design.

As specified in the approved FHCP, water depth measurements of the pond area were conducted on July 29, 2018, even though water levels were below design elevation. The in-field water depth measurements of refuge areas showed water depths of 0.20 to 3.2 m where depths should have ranged from 3.2 to 5.2 m per the design (Table 5-4). The Stockpile Pond as-constructed drawings, showing the manual depth measurement locations are provided in Appendix C.

Despite the reduced aerial extent and maximum depth of the stockpile pond diversion habitat, the function of the measure is still largely effective at providing a permanent habitat for small bodied fish. The observed maximum depth of 3.2 m is more than sufficient to provide overwintering refuge areas for all resident fish species.

5.2.2 Physical Function of Stockpile Diversion Channel

Stockpile Diversion Channel high flow performance monitoring was initiated on April 25, 2018 by Wood field staff. The survey documented that water from Stockpile Pond was not flowing through the channel; however, water from the West Creek Tributary 2 stream provided constant flow during the high flow monitoring event. Consequently, the section of diversion channel between the pond outlet and the confluence with West Creek Tributary 2 did not receive flow during the 2018 season other than surface runoff during periods of precipitation. As discussed above, 2018 was a drier than average year, and additional years monitoring will confirm whether this channel segment is periodically flowing and as such hydraulically connected to the downstream habitats.

High flow monitoring was conducted between the West Creek Tributary 2 inflow and the outlet to West Creek Pond near the Roen Road box culverts. The pool and flat habitats contained total depths of up to 0.57 m with velocities ranging from 0 to 0.422 m/s. The total depths of riffles ranged between 0.04 and 0.14 m, with velocities ranging between 0.179 to 0.833 m/s (Table 5-5). These velocities are within the sustained swimming speeds for the resident species relative to body size and the short swim distances through the riffle areas with higher velocity (Gervais & Katopodis 2013, Di Rocco 2018). The photograph record provided in Appendix A.3 illustrates water level conditions within the channel during April and July 2018.

The low flow monitoring event on July 24, 2018 documented water from Stockpile Pond was not flowing through the channel due to low pond water level elevation and there was no flow contribution from West Creek Tributary 2. Consequently, the diversion channel performance monitoring was conducted within areas of the channel between the Roen Road box culverts crossing and upstream confluence with the West Creek Tributary 2 where possible (Table 5-8) throughout the pre-determined channel stability stations shown on Figure 2-2. Diversion channel reaches with flat and pool morphology maintained sufficient water depth to provide fish habitat; however, the riffle areas were mostly dry (Table 5-6). The dry conditions are natural to the system during periods of intermittency, and 2018 represented drier than average conditions. Fish were found in the isolated pools, thereby demonstrating fish are passing through the channel during periods of flow. This was further substantiated by observations from New Gold and Wood site staff in early May 2018 that confirmed White Sucker (*Catostomus commersonii*) were staging to spawn and congregating at the Roen Road box culverts in the lower reaches of the diversion channel.

5.2.3 Physical Function of West Creek Pond

West Creek Pond was built to include permanent deeper water refuge pools, log and boulder structures, and highly productive emergent wetland margins with a normal water level of 361.0 masl. The overwintering and summer refuge habitat were constructed to provide between 1.5 and 4.0 m of total water depth at static pond water level design elevation. Monitoring the physical function of West Creek Pond included:

- Photo documentation of pond water levels and stability monitoring stations discussed in Section 7.0 (Appendix A and B, respectively);
- Installation of a Solinst 3001 LT Levelogger Edge, M10 water level logger adjacent to the dam, near the outlet spillway, with a direct read cable on April 26, 2018 (Figure 5-2 and Appendix A); and
- Manual water depth measurements of the overwintering and summer refuge habitat during the summer for comparison to design water depths (Table 5-7).

The West Creek Pond water level logger pressure sensor data, as well as the manually surveyed water level data shown on Figure 5-4 confirm the pond maintained water levels throughout 2018, with a maximum seasonal fluctuation of 0.24 m during the open water period (April to November).

As specified in the approved FHCP, water depth measurements of the pond area were conducted once per year during the monitoring period to confirm refuge areas are maintained. The FHCP as-constructed report (Amec Foster Wheeler 2017b) confirmed refuge areas were established per the design and in-field water depth measurements during the 2018 summer field studies confirmed that these areas maintained appropriate water depths of 1.0 to 4.6 m within the refuge pool and connecting channels (Table 5-1). The West Creek Pond as-constructed drawings are provided in Appendix C.

5.2.4 Physical Function of West Creek Diversion Channel

West Creek Diversion Channel high flow performance monitoring was initiated on April 24, 2018 by Wood field staff. The observed high flow conditions show sufficient water depth existed during spring freshet to maintain fish passage between West Creek Pond, the diversion channel and Loslo Creek (Table 5-8). The total depths of riffles ranged between 0.06 and 0.41 m, with velocities ranging between 0.043 to 0.959 m/s (Table 5-8). These measured velocities are within the sustained swimming speeds for the resident species relative to body size and the short swim distances through the riffle areas with higher velocity (Gervais & Katopodis 2013, Di Rocco 2018). The photograph record provided in Appendix A.4 illustrates water level conditions within the channel during April, May and July 2018.

The low flow monitoring event on July 24, 2018 was also conducted by Wood field staff. Diversion channel wetted widths, total depths and water velocity in pools, flats and riffles were measured where possible (Table 5-9) throughout the pre-determined channel stability stations shown on Figure 2-2. No measureable flow was observed within the channel due to intermitent flow conditions. Total depths ranged from 0.02 to 1.2 m within all habitat types, and station CSS-5 near the outlet of West Creek Pond was dry. Figure 5-1 shows a comparison between the 2017 and 2018 Barwick, Ontario monthly precipitation records to the 1981 to 2010 Canadian climate normal for this area, demonstrating the 2018 period of record was drier than 2017 and both years were drier than the normal values.

Fish were found in all sampled channel habitats, further demonstrating the fish are passing through the channel and connectivity is maintained between West Creek Pond and Loslo Creek. This was further substantiated by observations from New Gold and Wood site staff in early May 2018 that confirmed White Sucker were staging to spawn and congregating in the channel reaches between stations CSS-1 and CSS-3 (Appendix A.4; Plate A.4-5).

5.3 Physical Function Monitoring Recommendations

The following recommendations are provided to improve physical function monitoring of the compensation measures:

- Investigate loss of water within Stockpile Pond as this measure will not meet the physical function success criteria until the pond contains normal water levels per the design and pond outflow activates the reach of Stockpile Diversion Channel between the pond outlet and confluence with West Creek Tributary 2.

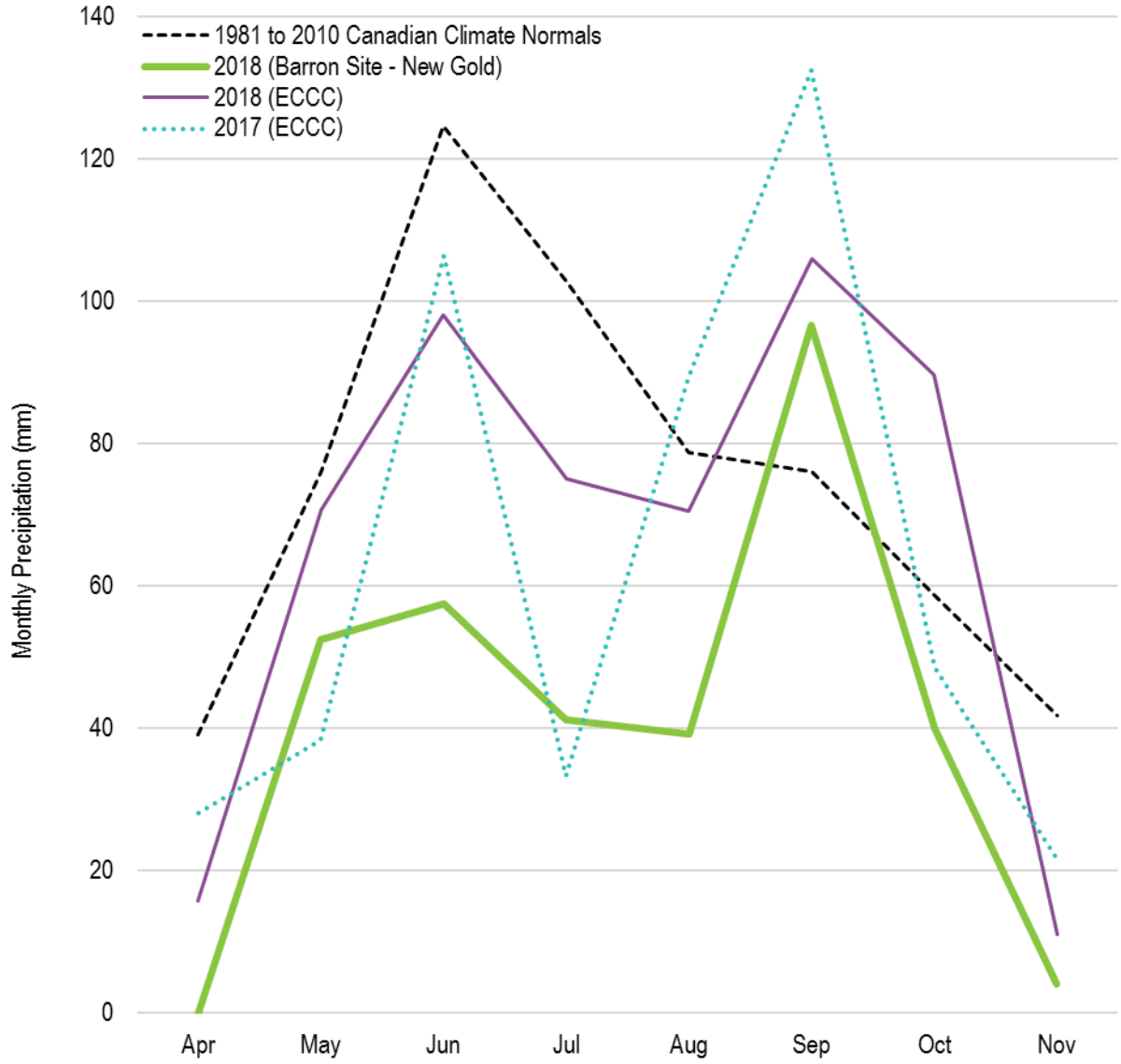


Figure 5-1: Monthly Precipitation Record

Notes:

1. Environment and Climate Change Canada, Barwick Climate Station ID 6020559 monthly precipitation records for 2017, 2018 and the 1981 to 2010 Canadian Climate Normals shown to demonstrate 2017 and 2018 were generally drier than average during the open water period (April to November).
2. Barron Site precipitation data provided by New Gold.

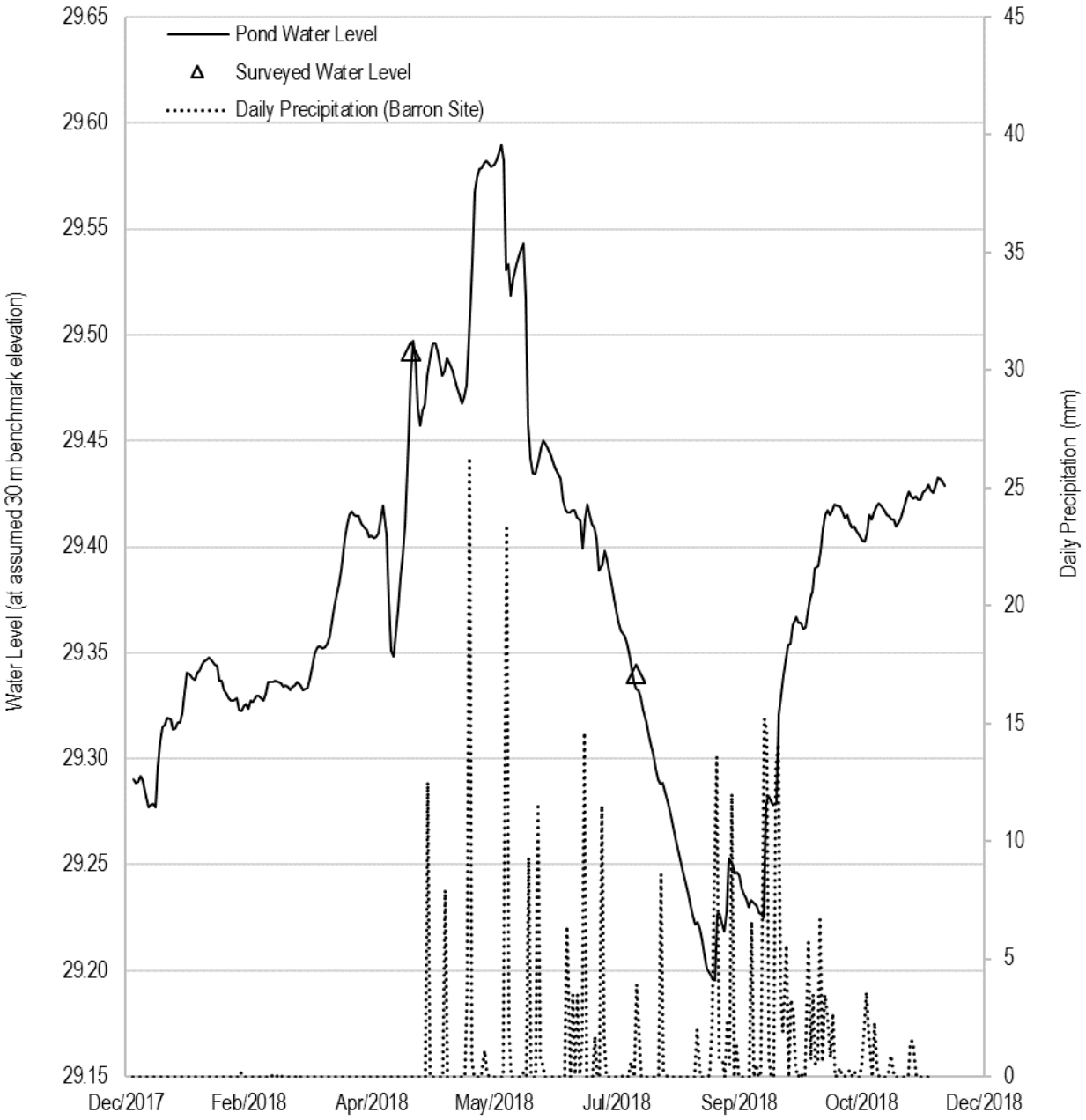


Figure 5-2: Clark Creek Pond Water Level and Survey Data

Notes:

1. Daily precipitation data from Barron Site provided by New Gold.

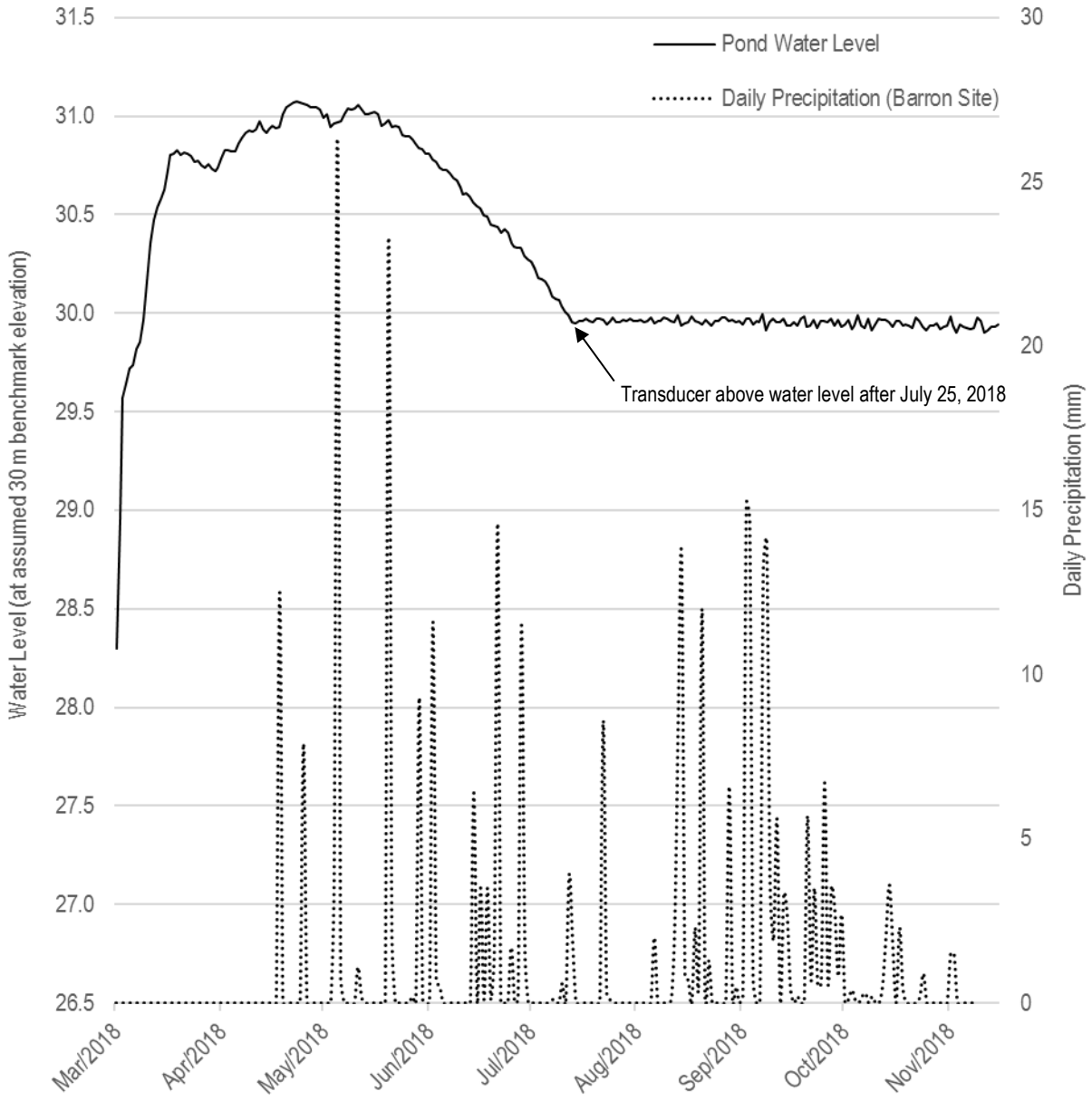


Figure 5-3: Stockpile Pond Water Level Data

Notes:

1. Stockpile Pond water level logger transducer was submerged from approximately March 21 to July 25, 2018.
2. The transducer was above the pond water level after July 25, 2018 as shown by the static level data to the end of this period of record (November 28, 2018).
3. Daily precipitation data from Barron Site provided by New Gold.

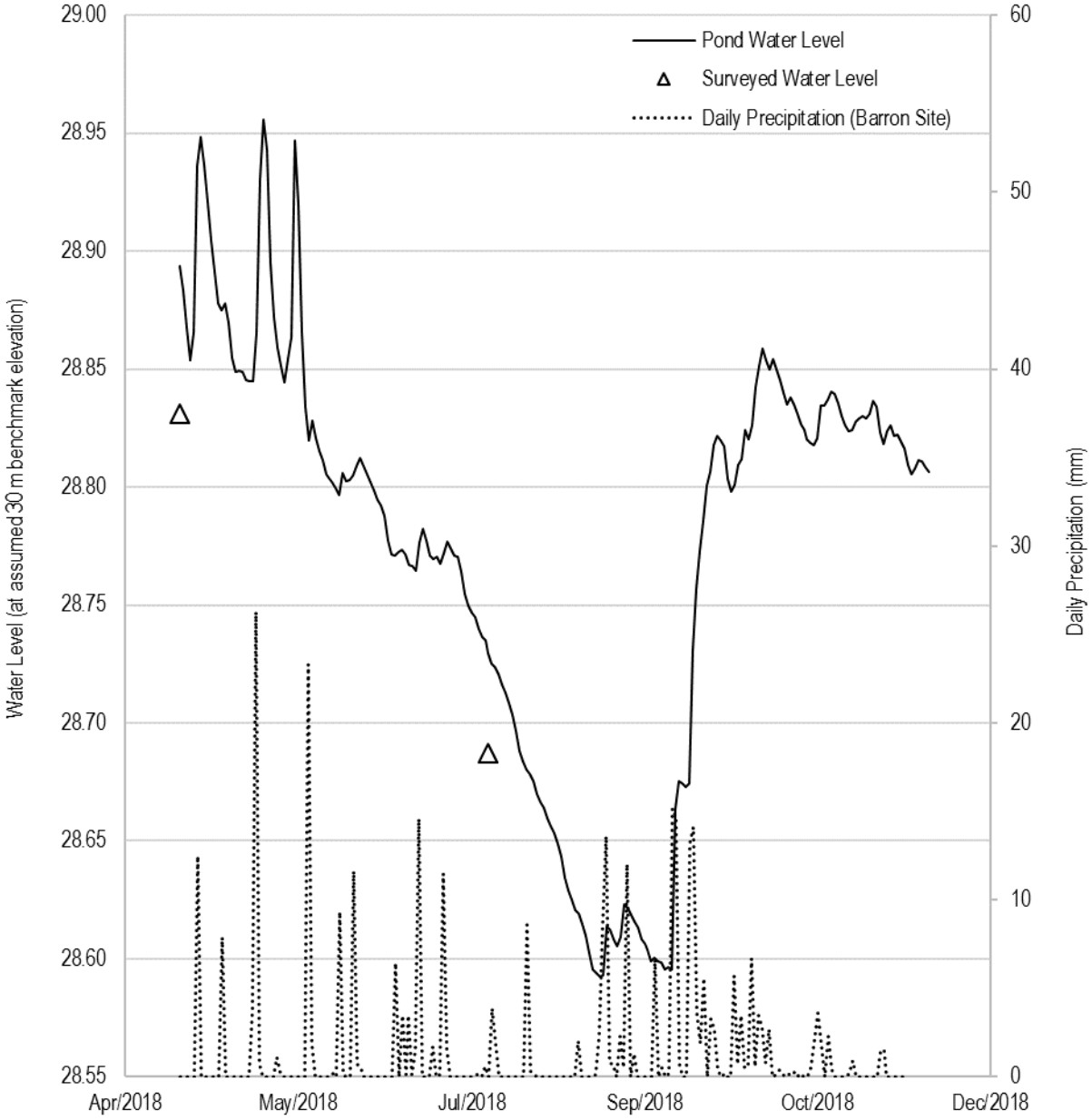


Figure 5-4: West Creek Pond Water Level and Survey Data

Notes:

1. West Creek Pond water level logger installed April 26, 2018.
2. Daily precipitation data from Barron Site provided by New Gold.

Table 5-1: Clark Creek Pond 2018 Water Depth Measurement Summary

Location No.	Design Water Depth (m)	Total Water Depth (m)	UTM Easting (m)	UTM Northing (m)
DP-A-01	0.71	0.83	429640	5410122
DP-A-02	0.68	0.91	429641	5410098
DP-A-03	0.64	1.06	429641	5410067
DP-A-04	0.89	1.67	429644	5410050
DP-A-05	2.34	2.80	429648	5410039
DP-A-06	2.71	2.80	429649	5410030
DP-A-07	2.64	2.50	429646	5410023
DP-A-08	1.65	1.60	429648	5410006
DP-A-09	1.10	1.48	429656	5409985
DP-A-10	0.77	1.00	429662	5409972
DP-A-11	1.63	1.75	429665	5409961
DP-A-12	0.36	0.66	429663	5409942
DP-B-01	1.74	2.00	429634	5409988
DP-B-02	1.69	1.60	429646	5410003
DP-B-03	1.70	2.10	429656	5410016
DP-B-04	2.26	2.10	429673	5410028
DP-B-05	1.46	1.50	429700	5410040
DP-B-06	1.35	1.40	429722	5410051
DP-B-07	1.17	0.95	429739	5410061
DP-B-08	0.60	0.90	429757	5410070
DP-B-09	0.49	1.20	429774	5410075

Notes:

1. Data collected July 28, 2018 by Wood field staff
2. UTM – Universal Transverse Mercator, Zone 15U, NAD 83
3. Locations accurate to approximately 3 metres, design water depth ranges provided per relative sample location within design drawings
4. Appendix C includes as-built conditions of Clark Creek Pond for reference.

Table 5-2: Clark Creek Diversion Channel 2018 High Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-1-1	Pool	14.5	0.17	0.4	0.18	0.005	0.2	0.049	
CSS-1-2	Flat	3.95	0.42	0.44	0.36	0.079	0.224	0.039	
CSS-1-3	Riffle	1.3	0.08	0.028	0.016	0.325	1.313	0.312	Turbulent centre
CSS-1-4	Flat	9.1	0.22	0.24	0.35	0.027	0.144	0.015	
CSS-2-1	Pool	13.5	0.62	0.74	0.8	0.007	0.005	0.022	
CSS-2-2	Flat	11.35	0.31	0.38	0.28	0.022	0.044	0.038	
CSS-2-3	Pool	8.3	0.45	0.5	0.53	0.021	0.048	0.021	
CSS-2-4	Riffle	6.55	0.18	0.3	0.14	0.147	0.153	0.031	
CSS-3-1	Pool	8.8	0.61	0.69	0.73	0.037	0.013	0.034	
CSS-3-2	Riffle	9.5	0.38	0.5	0.34	0.02	0.056	0.018	
CSS-3-3	Pool	6.75	0.64	0.81	0.64	0.004	0.077	0.023	
CSS-3-4	Flat	7.5	0.32	0.39	0.28	0.061	0.062	0.048	

Notes:
1. Data collected April 25, 2018 by Wood field staff
2. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter

Table 5-3: Clark Creek Diversion Channel 2018 Low Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-1-1	Riffle	2.6	0.11	0.14	0.08	0	0	0	No measurable flow
CSS-1-2	Flat	7.8	0.11	0.11	0.10	0	0	0	
CSS-1-3	Flat	2.4	0.08	0.16	0.1	0	0	0	
CSS-2-1	Pool	13.6	0.61	0.53	0.27	0	0	0	
CSS-2-2	Riffle	9.5	0.10	0.22	0.14	0	0	0	
CSS-2-3	Pool	10.1	0.39	0.31	0.25	0	0	0	
CSS-3-1	Pool	6.6	0.38	0.40	0.33	0	0	0	
CSS-3-2	Riffle	5.1	0.04	0.18	0.08	0	0	0	
CSS-3-3	Pool	7.0	0.35	0.49	0.50	0	0	0	

Notes:
1. Data collected July 24, 2018 by Wood field staff
2. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter

Table 5-4: Stockpile Pond 2018 Water Depth Measurement Summary

Location No.	Design Water Depth (m)	Total Water Depth (m)	UTM Easting (m)	UTM Northing (m)	Comments
DP-A-01	3.6	0.82	427001	5410721	
DP-A-02	3.7	0.9	427009	5410728	
DP-A-03	3.8	1.56	427017	5410741	
DP-A-04	4.6	3.2	427028	5410751	
DP-A-05	4.4	3.1	427044	5410755	
DP-A-06	5.0	2.1	427064	5410755	
DP-A-07	4.9	1.7	427076	5410753	
DP-A-08	4.6	1.1	427102	5410760	
DP-A-09	5.2	1.9	427120	5410771	
DP-A-10	3.8	0.8	427140	5410784	
DP-A-11	3.6	0	427155	5410792	Beaver dam
DP-A-12	3.9	0.7	427163	5410796	
DP-A-13	3.6	0.4	427186	5410796	
DP-A-14	3.3	0.3	427195	5410805	
DP-A-15	3.3	0.2	427210	5410812	
DP-A-16	3.4	0.59	427219	5410817	
DP-A-17	3.6	0.6	427229	5410821	
DP-B-01	4.0	1.6	427163	5410789	
DP-B-02	4.0	1.2	427162	5410798	
DP-B-03	4.0	1.1	427156	5410808	
DP-B-04	3.7	0.7	427153	5410817	
DP-B-05	3.2	0.4	427152	5410824	

Notes:

1. Data collected July 29, 2018 by Wood field staff
2. UTM – Universal Transverse Mercator, Zone 15U, NAD 83
3. Locations accurate to approximately 3 metres, design water depth ranges provided per relative sample location within design drawings
4. Appendix C includes as-built conditions of Stockpile Pond for reference.

Table 5-5: Stockpile Diversion Channel 2018 High Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-6-1	Riffle	1	0.04	0.08	0.08	0.483	0.711	0.466	
CSS-6-2	Pool	2.35	0.4	0.48	0.32	-0.05	0.028	0.212	Main flow at right
CSS-6-3	Run	1.5	0.24	0.12	0.14	0.004	0.422	0.019	
CSS-6-4	Riffle	0.75	0.06	0.08	0.05	0.573	0.672	0.275	
CSS-6-5	Pool	1.95	0.54	0.57	0.31	0.132	0.053	0.007	
CSS-6-6	Run	2.25	0.18	0.27	0.2	0.021	0.104	0.06	
CSS-7-1	Run	2.3	0.18	0.19	0.17	0.017	0.112	0.061	
CSS-7-2	Riffle	0.76	0.04	0.08	0.06	0.34	0.593	0.332	
CSS-7-3	Run	1.7	0.22	0.3	0.18	0.008	0.132	0.055	
CSS-7-4	Pool	2.5	0.4	0.56	0.53	0.001	0.071	0.076	
CSS-7-5	Riffle	0.7	0.06	0.07	0.04	0.833	0.698	0.228	
CSS-7-6	Pool	1.9	0.4	0.44	0.31	0.044	0.026	0.033	
CSS-7-7	Riffle	0.8	0.11	0.14	0.09	0.179	0.556	0.564	
CSS-8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Dry conditions

Notes:
1. Data collected April 24, 2018 by Wood field staff
2. N/A – value not able to be recorded
3. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter

Table 5-6: Stockpile Diversion Channel 2018 Low Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-6-1	Pool	3.7	0.86	0.76	0.81	0	0	0	No measurable flow
CSS-6-2	Riffle	2.4	0.26	0.35	0.28	0	0	0	
CSS-6-3	Run	2.95	0.62	0.51	0.54	0	0	0	
CSS-7	Pool	5.05	0.27	0.24	0.18	0	0	0	
CSS-8	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Dry conditions

Notes:
1. Data collected July 24, 2018 by Wood field staff
2. N/A – value not able to be recorded
3. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter

Table 5-7: West Creek Pond 2018 Water Depth Measurement Summary

Location No.	Design Water Depth (m)	Total Water Depth (m)	UTM Easting (m)	UTM Northing (m)	Comments
DP-A-01	0.8	0.7	425741	5411118	Near dam
DP-A-01	2.1	1.3	425761	5411118	
DP-B-01	1.0	1.0	425858	5411236	WCP diversion outlet
DP-B-02	2.2	2.1	425866	5411218	
DP-B-03	1.7	0.9	425885	5411201	
DP-B-04	1.4	1.6	425901	5411183	
DP-B-05	3.1	3.3	425934	5411164	
DP-B-06	3.4	4.6	425950	5411153	Mid-pond refuge
DP-B-07	3.5	3.2	425962	5411138	
DP-B-08	1.3	1.0	425991	5411121	
DP-B-09	0.7	0.3	426007	5411107	SE bank
DP-B-10	0.9	1.8	426121	5411397	Stockpile diversion outlet
DP-B-11	0.7	1.2	426087	5411352	
DP-B-12	1.2	1.9	426067	5411339	
DP-B-13	1.9	2.6	426034	5411296	
DP-B-14	2.1	2.4	426013	5411272	
DP-B-15	2.5	2.2	425999	5411201	
DP-B-16	2.5	2.1	425989	5411181	
DP-B-17	2.8	2.8	425976	5411168	
DP-B-18	3.2	3.2	425936	5411136	
DP-B-19	2.9	3.0	425919	5411125	
DP-B-20	3.9	4.0	425899	5411120	
DP-B-21	3.9	3.8	425880	5411116	
DP-B-22	4.0	4.5	425861	5411114	Deep area closer to dam
DP-B-23	3.6	4.2	425837	5411113	
DP-B-24	4.3	4.0	425813	5411114	
DP-B-25	3.9	4.0	425791	5411117	
DP-B-26	2.8	2.4	425772	5411120	
DP-B-27	1.6	1.4	425755	5411117	
DP-B-28	0.8	0.8	425737	5411120	At dam

Notes:

1. Data collected July 29, 2018 by Wood field staff
2. UTM – Universal Transverse Mercator, Zone 15U, NAD 83
3. Locations accurate to approximately 3 metres, design water depth ranges provided per relative sample location within design drawings
4. Appendix C includes as-built conditions of West Creek Pond for reference.

Table 5-8: West Creek Diversion Channel 2018 High Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-1-1	Riffle	5.95	0.14	0.36	0.2	0.175	0.2	0.201	
CSS-1-2	Riffle	5.4	0.19	0.37	0.31	0.068	0.251	0.043	
CSS-1-3	Run	5.6	0.64	0.56	0.46	0.195	0.29	0.102	
CSS-1-4	Pool	6.15	0.37	0.52	0.42	0.003	0.257	0.105	
CSS-1-5	Run	5.4	0.48	0.5	0.55	0.12	0.319	0.268	
CSS-1-6	Pool	7.3	0.42	0.66	0.42	0.107	0.173	0.08	
CSS-2-1	Riffle	2.8	0.12	0.25	0.13	0.675	0.6663	0.288	
CSS-2-2	Run	3.1	0.24	0.47	0.28	0.129	0.227	0.03	
CSS-2-3	Pool	3.33	0.3	0.71	0.42	0.02	0.261	0.047	
CSS-2-4	Run	3.2	0.31	0.38	0.35	0.109	1.121	-0.066	Centre turbulent
CSS-2-5	Riffle	2.15	0.16	0.26	0.14	0.66	0.959	0.754	
CSS-2-6	Pool	4.05	0.36	0.64	0.32	0.133	0.185	0.062	
CSS-3-1	Riffle	7.1	0.36	0.41	0.3	0.093	0.134	0.1	
CSS-3-2	Run	6	0.46	0.81	0.52	0.02	0.05	0.05	
CSS-3-3	Pool	5.9	0.35	0.59	0.41	0.02	0.085	0.016	
CSS-3-4	Riffle	6.5	0.22	0.32	0.22	0.151	0.05	0.326	
CSS-4-1	Run	2.8	0.24	0.32	0.2	0.278	0.288	0.194	
CSS-4-2	Pool	3.4	0.39	0.6	0.36	0.018	0.244	0.108	
CSS-4-3	Riffle	1.7	0.12	0.2	0.08	0.277	0.66	0.503	
CSS-4-4	Run	2.45	0.2	0.3	0.3	0.355	0.29	0.179	
CSS-4-5	Pool	3.6	0.33	0.35	0.22	0.081	0.202	-0.018	
CSS-4-6	Riffle	1.7	0.06	0.15	0.1	0.656	0.833	0.675	
CSS-5-1	Riffle	5.75	0.08	0.27	0.06	0.143	0.417	0.062	
CSS-5-2	Run	5.7	0.2	0.14	0.66	0.056	0.085	0.149	Deep channel at right
CSS-5-3	Run	6.3	0.12	0.36	0.11	0.24	0.405	0.015	
CSS-5-4	Pool	7.34	0.17	0.7	0.34	0.157	0.018	0	
CSS-5-5	Riffle	5.6	0.13	0.24	0.16	0.393	0.614	0.53	
CSS-5-6	Pool	3.5	0.6	0.74	0.47	0.109	0.184	0.114	

Notes:

1. Data collected April 24, 2018 by Wood field staff
2. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter

Table 5-9: West Creek Diversion Channel 2018 Low Flow Stability Monitoring Summary

Channel Stability Station ID	Morphology	Wetted Width (m)	Total Depth (m)			Velocity (m/s)			Comments
			Left	Centre	Right	Left	Centre	Right	
CSS-1-3	Run	2.37	0.13	0.14	0.05	0	0	0	No measurable flow
CSS-2-1	Riffle	0.82	0.04	0.03	0.02	0	0	0	
CSS-2-2	Run	0.96	0.105	0.09	0.08	0	0	0	
CSS-2-3	Pool	2.48	0.29	0.2	0.165	0	0	0	
CSS-3-2	Run	4.35	0.25	0.49	0.29	0	0	0	
CSS-3-3	Pool	7.9	0.9	1.2	0.76	0	0	0	
CSS-4	Pool	5.45	0.645	0.88	0.79	0	0	0	

Notes:
1. Data collected July 24, 2018 by Wood field staff
2. Velocity measurements collected using a Marsh McBirney FloMate Model 2000 portable velocity meter

6.0 Stability of Structures

Performance monitoring of the sturcture stability included a dedicated site assessment between July 24 and 29, 2018, as well as opportunistic observations throughout the year by on site staff to document vegetation cover and plantings, repair activities and general condition as able. Observations of the compensation measures stability were conducted during the low flow monitoring period as this timing provided the best visibility to assess whether the constructed features were in place and functional. Photo vantage points were established along the perimeter of the ponds and along the diversion channels to document stability of these features at consistent locations (Appendix B).

6.1 Clark Creek Diversion

All of the Clark Creek Diversion constructed habitat features were observed to remain in place and more than 80% of shorelines and graded offset features are considered stable. Riparian vegetation and cover plantings have achieved more than 80% coverage. As such, the compensation measures have achieved the stability of structures success criteria specified in the approved FHCP as discussed in detail below.

6.1.1 Clark Creek Pond

Photo stations P1 and P2 were established to document the nearshore areas and open-water habitat of Clark Creek Pond (Figure 2-1). Appendix B (Plates B.1-1 and B.1-2) provides photographs of these stations and the constructed habitat features during high and low flow monitoring events to show changes in water level and vegetation cover.

The shoreline, as well as the observed constructed habitat features (tree piles and boulder clusters) appeared (where visible) to remain in place as identified in the As-Constructed report. Most boulder clusters and some tree piles were submerged, with one exposed boulder pile near the southern region of the pond and three emergent tree piles positioned near the southern, northern and eastern extents of the pond. The nearshore partly exposed tree piles are meant to provide subsurface fish habitat, as well as perching areas for avian wildlife and basking structures suitable for turtles and other herptiles. All observed shorelines and graded offset features were stable and not eroding, thereby meeting the success criteria of greater than 80% of features are considered stable. Riparian vegetation was well established at most areas surrounding Clark Creek Pond, with no areas of concern identified. Overall, these areas have greater than 90% vegetation cover, which meet the success criteria of greater than 80% coverage identified within the approved FHCP.

6.1.2 Clark Creek Diversion Channel

Photo stations P3, P4 and P5 and channel stability stations CSS-1, CSS-2 and CSS-3 were established to document stability of the Clark Creek Diversion Channel (Figure 2-1). Appendix B (Plates B.1-3 to B.1-5) provides photographs of these stations and the constructed habitat features during high and low flow monitoring events to show changes in water level and vegetation cover.

The shallow conditions observed during the low flow monitoring event are considered typical during periods of intermittency, and 2018 represented drier than average conditions (Figure 6-1). Due to the low gradient design, much of the Clark Creek Diversion Channel contained water in pool and flat morphology, despite drier than average conditions. The rock riffle in CSS-1 was dry at the time of observation on July 24, 2018. This feature had less than 0.01 m water depth at the time of assessment, thereby posing a potential barrier to fish passage during extended periods of low precipitation and limited or no outflow

from Clark Creek Pond. Additionally, beaver activity was observed directly upstream of the rock riffle in CSS-1, which posed a partial fish barrier to fish. Beaver dams are natural components of the creak system and regularly result in partial obstructions to fish movement. No evidence of erosion was observed within the diversion channel, meaning the channel has met the success criteria and that greater than 80% of the channel is considered stable. Riparian vegetation was well established at most areas along the Clark Creek Diversion Channel, with no areas of concern identified. Overall, the diversion channel has greater than 90% vegetation cover, which meet the success criteria of greater than 80% coverage identified within the approved FHCP.

6.2 West Creek Diversion

The West Creek Diversion compensation measures have achieved the stability of structures success criteria specified in the approved FHCP. Even though Stockpile Pond has not filled with water to the design water level, and a section of the Stockpile Diversion Channel does not receive outflow from the pond, the constructed habitat features are in place, more than 80% of shorelines and graded offset features are considered stable and riparian vegetation and cover plantings have more than 80% coverage. Future performance monitoring activites will confirm continued stability of these stuctures. The following sections provide further details regarding the stability of each West Creek Diversion compensation measure.

6.2.1 Stockpile Pond

Photo station P14 was established to document the nearshore areas and open-water habitat of Stockpile Pond (Figure 2-2). Appendix B (Plates B.2-5 and B.2-6) provides photographs of this station and the constructed habitat features during high and low flow monitoring events to show changes in water level and vegetation cover.

The shoreline, as well as the observed constructed habitat features (tree piles and boulder clusters) appeared to remain in place as identified in the As-Constructed report. Many of the boulder clusters and tree piles were exposed, due to low water level elevation within the pond during the July 2018 monitoring event. All observed shorelines and graded offset features were stable and not eroding, thereby meeting the success criteria of greater than 80% of features are considered stable. Riparian vegetation was well established at most areas surrounding Stockpile Pond, with no areas of concern identified. Overall, these areas have greater than 90% vegetation cover, which meet the success criteria of greater than 80% coverage identified within the approved FHCP.

6.2.2 Stockpile Diversion Channel

Photo stations P11, P12 and P13 and channel stability stations CSS-6, CSS-7 and CSS-8 were established to document stability of the diversion channel (Figure 2-2). Appendix B (Plates B.2-1 to B.2-4) provides photographs of these stations and the constructed habitat features during high and low flow monitoring events to show changes in water level and vegetation cover.

The shallow conditions observed during the low flow monitoring event are considered typical during periods of intermittency, and 2018 represented drier than average conditions (Figure 6-1). Due to the lack of outflow from Stockpile Pond or West Creek Tributary 2 inflow, much of the Stockpile Diversion Channel was dry during the low flow monitoring event. Consequently, only isolated pools and flat sections contained water. Some evidence of localized erosion was observed within the diversion channel but overall the channel has met the success criteria and that greater than 80% of the channel is considered

stable. Riparian vegetation was well established at most areas along the Stockpile Diversion Channel, some spares areas noted near the CSS-7 station. Overall, the diversion channel has greater than 80% vegetation cover, which achieves the success criteria identified within the approved FHCP.

6.2.3 West Creek Pond

Photo stations P8, P9 and P10 were established to document the nearshore areas and open-water habitat of West Creek Pond (Figure 2-2). Appendix B (Plates B.3-10 and B.3-12) provides photographs of these stations and the constructed habitat features during high and low flow monitoring events to show changes in water level and vegetation cover.

The shoreline, as well as the observed constructed habitat features (tree piles and boulder clusters) appeared (where visible) to remain in place as identified in the As-Constructed report. Most boulder clusters and some tree piles were submerged. The exposed tree piles are meant to provide subsurface fish habitat, as well as perching areas for avian wildlife and basking structures suitable for turtles and other herptiles. All observed shorelines and graded offset features were stable and not eroding, thereby meeting the success criteria of greater than 80% of features are considered stable. Riparian vegetation was well established at most areas surrounding West Creek Pond, with no areas of concern identified. Overall, these areas have greater than 90% vegetation cover, which meet the success criteria of greater than 80% coverage identified within the approved FHCP.

6.2.4 West Creek Diversion Channel

Photo stations P1 to P7 and channel stability stations CSS-1 to CSS-5 were established to document stability of the West Creek Diversion Channel (Figure 2-2). Appendix B (Plates B.3-1 to B.3-9) provide photographs of these stations and the constructed habitat features during high and low flow monitoring events to show changes in water level and vegetation cover.

The shallow conditions observed during the low flow monitoring event are considered typical during periods of intermittency, and 2018 represented drier than average conditions (Figure 6-1). Due to the lack of outflow from West Creek Pond, the upper reaches of West Creek Diversion Channel were dry during the low flow monitoring event. The mid and lower reaches contained water in all habitat types, but no measurable flow. No evidence of erosion was observed within the diversion channel, meaning the channel has met the success criteria and that greater than 80% of the channel is considered stable. Riparian vegetation was well established at most areas along the West Creek Diversion Channel, with no areas of concern identified. Overall, the diversion channel has greater than 90% vegetation cover, which meet the success criteria of greater than 80% coverage identified within the approved FHCP.

6.3 Structure Stability Monitoring Recommendations

The Clark Creek and West Creek Diversions are meeting or are on track to achieve the performance monitoring success criteria. The year-two performance monitoring studies will assess Stockpile Pond and additional measures may be taken if required to increase water levels.

7.0 Fish Community Metrics

The year-one fish community performance monitoring results show the physical habitat supports all life history stages for the fish species present. These results indicate that the compensation measures are progressing as expected for achieving all success criteria by year-five of the monitoring program.

Fish community sampling was conducted during July 2018, using non-lethal fish collection methods including; minnow traps, seine net and a backpack electrofishing as specified in the approved FHCP. Sampling efforts met or exceeded the minimum gear-specific requirements as specified in Table 7 of the approved FHCP performance monitoring criteria for pond and diversion channel habitats (New Gold 2017). These sampling activities documented species presence, relative abundance and confirmed presence of multiple fish life stages for some species. Fish community results are discussed below for each compensation measure habitat type. The detailed gear-specific results and comparison of year-one Clark Creek, Stockpile and West Creek ponds and diversion channel performance monitoring results to the approved FHCP success criteria are discussed below.

7.1 Clark Creek Diversion

The Clark Creek Diversion fish community results show multiple year classes of several species were present, a total of seven fish species were documented and the seine net fish community abundance success metric was achieved. Other gear-specific catch results show fish abundance is on track to achieving all success criteria by year-five of the monitoring program, as discussed below.

7.1.1 Clark Creek Pond Fish Community Monitoring Results

A summary of the Clark Creek Pond fish species caught during the 2018 field studies is provided in Table 7-1, with gear-specific and catch-per-unit effort (CPUE) results in Table 7-2. Seven fish species were documented in Clark Creek Pond during the 2018 studies. Northern Redbelly Dace and Finescale Dace were the most abundant species, followed by Pearl Dace and Brook Stickleback. Many young-of-the-year (YOY) individuals were encountered, which were likely members of the Phoxinus genus but were too small to non-lethally confirm species (e.g., likely Finescale Dace, Northern Redbelly Dace, or hybrids of these species). Most fish were captured in baited minnow traps or by the fine mesh seine net. The majority of seine net catch were YOY individuals (93% of catch), representing approximately 45% of the cumulative total catch from all gear types in the pond (Table 7-2). Consequently, the high proportion of YOY individuals within Clark Creek Pond influenced the CPUE of the gear-specific catch results since those smaller individuals were only catchable using seine netting.

A subsample of individuals from each species and from each gear type were measured for fork or total length for those species with rounded caudal fins (e.g., Brook Stickleback and Central Mudminnow). Species-specific results of these measurements, where a minimum of 100 individuals were measured, are shown on Figure 7-1 illustrating multiple age classes of Brassy Minnow, Brook Stickleback, Finescale Dace, Northern Redbelly Dace and Pearl Dace were present. These results confirm that Clark Creek Pond functions as overwintering and summer refuge, spawning, rearing and foraging habitat for these species.

7.1.2 Clark Creek Diversion Channel Fish Community Monitoring Results

Pool, flat and riffle habitats were sampled using minnow traps and backpack electrofishing; however, no measurable flow was observed within the channel and no outflow from Clark Creek Pond was noted. Fish within the diversion channel did however have unimpeded access to Teeple Pond. A summary of the Clark

Creek Diversion Channel fish species caught during the 2018 field studies is provided in Table 7-1, with gear-specific and CPUE results in Table 7-2. Three fish species were documented in Clark Creek Diversion Channel during the 2018 studies. Northern Redbelly Dace and unidentified YOY (likely Phoxinus species) represented 92% of the total cumulative catch. Central Mudminnow and Brook Stickleback were also caught in the diversion channel (Table 7-2). Minnow trapping captured all Northern Redbelly Dace and two Central Mudminnow. Electrofishing captured the remaining Central Mudminnow, all Brook Stickleback and all YOY cyprinids. Body size of the YOY individuals precluded their capture within the minnow traps since they could freely swim through the mesh size.

7.2 West Creek Diversion

The West Creek Diversion fish community sampling results show multiple year classes of several species were present, a total of twelve fish species were documented and the seine net fish community abundance success metric was achieved Other gear-specific catch results show fish abundance is on track to achieving all success criteria by year-five of the monitoring program, as discussed below.

7.2.1 Stockpile Pond Fish Community Monitoring Results

A summary of the Stockpile Pond fish species caught during the 2018 field studies is provided in Table 7-3, with gear-specific and CPUE results in Table 7-4. Eleven fish species were documented in Stockpile Pond during the 2018 studies. Brown Bullhead, Northern Redbelly Dace, Finescale Dace and Creek Chub were the most abundant species, followed by Brook Stickleback, Pearl Dace and Brassy Minnow. Many YOY individuals were encountered, which were likely members of the Phoxinus genus but were too small to non-lethally confirm species (e.g., likely Finescale Dace, Northern Redbelly Dace, or hybrids of these species). Most fish older than YOY were caught in baited minnow traps, whereas the majority of seine net catch were YOY individuals representing approximately 75% of the cumulative total catch from all gear types within the pond (Table 7-4). Consequently, the high proportion of YOY individuals within Stockpile Pond influenced the CPUE of the gear-specific catch results since those smaller individuals were only catchable using seine netting.

A subsample of individuals from each species and from each gear type were measured for fork or total length for those species with rounded caudal fins. Species-specific results of these measurements, where a minimum of 100 individuals were measured, are shown on Figure 7-2 illustrating multiple age classes of Brassy Minnow, Creek Chub, Finescale Dace, Northern Redbelly Dace and Pearl Dace were present. These results confirm that Stockpile Pond functions as summer refuge, spawning, rearing and foraging habitat for these species.

7.2.2 Stockpile Diversion Channel Fish Community Monitoring Results

Available pool and flat habitats were sampled using minnow traps and backpack electrofishing; however, the riffles were mostly all dry and no measurable flow was observed within the channel. Fish within the lower reach of the diversion channel did however have unimpeded access to West Creek Pond. A summary of the Stockpile Diversion Channel fish species caught during the 2018 field studies is provided in Table 7-3, with gear-specific and CPUE results in Table 7-4. Eight fish species were documented in Stockpile Diversion Channel during the 2018 studies. Brook Stickleback, Creek Chub and juvenile White Sucker represented 84% of the total cumulative catch. Brassy Minnow, Central Mudminnow, Fathead Minnow, Finescale Dace and Pearl Dace were also caught in low abundace within the diversion channel (Table 7-4). Minnow trapping captured nearly 90% of the cumulative catch for both gear types within the

diversion channel. Electrofishing captured individuals from five of the species captured in the minnow traps.

7.2.3 West Creek Pond Fish Community Monitoring Results

A summary of the West Creek Pond fish species caught during the 2018 field studies is provided in Table 7-3, with gear-specific and CPUE results in Table 7-4. Ten fish species were documented in West Creek Pond during the 2018 studies. Pearl Dace and Brassy Minnow were the most abundant species, representing approximately 25% and 10% of the cumulative catch for all gear types within the pond, respectively. Many YOY individuals were encountered, which were likely members of the Phoxinus genus but were too small to non-lethally confirm species. Most fish were captured in baited minnow traps or by the fine mesh seine net. The majority of seine net catch were YOY individuals, representing approximately 45% of the cumulative total catch from all gear types (Table 7-4). Consequently, the high proportion of YOY individuals within West Creek Pond influenced the CPUE of the gear-specific catch results since those smaller individuals were only catchable using seine netting.

A subsample of individuals from each species and from each gear type were measured for fork or total length for those species with rounded caudal fins (e.g., Brook Stickleback and Central Mudminnow). Species-specific results of these measurements, where a minimum of 100 individuals were measured, are shown on Figure 7-3 illustrating multiple age classes of Brassy Minnow, Creek Chub, Fathead Minnow, Northern Redbelly Dace and Pearl Dace were present. These results confirm that West Creek Pond functions as overwintering and summer refuge, spawning, rearing and foraging habitat for these species.

7.2.4 West Creek Diversion Channel Fish Community Monitoring Results

Pool, flat and riffle habitats were sampled using minnow traps and backpack electrofishing; however, no measurable flow was observed within the channel and no outflow from West Creek Pond was noted. The diversion channel upstream reaaches were dry, but the lower reaches maintained sufficient water depth and connectivity to Loslo Creek. A summary of the West Creek Diversion Channel fish species caught during the 2018 field studies is provided in Table 7-3, with gear-specific and CPUE results in Table 7-4. Nine fish species were documented in West Creek Diversion Channel during the 2018 studies. Creek Chub, White Sucker and Brook Stickleback represented 33%, 19% and 14% of the total cumulative catch for both gear types within the diversion channel, respectively (Table 7-4). Minnow trapping captured eight fish species and approximately 52% of the total cumulative catch within the diversion channel. Electrofishing was conducted in other areas of the diversion channel and captured seven speices, one of which (Johnny Darter), which was not captured in the minnow traps.

7.3 Fish Community Monitoring Recommendations

The following recommendations are provided to improve fish community monitoring of the compensation measures:

- Alternate fishing methods such as boat-mounted electrofishing may be considered to improve electrofishing CPUE within the pond habitat since a boat can sample larger areas with similar effort and reach deeper (non-wadable) habitat.

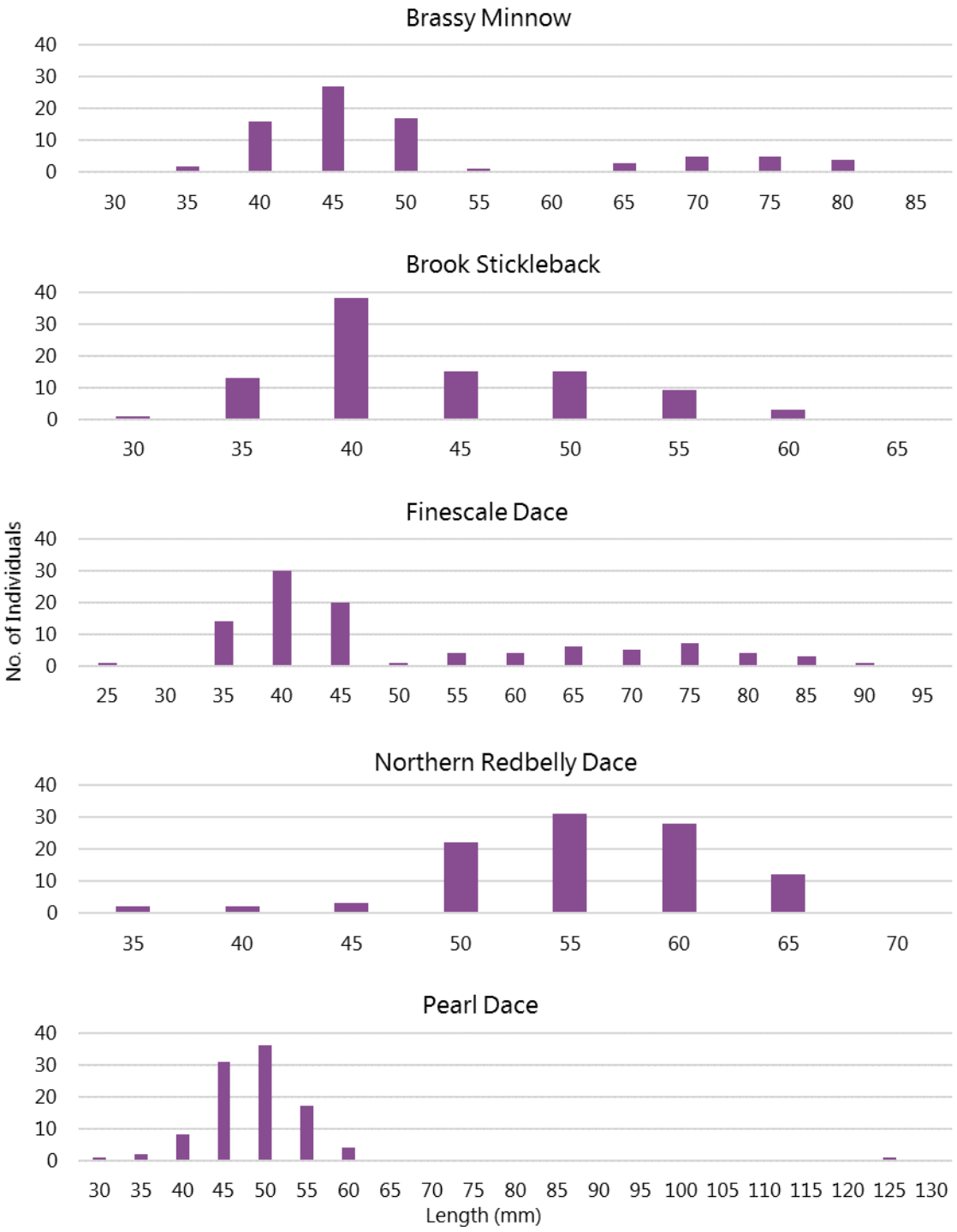


Figure 7-1: Clark Creek Pond Species-Specific Length-Frequency Summary

Note:

1. Brook Stickleback were measured for total length, all other species data represents fork length.

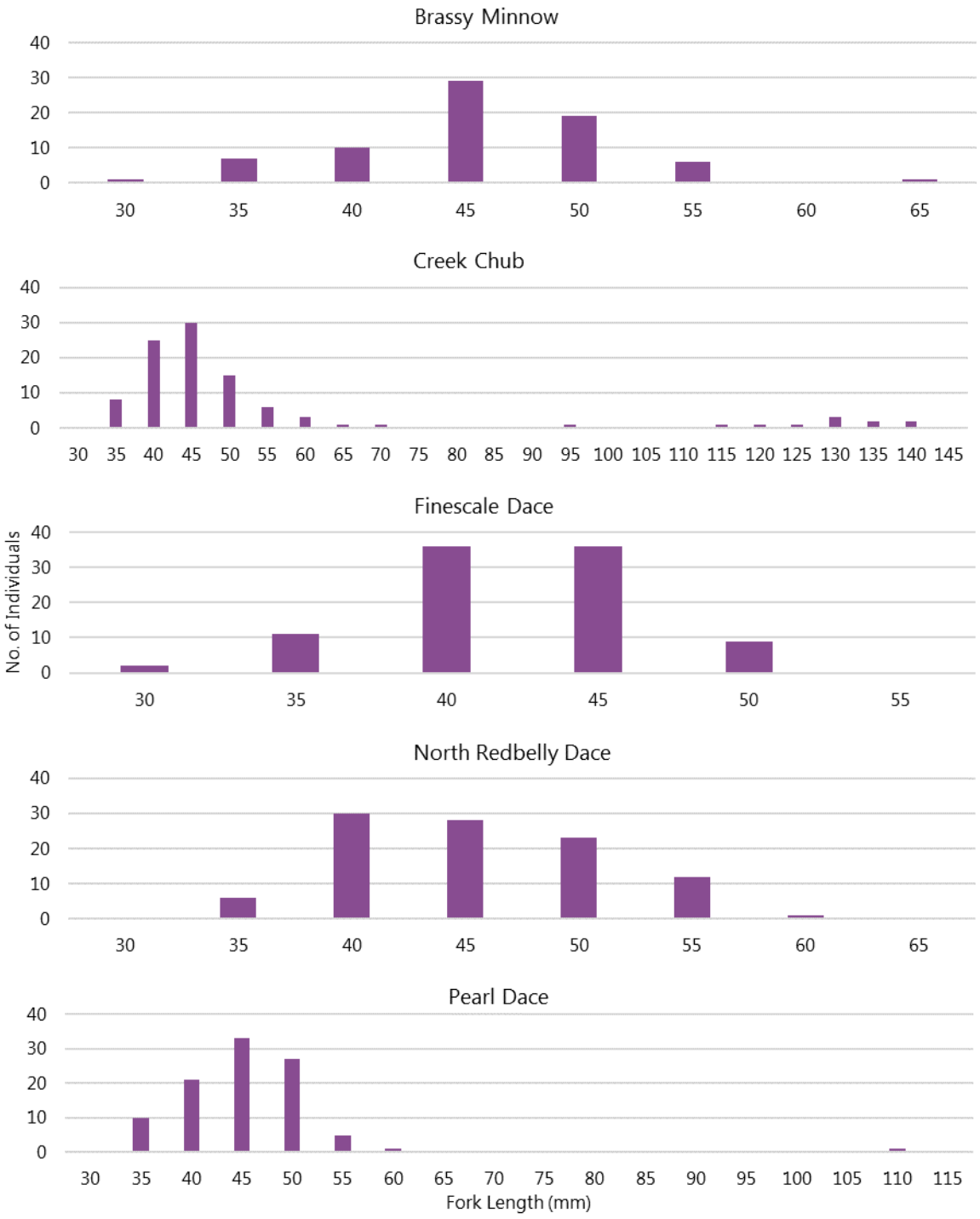


Figure 7-2: Stockpile Pond Species-Specific Length-Frequency Summary

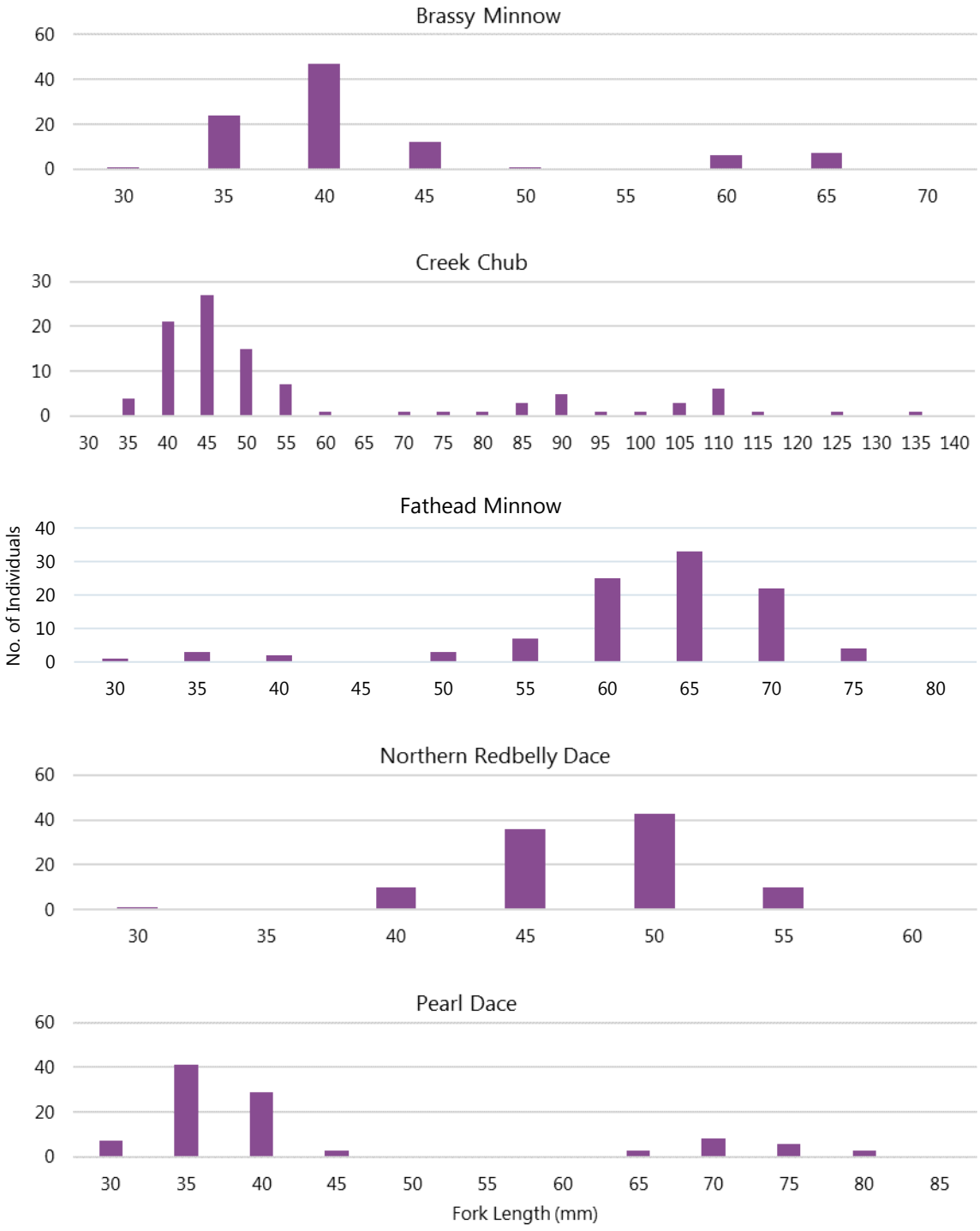


Figure 7-3: West Creek Pond Species-Specific Length-Frequency Summary

Table 7-1: Clark Creek Diversion 2018 Fish Species Presence Summary

Expected Species[1] Clark Creek (Teeple Drain) Sub-watershed	Year-one (2018)		Success Target of 9 Species
	Clark Creek Pond	Clark Creek Diversion Channel	
Blacknose Dace			
Blackside Darter			
Brassy Minnow	**X**		**X**
Brook Stickleback	**X**	**X**	**X**
Central Mudminnow	**X**	**X**	**X**
Common Shiner			
Creek Chub			
Emerald Shiner			
Fathead Minnow[2]	**X**		**X**
Finescale Dace	**X**		**X**
Golden Shiner			
Lake Chub			
Northern Redbelly Dace	**X**	**X**	**X**
Pearl Dace	**X**		**X**
Spottail Shiner			
White Sucker			
Species Richness	**7**	**3**	**7**

Notes:

1. List of expected species from the Fish Habitat No Net Loss Plan Section 35(2) Waterbodies, Table 3-3 (AMEC 2015)
2. Fathead Minnow were not previously listed to occur within the sub-watershed, but were encountered during the year-one performance monitoring studies.

Table 7-2: Clark Creek Diversion – Fish Community Monitoring Results Summary

Gear	Year	Sample ID	Sample Date (dd/mm/yy)	No. of Gear	Total Effort	Species Specific Catch Per Unit Effort (CPUE)								Area Catch Total (n)	Area Catch CPUE	Ultimate (5-year) Target CPUE
						Brassy Minnow	Brook Stickleback	Central Mudminnow	Fathead Minnow	Finescale Dace	Northern Redbelly Dace	Pearl Dace	YOY Cyprinid			
Minnow Trap	2018	CCP-MT1	28/07/18	75	1,775	80	94	56	57	509	826	191	0	**1,813**		
		CP-DC-MT1	26/07/18	13	312	0	0	2	0	0	18	0	0	**20**		
		Gear-Specific Totals			**2,087**	**80**	**94**	**58**	**57**	**509**	**844**	**191**	**0**	**1,833**	**0.88**	**≥ 2**
Seine Net	2018	CCP-SN1	28/07/18	1	10	0	21	0	7	44	42	0	1,605			
		Gear-Specific Totals			**10**	**0**	**21**	**0**	**7**	**44**	**42**	**0**	**1,605**	**1,719**	**172**	**≥ 16**
Electrofishing	2018	CCP-EF1	29/08/18	1	10,028	3	5	19	0	16	0	0	0	**43**		
		CP-DC-EF1	24/07/18	1	1,040	0	7	10	0	0	0	0	0	**17**		
		Gear-Specific Totals			**11,068**	**3**	**12**	**29**	**0**	**16**	**0**	**0**	**0**	**60**	**5.4**	**≥ 44**
2018 All-Gear Catch Total						**83**	**127**	**87**	**64**	**569**	**886**	**191**	**1,605**	**3,612**	**-**	**-**

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. Minnow trap effort presented as the number of fish caught per minnow trap hour; FCHP minimum effort required for monitoring (1,500 hours in pond habitat, 250 hours in diversion habitat)
3. Seine net effort presented as the number of fish caught per 15 metre net haul; FHCP minimum effort required for monitoring (10 individual 15 m net hauls; pond habitat only)
4. Backpack electrofishing effort presented as the number of fish caught per 1,000 electrofishing seconds; FCHP minimum effort required for monitoring (10,000 seconds in pond habitat, 1,000 seconds in diversion channel habitat)
5. All gear-specific minimum required efforts were met or exceeded

Table 7-3: West Creek Diversion 2018 Fish Species Presence Summary

Expected Species[1] Clark Creek (Teeple Drain) Sub-watershed	Year-one (2018)				Success Target of 9 Species
	Stockpile Pond	Stockpile Diversion Channel	West Creek Pond	West Creek Diversion Channel	
Blacknose Dace					
Blackside Darter					
Brassy Minnow	X	X	X	X	X
Brook Stickleback	X	X	X	X	X
Brown Bullhead[2]	X				X
Central Mudminnow	X	X	X	X	X
Common Shiner	X		X	X	X
Creek Chub	X	X	X	X	X
Emerald Shiner					
Fathead Minnow[2]	X	X	X	X	X
Finescale Dace	X	X	X		X
Golden Shiner					
Johnny Darter[2]				X	X
Lake Chub					
Northern Redbelly Dace	X		X		X
Pearl Dace	X	X	X	X	X
Spottail Shiner					
White Sucker	X	X	X	X	X
Species Richness	**11**	**8**	**10**	**9**	**12**

Notes:

1. List of expected species from the Fish Habitat No Net Loss Plan Section 35(2) Waterbodies, Table 3-3 (AMEC 2015)
2. Brown Bullhead, Fathead Minnow and Johnny Darter were not previously listed to occur within the sub-watershed, but were encountered during the year-one performance monitoring studies.

Table 7-4: West Creek Diversion 2018 Fish Community Monitoring Results Summary

Gear	Sample ID	Sample Date (dd/mm/yy)	No. of Gear	Total Effort	Species Specific Catch Per Unit Effort (CPUE)													Area Catch Total (n)	Area Catch CPUE	Ultimate (5-year) Target CPUE
					Brassy Minnow	Brook Stickleback	Brown Bullhead	Central Mudminnow	Common Shiner	Creek Chub	Fathead Minnow	Finescale Dace	Johnny Darter	Northern Redbelly Dace	Pearl Dace	White Sucker	YOY Cyprinid			
Minnow Trap	WCP-MT1	26/07/18	75	1,800	540	317	0	0	5	286	185	55	0	286	1,445	0	0	**3,119**		
	WC-DC-MT1	27/07/18	13	318	23	18	0	4	1	37	7	0	0	0	1	19	0	**110**		
	SP-MT1	25/07/18	75	1,650	73	187	504	7	2	215	7	244	0	312	98	22	0	**1,671**		
	SP-DC-MT1	25/07/18	13	328	2	55	0	3	0	37	10	3	0	0	4	24	0	**138**		
	Gear-Specific Totals			**4,096**	**638**	**577**	**504**	**14**	**8**	**575**	**209**	**302**	**0**	**598**	**1,548**	**65**	**0**	**5,038**	**1.2**	**≥ 2**
Seine Net	WCP-SN1	24/07/18	1	10	0	3	0	0	0	1	0	0	0	0	0	0	2550	**2,554**		
	SP-SN1	28/07/18	1	10	0	6	0	0	0	2	1	0	0	19	0	0	5,350	**5,378**		
	Gear-Specific Totals			**20**	**0**	**9**	**0**	**0**	**0**	**3**	**1**	**0**	**0**	**19**	**0**	**0**	**7,900**	**7,932**	**397**	**≥ 16**
Electrofishing	WCP-EF1	24/07/18	1	10,112	0	5	1	0	0	12	0	6	0	0	0	0	0	**24**		
	WC-DC-EF1	29/07/18	1	1,189	0	11	0	14	6	34	0	0	3	0	13	21	0	**102**		
	SP-EF1	28/07/18	1	10,006	0	14	0	18	0	11	3	0	0	8	0	0	0	**54**		
	SP-DC-EF1	25/07/18	1	1,042	0	4	0	0	0	4	1	2	0	0	0	5	16	**32**		
	Gear-Specific Totals			**22,349**	**0**	**34**	**1**	**32**	**6**	**61**	**4**	**8**	**3**	**8**	**13**	**26**	**16**	**212**	**9.5**	**≥ 44**
2018 All-Gear Catch Total					**638**	**620**	**505**	**46**	**14**	**639**	**214**	**310**	**3**	**625**	**1,561**	**91**	**7,916**	**13,182**	**-**	**-**

Notes:

1. CPUE - catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. Minnow trap effort presented as the number of fish caught per minnow trap hour; FHCP minimum effort required for monitoring (1,500 hours in pond habitat, 250 hours in diversion habitat)
3. Seine net effort presented as the number of fish caught per 15 metre net haul; FHCP minimum effort required for monitoring (10 individual 15 m net hauls; pond habitat only)
4. Backpack electrofishing effort presented as the number of fish caught per 1,000 electrofishing seconds; FHCP minimum effort required for monitoring (10,000 seconds in pond habitat, 1,000 seconds in diversion channel habitat)
5. All gear-specific minimum required efforts were met or exceeded

8.0 Performance Summary

Implementation and effectiveness of the compensation measures are determined by confirming that the ponds and diversion channels have been constructed as per the approved plans and are functioning as intended using the success criteria specified in the approved FHCP and listed in Table 3-1. Biological systems such as Clark Creek, Stockpile and West Creek ponds and diversion channels are dynamic and will likely require several years to develop full biological communities that meet the success criteria; however, the year-one monitoring results show very good progress toward these targets.

The success criteria for physical construction and function of offset measures was achieved for Clark Creek and West Creek Diversions, although the aerial extent of Stockpile Pond and the section of Stockpile Diversion Channel between the pond outlet and West Creek Tributary 2 that have not developed as expected.

Presence of multiple year classes of fish have been demonstrated within Clark Creek and West Creek Diversions and the richness of at least nine fish species has been documented in West Creek Diversion, thereby achieving some species presence (richness) success criteria. Fish species abundance success criteria were achieved for seine netting within Clark Creek and West Creek Diversions; however, the remaining gear-specific CPUE success criteria are not yet achieved.

Further to the above, the fish catch results show thousands of YOY cyprinid individuals (seine netting catch), which will likely substantively improve the species-specific CPUE for each gear type in future studies as these individuals grow and mature into larger, spawning individuals within the population. It is anticipated that the majority of these fish will survive overwinter in refuge pools, and as such will help the population sooner attain the carrying capacity and productivity of this habitat. The 2018 performance monitoring results comparison to success criteria for Clark Creek and West Creek Diversion meaures are summarized in Tables 8-1 and 8-2, respectively.

Table 8-1: Comparison of Performance Monitoring Results to Success Criteria – Clark Creek Diversion

Attribute and Due Date	Success Criteria	Clark Creek Pond (Year-one)	Clark Creek Diversion Channel (Year-one)	Ultimate (5-year) Post Monitoring Success Criteria
Physical Construction of Offset measures (December 31, 2016)	As-built survey demonstrates that measures are constructed as per the approved plans	Yes	Yes	**Achieved**
	Area of replacement habitat is equal to or greater than 3.86 ha	Yes	Yes	**Achieved**
Physical Function of Offset Measures (December 31, 2019)	Water levels are consistent with those specified in the design	Yes	Yes	**Achieved**
	The outlet channel and pond allows for passage of fish	Yes	Yes	**Achieved**
Stability of Structures (December 31, 2019)	Constructed habitat features remain in place (log and boulder structures in place)	Yes	Yes	**Achieved**
	Shorelines and graded offset features are stable and not eroding (greater than 80% of features are considered stable)	100%	100%	**Achieved**
	Riparian vegetation cover and plantings achieve 80% coverage of area, and or survival of planted stock	>90%	>90%	**Achieved**
Species Presence (December 31, 2021)	Minimum of 9 species of fish are present in the offset measure.	7		On track
Full Life Cycle Usage (December 31, 2021)	Multiple year classes including young of the year fish are present in the offset feature.	Yes		**Achieved**
Fish Abundance (December 31, 2021)	Overall Catch per Unit Effort (CPUE) for all species combined, for at least two of following capture methods (electrofishing, Minnow Traps, Seine Nets). Minimum success criteria are:			On track
	Minnow Trap CPUE ≥ 2 fish per trap hour	0.88		On track
	Seine Net CPUE ≥ to 16 fish per 15 m net pull	172		**Achieved**
	Electrofishing CPUE ≥ 44 fish per 1,000 seconds	5.4		On track

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. Achieved = planned success criteria already achieved
3. On track = within the expected progress for the performance monitoring period
4. High proportion of YOY individuals influenced CPUE of gear-specific results since those fish were only catchable using seine netting

Table 8-2: Comparison of Performance Monitoring Results to Success Criteria – West Creek Diversion

Attribute and Due Date	Success Criteria	Ponds (Year-one)	Diversion Channels (Year-one)	Ultimate (5-year) Post Monitoring Success Criteria
Physical Construction of Offset measures (December 31, 2016)	As-built survey demonstrates that measures are constructed as per the approved plans	Yes	Yes	**Achieved**
	Area of replacement habitat is equal to or greater than 21.7 ha	Yes	Yes	**Achieved**
Physical Function of Offset Measures (December 31, 2019)	Water levels are consistent with those specified in the design	No	Approx. 75%	On track
	The outlet channel and pond allows for passage of fish	No	Approx. 75%	On track
Stability of Structures (December 31, 2019)	Constructed habitat features remain in place (log and boulder structures in place)	Yes	Yes	**Achieved**
	Shorelines and graded offset features are stable and not eroding (greater than 80% of features are considered stable)	>90%	>90%	**Achieved**
	Riparian vegetation cover and plantings achieve 80% coverage of area, and or survival of planted stock	>90%	>80%	**Achieved**
Species Presence (December 31, 2021)	Minimum of 9 species of fish are present in the offset measure.	12		**Achieved**
Full Life Cycle Usage (December 31, 2021)	Multiple year classes including young of the year fish are present in the offset feature.	Yes		**Achieved**
Fish Abundance (December 31, 2021)	Overall Catch per Unit Effort (CPUE) for all species combined, for at least two of following capture methods (electrofishing, Minnow Traps, Seine Nets). Minimum success criteria are:			
	Minnow Trap CPUE ≥ 2 fish per trap hour	1.2		On track
	Seine Net CPUE ≥ to 16 fish per 15 m net pull	397		**Achieved**
	Electrofishing CPUE ≥ 44 fish per 1,000 seconds	9.5		On track

Notes:

1. CPUE = catch-per-unit-effort, expressed as the number of fish caught per gear-specific effort type
2. Achieved = planned success criteria already achieved
3. On track = within the expected progress for the performance monitoring period
4. Assess conditions = compensation measure not progressing as expected, further investigation and assess of existing conditions required
5. High proportion of YOY individuals influenced CPUE of gear-specific results since those fish were only catchable using seine netting

9.0 Closing

We trust the information provided in this report meets the performance monitoring obligations with respect to approved Fish Habitat Compensation Plan. Should you require further details or wish to discuss any aspect of this information, please do not hesitate to contact us at your convenience.

Sincerely,

Wood Environment & Infrastructure Solutions,
a Division of Wood Canada Limited

Prepared by:	Reviewed by:
	<Original signed by>
Dale Klodnicki, M.E.Sc., C.E.T. Senior Aquatic Ecologist	Mark Ruthven, C.E.T. Head, Environmental Assessment

10.0 References

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Appendix A

Physical Function of Offset Measures Photograph Record

A.1 Water Level Logger Installations

A.2 Clark Creek Pond and Diversion Channel

A.3 Stockpile Pond and Diversion Channel

A.4 West Creek Pond and Diversion Channel

Appendix A.1

Water Level Logger Installations

Clark Creek Pond level logger facing east from dam (June 10, 2017)

Clark Creek Pond level logger facing north from dam (June 10, 2017)

Stockpile level logger facing south (June 15, 2017)

Stockpile level logger facing east (July 24, 2018)

Plate A.1-1: Water Level Loggers – Clark Creek and Stockpile Ponds

Level logger sensor and cable/tube, pre-install (April 24, 2018)

West Creek Pond level logger facing northeast (April 24, 2018)

Level logger sensor attached to weight, pre-install (April 24, 2018)

West Creek Pond level logger facing north (April 24, 2018)

Plate A.1-2: Water Level Loggers – West Creek Pond

Appendix A.2

Clark Creek Pond and Diversion Channel

CSS-1 facing upstream during high flow conditions (April 25, 2018)

CSS-1 riffle during high flow conditions (April 25, 2018)

CSS-1 facing west from P3 stake (April 25, 2018)

CSS-1 pool during high flow conditions (April 25, 2018)

Plate A.2-1: Clark Creek Diversion Channel (CSS-1) – High Flow Monitoring

CSS-1 facing upstream during low flow conditions (July 24, 2018)

CSS-1 riffle displaying recent beaver activity (July 24, 2018)

CSS-1 run with heavy vegetation cover (July 24, 2018)

CSS-1 riffle with heavy vegetation cover (July 24, 2018)

Plate A.2-2: Clark Creek Diversion Channel (CSS-1) – Low Flow Monitoring

CSS-2 facing downstream (April 25, 2018)

CSS-2 submerged riffle during high flow conditions (April 25, 2018)

CSS-2 facing downstream (July 24, 2018)

CSS-2 facing west from P4 stake (July 24, 2018)

Plate A.2-3: Clark Creek Diversion Channel (CSS-2) – High and low Flow Monitoring

CSS-3 facing east during high flow conditions (April 25, 2018)

CSS-3 facing east towards P5 (April 25, 2018)

CSS-3 facing south from P5 stake (July 27, 2018)

CSS-3 facing west displaying P5 stake in foreground (July 27, 2018)

Plate A.2-4: Clark Creek Diversion Channel (CSS-3) – High and Low Flow Monitoring

Appendix A.3

Stockpile Pond and Diversion Channel

CSS-6 facing downstream towards culvert (P11) (April 25, 2018)

CSS-6 facing west (downstream) toward culvert (April 25, 2018)

CSS-6 facing east (upstream) (April 25, 2018)

CSS-6 conducting flow monitoring in flat (April 25, 2018)

Plate A.3-1: Stockpile Diversion Channel (CSS-6) – High Flow Monitoring

CSS-6 facing south during low flow conditions (July 24, 2018)

CSS-6 facing upstream through north side culvert (July 24, 2018)

CSS-6 pool downstream of crossing (July 24, 2018)

CSS-6 backwatered pool from West Creek Pond (July 24, 2018)

Plate A.3-2: Stockpile Diversion Channel (CSS-6) – Low Flow Monitoring

CSS-7 facing downstream from confluence (April 24, 2018)

CSS-7 facing upstream toward confluence (April 24, 2018)

CSS-7 facing north, overlooking confluence (April 24, 2018)

CSS-7 conducting flow monitoring in flat (July 27, 2018)

Plate A.3-3: Stockpile Diversion Channel (CSS-7) – High Flow Monitoring

CSS-7 facing upstream toward confluence (July 24, 2018)

CSS-7 facing west toward refuge pool, from confluence (July 24, 2018)

CSS-7 dry riffle in north channel above confluence (July 24, 2018)

CSS-7 stagnant refuge pool below confluence (July 24, 2018)

Plate A.3-4: Stockpile Diversion Channel (CSS-7) – Low Flow Monitoring

CSS-8 facing northwest from Stockpile outlet (April 24, 2018)

CSS-8 facing east toward Stockpile Pond (April 24, 2018)

CSS-8 facing northwest from Stockpile outlet (July 24, 2018)

CSS-8 facing east toward Stockpile Pond (July 24, 2018)

Plate A.3-5: Stockpile Diversion Channel (CSS-8) – High and Low Flow Monitoring

Appendix A.4

West Creek Pond and Diversion Channel

CSS-1 facing upstream (April 24, 2018)

CSS-1 facing downstream to Loslo Creek confluence (April 24, 2018)

CSS-1 conducting flow monitoring in riffle (April 24, 2018)

CSS-1 facing north to confluence with Loslo Creek (April 24, 2018)

Plate A.4-1: West Creek Diversion Channel (CSS-1) – High Flow Monitoring

CSS-1 facing upstream during low flow conditions (July 24, 2018)

CSS-1 facing downstream towards Loslo Cr. confluence (July 24, 2018)

CSS-1 run/riffle during low flow conditions (July 24, 2018)

CSS-1 confluence facing downstream during low flow (July 24, 2018)

Plate A.4-2: West Creek Diversion Channel (CSS-1) – Low Flow Monitoring

CSS-2 facing southwest from P4 (April 26, 2018)

CSS-2 facing west from P4 (April 26, 2018)

CSS-2 facing northeast during low flow conditions (July 24, 2018)

CSS-2 facing southwest during low flow conditions (July 24, 2018)

Plate A.4-3: West Creek Diversion Channel (CSS-2) – High and Low Flow Monitoring

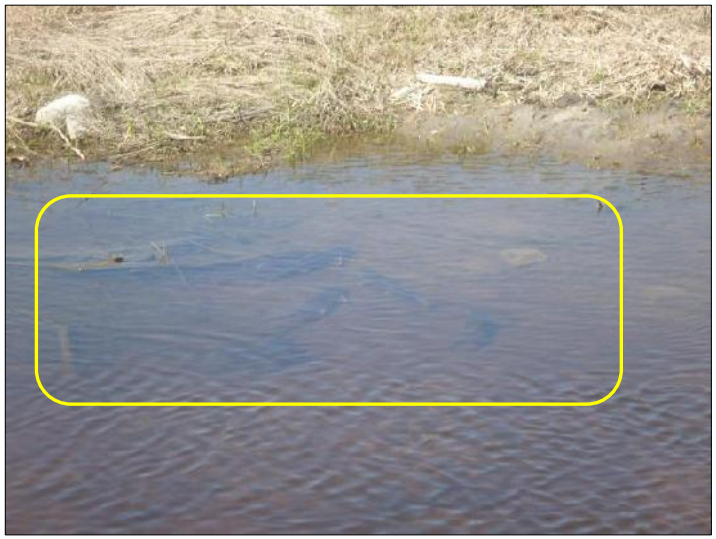
CSS-3 facing upstream toward culvert (C10) (April 26, 2018)

CSS-3 conducting flow monitoring in flat (April 26, 2018)

CSS-3 facing upstream towards culvert (C10) (July 24, 2018)

CSS-3 facing downstream from culvert (C10) (July 24, 2018)

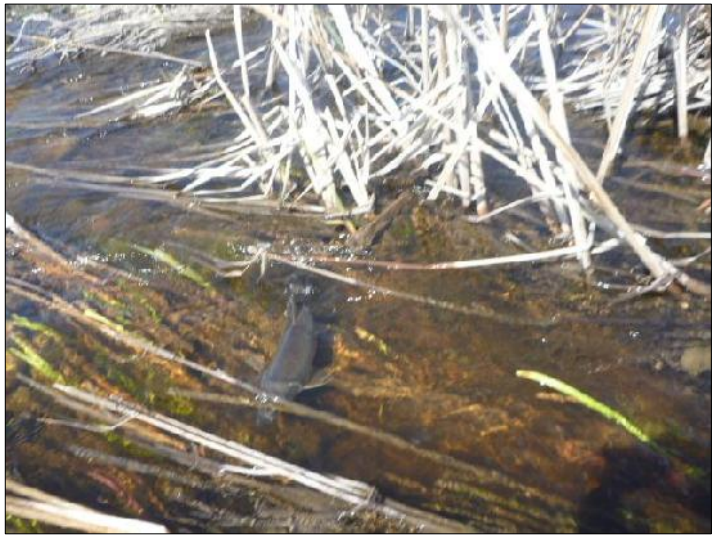
Plate A.4-4: West Creek Diversion Channel (CSS-3) – High and Low Flow Monitoring



White Sucker staging

White Sucker staging

Female White Sucker ripe with eggs



White Sucker swimming through riffle

Plate A.4-5: West Creek Diversion Channel – White Sucker Staging Activity (May 7, 2018)

CSS-4 facing downstream from culvert (P7) (April 24, 2018)

CSS-4 conducting flow monitoring in riffle (April 24, 2018)

CSS-4 facing downstream from P7 (July 24, 2018)

CSS-4 facing downstream from dry riffle (July 24, 2018)

Plate A.4-6: West Creek Diversion Channel (CSS-4) – High and Low Flow Monitoring

CSS-5 facing upstream to West Creek Pond outlet (April 24, 2018)

CSS-5 conducting flow monitoring in riffle at outlet (April 26, 2018)

CSS-5 facing downstream at West Creek Pond outlet (July 24, 2018)

CSS-5 facing downstream from dry run/riffle (July 24, 2018)

Plate A.4-7: West Creek Diversion Channel (CSS-5) – High and Low Flow Monitoring

Appendix B

Stability of Structures Photograph Record

B.1 Clark Creek Pond and Diversion Channel

B.2 Stockpile Pond and Diversion Channel

B.3 West Creek Pond and Diversion Channel

Appendix B.1

Clark Creek Pond and Diversion Channel

Station P1 facing northeast; high flow conditions (April 25, 2018)

Station P1 facing east (April 25, 2018)

Station P1 facing southeast (April 25, 2018)

Station P1 facing northeast (November 28, 2018)

Plate B.1-1: Clark Creek Pond Stability of Structures Photo Station P1

Station P2 southeast; high flow conditions (April 25, 2018)

Station P2 facing southwest to dam (April 25, 2018)

Station P2 facing southeast; low flow conditions (July 27, 2018)

Station P2 facing southwest to dam (July 27, 2018)

Plate B.1-2: Clark Creek Pond Stability of Structures Photo Station P2

Station P3 facing northwest; high flow conditions (April 25, 2018)

Station P3 facing southeast; downstream (April 25, 2018)

Station P3 facing northwest; low flow conditions (July 24, 2018)

Station P3 facing southeast; downstream (July 24, 2018)

Plate B.1-3: Clark Creek Diversion Channel Stability of Structures Photo Station P3

Station P4 facing south; low flow condition (April 25, 2018)

Station P4 facing north; upstream (April 25, 2018)

Station P4 facing south; low flow condition (July 24, 2018)

Station P4 facing north; upstream (July 24, 2018)

Plate B.1-4: Clark Creek Diversion Channel Stability of Structures Photo Station P4

Station P5 facing south; high flow condition (April 25, 2018)

Station P5 facing north; high flow condition (April 25, 2018)

Station P5 facing south, toward Teeple Pond (July 24, 2018)

Station P5 facing north; upstream (July 24, 2018)

Plate B.1-5: Clark Creek Diversion Channel Stability of Structures Photo Station P5

Appendix B.2

Stockpile Pond and Diversion Channel

Station P11 facing west; to West Creek Pond (April 24, 2018)

Station P11 facing east; upstream (April 24, 2018)

Station P11 facing southwest; low flow conditions (July 24, 2018)

Station P11 facing northeast (July 24, 2018)

Plate B.2-1: Stockpile Diversion Channel Stability of Structures Photo Station P11

Station P12 facing west; downstream (April 24, 2018)

Station P12 facing south; toward Stockpile Pond (April 24, 2018)

Station P12 facing northeast; high flow conditions (April 24, 2018)

Station P12 facing northeast; low flow conditions (July 24, 2018)

Plate B.2-2: Stockpile Diversion Channel Stability of Structures Photo Station P12

Station P12 facing west; downstream (July 24, 2018)

Near Station P12 facing south; toward Stockpile Pond (July 24, 2018)

Near Station P12 facing downstream to refuge pool (July 24, 2018)

Near Station P12 facing southeast; downstream (July 24, 2018)

Plate B.2-3: Stockpile Diversion Channel Stability of Structures Photo Station P12

Station P13 facing northeast; high flow conditions (April 24, 2018)

Station P13 facing northwest; downstream (April 24, 2018)

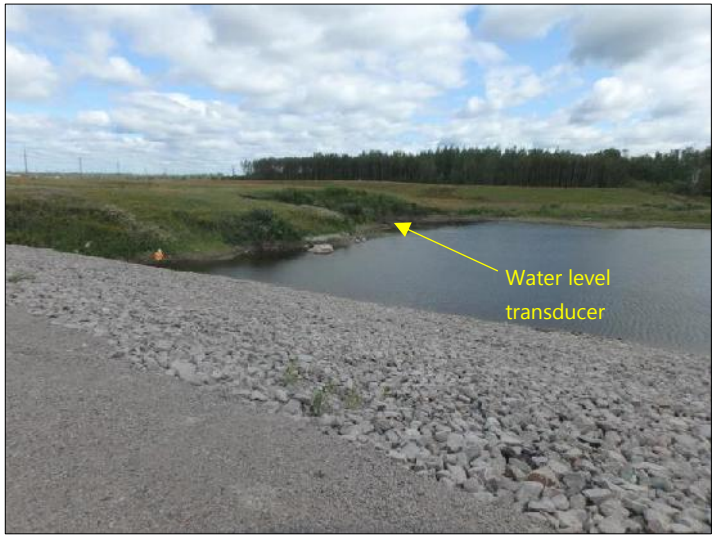
Station P13 facing northeast; low flow conditions (July 24, 2018)

Station P13 facing northwest; downstream (July 24, 2018)

Plate B.2-4: Stockpile Diversion Channel Stability of Structures Photo Station P13

Station P14 facing northeast; high flow conditions (April 24, 2018)

Station P14 facing east; high flow conditions (April 24, 2018)



Station P14 facing northeast, low flow conditions (July 24, 2018)

Station P14 facing east; low flow conditions (July 24, 2018)

Plate B.2-5: Stockpile Pond Stability of Structures Photo Station P14

Station P14 facing east; high flow conditions (April 24, 2018)

Station P14 facing east; pond frozen (November 28, 2018)

Plate B.2-6: Stockpile Pond Stability of Structures Photo Station P14

Appendix B.3

West Creek Pond and Diversion Channel

Station P1 facing northeast; high flow conditions (April 24, 2018)

Station P1 facing north (April 24, 2018)

Station P1 facing south (April 24, 2018)

Station P1 facing northeast; to confluence (July 24, 2018)

Plate B.3-1: West Creek Diversion Channel Stability of Structures Photo Station P1

Station P1 south; low flow conditions (July 24, 2018)

Station P1 facing north (July 24, 2018)

Station P2 facing southeast; high flow conditions (April 24, 2018)

Station P2 facing southeast; low flow conditions (July 24, 2018)

Plate B.3-2: West Creek Diversion Channel Stability of Structures Photo Stations P1 and P2

Station P3 facing southwest; high flow conditions (April 24, 2018)

Station P3 facing northeast; upstream (April 24, 2018)

Station P3 facing southwest; low flow conditions (July 24, 2018)

Station P3, facing northeast; upstream (July 24, 2018)

Plate B.3-3: West Creek Diversion Channel Stability of Structures Photo Station P3

Station P4 facing southwest; high flow conditions (April 26, 2018)

Station P4 facing northeast; upstream (April 26, 2018)

Station P4 facing southwest; low flow conditions (July 24, 2018)

Station P4 facing northeast; upstream (July 24, 2018)

Plate B.3-4: West Creek Diversion Channel Stability of Structures Photo Station P4

Station P5 facing northeast; high flow conditions (April 26, 2018)

Station P5 facing south; high flow conditions (April 26, 2018)

Station P5 facing northeast (July 24, 2018)

P5 facing southwest; downstream (July 29, 2018)

Plate B.3-5: West Creek Diversion Channel Stability of Structures Photo Station P5

Station P6 facing northeast; high flow conditions (April 26, 2018)

Station P6 facing southwest; high flow conditions (April 26, 2018)

Station P6 facing northeast; low flow conditions (July 24, 2018)

Station P6 facing southwest; downstream (July 24, 2018)

Plate B.3-6: West Creek Diversion Channel Stability of Structures Photo Station P6

Station P7 facing northwest; high flow conditions (April 26, 2018)

Station P7 facing southeast; upstream (April 26, 2018)

Station P7 facing northwest (July 24, 2018)

Station P7 facing southeast; upstream (July 24, 2018)

Plate B.3-7: West Creek Diversion Channel Stability of Structures Photo Station P7

Station P8 facing northwest; high flow conditions (April 24, 2018)

Station P8 facing south; high flow conditions (April 24, 2018)

Station P8 facing northwest (July 24, 2018)

Station P8 facing south (July 24, 2018)

Plate B.3-8: West Creek Diversion Channel Stability of Structures Photo Station P8

Station P8 facing southeast; high flow conditions (April 24, 2018)

Station P8 facing southeast; high flow conditions (April 24, 2018)

Station P8 facing southeast; low flow conditions (July 24, 2018)

Station P8 facing southeast; low flow conditions (July 24, 2018)

Plate B.3-9: West Creek Diversion Channel Stability of Structures Photo Station P8

Station P9 facing northeast (April 24, 2018)

Station P9 facing northeast; high flow condition (April 26, 2018)

Station P9 facing northeast; low flow conditions (July 24, 2018)

Station P9 facing northeast (July 24, 2018)

Plate B.3-10: West Creek Pond Stability of Structures Photo Station P9

Station P10 facing west; high flow conditions (April 24, 2018)

Station P10 facing northwest (April 24, 2018)

Station P10 facing west; low flow conditions (July 24, 2018)

Station P10 facing northwest (July 24, 2018)

Plate B.3-11: West Creek Pond Stability of Structures Photo Station P10

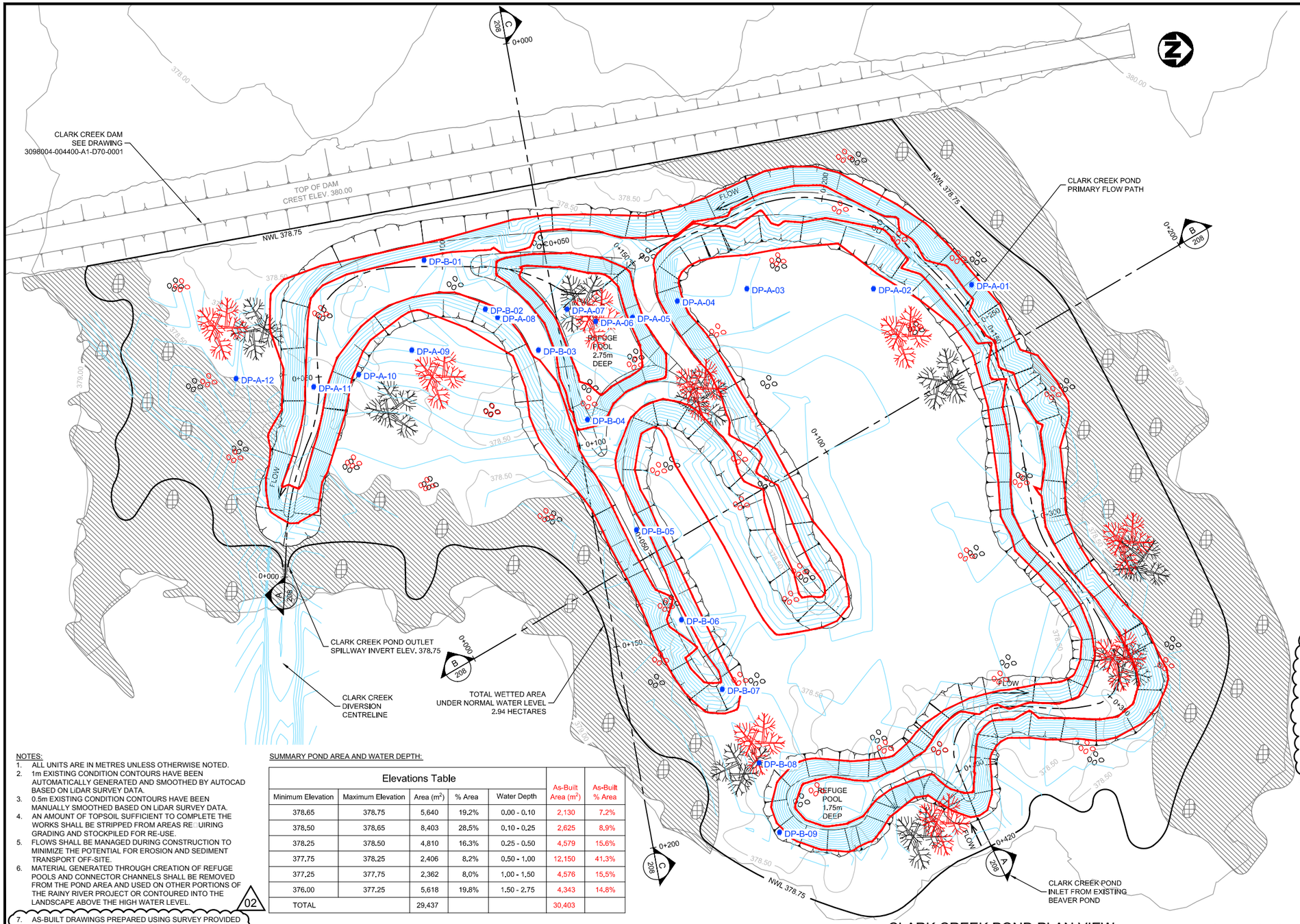
Station P10 facing southeast; high flow conditions (April 24, 2018)

Station P10 facing southeast (July 24, 2018)

Plate B.3-12: West Creek Pond Stability of Structures Photo Station P10

Appendix C

Attachments



LEGEND

BOULDER CLUSTER

TREE PILE

ZONE A - SCRUB-SHRUB WETLAND - 350 m^2

ZONE B - EMERGENT WETLAND - 12,254 m^2

NWL NORMAL WATER LEVEL

VEGETATION RESTORATION NOTES:

1. ALL AREAS EXCAVATED TO THE DEPTH OF MINERAL SOIL SHALL BE TREATED WITH A MINIMUM OF 100mm OF TOPSOIL / ORGANIC SOIL SALVAGED FROM SITE.
2. PLACED TOPSOIL SHALL BE COMPACTED UTILIZING THE TRACK WEIGHT OF A CRAWLER TRACTOR OR DOZER. FURTHER MACHINERY TRAFFIC ATOP PLACED TOPSOIL SHALL BE MINIMIZED TO PREVENT OVER-COMPACTION.
3. ANY SOIL COMPACTED DUE TO REPEATED MACHINERY ACCESS SHALL BE LOOSENED PRIOR TO SEED APPLICATION.
4. ALL DISTURBED SOILS SHALL BE STABILIZED WITH A NURSE CROP OUTLINED IN TABLE 2.
5. ZONE A AND B SHALL BE SEEDED WITH NATIVE WETLAND SEED MIX AT A RATE OF 5.5 kg/ha IN ADDITION TO NURSE CROP SEED.
6. ZONE A SHALL BE PLANTED WITH NATIVE SHRUB CUTTINGS. CUTTINGS SHALL BE PLANTED AT A 0.75m SPACING. ZONE A PLANTING AREAS SHALL BE APPROXIMATELY 10 m^2 IN SIZE AND LOCATED AS SHOWN IN THE PLAN VIEW DRAWING.
7. NATIVE SHRUB CUTTINGS SHALL BE TAKEN FROM WILLOW AND DOGWOOD SPECIES PRESENT ON SITE AND IN SURROUNDING AREA.
8. NATIVE SHRUB CUTTINGS SHALL BE HARVESTED DURING THE PLANTS' DORMANT PERIOD AND SHALL BE TREATED WITH ROOTING HORMONE PRIOR TO PLANTING.
9. NO PLANTING OR SEEDING IS REQUIRED WITHIN EXISTING BEAVER PONDS OR CONNECTING CHANNELS.
10. SUBSTITUTIONS OF PLANT MATERIAL MUST BE APPROVED BY NEW GOLD'S ENVIRONMENTAL SPECIALIST.

TABLE 1. MATERIAL SUMMARY

ZONE	MATERIAL	QUANTITY
DISTURBED AREAS	NURSE CROP SEED MIX	VARIES
A & B	WETLAND SEED MIX	6.9 kg
A	NATIVE SHRUB CUTTINGS	622
-	BOULDER CLUSTER	34
-	TREE PILE	9

CUTTINGS SHALL BE COMPRISED OF VARIOUS NATIVE WILLOW AND DOGWOOD SPECIES PRESENT ONSITE AND IN THE SURROUNDING AREA.

TABLE 2. NURSE CROP SEEDING

TIMING OF SEEDING	SELECTED SEED TYPE		
	LATIN NAME	COMMON NAME	APPLICATION RATE
POST-SPRING FRESHET TO AUG. 14	*Avena sativa*	Oats	30 kg/ha
AUG. 15 TO OCT. 15	*Triticum aestivum*	Winter Wheat	30 kg/ha

02

TABLE 3. WETLAND SEED MIX (APPLICATION RATE 5.5 kg/ha)

SPECIES	COMMON NAME	PERCENTAGE OF MIX (BY WEIGHT)
GRASSES (TOTAL 50% OF MIX)		
Glyceria grandis	Tall Manna Grass	14 %
Elymus virginicus	Virginia Wild Rye	27 %
Leersia oryzoides	Rice Cut Grass	9 %
SEDGES AND RUSHES (TOTAL 31% OF MIX)		
Carex comosa	Bristly Sedge	8 %
Carex lacustris	Lake Sedge	2 %
Carex stricta	Tussock Sedge	3 %
Juncus canadensis	Canadian Rush	6 %
Scirpus validus	Soft Stem Bulrush	8 %
Scirpus cyperinus	Woolgrass	4 %
FORBS (TOTAL 19% OF MIX)		
Acorus americanus	Sweet Flag	4 %
Alisma subcordatum	Water Plantain	4 %
Sagittaria latifolia	Broad-Leaved Arrowhead	3 %
Sparganium eurycarpum	Giant Bur Reed	8 %

NOTES:

1. ALL UNITS ARE IN METRES UNLESS OTHERWISE NOTED.
2. 1m EXISTING CONDITION CONTOURS HAVE BEEN AUTOMATICALLY GENERATED AND SMOOTHED BY AUTOCAD BASED ON LiDAR SURVEY DATA.
3. 0.5m EXISTING CONDITION CONTOURS HAVE BEEN MANUALLY SMOOTHED BASED ON LiDAR SURVEY DATA.
4. AN AMOUNT OF TOPSOIL SUFFICIENT TO COMPLETE THE WORKS SHALL BE STRIPPED FROM AREAS REQUIRING GRADING AND STOCKPILED FOR RE-USE.
5. FLOWS SHALL BE MANAGED DURING CONSTRUCTION TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT TRANSPORT OFF-SITE.
6. MATERIAL GENERATED THROUGH CREATION OF REFUGE POOLS AND CONNECTOR CHANNELS SHALL BE REMOVED FROM THE POND AREA AND USED ON OTHER PORTIONS OF THE RAINY RIVER PROJECT OR CONTOURED INTO THE LANDSCAPE ABOVE THE HIGH WATER LEVEL.
7. AS-BUILT DRAWINGS PREPARED USING SURVEY PROVIDED BY NEW GOLD NOVEMBER 11 2016.

02

SUMMARY POND AREA AND WATER DEPTH:

Elevations Table						
Minimum Elevation	Maximum Elevation	Area (m^2)	% Area	Water Depth	As-Built Area (m^2)	As-Built % Area
378.65	378.75	5,640	19.2%	0.00 - 0.10	2,130	7.2%
378,50	378,65	8,403	28.5%	0.10 - 0.25	2,625	8,9%
378.25	378.50	4,810	16.3%	0.25 - 0.50	4,579	15,6%
377.75	378.25	2,406	8.2%	0.50 - 1.00	12,150	41,3%
377.25	377,75	2,362	8,0%	1.00 - 1.50	4,576	15,5%
376.00	377.25	5,618	19.8%	1.50 - 2.75	4,343	14,8%
TOTAL		29,437			30,403	

CLARK CREEK POND PLAN VIEW

SCALE : 1:500

0m 5 10 15 20

1 : 500

3098004-004400-A1-D50-0002

REFERENCE DRAWINGS:

THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 3098004-004400-A1-D50-0001, 3098004-004400-A1-D50-0003, 3098004-004400-A1-D70-0001, AND 3098004-004400-A1-D70-0002.

03	20	12	2017	AS-BUILT - BOULDER CLUSTERS UPDATED	NSH	MCR
02	07	12	2016	AS-BUILT	NSH	DGR
01	14	11	2014	ISSUED FOR TENDER	NSH	DGR
00	15	09	2014	ISSUED FOR USE	NSH	DGR
AC	15	08	2014	ISSUED FOR CLIENT APPROVAL	NSH	MCR
AB	16	07	2014	ISSUED FOR CLIENT APPROVAL	NSH	MCR
AA	30	12	2013	ISSUED FOR REVIEW	NSH	MCR
REV	D	M	Y	ISSUE/REVISION DESCRIPTION	DES.	APPR

newgold Rainy River Project

amec.com/earthandenvironmental

Client: NEW GOLD INC.

AMEC Environment & Infrastructure
160 Traders Boulevard East
Mississauga, Ontario, Canada L4Z 3K7

DRAWN BY:	NSH
DESIGNED BY:	NSH
CHECKED BY:	MCR
REVIEWED BY:	DGR
APPROVED BY:	DGR

PROJECT: RAINY RIVER PROJECT
DETAILED DESIGN

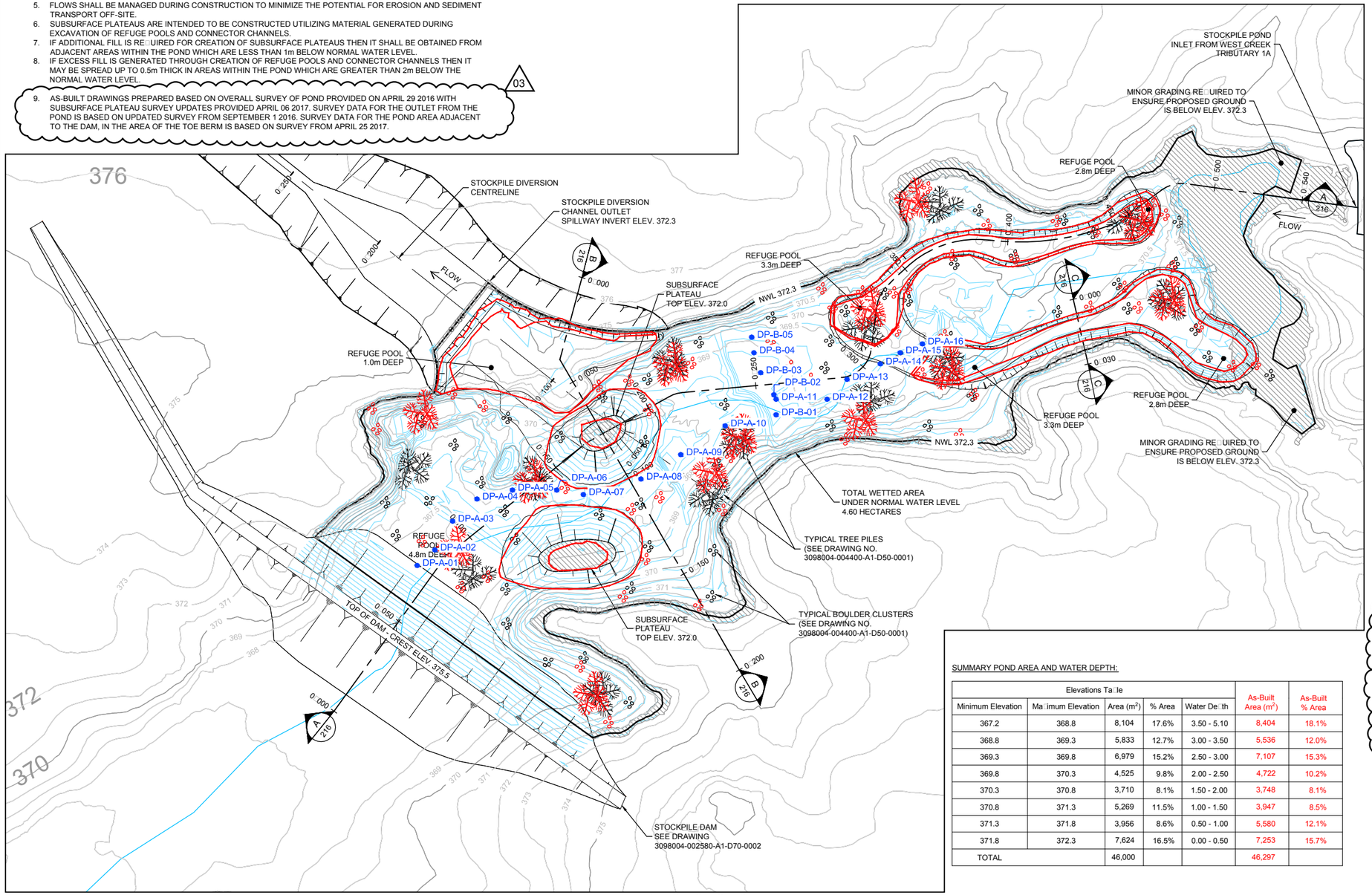
TITLE: CLARK CREEK POND
PLAN VIEW

PROJECT NO.:	TC133921
REVISION NO.	03
DATE:	DEC. 2013
SCALE:	AS SHOWN
DRAWING NO.:	207

\\Working Folders - 2018-05-11\WP\Schedule 2\As Built\Civil\207_205 - CC - Pond_Depth Locations.dwg - Plan - Dec. 14, 2018, 2:13pm - nothos.hastings

NOTES:
1. ALL UNITS ARE IN METERS UNLESS OTHERWISE NOTED.
2. 1m EXISTING CONDITION CONTOURS HAVE BEEN AUTOMATICALLY GENERATED AND SMOOTHED BY AUTOCAD BASED ON LiDAR SURVEY DATA.
3. 0.5m EXISTING CONDITION CONTOURS HAVE BEEN MANUALLY SMOOTHED BASED ON LiDAR SURVEY DATA.
4. AN AMOUNT OF TOPSOIL SUFFICIENT TO COMPLETE THE WORKS SHALL BE STRIPPED FROM AREAS RE□UIRING GRADING AND STOCKPILED FOR RE-USE.
5. FLOWS SHALL BE MANAGED DURING CONSTRUCTION TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT TRANSPORT OFF-SITE.
6. SUBSURFACE PLATEAUS ARE INTENDED TO BE CONSTRUCTED UTILIZING MATERIAL GENERATED DURING EXCAVATION OF REFUGE POOLS AND CONNECTOR CHANNELS.
7. IF ADDITIONAL FILL IS RE□UIRED FOR CREATION OF SUBSURFACE PLATEAUS THEN IT SHALL BE OBTAINED FROM ADJACENT AREAS WITHIN THE POND WHICH ARE LESS THAN 1m BELOW NORMAL WATER LEVEL.
8. IF EXCESS FILL IS GENERATED THROUGH CREATION OF REFUGE POOLS AND CONNECTOR CHANNELS THEN IT MAY BE SPREAD UP TO 0.5m THICK IN AREAS WITHIN THE POND WHICH ARE GREATER THAN 2m BELOW THE NORMAL WATER LEVEL.
9. AS-BUILT DRAWINGS PREPARED BASED ON OVERALL SURVEY OF POND PROVIDED ON APRIL 29 2016 WITH SUBSURFACE PLATEAU SURVEY UPDATES PROVIDED APRIL 06 2017. SURVEY DATA FOR THE OUTLET FROM THE POND IS BASED ON UPDATED SURVEY FROM SEPTEMBER 1 2016. SURVEY DATA FOR THE POND AREA ADJACENT TO THE DAM, IN THE AREA OF THE TOE BERM IS BASED ON SURVEY FROM APRIL 25 2017.

03



STOCKPILE POND PLAN VIEW
SCALE : 1:1000

0m 10 20 30 40
1 : 1000

LEGEND

	BOULDER CLUSTER (51)		ZONE A - SCRUB-SHRUB WETLAND - 1,249 m^2
	TREE PILE (13)		ZONE B - EMERGENT WETLAND - 8,007 m^2
NWL	NORMAL WATER LEVEL		

VEGETATION RESTORATION NOTES:

1. ALL AREAS EXCAVATED TO THE DEPTH OF MINERAL SOIL SHALL BE TREATED WITH A MINIMUM OF 100mm OF TOPSOIL / ORGANIC SOIL SALVAGED FROM SITE.
2. PLACED TOPSOIL SHALL BE COMPACTED UTILIZING THE TRACK WEIGHT OF A CRAWLER TRACTOR OR DOZER. FURTHER MACHINERY TRAFFIC ATOP PLACED TOPSOIL SHALL BE MINIMIZED TO PREVENT OVER-COMPACTION.
3. ANY SOIL COMPACTED DUE TO REPEATED MACHINERY ACCESS SHALL BE LOOSENED PRIOR TO SEED APPLICATION.
4. ALL DISTURBED SOILS SHALL BE STABILIZED WITH A NURSE CROP OUTLINED IN TABLE 2.
5. ZONE A AND B SHALL BE SEEDED WITH NATIVE WETLAND SEED MIX AT A RATE OF 5.5 kg/ha IN ADDITION TO NURSE CROP SEED.
6. ZONE A SHALL BE PLANTED WITH NATIVE SHRUB CUTTINGS. CUTTINGS SHALL BE PLANTED IN CLUMPS OF 3 - 12 AT A 0.75m SPACING. A TOTAL OF 15-25% OF ZONE A SHALL BE PLANTED WITH THESE CUTTINGS.
7. NATIVE SHRUB CUTTINGS SHALL BE TAKEN FROM WILLOW AND DOGWOOD SPECIES PRESENT ON SITE AND IN SURROUNDING AREA.
8. NATIVE SHRUB CUTTINGS SHALL BE HARVESTED DURING THE PLANT'S DORMANT PERIOD AND SHALL BE TREATED WITH ROOTING HORMONE PRIOR TO PLANTING.
9. NO PLANTING OR SEEDING IS RE□UIRED WITHIN EXISTING BEAVER PONDS OR CONNECTING CHANNELS.
10. SUBSTITUTIONS OF PLANT MATERIAL MUST BE APPROVED BY NEW GOLD'S ENVIRONMENTAL SPECIALIST.

TABLE 1. MATERIAL SUMMARY

ZONE	MATERIAL	□UANTITY
DISTURBED AREAS	NURSE CROP SEED MIX	VARIES
A & B	WETLAND SEED MIX	5.1 □g
A	NATIVE SHRUB CUTTINGS□	445
-	BOULDER CLUSTER	51
-	TREE PILE	13

□CUTTINGS SHALL BE COMPRISED OF VARIOUS NATIVE WILLOW AND DOGWOOD SPECIES PRESENT ONSITE AND IN THE SURROUNDING AREA.

TABLE 2. NURSE CROP SEEDING

TIMING OF SEEDING	SELECTED SEED TYPE		
	LATIN NAME	COMMON NAME	APPLICATION RATE
POST-SPRING FRESHET TO AUG. 14	*Avena sativa*	Oats	30 □g/ha
AUG. 15 TO OCT. 15	*Triticum aestivum*	Winter Wheat	30 □g/ha

03

TABLE 3. WETLAND SEED MIX (APPLICATION RATE 5.5 □g/ha)

SPECIES	COMMON NAME	PERCENTAGE OF MIX (BY WEIGHT)
GRASSES (TOTAL 50% OF MIX)		
Glyceria grandis	Tall Manna Grass	14 %
Elymus virginicus	Virginia Wild Rye	27 %
Leersia oryzoides	Rice Cut Grass	9 %
SEDGES AND RUSHES (TOTAL 31% OF MIX)		
Carex comosa	Bristly Sedge	8 %
Carex lacustris	La□e Sedge	2 %
Carex stricta	Tussoc□ Sedge	3 %
Juncus canadensis	Canadian Rush	6 %
Scirpus validus	Soft Stem Bulrush	8 %
Scirpus cyperinus	Woolgrass	4 %
FORBS (TOTAL 19% OF MIX)		
Acorus americanus	S□eet Flag	4 %
Alisma subcordatum	Water Plantain	4 %
Sagittaria latifolia	Broad-Leaved Arro□head	3 %
Sparganium eurycarpum	Giant Bur Reed	8 %

SUMMARY POND AREA AND WATER DEPTH:

Elevations Ta□le					As-Built Area (m^2)	As-Built % Area
Minimum Elevation	Ma□imum Elevation	Area (m^2)	% Area	Water De□th		
367.2	368.8	8,104	17.6%	3.50 - 5.10	8,404	18.1%
368.8	369.3	5,833	12.7%	3.00 - 3.50	5,536	12.0%
369.3	369.8	6,979	15.2%	2.50 - 3.00	7,107	15.3%
369.8	370.3	4,525	9.8%	2.00 - 2.50	4,722	10.2%
370.3	370.8	3,710	8.1%	1.50 - 2.00	3,748	8.1%
370.8	371.3	5,269	11.5%	1.00 - 1.50	3,947	8.5%
371.3	371.8	3,956	8.6%	0.50 - 1.00	5,580	12.1%
371.8	372.3	7,624	16.5%	0.00 - 0.50	7,253	15.7%
TOTAL		46,000			46,297	

3098004-002580-A1-D50-0001

REFERENCED DRAWINGS:

THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 3098004-004400-A1-D50-0001, 3098004-002580-A1-D50-0002, 3098004-002580-A1-D70-0002, AND 3098004-002580-A1-D70-0004.

03	04	12	2017	AS-BUILT	NSH	
02	15	04	2015	ISSUED FOR CONSTRUCTION	NSH	DGR
01	14	11	2014	ISSUED FOR TENDER (REVISED LOCATION)	NSH	DGR
00	15	09	2014	ISSUED FOR USE	NSH	DGR
AB	15	08	2014	ISSUED FOR CLIENT APPROVAL	NSH	MCR
AB	16	07	2014	ISSUED FOR CLIENT APPROVAL	NSH	MCR
AA	19	12	2013	ISSUED FOR REVIEW	NSH	MCR
REV	D	M	Y	ISSUE/REVISION DESCRIPTION	DES.	APPR

newgold Rainy River Project

Client:
NEW GOLD INC.

AMEC Environment & Infrastructure
160 Traders Boulevard East
Mississauga, Ontario, Canada L4Z 3K7
□□□.amec.com/earthandenvironmental

DRAWN BY: NSH
DESIGNED BY: NSH
CHECKED BY: MCR
REVIEWED BY: DGR
APPROVED BY: DGR

PROJECT: RAINY RIVER PROJECT DETAILED DESIGN

TITLE: STOCKPILE POND PLAN VIEW

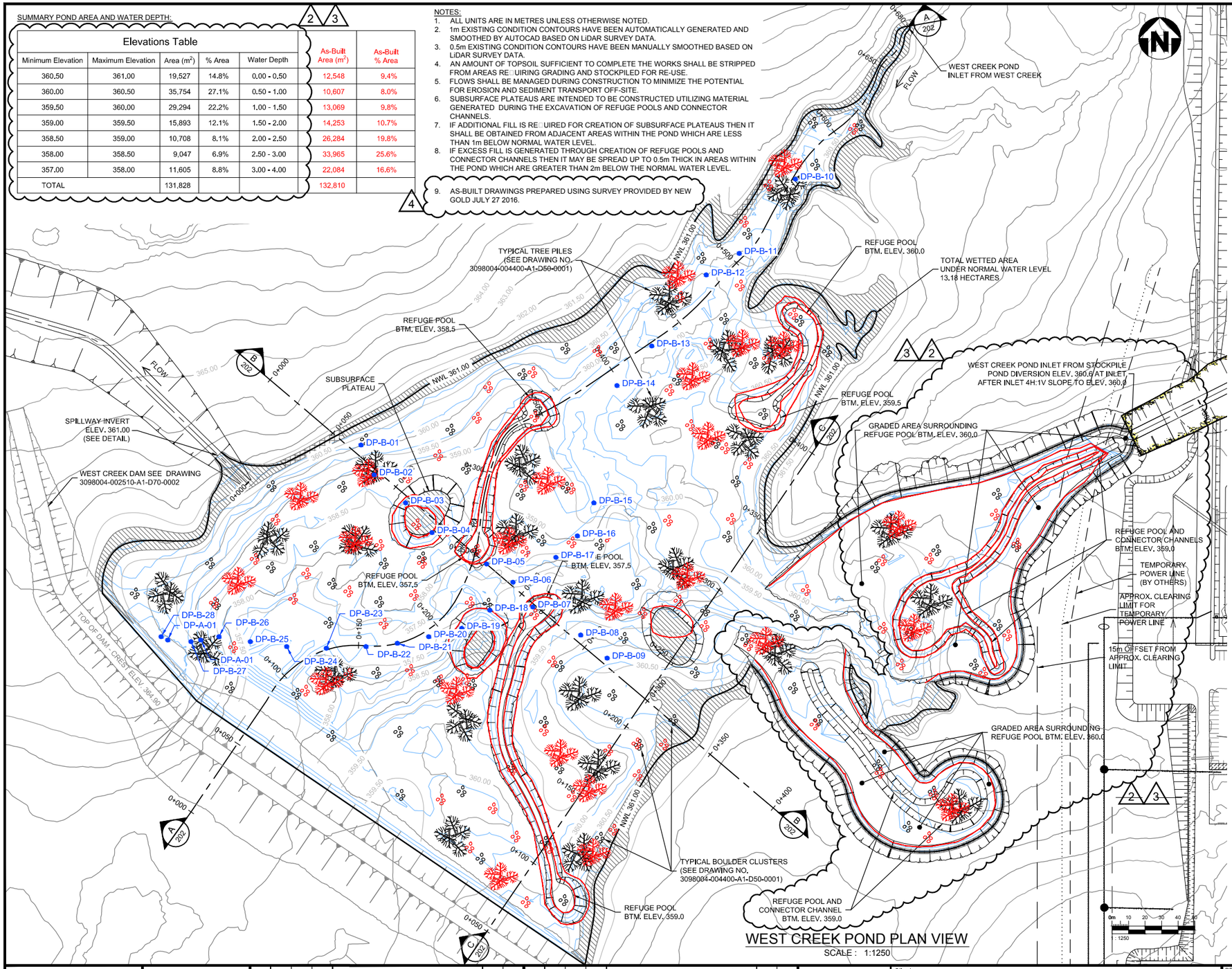
PROJECT NO.: TC133921
REVISION NO. 03
DATE: DEC. 2013
SCALE: AS SHOWN
DRAWING NO.: 215

I:\Working Folders - 2014\-00-11\RR\Schedule 2\As Built\Stockpile\Pond\3P - Pond - As-Built_Depth Locations.dwg - Plan - Dec. 14, 2015, 3:35pm - matthew.hastings

SUMMARY POND AREA AND WATER DEPTH:

Elevations Table					As-Built	As-Built
Minimum Elevation	Maximum Elevation	Area (m^2)	% Area	Water Depth	Area (m^2)	% Area
360.50	361.00	19,527	14.8%	0.00 - 0.50	12,548	9.4%
360.00	360.50	35,754	27.1%	0.50 - 1.00	10,607	8.0%
359.50	360.00	29,294	22.2%	1.00 - 1.50	13,069	9.8%
359.00	359.50	15,893	12.1%	1.50 - 2.00	14,253	10.7%
358.50	359.00	10,708	8.1%	2.00 - 2.50	26,284	19.8%
358.00	358.50	9,047	6.9%	2.50 - 3.00	33,965	25.6%
357.00	358.00	11,605	8.8%	3.00 - 4.00	22,084	16.6%
TOTAL		131,828			132,810	

NOTES:
1. ALL UNITS ARE IN METRES UNLESS OTHERWISE NOTED.
2. 1m EXISTING CONDITION CONTOURS HAVE BEEN AUTOMATICALLY GENERATED AND SMOOTHED BY AUTOCAD BASED ON LiDAR SURVEY DATA.
3. 0.5m EXISTING CONDITION CONTOURS HAVE BEEN MANUALLY SMOOTHED BASED ON LiDAR SURVEY DATA.
4. AN AMOUNT OF TOPSOIL SUFFICIENT TO COMPLETE THE WORKS SHALL BE STRIPPED FROM AREAS RE□UIRING GRADING AND STOCKPILED FOR RE-USE.
5. FLOWS SHALL BE MANAGED DURING CONSTRUCTION TO MINIMIZE THE POTENTIAL FOR EROSION AND SEDIMENT TRANSPORT OFF-SITE.
6. SUBSURFACE PLATEAUS ARE INTENDED TO BE CONSTRUCTED UTILIZING MATERIAL GENERATED DURING THE EXCAVATION OF REFUGE POOLS AND CONNECTOR CHANNELS.
7. IF ADDITIONAL FILL IS RE□UIRED FOR CREATION OF SUBSURFACE PLATEAUS THEN IT SHALL BE OBTAINED FROM ADJACENT AREAS WITHIN THE POND WHICH ARE LESS THAN 1m BELOW NORMAL WATER LEVEL.
8. IF EXCESS FILL IS GENERATED THROUGH CREATION OF REFUGE POOLS AND CONNECTOR CHANNELS THEN IT MAY BE SPREAD UP TO 0.5m THICK IN AREAS WITHIN THE POND WHICH ARE GREATER THAN 2m BELOW THE NORMAL WATER LEVEL.
9. AS-BUILT DRAWINGS PREPARED USING SURVEY PROVIDED BY NEW GOLD JULY 27 2016.



WEST CREEK POND PLAN VIEW
SCALE : 1:1250

LEGEND

	BOULDER CLUSTER	ZONE A - SCRUB-SHRUB WETLAND	12,247 m^2
	TREE PILE	ZONE B - EMERGENT WETLAND	16,440 m^2
NWL	NORMAL WATER LEVEL		

VEGETATION RESTORATION NOTES:

1. ALL AREAS EXCAVATED TO THE DEPTH OF MINERAL SOIL SHALL BE TREATED WITH A MINIMUM OF 100mm OF TOPSOIL / ORGANIC SOIL SALVAGED FROM SITE.
2. PLACED TOPSOIL SHALL BE COMPACTED UTILIZING THE TRACK WEIGHT OF A CRAWLER TRACTOR OR DOZER. FURTHER MACHINERY TRAFFIC ATOP PLACED TOPSOIL SHALL BE MINIMIZED TO PREVENT OVER-COMPACTION.
3. ANY SOIL COMPACTED DUE TO REPEATED MACHINERY ACCESS SHALL BE LOOSENED PRIOR TO SEED APPLICATION.
4. ALL DISTURBED SOILS SHALL BE STABILIZED WITH A NURSE CROP OUTLINED IN TABLE 2.
5. ZONE A AND B SHALL BE SEEDED WITH NATIVE WETLAND SEED MIX AT A RATE OF 5.5 kg/ha IN ADDITION TO NURSE CROP SEED.
6. ZONE A SHALL BE PLANTED WITH NATIVE SHRUB CUTTINGS. CUTTINGS SHALL BE PLANTED IN CLUMPS OF 3 - 12 AT A 0.75m SPACING. A TOTAL OF 15-25% OF ZONE A SHALL BE PLANTED WITH THESE CUTTINGS .
7. NATIVE SHRUB CUTTINGS SHALL BE TAKEN FROM WILLOW AND DOGWOOD SPECIES PRESENT ON SITE AND IN SURROUNDING AREA.
8. NATIVE SHRUB CUTTINGS SHALL BE HARVESTED DURING THE PLANTS' DORMANT PERIOD AND SHALL BE TREATED WITH ROOTING HORMONE PRIOR TO PLANTING.
9. NO PLANTING OR SEEDING IS RE□UIRED WITHIN AREAS WHICH ARE EXISTING BEAVER PONDS OR CONNECTING CHANNELS.
10. SUBSTITUTIONS OF PLANT MATERIAL MUST BE APPROVED BY NEW GOLD'S ENVIRONMENTAL SPECIALIST.

TABLE 1. MATERIAL SUMMARY

ZONE	MATERIAL	□UANTITY
DISTURBED AREAS	NURSE CROP SEED MIX	VARIES
A & B	WETLAND SEED MIX	10.3 □g
A	NATIVE SHRUB CUTTINGS□	799
-	BOULDER CLUSTER	80
-	TREE PILE	25

□CUTTINGS SHALL BE COMPRISED OF VARIOUS NATIVE WILLOW AND DOGWOOD SPECIES PRESENT ONSITE AND IN THE SURROUNDING AREA.

TABLE 2. NURSE CROP SEEDING

TIMING OF SEEDING	SELECTED SEED TYPE		
	LATIN NAME	COMMON NAME	APPLICATION RATE
POST-SPRING FRESHET TO AUG. 14	*Avena sativa*	Oats	30 □g/ha
AUG. 15 TO OCT. 15	*Triticum aestivum*	Winter Wheat	30 □g/ha

4 — 24 TREE PILES INSTALLED ACCORDING TO AS-BUILT SURVEY

4 — 79 BOULDER CLUSTERS INSTALLED ACCORDING TO AS-BUILT SURVEY

TABLE 3. WETLAND SEED MIX (APPLICATION RATE 5.5 □g/ha)

SPECIES	COMMON NAME	PERCENTAGE OF MIX (BY WEIGHT)
GRASSES (TOTAL 50% OF MIX)		
Glyceria grandis	Tall Manna Grass	14 %
Elymus virginicus	Virginia Wild Rye	27 %
Leersia oryzoides	Rice Cut Grass	9 %
SEDGES AND RUSHES (TOTAL 31% OF MIX)		
Carex comosa	Bristly Sedge	8 %
Carex lacustris	La□e Sedge	2 %
Carex stricta	Tussoc□ Sedge	3 %
Juncus canadensis	Canadian Rush	6 %
Scirpus validus	Soft Stem Bulrush	8 %
Scirpus cyperinus	Woolgrass	4 %
FORBS (TOTAL 19% OF MIX)		
Acorus americanus	S□eet Flag	4 %
Alisma subcordatum	Water Plantain	4 %
Sagittaria latifolia	Broad-Leaved Arro□head	3 %
Sparganium eurycarpum	Giant Bur Reed	8 %

3098004-002510-A1-D50-0002

REFERENCE DRAWINGS:

THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. 3098004-004400-A1-D50-0001, 3098004-002510-A1-D50-0003, 3098004-002510-A1-D70-0002, AND 3098004-002510-A1-D70-0003.

REV	D	M	Y	ISSUE/REVISION DESCRIPTION	DES.	APPR.
04	06	12	2017	AS-BUILT	NSH	MCR
AA	20	12	2013	ISSUED FOR REVIEW	NSH	MCR
AB	15	07	2014	ISSUED FOR CLIENT APPROVAL	NSH	MCR
AC	15	08	2014	ISSUED FOR CLIENT APPROVAL	NSH	MCR
00	15	09	2014	ISSUED FOR USE	NSH	DGR
01	14	11	2014	ISSUED FOR TENDER	NSH	DGR
02	12	08	2015	ISSUED FOR CONSTRUCTION (REVISED EASTERN GRADING)	NSH	DGR
03	08	09	2015	ISSUED FOR CONSTRUCTION (REVISED EASTERN GRADING)	NSH	DGR

newgold Rainy River Project

Client: NEW GOLD INC.

AMEC Environment & Infrastructure
160 Traders Boulevard East
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□□□amec.com/earthandenvironmental

DRAWN BY:	NSH
DESIGNED BY:	NSH
CHECKED BY:	MCR
REVIEWED BY:	DGR
APPROVED BY:	DGR

PROJECT:	RAINY RIVER PROJECT DETAILED DESIGN
TITLE:	WEST CREEK POND PLAN VIEW
PROJECT NO.:	TC133921
REVISION NO.	04
DATE:	DEC. 2013
SCALE:	AS SHOWN
DRAWING NO.:	201

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Limitations

Limitations

1. The work performed in the preparation of this report and the conclusions presented are subject to the following:
    a. The Standard Terms and Conditions which form a part of our Professional Services Contract;
    b. The Scope of Services;
    c. Time and Budgetary limitations as described in our Contract; and
    d. The Limitations stated herein.
2. No other warranties or representations, either expressed or implied, are made as to the professional services provided under the terms of our Contract, or the conclusions presented.
3. The conclusions presented in this report were based, in part, on visual observations of the Site and attendant structures. Our conclusions cannot and are not extended to include those portions of the Site or structures, which are not reasonably available, in Wood's opinion, for direct observation.
4. The environmental conditions at the Site were assessed, within the limitations set out above, having due regard for applicable environmental regulations as of the date of the inspection. A review of compliance by past owners or occupants of the Site with any applicable local, provincial or federal bylaws, orders-in-council, legislative enactments and regulations was not performed.
5. The Site history research included obtaining information from third parties and employees or agents of the owner. No attempt has been made to verify the accuracy of any information provided, unless specifically noted in our report.
6. Where testing was performed, it was carried out in accordance with the terms of our contract providing for testing. Other substances, or different quantities of substances testing for, may be present on-site and may be revealed by different or other testing not provided for in our contract.
7. Because of the limitations referred to above, different environmental conditions from those stated in our report may exist. Should such different conditions be encountered, Wood must be notified in order that it may determine if modifications to the conclusions in the report are necessary.
8. The utilization of Wood's services during the implementation of any remedial measures will allow Wood to observe compliance with the conclusions and recommendations contained in the report. Wood's involvement will also allow for changes to be made as necessary to suit field conditions as they are encountered.
9. This report is for the sole use of the party to whom it is addressed unless expressly stated otherwise in the report or contract. Any use which any third party makes of the report, in whole or the part, or any reliance thereon or decisions made based on any information or conclusions in the report is the sole responsibility of such third party. Wood accepts no responsibility whatsoever for damages or loss of any nature or kind suffered by any such third party as a result of actions taken or not taken or decisions made in reliance on the report or anything set out therein.
10. This report is not to be given over to any third party for any purpose whatsoever without the written permission of Wood.
11. Provided that the report is still reliable, and less than 12 months old, Wood will issue a third-party reliance letter to parties that the client identifies in writing, upon payment of the then current fee for such letters. All third parties relying on Wood's report, by such reliance agree to be bound by our proposal and Wood's standard reliance letter. Wood's standard reliance letter indicates that in no event shall Wood be liable for any damages, howsoever arising, relating to third-party reliance on Wood's report. No reliance by any party is permitted without such agreement.

NEW GOLD RAINY RIVER MINE
APPENDIX P
2017 DEER TISSUE REPORT

RAINY RIVER MINE

2017 WHITE-TAILED DEER TISSUE SAMPLING REPORT

Prepared by:

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160 Traders Blvd. E., Suite 110
Mississauga, Ontario
L4Z 3K7

August 2018
TC111504

newgold™ Rainy River Project

Principal Contact: Sylvie St-Jean, Environmental Manager
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EXECUTIVE SUMMARY

New Gold Inc. (New Gold) is currently constructing and operating, and eventually plans to reclaim a new open pit and underground gold mine in Chapple Township, Ontario. As part of commitments made during the environmental approvals process, New Gold conducted a second White-tailed Deer tissue and organ sampling program in 2017 to determine concentration levels of various contaminants such as metals (e.g., cadmium, copper and zinc) and cyanide within deer located near the Rainy River Mine (RRM). This, in addition to future sampling conducted will aid in determining exposure and ecological risk to wildlife, if any, from RRM related contaminants. The study will also assist in determining if there are risks to humans that consume local wildlife.

Sampling kits were distributed by New Gold RRM to collect deer tissue and liver samples from hunters on a voluntary basis. Tissues were also sampled from three deer that died from vehicle collisions, and liver tissue only was sampled from one deer which was killed by an unidentified poacher (a pile of viscera was found just north of the RRM on Richardson Road). There was no harvesting of deer solely for the purpose of this program to the knowledge of RRM. Samples from 36 deer were analyzed for several metals and 30 of those were analyzed for cyanide as well. A Spearman Correlation test was completed on each of the tested parameters to determine if there was a significant relationship between the contaminant concentration and the distance from the RRM. A Kruskal-Wallis test was completed on the 2016 and 2017 datasets to determine if the sample concentrations for each of the parameters differed significantly between the data collection years.

As seen in in the various graphs presented in this report, none of the contaminants exhibited a statistically significant relationship between concentration levels and proximity to the RRM boundary. This is likely attributable to the high variances associated with most of the parameters measured, whereby the standard deviations ranged from 0 to 793 3g/kg ww.

Most potential contaminant concentration levels did not differ significantly from the baseline data. However, arsenic, bismuth, cesium, copper, lithium, and magnesium concentration levels did exhibit significant differences ($P<0.05$) from the 2016 baseline concentration levels for those parameters.

There are very few similar studies in Canada or in North America which provide contaminant information from healthy White-tailed Deer populations that can be used as a baseline comparison for this study. It is also difficult to make comparisons at large geographic scales (e.g., outside Ontario or outside of Canada) as different ecological factors and human activities can result in different contaminant concentrations between populations. Accordingly, New Gold will use the 2016 data as baseline data for comparisons of concentration levels in deer tissue in future years (e.g., after operations have commenced and post-closure), rather than relying on comparisons to contaminant concentration levels in other studies.

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1.0 INTRODUCTION

1.1 Project Background

New Gold Inc. (New Gold) is currently operating an open pit gold mine producing doré bars (gold with silver) for sale. Construction of the underground gold mine is in progress, with future plans to reclaim both the open pit and underground operational areas (Figure 1-1).

Physical works related to the RRM consist primarily of:

- Open pit;
- Underground mine (under construction);
- Overburden, mine rock and low-grade ore stockpiles;
- Primary crusher and process plant;
- Tailings management area;
- 230 kilovolt transmission line;
- Relocation of a portion of gravel-surfaced Highway 600; and
- Associated buildings, facilities and infrastructure.

Development of the RRM was initiated in 2015 following completion of the Environmental Assessment process and receipt of applicable environmental approvals. In accordance with the *Canadian Environmental Assessment Act, 2012* (CEAA, 2012) a follow-up monitoring plan was developed to verify the accuracy of the predictions made in the Environmental Assessment about the impacts of the RRM on wildlife and wildlife habitat, and to monitor the effectiveness of rehabilitation efforts for wildlife habitat and terrestrial environments.

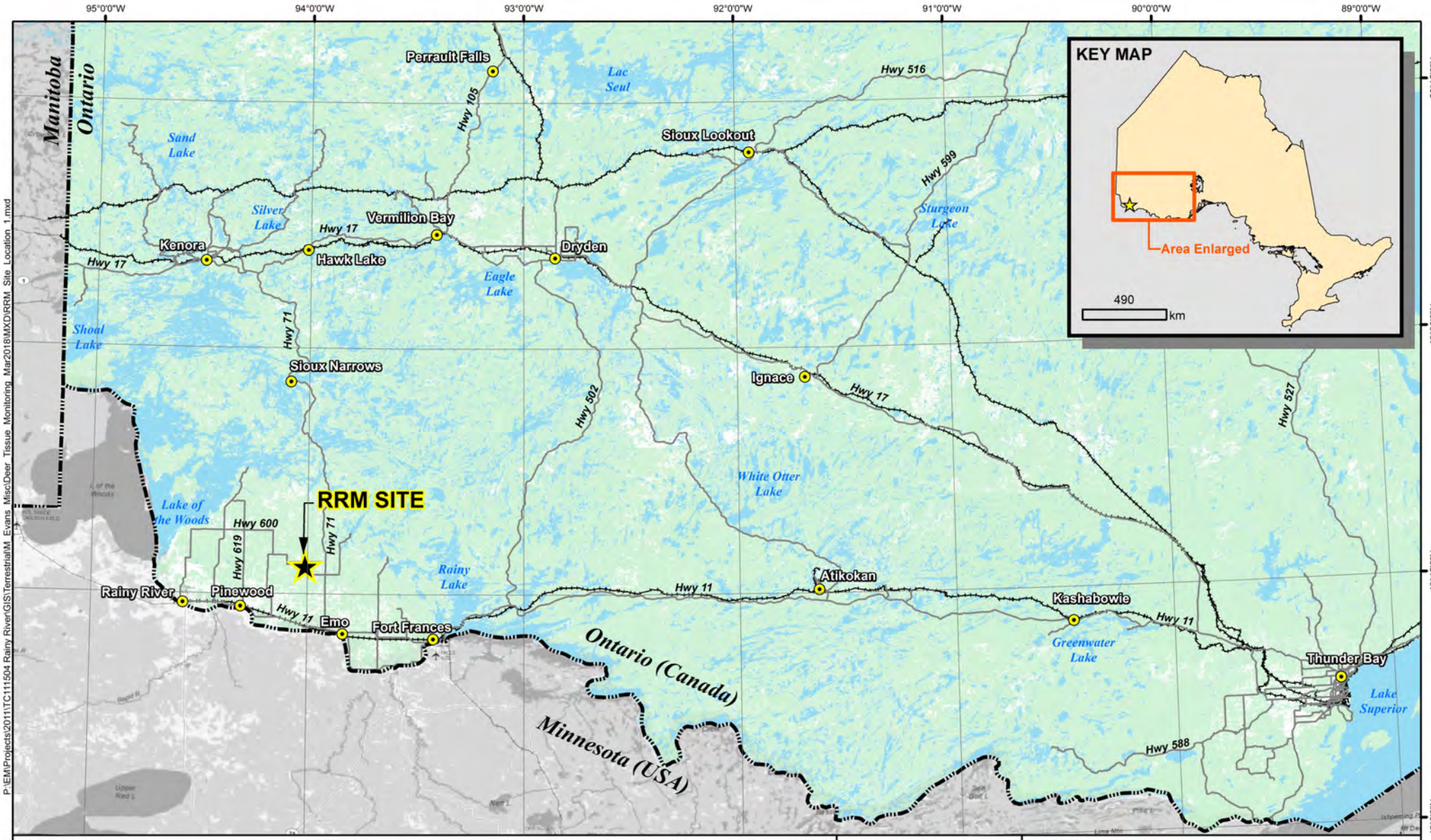
As part of the overall follow-up monitoring plan, and to address concerns that dust from the project will settle on the vegetation deer will be eating (and thus carry the contaminants up the food chain) New Gold RRM committed to a White-tailed Deer (*Odocoileus virginianus*) tissue and organ sampling program. This program will determine exposure and ecological risk to wildlife from mine-related contaminants and confirm the low risks to humans that consume local wildlife.

1.2 Objective and Scope

Metals such as cadmium, copper and zinc are naturally-occurring in the environment but may also be released to the environment in an enhanced manner through anthropogenic activities. Plant-eating animals, such as deer, are susceptible to ingesting unnaturally high levels of contaminants by feeding in areas exposed to industrial activities. Plants can absorb metals from soil or become coated by microscopic airborne contaminants from dust and industrial emissions. Airborne contaminants can be carried long distances by winds before they are deposited at ground level, while dust generated along roads tends to remain more localized. This dust may have a more concentrated effect on nearby plants, and subsequently, on the animals that consume these plants. Both of these sources of contaminants have the potential to harm the

health of the animals that consume affected plants, as well as potentially the health of humans who consume these animals.

Preliminary results of the tissue sampling for the White-tailed Deer population located to close to the RRM are presented in this report. These data have been compared to the 2016 study results to aid in determining exposure and ecological risk to local wildlife from mine-related contaminants and assessing the risks to humans that consume local wildlife if any.



P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\M. Evans Misc\Deer Tissue Monitoring Mar2018\MXD\RRM Site Location 1.mxd

LEGEND

- RRM Site
- Regional Communities
- Provincial / National Border
- Regional Road / Highway
- Railway

0 25 50 100 150 200 250 Kilometres

NOTES:
- Ontario base data extracted from Land Information Ontario (MNR) data warehouse, Queen's Printer for Ontario, 2011-2012
- Base data outside of Ontario extracted from ESRI DeLorme World Basemap

Datum: NAD83
Projection: UTM Zone 15N

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Project Site Location

PROJECT N°: TC111504	**FIGURE: 1-1**
SCALE: 1:1,800,000	DATE: June 2018

2.0 METHODOLOGY

2.1 Sample Collection

A tissue collection program was developed by New Gold in 2016 to test for metal and cyanide concentrations in White-tailed Deer. Sampling kits were provided to interested parties in 2016. Sampling kits were again distributed to interested parties during the 2017 deer hunting season to collect liver and muscle tissue samples from hunters on a voluntary basis. Tissues were also sampled from three deer that died in vehicle collisions (D004, D009, and D027) and liver tissue only was sampled from one deer which died in an unknown manner (D028; a pile of viscera was found just north of the RRM on Richardson Road). There was no harvesting of deer solely for the purpose of this program to the knowledge of New Gold RRM. Tissue and organ samples were collected from 36 deer at harvest locations shown in Figure 2-1.

Detailed information about each animal the samples were collected from was collected, including:

- Date harvested;
- Weather;
- Name and contact details of sample provider;
- Location of harvest;
- Tag number;
- Deer sex, age and physical condition;
- Time of harvest and time of sample collection;
- Type of harvest (firearm or crossbow);
- Location of shot (injury); and
- Any additional comments.

Table 2-1 provides the sample identification number with the relevant sex, age and type of harvest for the specimens described in this report.

2.2 Analyses

Construction of the RRM began in the winter of 2015, and operations and production started in mid-2017. Consequently, the 2017 data presented in this report represent early operational data levels for the local deer population. The 2017 data will be compared herein to the baseline data levels collected in 2016. Tissue and organ sample collection will be conducted again in 2018, and then planned for every three years through the operations phase until the closure of the RRM. If contaminant levels are found to increase problematically, the frequency of the program will be changed to annual sampling and mitigation measure will be determined and implemented. The results of these future sampling periods will also be compared to the 2016 baseline levels.

400000 410000 420000 430000 440000 450000

5450000 5440000 5430000 5420000 5410000 5400000 5390000 5380000

MAP OVERVIEW

ENLARGED AREA

50 Km

D001
D002
D003
D004
D005
D006
D007
D008
D009
D010
D011
D012
D013
D014
D015
D016
D017
D018
D019
D020
D021
D022
D023
D024
D025
D026
D027
D028
D029
D030
D031
D032
D033
D034
D035
D036

HIGHWAY 621
HIGHWAY 619
HIGHWAY 600
HIGHWAY 617
HIGHWAY 71
HIGHWAY 615
HIGHWAY 613
HIGHWAY 11
HIGHWAY 11 & 71

CANADA
UNITED STATES

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\M_Evans_Misc\Deer_Tissue_Monitoring_Mar2018\MXD\Deer_Tissure_Sampling_Locations_2.mxd

LEGEND

- 2017 Deer Tissue Sampling Locations
- Approximate Principal RRM Facilities
- Highway
- Local Road
- Resource / Recreation Road
- Provincial Border

NOTES:
- Imagery extracted from ESRI.
- Road data extracted from Land Information Ontario, Ontario Road Network, MNRF

Datum: NAD83
Projection: UTM Zone 15N

0 2.5 5 10 15 20 25 30 Kilometres

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2017 Deer Tissue Sampling Locations

PROJECT N°: TC111504	**FIGURE: 2-1**
SCALE: 1:230,000	DATE: June 2018

Table 2-1: White-tailed Deer Tissue Collection Data

Sample ID	Sex	Age	Type of Harvest
D001	Male	Unknown	Shot - Unknown
D002	Male	Adult	Shot - Unknown
D003	Male	Adult	Firearm
D004	Male	Fawn	Vehicle
D005	Male	Adult	Firearm
D006	Male	Adult	Firearm
D007	Male	Adult	Firearm
D008	Male	Adult	Bow
D009	Male	Fawn	Vehicle
D010	Male	Yearling	Firearm
D011	Female	Adult	Firearm
D012	Male	Yearling	Firearm
D013	Female	Adult	Firearm
D014	Female	Adult	Bow
D015	Male	Adult	Firearm
D016	Male	Adult	Firearm
D017	Female	Adult	Firearm
D018	Male	Adult	Firearm
D019	Male	Adult	Firearm
D020	Male	Adult	Firearm
D021	Female	Adult	Bow
D022	Male	Yearling	Firearm
D023	Male	Fawn	Firearm
D024	Female	Adult	Shot - Unknown
D025	Male	Adult	Firearm
D026	Male	Adult	Firearm
D027	Male	Adult	Vehicle
D028	Unknown	Unknown	Unknown
D029	Female	Unknown	Bow
D030	Male	Adult	Firearm
D031	Male	Yearling	Firearm
D032	Male	Adult	Firearm
D033	Male	Adult	Firearm
D034	Female	Yearling	Firearm
D035	Female	Adult	Firearm
D036	Male	Adult	Firearm

2.3.1 Chemical Analyses

Deer tissue and organ samples were sent to ALS Environmental Labs in Mississauga, Ontario for metal and cyanide analysis. Liver samples were analyzed for a suite of metals and muscle tissue was analyzed for cyanide. All metals other than mercury were tested for using an Inductively Coupled Plasma Mass Spectrometry (ICPMS) test (wet). Mercury was tested for using a Cold Vapour Atomic Fluorescence Spectroscopy (CVAFS) test (wet). The tests for metals were conducted following the British Columbia Lab Manual method described in *Metals in Animal Tissue and Vegetation (Biota) – Prescriptive*. Tissues samples were homogenized and sub-sampled prior to hotblock digestion with nitric acid, hydrochloric acid and hydrogen peroxide. For the ICPMS, analysis was by collision cell inductively coupled plasma – mass spectrometry, modified from United States Environmental Protection Agency (US EPA) Method 6020A. The CVAFS analysis uses atomic fluorescence spectrophotometry or atomic absorption spectrophotometry, adapted from US EPA Method 245.7.

2.3.2 Statistical Analyses

Low concentrations of contaminants cannot always be precisely measured. Concentrations that are too low to be measured are said to be below the Lowest Detection Limit (LDL) and as such range from 0 to the LDL value itself. In statistical analyses these values are often substituted with a constant value such as the LDL, half of the LDL, or 0. For the purposes of this study, concentrations that were below the LDL were assumed to be 0.

Statistics were calculated using Systat 13® software. Descriptive statistics, such as mean, maximum, minimum, median, and standard deviation values were calculated for each potential contaminant analyzed in this study. Descriptive statistics of skewness and kurtosis were used to assess data normality. Log-transformations were unsuccessful in normalizing the data sets. Consequently, non-parametric statistical testing was used. The Spearman correlation analysis was completed to determine the strength and direction of the relationship between the analyte concentration and the distance from the RRM, expressed as the Spearman Rho statistic (r_s). The Spearman correlation analysis was selected since there is no requirement for normality. The r_s absolute values range between 0 and 1, whereby the closer the r_s is to 0, the weaker the relationship. Directionality of the relationship is inferred by either a positive or negative r_s. Consequently, an increase in the contaminant concentration with increased distance from the RRM would be expressed as a positive r_s, while a decrease in concentration of a contaminant with increased distance from the RRM would be expressed as a negative r_s. The following distinctions between r_s ranges were used in this study to describe the strength of the relationship between the analyte and the distance from the RRM:

r_s = 0.00-0.19 indicates a very weak relationship;
r_s = 0.20-0.39 indicates a weak relationship;
r_s = 0.40-0.59 indicates a moderate relationship;
r_s = 0.60-0.79 indicates a strong relationship; and
r_s = 0.80-1.0 indicates a very strong relationship.

No test for significance was performed on the r_s values since all of the relationships between analyte and distance from the RRM were interpreted as very weak or weak.

The nonparametric Kruskall-Wallis test was completed to compare the 2017 parameter concentrations with those recorded in 2016 ($P<0.05$).

3.0 RESULTS

Raw data for each contaminant and each sample as analyzed by ALS Environmental Labs are presented in Appendix A.

3.1 Sample Collection

Due to the nature of the study (e.g., samples were provided voluntarily by hunters) there was no control over the locations, or the distribution of locations, from which the 36 deer samples were collected. Many of the animals were harvested within 20 km of the RRM boundary and are distributed in a useful pattern for analysing distances from the RRM boundary:

- 14% of the samples were collected within 5 km of the boundary;
- 58% were collected within 10 km; and
- 75% were collected within 20 km of the boundary.

More distant samples were taken between 21 km and 37 km from the Project boundary as well as the furthest sample which was taken approximately 335 km from the Project boundary.

Samples D019 and D030 were harvested near mineral troughs for cattle, and in many cases in the results below, D019 and D030 have elevated concentrations; it is possible that the source of these elevated concentrations is from foraging in the cattle mineral troughs.

3.2 Concentrations of Contaminants

Most the potential contaminants tested were detected in the tissue samples (Table 3-1). The exceptions were beryllium and bismuth, which were below the LDL for all of the 2017 samples analyzed. On average, 34.3% of the samples fell below the LDL for the potential pollutants tested.

Descriptive statistics are presented in Table 3-1, with the mean, median, maximum, minimum, standard error (SE), standard deviation (SD), skewness, and kurtosis for each of the potential contaminants. Approximately 30.3% of the datasets did not conform to the assumptions of normality and attempts at log transformations were unsuccessful at normalizing these data. Consequently, non-parametric testing was used to assess relationships within and between datasets. Figure 3-1 illustrates potential contaminant concentrations found in the 36 deer samples from the RRM The samples have been plotted relative to the distance between the deer tissue

harvest location (Figure 2-1) and the boundary of the RRM. The relationship between contaminant concentration and distance to the RRM is discussed in Section 3.2.

Slightly more than one third (36.4%) of the potential contaminants differed significantly ($P<0.05$) from their 2016 baseline concentrations (Table 3-2). The small sample sizes (n=38 in 2016 and n=36 in 2017) and lack of baseline metal contamination values for White-tailed Deer in literature make it difficult to clearly demonstrate expected normal values. Trends in contaminant concentration levels will become clearer as more data are collected in subsequent years.

A comparison between the 2016 and 2017 contaminant concentrations revealed that approximately 37% of the 2017 parameter concentrations differed significantly ($P<0.05$) from the baseline concentrations measured in 2016 (Table 3-2). Concentrations of arsenic, bismuth, cesium, copper, lithium, mercury, nickel, rubidium, selenium, strontium, and cyanide concentrations were significantly lower in the tissue samples compared with the 2016 baseline concentrations for those analytes. Only sodium concentrations were significantly higher than the 2016 baseline concentrations. With limited samples (n=38 in 2016 and n=36 in 2017) resulting in large variations, any inferences to causation would be speculative. As mentioned above, trends are expected to become established with the collection of more data during subsequent sampling rounds.

The results for each contaminant are discussed briefly below with a brief comparison to 2016 baseline data.

Aluminum

Aluminum is the most abundant metal in the earth's crust and is found commonly in bedrock and unconsolidated surficial sediments/soil as well as groundwater and can be introduced into the environment by burning coal (United States Department of the Interior 2016; Agency for Toxic Substances and Disease Registry 2017). Aluminum is found to be locally elevated naturally in surface water both on and off the RRM site (personal communication with Nathan Baird).

Aluminum has a LDL of 0.40 milligrams per kilogram wet weight (mg/kg ww). Most of the 2017 values for this metal in deer tissues for the RRM study were near the LDL for aluminum, with 61.1% of the samples having non-detectable levels (the value is less than the LDL). The highest aluminum concentrations are 2.63 mg/kg ww, 3.63 mg/kg ww and 4.22 mg/kg ww from samples D018, D028 and D020, respectively.

Results of the Kruskal-Wallis test indicate that aluminum concentrations did not differ significantly between 2016 and 2017 deer tissue samples ($P=0.447$).

Antimony

Antimony is naturally present in the earth's crust in bedrock, soil and waterbodies (i.e., lakes and rivers) although it is generally found in low concentrations (Agency for Toxic Substances and

Disease Registry 2017; United States Department of the Interior 2016). Antimony can also enter the environment through various human activities including: coal-fired power plants, copper smelters and inorganic chemical plants (CCREM nd).

Antimony has a LDL of 0.002 mg/kg ww and most of the samples contained concentrations of this element at or below the LDL (i.e., 88.9% less than the LDL). The remainder of the concentrations in the samples ranged from 0.0025 mg/kg ww to 0.0061 mg/kg ww which are considered to be low (close to the LDL).

Results of the Kruskal-Wallis test indicate that antimony concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.075).

Arsenic

Arsenic is a widely distributed element found naturally in the earth's crust in soil and minerals and the largest natural source of arsenic entering surface waters is that from weathered rocks and soils (Nriagu 1989 in CCME 2017). Arsenic is used in metallurgical applications, wood preservatives, herbicides, pharmaceutical and glass manufacturing (Government of Canada 1993). As arsenic was historically widely used in pesticides, agricultural areas where it was used can have high levels in soils (United States Department of the Interior 2016; Agency for Toxic Substances and Disease Registry 2017).

The LDL for Arsenic is 0.004 mg/kg ww; 75.0% of the samples in this study had concentrations less than the LDL and the remainder of the concentrations in samples ranged from 0.004 mg/kg ww to 0.022 mg/kg ww. Two samples (D004 and D017) had relatively high concentrations (i.e., within the highest 25th percentile) of 0.0220 mg/kg ww, and 0.0175 mg/kg ww, respectively.

Results of the Kruskal-Wallis test indicate that arsenic concentrations were significantly lower in the 2017 deer tissues samples compared with the 2016 baseline concentrations (P=0.000).

Barium

Barium is found naturally in some rocks and soils, and can be introduced to air and water by natural weathering processes. Some vegetation types are known to accumulate barium. Barium minerals and compounds are widely used in industry. Barium is used as a filler in such anthropogenic substances such as: paint, bricks, glass, rubber and insect / rodent poisons, and could enter the environment from the manufacturing or disposal of these products (United States Department of the Interior 2016; Agency for Toxic Substances and Disease Registry 2017).

All of the deer tissue samples had detectable levels of barium (LDL of 0.01 mg/kg ww), ranging from 0.016 mg/kg ww to 0.105 mg/kg ww. The highest barium concentration values are 0.105 mg/kg ww, 0.082 mg/kg ww, and 0.078 mg/kg ww from samples D019, D020, D001, respectively.

Results of the Kruskal-Wallis test indicate that barium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.452).

Beryllium

Beryllium occurs naturally in some rocks including coal and soil, although generally in low levels in Canada (CCREM nd). Natural weathering of soil and rocks causes it to enter water sources and it can accumulate in some plants. It is also released into the environment when coal or oil are burned or improperly disposed of (United States Department of the Interior 2016; Agency for Toxic Substances and Disease Registry 2017).

There were no 2017 samples with beryllium concentrations above the respective LDL of 0.002 mg/kg ww.

Results of the Kruskal-Wallis test indicate that beryllium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=1.000).

Bismuth

Bismuth is a naturally occurring metal in the earth's crust. Bismuth can be released into soil and water by natural weathering processes (Salminen et al. 2005).

There were no samples with bismuth above the respective LDL of 0.002 mg/kg ww.

Results of the Kruskal-Wallis test indicate that bismuth concentrations were significantly lower in the 2017 deer tissue samples compared with the 2016 baseline concentrations (P=0.000).

Boron

Boron is a widely occurring metal in the earth's crust. Due to the extensive occurrence of boron in clay-rich sediments and sedimentary rocks, most boron found in surface soils and waters results from weathering of natural sources. Boron can accumulate in some plants. Boron is also widely used in fertilizers and pesticides so agricultural areas can have high levels in the soils (Agency for Toxic Substances and Disease Registry 2017).

Boron has a LDL of 0.2 mg/kg ww. Almost half (47.2%) of the tissue samples had non-detectable concentration levels of boron, with the remaining values ranging from 0.21 to 0.35 mg/kg ww.

Results of the Kruskal-Wallis test indicate that boron concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.242).

Cadmium

Cadmium occurs naturally in rocks including coal and petroleum, and can enter water or soil when it is broken down by acidic water such as acid precipitation. Some areas naturally contain elevated concentrations of cadmium in underlying rock, with the spatial variation related to both rock composition and other natural processes. As cadmium is used in such items as batteries, plastics and pesticides (CCME 2017), it can also enter the environment from anthropogenic means including from landfills or incineration. Cadmium is known to accumulate in plants, including agricultural crops although the uptake rates will depend on the plant species (United States Department of the Interior 2016; Agency for Toxic Substances and Disease Registry 2017; CCME 2015).

All of the deer tissue samples had detectable levels of cadmium (LDL of 0.001 mg/kg ww), ranging from 0.0011 mg/kg ww to 1.89 mg/kg ww. The four highest cadmium concentrations reported were 1.89 mg/kg ww (sample D008), 1.59 mg/kg ww (sample D036), 1.2 mg/kg ww (sample D006) and 1.16 mg/kg ww (sample D017).

Results of the Kruskal-Wallis test indicate that cadmium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.087).

Calcium

Calcium is the third most abundant metal in the earth's crust and can be found naturally in rocks, minerals, and in all plants and animals. It is readily soluble in water and as a result, enters the environment through the weathering of rocks, especially limestone (CCREM nd).

All of the deer tissue samples from the RRM had detectable levels of calcium (LDL of 4 mg/kg ww), ranging from 12.7 mg/kg ww to 76.4 mg/kg ww. The lowest concentration of 12.7 mg/kg ww is considerably lower than the rest of the values.

Results of the Kruskal-Wallis test indicate that calcium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.143).

Cesium

Cesium occurs naturally in rocks, soil and mineral and can enter water and air by natural erosion and weathering processes. Anthropogenic sources of cesium include nuclear power plants and other nuclear operations (Agency for Toxic Substances and Disease Registry 2017).

Cesium has a LDL of 0.001 mg/kg ww. All of the samples had detectable levels of cesium, ranging from 0.0024 mg/kg ww to 0.104 mg/kg ww. The maximum result of 0.104 mg/kg ww (D030) is substantially higher than then the next highest concentration detected of 0.73 mg/kg ww (D036).

Results of the Kruskal-Wallis test indicate that cesium concentrations in the 2017 deer tissues were significantly lower compared with the 2016 baseline concentrations (P=0.009).

Chromium

Chromium us a naturally occurring element in rocks, soil, water, air, plants and animals. In rocks and soil, it is generally found as an insoluble oxide (CCME 2017). Anthropogenic sources of chromium in the environment include fossil fuel combustion, cement manufacturing, incineration and from industries such as ferrochromium production and electroplating (United States Department of the Interior 2016; Agency for Toxic Substances and Disease Registry 2017; CCME 2017).

Chromium has a LDL of 0.01 mg/kg ww. Most (i.e., 83.3%) of the deer tissue samples had detectable concentration levels of chromium, with values ranging from 0.01 mg/kg ww to 0.36 mg/kg ww. The highest concentrations of chromium were detected in D017, D018, and D022, with concentrations measuring 0.36 mg/kg ww, 0.31 mg/kg, and 0.33 mg/kg, respectively.

Results of the Kruskal-Wallis test indicate that chromium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.317).

Cobalt

Cobalt occurs naturally in many rock types, and accordingly, is present in soil, water, plants and animals. Anthropogenic sources of cobalt in the environment including coal burning, other industries, fertilizers, and vehicle exhaust (CCREM nd; Agency for Toxic Substances and Disease Registry 2017).

All but two of the deer tissue samples (94.4%) had detectable concentrations of cobalt (LDL of 0.004 mg/kg ww). Concentrations of cobalt in the deer tissue samples ranged from 0.0041 mg/kg ww to 0.0943 mg/kg ww. While most of the samples had similar concentrations of this element, elevated cobalt concentrations were detected in several samples. Samples D013 and D036 exhibited the levels of cobalt in their tissues, with samples reaching concentrations of 0.0943 mg/kg ww and 0.0806 mg/kg ww, respectively.

Results of the Kruskal-Wallis test indicate that cobalt concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.600).

Copper

Copper is a common, naturally occurring metal in rocks and minerals of the earth's crust and is found in surface soil, water, sediments, air, plants and animals. Major industrial sources include copper mining, smelting and refining industries, wire mills, coal-burning industries, and iron- and steel-producing industries (CCREM nd). As well as from industrial discharges and emissions,

copper also enters the environment naturally from decaying plants and forest fires (United States Department of the Interior 2016; Agency for Toxic Substances and Disease Registry 2017).

All of the tissue samples had detectable levels of copper, ranging from 0.574 mg/kg ww to 173 mg/kg ww (LDL of 0.020 mg/kg ww). Only four of the 36 samples (11.1%) had copper concentrations below 4 mg/kg ww (D016, D019, D020, and D032). The highest concentrations measured were from samples D007, D013, and D017, with copper concentrations of 173 mg/kg ww, 101 mg/kg ww, and 100 mg/kg ww, respectively.

Results of the Kruskal-Wallis test indicate that copper concentrations were significantly lower in the 2017 deer tissue samples compared with the 2016 baseline concentrations (P=0.012).

Iron

Iron is a naturally occurring metal found in minerals and is the fourth most abundant element in the earth's crust. It is released into soil and water by the natural weathering of rocks and is commonly present. Iron can also be introduced into the environment from human activities, including from burning of coal, acid mine drainage, mineral processing, landfill leachates, iron-related industries, and the corrosion of iron and steel (CCREM nd).

All of the deer tissue samples from the RRM had detectable levels of iron (i.e., >0.6 mg/kg ww), ranging from 49.3 mg/kg ww to 990 mg/kg ww. The two highest concentrations (871 mg/kg ww and 990 mg/kg ww, samples D019 and D032, respectively) were substantially higher than the next highest value of 396 mg/kg ww (D016).

Results of the Kruskal-Wallis test indicate that iron concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.709).

Lead

Lead is a naturally occurring metal in the earth's crust. Most of the lead in the environment however, comes from human activities rather than the weathering of lead-containing rock (CCREM nd). The historic use of gasoline and pesticides containing lead caused large amounts to enter the environment. Lead binds to soil and will stay in an area for many years. Other sources of lead in the environment are burning fossil fuels, incineration, leaching from plumbing and weathering of paint (Agency for Toxic Substances and Disease Registry 2017).

The LDL for lead is 0.0040 mg/kg ww and 38.9% of the samples had non-detectable levels of lead. The remainder of the results range from 0.0046 mg/kg ww to 0.131 mg/kg ww. The highest lead concentration levels were recorded in samples D002, D011, and D030, with concentrations measuring 0.131 mg/kg ww, 0.0655 mg/kg ww, and 0.0354 mg/kg, respectively

Results of the Kruskal-Wallis test indicate that lead concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.157).

Lithium

Lithium naturally occurs in rocks and can be introduced to water and soils by natural weathering processes. Human activities also introduce lithium into the environment such as through the disposal of batteries, as well as coal combustion and aluminum product production (Salminen et al. 2005; Yalamanchali 2012; CCREM nd). Lithium compounds are readily soluble; and is easily taken up and accumulated in plants (CCREM nd; Yalamanchali 2012; Lenntech 2017).

Lithium has a LDL of 0.10 mg/kg ww. Fifty percent (50%) of the samples had non-detectable levels of lithium. The rest of the sample lead concentrations ranged from 0.11 mg/kg ww to 0.72 mg/kg ww. Four samples contained elevated lithium concentrations. D002, D003, D004, and D010 tissues contained 0.52 mg/kg ww, 0.59 mg/kg ww, 0.53 mg/kg ww, and 0.72 mg/kg ww of lead, respectively.

Results of the Kruskal-Wallis test indicate that lithium concentrations were significantly lower in the 2017 tissue samples compared with the 2016 baseline concentrations (P=0.003).

Magnesium

Magnesium is a common naturally occurring element in the earth's crust and is found in many different rock types, including dolomite which is commonly quarried and used as an aggregate. It is used in a variety of industry applications, including: textiles, paper, refractories, ceramics and fertilizers. Magnesium is considered to be an essential element for all organisms and may be accumulated in in calcareous tissues (CCREM nd).

All of the samples had detectable concentrations (i.e., >0.4 mg/kg ww) of magnesium ranging from 47.3 mg/kg ww to 325 mg/kg ww. The highest concentration of magnesium (325 mg/kg ww; D030) was substantially higher than the next highest concentration detected (205 mg/kg ww; D013). While 97.2% of the samples contained magnesium concentrations above 100 mg/kg ww, one sample (D019) contained only 47.3 mg/kg ww of magnesium in its tissue.

Results of the Kruskal-Wallis test indicate that magnesium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.169).

Manganese

Manganese occurs naturally in mineral form from sediments and rocks, and is taken up and accumulated by some plants. As it is used in the steel and chemical industries, manganese can also be released from emissions and waste disposal (United States Department of the Interior 2016; Agency for Toxic Substances and Disease Registry 2017; CCREM nd).

All of the samples had detectable levels (LDL of 0.010 mg/kg ww) of manganese, ranging from 0.066 mg/kg ww to 4.35 mg/kg ww. D013, D023, and D027 yielded the highest manganese

concentrations in their tissues, with concentrations of 4.05 mg/kg ww, 4.26 mg/kg ww, and 4.35 mg/kg ww, respectively.

Results of the Kruskal-Wallis test indicate that manganese concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.369).

Mercury

Mercury occurs naturally and enters soil, water and air by the weathering of minerals in rocks and soils (Agency for Toxic Substances and Disease Registry 2017). Mercury is also introduced into the environment from anthropogenic usage, including: the pulp and paper manufacture, combustion of coal, and disposal of medical and electrical equipment (Agency for Toxic Substances and Disease Registry 2017; United States Department of the Interior 2016; CCME 2017).

Mercury has a LDL of 0.0010 mg/kg ww. Four samples had non-detectable concentrations (i.e., <0.001 mg/kg ww) and the rest of the samples had concentrations ranging from 0.0014 mg/kg ww to 0.0114 mg/kg ww. The highest concentrations of mercury were detected in D004 and D017, with concentrations of 0.0114 mg/kg ww and 0.0109 mg/kg ww, respectively.

Results of the Kruskal-Wallis test indicate that mercury concentrations were significantly lower in the 2017 tissue samples compared with the 2016 baseline concentrations (P=0.000).

Molybdenum

Molybdenum occurs naturally in rocks, and the weathering of igneous and sedimentary rocks (especially shales) introduces molybdenum to the environment naturally. Molybdenum can also be released into the environment by combustion of fossil fuels and through waste products of industries using molybdenum (CCME 2017).

All of the samples in this study had detectable levels of molybdenum (LDL of 0.0040 mg/kg ww); with concentrations ranging from 0.0104 mg/kg ww to 0.866 mg/kg ww. Four samples contained molybdenum concentrations exceeding 0.8 mg/kg ww. D023, D024, D034, and D035 had molybdenum concentrations measuring 0.825 mg/kg ww, 0.81 mg/kg ww, 0.845 mg/kg ww, and 0.866 mg/kg ww, respectively.

Results of the Kruskal-Wallis test indicate that molybdenum concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.556).

Nickel

Nickel is mined commercially in Canada including in Ontario. Nickel is found naturally in soils and water through the weathering of bedrock and can accumulate in plants. Human activities such as such as burning fossil fuels can also cause nickel to be introduced into the environment, as well

as waste from nickel industries such as electroplating, stainless steel and alloy production (Agency for Toxic Substances and Disease Registry 2017; United States Department of the Interior 2016).

Most (86.1%) of the tissue samples had nickel concentrations below the LDL of 0.040 mg/kg ww. The remainder of the samples had nickel concentrations ranging from 0.045 mg/kg ww to 0.076 mg/kg ww. Of the 36 samples, only D026 (0.076 mg/kg ww) was within the top 25% of the nickel concentrations measured.

Results of the Kruskal-Wallis test indicate that nickel concentrations were significantly lower in the 2017 tissue samples compared with the 2016 baseline concentrations (P=0.040).

Phosphorus

Phosphorus can be released into soil and water by natural weathering process of native bedrock, and is actively taken up by plants. Decomposition of these plants is another source of phosphorus to the environment, as well as such anthropogenic sources as fertilizers, pesticides and detergents (Lenntech 2017).

Phosphorus has a LDL of 2.0 mg/kg ww. All of the tissue samples had detectable levels of phosphorus ranging from 671 mg/kg ww to 4530 mg/kg ww. The minimum concentration of 671 mg/kg ww (D019) is substantially lower than the next lowest concentration of 1580 mg/kg ww.

Results of the Kruskal-Wallis test indicate that phosphorus concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.754).

Potassium

Potassium is found in nature as a mineral and is released into the environment by natural weathering processes although it is resistant to weather processes. Potassium is used widely in fertilizers and detergents which can also introduce this element into the environment (Lenntech 2017). Potassium is needed for all life and is found in all plants and animals. This element is readily accumulated (CCREM nd).

All of the deer tissue samples had detectable levels of potassium (LDL of 4.0 mg/kg ww), ranging from 2150 mg/kg ww to 4190 mg/kg ww. The potassium concentrations differed little between the samples and no elevated concentrations were detected.

Results of the Kruskal-Wallis test indicate that potassium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.060).

Rubidium

Rubidium exists naturally in minerals and rocks and enters soil and water by natural weathering processes. Rubidium can also be introduced into the environment due to human activities, such as glass dust, however natural sources are considered more abundant (Salminen et al. 2005).

The LDL of rubidium is 0.010 mg/kg ww. All of the samples had detectable levels of rubidium ranging from 6.59 mg/kg ww to 37.5 mg/kg ww. The highest concentrations of rubidium were detected in D013, D019, D016, and D033, with concentrations measuring 25.4 mg/kg ww, 26 mg/kg ww, 24 mg/kg ww, and 37.5 mg/kg ww, respectively.

Results of the Kruskal-Wallis test indicate that rubidium concentrations were significantly lower in the 2017 tissue samples compared with the 2016 baseline concentrations (P=0.017).

Selenium

Selenium occurs naturally in rocks and soils, is easily taken up by plants, and can be introduced to the water and air by natural weathering processes and volcanic activity (CCREM nd). Selenium can also be released into the environment by the burning of coal and oil (Agency for Toxic Substances and Disease Registry 2017).

Selenium (LDL of 0.010 mg/kg ww) was detected in all of the samples, with concentrations ranging from 0.135 mg/kg ww to 1.85 mg/kg ww. The highest concentrations of selenium were detected in D007, D010, and D017 (1.85 mg/kg ww, 1.06 mg/kg ww, and 1.12 mg/kg ww, respectively).

Results of the Kruskal-Wallis test indicate that selenium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.000).

Sodium

Sodium exists naturally exists in the earth's crust, including as sodium chloride (salt) deposits. It is released into soils and waterbodies by weathering and leaching. Anthropogenic products and use in snow and ice control (sodium chloride) can also introduce sodium into the environment (United States Department of the Interior 2016; CCREM nd).

Sodium has a LDL of 4.0 mg/kg ww. All of the samples had detectable levels of sodium which ranged from 352 mg/kg ww to 1,510 mg/kg ww. The highest sodium concentrations were measured in D009, D021, D022, and D027, with sodium levels of 1,200 mg/kg ww, 1,510 mg, kg ww, 1,230 mg/kg ww, and 1,260 mg/kg ww.

Results of the Kruskal-Wallis test indicate that sodium concentrations were significantly higher in the 2017 tissue samples compared with the 2016 baseline concentration (P=0.048).

Strontium

Strontium is found in nature through the weathering of native rocks, and can accumulate in many plants. Strontium can be introduced into the environment by burning coal and oil (Agency for Toxic Substances and Disease Registry 2017).

Strontium has a LDL of 0.010 mg/kg ww. All samples had detectable levels of strontium, with concentrations ranging from 0.011 mg/kg ww to 0.317 mg/kg ww. The maximum value (0.317 mg/kg ww) was substantially higher than the rest of the sample values.

Results of the Kruskal-Wallis test indicate that strontium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.012).

Tellurium

Tellurium exist naturally in coal and minerals though is quite rare (Lenntech 2017). Natural weathering processes introduce tellurium into soils (Salminen et al. 2005) from where it is taken up readily by plants (Lenntech 2017). Tellurium can be introduced into the environment as a by-product of copper and lead refining (P S Analytical 2015).

Tellurium has a LDL of 0.0040 mg/kg ww and all of the samples in this study were below this concentration level.

Results of the Kruskal-Wallis test indicate that tellurium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=1.000).

Thallium

Thallium has a LDL of 0.00040 mg/kg ww. Over half (55.5%) of the samples had non-detectable thallium concentration levels. Concentration levels measured in the rest of the samples ranged from 0.00042 mg/kg ww to 0.00172 mg/kg ww. The maximum concentration of 0.00172 mg/kg ww (D030) is substantially higher than the rest of the sample concentrations.

Results of the Kruskall-Wallis test indicate that thallium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.117).

Thallium is found naturally in soils, air and water as a result of weathering of native rocks, and is readily taken up by plants (Agency for Toxic Substances and Disease Registry 2017).

Tin

Tin also is found naturally in soil, air and water, and can be released to the environment from industrial discharges, steel manufacturing and municipal sewage as well as other anthropogenic sources (CCREM nd).

Tin has a LDL of 0.020 mg/kg ww. Seventy-two percent (72.2%) of the samples had non-detectable tin concentration levels. The concentrations of the remaining samples ranged from 0.022 mg/kg ww to 0.075 mg/kg ww. Two samples (D026 and D030) contributed to the top 25th percentile of the sample set, with concentrations of 0.05 mg/kg ww, and 0.075 mg/kg ww, respectively.

Results of the Kruskal-Wallis test indicate that tin concentrations were significantly lower in the 2017 tissue samples compared with the 2016 baseline concentrations (P=0.005).

Uranium

Uranium naturally occurs in rocks and can be readily mobilized by weathering and natural erosion (CCME 2017).

Uranium accumulates in plants, especially in the roots Uranium has a LDL of 0.00040 mg/kg ww. Four samples (11.1%) had detectable uranium concentration levels ranging from 0.00060 mg/kg ww to 0.00457 mg/kg ww. Only one sample (D026) contributed to the top 25th percentile of uranium concentrations, with 0.00457 mg/kg ww of uranium detected.

Results of the Kruskal-Wallis test indicate that uranium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.326).

Vanadium

Vanadium is naturally occurring element present in the earth's crust in abundance, particularly with basic igneous rocks. It is released to soils, water and air by weathering processes. Anthropogenic sources of vanadium include air borne particles from oil and coal combustion, and steel production (CCREM nd).

Vanadium has a LDL of 0.020 mg/kg ww. Fifty-eight percent (58.3%) of the samples had non-detectable vanadium concentration levels and the rest ranged from 0.022 mg/kg ww to 0.236 mg/kg ww. Notably, the two highest concentration levels (0.202 mg/kg ww and 0.236 mg/kg ww) are substantially higher than the next highest concentration level (0.113 mg/kg ww).

Results of the Kruskal-Wallis test indicate that vanadium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.218).

Zinc

Zinc is a common element in the earth's crust. It is mined and refined in Canada and has many of industrial uses. Anthropogenic sources of zinc release to the environment include burning of coal, fertilizer use and steel production (Agency for Toxic Substances and Disease Registry 2017). Zinc is an essential element, and is easily taken up by plants.

All of the deer tissue samples had detectable levels of zinc ranging from 6.22 mg/kg ww to 50.4 mg/kg ww. Zinc concentrations were notably lower in D019 and D031 than the rest of the samples (6.22 mg/kg ww and 11 mg/kg ww, respectively). The remaining concentrations were relatively similar between the samples.

Results of the Kruskal-Wallis test indicate that zinc concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.918).

Zirconium

Zirconium is present naturally in minerals and rocks, although the most common form is resistant to weathering so it is not often introduced into soils and therefore not often taken up by plants (Lenntech 2017). Zirconium can also be introduced into the environment due to human activities; however, natural sources are considered more abundant (Salminen et al. 2005).

Zirconium has an LDL of 0.040 mg/kg ww. Only two samples (5.6%), D031 and D030, had detectable concentration levels (0.053 mg/kg ww and 0.055 mg/kg ww, respectively).

Results of the Kruskal-Wallis test indicate that zirconium concentrations did not differ significantly between 2016 and 2017 deer tissue samples (P=0.143).

Cyanide

Cyanide is group of organic compounds that can be found naturally in the environment or introduced through anthropogenic means. Some micro-organisms (bacteria, fungi and algae) produce cyanide and it is also found naturally in some plants such as soy and released to the environment during decomposition. Cyanide can also be introduced into the environment from industrial processes and effluent, including from gold processing plants; as well as from landfills, public wastewater treatment plants, and some pesticides (Agency for Toxic Substances and Disease Registry 2017; United States Department of the Interior 2016).

Cyanide has a LDL of 0.10 mg/kg ww and in 2017 only one sample (3.3%) had a detectable concentration level of 0.11 mg/kg ww. This value is considered low as it is very close to the LDL.

Results of the Kruskal-Wallis test indicate that cyanide concentrations were significantly lower in the 2017 tissue samples compared with the 2016 baseline concentrations (P=0.000).

Comparison of Results to Distance of Harvest from the Project Boundary

The concentration of contaminants relative to the distance between the deer tissue harvest location (shown in Figure 2-1) and the boundary of the RRM are presented in Table 3-3 and Figure 3-1. These data are presented to illustrate early patterns between potential contaminant concentration levels in deer tissue and proximity to the RRM. Interestingly, the number of analytes that showed decreasing concentrations with increasing distance from the RRM was the same as

the number of analytes that showed increasing concentrations with increasing distance from the RRM. However, as seen in Table 3-3 and in the various graphs in Figure 3-1, none of the contaminants exhibited a strong relationship between concentration levels and proximity to the RRM boundary. No test for significance was performed on the r_s values since all of the relationships between analyte and distance from the RRM were interpreted as very weak or weak.

Within most of the potential contaminant concentration datasets there exists a high degree of variability. The standard deviations calculated for the potential contaminants sampled in 2017 ranged from 0.00 mg/kg ww to 737 mg/kg ww. The low sample size (n=36) is a likely contributor to the high degree of variation detected in the datasets. With subsequently sampling rounds, it is anticipated that between year data can be pooled for each of the potential contaminants, resulting in a more robust dataset from which to observe statistical trends.

Table 3-1: Measured Contaminants in White-tailed Deer Samples in 2017 (n=36)

Contaminant	Mean	Median	Minimum	Maximum	SE[1]	SD[2]	Kurtosis[3]	Skewness[3]
	(mg/kg ww)	(mg/kg ww)	(mg/kg ww)	(mg/kg ww)	(mg/kg ww)	(mg/kg ww)		
Aluminum	0.5244	0.0000	0.0000	4.2200	0.1723	1.0336	5.99	2.54
Antimony	0.0004	0.0000	0.0000	0.0061	0.0002	0.0013	12.38	3.43
Arsenic	0.0021	0.0000	0.0000	0.0220	0.0009	0.0051	7.61	2.79
Barium	**0.0438**	**0.0420**	**0.0160**	**0.1050**	**0.0036**	**0.0216**	**0.33**	**0.87**
Beryllium	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	-
Bismuth	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	-
Boron	**0.1419**	**0.2150**	**0.0000**	**0.3500**	**0.0232**	**0.1392**	**-1.93**	**0.02**
Cadmium	0.4209	0.2815	0.0011	1.8900	0.0745	0.4468	3.11	1.75
Calcium	51.4417	49.5500	12.7000	76.4000	1.8199	10.9196	4.27	-0.59
Cesium	0.0207	0.0144	0.0024	0.1040	0.0035	0.0212	6.54	2.43
Chromium	**0.0745**	**0.0335**	**0.0000**	**0.3600**	**0.0170**	**0.1022**	**1.90**	**1.77**
Cobalt	**0.0498**	**0.0527**	**0.0000**	**0.0943**	**0.0041**	**0.0248**	**-0.28**	**-0.62**
Copper	**56.2337**	**58.0000**	**0.5740**	**173.0000**	**6.2652**	**37.5910**	**1.13**	**0.60**
Iron	193.0722	141.0000	49.3000	990.0000	32.1865	193.1192	11.79	3.41
Lead	0.0126	0.0055	0.0000	0.1310	0.0040	0.0241	17.28	3.87
Lithium	0.1378	0.0550	0.0000	0.7200	0.0318	0.1906	2.14	1.63
Magnesium	168.6750	171.5000	47.3000	325.0000	6.3584	38.1505	10.06	0.99
Manganese	**2.4550**	**2.6300**	**0.0660**	**4.3500**	**0.2064**	**1.2386**	**-0.75**	**-0.51**
Mercury	0.0033	0.0028	0.0000	0.0114	0.0005	0.0027	2.50	1.54
Molybdenum	**0.3881**	**0.3700**	**0.0104**	**0.8660**	**0.0469**	**0.2813**	**-1.38**	**0.26**
Nickel	0.0084	0.0000	0.0000	0.0760	0.0036	0.0217	4.28	2.38
Phosphorus	3451.4167	3645.0000	671.0000	4530.0000	122.8836	737.3014	5.52	-2.06
Potassium	**2937.2222**	**2920.0000**	**2150.0000**	**4190.0000**	**73.0966**	**438.5796**	**0.68**	**0.56**
Rubidium	14.1756	13.4000	6.5900	37.5000	1.0803	6.4821	3.65	1.61
Selenium	0.5452	0.4410	0.1350	1.8500	0.0555	0.3331	5.62	2.00
Sodium	**900.4167**	**867.0000**	**352.0000**	**1510.0000**	**38.3644**	**230.1863**	**0.79**	**0.18**
Strontium	0.0518	0.0380	0.0110	0.3170	0.0089	0.0532	18.54	4.02
Tellurium	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	-
Thallium	0.0003	0.0000	0.0000	0.0017	0.0001	0.0004	3.76	1.61
Tin	0.0104	0.0000	0.0000	0.0750	0.0032	0.0190	2.91	1.84
Uranium	0.0002	0.0000	0.0000	0.0046	0.0001	0.0009	20.11	4.35
Vanadium	0.0307	0.0000	0.0000	0.2360	0.0093	0.0556	6.42	2.49
Zinc	**31.5728**	**31.3500**	**6.2200**	**50.4000**	**1.7505**	**10.5032**	**0.01**	**-0.15**

Zirconium	0.0030	0.0000	0.0000	0.0550	0.0021	0.0125	15.29	4.05
Cyanide	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-	-

Notes:

[1]SE – Standard Error

[2]SD – Standard Deviation

[3]The values for asymmetry and kurtosis between -2 and +2 are considered acceptable in order to prove normal univariate distribution (George & Mallery, 2010).

Table 3-2: Comparison between 2016 and 2017 Contaminant Concentrations

Contaminant	2016 Mean (mg/kg ww)	2017 Mean (mg/kg ww)	K-W[1] Statistic	P-Value[2]
Aluminum	0.9784	0.5244	0.58	0.447
Antimony	0.0104	0.0004	3.17	0.075
Arsenic	**0.0118**	**0.0021**	**30.85**	**0.000**
Barium	0.0444	0.0438	0.57	0.452
Beryllium	0.0000	0.0000	0.00	1.000
Bismuth	**0.0010**	**0.0000**	**10.73**	**0.001**
Boron	0.1918	0.1419	1.37	0.242
Cadmium	0.5391	0.4209	2.92	0.087
Calcium	50.6026	51.4417	2.15	0.143
Cesium	**0.0479**	**0.0207**	**6.79**	**0.009**
Chromium	0.1391	0.0745	1.00	0.317
Cobalt	0.0505	0.0498	0.28	0.600
Copper	**80.8266**	**56.2337**	**6.32**	**0.012**
Iron	160.3842	193.0722	0.14	0.709
Lead	1.1385	0.0126	2.00	0.157
Lithium	**0.2516**	**0.1378**	**8.79**	**0.003**
Magnesium	161.2000	168.6750	1.89	0.169
Manganese	2.2904	2.4550	0.81	0.369
Mercury	**0.0085**	**0.0033**	**13.89**	**0.000**
Molybdenum	0.3488	0.3881	0.35	0.556
Nickel	**0.0710**	**0.0084**	**4.22**	**0.040**
Phosphorus	3488.7632	3451.4167	0.10	0.754
Potassium	2737.1053	2937.2222	3.54	0.060
Rubidium	**17.9661**	**14.1756**	**5.74**	**0.017**
Selenium	**0.8755**	**0.5452**	**12.13**	**0.000**
Sodium	814.3421	900.4167	3.90	0.048

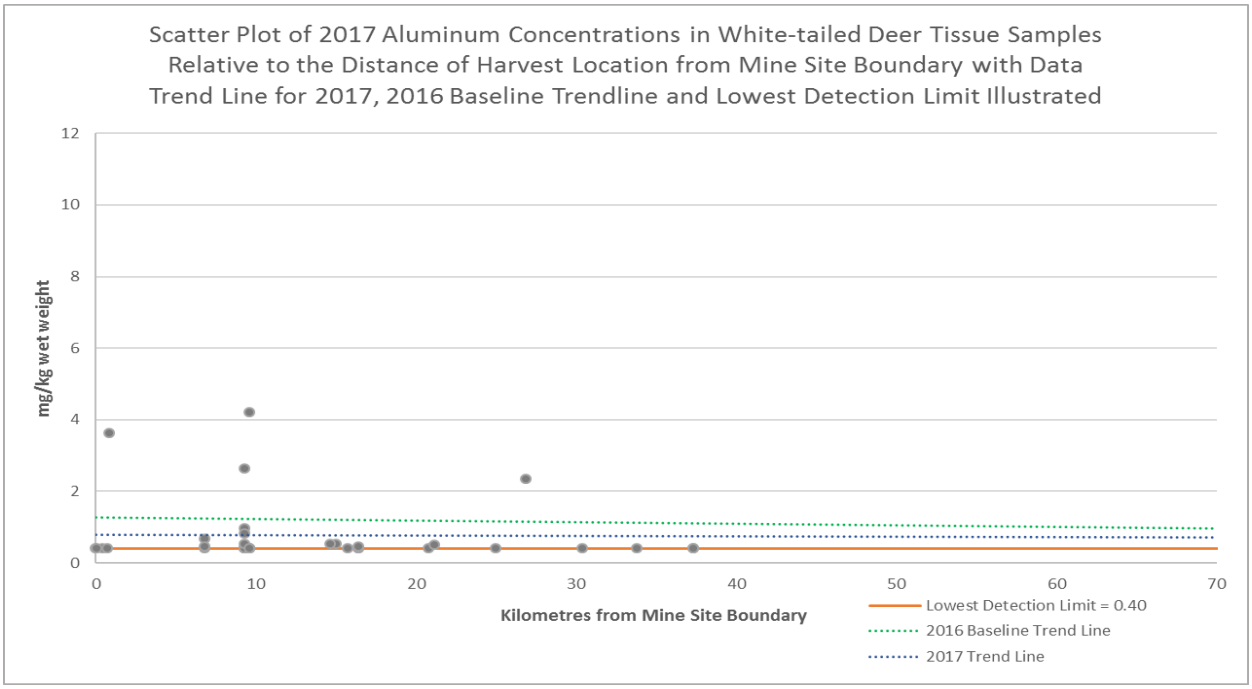
Table 3-2: Comparison between 2016 and 2017 Contaminant Concentrations (continued)

Contaminant	2016 Mean (mg/kg ww)	2017 Mean (mg/kg ww)	K-W[1] Statistic	P-Value[2]
Strontium	**0.0328**	**0.0518**	**6.25**	**0.012**
Tellurium	0.0000	0.0000	0.00	1.000
Thallium	0.0005	0.0003	2.46	0.117
Tin	**0.0241**	**0.0104**	**8.02**	**0.005**
Uranium	0.0000	0.0002	0.97	0.326
Vanadium	0.0345	0.0307	1.52	0.218
Zinc	32.1711	31.5728	0.01	0.918
Zirconium	0.0000	0.0030	2.14	0.143
Cyanide	**0.1779**	**0.0000**	**41.30**	**0.000**

Notes:
[1]K-W is the Kruskall-Wallis statististic, calculated, where the degrees of freedom is 1.
[2] Significance was assigned at P<0.05.
Bold values indicate significant differences between the 2016 and 2017 contaminant concentrations

Table 3-3: Relationship between Contaminant Concentration and Distance from Rainy River Mine for Samples Collected in 2017

Contaminant	Spearman Rho (r_s)
Aluminum	-0.039
Antimony	0.352
Arsenic	0.192
Barium	0.276
Berylium	-
Bismuth	-
Boron	0.134
Cadmium	-0.077
Calcium	-0.353
Cesium	0.26
Chromite	-0.218
Cobalt	-0.014
Copper	-0.092
Iron	-0.135
Lead	0.358
Lithium	0.034
Magnesium	0.132
Manganese	0.039
Mercury	-0.106
Molybdenum	-0.129
Nickel	-0.081
Phosphorus	-0.015
Potassium	0.022
Rubidium	0.017
Selenium	-0.189
Sodium	-0.105
Strontium	0.134
Tellurium	-
Thallium	-0.043
Tin	-0.137
Uranium	0.002
Vanadium	-0.047
Zinc	-0.054
Zirconium	0.076
Cyanide	-



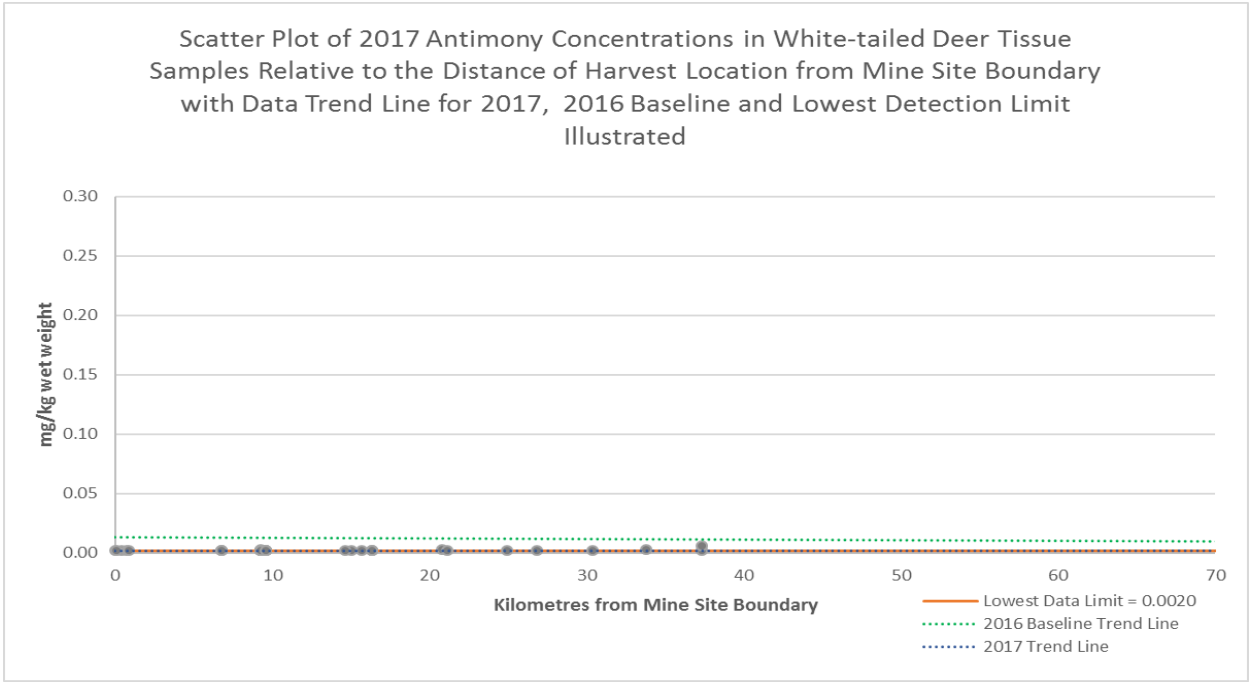
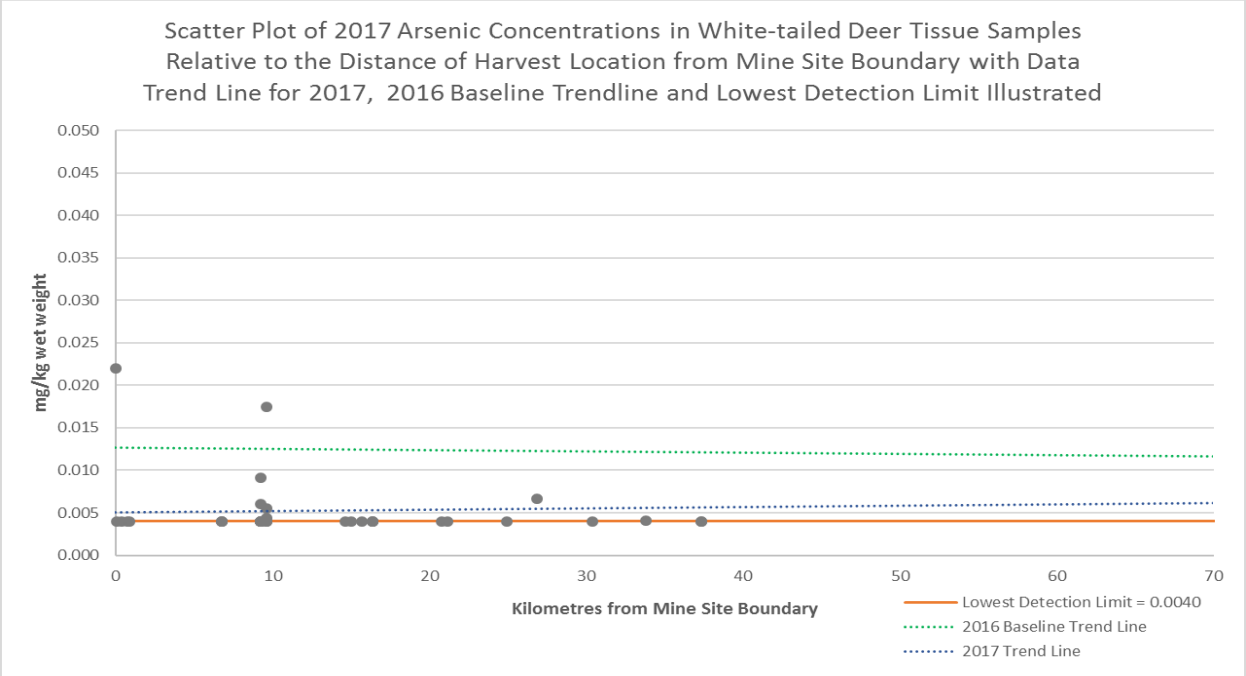


Figure 3-1: Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



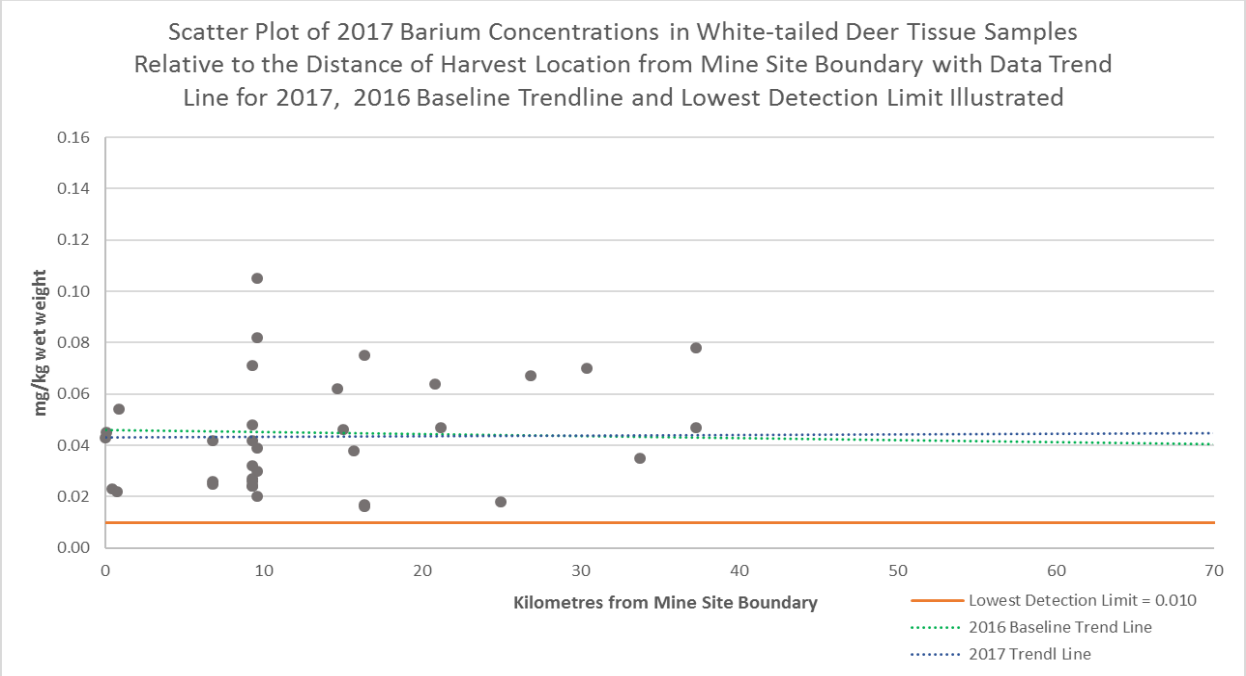
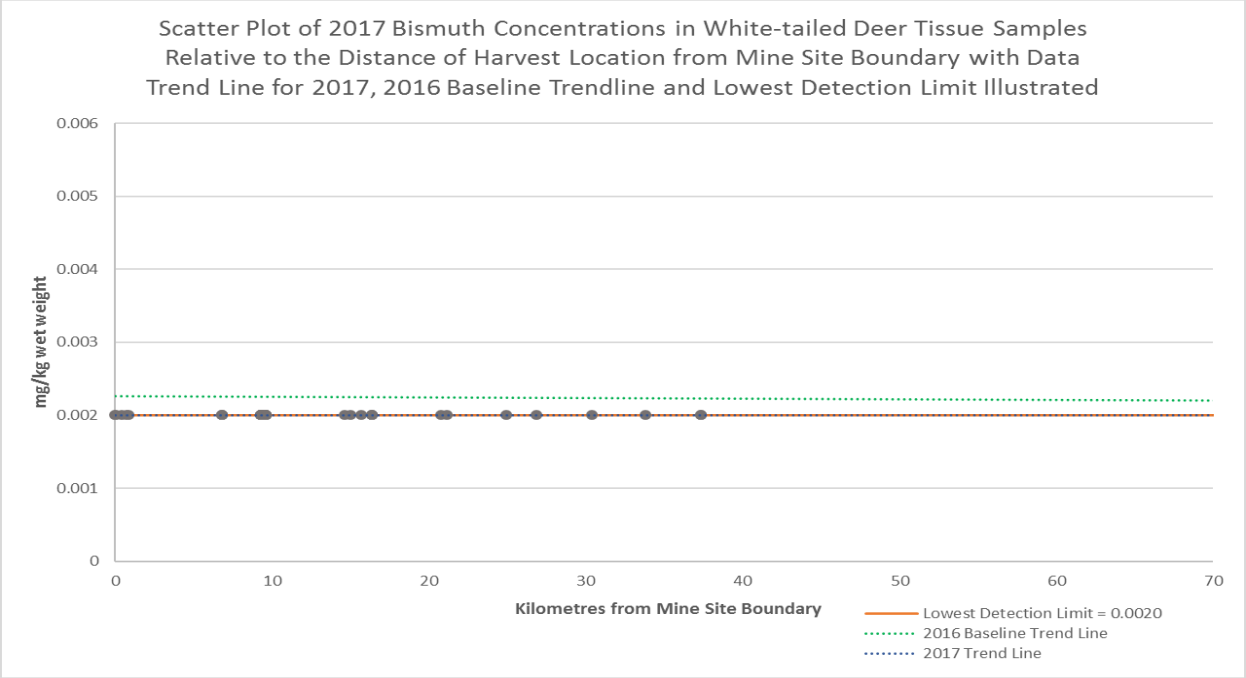


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



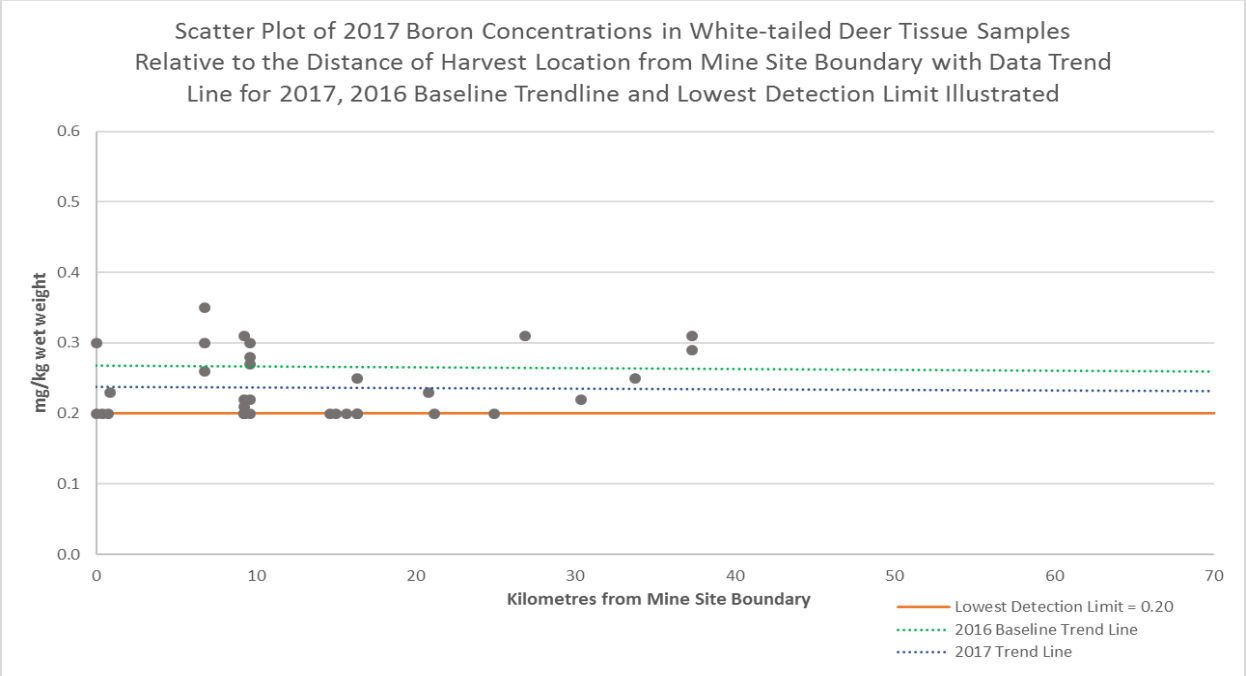
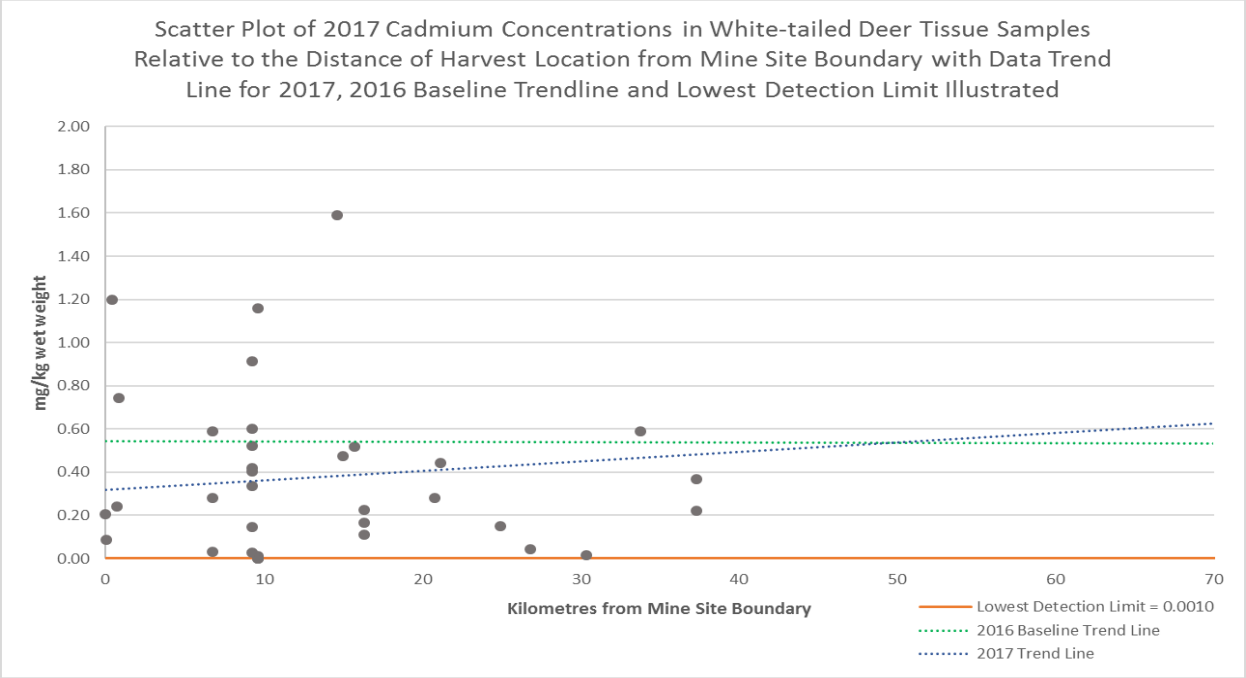


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



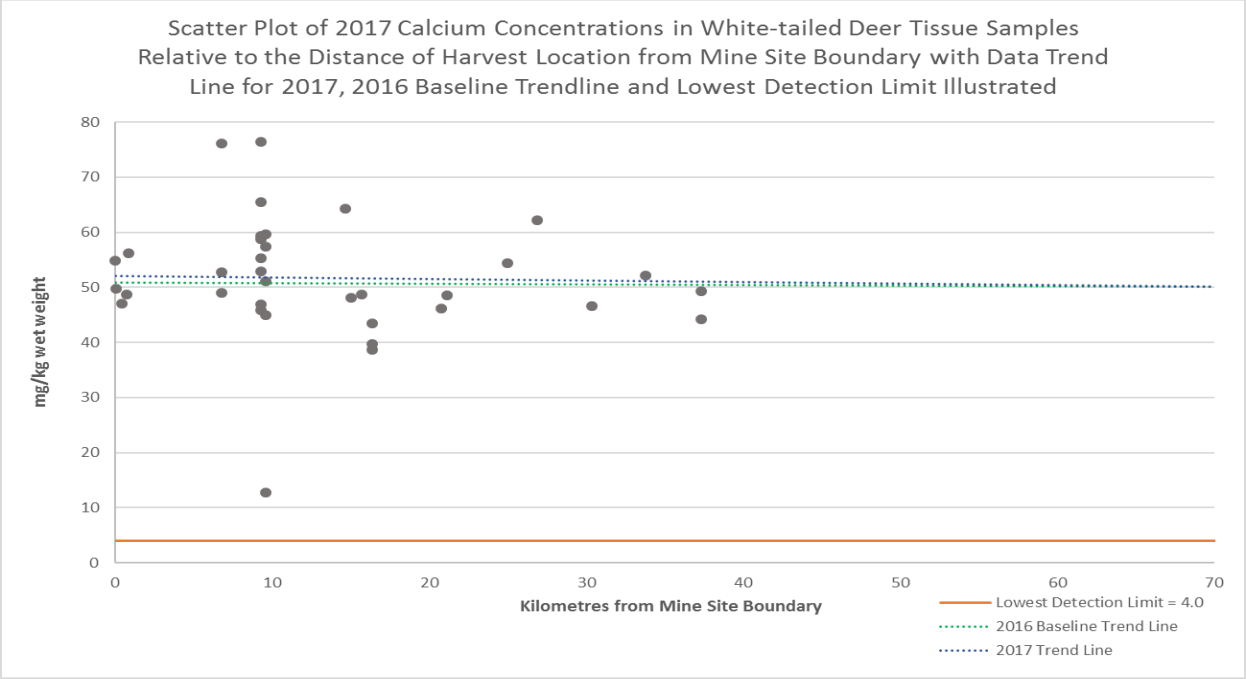
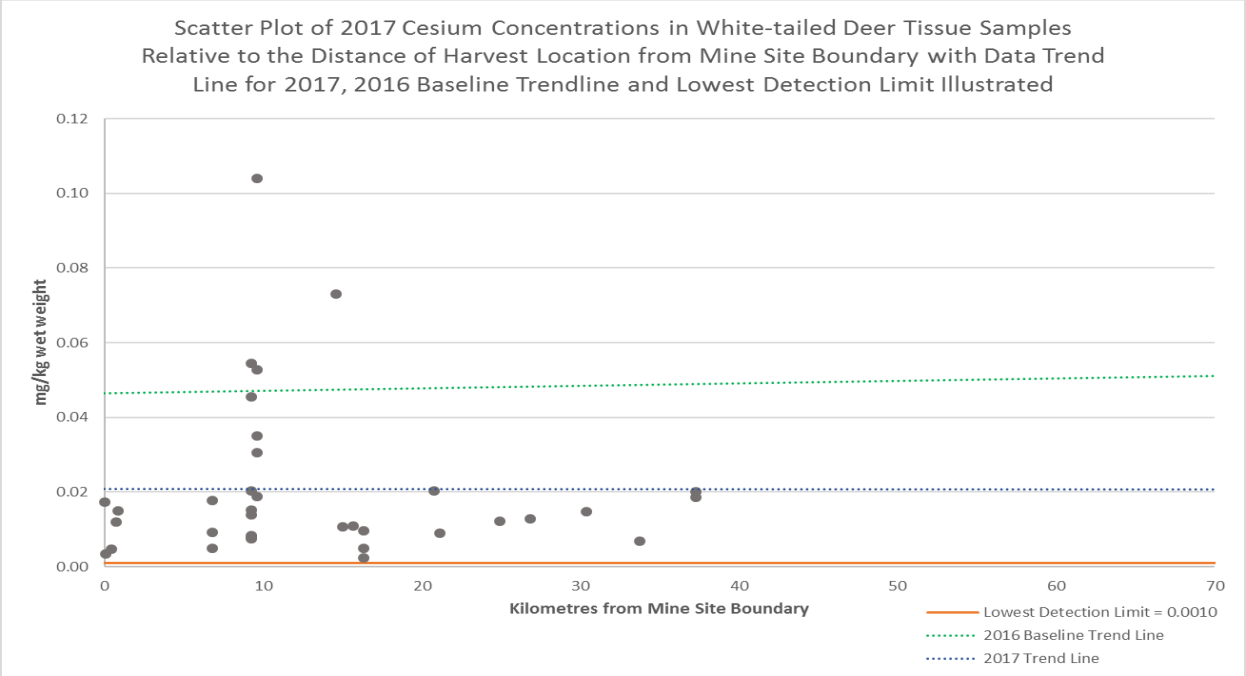


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



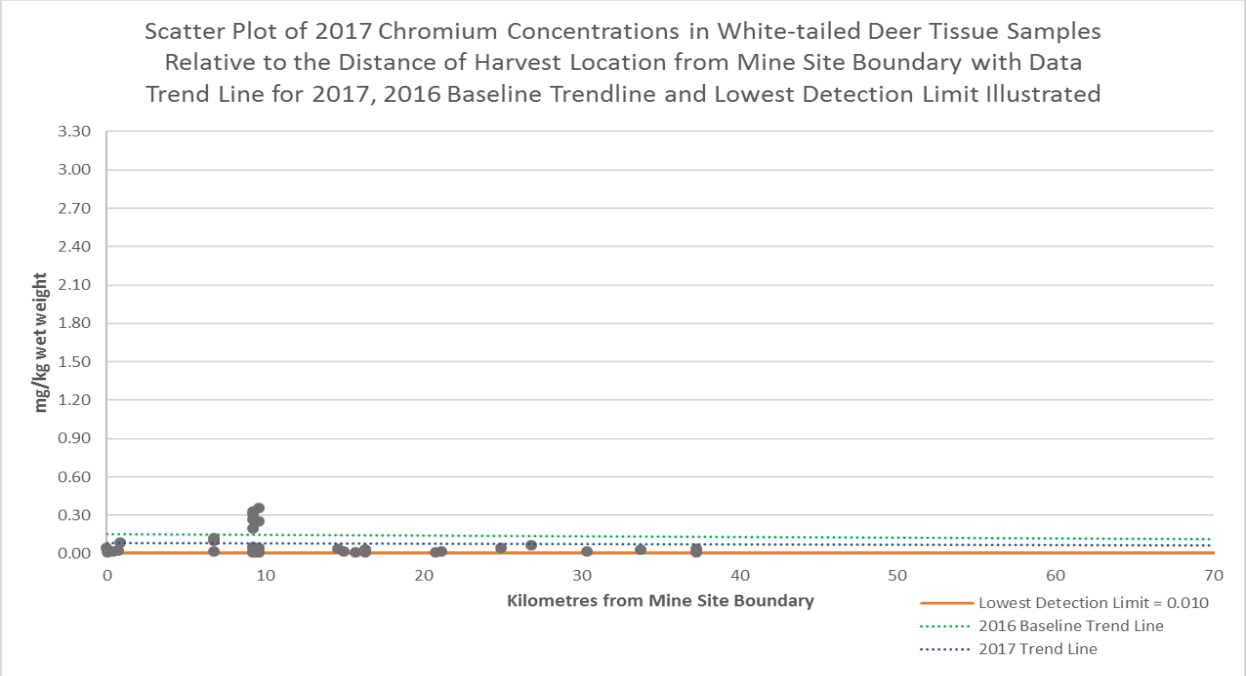
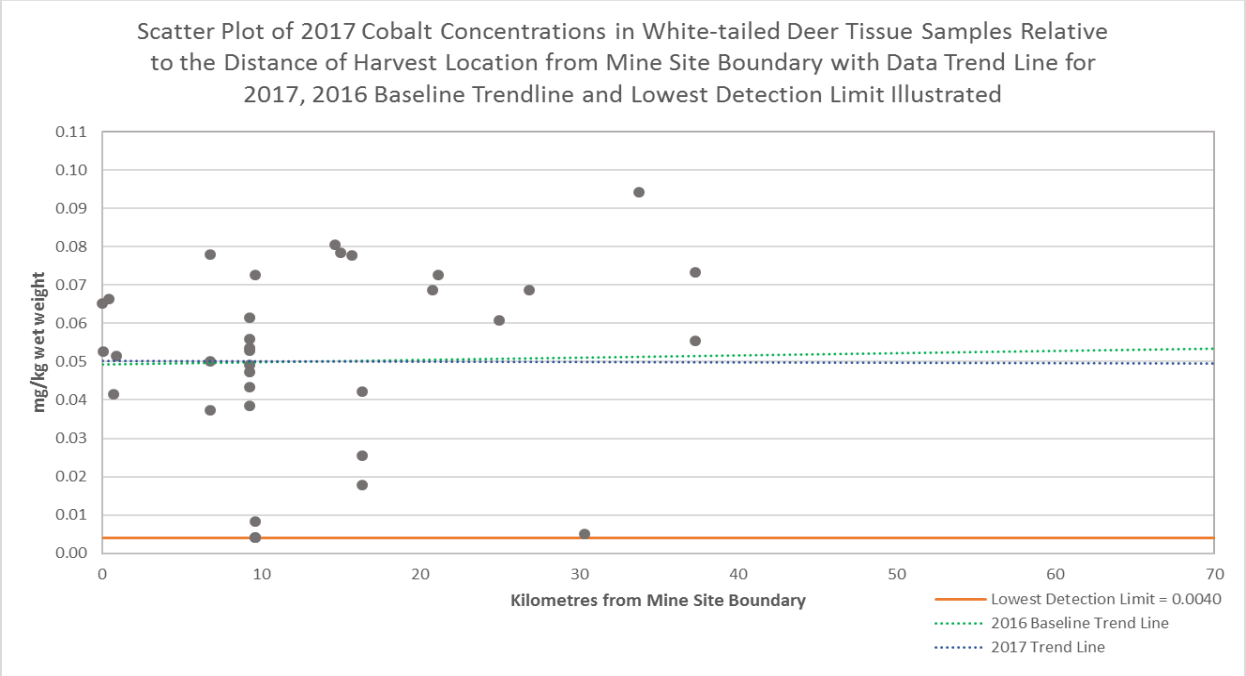


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



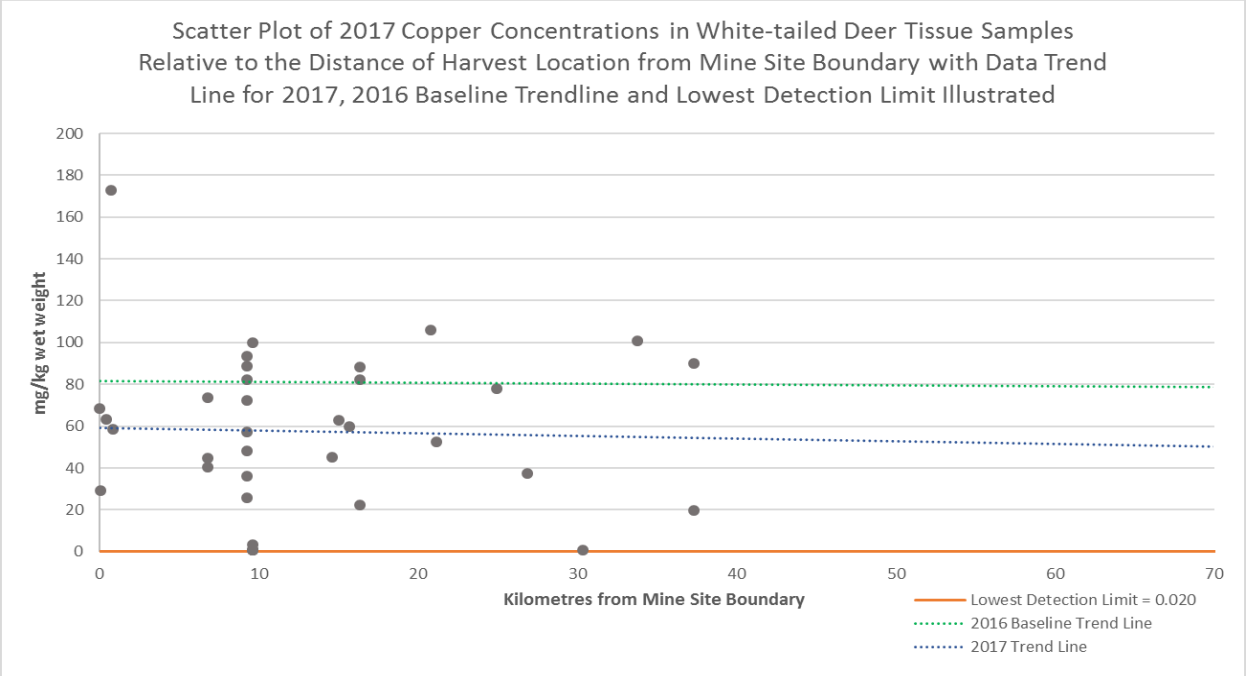
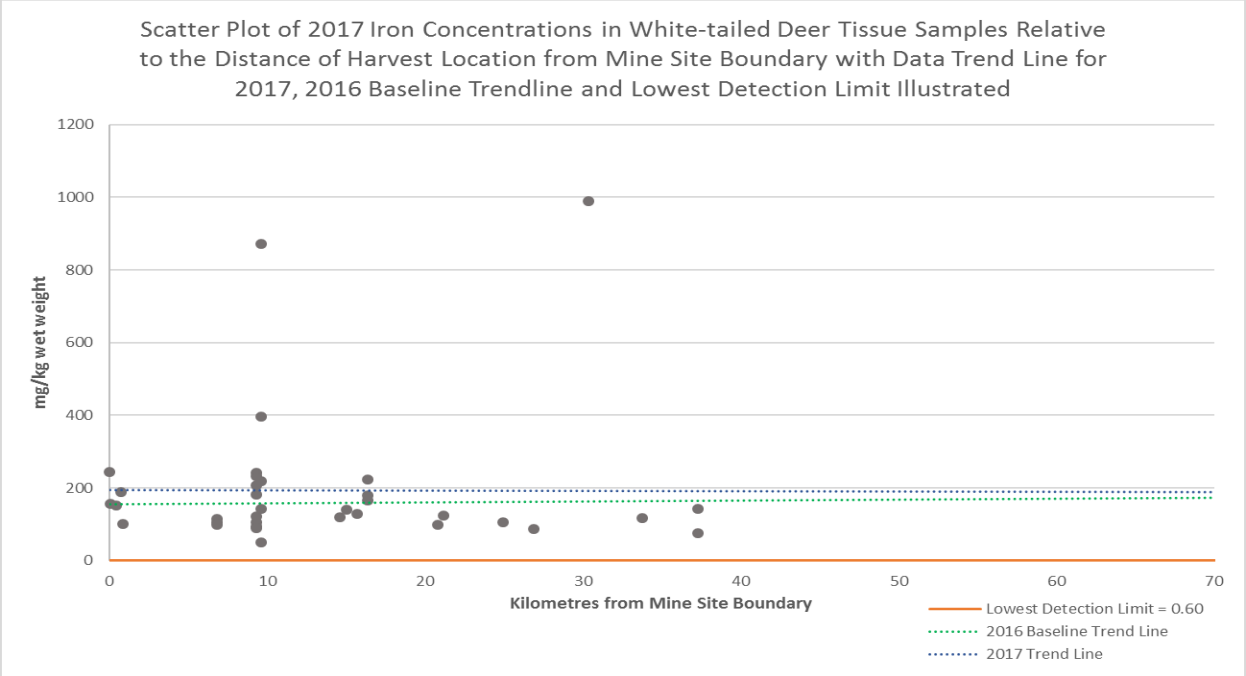


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



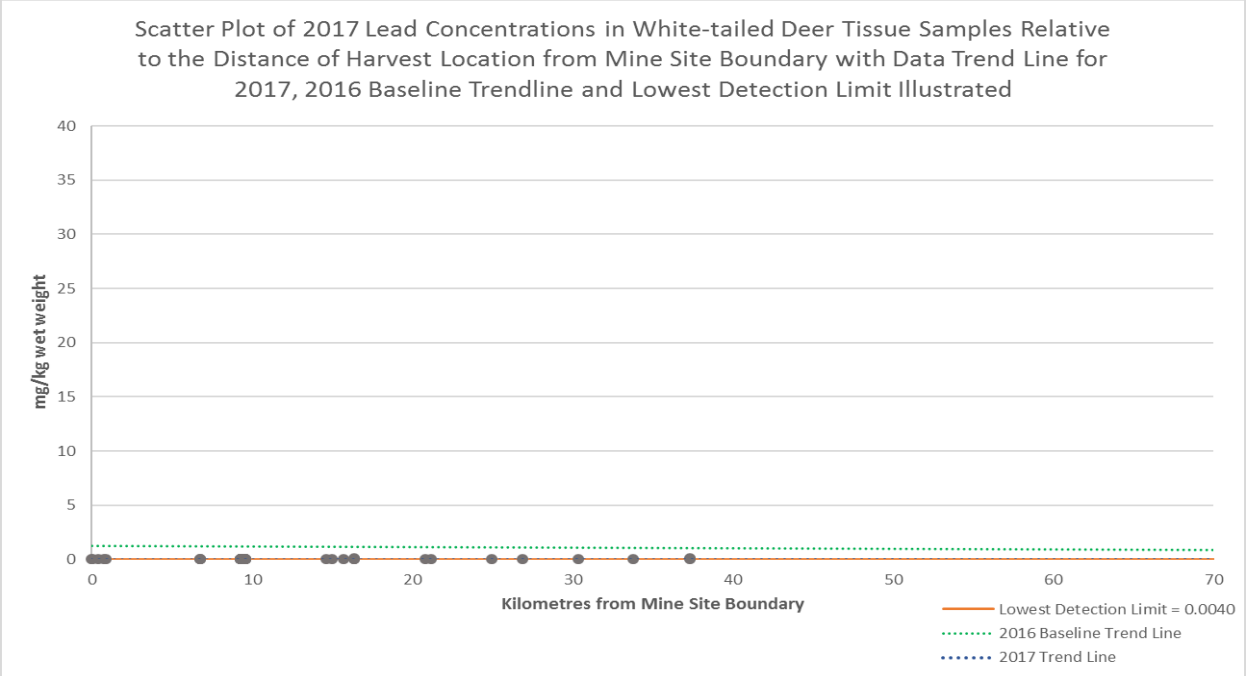
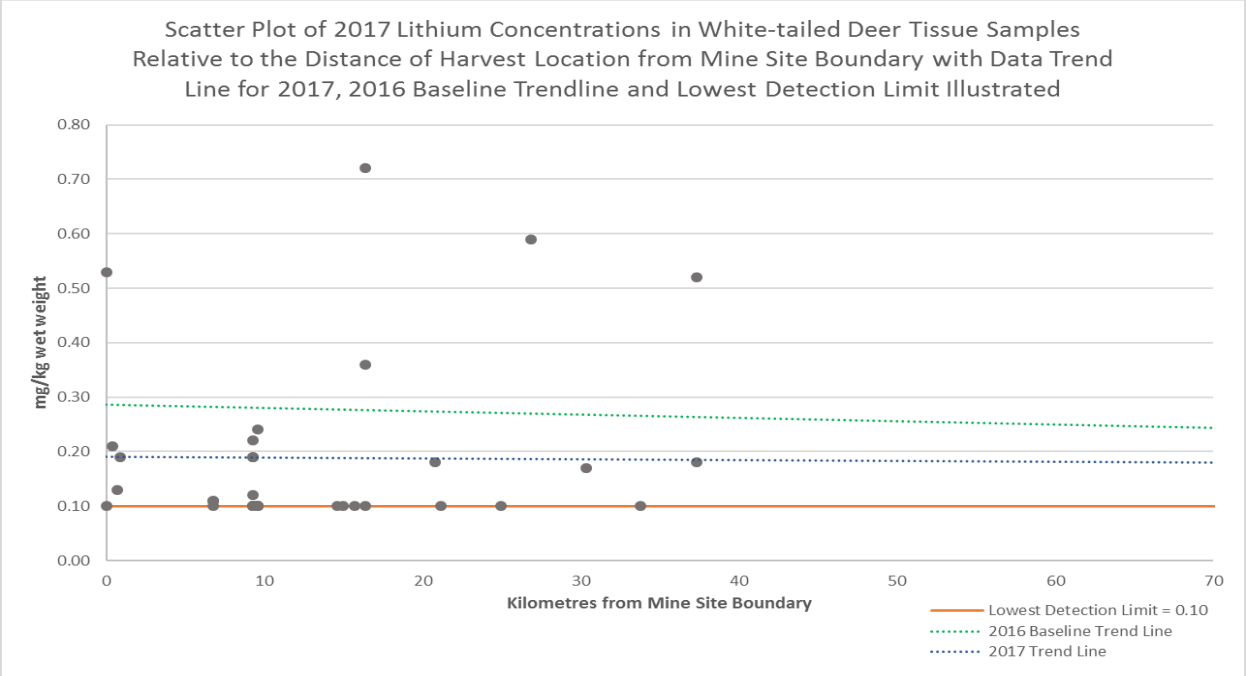


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



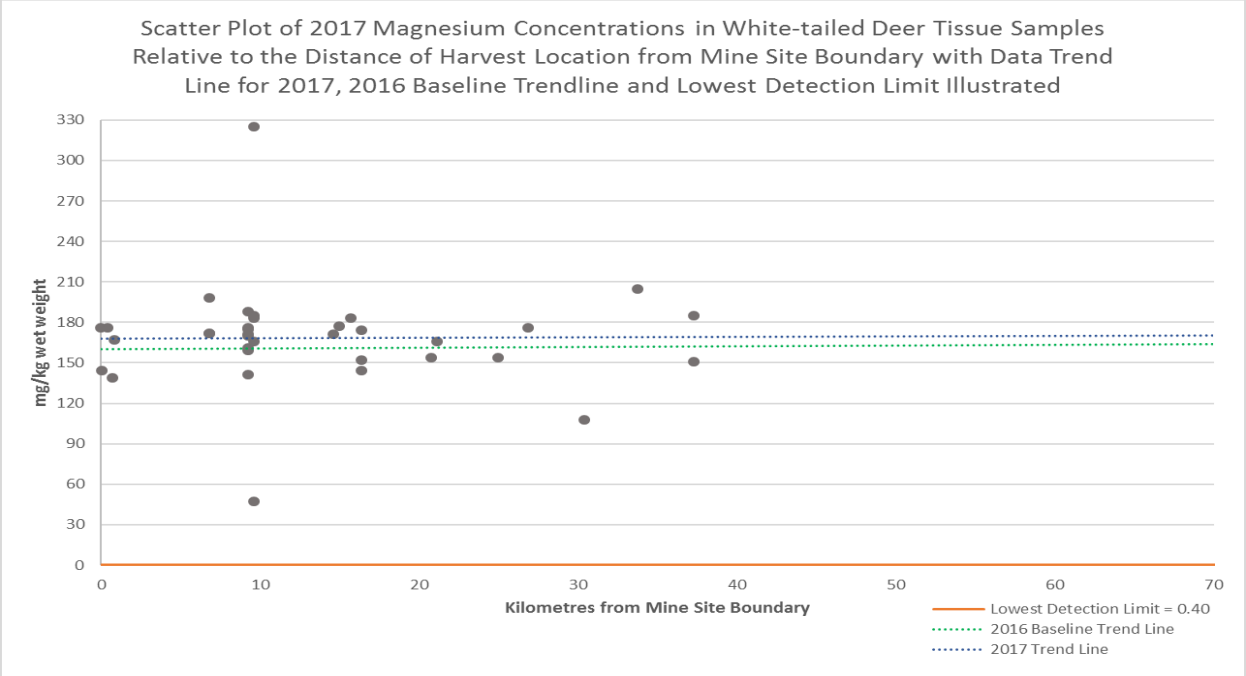
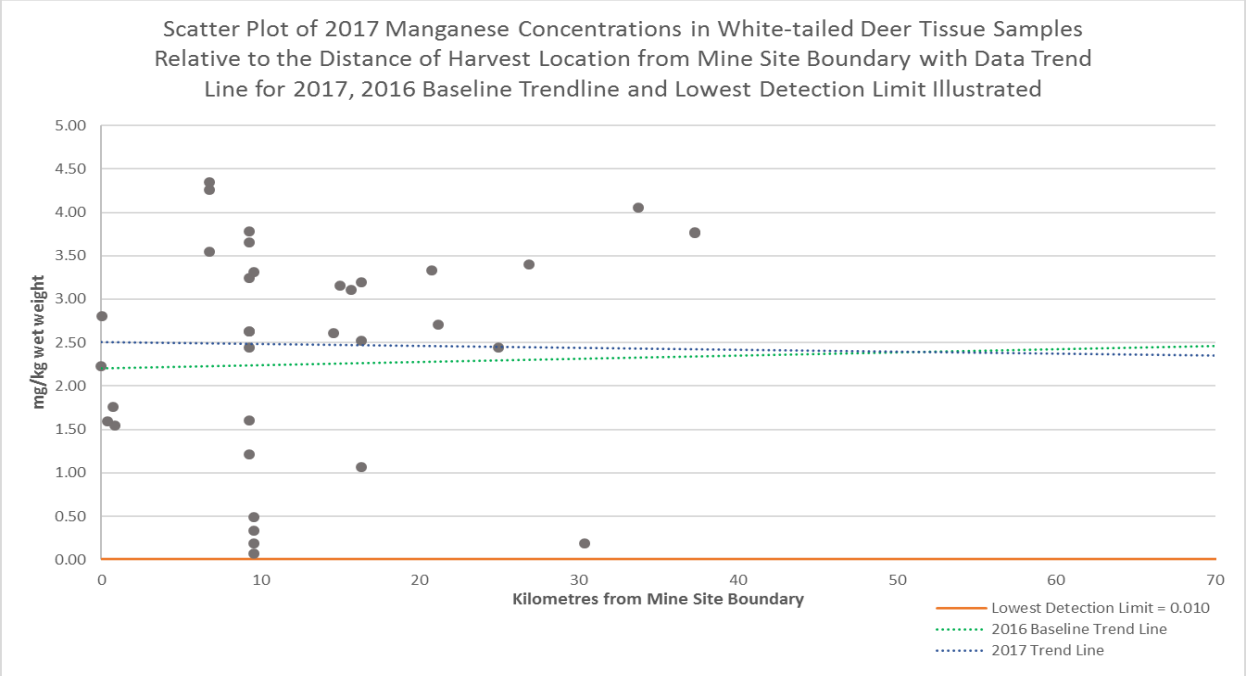


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



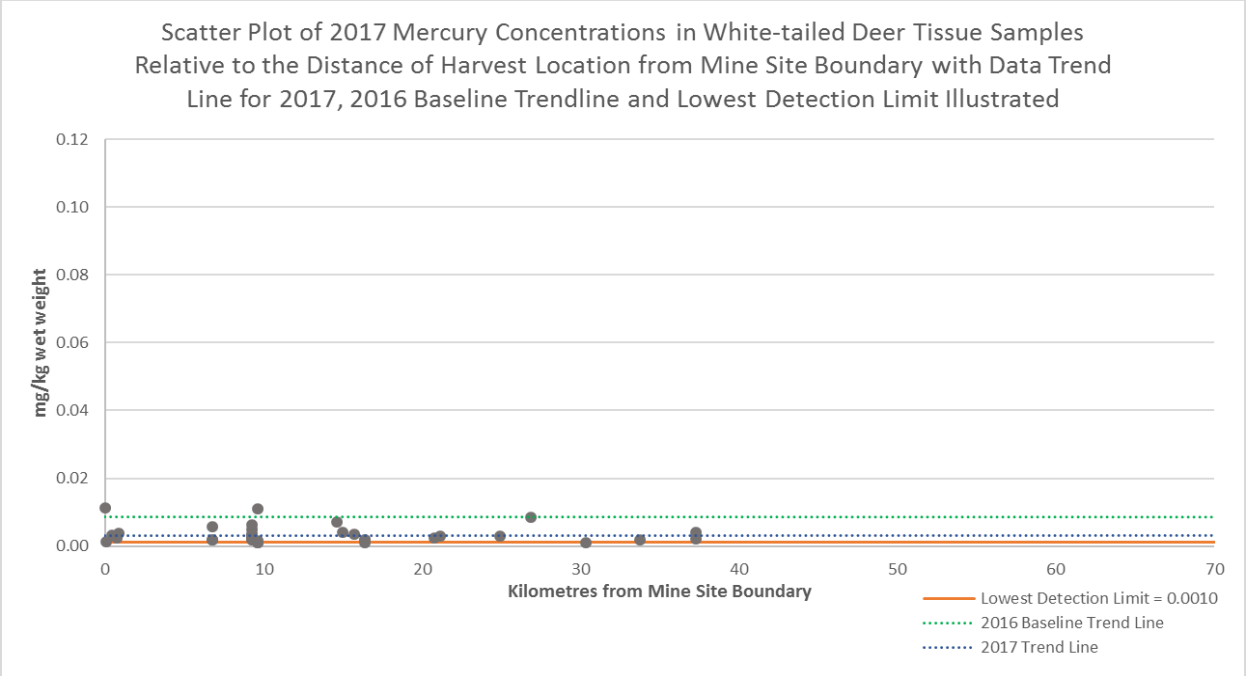
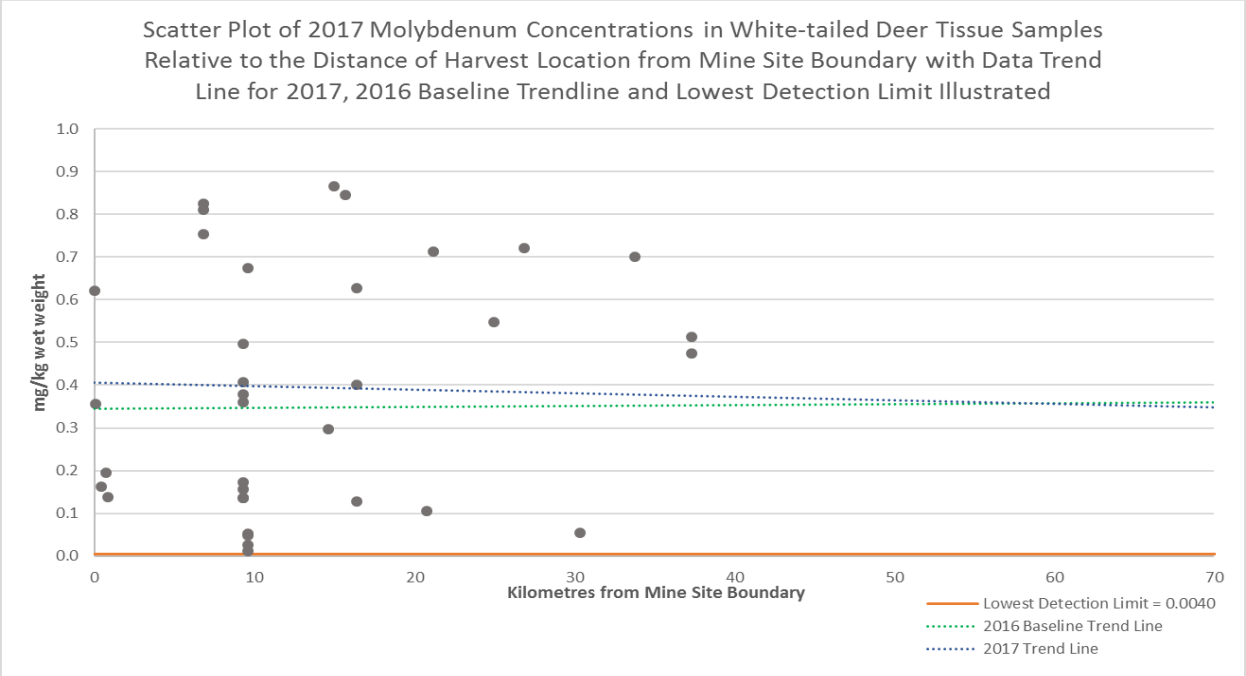


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



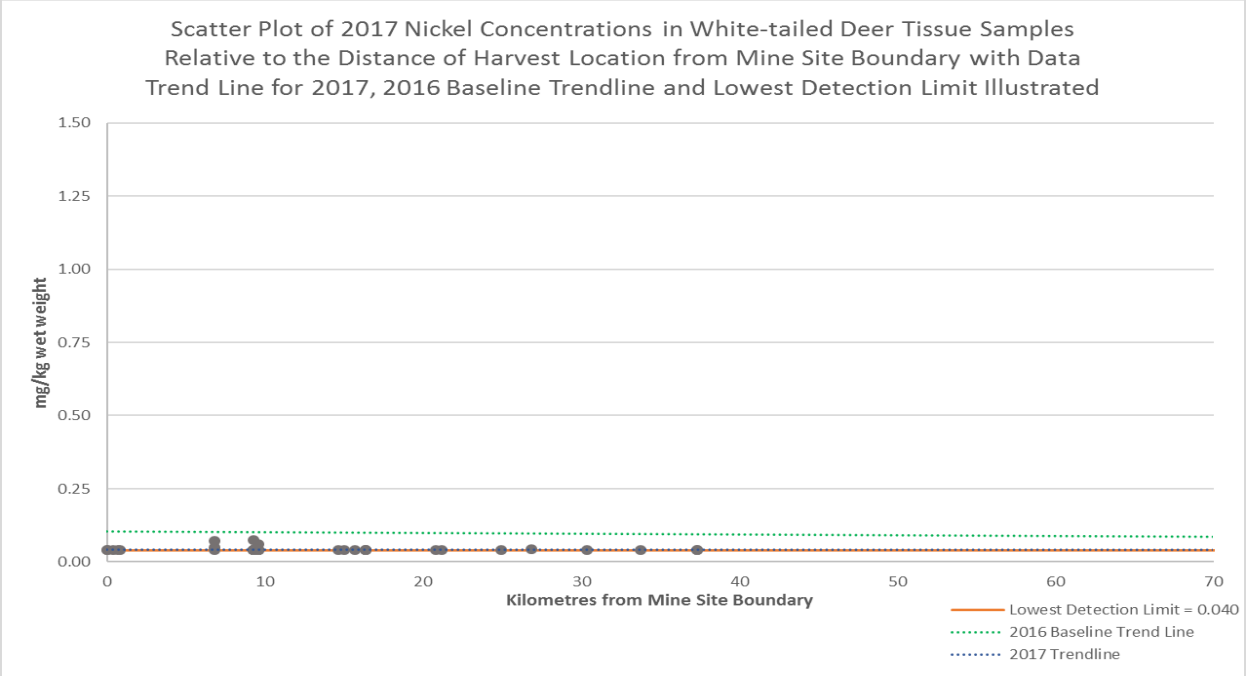
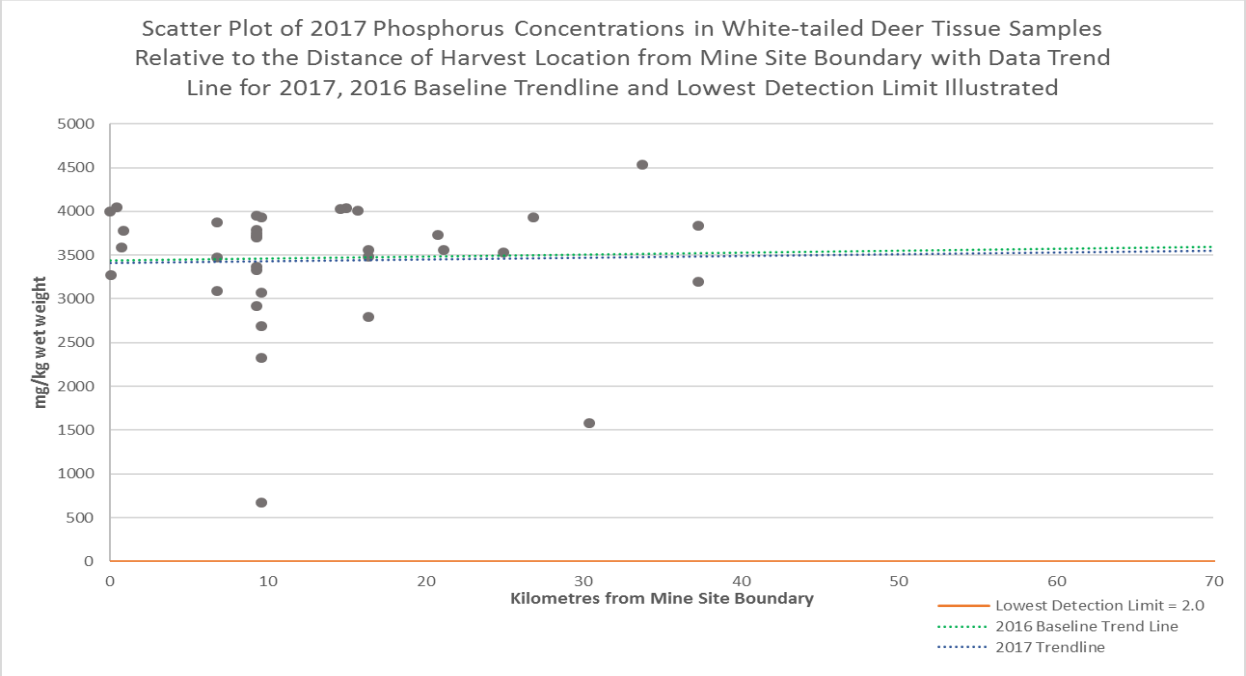


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



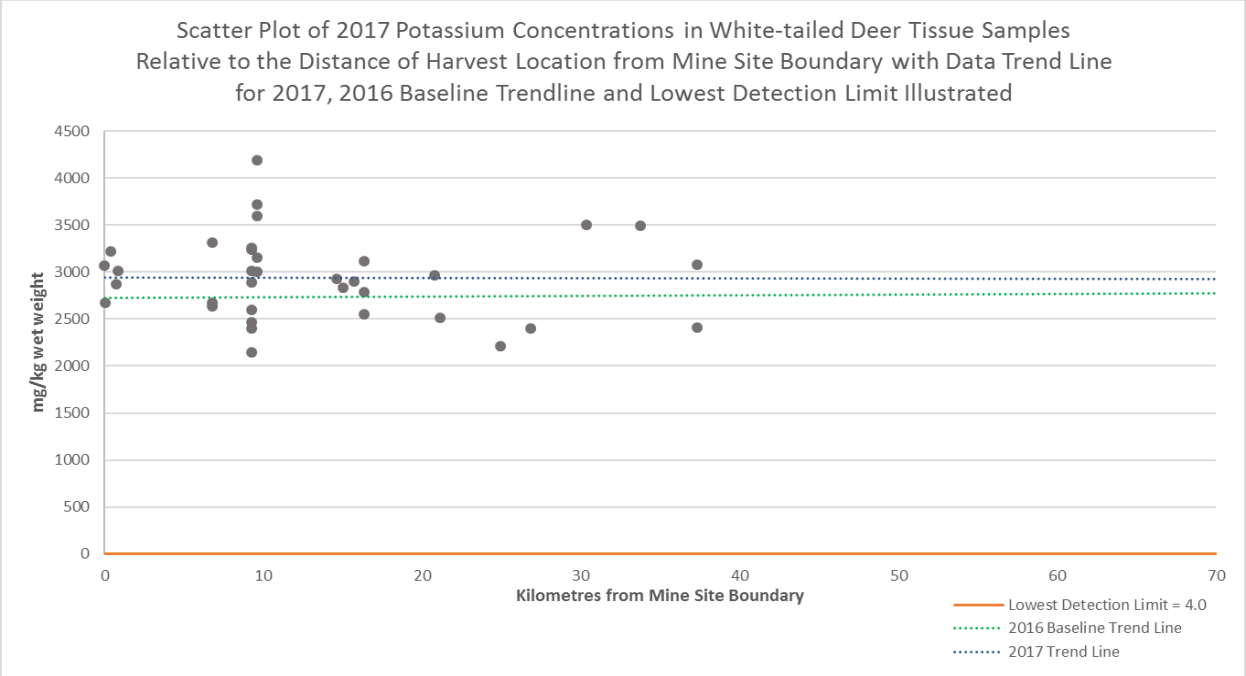
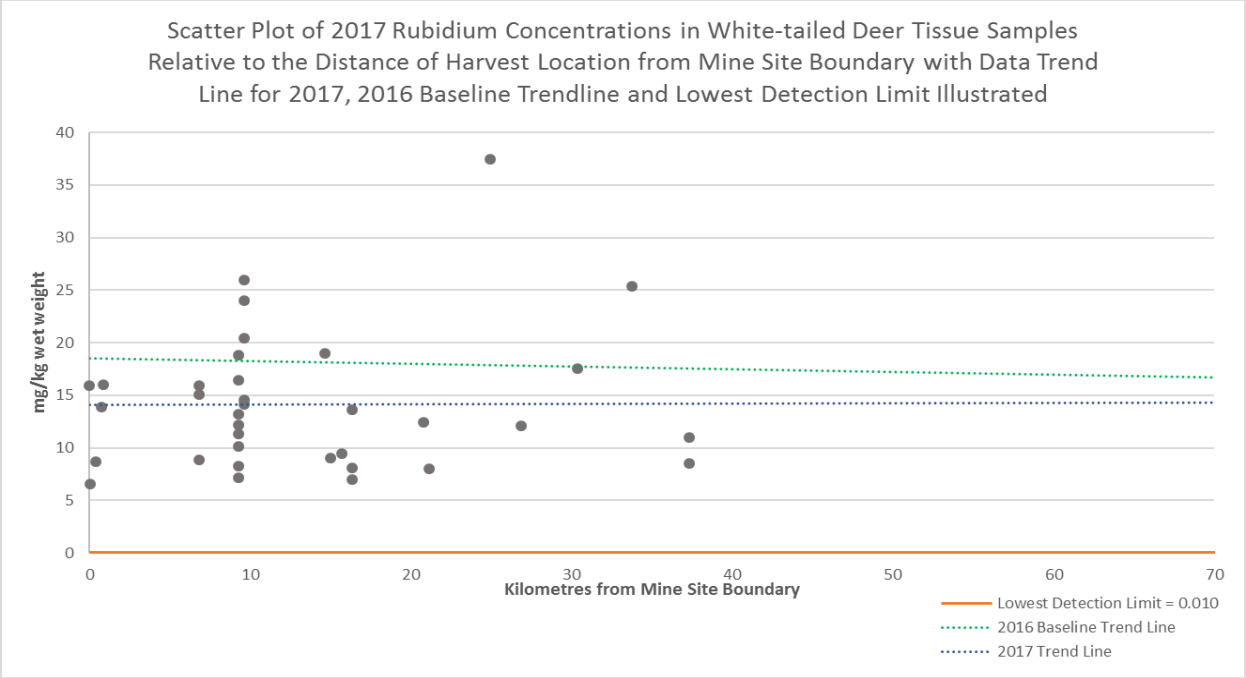


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



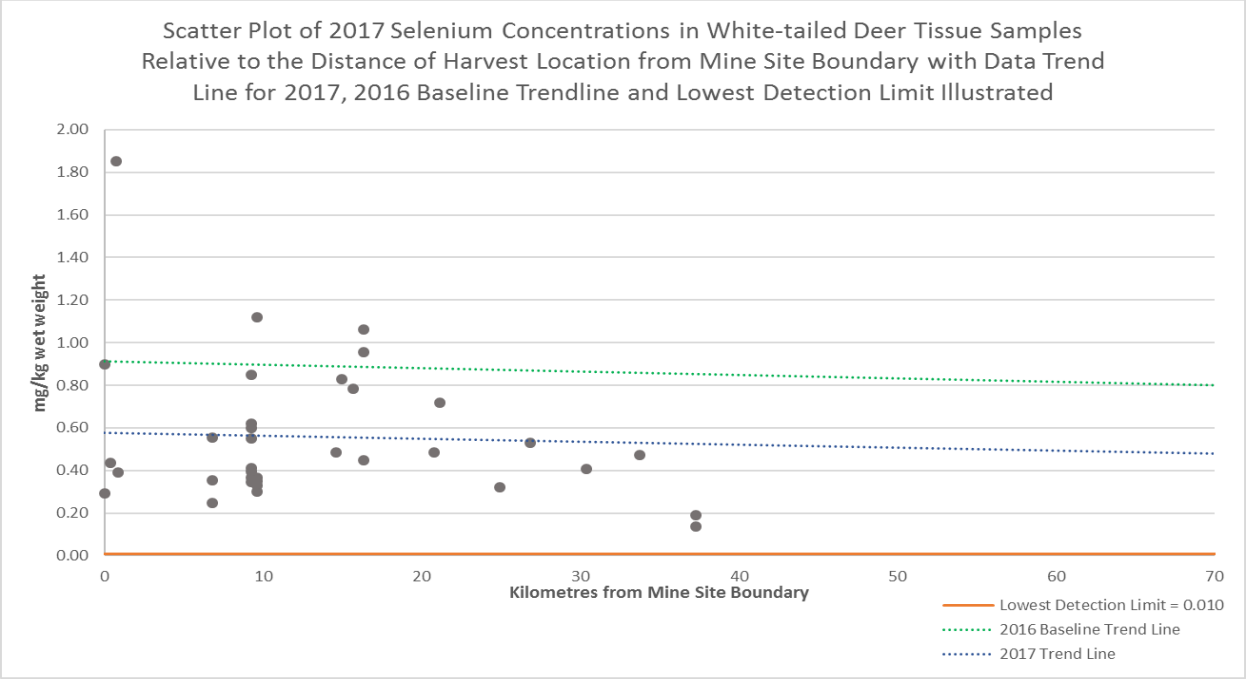
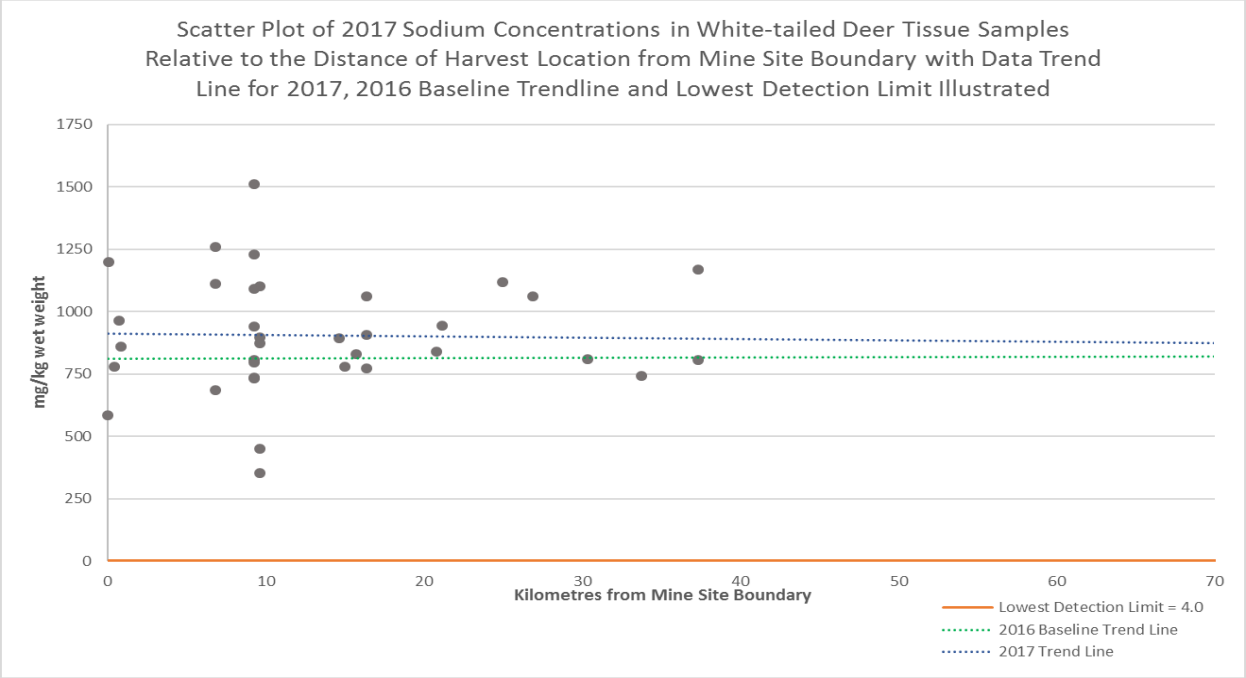


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



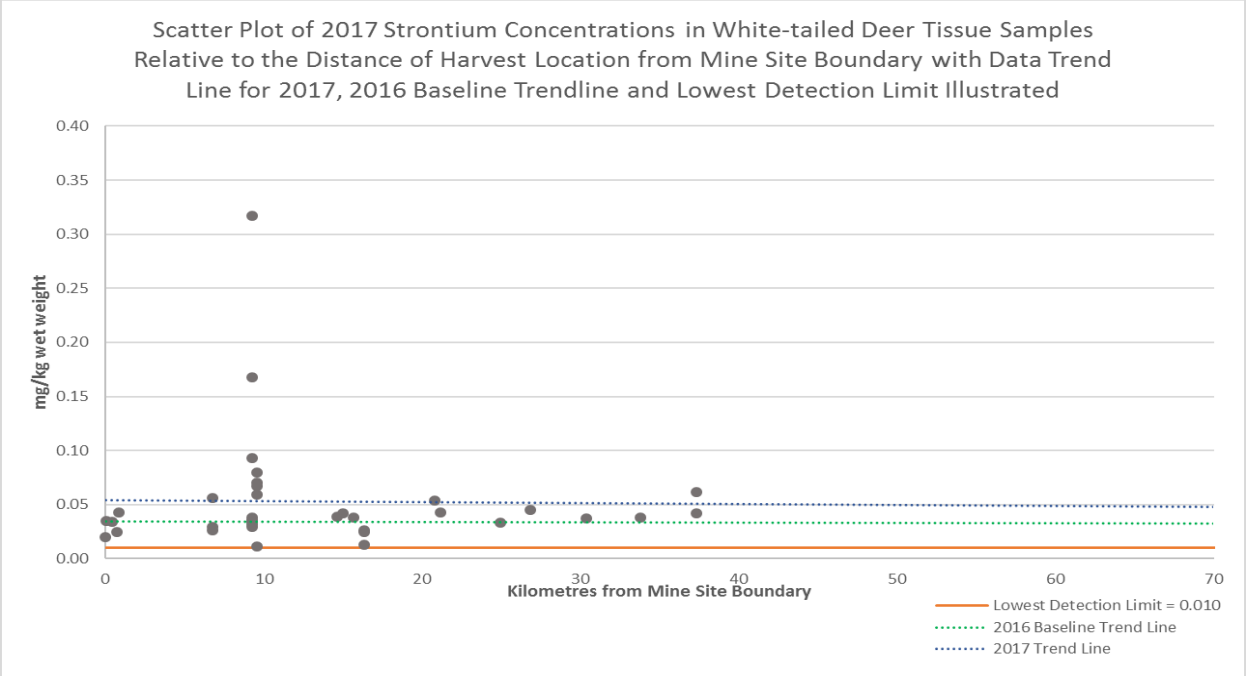
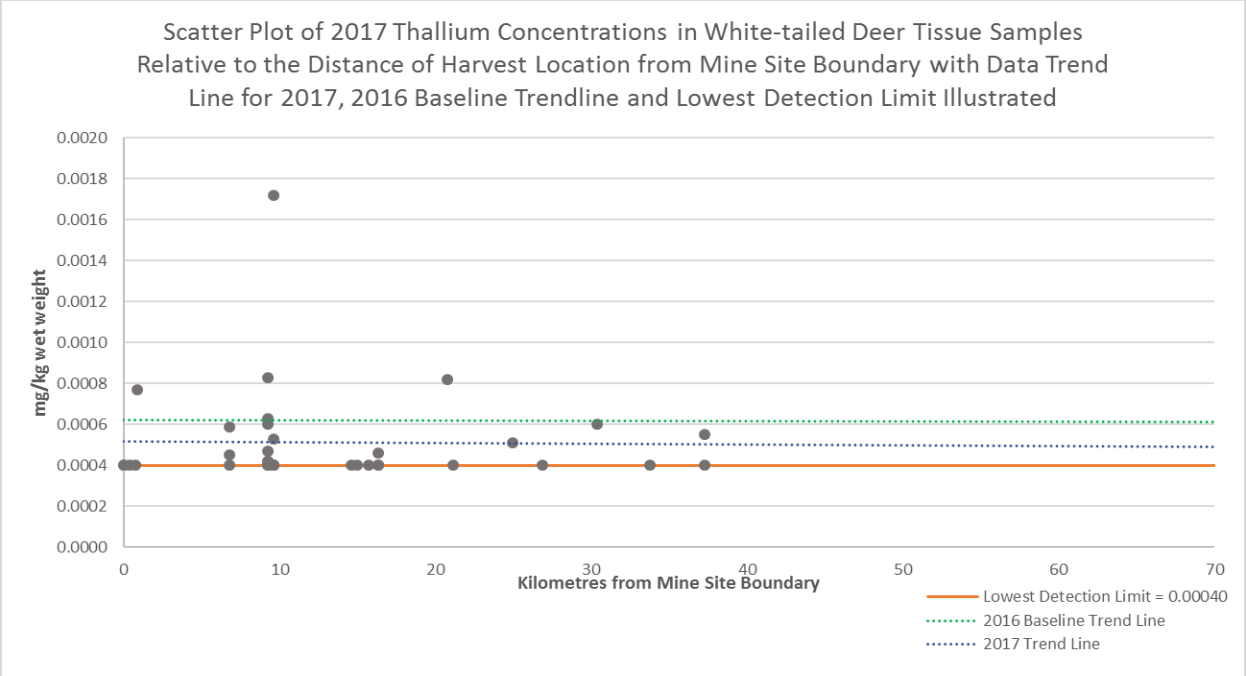


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



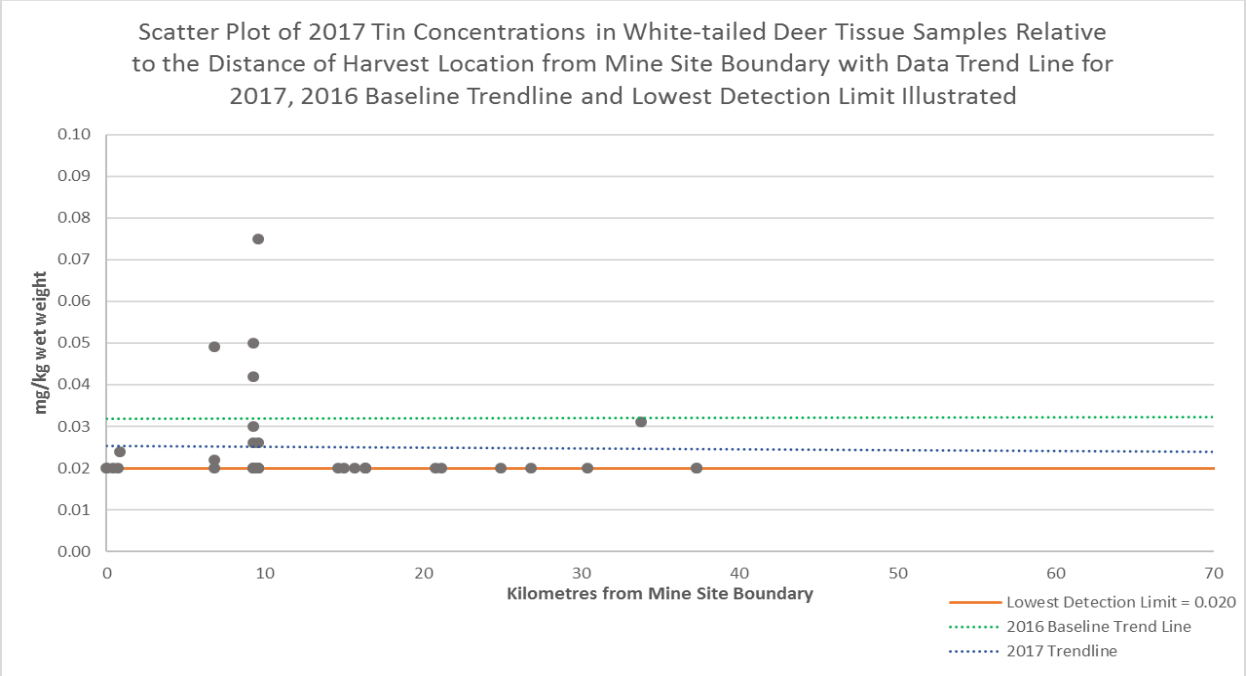
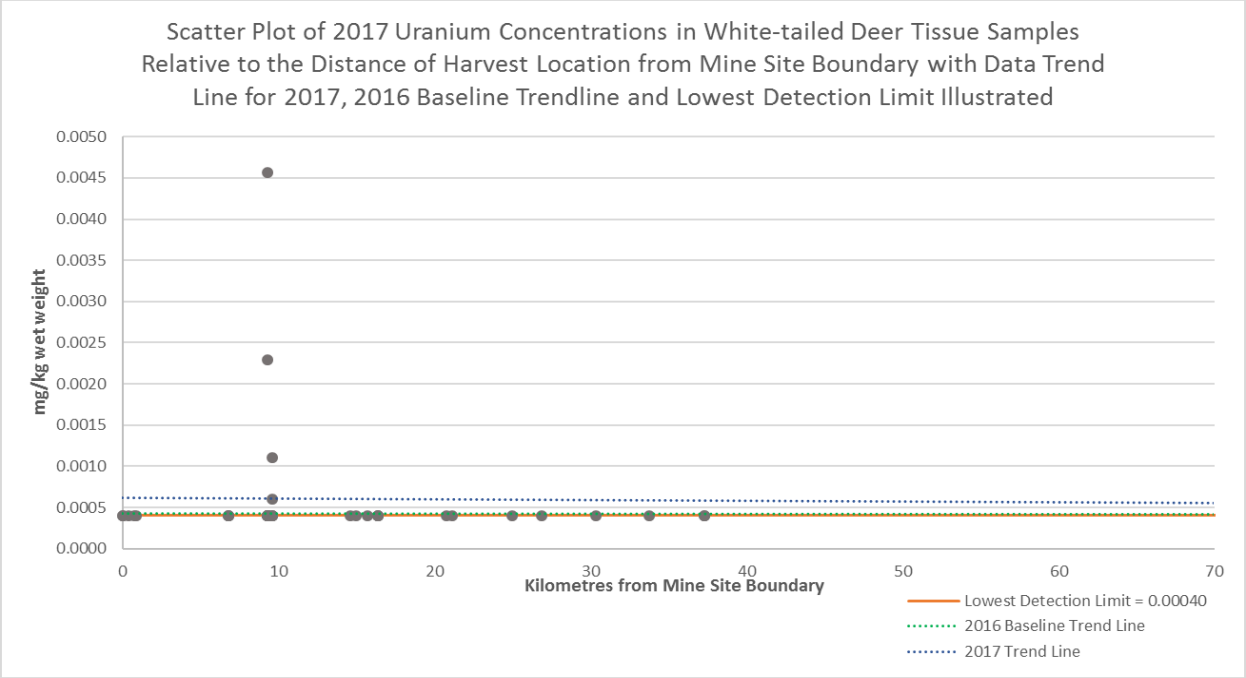


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



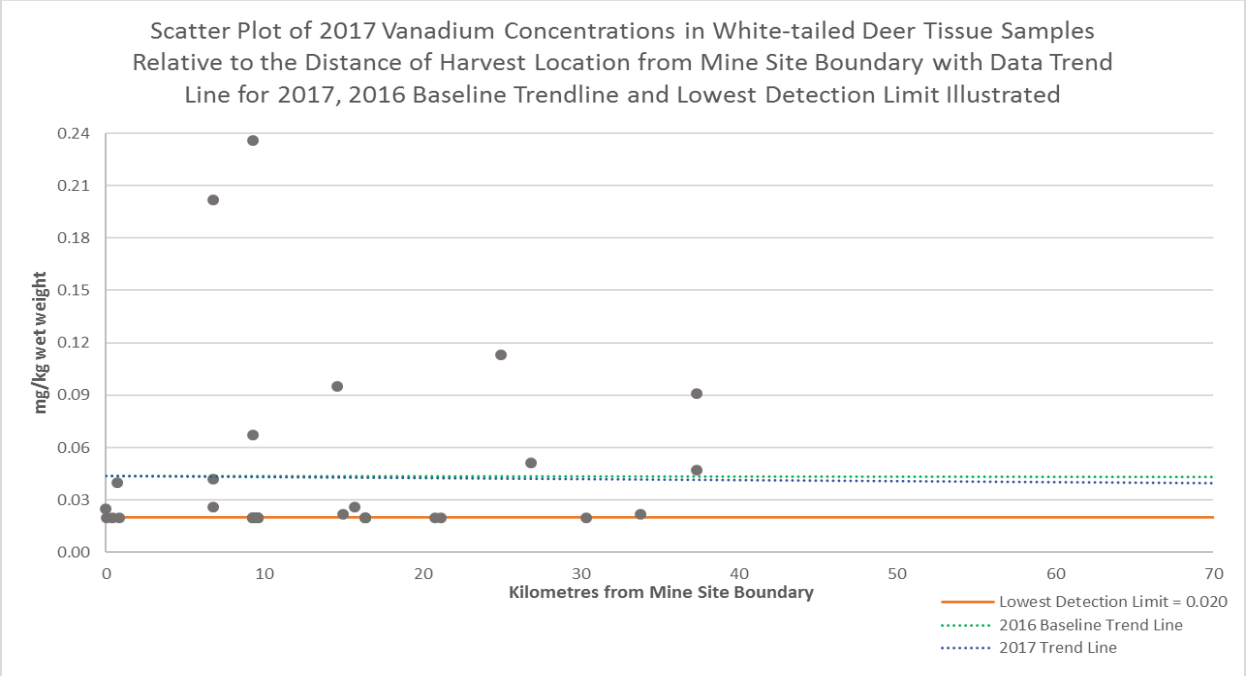
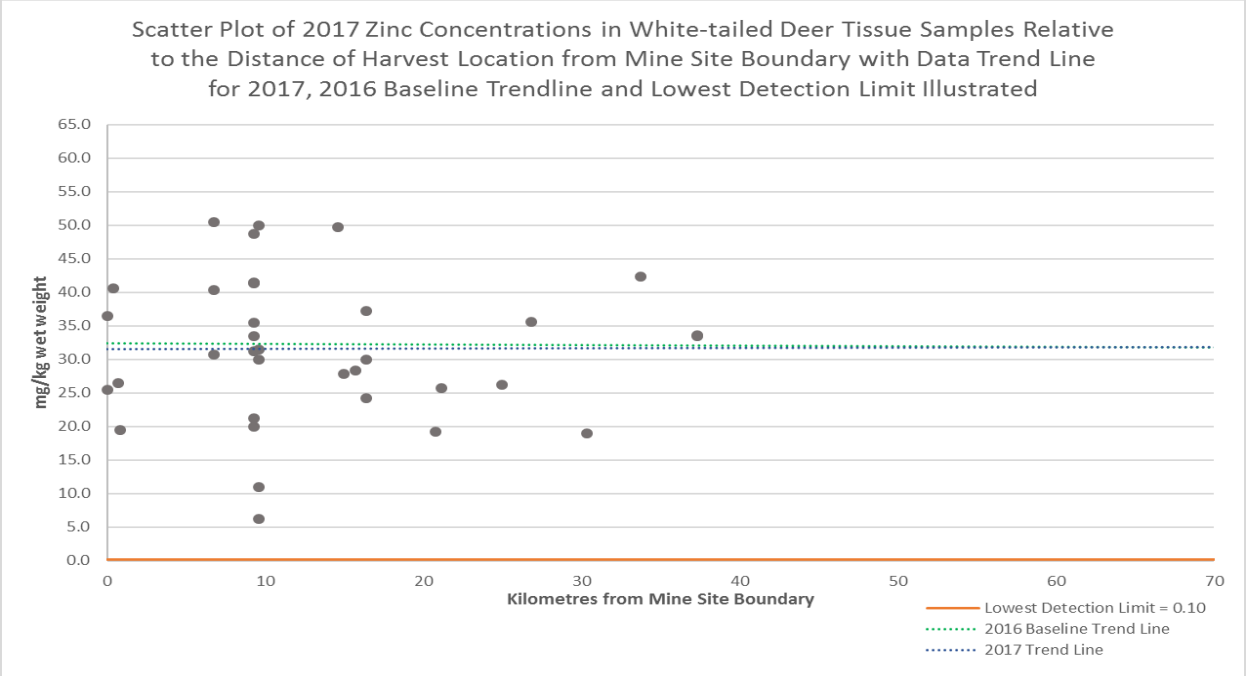


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit



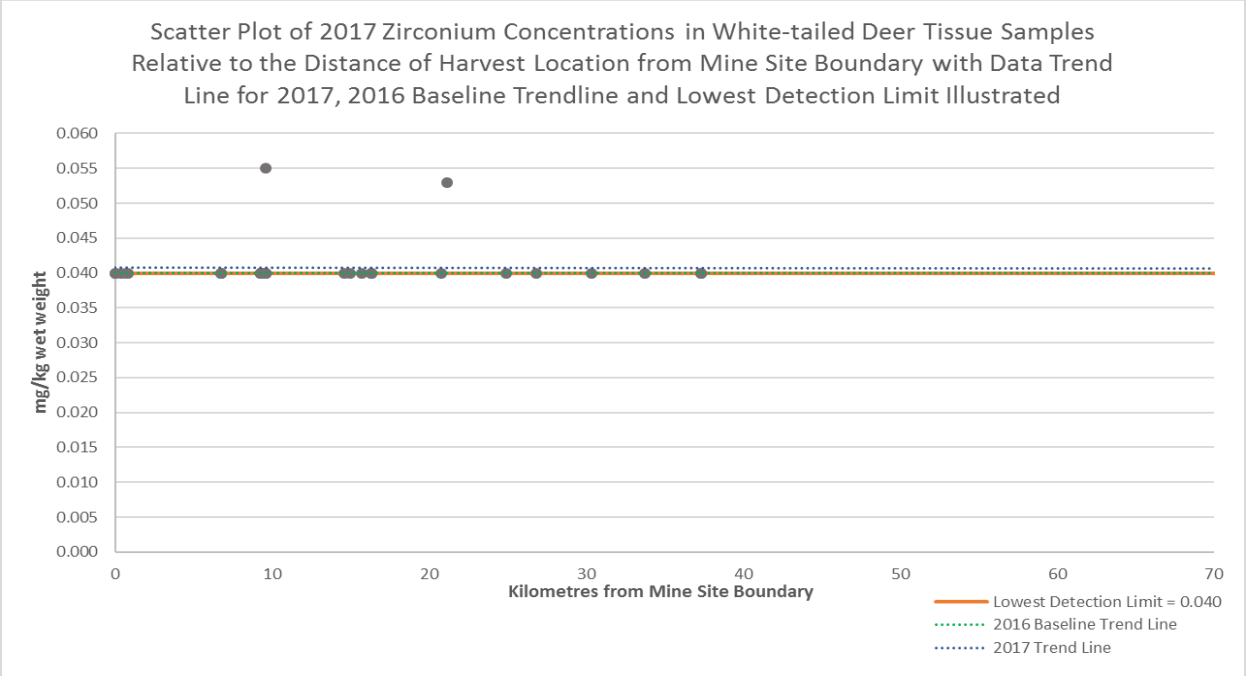


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit

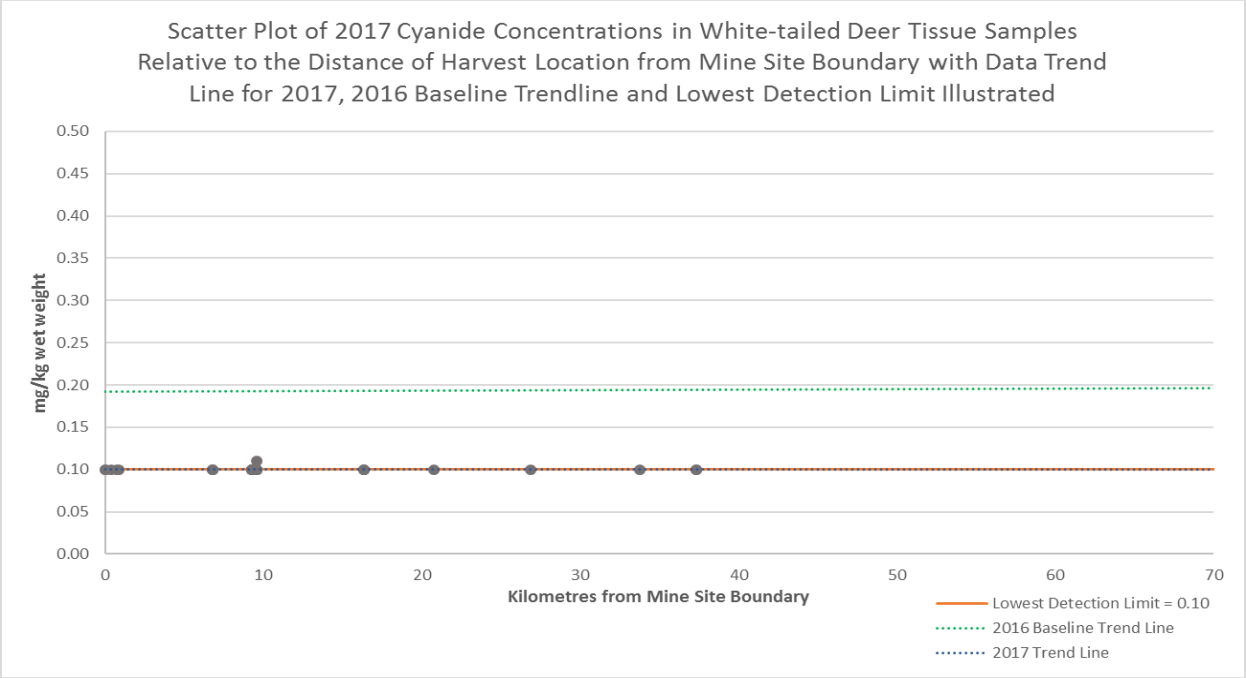


Figure 3-1 (cont'd): Scatter Plots showing 2017 Contaminant Concentrations for White-tailed Deer Tissue Samples relative to the distance of the Harvest Location from the Mine Site Boundary with a Linear Trend Line, 2016 Baseline Trend Line and the Lowest Detection Limit

4.0 DISCUSSION

Wildlife exposure to contaminants such as metals may come from ingestion of effected plants, soil or water that have been exposed to the contaminants. Metal contaminants arise from many sources, including some which occur naturally in the environment, but may also be formed from industry discharges (Oladunjoye et al. 2015). Some of these metals occur naturally in the environment and are required by wildlife in small (trace) amounts for nutrition. While these metals may become toxic at high concentrations, deficiencies in some of these metals can also cause health problems.

There are few published studies on contaminant concentrations in the tissues and organs of deer in Ontario and Canada, and little is known about the normal nutritional requirements of various minerals and elements by deer (Schultz et al. 1994, Khan et al. 1995, Zimmerman et al. 2008). Accordingly, little is known about what the normal baseline concentrations are in deer for the various metals analyzed in this study. Similarly, information is not available regarding what concentrations would be considered detrimental, nor what the effects of detrimental concentrations would be on the physiology of deer.

Direct comparisons between the data collected in this study (including the baseline data) and previous studies are difficult for many reasons, such as differences in variables such as age, sex, habitat, food sources and proximity to anthropogenic sources of contamination, which are all often unknown. Therefore, the baseline data collected in 2016 is assumed to represent the normal variation in the concentration levels of the elements examined in this study for local White-tailed Deer populations. The 2016 results will therefore provide pre-operation data for comparison with 2017 post-operation concentration levels and future study results from data collected as the RRM continues operations. The purpose of these comparisons is to identify any exposure and ecological risk to local wildlife from mine-related contaminants and asses the risks to humans that consume local wildlife should they arise.

Both, the 2016 baseline data and the 2017 data had high variations in the concentrations measured in the tissue samples for several contaminants. Such a high variation in values renders interpretation problematic with only one year of comparison. Two of the donors in the 2017 sample collection (D026 and D030) contained maximum concentration levels for five and six of the parameters, respectively. Most donors contained only one maximum concentration, suggesting something other than the impact of mining activities were causing the elevated contaminant levels in these two individuals. It is possible that their health was otherwise compromised, but the results of this study are unable to confirm this hypothesis. A similar trend was observed in the 2016 dataset, where one donor was discovered to have several elevated contaminant concentrations. The liver of this individual was discoloured, suggesting compromised health. Trends in data will be more obvious as subsequent sampling takes place and more data is available for statistical comparisons.

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6.0 CLOSING

This White-tailed Deer Tissue Sampling Report was prepared by Wood for the sole benefit of New Gold Inc. RRM for specific application to the RRM site. The quality of information, conclusions and estimates contained herein are consistent with the level of effort involved in Wood's services and based on: i) information available at the time of preparation, and ii) the assumptions, conditions and qualifications set forth in this document. This report is intended to be used by New Gold Inc. only, and its nominated representatives, subject to the terms and conditions of its contract with Wood. Any other use of, or reliance on, this report by any third party is at that party's sole risk. This report has been prepared in accordance with generally accepted industry-standard. No other warranty, expressed or implied, is made.

If you require further information regarding the above or the project in general, please contact Dan Russell, Geoscientist, Mining Environmental or Matt Evans, Senior Ecologist, Environmental at (905) 568-2929. Thank you for the opportunity to be of service to New Gold Inc.

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APPENDIX A

2017 WHITE-TAILED DEER TISSUE CONTAMINANT CONCENTRATION VALUES

	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Cesium (Cs)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)
Lowest Detection Limit	**0.40**	**0.0020**	**0.0040**	**0.010**	**0.0020**	**0.0020**	**0.20**	**0.0010**	**4.0**	**0.0010**	**0.010**	**0.0040**	**0.020**	**0.60**	**0.0040**	**0.10**	**0.40**
Sample ID																	
D001	**<0.4**	**<0.002**	**<0.004**	0.078	**<0.002**	**<0.002**	0.29	0.221	49.3	0.0186	0.036	0.0555	19.8	143	0.0106	0.18	151
D002	**<0.4**	**0.0061**	**<0.004**	0.047	**<0.002**	**<0.002**	0.31	0.368	44.2	0.0200	**<0.01**	0.0733	90.1	75.5	0.1310	0.52	185
D003	2.34	**<0.002**	0.0066	0.067	**<0.002**	**<0.002**	0.31	0.0420	62.2	0.0129	0.065	0.0688	37.4	87.9	0.0079	0.59	176
D004	**<0.4**	**<0.002**	0.0220	0.043	**<0.002**	**<0.002**	0.30	0.205	54.9	0.0173	0.045	0.0653	68.4	243	**<0.004**	0.53	176
D005	**<0.4**	0.0029	**<0.004**	0.064	**<0.002**	**<0.002**	0.23	0.280	46.1	0.0202	0.012	0.0688	106	98.8	**<0.004**	0.18	154
D006	**<0.4**	**<0.002**	**<0.004**	0.023	**<0.002**	**<0.002**	**<0.2**	1.20	47.1	0.0047	0.015	0.0663	63.2	151	**<0.004**	0.21	176
D007	**<0.4**	**<0.002**	**<0.004**	0.022	**<0.002**	**<0.002**	**<0.2**	0.241	48.7	0.0120	0.022	0.0415	173	188	**<0.004**	0.13	139
D008	0.56	**<0.002**	0.0114	0.045	**<0.002**	**<0.002**	**<0.2**	1.89	44.1	0.0218	0.013	0.0419	17.1	148	0.0048	**<0.1**	181
D009	**<0.4**	**<0.002**	**<0.004**	0.045	**<0.002**	**<0.002**	**<0.2**	0.0888	49.8	0.0034	0.014	0.0526	29.1	155	**<0.004**	**<0.1**	144
D010	**<0.4**	**<0.002**	**<0.004**	0.075	**<0.002**	**<0.002**	**<0.2**	0.167	39.7	0.0049	0.032	0.0422	88.4	165	0.0047	0.72	152
D011	**<0.4**	**<0.002**	**<0.004**	0.017	**<0.002**	**<0.002**	**<0.2**	0.113	38.7	0.0024	**<0.01**	0.0179	22.5	179	0.0655	0.36	174
D012	0.47	**<0.002**	**<0.004**	0.016	**<0.002**	**<0.002**	0.25	0.226	43.5	0.0096	0.034	0.0254	82.2	224	**<0.004**	**<0.1**	144
D013	**<0.4**	0.0025	0.0041	0.035	**<0.002**	**<0.002**	0.25	0.591	52.2	0.0068	0.033	0.0943	101	117	0.0089	**<0.1**	205
D014	**<0.4**	**<0.002**	**<0.004**	0.026	**<0.002**	**<0.002**	**<0.2**	0.147	45.9	0.0075	**<0.01**	0.0433	48.0	207	**<0.004**	0.22	171
D015	**<0.4**	0.0031	**<0.004**	0.024	**<0.002**	**<0.002**	**<0.2**	0.603	59.4	0.0204	**<0.01**	0.0559	82.3	105	**<0.004**	**<0.1**	170
D016	**<0.4**	**<0.002**	**<0.004**	0.039	**<0.002**	**<0.002**	0.30	0.0042	51.1	0.0305	**<0.01**	**<0.004**	0.700	396	**<0.004**	**<0.1**	166
D017	**<0.4**	**<0.002**	0.0175	0.030	**<0.002**	**<0.002**	0.27	1.16	59.7	0.0350	0.360	0.0727	100	142	0.0061	0.24	183
D018	2.63	**<0.002**	**<0.004**	0.042	**<0.002**	**<0.002**	0.22	0.915	52.9	0.0151	0.307	0.0537	57.4	90.2	0.0111	0.19	175
D019	**<0.4**	**<0.002**	**<0.004**	0.105	**<0.002**	**<0.002**	0.28	0.0011	12.7	0.0187	0.046	**<0.004**	0.574	871	0.0113	**<0.1**	47.3
D020	4.22	**<0.002**	0.0044	0.082	**<0.002**	**<0.002**	0.22	0.133	57.4	0.0527	0.254	0.0082	0.836	218	0.0071	**<0.1**	185
D021	0.96	**<0.002**	0.0060	0.071	**<0.002**	**<0.002**	0.21	0.405	65.5	0.0084	0.327	0.0491	25.7	241	0.0108	0.19	141
D022	**<0.4**	**<0.002**	0.0040	0.032	**<0.002**	**<0.002**	**<0.2**	0.524	55.3	0.0545	0.051	0.0528	93.5	181	**<0.004**	**<0.1**	161
D023	**<0.4**	**<0.002**	**<0.004**	0.025	**<0.002**	**<0.002**	0.30	0.0303	49.0	0.0093	0.019	0.0374	40.6	98.7	0.0171	0.11	198
D024	0.67	**<0.002**	**<0.004**	0.026	**<0.002**	**<0.002**	0.35	0.591	52.8	0.0177	0.103	0.0780	73.7	114	**<0.004**	0.11	172
D025	**<0.4**	**<0.002**	0.0091	0.024	**<0.002**	**<0.002**	0.31	0.421	46.9	0.0139	0.270	0.0385	88.7	122	0.0131	0.12	159
D026	0.82	**<0.002**	**<0.004**	0.048	**<0.002**	**<0.002**	**<0.2**	0.338	76.4	0.0454	0.198	0.0615	72.5	233	**<0.004**	**<0.1**	176
D027	0.47	**<0.002**	**<0.004**	0.042	**<0.002**	**<0.002**	0.26	0.283	76.1	0.0049	0.122	0.0501	44.8	106	**<0.004**	**<0.1**	172
D028	3.63	**<0.002**	**<0.004**	0.054	**<0.002**	**<0.002**	0.23	0.742	56.2	0.0149	0.089	0.0515	58.6	100	0.0138	0.19	167
D029	0.54	**<0.002**	**<0.004**	0.027	**<0.002**	**<0.002**	**<0.2**	0.0264	58.7	0.0080	0.049	0.0473	36.1	93.2	0.0048	**<0.1**	188
D030	**<0.4**	**<0.002**	0.0055	0.020	**<0.002**	**<0.002**	**<0.2**	0.0021	44.9	0.104	0.010	0.0041	3.26	49.3	0.0354	**<0.1**	325

	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Cesium (Cs)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)
Lowest Detection Limit	**0.40**	**0.0020**	**0.0040**	**0.010**	**0.0020**	**0.0020**	**0.20**	**0.0010**	**4.0**	**0.0010**	**0.010**	**0.0040**	**0.020**	**0.60**	**0.0040**	**0.10**	**0.40**
Sample ID																	
D031	0.51	**<0.002**	**<0.004**	0.047	**<0.002**	**<0.002**	**<0.2**	0.442	48.5	0.0089	0.015	0.0727	52.6	124	0.0255	**<0.1**	166
D032	**<0.4**	**<0.002**	**<0.004**	0.070	**<0.002**	**<0.002**	0.22	0.0153	46.6	0.0148	0.021	0.0049	0.643	990	**<0.004**	0.17	108
D033	**<0.4**	**<0.002**	**<0.004**	0.018	**<0.002**	**<0.002**	**<0.2**	0.152	54.4	0.0121	0.049	0.0609	77.8	105	0.0046	**<0.1**	154
D034	**<0.4**	**<0.002**	**<0.004**	0.038	**<0.002**	**<0.002**	**<0.2**	0.519	48.7	0.0108	0.012	0.0778	59.9	129	0.0239	**<0.1**	183
D035	0.53	**<0.002**	**<0.004**	0.046	**<0.002**	**<0.002**	**<0.2**	0.474	48.1	0.0106	0.021	0.0784	62.9	140	0.0238	**<0.1**	177
D036	0.53	**<0.002**	**<0.004**	0.062	**<0.002**	**<0.002**	**<0.2**	1.59	64.2	0.0730	0.037	0.0806	45.1	120	0.0106	**<0.1**	171

- **Values listed in BOLD are the 'Lowest Detection Limit' where the actual value recorded was below this limit.**
- **Values are in mg/kg wet weight**

Appendix A – Raw Values Cont'd

	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Rubidium (Rb)	Selenium (Se)	Sodium (Na)	Strontium (Sr)	Tellurium (Te)	Thallium (Tl)	Tin (Sn)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)	Cyanide
Lowest Detection Limit	**0.010**	**0.0010**	**0.0040**	**0.040**	**2.0**	**4.0**	**0.010**	**0.010**	**4.0**	**0.010**	**0.0040**	**0.00040**	**0.020**	**0.00040**	**0.020**	**0.10**	**0.040**	**0.10**
Sample ID																		
D001	3.77	0.0021	0.513	**<0.04**	3200	2410	8.55	0.135	1170	0.062	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.047	33.5	**<0.04**	**<0.10**
D002	3.76	0.0040	0.475	**<0.04**	3840	3080	11.0	0.190	805	0.042	**<0.004**	0.00055	**<0.02**	**<0.0004**	0.091	33.6	**<0.04**	**<0.10**
D003	3.40	0.0086	0.722	0.045	3930	2400	12.1	0.528	1060	0.045	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.051	35.6	**<0.04**	**<0.10**
D004	2.23	0.0114	0.622	**<0.04**	4000	3070	15.9	0.897	586	0.020	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.025	36.4	**<0.04**	**<0.10**
D005	3.33	0.0025	0.105	**<0.04**	3730	2970	12.4	0.485	839	0.054	**<0.004**	0.00082	**<0.02**	**<0.0004**	**<0.02**	19.2	**<0.04**	**<0.10**
D006	1.59	0.0031	0.163	**<0.04**	4050	3220	8.72	0.435	778	0.034	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	40.6	**<0.04**	**<0.10**
D007	1.76	0.0025	0.194	**<0.04**	3590	2870	13.9	1.85	965	0.025	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.040	26.4	**<0.04**	**<0.10**
D008	1.43	0.0038	0.0592	**<0.04**	4100	2910	14.2	0.189	714	0.027	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	33.3	**<0.04**	**<0.10**
D009	2.80	0.0014	0.357	**<0.04**	3270	2670	6.59	0.294	1200	0.035	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	25.5	**<0.04**	**<0.10**
D010	1.07	0.0019	0.128	**<0.04**	3560	2790	8.09	1.06	908	0.026	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	24.2	**<0.04**	**<0.10**
D011	3.19	**<0.001**	0.628	**<0.04**	3480	3120	6.96	0.447	774	0.013	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	37.2	**<0.04**	**<0.10**
D012	2.52	0.0019	0.400	**<0.04**	2790	2550	13.6	0.956	1060	0.025	**<0.004**	0.00046	**<0.02**	**<0.0004**	**<0.02**	29.9	**<0.04**	**<0.10**
D013	4.05	0.0019	0.700	**<0.04**	4530	3490	25.4	0.474	743	0.038	**<0.004**	**<0.0004**	0.031	**<0.0004**	0.022	42.3	**<0.04**	**<0.10**
D014	3.65	0.0021	0.408	**<0.04**	3750	3010	10.1	0.413	736	0.032	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	41.3	**<0.04**	**<0.10**
D015	2.44	0.0017	0.136	**<0.04**	3700	2470	18.8	0.620	734	0.168	**<0.004**	0.00042	**<0.02**	0.00229	**<0.02**	35.5	**<0.04**	**<0.10**
D016	0.188	**<0.001**	0.0527	**<0.04**	2330	3600	26.0	0.329	898	0.080	**<0.004**	0.00053	**<0.02**	**<0.0004**	**<0.02**	31.5	**<0.04**	**<0.10**
D017	3.31	0.0109	0.675	0.061	3930	3000	14.1	1.12	1100	0.059	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	49.9	**<0.04**	**<0.10**
D018	1.60	0.0034	0.136	**<0.04**	3950	3240	16.4	0.393	807	0.036	**<0.004**	0.00063	**<0.02**	**<0.0004**	**<0.02**	21.2	**<0.04**	**<0.10**
D019	0.066	**<0.001**	0.0104	**<0.04**	671	3150	24.0	0.349	352	0.011	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	6.22	**<0.04**	**<0.10**
D020	0.337	0.0014	0.0482	**<0.04**	2690	3720	14.6	0.301	874	0.067	**<0.004**	**<0.0004**	0.026	0.00060	**<0.02**	30.0	**<0.04**	**<0.10**
D021	2.63	0.0031	0.361	**<0.04**	2920	2400	7.15	0.346	1510	0.093	**<0.004**	**<0.0004**	0.042	**<0.0004**	**<0.02**	33.5	**<0.04**	**<0.10**
D022	2.63	0.0048	0.173	**<0.04**	3330	2600	12.2	0.598	1230	0.034	**<0.004**	0.00060	**<0.02**	**<0.0004**	**<0.02**	31.2	**<0.04**	**<0.10**
D023	4.26	0.0017	0.825	**<0.04**	3870	3310	15.9	0.247	687	0.029	**<0.004**	0.00045	0.022	**<0.0004**	0.026	50.4	**<0.04**	**<0.10**
D024	3.55	0.0058	0.810	0.072	3470	2640	15.1	0.553	1110	0.026	**<0.004**	0.00059	0.049	**<0.0004**	0.202	30.7	**<0.04**	**<0.10**
D025	1.21	0.0027	0.156	**<0.04**	3720	2890	11.3	0.850	940	0.029	**<0.004**	0.00083	0.030	**<0.0004**	**<0.02**	19.9	**<0.04**	**<0.10**
D026	3.78	0.0064	0.379	0.076	3370	2150	13.2	0.552	797	0.317	**<0.004**	0.00047	0.050	0.00457	0.236	48.7	**<0.04**	**<0.10**
D027	4.35	0.0018	0.754	0.048	3090	2670	8.85	0.354	1260	0.056	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.042	40.3	**<0.04**	**<0.10**

	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Rubidium (Rb)	Selenium (Se)	Sodium (Na)	Strontium (Sr)	Tellurium (Te)	Thallium (Tl)	Tin (Sn)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)	Cyanide
Lowest Detection Limit	**0.010**	**0.0010**	**0.0040**	**0.040**	**2.0**	**4.0**	**0.010**	**0.010**	**4.0**	**0.010**	**0.0040**	**0.00040**	**0.020**	**0.00040**	**0.020**	**0.10**	**0.040**	**0.10**
Sample ID																		
D028	1.54	0.0037	0.138	**<0.04**	3780	3010	16.0	0.389	860	0.043	**<0.004**	0.00077	0.024	**<0.0004**	**<0.02**	19.5	**<0.04**	**<0.10**
D029	3.24	0.0029	0.497	**<0.04**	3790	3260	8.29	0.367	1090	0.038	**<0.004**	0.00042	0.026	**<0.0004**	0.067	41.5	**<0.04**	**<0.10**
D030	0.486	0.0016	0.0248	**<0.04**	3070	4190	20.4	0.367	449	0.070	**<0.004**	0.00172	0.075	0.00110	**<0.02**	11.0	0.055	0.11
D031	2.71	0.0030	0.714	**<0.04**	3560	2510	8.04	0.717	943	0.043	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	25.7	0.053	N/A
D032	0.183	**<0.001**	0.0538	**<0.04**	1580	3500	17.5	0.406	810	0.037	**<0.004**	0.00060	**<0.02**	**<0.0004**	**<0.02**	18.9	**<0.04**	N/A
D033	2.44	0.0029	0.547	**<0.04**	3530	2210	37.5	0.323	1120	0.033	**<0.004**	0.00051	**<0.02**	**<0.0004**	0.113	26.2	**<0.04**	N/A
D034	3.11	0.0036	0.845	**<0.04**	4010	2900	9.42	0.783	831	0.038	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.026	28.3	**<0.04**	N/A
D035	3.16	0.0040	0.866	**<0.04**	4040	2830	9.06	0.827	781	0.042	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.022	27.8	**<0.04**	N/A
D036	2.61	0.0071	0.296	**<0.04**	4030	2930	19.0	0.483	894	0.039	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.095	49.7	**<0.04**	N/A

- **Values listed in BOLD are the 'Lowest Detection Limit' where the actual value recorded was below this limit.**
- **Values are in mg/kg wet weight**

APPENDIX B

2016 WHITE-TAILED DEER TISSUE CONTAMINANT BASELINE CONCENTRATION VALUES

	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Cesium (Cs)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)
Lowest Detection Limit	**0.40**	**0.0020**	**0.0040**	**0.010**	**0.0020**	**0.0020**	**0.20**	**0.0010**	**4.0**	**0.0010**	**0.010**	**0.0040**	**0.020**	**0.60**	**0.0040**	**0.10**	**0.40**
Sample ID																	
D001	**<0.4**	0.0022	0.0067	0.037	**<0.002**	**<0.002**	0.25	0.367	40.5	0.293	**<0.01**	0.0467	72.1	113	**<0.004**	0.26	161
D002	**<0.4**	**<0.002**	0.0132	0.089	**<0.002**	**<0.002**	**<0.2**	0.230	41.7	0.0200	**<0.01**	0.0462	105	161	**<0.004**	0.19	152
D003	0.51	**<0.002**	**<0.004**	0.052	**<0.002**	**<0.002**	**<0.2**	0.686	70.4	0.0332	0.263	0.0550	64.3	103	**<0.004**	0.27	164
D004	**<0.4**	**<0.002**	0.0077	0.056	**<0.002**	**<0.002**	0.26	0.759	43.2	0.0822	0.025	0.0492	148	133	**<0.004**	0.39	143
D005	0.58	0.0797	0.0088	0.039	**<0.002**	**<0.002**	0.29	0.310	51.1	0.0335	0.111	0.0648	58.8	96.6	2.52	0.68	177
D006 LIVER ONLY	**<0.4**	**<0.002**	0.0118	0.027	**<0.002**	**<0.002**	**<0.2**	0.527	60.8	0.0302	**<0.01**	0.0367	70.4	151	**<0.004**	0.45	166
D006 LIVER & HEART	**<0.4**	**<0.002**	0.0120	0.022	**<0.002**	**<0.002**	**<0.2**	0.474	58.1	0.0302	**<0.01**	0.0355	67.3	172	**<0.004**	0.46	157
D007	0.41	**<0.002**	**<0.004**	0.110	**<0.002**	**<0.002**	0.24	0.589	41.0	0.0800	0.236	0.0906	110	139	0.0053	0.19	125
D008	**<0.4**	**<0.002**	0.0087	0.075	**<0.002**	**<0.002**	**<0.2**	0.925	57.9	0.270	0.035	0.0665	68.2	141	0.0068	0.26	154
D009	10.2	**<0.002**	0.0065	0.155	**<0.002**	**<0.002**	0.28	0.444	88.1	0.0231	0.043	0.0495	36.8	96.7	0.0728	0.29	160
D010	**<0.4**	**<0.002**	0.0084	0.019	**<0.002**	**<0.002**	0.23	0.582	49.6	0.0136	0.015	0.0672	61.0	236	**<0.004**	0.11	182
D011	**<0.4**	**<0.002**	0.0074	0.019	**<0.002**	**<0.002**	0.24	0.0989	45.5	0.0841	**<0.01**	0.0185	6.85	100	**<0.004**	0.17	202
D012 LIVER ONLY	0.52	0.0033	0.0151	0.021	**<0.002**	0.0025	0.31	0.384	34.0	0.0345	0.011	0.0435	43.5	129	0.104	**<0.1**	157
D013	**<0.4**	**<0.002**	0.0180	0.027	**<0.002**	0.0042	0.52	0.239	49.3	0.0108	**<0.01**	0.0612	94.3	98.7	0.0042	0.36	180
D014	0.47	**<0.002**	**<0.004**	0.055	**<0.002**	**<0.002**	**<0.2**	0.487	54.2	0.0056	**<0.01**	0.0243	191	119	0.0280	0.14	155
D015	0.49	**<0.002**	0.0106	0.029	**<0.002**	**<0.002**	0.50	0.157	49.3	0.0077	**<0.01**	0.0405	143	144	0.0112	0.15	175
D016	**<0.4**	**<0.002**	0.0135	0.020	**<0.002**	0.0060	0.24	0.205	54.3	0.0078	0.127	0.0299	107	125	0.0488	0.32	197
D017	**<0.4**	**<0.002**	0.0139	0.022	**<0.002**	**<0.002**	**<0.2**	0.775	39.4	0.0044	0.039	0.0739	181	153	0.0042	0.32	175
D018	**<0.4**	**<0.002**	0.0176	0.023	**<0.002**	0.0023	0.32	0.184	48.4	0.0260	0.011	0.0397	110	194	0.0076	0.31	171
D019	0.91	0.0031	**<0.004**	0.071	**<0.002**	**<0.002**	0.28	0.0094	29.2	0.0105	0.010	**<0.004**	0.562	901	0.0127	**<0.1**	57.6
D020	0.76	**<0.002**	0.0049	0.024	**<0.002**	**<0.002**	0.20	0.236	39.5	0.0131	0.041	0.0426	106	182	0.0070	0.14	142
D021	**<0.4**	**<0.002**	0.0188	0.017	**<0.002**	0.0036	**<0.2**	0.314	43.3	0.0163	0.140	0.0561	58.5	172	0.0042	0.53	184
D022	1.35	0.0053	0.0066	0.038	**<0.002**	**<0.002**	0.35	0.187	45.7	0.0064	0.026	0.0554	90.0	117	0.267	0.55	174
D023	**<0.4**	**<0.002**	0.0176	0.012	**<0.002**	**<0.002**	0.28	0.183	40.2	0.0141	0.107	0.0532	74.9	192	0.0073	0.16	183
D024	**<0.4**	**<0.002**	0.0205	0.036	**<0.002**	**<0.002**	**<0.2**	0.639	54.1	0.0993	0.169	0.0453	89.0	120	0.0125	**<0.1**	166
D025	0.41	**<0.002**	**<0.004**	0.063	**<0.002**	**<0.002**	0.22	1.98	61.1	0.0085	0.025	0.0528	48.2	140	0.0044	**<0.1**	132
D026	**<0.4**	**<0.002**	0.0044	0.021	**<0.002**	0.0028	0.42	0.0944	59.7	0.0124	0.024	0.0748	42.0	142	0.0093	0.44	162
D027	6.12	**<0.002**	0.0375	0.064	**<0.002**	**<0.002**	**<0.2**	0.719	47.6	0.0412	0.033	0.0515	92.8	91.8	0.0054	0.46	172
D028	9.96	0.0049	0.0180	0.105	**<0.002**	0.0022	0.34	0.781	52.6	0.0654	3.20	0.108	30.7	124	0.0382	0.22	195
D029	**<0.4**	0.0054	0.0079	0.031	**<0.002**	**<0.002**	0.20	1.69	45.1	0.0898	**<0.01**	0.0463	94.6	107	0.0268	**<0.1**	147

	Aluminum (Al)	Antimony (Sb)	Arsenic (As)	Barium (Ba)	Beryllium (Be)	Bismuth (Bi)	Boron (B)	Cadmium (Cd)	Calcium (Ca)	Cesium (Cs)	Chromium (Cr)	Cobalt (Co)	Copper (Cu)	Iron (Fe)	Lead (Pb)	Lithium (Li)	Magnesium (Mg)
Lowest Detection Limit	**0.40**	**0.0020**	**0.0040**	**0.010**	**0.0020**	**0.0020**	**0.20**	**0.0010**	**4.0**	**0.0010**	**0.010**	**0.0040**	**0.020**	**0.60**	**0.0040**	**0.10**	**0.40**
Sample ID																	
D030	0.58	0.0041	0.0092	0.057	**<0.002**	**<0.002**	**<0.2**	0.788	47.9	0.0524	0.017	0.0433	48.4	120	0.0376	**<0.1**	158
D031	1.73	**<0.002**	0.0073	0.034	**<0.002**	0.0026	0.22	0.264	42.6	0.0188	0.032	0.0305	37.8	294	0.0063	0.29	143
D032	**<0.4**	0.0053	0.0090	0.026	**<0.002**	**<0.002**	**<0.2**	1.83	41.5	0.0962	0.016	0.0503	111	111	0.0662	**<0.1**	153
D033	0.56	**<0.002**	0.0075	0.020	**<0.002**	**<0.002**	**<0.2**	0.126	43.9	0.0119	**<0.01**	0.0677	66.7	79.8	0.0102	0.25	159
D034	0.42	**<0.002**	0.0199	0.012	**<0.002**	0.0049	0.27	0.281	55.9	0.0230	0.097	0.0389	124	194	0.0070	0.28	163
D035	0.65	0.281	0.0491	0.084	**<0.002**	0.0067	0.49	0.658	106	0.0617	0.041	0.0488	22.0	102	39.9	0.46	153
D036	0.55	**<0.002**	0.0191	0.023	**<0.002**	**<0.002**	0.34	0.311	43.5	0.0480	0.393	0.0588	128	155	0.0226	0.46	167
D037	**<0.4**	**<0.002**	0.0114	0.051	**<0.002**	**<0.002**	**<0.2**	0.973	46.7	0.0406	**<0.01**	0.0560	67.7	145	0.0045	**<0.1**	162

- **Values listed in BOLD are the 'Lowest Detection Limit' where the actual value recorded was below this limit.**
- **Values are in mg/kg wet weight**

Appendix B – Raw Values Cont'd

	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Rubidium (Rb)	Selenium (Se)	Sodium (Na)	Strontium (Sr)	Tellurium (Te)	Thallium (Tl)	Tin (Sn)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)	Cyanide
Lowest Detection Limit	**0.010**	**0.0010**	**0.0040**	**0.040**	**2.0**	**4.0**	**0.010**	**0.010**	**4.0**	**0.010**	**0.0040**	**0.00040**	**0.020**	**0.00040**	**0.020**	**0.10**	**0.040**	**0.10**
Sample ID																		
D001	1.68	0.0108	0.0736	**<0.04**	3950	2900	26.8	1.36	952	0.033	**<0.004**	0.00193	**<0.02**	**<0.0004**	**<0.02**	24.8	**<0.04**	0.27
D002	0.789	0.0049	0.102	**<0.04**	3720	2540	22.6	1.39	684	0.014	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	22.7	**<0.04**	0.13
D003	1.41	0.0110	0.130	0.170	3780	3000	20.9	1.20	853	0.041	**<0.004**	0.00072	**<0.02**	**<0.0004**	**<0.02**	51.8	**<0.04**	0.31
D004	1.36	0.0096	0.0904	**<0.04**	3720	2440	32.5	1.88	813	0.052	**<0.004**	0.00042	0.038	**<0.0004**	0.024	37.0	**<0.04**	**<0.10**
D005	1.73	0.0042	0.170	0.072	4040	2820	24.5	0.609	749	0.030	**<0.004**	0.00091	**<0.02**	**<0.0004**	**<0.02**	29.6	**<0.04**	0.28
D006 LIVER ONLY	1.10	0.0033	0.0834	**<0.04**	3820	3030	13.8	0.922	699	0.056	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	20.5	**<0.04**	0.35
D006 LIVER & HEART	1.06	0.0031	0.0792	**<0.04**	3640	2900	13.6	0.903	676	0.050	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	19.8	**<0.04**	0.16
D007	2.13	0.0061	0.125	0.165	2860	2260	20.2	0.863	783	0.089	**<0.004**	0.00081	0.034	**<0.0004**	0.059	19.0	**<0.04**	0.41
D008	1.57	0.0040	0.0851	**<0.04**	3580	2860	24.9	1.51	838	0.079	**<0.004**	0.00078	0.043	**<0.0004**	**<0.02**	20.5	**<0.04**	0.33
D009	3.07	0.0060	0.178	**<0.04**	3620	2620	20.1	0.560	927	0.075	**<0.004**	0.00055	**<0.02**	0.00058	0.135	61.0	**<0.04**	0.20
D010	3.64	0.0033	0.458	**<0.04**	4150	2910	7.08	0.198	852	0.021	**<0.004**	**<0.0004**	0.035	**<0.0004**	0.048	33.9	**<0.04**	0.18
D011	1.23	0.0054	0.345	**<0.04**	2820	2860	11.6	0.267	1050	0.014	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	31.4	**<0.04**	0.20
D012 LIVER ONLY	2.60	0.0053	0.575	**<0.04**	3350	2190	20.7	0.473	1110	0.010	**<0.004**	0.00174	0.023	**<0.0004**	0.034	29.3	**<0.04**	0.17
D013	3.26	0.0029	0.775	**<0.04**	3650	2420	14.3	1.34	579	0.059	**<0.004**	0.00109	0.029	**<0.0004**	0.035	32.6	**<0.04**	0.18
D014	1.60	0.0024	0.180	**<0.04**	3650	2970	14.7	1.49	612	0.035	**<0.004**	**<0.0004**	0.021	**<0.0004**	0.033	42.4	**<0.04**	**<0.10**
D015	2.55	0.0100	0.357	**<0.04**	3770	2820	24.7	1.33	684	0.013	**<0.004**	0.00080	0.027	**<0.0004**	0.055	45.3	**<0.04**	0.10
D016	0.969	0.0020	0.0873	0.088	4430	2950	20.8	1.25	732	0.012	**<0.004**	0.00049	0.034	**<0.0004**	**<0.02**	33.3	**<0.04**	0.12
D017	2.94	0.0052	0.686	**<0.04**	3640	2660	18.3	1.63	863	0.014	**<0.004**	**<0.0004**	0.038	**<0.0004**	0.075	40.7	**<0.04**	0.11
D018	2.75	0.0064	0.198	**<0.04**	4150	2760	11.1	1.44	893	0.018	**<0.004**	0.00055	0.037	**<0.0004**	0.037	34.6	**<0.04**	**<0.10**
D019	0.138	**<0.001**	0.0269	**<0.04**	853	3650	7.00	0.318	413	0.030	**<0.004**	0.00041	**<0.02**	**<0.0004**	**<0.02**	10.4	**<0.04**	**<0.10**
D020	2.97	0.0029	0.331	0.059	3140	2670	10.9	0.528	861	0.024	**<0.004**	**<0.0004**	0.072	**<0.0004**	0.089	30.1	**<0.04**	0.18
D021	3.45	0.0024	0.688	0.084	3550	2690	11.1	0.518	976	0.013	**<0.004**	**<0.0004**	0.037	**<0.0004**	**<0.02**	37.7	**<0.04**	**<0.10**
D022	3.07	0.0026	0.565	**<0.04**	3480	2850	7.38	0.550	734	0.027	**<0.004**	0.00066	0.055	**<0.0004**	0.082	41.6	**<0.04**	**<0.10**
D023	3.02	0.0040	0.824	0.072	3710	3110	29.8	0.559	626	**<0.01**	**<0.004**	0.00052	**<0.02**	**<0.0004**	**<0.02**	35.3	**<0.04**	0.17
D024	3.76	0.111	0.623	0.108	3870	2530	20.9	0.545	1220	0.026	**<0.004**	0.00082	0.022	**<0.0004**	**<0.02**	27.7	**<0.04**	0.14
D025	2.30	0.0051	0.401	**<0.04**	2790	1310	6.69	0.354	1440	0.029	**<0.004**	**<0.0004**	0.086	**<0.0004**	0.059	24.0	**<0.04**	0.27
D026	1.37	0.0076	0.280	**<0.04**	3320	2550	12.9	0.522	1020	0.029	**<0.004**	0.00064	0.022	**<0.0004**	0.075	28.2	**<0.04**	0.18

	Manganese (Mn)	Mercury (Hg)	Molybdenum (Mo)	Nickel (Ni)	Phosphorus (P)	Potassium (K)	Rubidium (Rb)	Selenium (Se)	Sodium (Na)	Strontium (Sr)	Tellurium (Te)	Thallium (Tl)	Tin (Sn)	Uranium (U)	Vanadium (V)	Zinc (Zn)	Zirconium (Zr)	Cyanide
Lowest Detection Limit	**0.010**	**0.0010**	**0.0040**	**0.040**	**2.0**	**4.0**	**0.010**	**0.010**	**4.0**	**0.010**	**0.0040**	**0.00040**	**0.020**	**0.00040**	**0.020**	**0.10**	**0.040**	**0.10**
Sample ID																		
D027	1.09	0.0151	0.0963	**<0.04**	3830	2970	16.8	1.23	627	0.022	**<0.004**	**<0.0004**	0.058	**<0.0004**	0.084	21.8	**<0.04**	0.34
D028	3.91	0.0151	0.726	1.50	4010	3240	26.6	0.419	813	0.049	**<0.004**	0.00112	0.034	0.00108	0.048	47.4	**<0.04**	0.32
D029	3.02	0.0056	0.419	0.056	3250	2870	13.2	0.792	799	0.020	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	**<0.02**	29.8	**<0.04**	0.12
D030	3.32	0.0058	0.367	**<0.04**	3340	2690	21.5	0.592	736	0.049	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.113	37.4	**<0.04**	0.11
D031	2.34	0.0041	0.310	**<0.04**	2640	2660	7.96	0.486	880	0.052	**<0.004**	**<0.0004**	0.029	**<0.0004**	0.094	33.4	**<0.04**	0.14
D032	3.21	0.0058	0.456	**<0.04**	3440	3070	14.2	0.868	694	0.018	**<0.004**	**<0.0004**	0.055	**<0.0004**	0.038	32.1	**<0.04**	0.20
D033	3.28	0.0016	0.510	**<0.04**	3300	2780	18.7	0.417	547	0.024	**<0.004**	**<0.0004**	**<0.02**	**<0.0004**	0.065	32.8	**<0.04**	0.18
D034	1.36	0.0043	0.116	0.066	3610	2700	29.7	1.29	791	**<0.01**	**<0.004**	0.00052	**<0.02**	**<0.0004**	**<0.02**	25.1	**<0.04**	0.28
D035	2.72	0.0109	0.698	**<0.04**	2980	2170	24.1	0.410	1250	0.087	**<0.004**	0.00073	0.057	**<0.0004**	0.029	34.0	**<0.04**	0.23
D036	4.14	0.0091	0.953	0.259	3340	2650	15.8	0.937	568	**<0.01**	**<0.004**	0.00048	0.031	**<0.0004**	**<0.02**	43.3	**<0.04**	0.27
D037	1.13	0.0052	0.0867	**<0.04**	3780	2940	24.3	1.32	601	0.031	**<0.004**	0.00048	**<0.02**	**<0.0004**	**<0.02**	20.2	**<0.04**	0.13

- **Values listed in BOLD are the 'Lowest Detection Limit' where the actual value recorded was below this limit.**
- **Values are in mg/kg wet weight**

APPENDIX C

COMPARISON OF KEY CONTAMINANT VALUES BETWEEN 2016 BASELINE DATA AND 2017 EARLY OPERATIONS DATA

Contaminant	Lowest Detection Limit (mg/kg ww)	Minimum (mg/kg ww)			Maximum (mg/kg ww)			Mean (mg/kg ww)			Median (mg/kg ww)		
		2017	2016	Difference	2017	2016	Difference	2017	2016	Difference	2017	2016	Difference
Aluminum	0.40	<0.40	<0.40	--	4.22	10.2	-5.98	0.524 – 0.769	0.978 – 1.178	-0.454 - (-0.409)	<0.40	0.205 – 0.405	≤0.195 – (-0.005)
Antimony	0.0020	<0.0020	<0.0020	--	0.0061	0.2810	-0.2749	0.0004 – 0.0022	0.0104 – 0.0119	-0.01 - (-0.0097)	<0.0020	<0.0020	--
Arsenic	0.0040	<0.0040	<0.0040	--	0.0220	0.0491	-0.0271	0.0025 – 0.0054	0.0118 – 0.0123	-0.0093 – (-0.0069)	<0.0040	0.0091	≤-0.0051
Barium	0.010	0.016	0.012	+0.04	0.105	0.155	-0.05	0.044	0.044	--	0.042	0.033	+0.01
Beryllium	0.0020	<0.0020	<0.0020	--	<0.0020	<0.0020	--	<0.0020	<0.0020	--	<0.0020	<0.0020	--
Bismuth	0.0020	<0.0020	<0.0020	--	<0.0020	0.0067	≤0.0047	<0.0020	0.0010 – 0.0025	≥0.001 – (-0.0005)	<0.0020	<0.0020	--
Boron	0.20	<0.20	<0.20	--	0.35	0.52	-0.17	0.14 – 0.24	0.19 – 0.27	-0.05 – (-0.03)	0.215	0.24	-0.025
Cadmium	0.0010	0.0011	0.009	-0.0079	1.89	1.980	-0.09	0.4175	0.539	-0.1215	0.2815	0.414	-0.1325
Calcium	4.0	12.7	29.2	-16.5	76.4	106.0	-29.6	51.4	50.6	+0.8	49.6	47.8	+1.8
Cesium	0.0010	0.0024	0.0044	-0.002	0.104	0.2930	-0.189	0.0207	0.0479	-0.0272	0.0144	0.0281	-00137
Chromium	0.010	<0.010	<0.010	--	3.6	3.2	+0.4	0.0744 – 0.0759	0.139 – 0.142	-0.0646 – (-0.0661)	0.0335	0.025	+0.085
Cobalt	0.0040	<0.0040	<0.0040	--	0.0943	0.1080	-0.0137	0.0498 – 0.0500	0.0505 – 0.0506	-0.0007 – (-0.0006)	0.0527	0.0494	+0.0033
Copper	0.020	0.574	0.6	-0.026	173.0	191.0	-18	56.2	80.8	-24.6	58.0	71.3	-13.3
Iron	0.60	49.3	79.8	-30.5	990.0	901.0	+89	193.1	160.4	+32.7	141.0	136.0	+5
Lead	0.0040	<0.0040	<0.0040	--	0.131	39.9*	-39.77	0.0126 – 0.0141	1.1385 – 1.1393	-1.126 – (-1.125)	0.00545	0.0072	-000175
Lithium	0.10	<0.10	<0.10	--	0.72	0.68	+0.04	0.14 – 0.19	0.25 – 0.27	-0.11 – (-0.08)	<0.10 – 0.11	0.26	≤-0.16 – (-0.15)
Magnesium	0.40	47.3	57.6	-10.3	325.0	202.0	+123	168.7	161.2	+7.5	171.5	162.0	+9.5
Manganese	0.010	0.066	0.14	-0.074	4.35	4.14	+0.21	2.455	2.29	+0.165	2.63	2.45	+0.18
Mercury	0.0010	<0.0010	<0.0010	--	0.0114	0.1110	-0.0996	0.0033 – 0.0034	0.0085 – 0.0086	-0.0052	0.0028	0.0052	-0.0024
Molybdenum	0.0040	0.0248	0.0269	-0.0021	0.8660	0.9530	-0.087	0.3881	0.3488	+0.0393	0.3700	0.3205	+0.0495
Nickel	0.040	<0.040	<0.040	--	0.076	1.5	-1.424	0.008 – 0.043	0.071 – 0.098	-0.063 – (-0.055)	<0.040	<0.040	--
Phosphorus	2.0	671.0	853.0	-182	4530.0	4430.0	+100	3451.4	3488.8	-37.4	3645.0	3630.0	+15

Potassium	4.0	2150.0	1310.0	+840	4190.0	3650.0	+540	2937.2	2737.1	+200.1	2920.0	2800.0	+120
Rubidium	0.010	6.59	6.7	-0.11	37.5	32.5	+5	14.2	18.0	-3.8	13.4	18.5	-5.1
Selenium	0.010	0.135	0.198	-0.063	1.85	1.880	-0.03	0.545	0.876	-0.331	0.441	0.828	-0.387
Sodium	4.0	352.0	413.0	-61	1510.0	1440.0	+70	900.4	814.3	+86.1	867	795.0	+72
Strontium	0.010	0.011	<0.010	≥0.001	0.317	0.089	+0.228	0.0518	0.033 – 0.034	+0.0188 – 0.0178	0.038	0.028	+0.01
Tellurium	0.0040	<0.0040	<0.0040	--	<0.0040	<0.0040	--	<0.0040	<0.0040	--	<0.0040	<0.0040	--
Thallium	0.00040	<0.00040	<0.00040	--	0.00172	0.00193	-0.00021	0.00029 – 0.00051	0.00045 – 0.00062	-0.00016 – (-0.00011)	<0.00040	0.00048	≤-0.00008
Tin	0.020	<0.020	<0.020	--	0.075	0.086	-0.011	0.010 – 0.025	0.024 – 0.032	-0.014 – (-0.007)	<0.020	0.025	≤-0.005
Uranium	0.00040	<0.00040	<0.00040	--	0.00457	0.00108	+0.00349	0.00024 – 0.00059	0.00004 – 0.00042	+0.0002 – 0.00017	<0.00040	<0.00040	--
Vanadium	0.020	<0.020	<0.020	--	0.236	0.135	+0.101	0.031 – 0.042	0.035 – 0.043	-0.004 – (-0.001)	<0.020	0.031	≤-0.011
Zinc	0.10	6.22	10.4	-4.18	50.4	61.0	-10.6	31.6	32.2	-0.6	31.3	32.4	-1.1
Zirconium	0.040	<0.040	<0.040	--	0.055	<0.040	≥0.016	0.003 – 0.041	<0.040	≥-0.037 – (+0.001)	<0.040	<0.040	--
Cyanide	0.10	<0.10	<0.10	--	0.11	0.41	-0.3	0.004 – 0.10	0.177 – 0.193	-0.173 – (-0.093)	<0.10	0.18	≤-0.08

NEW GOLD RAINY RIVER MINE
APPENDIX Q
OMS MANUAL

newgold™ Rainy River Project

RAINY RIVER PROJECT

OPERATION, MAINTENANCE AND SURVEILLANCE MANUAL WATER MANAGEMENT STRUCTURES

New Gold Inc.
Rainy River Project
5967 Highway 11/71, P.O. Box 5
Emo, Ontario
P0W 1E0

August 2017

Version 2017-08

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Appendix F Inspection Sheets

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Appendix F2 - Weekly Inspection Sheets
Appendix F3 - Inspection Sheets For Unusual Events

Appendix G MNRF Comments on the Pre-Production OMS Manual and New Gold Responses on revision AG (October 2016) & ITRB Review Comments on Pre-Production Version (July 2017)

1.0 INTRODUCTION

The Rainy River Mine (RRM) is located in the Rainy River District, in northwestern Ontario in Chapple Township, approximately 65 kilometers (km) northwest of Fort Frances and 420 km west of Thunder Bay. The mine includes an open pit mine, a mill, tailings management area (TMA), process water and water treatment structures. The project is currently in its second year of construction and close to operations in late 2017 at the time of this Operation, Maintenance and Surveillance (OMS) manual update (to August 15, 2017).

This OMS Manual has been prepared by the Rainy River Mine with the assistance of AMEC Foster Wheeler (AMECFW) and the Engineer of Record for the dams. The OMS is a requirement of the Ministry of Natural Resources and Forestry (MNRF), Lakes Rivers Improvement Act (LRIA) approvals, and has been prepared in general accordance with the latest guidelines titled "Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities:" developed by the Mining Association of Canada (MAC, 2011).

The goal of the OMS Manual is to provide specific guidance the operation to the Tailings, Water Management and Water Diversion dams. The objectives of this OMS are to define and describe the following:

- Roles and responsibilities of personnel assigned to the facility;
- The key components of the facility;
- Set out procedures required to operate, monitor the performance of, and maintain a facility to ensure that it functions in accordance to design, meets regulatory and corporate policy obligations, and links to emergency preparedness and response;
- Procedures and processes for managing change;
- Requirements for analysis and documentation of the performance of the facility;
- Serve as a training document for personnel that are new to the mine;
- Identify potentially unsafe conditions or indicators and provide links to emergency response procedures; and
- Satisfy the requirements of the Mining Association of Canada's (MAC) guidelines Towards Sustainable Mining (TSM) initiative.

The OMS Manual covers operations of the facility through the commissioning, operations, and closure phases of the Rainy River Mine. The tailings facilities include the equipment and operations beginning with the tailings discharge from the mine mill, pipelines, deposition equipment, tailings, water treatment and water management (seepage collection ponds) and water diversion. In addition, the OMS guides operators and staff on when to initiate the EPRP.

This document has been prepared primarily for use by the mine personnel who are responsible for the operation, maintenance and surveillance of the tailings facility. It contains information and instructions necessary to perform the above required activities. Comprehensive checklists and procedures for operation, maintenance and annual inspections are utilized by the RRM e.g., through the SAP work order system and are not reproduced herein.

1.1 Regulatory Requirements and Guidelines

This document is consistent with the New Gold Tailings, Heap Leach and Waste Rock Facilities Management Policy and was prepared pursuant to the MAC guidelines for *Developing an Operation, Maintenance and Surveillance Manual for Tailings and Water Management Facilities* (MAC, 2011).

There are a number of Federal and Provincial environmental approvals required to construct, operate, and eventually reclaim the mine. Key Provincial legislation related to the RRM includes the: *Ontario Water Resources Act*, *Environmental Protection Act*, *Endangered Species Act*, *Mining Act*, *Lakes and Rivers Improvement Act*, *Public Lands Act* and *Planning Act*. From the Federal perspective, the *Fisheries Act* and the associated Metal Mining Effluent Regulation are the primary regulatory instruments related to the RRM.

The primary approval(s) for construction of the various hydraulic structures and associated water storage facilities are as follows:

- Work Permits from Ontario Ministry of Natural Resources and Forestry (MNRF), under the *Lakes and Rivers Improvement Act* (LRIA).
    - These permits approve the design of the dams and appurtenances, in accordance with the provided design drawings and report.
    - LRIA approvals are generally required for each annual dam raising campaign.
- Discharge of effluent (e.g. from the TMA) is governed by the Environmental Compliance Approvals (ECAs) for Industrial Sewage Works issued under the *Environmental Protection Act* by the Ontario Ministry of the Environment and Climate Change (MOECC).
    - The ECAs dictate the quality and quantity of effluent allowed to be discharged to the environment as well as other measures intended to ensure the environment is protected; as well as the overall design of the facility.
- Permits to Take Water (PTTWs) issued under the *Ontario Water Resources Act* direct water takings associated with the Site, including dam foundation dewatering and water supply from the Pinewood River.
    - Where water takings (surface or groundwater) are required to support construction and operation, they are generally restricted by the PTTWs received from the MOECC which limit the volume of water that can be taken from the environment.
- A Closure Plan has been filed with the Ministry of Northern Development and Mines (MNDM) under the *Mining Act,* which describes the planned development and operation of the RRM, the proposed approach to closure of the RRM, and outlines the associated financial assurance related to closure aspects.
    - This Closure Plan will be amended from time to time as required, such as any changes to the proposed operation of the TMA, or other changes to the RRM which are deemed to be material.
    - The Closure Plan primarily focuses on the physical and chemical stability of the site post-closure or during a temporary shutdown scenario.

- Planning to date has assumed permanent flooding of the potentially acid generating (PAG) tailings to inhibit oxidation.

In addition to these and other regulatory approval requirements, a number of commitments were made regarding the RRM through the Federal and Provincial environmental assessment processes. These commitments were initially tabulated in Table 14-1 of the Rainy River Project, Final Environmental Assessment Report (AMEC, January 2014) and are maintained and tracked by the Environmental Department as the Rainy River Project Commitments Registry.

Where pertinent to the operation of tailings and water management and water diversions, specific regulatory approvals have been included in this manual (Table 1-1). However, the full list of regulatory conditions has not been reproduced herein and should be reviewed, where required, including when changes to the OMS of the facilities are considered. The full list of regulations, permits and approvals associated with this OMS are available through the site environmental team who should be contacted for the most current environmental approval and regulatory requirements.

Table 1-1; Summary of Permits and Approvals Relating to the OMS

Legislation	Permit	OMS Component	Influence
Environmental Protection Act	Environmental Compliance Approval #0412-A2LR4V (Air)	TMA	Limits and requirements related to emissions and discharges related to air.
	Environmental Compliance Approval #5178-9TUPD9 (Industrial Sewage)	TMA, process water management and water treatment	Limits and requirements related to emissions and discharges to the environment.
Ontario Water Resources Act and O.Reg 387/04	PTTW number 8776-9W2QN3	WMP/Pinewood River	Defines water taking limits and defines reporting and monitoring requirement
	Permit to Take Water – Surface and Groundwater PTTW 0040-9VUL6B TMA Infrastructure	TMA and process water management	Defines water taking limits and defines reporting and monitoring requirement
	Permit to Take Water – Surface and Groundwater PTTW 2133-9VUPVZ Construction Phase	Fresh Water Diversions and Water Treatment	Defines water taking limits and defines reporting and monitoring requirement
Lakes Rivers Improvement Act	FF-2015-02B (as amended) West Creek Diversion and Dam	Freshwater Diversions	Management, protection, preservation and use of waters and lakes. Ensure that dams are suitably located, constructed, operated and maintained.
	FF-2015-03B Clark Creek Diversion (as amended)	Freshwater Diversions	
	FF-2015-04 Tailings Management Area	TMA, Process Water Management and Water Treatment	

Legislation	Permit	OMS Component	Influence
	FF-2015-04A (as amended March 6, 2017) Water Management 4 and 5	Process Water Management	
	FF-2015-04B (as amended March 6, 2017) Water Management Ponds1, 2 and 3	Process Water Management	
	FF-2015-04C Tailings Management Area (Start-Up Arrangement), Haul Road 13 and TMA Start-Up Cell	Tailings Management Area	
	FF-2015-05A (as amended) Mine Rock Pond	Process Water Management	
	FF-2015-07 Pinewood River Intake/Discharge Structure	Process Water/Water Treatment	Management, protection, preservation and use of waters and lakes.
	FF-2017-03 Tailings Management Area Cell 2	Tailings Management Area	Management, protection, preservation and use of waters and lakes. Ensure that dams are suitably located, constructed, operated and maintained.
Endangered Species Act	ESA Permit FF-C-001-14	All	Defines project boundaries, disturbance limits including noise and dust and reclamation
Fisheries Act	Authorization 15-HCAA-00039	Freshwater diversions	West, Clark, Teeple, Stockpile dams and diversions
	Metal Mining Effluent Regulation (MMER) discharge notification	TMA, WMP Water Treatment and seepage	Standards/limits for quality of effluent discharged into waters frequented by fish.
Ontario Environmental Assessment Act	Provincial EA Approval Conditions	All	Conditions subject to the Approval to proceed with the planning, design, construction, operation and closure of a combination open pit and underground gold mine.
Federal Canadian Environmental Assessment Act 2012	Federal EA Approval Conditions	All	Conditions in relation to the environmental effects referred to in subsection 5(1) of CEAA 2012, with which the Proponent must comply.
Environmental Assessment (EA) Act	Environmental Assessment (EA) Commitments	All	Commitments identified in the final Environmental Assessment (EA) Report, in accordance with the Federal

Legislation	Permit	OMS Component	Influence
			Environmental Impact Statement (EIS) Guidelines and Provincially approved Amended Terms of Reference (ToR).

1.2 Review and Update

The accountability for review and updates of the OMS Manual is with the Mill Manager (who will designate responsibility for the review) as well as the General Manager who has final site authority.

Updates to the OMS manual are required to incorporate change as facilities are constructed or change in facility design, performance, capacity, operations/closure requirements, site management, roles and responsibilities, regulations or procedures. When updated the OMS manual will be reviewed by the Environmental Department, Engineer of Record (EOR) and annually, as part of review by the Independent Tailings Review Board (ITRB) or as at their request.

The OMS will be updated prior to operating new structures. The OMS manual will be reviewed, at minimum, on an annual basis. The OMS manual will be submitted to MNRF as defined by permit conditions as part of annual updates.

Previous revisions and future proposed revisions are outlined in the revision history presented below (Table 1-2). Comments from the MNRF and ITRB are included in Appendix G. This revision history will be updated for each revision – **this revision is current to August 15, 2017.**

Table 1-2; OMS Revision History

Revision	Addition	Details	Date
Pre-Production OMS Manual (3098004-000000-A1-EMA-0001):			
AG	Revised Final for Pre-Production	Updated dam design criteria, instrumentation details – submitted for MNRF review and comment	August 31, 2016
AH	Revised Final for Pre-Production	Updated in response to MNRF comments – see appendix G	October 5, 2016
AI	Revised Final for Pre-Production	Removed reference to WMP filling plan	November 10, 2016
AJ	Final with West Creek Diversion updates	Required by MNRF in West Creek Diversion LRIA approval	March 31, 2017
00	For Use	WMP Filling, Clark Creek Diversion (MNRF approval April 28, 2017)	May 1, 2017
01	For Use	Updated for WMP filling above 364.7	July 2017
OMS Manual for Operations (3098004-000000-A1-EMA-0002):			

Revision	Addition	Details	Date
AC	Final draft	Including TMA Start-up Cell details submitted to MNRF	March 31, 2017
OMS Manual – Current revisions			
2017-08	Updated based on ITRB comments and MNRF conditions for MRP and Cell 2 and 3	ITRB comments (Appendix G) responses • Updated sections to current project status and current to Aug 15, 2017 • Contact list updated (s2.3) • Revised geology section re plastic clay tills (s3.3) • Included trigger levels for instrumentation and defined thresholds for event driven surveillance (Table 7.3) • States responsibility for OMS updates (s1.2 and s2.2) • Reworded reference to MNRF screening but submission for comment (s1.2) MNRF requirements consistent with LRIA permit conditions • Mine Rock Pond (s4.3.2 and s5.3.2) • Cell 2 (s4.2.2. and s5.1.2) • Cell 3 (s4.2.3 and s5.1.2)	August 2017
Future Planned Updates – excludes updates required as a result of unplanned changes			
TBD	TMA Starter Cell Completion	Update OMS prior to completion of TMA south starter dam	May 1, 2018 or as determined by LRIA conditions of approval
TBD	Water Discharge Pond and Constructed Wetland	Update OMS prior to the commissioning of theses facilities	June 30, 2018 or as determined by LRIA conditions of approval
TBD	Sediment Ponds 1 and 2	Update OMS prior to the commissioning of theses facilities	
TBD	Annual update 2018	Annual review and update e.g., include ITRB comments	August 2018

1.3 Supporting Documents

The OMS manual and supporting documents will be stored in a location accessible to those required to follow the manual i.e., RRM sharepoint site. The list of supporting documents (Table 1-3) isn't an exhaustive list and permit approvals are based on applications and supplemental information which need to be followed (see list of regulatory permits and approvals Table 1-2).

The following documents and procedures are relevant to the geotechnical site investigations, design, construction, and operation of the TMA, process water ponds, and freshwater diversion dams and channels are listed below (Table 1-3). However, additional information is provided in the facility description section of this manual (see section 4). A list of supporting drawings is provided in Appendix A. Additional details regarding pumping requirements, tailings pumping and pipeline designs and water recirculation pumping and pipeline designs are provided in Appendix B.

Safety requirements for work at the RRM and apply to work associated with the OMS are documented on the RRM health and safety sharepoint site and include;

- Hazard Identification and Risk Management;
- Document Records and Development Control;
- Training and Competency Awareness;
- Incident Management;
- Job Hazard Analysis; and
- Emergency Preparedness and Response Plan (EPRP) for the Site (New Gold, 2017).

Table 1-3; Supporting Documents

Document Number				Document Title
RRP	GEO	MEM	001	ITRB Recommendations and Implications
RRP	GEO	MEM	002	Dam Change Effect on Constraint in Northwest
RRP	GEO	MEM	004	Supplemental Information West Creek Diversion Amendment
RRP	GEO	MEM	006	Design Criteria for TMA Dams
RRP	GEO	MEM	011	WMP Fill Plan Memo
RRP	GEO	MEM	012	West Creek Diversion Channel - Overflow Diversion Structure
RRP	GEO	MEM	013	Clark Diversion Channel - As Built Hydraulic Assessment
RRP	GEO	MEM	17A	WMP Borrow Filling (Formally WMP Level 1 Filling)
RRP	GEO	MEM	019	LRIA: Mine Rock Pond Amendment
RRP	GEO	MEM	020	WMP Borrow Filling - Supplemental Information
RRP	GEO	MEM	021	West Creek Diversion Amendment Box Culvert
RRP	GEO	MEM	025	Dam 1 Work Authorization
RRP	GEO	MEM	026	WMP Dam 1 - Geotech Investigation and Stability Analysis
RRP	GEO	MEM	030	TMA South Dam - Haul Road 13 Construction
RRP	GEO	MEM	033	Teeple Dam IDF Stability
RRP	GEO	MEM	034	West Creek Diversion Channel - Sequencing of Sediment Pond 1 Dams
RRP	GEO	MEM	037	Water Management Pond Water Intake Structure
RRP	GEO	MEM	039	Clark Creek Plans and Specifications Comments & Responses

RRP	GEO	MEM	043	TMA LRIA - TMA Start Up Cell Seepage Collection - Supplemental Information
RRP	GEO	MEM	056	Teeple Permanent Repair - Supplemental Information
RRP	GEO	MEM	063	Seismic Stability Assessment of TMA Dams
RRP	GEO	MEM	065	Permanent Seepage Collection Drawings Comments & Reponses
RRP	GEO	MEM	071	Teeple Pond Diversion Channel Completion
RRP	GEO	MEM	074	Clark Pond Diversion Channel Completion
RRP	GEO	MEM	076	Addendum to WMP Dams 1,2,3 and Dam 4 and 5
RRP	GEO	MEM	080	Stockpile Pond Diversion Channel Completion
RRP	GEO	MEM	088	Clark Creek Dam Completion
RRP	GEO	MEM	089	Teeple Road Dam Completion
RRP	GEO	MEM	100	MNRF QAQC Information Request
RRP	GEO	MEM	104	Seismic Stability Assessment of MRP Dam
RRP	GEO	MEM	106	Seismic Stability Assessment of MRP Dam - ITRB Responses
RRP	GEO	MEM	108	TMA Cell 2 - Design Criteria
RRP	GEO	MEM	114	Appendix A of RRP-GEO-REP-026
RRP	GEO	MEM	115	Appendix B of RRP-GEO-REP-026
RRP	GEO	MEM	116	TMA Cell 2 - Sump Sizing
RRP	GEO	MEM	119	Stockpile Dam Completion
RRP	GEO	MEM	130	Sediment Pond Spillway Details
RRP	GEO	MEM	134A	West Creek Diversion Channel - As-built Review
RRP	GEO	MEM	134B	West Creek Diversion Channel - As-built Review
RRP	GEO	MEM	138	West Creek Dam Compliance
RRP	GEO	MEM	141	WMP Dams Final Stage Design Compliance
RRP	GEO	MEM	143	Cell 1 Borrow Deposition
RRP	GEO	MEM	144	TMA Cell 1 - Pre-Commissioning
RRP	GEO	REP	001	TMA geotechnical investigations
RRP	GEO	REP	1A	Geotechnical Investigations Report, Tailings Management Area, Volume 1 – Design Implications – Version 3
RRP	GEO	REP	1B	Geotechnical Investigations Report, Tailings Management Area, Volume 2 – Investigation and Interpretations
RRP	GEO	REP	003	West Creek Pond Dam - Design Revision and Operating Guidelines
RRP	GEO	REP	004	Stockpile Pond Dam Design Revision
RRP	GEO	REP	006	Design Update - Clark Creek Dams
RRP	GEO	REP	007	MRP Dam Design Revision Report
RRP	GEO	REP	008	Design brief TMA start up cell
RRP	GEO	REP	017	Instrumentation Plan Water Dams
RRP	GEO	REP	018	WMP Filling Plan - To Elevation 367m
RRP	GEO	REP	022	WMP Dewatering Plan
RRP	GEO	REP	024	2016 Dam Instrumentation
RRP	GEO	REP	026	TMA Cell 2 Design Brief
RRP	GEO	REP	027	Clark Diversion As-built Report
3098004-004000-A1-ETR-0004-00				2013/2014 Geotechnical Site Investigations Report
3098004-004400-A1-ETR-0003-00				Water Management Plan for Operations
3098004-004400-A1-ETR-0004-00				Design Brief – Water Management Dams
3098004-004000-A1-ETR-0012-00				Dam Instrumentation During Construction

3098004-001100-A1-ETR-0001-00	Mine Waste Management Plan
3098004-004400-A1-ETR-0002-00	Water Management Plan for Construction
3098004-004000-A1-ETR-0005-AB	Tailings Deposition Plan
	Fish Habitat Offset Strategy
3098004-004000-A1-ETR-0006-00	Design Brief – Tailings Management Dams
3098400-004000-A1-ETR-0004-00	2013-2014 Geotechnical Field Investigations

1.4 Document and Records Control

Records from shift and periodic (daily, weekly and annual) TMA and water management system inspections will be retained in a secure repository as per the requirements of the site document control system. Once documents are printed, they are uncontrolled. Document Control follows the New Gold RRM document control procedures.

All records relating this OMS manual shall be retained for a minimum period of 25 years or until decommissioning ends, whichever is longer, as per regulatory requirements in the Federal CEAA Decision Statement. This includes place, date, time of sampling, dates and types of analysis performed, analytical techniques, methods or procedures, results of analysis and the names of persons who collected, analysed each sample and documentation of their training. All records and documents shall be retained at a facility close to the RRM.

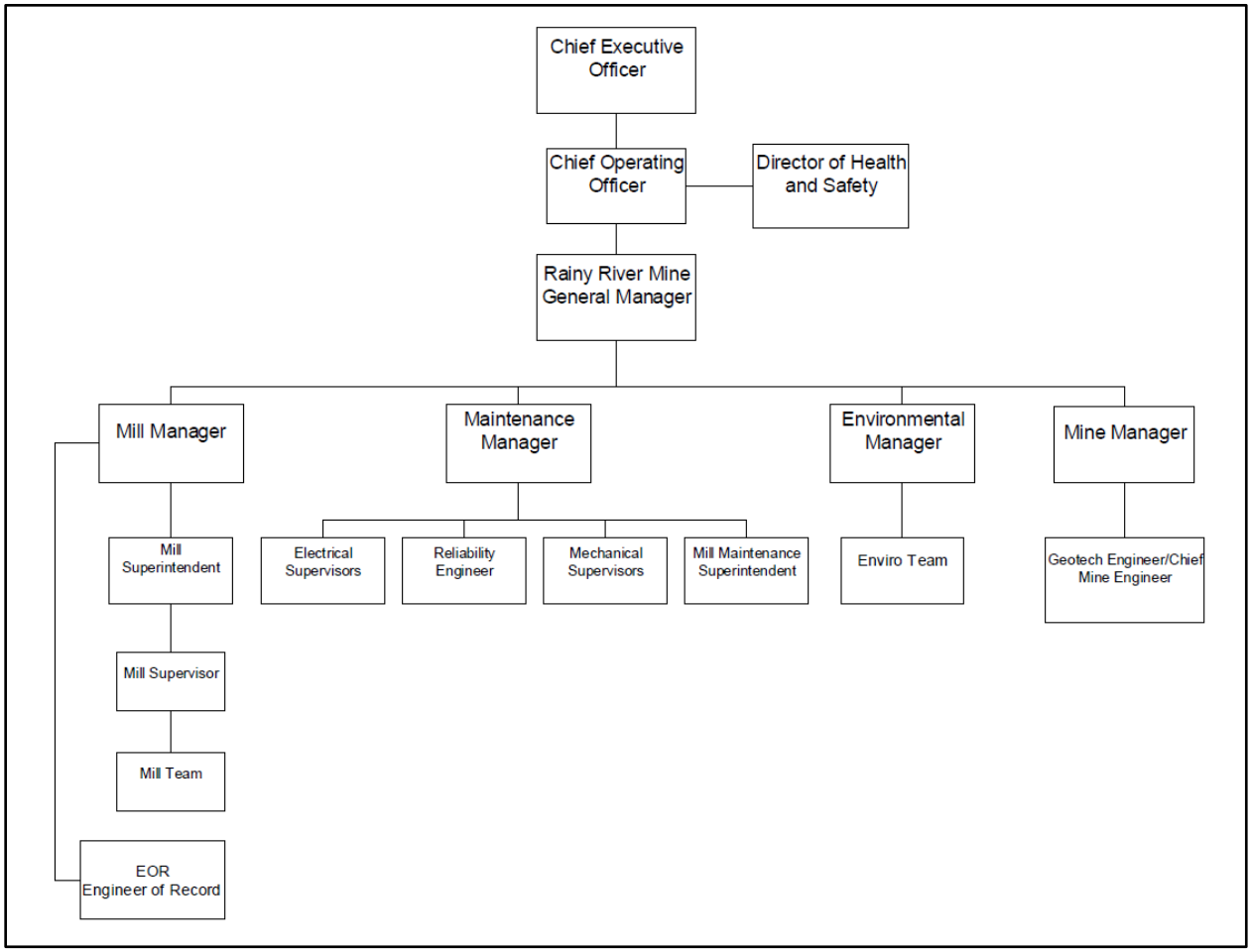
2.0 ROLES AND RESPONSIBILITIES

This section identifies the individuals having responsibility for the operation, maintenance and surveillance of the tailings, process water and freshwater dams and diversion channels. Though the accountability of tailings and water management lies with the General Manager, the Mill Manager is responsible for the operation of the tailings and water management at the RRM. The Environmental Department provides environmental technical support, including monitoring, land and water management and environmental contact with regulatory agencies.

2.1 Organizational Structure

The organizational structure for the RRM, relative to the OMS, is illustrated in Figure 2-1. The RRM/New Gold personnel and contact information associated with the positions referenced within each organizational flow chart can be found in Table 2-1. The organization chart is representative of the organization of persons related to the OMS following the construction and hand over of facilities. Prior to the handover of facilities, the EOR reports through the construction management team, for those facilities under construction.

Figure 2-1; Organisation Chart For Tailings and Water Management



2.2 Roles and Responsibilities

Executive Vice President / Chief Operating Officer:

- Is formally responsible for all of New Gold's operations; and
- Has responsibility for corporate "*Tailings, Heap-leach and Waste Rock Facilities Management Policy*". (included in Appendix C)

General Manager:

- Has accountability for tailings management;
- Shall ensure that all TMA, process water and freshwater structures meet Canadian Dam Association, Dam Safety Guidelines;

Mill Manager:

- Has responsibility for the tailings management facility and ancillary process water management structures, and water diversion structures including operation, maintenance and surveillance;

- Accountable for ensuring maintenance of the OMS Manual and conformance to the Mining Association of Canada's "Guide to Developing Operation, Maintenance and Surveillance for Tailings and Water Management Facilities";
- Ensures that manuals for the tailings and water management systems are reviewed annually, including an assessment of the effectiveness of the established system and performance against objectives, and updated as required;
- Ensures that the tailings handling and disposal operation is staffed by trained and competent persons;
- Integrates guidance from the Environment Department under the requirements of regulatory approvals and the Environmental Management System (EMS) where applicable to tailings management;
- Shall submit an annual dam safety inspection report for all dams (TMA area and others) to MOECC/MNRF where required; and
- Report any potential facility design changes that could affect the facility's integrity.
- Coordination of activities with the EOR during operations; and
- Has emergency management and response roles.

Maintenance Manager:

- Has primary responsibility for the maintenance work and maintenance management systems including dams and water management structures; and
- Ensures records of maintenance inspections for the dams and water management structures and related activities are accurately and permanently recorded and provided to the Geotechnical Engineer and the Engineer of Record (EOR).

Reliability Engineer, Mechanical Superintendent and Electrical Supervisors:

- Oversees planning and execution of equipment maintenance through the work order system;
- Arranges/conducts maintenance for equipment e.g., calibration and maintains instrumentation calibration records; and
- Identifies issues and corrective actions to prevent incidents.

Chief Mine Engineer / Geotechnical Engineer:

- Manages dam design, construction and contracts;
- Completing quarterly and annual inspections on TMA, process water and freshwater dams, diversion channels;
- Ensuring monitoring activities are undertaken as per schedule;
- Responding to concerns raised by operations personnel;
- Maintaining a dam raise schedule;
- Review spigotting and dam construction schedules;
- Construction oversight for major dam raise projects;

- Ensure that the OMS Manual is updated appropriately, as assigned by the Mill Manager; and
- Coordinating and managing survey.

Mill Superintendent:

- Responsible for ensuring daily, monthly and as-required reports with respect to all aspects of the operation, maintenance and surveillance of the tailings facilities are prepared, including all records of inspection and monitoring;
- Ensures that a system exists to implement the OMS manual procedures and requirements and the system is subjected to regular review and effectiveness checks;
- Oversees water taking from the Pinewood River;
- Participates in the review cycle for the OMS manual; and
- Undertakes any modifications as required to maintain a safe and effective tailings operation including adjustments to deposition plans, equipment and facilities.

Mill Supervisor:

- Responsible for the day-to-day operation, maintenance and surveillance of the tailings distribution system and related works including buildings, equipment, pipes, pumps, and dams;
- Verifies work order completion;
- Identifies new and revised maintenance requirements; and
- Performs visual inspection surveillance of tailings facilities including dams, pipelines, decants and other operations.

Mill Team:

- Responsible for operating, inspecting and maintaining dams and water pump houses;
- Responsible for security inspections during the shift, via work requests;
- Perform inspections, monitoring, audits and assessments including but not limited to;
    - Visual inspection (dams, water, spillways and pipelines);
    - Water levels;
    - Freeboard; and
    - Instrumentation.
- Ensures adequate maintenance, via work requests, of access roads, diversion ditches, emergency spill catchment areas and the reclaim water system; and
- Adjusting spigotting as directed by the supervisor.

Engineer of Record (EOR):

- Verifies the TMA and water diversion structures are constructed and operated as per the design intent;
- Performs Annual Dam Safety Inspections as per regulatory requirements; and

- Provides support for safe operation of the TMA and water diversion structures.

Environmental Manager:

- Support the Operation, Maintenance and Surveillance activities;
- Maintain contact and communication with regulatory agencies;
- Assist with environment related technical support such as inspection and evaluation of stability by an external expert;
- Ensure regulatory and other sampling, monitoring, and analyses programs are conducted as required and all analytical results and/or reports are reviewed and reported to the appropriate internal and external stakeholders;
- Ensure rehabilitation and stabilization programs are conducted for tailings in conjunction with closure plan requirements;
- Prepare Annual Reports to regulatory agencies; and
- Administer and track compliance against Permits.

Environmental Team:

- Monitor conformance with relevant permits for the OMS manual requirements;
- Perform inspections, monitoring, audits and assessments including but not limited to;
    - Visual inspection (dams, water, spillways and pipelines); and
    - Instrumentation.
- Integrate tailings operations activities into the EMS;
- Identify and assess applicable tailings related regulatory requirements including permits, licenses, authorizations;
- Support tailings/geotechnical engineering and operations efforts; and
- Provides environmental support to the mill area activities and parties including but not limited to: construction, earth moving, erosion and dust control and water discharges.
-

2.3 Contact Information

The RRM contact information, for the positions listed in Sections 2.1 and 2.2, can be found in Table 2-1.

Table 2-1; Rainy River Project Contact Information

Position	Name	Phone Number	Ext	Mobile	Email
President CEO	Hannes Portmann	(416) 324-6014		(416) 303-1511	hannes.portmann@newgold.com
Chief Operating Officer (Interim)	Raymond Threlkeld			(571) 577-0198	raymond.threlkeld@newgold.com

Position	Name	Phone Number	Ext	Mobile	Email
Director HSE	Dennis Wilson	(647) 789-5002		(647) 209-9508	Dennis.wilson@newgold.com
General Manager	Greg Bowkett	(807) 482-0902	8002	(807) 456-3668	greg.bowkett@newgold.com
Mine Manager	Hubert Schimann	807 482 0911	2253	(807) 707 2578	hubert.schimann@newgold.com
Mill Manager	Dave Hall	(807) 482-0926	8021	(807) 707-1014	dave.hall@newgold.com
Environmental Manager	Darrell Martindale	(807) 482-0900	8055	(807) 707-3497	darrell.martindale@newgold.com
Maintenance Manager	Tony Lord	(807) 482-0900	8006		tony.lord@newgold.com
Mill Superintendent	Don Emms	(807) 482-0907	8066	(807) 708-1853	don.emms@newgold.com
Mill Shift Supervisor	Jean Tougas	(807) 482-0900	8077	(807) 708-1172	jean.tougas@newgold.com
Mill Shift Supervisor	Ron Langdon	(807) 482-0900	8077	(807) 708-1172	ron.langdon@newgold.com
Mill Shift Supervisor	Gilbert Tougas	(807) 482-0900	8077	(807) 708-1172	gilbert.tougas@newgold.com
Mill Shift Supervisor	Terry Hamilton	(807) 482-0900	8077	(807) 708-1172	terry.hamilton@newgold.com
Mill Maintenance Supervisor	Don Ibey	(807) 482-0900	8006	(807) 707 1061	Don.Ibey@newgold.com
Maintenance Mechanical Supervisor	Derek Nelson	(807) 482-0900			derek.nelson@newgold.com
Maintenance Mechanical Supervisor	Mitch Lemaire	(807) 482-0900			
Maintenance Electrical Supervisor	Lewis Kempf	(807) 482-0900			Lewis.Kempf@newgold.com
Maintenance Electrical Supervisor	Bill Cole	(807) 482-0900			bill.cole@newgold.com
Reliability Engineer - Maintenance	Ian Strain	(807) 482-0919	8019	(807) 707-1060	ian.strain@newgold.com
Geotech Engineer	TBD				

Position	Name	Phone Number	Ext	Mobile	Email
New Gold Environment On Call		(807) 632-6152			rainyriver.enviro@newgold.com
Ministry of Natural Resources and Forestry – MNRF	Andrew Bromley	(807) 475-1368			Andrew.bromley@ontario.ca
Ministry of Environment and Climate Change	Matt Hoffmeister	1-807-468-2703			Matt.hoffmeister@ontario.ca
Spills Action Centre (SAC)		1-800-268-6060			
Ministry of Northern Development and Mines	Neal Bennett	1-807-475-1123			Neal.bennett@ontario.ca
Ministry of Northern Development and Mines	Bryce Voca	1-807-475-1434			Bryce.voca@ontario.ca
Environmental Canada and Climate Change	Adam Scheepers	1-613-990-9744			Adam.scheepers@canada.ca
Engineer of Record	Mickey Davachi	1-403-387-1917		403-826-8666	mickey.davachi@amecfw.com

2.4 Competency and Training

Training and education will be provided to employees to enhance their performance and RRM will ensure that all personnel receive the level of training to ensure they are competent. Tailings specific training is essential in ensuring safe and effective operation of the TMA as well as correct construction. The RRM in conjunction with the Engineer of Record will provide training programs or opportunities as required and job related training covering aspects related to requirements for the specific types of equipment and operational requirements.

Table 2-1 demonstrates the training that will be provided at a minimum, to support operation of the tailings water, process water, water treatment and freshwater management structures as required.

Table 2-1; OMS Manual Training Matrix

Training	TMA contractor	Mill Crews and Supervisor	Mill Supt.	Geotech. Engineer	Enviro Dept.	Mgmt. Team
Site Orientation	x	x	x	x	x	x
Daily Inspection		x				
Quarterly Inspection			x	x	x	
OMS / General Tailings & Ponds	x	x	x	x	x	
EPRP training	x	x	x	x	x	x
Construction method of TMA raises	x			x		
Towards Sustainable Mining			x	x	x	x
Instrument Data Collection		x		x	x	

3.0 SITE CONDITIONS

3.1 Site Location and Tenure

The site is located in the Township of Chapple, approximately 65 kilometers (km) by road northwest of Fort Frances, in northwestern Ontario. New Gold has 100% interest in the lands forming the RRM through direct ownership or option agreement, however surface rights are not owned throughout the site boundary.

The RRM is located with lands used by Indigenous Groups for traditional and ceremonial purposes including but not limited to the following groups; Rainy River First Nations, Naicatchewenin First Nation, Big Grassy River First Nation, Naotkamegwanning (Whitefish Bay) First Nation, Anishinaabeg of Naongashiing (Big Island) First Nation, Ojibways of Onigaming First Nation, and the Sunset Country Métis community (represented by Métis Nation of Ontario Region 1 Consultation Committee). New Gold has regulatory requirements and/or biparty agreements to engage with these communities.

Road access to the site is by provincial Highways 600 and 71 and Korpi Road (east access road). A site location map is provided in Figure 3-1. The mine is serviced by local municipal infrastructure and is in close proximity to Fort Frances, Ontario for support and supply.

The site topography is variable with elevations ranging from 350 m to 390 m. The terrain is comprised of both forested and non-forested areas, including agricultural and wetland areas. The local drainage systems are characterized by numerous small creeks that drain into the Pinewood River. The small creeks typically originate from rocky uplands or headwater wetland systems.

The forested areas are dominated by mixed poplar and black spruce forests. Wetlands are comprised mainly of treed and open fens, together with wetland thickets and marsh areas.

415000 417500 420000 422500 425000 427500 430000 432500

5415000 5412500 5410000 5407500

Highway 600
Marr Road
TRANSMISSION LINE
MUSKRAT LAKE
EXPLOSIVES FACILITIES
OUTCROP 4 QUARRY
EAST ACCESS ROAD
Korpi Road
TAILINGS MANAGEMENT AREA
CELL 2
CELL 2 DAM
CELL 1 DAM
CELL 1
CELL 3
WATER TREATMENT PLANT
WATER MANAGEMENT POND
EMERGENCY SPILLWAY
WATER DISCHARGE POND
WEST CREEK DIVERSION CHANNEL
ROEN PIT SAND & GRAVEL
SEDIMENT POND #1
CONSTRUCTED WETLAND
OVERBURDEN STOCKPILE
WEST CREEK POND
PROCESS PLANT
STOCKPILE POND DIVERSION CHANNEL
STOCKPILE POND
STOCKPILE POND DAM
CRUSHED ORE STOCKPILE
CLARK CREEK
CLARK CREEK POND
CLARK CREEK DIVERSION CHANNEL
Gallinger Road
Highway 71
WEST MINE ROCK STOCKPILE
SEDIMENT POND #2
LOSLO CREEK
OPEN PIT
LOW GRADE ORE STOCKPILE
CLARK CREEK POND DAM
PIT PROTECTION BERM
EAST MINE ROCK STOCKPILE
MINE ROCK POND
TEEPLE POND
TEEPLE POND DAM
TEEPLE POND DIVERSION CHANNEL
Teeple Road
CORE SHACK AREA
MCCALLUM CREEK
WATER MANAGEMENT PIPELINE
PINEWOOD RIVER
TAIT QUARRY
PUMPHOUSE ACCESS ROAD
PUMPHOUSE
TAIT CREEK
HIGHWAY 600 RE-ALIGNMENT
PINEWOOD RIVER
Heathwole Road

P:\2015\Projects\TC150321_New Gold_ Dam&Site_Eng\11_CAD\GIS\D_Renda_Misc_Apr18_2017\MXD_Maps\Site_Plan_from_EA_Revised_19_v3.mxd

LEGEND

Proposed Site Features

- Underground Portal
- Open Pit
- Process Plant
- Water Management Pipelines
- Tailings/Reclaim Pipeline
- Pond
- 230 kV Transmission Line
- Tailings Management Area
- TMA Cell 1
- TMA Cell 2
- TMA Cell 3
- Overburden Stockpile
- Rock Stockpile
- Dam
- Site Roads
- Flow Direction
- Quarry
- Sand & Gravel Pit

0 1.5 3 6 9 12 Kilometres

NOTES:
-

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

Site Plan
General Arrangment

PROJECT Nº: TC150321

FIGURE: 3-1

SCALE: 1:45,000

DATE: April 2017

3.2 Climate

Weather at the site is seasonal with cold winters with freezing conditions from November until March. The site receives ~700 mm of precipitation in an average year and the pond evaporation is estimated to be ~540 mm (Table 3-1). An estimated evapotranspiration of 500 mm is inferred by the difference between precipitation and runoff in the Pinewood River.

Table 3-1; Mean Annual and 1:20 year Precipitation and Evaporation

Barwick - 1981 to 2010 Canadian Climate Normals station data													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year
Daily Average (°C)	-15	-11.6	-4.4	4.4	11.4	16.4	19	17.9	12.6	5.5	-3.4	-11.8	3.4
Rainfall (mm)	0.2	3	11	30.4	75.1	124.7	102.9	78.8	75.5	51.3	13.6	2.1	568
Snowfall (cm)	29.5	18.3	18.8	8.9	1.1	0	0	0	0.8	7.5	28.3	28.6	142
Precipitation (mm)	29.8	21.3	29.8	39.2	76.2	124.7	102.9	78.8	76.2	58.8	41.8	30.7	710
Pond Evaporation													
Pond Evaporation (mm)	0	0	0	0	109	110	129	104	63	23	0	0	538
Barwick 2017 station data													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug*	Sep	Oct	Nov	Dec	Year
Daily Average (°C)	-12	-9	-3.6	4.9	10.2	16.7	18.9	17.5					
Difference (°C)	3.6	2.6	0.8	0.5	-1.2	0.3	-0.1	-0.4					
Rainfall (mm)	5	14.4	5.2	21.6	38.4	106.5	33.4	48.8					
Snowfall (cm)	37.4	23.4	6.4	6.6	0	0	0	0					
Precipitation (mm)	42.4	37.8	11.6	28.2	38.4	106.5	33.4	48.8					
% Difference	42.3	77.5	-61.1	-28.1	-49.6	-14.6	-67.5	-38.1	* = Data to Aug 11				

Site runoff varies widely in response to the climatic conditions. In normal (50% non-exceedance) and wetter years there is surplus water available for taking for site catchments or the Pinewood River. However, the Pinewood River frequently has no flow in September, and in extreme dry years, presents a water supply risk to the project.

Further details regarding the climatic conditions and hydrology can be found in the Water Management Plan for Operations (RRP-GEO-REP-026 R1). The site and project climatic characteristics (and seismic hazard analysis) are summarized in Table 3-2.

Table 3-2; Site Characteristics used in Geotechnical Design

Criterion	Source or Calculation	Value	Unit
Climatic Data			
Monthly temperatures (Note 1)			
Mean		3.2	°C
Low (February)		-15.9	°C

Criterion	Source or Calculation	Value	Unit
High (August)	Environment Canada - Barwick Station (Stn 6020559)	18.8	^{o}C
Period of freezing		November to March	-
Precipitation (Note 2)			
Mean annual precipitation	Environment Canada - Barwick Station (Stn 6020559)	682.1	mm
Mean annual rainfall		543.7	mm
Mean annual snowfall		138.4	cm
Storm events (24-hour) (Note 3)			
2-yr	Ministry of Transportation (MTO)	51	mm
5-yr		51	mm
10-yr		93	mm
25-yr		102	mm
100-yr		129	mm
Regional Flood (Timmins Storm)		193	mm
Probable Maximum Precipitation (PMP)		586	mm
Wind velocities (for wind-wave calculations)			
Average annual maximum	(Note 4)	16	km/h
Maximum likely		80	km/h
Probabilistic Seismic Hazard Analysis (Note 5)			
Peak Ground Acceleration for Rock Sites (outcrops) Return Period (Years)			
475	Natural Resources Canada	0.009	g
2,475		0.036	g
10,000		0.096	g
Peak Ground Acceleration for Overburden Sites (20 to 30 m) Return Period (Years)			
475	Natural Resources Canada	0.014	g
2,475		0.054	g
10,000		0.136	g

Notes:

1. Data obtained between 1971-2000
2. Data obtained between 1979-2012
3. Data for 2 to 100 year return obtained from MTO (2010), PMP) from AES IDF values prepared by the Hydrometeorology Division, Canadian Climate Centre, Station Rainy River, ON, Station Number 6026852
4. AMEC, 2013. Rainy River Gold Project, Climate, Air Quality, and Sound Baseline Study

5. The 1:10,000 year earthquake is considered equivalent to the maximum credible earthquake. AMEC, 2012. Earthquake Ground Motion Hazard Assessment, Rainy River Gold Project, Richardson Township, Ontario

3.3 Surficial and Bedrock Geology

The RRM is positioned within the Achaean age Rainy River Greenstone Belt that forms part of the 900 km long, east-west trending Wabigoon Subprovince of the Canadian Shield. In general, the Rainy River Greenstone Belt is bounded by the Sabaskong Batholith in the north and the Rainy Lake Batholithic Complex in the east. It extends south into Minnesota where the Long Point Intrusive Rocks, the Baudette Intrusive Rocks (both granitoid), and the Rainy Lake – Seine River Fault, the Vermillion Fault and the Four Towns Fault constrain the belt.

The site is characterized by gently undulating topography, strongly influenced by a sequence of glaciations, which on higher ground has left bedrock exposed with little to no overburden cover. In the lower lying areas, thick overburden deposits primarily of glacial origin (e.g., till) are found.

The mine site area can be divided into two general physiographic types based on topography and frequency of bedrock outcrops. The north and east portions of the project site have numerous bedrock outcrops, with variable soil cover, where the bedrock has a significant influence on the surface topography. The southwest and central portions of the site have thicker and more extensive soil deposits, with isolated bedrock outcrops.

The surficial geology generally consists of the following stratigraphy:

- Peat/Holocene: variable thickness ranging from thin veneers to greater than 3 m in thickness;
- Glaciolacustrine clay: typically located below the peat layer (Brenna Formation) and above the Whiteshell Till (Whylie Formation). The upper unit is typically low to high plastic silty clay, with occasional sand layers. The lower unit is typically clay silt and fine sand. Both units have varved silt and clay with varying thickness typically in the millimeter scale;
- Whitemouth Lake (WML) Till: Thickest and most widespread unit on site. The till is typically medium to high plastic silty clay with trace to some sand and gravel;
- Whiteshell Till: confined under the Whitemouth Till, the Whiteshell Till is a silty sand till with some gravel and cobbles and trace clay with some boulders. It is an aquifer with artesian pressures (above the ground surface) in some locations; and
- Bedrock: underlying the Whiteshell Till.

Groundwater recharge to the deeper groundwater system (shallow bedrock and Whiteshell Till) is limited to areas where the bedrock is at surface or has limited cover of overburden, mainly to the north and east of the open pit. Very limited recharge to the deeper groundwater system is probable through the Whitemouth Lake Till on higher ground. Where glaciolacustrine clays and peat are present, recharge to the deeper groundwater system is minimal.

Note; the TMA dams have been designed assuming high pore pressures and residual strength in the clayey foundation units (Upper/Lower Glaciolacustrine and WML Till). Further details regarding the surficial geology at the site and design criteria for the TMA Dams is provided in TMA – Volume 1 – Dam Design Implications (Amec Foster Wheeler, 2016f) and Volume 2 – Investigation and Interpretations (Amec Foster Wheeler, 2016g).

3.4 Geochemistry

3.4.1 Mine Rock

Static and kinetic geochemical testing representing all major lithology types of non-ore mine rock in the vicinity of the proposed pit development determined that approximately 50% of the mine rock samples were unlikely to generate acidic drainage (NPAG) in the future (neutralization potential ratio [NPR] >2). The remainder of the samples were classified as potentially acid generating (PAG) materials with NPR<2. It's noted that NPR ratios are influences by the low concentrations of both sulphides and carbonates.

Progressive encapsulation of the PAG rock during operations and at closure will limit precipitation infiltration and flushing of oxidation products from the mine rock. Restriction of oxygen inflow to the PAG rock may occur as a result of complete encapsulation of the pile.

The dam design includes only non-potentially acid generating (NPAG) mine rock downstream of the dam core. PAG rock is used in the completion of portions the TMA starter cell/cell 1, cell 2 dam and the upstream sections of the ultimate TMA dams.

3.4.2 Tailings

Based on geochemical testing, the tailings are PAG with an expected lag time to net acidic conditions of approximately 30 years. In addition, there is a potential risk of elevated cadmium concentrations in the TMA during operations due to leaching from the tailings.

Metal release from subaerial (beached) tailings may occur prior to acidic conditions and management of the tailings pond water may be required at this time. Metal release may occur from submerged tailings; however, subaerial tailings appear to be a greater source of loadings than submerged tailings. The milled ore is also a substantial source of loadings to the tailings pond, in some cases (e.g., cadmium) it is the dominant loading source early in mining operations.

Geochemical assessments suggest that Cd concentrations in the TMA may exceed the working site specific value (0.001 mg/L subject to confirmation through permitting) within 1 year after mining begins. Reductions in the tailings beach areas could extend the period of time until exceedance is reached. Water treatment in the WMP is planned to be employed to support discharges from the WMP meeting discharge effluent quality targets.

3.5 Hydrology and Water Flow

The collection of runoff and hydrology data for the RRM is challenged by low gradient, small systems and frequent beaver impoundment. Water Survey of Canada Station 05PC011 at the Pinewood River provides the longest and most reliable available data set. Water Survey of Canada Station 05PC023 (at Highway 617) provides a shorter period of record and is known to provide erroneous readings of up to 20 %. Table 3-3 presents mean streamflow data in the Pinewood River as presented in the EA application, which have been pro-rated where required and in winter months.

Table 3-3; Monthly Streamflow in the Pinewood River at WSC 05PC011

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Mean	0.218	0.144	0.538	9.595	7.135	5.412	3.163	1.536	1.787	2.352	1.913	0.383	194.8
5th %ile	0.073	0.049	0.181	3.228	2.400	1.820	1.064	0.517	0.601	0.791	0.644	0.129	65.5
95 %ile	0.440	0.292	1.087	19.41	14.43	10.95	6.398	3.107	3.615	4.758	3.870	0.776	394.1

The RRM site on the north side of the Pinewood River is drained by four small creek systems, which from east to west are: Clark Creek (Teeple Drain), West Creek, Marr Creek and Loslo Creek (Cowser Drain). These creek basins range in size from 7.3 km2 (Marr Creek) to 16.35 km2 (West Creek). Major portions of the Clark Creek, Marr Creek and Loslo Creek basins will be overprinted by RRM developments, principally the tailings management area and stockpiles. West Creek currently flows through the proposed open pit and will have to be diverted around the pit in order for the RRM to proceed.

It should be also noted that the lower approximately 3.3 km reach of Loslo Creek and 2.3 km of Clark Creek leading to the outflow into the Pinewood River have been previously designated as Municipal drains under the Drainage Act (respectively, the Cowser Drain constructed in 1980 and the Teeple Drain constructed in 1994).

3.6 Water Quality

Water quality in the area of the RRM is influence by the presence of clays/silts and water quality guidelines are frequently exceeded at baseline or upstream sites. There are a number of circumstances where exceedance of the Provincial Water Quality Objectives (PWQO) and Canadian Environmental Quality Guidelines (CEQG) values are common:

- Total metal values for samples showing elevated total suspended solids (TSS), especially for very common minerals such as aluminum and iron;
- Total aluminum concentrations in areas where clay / silt soils are common, as aluminum is a common clay mineral;
- Samples collected from under the ice in low volume water systems, because the process of ice formation tends to exclude ions from the ice crystal lattice, thereby concentrating the ejected ions in the underlying water column; and
- Samples collected during summer drought conditions in low volume water systems, because of ion concentration due to evaporative processes

The majority of parameters for surface waters met PWQO and CEQG for the protection of aquatic life, with the exception of common exceedances for aluminum (mainly CEQG), iron and phosphorus; frequent exceedances for cadmium (CEQG), copper (mainly CEQG) and cobalt (PWQO); and occasional, to rare, exceedances for arsenic, lead, nickel and zinc.

3.7 Hydrogeology

Regional groundwater flow is generally towards the west in the Pinewood River watershed, but locally is towards the Pinewood River corridor. Horizontal gradients are relatively steep on higher ground, approaching 0.01, but become more subdued in the lower lying areas where they decrease to approximately 0.003. This change in horizontal gradient is a strong indication that,

as the groundwater flows from the higher ground to lower elevations, there is flow from the relatively impermeable shallow bedrock to the more permeable Whiteshell Till and other granular material immediately above the bedrock, referred to generically as the Pleistocene lower granular deposits (PLGD).

Groundwater in the shallow bedrock and PLGD becomes confined as it moves westwards and towards the Pinewood River beneath the lower permeability silty clays of the Whitemouth Lake Till and the glaciolacustrine deposits that largely sandwich this till (the Pleistocene Aquitard). Artesian conditions within the shallow bedrock and PLGD are common along the stream corridors with upwards gradients on the order of 0.03 to 0.1, while downwards gradients occur in the higher areas between the streams.

Groundwater quality is typical calcium magnesium-bicarbonate type water with the majority of sampling points having total dissolved solids exceeding 500 mg/L. Sampling of groundwater since 2007 has indicated metal concentrations above application guidelines e.g., arsenic, cobalt, iron, molybdenum, zinc, mercury and uranium.

3.8 Biological

3.8.1 Fisheries

The fish community proximal to the RRM is dominated by baitfish and forage fish species with sportfish (e.g., Walleye and Northern Pike) in the lower Pinewood River below the Pinewood Pumphouse. Presently Marr and Loslo Creek are fish bearing and a fish relocation porgram is underway. West Creek and Clark Creek are former tributaries to the Pinewood River and have been offset for by the Clark Creek Diversion and West Creek Diversion. Clark Creek Diversion and West Creek Diversion are offsetting habitat and support all life history stages of baitfish and forage fish species.

The freshwater diversions are fish bearing waters and subject to protection under numerous permits and legislation e.g., *Fisheries Act*. Cowser Drain (Loslo Creek) and the Pinewood River are also fish bearing. Water quality discharges into these areas must meet MMER and ECA permit requirements. Additional studies as required by the ECA e.g., for mercury, sulphate and ammonia are ongoing, the results of which may influence operation of the TMA.

3.8.2 Vegetation

The RRM is within Ecoregion 5S (Agassiz Clay Plain) and there are no published Significant Wildlife Habitat Ecoregion Criteria Schedules for this ecoregion. Apsen-Birch hardwood forest is the dominant (46.6 %) forest type proximal to the mine, followed by coniferous swamp / wetland (29.4 %). Agricultural lands are present across 8 % of the area proximal to the mine, primarily along roads and in areas of well drained clays. No records of rare vegetation communities or rare plants were identified during the Environmental Assessment.

Based on the ecoregion, the growing season length is 180-190 days with mean annual temperatures of 1.5 to 3.0 ºC. The frost free period is ~125 days from mid-May to mid/late September (Ministry of Agriculture; 1976-2005).

3.8.3 Wildlife

Key wildlife aspects influencing the OMS manual include the presence of;

- Species at risk including but not limited to Eastern Whip-poor-will and bobolink which require consideration of limits of disturbance, timing of works, noise mitigation and dust management;

- Snapping turtles, for which measures must be taken to prevent them entering the TMA, process water and water treatment facilities;
- Migratory birds requiring noise mitigation measures, reduced light pollution, timing windows on clearing, deterrents to prevent use of the TMA and monitoring for use of the TMA;
- Deer, which along with other wildlife require that a fence is to be constructed around the active tailings deposition areas; and
- Bear, which along with other wildlife need to be managed through controlling wildlife-human interactions including reporting, no harassing of wildlife, no fishing or hunting on the mine site, speed restriction and waste management to exclude wildlife.

3.9 Natural Hazards

Natural hazards to the RRM are limited to weather related hazards e.g., flooding, drought, extreme cold or high winds and forest fires. Other natural hazards e.g., volcanic activity, subsidence, avalanches and landslides are not expected to affect the mine given surrounding geology and topography. Responses to natural hazards are considered as part of the site EPRP. Potential natural hazards relating to the OMS are discussed here, however further consideration on how to respond to natural hazards is considered in the maintenance and contingency sections.

- Forest Fire; there is potential for forest fire to affect operations of the mine, with the cycle in the area of the RRM being 63 to 210 years. The RRM has a fire prevention and preparedness plan (June 2017) developed with the MNRF.
- Pit Slope Failure; could be cause by flooding or slope instability. Modelling of the 1:100 year flow in the Pinewood River would result in the Pinewood River cresting adjacent to the pit at between 347-349 masl. A berm is proposed to protect the pit. This is the same mitigation proposed as for managing ice jams in the Pinewood River.
- Flooding; there is potential for flooding, and associated rainfall to affect operations of the mine. Design of the dams and diversion structures has considered these events as described in section 4 and contingencies are discussed in section 10. Results of flooding leading to a potential need to discharge additional water is offset by the increased assimilative capacity of the receiving environmental at the permitted 1:1 discharge ratio.
- Drought; drought conditions may result in a reduction in water availability for processing and discharge. Drought conditions for processing is mitigated through the design of the WMP and water storage. In the event of 5^{th} %ile low flow fall, only 1.53 Mm^3 could be discharged. However, this is managed through capacity in the TMA, WMP and water treatment.
- Seismic hazard; the site is located in the Canadian Shield which is comprised of Precambrian granites and gneisses that host some of the oldest rocks in the world. No earthquakes recorded with a magnitude greater than M 4.5 have occurred within approximately 500 km of the site. The results of the probabilistic seismic hazard analysis (PSHA) are shown in Table 3-1. Further details regarding the PSHA are provided in the *2013/2014 Geotechnical Site Investigations Report* (AMEC, 2014d).

4.0 FACILITY DESCRIPTIONS

The components of the RRM relative to the scope of the OMS include tailings and process water management, freshwater diversions and water treatment. The site layout is shown on Figure 3-1. While there is interconnectivity between the systems, for the purposes of the OMS they are categorised in these groupings and reference made between them where required e.g., water management pond, water discharge pond and constructed wetland.

Tailings and process water management are provided by the following;

- Tailings Management Area –TMA (including cells 1, 2 and 3 and associated pipelines);
- Water Management Pond - WMP; and
- Mine Rock Pond - MRP.

The TMA provides long term containment for the tailings. The mill make-up water is reclaimed from the Tailings Management Area (TMA) and the Mine Rock Pond (MRP). The TMA dam raising schedule is divided into five stages and has been set to ensure ample pond storage is available to satisfy mill make-up water supply and effluent management requirements.

The TMA has been designed to optimize natural degradation processes, by ensuring there is sufficient time to allow for heavy metals to precipitate to low levels in the pond. The natural degradation processes are most effective during warm weather conditions when biophysical activity is optimal, and are also augmented by exposure to sunlight.

Freshwater is supplied to the mill from the WMP. Mill make-up water is provided through reclaim from the TMA and the transfer of contact water from the Mine Rock Pond (MRP). Surplus water (effluent) is transferred to the WMP before it is discharged to the environment via the constructed wetland or pipeline to the Pinewood River. Effluents planned for discharge to the environment will be held for a sufficient period under warm weather conditions, to maximize the effects of natural degradation. Such effluent aging will take place mainly in the summer.

Freshwater diversion is provided by the following;

- Clark Creek diversion including the Clark Creek and Teeple dam and diversions; and
- West Creek diversion including the Stockpile and West Creek dam and diversions.

The freshwater diversions function to reduce inflows to the RRM and provide offsetting habitat for the loss of portions of Loslo, Marr, Clark and West creeks. Diversion of the non-contact runoff from these catchments reduces the effluent management requirements. All structures support fish habitat.

Water treatment is provided by the following;

- Water Discharge Pond (WDP) and the Constructed wetland – (CW); and
- Sediment ponds 1 and 2.

Sedimentation ponds have been designed to allow for the settlement of total suspended solids present in the non-contact runoff or effluent prior to discharge to the environment. Sediment Ponds #1 and #2 receive runoff and seepage from the West Mine Rock Stockpile (WMRS). The Water Discharge Pond (WDP) and Constructed Wetland receive discharge water from the WMP. The constructed wetland in the primary and priority discharge location from the WMP (to mitigate flow reductions in the Pinewood River) ahead of discharging to the Pinewood River downstream of McCallum Creek.

4.1 Design Criteria and Basis

The basis for design of the tailings, process water, freshwater diversion and sedimentation dams are summarized in the subsequent sections. Where practically possible, the RRM has been designed to minimize effort at closure by promoting progressive reclamation opportunities including but not limited to: establishing the TMA closure cover and developing the East Mine Rock Stockpile (EMRS) and West Mine Rock Stockpile (WMRS) to closure slopes.

Results from field investigations (subsurface and groundwater conditions) have been incorporated to the design as per the documented findings from the *2013/2014 Geotechnical Site Investigations* (AMEC, 2014d) and *Geotechnical Investigations Report – TMA, Volume 1 – Design Implications* (Amec Foster Wheeler, 2016f).

Table 4-1; Summary of Dam Design Criteria

Dam	Hazard Potential Classification	Upstream Watershed	Maximum Operating Pond Level		Environmental Design Flood		Inflow Design Flood	Spillway design/Emergency Spillway design			Design Slopes
			Volume	Level	Storm Event	Volume		Width	Design Flow	Max. flow depth (IDF)	
-	-	-	Mm3	m	-	Mm^3	-	m	m3/s	m	(_H:1V)
Tailings Management Area											
Cell 1	Very high	None/Tailings		369.9	100 yr 30 day	0.320	PMF	8			11
Cell 2	Very high	Loslo/Tailings		364.05	100 yr 24h	0.828	PMF	19	293.0	1.4	11
Process Water Management											
WMP	Very high	TMA	5.0	369.7	100 yr 30 day	0.630	PMF	8	3.7	0.50	4-9.2
MRP	Very high	EMRS	0.5	356.8	100 yr 30 day	1.0	PMF	15	64.7	1.60	11
Freshwater Diversions											
Clark Creek Dam	Low	Clark Creek		378.75	n/a	n/a	100-yr	20		0.30	5.5
Teeple Dam	Low			378.5	n/a	n/a	100-yr	120		0.10	6.0
Stockpile Pond Dam	Very high	West Creek	0.095 NOWL	372.2	n/a	n/a	PMF	33	79.6	2.30	6.5
West Creek Dam	Very high		0.156 NOWL	361.0	n/a	n/a	PMF	8			7.9

Notes
Hazard potential classification per LRIA
Spillways have been designed to pass an IDF event while satisfying minimum freeboard requirements
PMF is probably maximum flood
To be updated for WDP, CW and Sediment ponds 1 and 2 based on approvals

Table 4-2; Summary of Dam Characteristics

Purpose & Facility	Dam Name	Type of Dam	Construction Method	Crest Elev.	Max. Dam Height	Dam Length	Crest Width	Slopes	Spillway		Normal Freeboard
									Invert Elev.	Width	
				(m)	(m)	(m)	(m)	(_H : 1V)	(m)	(m)	(m)
Tailings containment dams											
Tailings Management Area (TMA)	TMA North	Central core	Staged centreline raises	366.5 (final 379.5)	2.5	3620	20	11.0	365.5 (emergency)	10	varies
	TMA South				11.0	3505	20				
	TMA West				7.5	1865	20				
	TMA Cell 1	Rockfill & liner	Final	371.5		1470	10	11.0	370.5 (emergency)	8	varies
Process Water Management											
Water Management Pond (WMP)	WMP Dam 1	Homogeneous	Final	371.5	4.2	850	10	4.0	370.5 (emergency)	8	3.6
	WMP Dam 2			371.5	9.5	800	10	5.5 *			
	WMP Dam 3			371.5	13.3	750	10	9.2 *			
	Settling Pond			371.5		550	5	4.0	n/a		3.6
Mine Rock Pond	Mine Rock Pond	Central core	Final	360.2	13.0	1655	10	11.0	358.9 (emergency)	80	3.4
Freshwater Diversion											
Clark Creek Diversion	Clark Creek	Homogeneous	Final	380.0	2.0	285	6	5.5 *	379.9	6	1.3
	Teeple Road	Homogeneous	Final	379.0	5.0	465	6	6.0 *	378.7	6	0.5
West Creek Diversion	Stockpile Pond	Central core	Fianl	375.5	9.8	380	6	6.5 *	372.3	20	3.2
	West Creek	Central core	Final	364.9	8.9	750	10	7.9 *	360.9	8	3.9
Sediment Control											
Water Discharge Pond (WDP)	Water Discharge Pond	Homogeneous	Final	355.2	2.2	350	6	4.0	354.2	5	1.0
Constructed Wetlands	Pond A	Homogeneous	Final	347.5	1.5	715	5	3.0	347	50	0.5
	Pond B			349.0	2.0	840			348.5		0.5
	Pond C			350.5	2.5	1015			350		0.5
	Pond D			351.5	1.5	305			351		0.5
	Pond E			352.5	1.5	190			352		0.5
West Mine Rock Stockpile	Sediment Pond #1	Central core	Final	354.0	3.8	1750	6	4.0	353.7 (emergency)	60	0.8
	Sediment Pond #2	Homogeneous	Final	348.2	5.2	1460	6	4.0	348 (emergency)	115	2.2
	Temporary Sediment Pond	Homogeneous	Final, temporary	348.6		600	6	4.0	348.5 (emergency)	60	0.6

Notes:
1) Refer to the relevant design reports for design details.
2) Normal freeboard is the height between the normal pond level and dam crest
3) Emergency spillways are noted in parenthesis for contact water ponds that require Environmental Design Flood (EDF) containment. Otherwise, spillways are working or overflow spillway.
4) Inclinations with an asterisk (*) include toe berms

4.2 Tailings Management Area

Design criteria, including mill throughput, used in the design of the TMA dams is summarised in the follow table. Subsequent sections describe tailings cells 1, 2 and 3 and associated seepage collection systems and supporting infrastructure.

Testing carried out in 2012 for the feasibility study determined that the tailings are non-plastic, predominantly silt sized particles, with 71% of the particles passing the 0.075 mm sieve. The specific gravity is 2.82. Column settling tests (undrained and drained) support a deposited void ratio of 1.0 for deposition planning purposes, inferring a dry density of about 1.4 t/m^3. This is quite typical for hard rock gold tailings. A much more conservative dry density of 1.1 t/m^3 was adopted for the design of the initial start-up cell due to the small footprint and relatively rapid filling.

Table 4-3; Mill and Tailings Operating Data used for design

Revision G	Symbol	Source	Total	Years 1 - 4	Years 4 - 14	Units (metric)

				Total	Total	Total	
Operating data provided (design criteria)							
Ore production							
Resource - Open Pit		A	New Gold	100.1	53.4	46.7	Mt
- underground		B	New Gold	4.2	0.5	3.7	Mt
Design production rate *(while operating)*		C	BBA		21,739	21,739	t/day
Mill availability *(% of the time the Mill operates)*		D	BBA	92			%
Nominal production rate		E	C x D		21,000	21,000	t/day
Tailings production							
Tailings / ore ratio		F	BBA	1.0			
Slurry density in the Mill		s_o	BBA		50.0	50.0	% solids
Discharge slurry percent solids (*mass of solids / total mass)*		s_d	BBA		46.7	46.7	% solids
Tailings properties							
Specific gravity of solid tailings particles		G_s	AMEC		2.82	2.82	-
Void ratio of deposited tailings *(vol. of voids / vol. of solids)*		e	AMEC		1.0	1.0	-
Flows affecting the Mill water balance							
- Moisture content of the ore entering the Mill (mass of water/mass of solids)		G	New Gold	3.0			%
- Freshwater for glands & reagent mixing *(per ton of ore)*		H	AMEC M&M	0.08			m^3/ t
- Evaporation and spillage losses in the Mill (*per ton of ore)*		I	assumed	0.02			m^3/t
Calculated data (design parameters)							
Project design life		J	(A) / (E x 365)	13.5	7.0	6.6	years
Tailings production							
- Nominal tailings production	daily	K	E x F		21,000	21,000	t/d
	monthly		E x F x 30		630,000	630,000	t/mo
	annual		E x F x 365		7,665,000	7,665,000	t/y
	total		E x F x 365 x J	103.8	53.4	50.4	Mt
Deposited tailings							
- Dry density		r_d	G_s / (1+e)		1.41	1.41	t/m^3
- Volume	daily	L	K / r_d		14,894	14,894	m^3/d
	monthly				446,809	446,809	m^3/mo
	annual				5,436,170	5,436,170	m^3/y
	total		A+B/r_d	73.96	38.19	35.77	M-m^3
- Water content (at 100% saturation) *(mass of water/mass of solids)*		w	e / G_s x 100		35.5	35.5	%
- Water retained in voids	daily	M	K x w		7,447	7,447	m^3/d
	monthly				223,404	223,404	m^3/mo

annual				2,718,085	2,718,085	m^3/y
Mill water balance						
- Water in ore entering the Mill	N	E x G x 30		18,900	18,900	m^3/mo
- Freshwater for glands and reagent mixing	O	E x H		51,881	51,881	m^3/mo
- Water leaving the Mill with the tailings	P	(K / s) - K		719,036	719,036	m^3/mo
- Losses in the Mill	Q	E x I		12,600	12,600	m^3/mo
- Make-up water required to balance the Mill	R	P + Q - N - O		677,326	677,326	m^3/mo

4.2.1 TMA Cell 1

The purpose of Cell 1 is to allow for the deposition of tailings, outside of fish bearing waters i.e., no MMER Schedule 2 requirement. Cell 1 has been designed to contain 3.3 Mm^3 of tailings, or 6 months storage capacity. The dam has a 'very high' hazard potential classification equivalent to extreme hazard classification by the CDA. The design information for Cell 1 is within RRP-GEO-LRIA-004C August, 2016 and the design brief is RRP-GEO-REP-008 R2. A summary of design characteristics is provided in the table below. The IDF for spillway and design is the 24h PMF (516 mm) and the EDF is the 100 year 30 day event. The facility creates a ring dam therefore reducing inflows and water management requirements. As the TMA is raised in stages over the life of mine the cell will become encapsulated within the ultimate TMA facility requiring no change to the closure plan.

The Cell 1 will have a crest elevation of 371.5 masl, and consists of (also see Table 4-4):

- a continuous raise of the TMA south starter dam from elevation 366.5 masl to 371.5 masl between stations 0+000 to 0+800;
- a raise of the TMA west dam (WMP dam 4) from 366.5 masl to 371.5 masl between stations 1+000 to 1+900; and
- a standalone internal containment dam also built to elevation 371.5 masl.

Table 4-4; Summary of Cell 1 Dam Characteristics

	Spillway Invert Elevation (m)	Dam Crest Elevation (m)	Minimum Ground Elevation[1] (m^3)	Maximum Height (m)	Length (m)	Dam Fill Volume (incremental) (Mm^3)
TMA Start-Up Cell Dam	370.5	371.5	360.0	11.5	1,500	1.17
TMA South Dam - Stage 1		371.5	365.0	6.5	800	0.24
TMA West Dam - Stage 1		371.5	363.0	8.5	700	0.19

Notes:
1 Minimum ground elevation noted is original ground

The TMA start-up cell will have a normal operating water level (NOWL) of approximately 369.90 masl at the conclusion of six months of production, which corresponds to the operational pond volume of 200,000 m^3. Once the water level rises above the NOWL it must be pumped from the TMA start-up cell to the WMP at a rate of approximately 57,000 m^3/day, to maintain sufficient capacity to contain the EDF event. Due to the limited storage in the TMA start-up cell at this point in mine operations, no operating range can be allowed (i.e., any water above the NOWL must be

pumped immediately). The TMA Cell 1 spillway has an invert elevation of 370.5 m and a base width of 8 m. The spillway discharges north into TMA Cell 2.

The primary dam construction materials are mine waste rock and select clay (overburden) obtained from a local borrow or from open pit development. The TMA South and West Dam have a clay core with select or processed sand filter/drain zones provided downstream of the core and above the foundation to inhibit the migration (piping) of fine-grained soils under seepage forces. The TMA Start-Up Cell Dam has an upstream bituminous liner to minimize seepage.

Work on Cell 1 is scheduled to be completed in late August with tailings deposition commencing in September 2017, pending approval from MNRF.

4.2.2 TMA Cell 2

The purpose of Cell 2, is to allow for continued operations and tailings deposition, following filling of Cell 1, as the ultimate TMA dams are constructed. TMA Cell 2 has been designed to provide containment for 12 months of tailings deposition based on the design criteria provided in this section (Table 4-1). The dam has a 'very high' hazard potential classification equivalent to extreme hazard classification by the CDA. The Design brief for Cell 2 dam is within RRP-GEO-REP-026 R1 Design Brief, April 28, 2017. A summary of dam characteristics is provided in the table below (Table 4-5). The IDF for spillway and design is the 24h PMF (516 mm) and the EDF is the 1:100 year 24h (127 mm) for containment below the spillway. The 19 m wide spillway with an invert of 364.70 is located in the north starter dam.

The TMA Cell 2 Dam has a crest elevation of 366.5 m which is equal to the crest elevation of the TMA Starter Dams and north starter dam forms part of the containment for tailings deposition. The cell provides containment for approximately 5.5 Mm3 of tailings. The facility is bounded by natural topography (high ground) in the north and by impoundment dams along the remaining perimeter. The facility will be encapsulated during the life of mine when the TMA Stage 2 raise (elevation 371.5 m) is constructed.

The dam section is a central clay core embankment with rockfill shells and a crest elevation of 366.5 m. Sand filter and transition zones are provided downstream of the clay core and a partial blanket beneath the downstream shell. The dam section requires shallow side slopes due to the characteristics of the foundation soils. Clean (NPAG) rockfill is required for construction of the downstream shell. Any rockfill (NPAG or PAG) may be used for construction of the upstream shell (outside Loslo Creek). Given the Schedule 2 approval schedule, 2x1600mm culverts will be placed in Loslo Creek until the approval is received, then these will be grouted and sheet piling used to close the dam.

Work on the dam is scheduled between approval (August) and December for clay placement, and sheet piling across Loslo Creek to be completed in 1Q2018, pending MMER Schedule 2 approval.

Table 4-5; Summary of Dam Characteristics for Cell 2

Tailings Management Area Dam	Spillway Invert Elevation (m)	Dam Crest Elevation (m)	Minimum Ground Elevation[1] (m^3)	Maximum Height (m)	Length (m)	Dam Fill Volume[2] (Mm^3)
Start-Up Cell Dam (Cell 1 Dam)	364.7	371.5	360.0	11.5	1,500	-
North Dam – Stage 1		366.5	363.5	3.0	1,100	-
West Dam (0+000 to 1+000)		366.5	363.5	3.0	600	-
West Dam (1+000 to 1+900)		371.5	363.0	8.5	650	-
South Dam (0+000 to 0+800)		371.5	365.0	6.5	800	-
South Dam (0+800 to 1+250)		366.5	364.5	2.0	300	-
Cell 2 Dam		366.5	356.0	10.5	900	0.47

Notes:
1 Minimum ground elevation noted is original ground.
2 Incremental fill volume to currently permitted structure.

4.2.3 TMA Cell 3

TMA cell 3 is a component of the ultimate TMA bounded by the TMA south starter dam and the Cell 2 dam. Cell 3 will provide containment for tailings/water for approximately 6 month (April to October 2019 prior to adjoining with Cell 2 through a spillway as part of the overall TMA.

The TMA south starter dam is will be built to 366.5 m and has a 'very high' hazard potential classification equivalent to extreme hazard classification by the CDA. The design brief for TMA dams is within Detailed Design Brief Design Brief - Tailings Management Dams 3098004-004000-A1-ETR-0006-00, July, 2014. This was revised following review by the ITRB and, for the starter dams, little design change was required to the 10:1 downstream slopes and the 4:1 upstream slopes (RRP-GEO-MEM-006 Rev 1). A summary of design characteristics is provided in design brief and in the summary table in this section. The IDF for spillway and design is the 24h PMF (516 mm) and the EDF is the 1:100 year 30 day event for containment below the spillway.

When full containment in the TMA is available (i.e. TMA South Dam is constructed to elevation 366.5 m), tailings will be discharged from the north side of the TMA South Dam (upstream slope).

An overflow spillway will connect TMA Cell 2 and 3 to allow for water reclaim during this period of operation. As tailings are discharged from the TMA South Dam, starting in April 2019 (approx.) the pond level in the cell will continue to increase until the water begins to passively overflow at elevation 364.5 m into TMA Cell 2. The TMA Cell 3 Overflow Spillway has an invert elevation of 364.5 m and a base width of 19 m. The spillway will allow TMA Cells 2 and 3 to act as one pond above this invert elevation.

4.2.4 Seepage Collection System

Seepage collection systems have been designed consistent with permitting requirements (MOECC ECA #5178-9TUPD9) to contain seepage and a 1:25 yr 24h storm event (102 mm). However, seepage and runoff reporting to the MRP, from the EMRS and LGOS, is through ditching designed for a 1:100 yr 24h storm event, also consistent with the ECA approval. There is no requirement for seepage collection from the MRP, however, as noted elsewhere in this manual (section 5) the MRP will be managed with a minimum water level to reduce seepage and dewatered in winter to 5,000 m^3.

Seepage collection systems may be modified during construction, however the design criteria will not be reduced.

4.2.4.1 Cell 1

Cell 1 seepage collection is based on continuous ditches reporting to sumps and pump back. Cell 1 seepage details are outlined in RRP-GEO-MEM-043-R1. Seepage to the south east (through WMP Dam 4) is part of inflows to the WMP and managed as part of the WMP water.

Three sumps are proposed with the base of the sump 1 to 2 m below grade to allow for the incoming ditch invert. Combined seepage flow to these sumps is 29 m^3/day and final dimensions are being field fitted. Where required, the downstream side of the ditches will be raised to 362.0 m to prevent back flooding from Loslo Creek. Pumping sizing is intended to drain the sumps within 5 days.

Table 4-6; TMA Cell 1 Seepage Collection Sumps

Parameter	Sump 1	Sump 2	Sump 3
Location	North side of cell 1	East side of cell 1	South of TMA south dam
Seepage flow (m^3/day)	12	7	10
Runoff (m^3/day)	9,321	4,113	5,257
Ditch steady flow (m^3/day)	200	117	173
Storage volume required (m^3)	9,532	4,237	5,440
Pump capacity (m^3/day)	2,500	1,000	1,500

4.2.4.2 Cell 2

Seepage from cell 2 dam has been estimated to be approximately 9.2 m^3/day when the cell is at capacity (364.7 m). Until the TMA south dam is completed i.e., Marr and Loslo Creek are impounded this seepage will be collected and pumped back into Cell 2, as such Cell 2 seepage management is temporary. Sumps and ditching have been designed for a 1:25 year event, consistent with seepage collection commitments;

- Seepage collection sump will be built with ~8,000 m^3 of live storage (NWL 354.0, MOWL 355.5)
- Minimum pumping capacity 1,600 m^3/day to dewater sump in 5 days

Seepage from the north starter dam, is estimated at 0.02 to 0.03 m3/day/m per metre run of dam which will be captured in WMP sump 3.

4.2.4.3 Cell 3

Cell 3 is not anticipated to impound tailings until April 2019 and as such seepage is not anticipated until after this time. Seepage from the south starter dam, is estimated at 0.02 to 0.03 m3/day/m per metre run of dam which will be directed via ditching to the water discharge pond, or if necessary pumped back.

4.2.4.4 WMP

Seepage from the WMP, similar to other dams is designed to be collected in ditches, routed to sumps and pumped back to the WMP. The ditches are designed to convey the 1:25 yr 24h event with flows typically around 5 m^3/s and up to 8.3 m^3/s. The ditches have 1 m bottom width, 3:1 slopes and up to 2 m flow depth. The following table provides a summary of the sumps.

Table 4-7; WMP Seepage Collection Sumps

Parameter	Sump 1	Sump 2	Sump 3
Location	Dam 2	Dam 3	North of WMP by North starter dam
NWL	359.5	358.0	361.5
MOWL	361.1	360.2	364.0
Storage volume required (m^3)	18,200	11,800	20,000
Pump capacity (m^3/day)	4,000	2,500	3,500
Note; Sump 3 to be expanded in 2018 to include seepage from North Dam – Cell 2			

4.2.5 Supporting Infrastructure

Site infrastructure have been constructed with locally available materials produced through the development of the Open Pit or quarrying sand/gravel deposits and bedrock. Figure 3-1 shows the general arrangement of the RRM, including site and haul roads, laydown areas, and stockpiles.

4.2.5.1 Pipelines

There are five pipeline corridors used to transfer tailings, fresh water, and reclaim water on site. Drawing 100126-4500-DD10-PIP-0001.001 shows the key plan of the tailings and reclaim pipelines that interact with the plant site. Drawing 100126-6200-DD10-PIP-0001.001 shows the key plan of the Pinewood Pipeline used for effluent discharge (see Appendix B).

- Tailings Pipeline: the tailings pipelines are 4,000 m in length between the Mill and the TMA and are used to transfer tailings to the TMA for discharge. The tailings line is contained within a lined corridor with six emergency dump ponds. The line is with in additional containment over West Creek and its tributaries.
- TMA Reclaim Pipeline: the TMA reclaim pipeline is 4,000 m in length between the TMA and the Mill and is used to transfer mill make-up water. The reclaim line is contained within a lined corridor with six emergency dump ponds. The line is with in additional containment over West Creek and its tributaries.
- MRP Reclaim Pipeline: The MRP reclaim pipeline is 1,750 m in length between the MRP and the Mill and is used to transfer mill make-up water.
- Open Pit Pipeline: The Open Pit pipeline is 1,400 m in length between the Open Pit and the MRP and used to transfer pit dewatering to the MRP.
- TMA Transfer Pipeline: The TMA transfer pipeline is 2,300 m in length between the TMA and the WMP and are used to transfer TMA surplus water to the WMP.
- WMP Freshwater Pipeline: The WMP freshwater pipeline is 4,000 m in length between the WMP and the plant site and used to transfer freshwater to plant site infrastructure and the Mill (if required).

- Pinewood Pipeline: The Pinewood pipeline is 10,300 m in length between the WMP and the Pinewood Pumphouse. It is used to discharge WMP effluent into the Pinewood River.

4.2.5.2 Utilities

The following utilities are used on site:

- Power to the plant site is provided by 230 kV transmission lines that are connected to Hydro One northwest of the site at a Switching Station;
- The main 230 kV substation is located near the concentrator building to provide power to the process equipment via underground supply lines. Power to the remainder of the site is provided by a network of overhead power lines fed from the main substation; and
- Site telecommunications and Process Control are distributed via fiber optic lines.

4.2.5.3 Tailings Distribution Systems

Mill tailings are produced and detoxified in a cyanide destruction circuit as shown on the process flow diagram 100126-3200-DC00-PFD-0017 (Appendix B). Pipelines to the TMA are shown on the process flow diagram 100126-3200-DC00-PFD-0022 (Appendix B). Tailings are beached from the TMA dams. A wide beach against the dams enhances safety and reduces seepage.

4.2.5.4 Water Circulation Systems

Appendix B contains supporting information for the pumping requirements and design of pumps and pipelines. Mill make-up water is provided from the TMA and MRP. The TMA reclaim recirculates water from the mill after the tailings solids have settled in the TMA. The MRP reclaim pumps water collected from the EMRS and Open Pit/future underground mine. Mill make-up water will be preferentially pumped from the MRP with the TMA supplying the remainder of make-up water.

Freshwater pipelines transfer water to the Plant site for the freshwater requirements at the Mill, as well as to provide water to the truck filling station, truck shop, truck wash facility, and fire water tank. Surplus water in the WMP may also be pumped to the Pinewood Discharge Structure for discharge into the Pinewood River. Details on effluent discharge via the Pinewood Pipeline are described in Section 4.4.

4.2.5.5 Mill Make-up Water Supply

Mill make-up water is provided by reclaim from the WMP, TMA cells and MRP. The reclaim water from the TMA is pumped from the central pond using the following three pumps:

Table 4-8; Make up water supply pump ID and capacity

Equipment ID	Name	Capacity
4520-PU-0023	Process Plant Pumps	1,350 m^3/hr
4520-PU-0024	Process Plant Pumps (Standby)	1,350 m^3/hr
4520-PU-0025	WMP Pump	1,516 m^3/hr

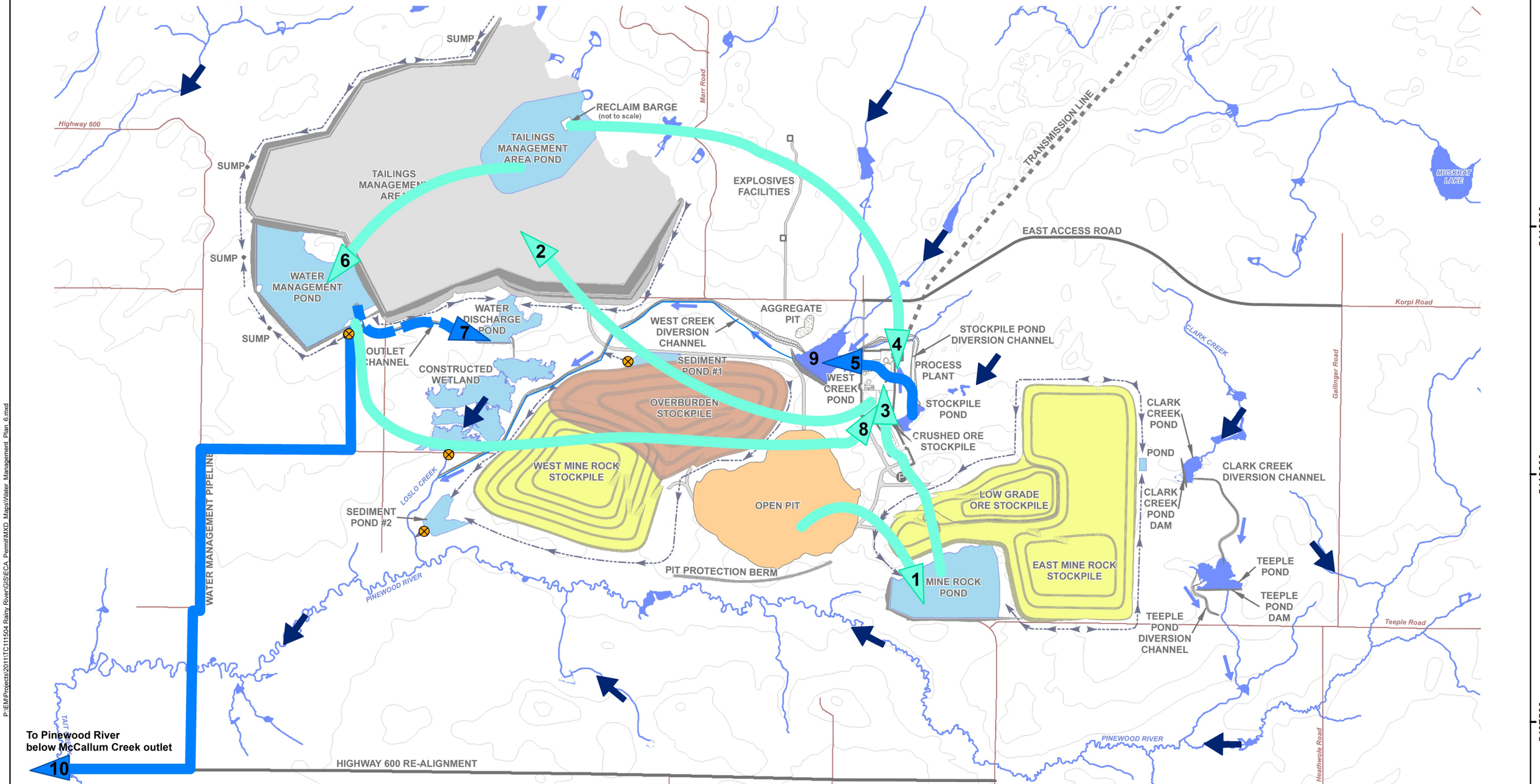
Reclaim water from the MRP is pumped using the following two pumps.

Equipment ID	Name	Capacity
2590-PU-0030	Mine Rock Pond Water Pump	680 m^3/hr

2590-PU-0030	Mine Rock Pond Water Pump	680 m^3/hr

4.3 Process Water and Water Management

Summary of the process water is shown in Figure 4-1 – process flow diagram water flow sheet. Appendix B includes process flow diagrams. Appendix E includes the process water balance for the TMA and WMP includes TMA cells 1, 2 and 3.



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LEGEND

- 1 Integrated Water Recycle
- Excess Water Discharge
- General Surface Water Flow Direction
- Final Compliance Point

ID (on this Figure)	Flow From	Flow To	Method	Purpose	Control Logic
1	Open Pit	Mine Rock Pond	Pumped	Dewatering of the Open Pit	Rate to match inflows (lower bench may flood during storm events).
2	Process Plant	TMA	Pumped	Tailings slurry discharge.	Pumped at fixed rate.
3	Mine Rock Pond	Process Plant	Pumped	Process Plant Make-up.	Fixed rate with on/off float switch at minimum pond level.
4	TMA	Process Plant	Pumped	Process Plant Make-up.	Pumped at fixed rate adjusted according to Mine Rock Pond supply.
5	Stockpile Pond	West Creek Pond	Gravity	Divert clean runoff.	Free draining to match inflow.
6	TMA	Water Management Pond	Pumped	Seasonal transfer. Net annual inflow to the system.	Transfer net annual inflow after effluent is released from the Water Management
7	Water Management Pond	Water Discharge Pond /Constructed Wetland	Gravity	Discharge treated effluent to the Pinewood River via the constructed wetland.	Seasonal discharge to constructed wetland (all months except Feb./March) for added treatment and maintain Pinewood River flows.
8	Water Management Pond	Process Plant	Pumped	Mill process fresh water and make-up requirements	Pumped at variable rates as needed.
9	West Creek Pond	Potable	Pumped	Provide potable water	Pumped at variable rates as needed.
10	Water Management Pond	Pinewood River / McCallum Creek	Pumped	Discharge treated effluent to the Pinewood River.	Discharge treated effluent to the Pinewood River.

NOTES:
- Nominal monthly pump rates indicate on figure are based on average annual conditions.
- Pump rates are provided on table 9

0 1.25 2.5 5 7.5 10 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

newgold™ Rainy River Project

amec

RAINY RIVER PROJECT

Process Water Flow Schematic

PROJECT N°: TC111504

FIGURE: 4-1

SCALE: 1:37,500

DATE: August 2014

4.3.1 Water Management Pond

The WMP collects runoff from direct drainage area, pumping from the Pinewood River and receives transfer from TMA. Initially the WMP will be utilized to build an inventory of 3.8 Mm^3 of water required for mill start-up and process operations. The start-up inventory of water will be provided by pumping from the Pinewood River via the pinewood pipeline.

WMP is made up of 5 dams with a crest of 371.5 m and MOWL of 369.7 m. The dams have a 'very high' hazard potential classification equivalent to extreme hazard classification by the CDA. As-built details will be provided in the WMP as-built report to be issued following construction completion. The IDF is 24h PMF with the emergency spillway invert at 370.5 m in bedrock on the north end of dam 5 into cell 2 / Loslo Creek catchment.

All the WMP dams were completed to their final crest elevation in July 2017 and EOR confirmation of compliance was completed on July 27, 2017. The WMP has been developed in accordance with the design details presented in the following documents and drawings. As-built details will be provided in the *WMP As-built Report*, which will be issued within 90 days of construction completion.

The design basis for the WMP includes, but is not limited to, the following;

- Minimum operating volume of 1.0 Mm^3 (i.e., dead storage below the intake for the pumps to the mill); and
- Maximum operating volume of 5.0 Mm^3;

The WMP will discharge via pumping to the Water Discharge Pond (except in winter); and pumping surplus effluent, above 10,000m^3/day, to the Pinewood River (spring and fall). The design criteria for the WMP dams are summarized in section 4.1.

Construction of the WMP began in September 2015 and finished in July 2017. Approval to proceed with the Intermediate Stage of filling to 364.5 m was granted by MNRF in April, 2017. Approval is pending to raise the fill level above 354.5 m to the ultimate elevation, as discussed in section 5.

4.3.1.1 Freshwater Taking from the Pinewood

The Pinewood Water Intake/Discharge Structure is located along the Pinewood River on the outside of a meander bend. The pumphouse is used for the initial filling of the WMP, after which it becomes a discharge structure used to discharge effluent from the WMP.

The Pinewood Water Intake/Discharge has been constructed to support the requirements of the *Water Management Plan for Operations* (Amec Foster Wheeler, 2015a). These features are illustrated in the following drawings:

Drawing Title	New Gold Drawing Number
Pinewood Water Intake/Discharge Earthworks – General Arrangement	3098004-006200-A1-D20-0002
Pinewood Water Intake/Discharge Earthworks - Channel	3098004-006200-A1-D70-0003

The Pinewood Pump House structural and mechanical details are illustrated in the following General Arrangement Drawings:

Drawing Title	New Gold Drawing Number
Pinewood River Water Intake Pipeline – Key Plan	100126-6200-DD10-PIP-0001.001
Mechanical General Arrangement Pinewood River Pump Station Plan	100126-6200-DE10-GAD-0002.001
Mechanical General Arrangement Pinewood River Pump Station Elevation	100126-6200-DE10-GAD-0003.001
Pinewood Water Intake Structure Structural General Arrangement	100126-6200-DT00-GAD-0003.001
Pinewood Water Intake/Discharge Mechanical General Arrangement	100126-200-DT00-GAD-0004.001
Piping General Arrangement Pinewood River Pump Station Plan and Section	100126-6210-DE20-GAD-0001.001
General Arrangement Pinewood River Pumphouse Grounding Plan	100126-6210-DF00-GAD-0001.001

4.3.2 Mine Rock Pond

The Mine Rock Pond has been designed to collect runoff and seepage from the East Mine Rock Stockpile (EMRS), Low Grade Ore Stockpile (LGOS), and dewatering from the Open Pit and future underground mine. The MRP design details are summarized in the following documents and drawings with the latest revision RRP-GEO-MEM-019 R0 – AMECFW 2016h. The dam has a ‘very high’ hazard potential classification equivalent to extreme hazard classification by the CDA. As-built details will be provided in the MRP as-built report to be issued 90 days following construction completion.

Document Title	**Reference**
Design Brief – Water Management Dams	(Amec Foster Wheeler, 2015b)
Mine Rock Pond Dam – Design Revision and Operating Guidelines	(Amec Foster Wheeler, 2016h)
MRP As-built Report	TBD
Drawing Title	**New Gold Document Number**
Mine Rock Pond Dam – Typical Cross Section	3098004-002590-A1-D70-0004
Interim Mine Rock Pond – Plan, Cross Sections, and Details	3098004-002590-A1-D50-0006

The design criteria for the MRP ultimate dams are summarized in section 4.1. Typical dam cross sections are provided on Drawings 3098004-002590-A1-D70-0004 for the MRP ultimate dam. The design basis for the MRP includes, but is not limited to, the following:

- 24h PMF and 1:100 year 30 day storm
- Maximum operating water volume: 0.5 Mm^3;
- Maximum water stored: 1.3 Mm^3;
- Minimum operating water volume: 0.05 Mm^3;
- Constructed from local materials as a clay core and rockfill embankment; and
- Decant pumping to the Mill via pipeline is at a rate of up to 680 m^3/hr.

The dam crest elevation is 360.2 m with an emergency spillway invert of 358.9 m. The available pond storage at the emergency spillway invert is reduced to 1.3 Mm^3. The MRP pumps will pump 680m^3/hr, and run continuously until the pond is empty. This 30% increase to the pumping rate and change in pumping philosophy means the normal pond will range between 5000 m^3 and about 525,000 m^3 depending on the open pit dewatering pump capacity. The larger decant pumps also mean that the EDF capacity required in the MRP is 775,000 m^3. The Maximum Operating Water Level (MOWL) in the MRP has been set at elevation 356.8 m (525,000 m^3).

Completion of the Mine Rock Pond Dam commenced in 2015, and with a hiatus in 2016, is expected to be completed in the fall of 2017. Until the dam is complete, runoff and seepage water from the EMRS will be diverted to the temporary Sediment Pond system located within the north portion of the ultimate MRP footprint and discharged to the remnant Clark Creek.

4.4 Water Treatment

At the time of preparation for this revision the constructed wetland and sediment ponds 1 and 2 have not been constructed or received all regulatory approvals. Based on the anticipated MMER schedule 2 approval timing, construction of these facilities is planned for 2018. The following section provides a summary of their design and intended operation, which is intended to be updated on receipt of all regulatory approvals.

4.4.1 Water Discharge Pond and Constructed Wetland

The Water Discharge Pond (WDP) has been designed to collect runoff from natural ground catchment south of the TMA, seepage from the seepage collection ditch, and bleed flow from the WMP (design rate of 10,000 m^3/day) for discharge to the constructed wetland. The WDP will also provide sediment control south of the TMA.

The constructed wetlands collect the water discharged from the WDP. They have been designed to provide a target 30-day retention time following discharge from the WDP. The wetlands are comprised of five ponds (Pond A, B, C, D, E), and the downstream pond (Pond A) will feature a control structure to stop discharge if the water quality does not meet discharge criteria. If required, water in Pond A would be pumped back to the TMA or WMP.

The design criteria for the Water Discharge and constructed wetland dams and ponds are provided in Tables 4-3 and 4-5, respectively. Further design details and typical cross-sections of the effluent dams are provided in the following documents:

Table 4-9; Water Discharge Pond and Constructed Wetland Documents

Document Title	Reference
LAKES AND RIVERS IMPROVEMENT ACT WORK PERMIT APPLICATION SUPPORT DOCUMENT WATER DISCHARGE POND AND CONSTRUCTED WETLAND	RRP-GEO-LRIA-004D R2
As-built Report(s)	TBD
Drawing Title	**New Gold Document Number**
Water Discharge Pond Dam – Plan and Typical Cross Sections	3098004-004410-A1-D70-0002
Constructed Wetland – Plan, Profiles & Section	3098004-004420-A1-D70-0002

4.4.2 Sediment Ponds 1 & 2

Sediment Ponds #1 and #2 collect seepage and runoff from the West Mine Rock Stockpile (WMRS) to allow for settlement of Total Suspended Solids (TSS). The sediment ponds have been designed to provide a 12-day hydraulic retention time. Sediment Pond #1 will also receive overflow water from the West Creek Overflow Weir during large storm events. Critical to the function of the sediment ponds is progressive reclamation. The ponds have been designed to meet the retention time objectives for Year 3 of mine operations. Further details on design are provided in the following documents:

Table 4-10; Sediment Ponds 1 and 2 Design Detail Documents

Document Title	Reference
LAKES AND RIVERS IMPROVEMENT ACT WORK PERMIT APPLICATION SUPPORT DOCUMENT SEDIMENT PONDS	RRP-GEO-LRIA-012 R1
As-built Report	TBD
Drawing Title	**New Gold Document Number**
Sediment Pond #1 – Sections & Details	3098004-004430-A1-D70-0002
Sediment Pond #2 – Plan, Cross Sections, and Details	3098004-004440-A1-D70-0002

After 2018, progressive rehabilitation would be required to reduce the sediment load on the ponds, or the ponds could be increased in size. After 3 years of mine operations, a better estimate of sediment loading from the stockpile area should be available to adequately design for additional area as required.

Seepage collection ditches will be constructed around the Overburden and NPAG stockpiles to convey runoff to the sediment ponds. The ditches will be constructed to minimize erosion protection requirements where practically possible. Flows may also be directed to the ponds using road side ditches.

Good engineering practices for placement, sediment and erosion control will be adopted for the management of the overburden pile to help reduce the sediment load and increase the chance that settling alone (as opposed to the addition of coagulants and flocculants) can be used for settling out the TSS. These practices include pre-settling ponds that are regularly cleaned out, construction of ditches with appropriate slopes, maintenance of the ditches, and progressive re-vegetation of the overburden stockpile.

4.5 Freshwater Diversion Dams and Channels

The freshwater ponds are designed to minimize the net freshwater inflows into the project by diverting non-contact runoff around the site via dams, ponds and diversion channels. The West Creek Pond, Clark Creek, Stockpile Pond and Teeple Road dams were developed in a single dam raise during the construction phase to support the requirements of the *Water Management Plan for Operations* (Amec Foster Wheeler, 2015a). Additional details regarding these dams, ponds, and diversion channels are provided in section 4.1.

The freshwater diversion structures have been developed in accordance with the following design briefs. As-built reports have been issued. A detailed list of Drawings is provided in Appendix A.

Table 4-11; Supporting Documents for the West Creek and Clark Creek Diversions

Document Title	**Reference**
Design Brief – Water Management Dams	(Amec Foster Wheeler, 2015b)
Design Update – Clark Creek Pond Dam	(Amec Foster Wheeler, 2016i)
Stockpile Pond Dam – Design Revision and Operating Guidelines	(Amec Foster Wheeler, 2016j)
West Creek Dam – Design Revision and Operating Guidelines	(Amec Foster Wheeler, 2016k)
Clark Creek Diversion – As-built Report	(Amec Foster Wheeler, 2017a)
West Creek Diversion – As-built Report in preparation	(Amec Foster Wheeler, 2017b)
Drawing Title	**New Gold Document Number**
West Creek Pond Dam – Layout and Foundation – Plan & Details	3098004-002510-A1-D50-0001
West Creek Diversion Channel – Plan and Profile	3098004-002510-A1-D50-0003
Stockpile Pond Dam – Plan, Typical Section and Profile	3098004-002580-A1-D70-0002
Stockpile Pond Diversion Channel – Plan and Profile	3098004-002580-A1-D70-0004
Clark Creek Pond Dam – Plan, Typical Section and Profile	3098004-004400-A1-D70-0001
Clark Creek Diversion Channel – Plan and Profile	3098004-004400-A1-D70-0002
Teeple Road Dam – Plan, Typical Section and Profile	3098004-004400-A1-D70-0003
Teeple Road Diversion Channel – Plan and Profile	3098004-004400-A1-D70-0004

Table 4-12; Summary of the Diversion Characteristics

Dam and Pond				Channel											
Dam		Pond		Channel Design Criteria											Additional features
Name	Crest Elev.	Area	Vol.	Diversion Channel Inlet/Outlet	Design Peak Flow Event	Segment	Function	Design Flow	Freeboard	Flow Depth	Base Width	Length	Gradient	Side Slopes	
	(m)	(ha.)	(Mm^3)		(-)	(Sta.)		(m^3/s)	(m)	(m)	(m)	(m)	(%)	(H : V)	
Clark Creek Diversion															
Clark Creek	380.0	9.2		Clark Creek Pond to Teeple Road Pond	100-yr 24-hr	0+000 - 1+229	Channel				6	1229	0.10	4 : 1	
Teeple Road	379.0	2.9		Teeple Road Pond to Pinewood River	100-yr 24-hr	0+020 - 0+580	Channel				6	560	1.25	4 : 1	
West Creek Diversion															
Stockpile Pond	375.5	4.6		Stockpile Pond to West Creek Pond	PMF	0+150 - 0+200	Spillway				33	50	0.96	4 : 1	- Tributary 2 confluence (Sta. 0+775)
						0+200 - 0+250	Channel				33 to 6	50			
						0+250 - 1+346					6	1096			
West Creek	364.9	13.2		West Creek Pond to Loslo Creek	PMF	0+000 - 0+584.5	Spillway				8	584.5	0.00 to 1.00	4 : 1	- High level side weir at flow control structure - Culverts?
					100-yr 24-hr	0+584.5 - 0+647	Flow control structure				8 to 3	62.5	1.00		
						0+647 - 2+150	Channel				3	1503	1.00 to 0.10		
						2+150 - 2+750					5	600	0.10		
						2+750 - 4+576					3	1826	0.10 to 0.57		

Notes
1) Low flow and fish habitat features are included in all diversion channels below the hydraulic flow section

4.5.1 West Creek Diversion

The West Creek Diversion system diverts flows from the West Creek and its tributaries around the Open Pit and discharges into the Pinewood River at Loslo Creek. It includes the Stockpile Pond Dam and Diversion Channel, which divert flows around the Plant Site, and the West Creek Pond and Diversion Channel, which divert flows around the Open Pit. The dams have a 'very high' hazard potential classification equivalent to extreme hazard classification by the CDA. The following sections describe the components of this diversion.

4.5.1.1 Stockpile Pond and Diversion Channel

The objective of the Stockpile Pond is to divert freshwater from natural ground into the West Creek Watershed. The Stockpile Pond Diversion Channel was designed to convey the Probable Maximum Flood (PMF) from the plant site area to the West Creek Pond. The Stockpile Pond Diversion will also provide fish habitat compensation. The Stockpile Pond Diversion Channel base width varies from 6 to 33 m with 4H:1V side slopes. The total length of the diversion channel is about 1,200 m.

The dam height is 7.5 m with 4:1 slopes with a crest width of 6 m and length of 175 m. The dam crest elevation is 375.5 m and the diversion channel invert is 372.2 m. NOWL provides capacity for 93,700 m^3 of storage with greater volumes discharges through the 33 m spillway into the diversion channel. The diversion channel is a low (<1%) gradient channel reporting to the West Creek Pond with a typical bottom width of 6 m.

The design brief for the dam is RRP-GEO-REP-003. Construction was completed on the diversion in November 2016 and confirmed by the EOR (RRP-GEO-MEM-080-R1). Construction of the dam was completed in May 2017 and confirmed by the EOR (RRP-GEO-MEM-119-R1). The dam was constructed with a central clay core and random fill and or NPAG rock shells.

4.5.1.2 West Creek Pond and Diversion Channel

The West Creek Pond is located upstream of the Open Pit and west of the Process Plant at a point that allows for the raising of the pond water level sufficiently to divert flows westerly through a diversion channel and around the Open Pit. The West Creek Dam intercepts all West Creek flows from the north, as well as drainage from two tributaries to the east, diverted through the Stockpile Diversion Channel.

The West Creek Dam is a central clay core with random fill upstream shell and NPAG mine rock downstream shell. It has a crest elevation of 364.9 m (~156,000 m^3), maximum height of 7.4 m, and overall side slopes of 7.9H:1V including rock toe berms. The West Creek Pond has been designed to contain the PMF while discharging to the West Creek Diversion Channel.

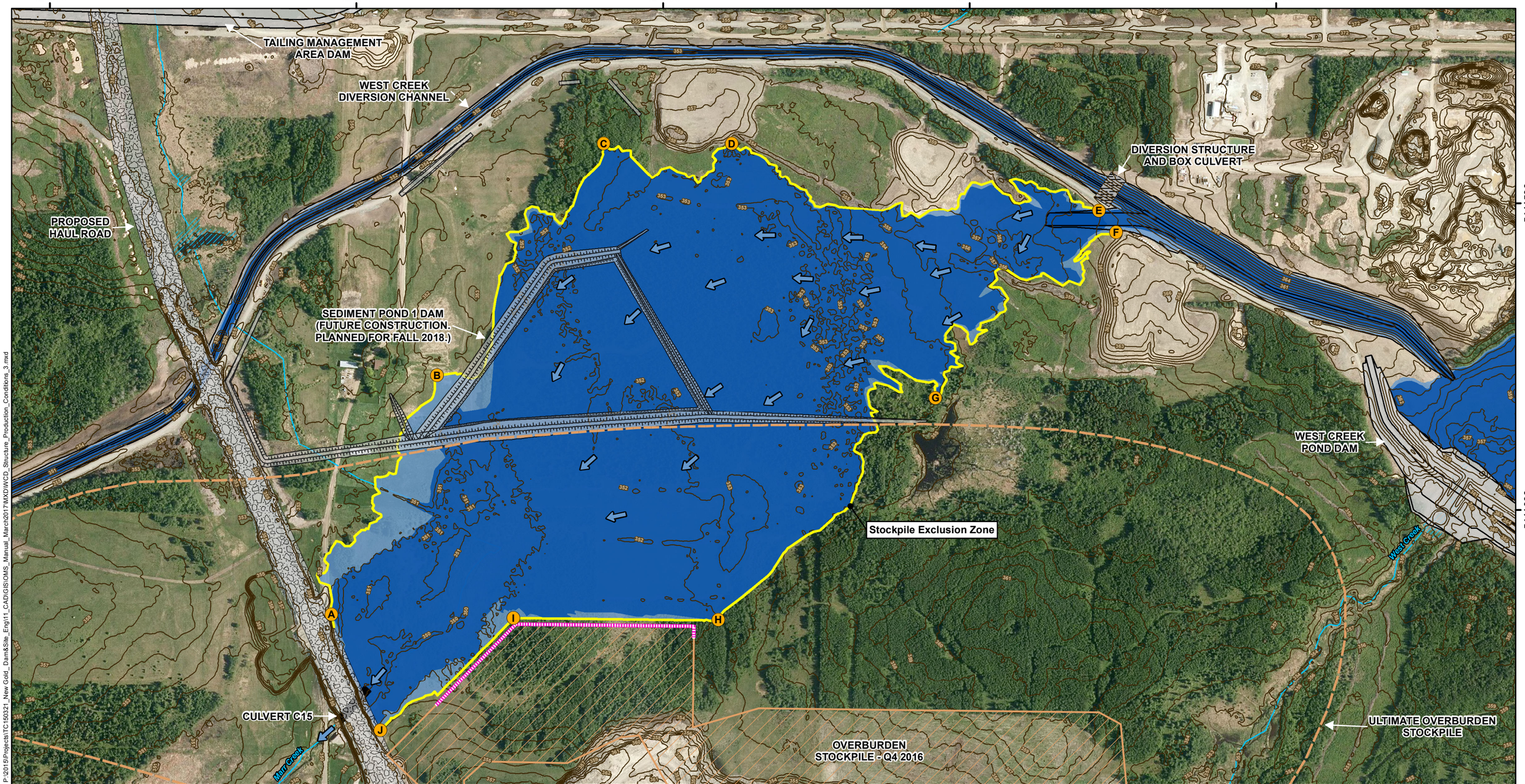
The first 615 m of the West Creek Diversion Channel acts as the Emergency Spillway of the West Creek Dam and has been designed to convey a PMF event. The spillway invert elevation is 361.0 m and is 8 m wide. This provides a freeboard of 4.0 m at normal water level in the pond. During a PMF event the peak water level would rise to 364.5 m, leaving 0.4 m of freeboard.

4.5.1.3 West Creek Diversion Overflow Structure

The Overflow Structure (or weir) is located at Sta. 0+615 within the Diversion Channel. A box culvert (62.5 m long by 2.4 m wide/tall) constricts the channel flow such that a side overflow weir may be activated (invert elevation 360 m, width 50 m). The purpose of the overflow structure is to restrict the flow rate discharging from the culvert under high flow conditions. The remaining ~4,000 m of diversion channel is over flat ground with minimal elevation change. The reduced flows through this section of diversion channel allow a much smaller channel excavation.

The overflow structure has been designed such that during a PMF event, the flow rate downstream of the culvert, i.e., in the channel, does not exceed the 100-year flood outflow from the West Creek Pond (26.9 m^3/s). The diversion channel upstream of the diversion structure will back up, with excess flows diverted through the side overflow channel. Containment is provided above the culvert by a berm across the diversion channel with a crest elevation of 363 m. The peak water level in the diversion channel during a PMF event will be 362.5 m, providing 0.5 m of freeboard to the crest of the berm.

The overflow structure will be activated for events greater than the 10-year storm. The peak overflow channel discharge during a PMF event will be 163.8 m^3/s. The overflow channel discharges onto a flat, grassy plain south of the West Creek Diversion Channel and north of the ultimate WMRS. This area, termed the exclusion zone, is shown on Figure 4-2 and is required to remain undeveloped to prevent the loss of natural vegetation until Sediment Pond 1 berm is constructed, north of the WMRS. In the field, this area is demarcated by bright coloured stakes and ribbons. The ground topography will naturally drain any overland flow through Culvert C15 into Marr Creek.



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LEGEND

- Setting Out Point
- Estimated 25 year Floodline
- Estimated 100 year Floodline
- Flow Direction
- Stockpile Exclusion Zone
- Silt Fence
- Culvert C15
- Diversion Structure and Box Culvert
- Dam
- Ultimate Overburden Stockpile
- Overburden Stockpile Progression
- Existing Contours (1 m interval)
- Watercourse
- Waterbody

Setting Out Points:

Label	Northing	Easting
A	5410830	423959
B	5411220	424131
C	5411598	424403
D	5411598	424612
E	5411489	425211
F	5411453	425239
G	5411183	424944
H	5410821	424590
I	5410824	424256
J	5410641	424039

0 0.1 0.2 0.4 0.6 0.8 1 Kilometres

NOTES:
- Aerial imagery - Pleiades June 2016

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

West Creek Diversion Structure Pre-Production Conditions

PROJECT Nº: TC150321	**FIGURE: 4-2**
SCALE: 1:6,000	DATE: March 2017

4.5.2 Clark Creek Diversion

The purpose of the Clark Creek diversion is to divert natural drainage and runoff around the East Mine Rock Stockpile and provide fish habitat offsetting. The Clark Creek Diversion Channel diverts runoff from the Clark Creek upstream of the Clark Creek Dam and the EMRS, through the Clark Creek diversion channel into Teeple Pond and subsequently into Teeple Diversion and to the Pinewood River via a culvert under Teeple Road.

Construction of the Clark Creek Diversion occurred between August 29, 2015 and December 4, 2016 and authorised by LRIA FF-2015-03A and the Fisheries Act approval. There are applicable federal and provincial EA commitments, however as a freshwater diversion there a limited MOECC requirements beyond sediment control.

Clark Creek and Teeple Road Dams were constructed as homogenous clay fill embankments utilizing native clay overburden. The clay fill is protected by gravel and cobble sized materials, with a layer of geotextile separation, to prevent erosion. Overflow sections for Teeple Dam are included on the dams to carry storm flows (i.e., activated by 2-year event) and have been designed to handle events in excess of the 100-year return design flow. Overflow sections are provided to permit the safe passage of water in the event the pond level exceeds the maximum operating water level. There are no active controls on the water flows. Clark Creek Dam features a 20 m wide overflow section and Teeple Road Dam features a 150 m wide overflow section designed to allow water and fish to flow over the structure.

The diversions are designed to convey the 1:100 year flow and are typically 6 m wide (base width) with 4:1 slopes. The Clark Creek diversion is 1,200 m and the Teeple Diversion is 580 m long.

Table 4-13; Design Parameters for the Clark Creek Diversion

Design Parameter	Unit	Clark Creek	Teeple
Embankment dam crest elevation	m	380.0	379.0
Dam overflow section invert elevation	m	379.9	378.7
Normal Water Level (NWL) elevation	m	378.75	378.5
Diversion channel inlet invert elv.	m	378.75	378.5
Diversion channel outlet elv.	m	377.6	371.5
Diversion channel gradient (average)	%	0.1	1.2
Diversion channel side slopes		4:1	4:1

Deviations from design occurred for both diversions, however not anticipated to have a negative effect of stability. Examples of deviation include absence of low flow channel, oversized boulders, variances on habitat feature frequency and riffles either not meeting design elevation or being too steep

4.6 Instrumentation

4.6.1 Dam Safety

Instrumentation has been and will be installed during construction. Instrumentation will include instrumented dam sections that will monitor dam foundation and clay fill pore pressures to infer consolidation characteristics, as well as monitor any movement of dam fill due to deformation.

Each dam instrumentation section will include: standpipe(s), a settlement plate, slope inclinometer(s), survey pins/monuments, and a terminal arrangement with data logger and vibrating wire piezometers.

Following construction, the instrumentation will remain for dam monitoring purposes. A detailed report containing the proposed locations, usage, and analysis of all instrumentation is provided in the *Geotechnical Monitoring Plan* (Amec Foster Wheeler, 2016b). The design details for the installed or proposed dam instrumentation is summarized in Table 4-14. The design information provided in Table 4-14 will be confirmed and updated as may be required following development of the As-Built drawings.

Table 4-14; Dam Instrumentation Summary

Facility		Dam Instrumentation							
		Slope Stability			Foundation Consolidation		Phreatic Level and Seepage		
	Section	Slope Inclinometers	Survey Pins	Survey Monuments	Vibrating Wire Piezometers	Settlement Plates	Vibrating Wire Piezometers	Standpipe Piezometers	Pond Level Gauge
	(Sta.)	(no.)	(no.)	(no.)	(no.)	(no.)	(no.)	(no.)	(type)
TMA North	3+300	0		0	2	1	1	2	
	Mass array				142				
TMA South	1+000				2				
	1+380				2	1	1	1	
	1+450	2		2	4	2	1	2	
	1+600	1			4	2	1	1	
	2+200	2		2	4	2	1	2	
	2+350	1			4	2	1	1	TBD
	Mass array				176				
TMA West	0+300			0	1		1		
	0+460	2		0	5		2	1	
	1+450	0	35	0	0	1		0	
	1+500	2		0	4	0	3	0	
	Mass array				82				
TMA Start-up Cell	0+400				2				
	1+000				2				TBD
	Mass array				88				
WMP Dam 1			16						- Staff gauge
WMP Dam 2	0+950	1	34	0	2	0	2	2	- Survey stakes
WMP Dam 3	0+300	0	17	0	1	0	1	2	
	0+500	1		0	2	1	4	1	
Mine Rock Pond	0+220	1		2	2	1	1	4	- Staff gauge
Clark Creek									- Staff gauge
Teeple Road									- Staff gauge
Stockpile Pond	0+125	1	8	0	1	0	1	2	- Staff gauge
West Creek	0+291				2			2	
	0+320	2	2						- Staff gauge
	0+340	2	2		2	1	1		
Water Discharge Pond									TBD
Constructed Wetlands									
- Pond A									TBD
- Pond B									TBD
- Pond C									TBD
- Pond D									TBD
- Pond E									TBD
Sediment Pond #1									TBD
Sediment Pond #2									TBD
Temporary Sediment Pond									TBD

Notes:
1) Survey pins installed at 100 m centres along 3-5 lengthwise lines (crest, toes, etc.) Quantities are total for each dam
2) TMA Dams feature mass array of VWP instruments installed in grids within the dam foundation. Installation of these instruments is currently on-going

In addition to the instrumentation described above, the TMA dams are equipped with an additional suite of vibrating wire piezometers (VWPs) to provide enhanced monitoring resolution during construction. A total of 524 VWPs were installed in the TMA dam foundations, arranged in a grid pattern, and managed with a remote wireless data acquisition and management system.

Instrumentation associated with the management of the dams is being managed through a software system that includes integration with data loggers and data storage and is configured

such that alarms for alert levels are defined and available. The software routinely generates reports and if trigger levels are exceeded sends out alarm notifications.

4.6.2 Other instrumentation

Additional instrumentation to support the OMS manual and management of water includes;

- Densometer on the tailings pipeline;
- Flow meters on the water management pipelines including from the Pinewood River, tailings reclaim lines, MPR line and freshwater line from the WMP and
- Pressure transducers in the WMP, Clark/Teeple Ponds.

This instrumentation provides continuous recording, which is collected during routine inspections and included.

4.7 Regulatory Requirements

Regulatory requirements, permits and authorizations are summarized in section 1.1. Key approvals include the Federal and Provincial Environmental Assessment conditions and commitments and permits including those issued pursuant to the LRIA and EPA. Additional legislation to be considered in implementing the OMS manual includes the MMER and various Ontario regulations including waste management.

No direct discharges are intended from any of the structures described in this section except the WMP which is described in sections 4 and 5. Seepage will be collected and pumped back from the WMP and TMA cells. Subsequent to this revision and LRIA approvals, additional details for the WDP, CW and sediment ponds discharges will be developed.

5.0 OPERATIONS

The overall operational objectives of the TMA and associated dams and facilities are to dispose and store the tailings and to manage all site water in a safe, economical and environmentally responsible manner. This section defines operating standards in accordance with design criteria and regulatory requirements specified in section 4.

5.1 Tailings transport and deposition

The RRM mill will be commissioning in fall 2017 with a design throughput of 22,000 tpd. As discussed in further detail in Section 4, final expected effluent quality results indicate that a high-quality effluent approaching ECA permit values can be achieved through a combination of in-plant cyanide destruction using the SO_2/Air process combined with natural aging in the TMA and the WMP.

5.1.1 Tailings Transport

Tailings will be pumped from the tailings pump box in the mill to the TMA and deposited as outlined in the tailings deposition plans (section 5.1.2) and Appendix D. The tailings and reclaim lines are HDPE pipe and are within lined containment and held in place with clay anchors. The lined containment drains to one of six emergency dump ponds located along the tailings corridor.

5.1.2 Tailings Deposition

The life of mine tailings deposition report (Document 3098004-004000-A1-ETR-0005) is being updated to reflect the operation of Cells 1 and 2. The deposition plan described here is based on the planned revisions. The tailings deposition plan involves discharging tailings from the crest of the dams to produce wide tailings beaches to enhance dam stability and inhibit seepage. In the non-winter months, spigotting will be carried out, with pipeline end-discharge in the winter once suitable beaches are present.

5.1.2.1 TMA Cell 1

Deposition will commence in the start-up cell (TMA Cell 1), which is planned for a total period of six months (October 1, 2017 to March 31, 2018 approx). During this period, supernatant water will be continuously pumped to the WMP. Table 5-1 provides an overview of the tailings deposition volumes and elevations. Tailings deposition for cell 1 is discussed in more detail in the LRIA application (RRP-GEO-LRIA-004C R1 Comments and Responses).

Table 5-1; Cell 1 Tailings Deposition

	Tailings		Water	
Time Elapsed	**Volume**	**Discharge Elev.**	**Volume**	**Pond Elev.**
(months)	**(m^3)**	**(m)**	**(m^3)**	**(m)**
<1	130,000	362.0	10,000	<362.0
1	580,000	366.0	200,000	365.0
6	3,300,000	371.4	200,000	369.9

Notes: Supernatant and water will be transferred to the WMP daily by pumping, recirculation to the processing plant via WMP intake pumps

Tailings pipelines will follow the TMA South Dam alignment and branch off to the TMA Start-up Cell Dam and West Dam. Spiggotting of tailings into the TMA Start-up Cell (TMA Cell 1) will occur from the TMA South, West, and Start-up Cell Dams, forming a beach upstream of these dams and a central pond that will be pumped into the WMP from the north end of the cell.

Spiggotting will initially occur into a borrow area not exceeding 362 m i.e., below the toe of the start up cell dams. The tailings discharge rate is 5,000 m^3/day to 9.000 m^3/day into the borrow, and will be measured by a flow meter on the tailings line reporting to the borrow. This initial volume of tailings will backfill Borrow Area B6 within the footprint of the start-up cell and will not exceed 130,000 m^3, and will remain below elevation 362.0m. The top of tailings surface will not contact any of the toes of the TMA dams forming the start-up cell until approval to operate the TMA / Start-up Cell has been granted by the MNRF.

For operation of the borrow, the normal operating pond volume is 10,000 m^3. The maximum operating water level is 361.9 m. If the MOWL is exceeded tailings discharge will cease and the pond drawn down by pumping to the WMP (e.g., 2 tractor pumps at a combined capacity of 40,000 m3/day). A staff gauge will be installed in the SW corner of the borrow (furthest from the tailings discharge), which will be monitored twice per 24h period (every 12h approx.). Within the borrow the volume of storage is 80,343 m^3, 104,276 m^3 and 164,005 m^3 at elevation 360.0, 361.0 and 362.0 respectively.

Upon regulatory approval for tailings deposition into Cell 1, tailings will be discharged from an elevation of 366.0 m. Areas where the ground elevation is higher than 366.0 m will not discharge tailings (i.e. the high ground around the dam abutments). By month 6 of deposition, the discharge elevation will be moved up to 371.4 m and spiggots will discharge from the south, west, and east sides of the cell. Provisions will be made, as required, to facilitate ongoing construction while discharging tailings.

Cell 1 will not discharge to the environment and there is no reclaim direct to the mill, for dam safety and emergency spillway to the north at elevation 370.5 has been constructed. The TMA start-up cell will have a normal operating water level (NOWL) of approximately 369.90 masl at the conclusion of six months of production, which corresponds to the operational pond volume of 200,000 m^3. Once the water level rises above the NOWL of 369.90 m, it will be pumped to the WMP at a rate of 57,000 m^3/day to contain the EDF event. Due to the limited storage in the TMA start-up cell at this point in mine operations, no operating range can be allowed (i.e., any water above the NOWL must be pumped immediately). During operation of Cell 2, cell 1 will passively overflow into Cell 2.

Figure 5-1; TMA Cell 1 Borrow Stage - Storage Relationship

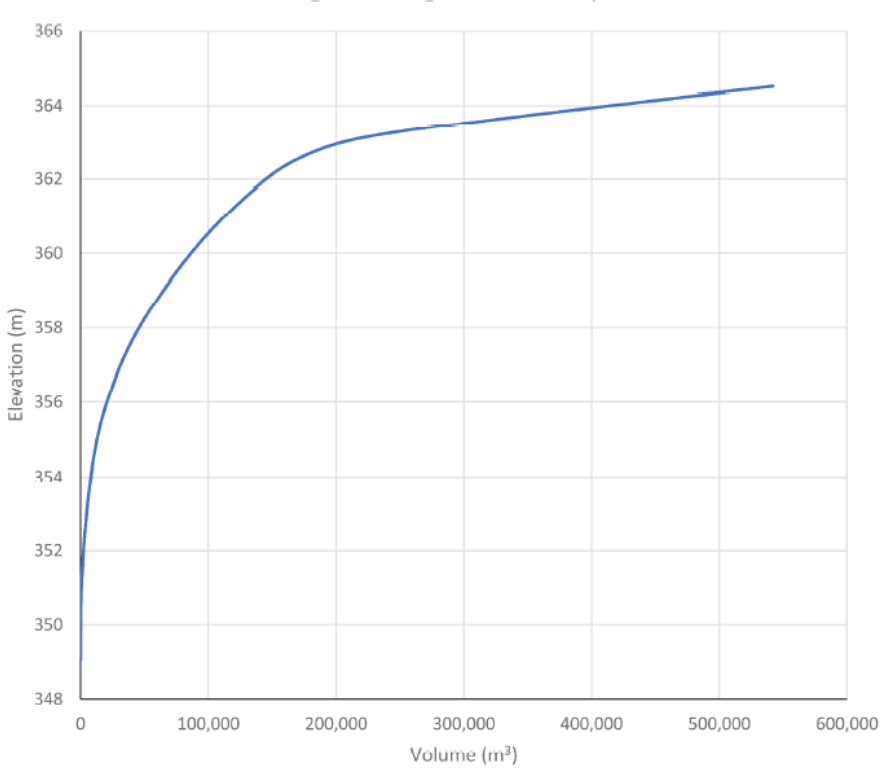
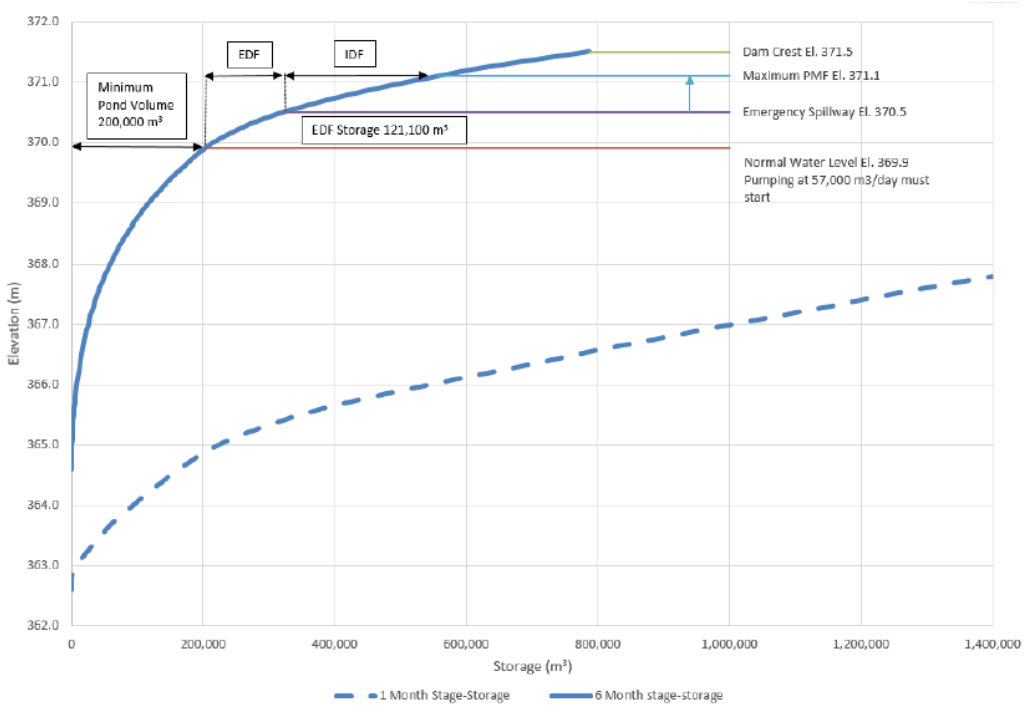


Figure 5-2; TMA Cell 1 Stage Storage Relationship



5.1.2.2 Future Tailings Deposition – Cell 2 and Cell 3

Cell 2 provides for 12 months (April 2018 to April 2019 approx.) of tailings deposition (5.5 Mm^3 of tailings) with a crest elevation of 366.5 m. 12months is the maximum permitted operating duration for cell 2. Following completion of this dam, and approval from MNRF, Cell 2 will operate as described here based on RRP-GEO-REP-026 R1, April 28, 2017 or as updated in the as-built report. A stage storage relationship is provided below.

- Tailings will be discharged from the northwest side of the dam (upstream slope) for 6 months. This will be followed by discharging from the downstream slope of the TMA Cell 1 Dam for an additional 6 months (or until the TMA South Dam is completed to elevation 366.5 m).
- Surplus water from TMA Cell 1 will overflow by gravity into TMA Cell 2 through the existing emergency spillway. A pond will form in the northwest end of TMA Cell 2 and be reclaimed to the mill via the reclaim line or transferred into the WMP.
- The MOWL of Cell 2 is 364.05 m providing 1 Mm3 of storage below the 19 m wide north dam spillway invert (364.7 m) to contain the 828,200 m3 EDF. This will be maintained at all times.

- The spillway will provide 0.39 m of freeboard from the maximum still pond IDF level (366.11 m) to the dam crest (366.5 m)
- Water reclaim to the mill from TMA cell 2 is to occur once water levels in the WMP are below 1.0 Mm^3. At minimum pumping will commence once Cell 2 pond volume increases to within approx. 800,000 m^3 of the MOWL and will continue until water levels are 1.2 Mm^3 below the MOWL.
- Pumping capacity of 40,000 m^3/day between TMA Cell 2 to Cell 3 and to the WMP will allow for management inflows to cell 2. As contingency, pumping will be considered from the WMP to TMA Cell 3 to reduce WMP volumes below 1.0 Mm3 prior to discharge from the WTP.

When full containment in the TMA is available (i.e. TMA South Dam is constructed to elevation 366.5 m), tailings will be discharged from the north side of the TMA South Dam (upstream slope) into an area referred to in this report as TMA Cell 3. Cell 3 will be constructed for completion in June 2018, at which time it will be used to manage excess water from cell 2 and the water impounded in the WMP (as described in this manual).

An overflow spillway is detailed for construction at the left abutment of the TMA Cell 2 Dam once the TMA South Dam is constructed to elevation 366.5. This overflow spillway (at 364.5) will provide a conduit to connect the TMA Cell 3 pond with the TMA Cell 2 pond and ultimately with the reclaim/transfer pumps. It's anticipated tailings deposition will occur for 6 months until this occurs.

Figure 5-3; TMA Cell 2 Stage Storage and Design Pond Levels

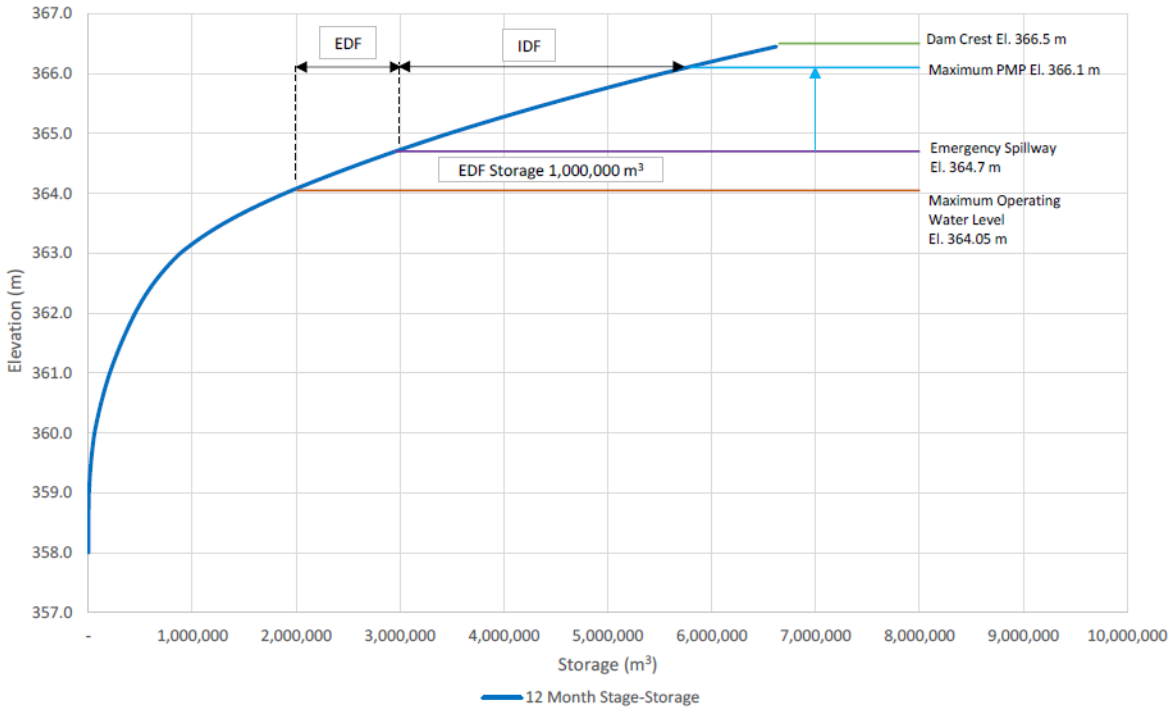
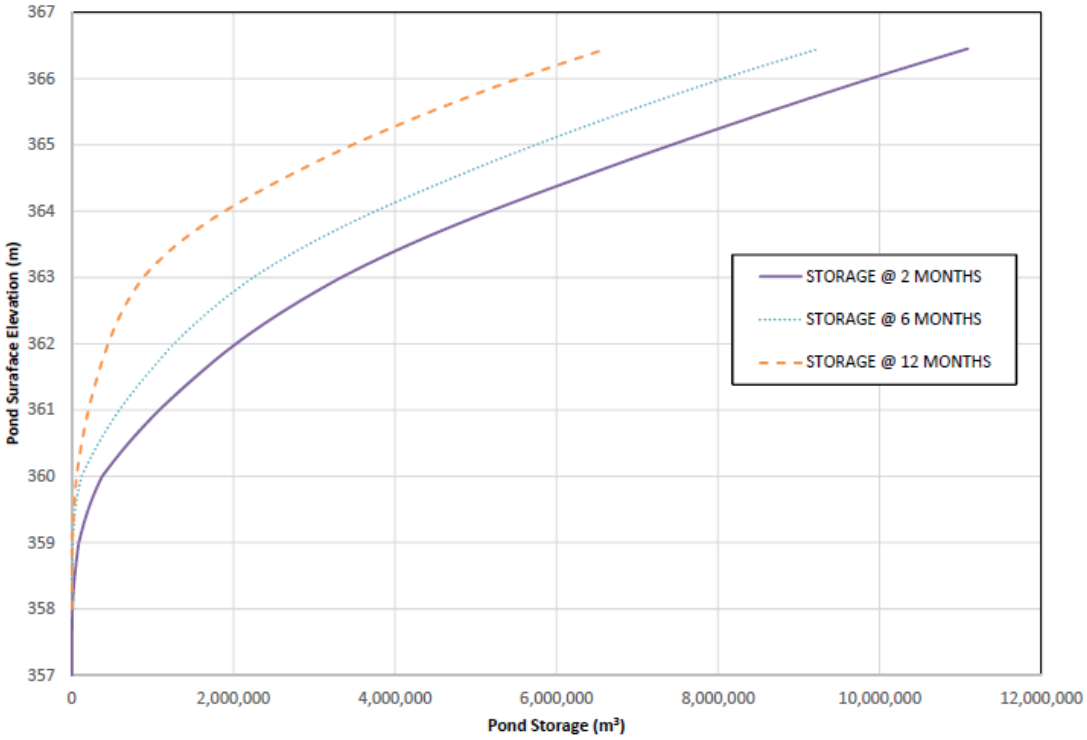

EDF
IDF
Dam Crest El. 366.5 m
Maximum PMP El. 366.1 m
Emergency Spillway
El. 364.7 m
EDF Storage 1,000,000 m³
Maximum Operating
Water Level
El. 364.05 m
Elevation (m)
Storage (m³)
12 Month Stage-Storage

Figure 5-4; Cell 2 TMA Pond Stage-Storage



5.1.3 Dam Raising

The dams will be raised to maintain discharge availability and sufficient pond storage capacity to contain the Environmental Design Flood (EDF).

5.2 Seepage Collection System

Seepage collection systems, as described in section 4, are in place and required for the WMP and TMA only. The design criteria of 1:25 yr 24h rainfall results in seepage systems (sumps, pumps and ditches) as described in section 4 (including MOWL) and summated here;

- Cell 1 seepage is not expected to exceed 29 m^3/day. Three sumps will be pumped back to Cell 1 with pumping capacity of 2,500, 1,000 and 1,500 m^3/day respectively. Sumps 1 and 2 pumping will cease once Loslo Creek is impounded by the TMA south dam (June 2018 approx);
- Cell 2 seepage is expected to not exceed 9.2 m^3/day and a sump of 8,000 m^3 will be pumped back to Cell 2 with pumping capacity of 1,600 m^3/day until Loslo Creek is impounded by the TMA south dam (June 2018 approx);
- Cell 3 seepage is intercepted and routed by ditch into the water discharge pond, and isn't expected to occur until June 2018 (approx.); and
- WMP includes 3 sumps, including a sump shared with the north starter dam and will be pumped back to the TMA, capacity of the sumps is 18,200, 11,800 and 20,000 m^3 for sumps 1, 2 and 3 respectively with pumping capacities of 4,000, 2,500 and 3,500 m^3/day respectively.

5.3 Process Water Management

The following detail design drawings will be referred to while reviewing the design details for the process water management: Additional design details for the process water dams and ponds are provided in section 4. A list of drawings are provided in Appendix A.

During the pre-production phase, process water management will involve filling the WMP and MRP, followed by pumping to the plant site during mill commissioning and start-up. The WMP will also supply the truck filling station, truck shop, truck wash facility, and fire water tank.

These processes are illustrated on the following Process Flow Diagrams:

- Water Reclaim Sheet No. 1 (100126-3200-DC00-PFD-0021.001); and
- Water Reclaim Sheet No. 2 (100126-3200-DC00-PFD-0021.001).

Additional details regarding pumping requirements, as well as pump and pipeline designs, are provided in Appendix B.

5.3.1 Water Management Pond

The WMP collects runoff from direct drainage area, pumping from the Pinewood River and receives transfer from TMA. Initially the WMP will be utilized to build an inventory of 3.8 Mm^3 of water required for mill start-up and process operations. The start-up inventory of water will be provided by pumping from the Pinewood River via the pinewood pipeline. However, additional water sources maybe utilised in filling the WMP including but not limited to:

- Pumping from Open Pit via a 6” pipeline;
- Pumping from Sump #4 (Open Pit) via 16” / 20” / 24” pipeline; and
- Direct drainage of natural runoff.

During late construction (starting April 27, 2017 from the Pinewood River), the WMP began filling and storing water prior to achieving the final dam crest elevation, as per approval from the MRNF. The start-up inventory of water will be primarily pumped from the Pinewood River, in addition to collecting natural runoff and dewater pumping from the Open Pit. Filling the WMP will occur in two stages:

- Intermediate stage: maximum water level 364.5 m providing 2.0 m of freeboard below the minimum dam crest elevation of 366.5 m
- Final stage: maximum operating water level 369.7 m

During the Intermediate Stage of filling the Interim Fill Plan (rev3 – March 2017) will be followed,

- all WMP dams were constructed to a minimum crest elevation of 366.5 m and width required to satisfy slope stability requirements. The maximum water level in the WMP shall not exceed 2.0 m below the lowest constructed dam crest elevation, i.e. 364.5 m.
- monitoring of water levels and instrumentation will occur daily, and water quality (TSS) will be sampled twice weekly, water quality will be sampled weekly and dam inspections will occur weekly
- Contingency will be maintained with an 8 inch pump ready to discharge to the approved location north of WMP Dam 4, and when water is above 364.0 a 12 inch pump will be mobilised

All the WMP dams were completed to their final crest elevation of 371.5 m in July 2017 and EOR confirmation of compliance was completed in on July 27, 2017. The requirements for the Final Stage of filling have been met and the maximum operating water level may be raised to 369.7 m, pending MNRF approval. Final filling of the WMP will be completed based on water takings from the Pinewood River and other approved water takings.

During the use of TMA Cell 1 and Cell 2, WMP filling will consider mill water needs the overall water balance and water quality discharge criteria based on the WMP water balance (Rainy River Project Development TMA Cell 2 and WMP Water Balance RRP-GEO-REP-026 R1).

- At the end of March 2018 WMP volume will be approx. 2.0 Mm^3, 50 % of which will be ice
- Water will be pumped during freshet (April – June 2018) from Cell 2 and the Pinewood River to increase the volume in the WMP
    - Pumping from the Pinewood is proposed if the total water volume in the WMP and TMA Cell 2 is below 4 Mm^3.
- The mill water use will maintain the WMP below the MOWL till June 2018 (approx.) and target a reduction of water levels to 1.0 Mm^3 stored volume i.e., dead storage
- After June 2018 (approx.) mill reclaim will switch to TMA cell 2 and excess water from Cell 2 will be pumped to Cell 3 (subject to TMA completion and regulatory approval) while the water treatment plant is constructed in the WMP adjacent to Dam 4.

Once the WTP is constructed and operational (prior to September 2018) the WMP will received treated (or blended untreated) supernatant from Cell 2 and subsequently the ultimate TMA. Operations will continue to meet MOECC requirements such that:

- Supernatant will be transferred from the TMA during June to August (or other times during the year to achieve overall water balance and water treatment objectives);
- Discharges effluent to environment: Preferentially bleed flow through constructed wetland with a 30-day retention time (design volume of 10,000 m^3/day) – estimated to commence in Spring 2019; and
- Decant to Pinewood River (through discharge pipeline);
- No discharge to occur between December 1 and the following spring melt (defined as a flow rate in the Pinewood River (upstream of Loslo Creek) of 10,000 m^3/day.

Bleed flow and decant to Pinewood River can only occur if there is sufficient flow in the Pinewood River to achieve a minimum mixing ratio of 1:1 with the two discharges combined. A pre-winter inventory of 2.8 Mm^3 will be targeted (to comply with environmental commitments to supply the bleed flow through constructed wetland in all climatic conditions). This is calculated from the sum of the outflows from the WMP between December and the following May;

- -0.04 Mm^3 seepage losses
- -0.10 Mm^3 evaporation losses
- -0.76 Mm^3 bleed to wetland
- -0.90 Mm^3 ice allowance

- 1.0 Mm^3 minimum inventory.

This volume is sufficient to maintain supply to the mill through dry winters and springs, up to the beginning of June, at which time the transfer from the TMA can replenish the WMP inventory. The mill make-up water demand is 22,605 m^3/day which will be supplied by the MRP and WMP. The make-up water will be preferentially taken from the MRP with the WMP supplying the difference. The Mill requires freshwater for reagent mixing at a rate of 1,729 m^3/day which will be supplied from the WMP.

Figure 5-5; Stage - Storage Curve for the WMP

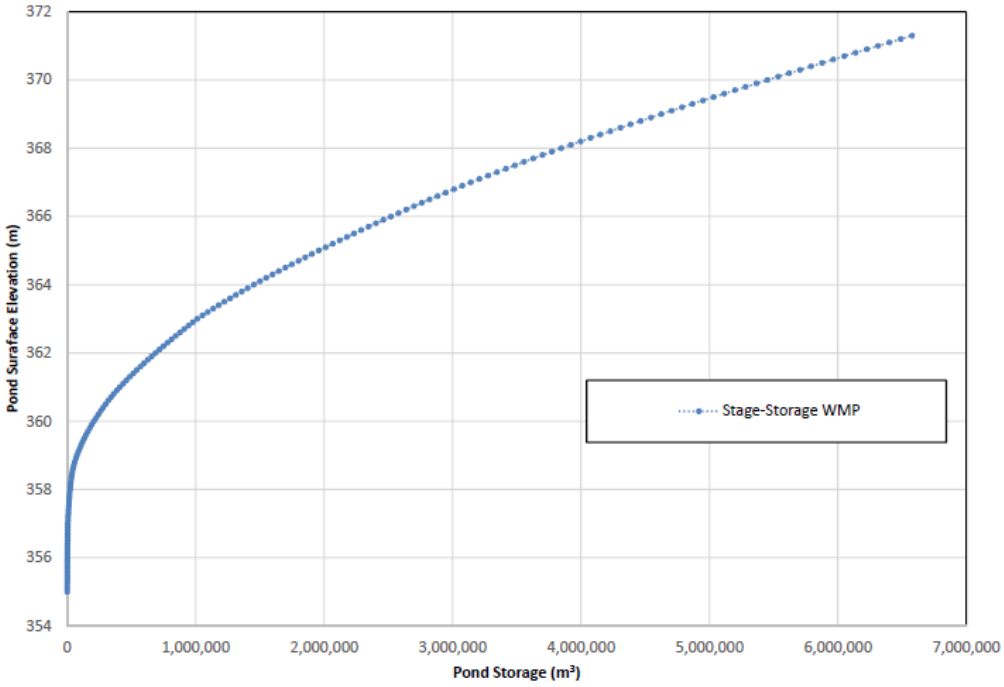


Table 5-2; Stage Storage Relationship For the WMP

Elevation (m)	Available Water Storage Volume (m^3)
355.00	0
355.50	169
356.00	1,016
356.50	2,384
357.00	4,803
357.50	11,417
358.00	21,533
358.50	38,013
359.00	75,235
359.50	132,541
360.00	207,591
360.50	299,155
361.00	409,425
361.50	541,181
362.00	687,276
362.50	845,119
363.00	1,012,352
363.50	1,223,489
364.00	1,452,674
364.50	1,698,321
365.00	1,958,559
365.50	2,233,087
366.00	2,520,422
366.50	2,821,561
367.00	3,142,089
367.50	3,486,292
368.00	3,846,892
368.50	4,229,229
369.00	4,625,413
369.50	5,033,241
370.00	5,451,690
370.50	5,879,025
371.00	6,314,382
371.30	6,579,245

5.3.1.1 Pinewood River Pump House

The Pinewood River pump house shall not exceed the maximum water intake of 20,000 litres/minute as per Permit to Take Water (PTTW) number 8776-9W2QN3 which expires November 30, 2018. Additional seasonal restrictions to the water taking as stipulated in PTTW number 8776-9W2QN3 include:

- March 1 through July 31: the water taking to an amount not more than 20% of the daily flow rate (as measured at the water intake location, and including allowance for site watershed capture) and that the calculated flow rate after pumping in the Pinewood River remains above 10,000 m^3/day;
- August 1 through November 30: the water taking is restricted to an amount not more than 15% of the daily flow rate (as measured at the water intake location, and including allowance for site watershed capture) and that the calculated flow rate after pumping in the Pinewood River remains above 5,000 m^3/day; and
- December 1 through February 28: no water taking in the Pinewood River shall occur.

This approval was amended till August 31, 2017 to allow for additional water takings;

- The total combined water taking (including all PTTW sources) from the Pinewood River can increase to not more than 30 % of the daily flow where 43,200 m3/day is the minimum flow threshold for this level of water taking
- The total combined water taking (including all PTTW sources) from the Pinewood River can increase to not more than 20 % of the daily flow where 10,000 m3/day is the minimum flow threshold for this level of water taking

The water taking for the day (24h period) is calculated based on a 24h period of flow in the previous 72h as measured consistent with the Pinewood hydrometric monitoring plan. This uses either the New Gold hydrometric station or the WSC hydrometric station at Hwy 617, consistent with MOECC approved plans. Monthly and annual reporting of takings is provided to MOECC.

5.3.2 Mine Rock Pond

The pond collects runoff and seepage from the East Mine Rock Stockpile (EMRS) and Low Grade Ore Stockpile (LGOS) and receives dewatering from the Open Pit and future underground mine.

Currently, the MRP Dam is not complete and the remnant Clark Creek drainage is required (by LRIA approvals) to be diverted through the construction diversion ditch to the remnant Clark Creek. Following completion of this dam, and approval from MNRF, the MRP will operate as described here based on RRP-GEO-REP-007 R1, September 15, 2016. A stage storage relationship is provided below.

- The MRP will be operated to minimize volume in the pond to reduce seepage and for increased dam safety, there is no seepage collection system for the MRP as it is the seepage collection system for the EMRS.
- The MOWL of the MRP is 356.8 m (525,000 m^3) and has been constructed with an 80 m spillway at an invert of 358.9 m (1.3 Mm^3) to store the EDF (775,000 m^3).
- The MRP will operated with a freeboard of 3.4 m to allow for the EDF (1:100 year 30 day event), a maximum wave height of 0.78 m with a required 0.31 of freeboard remaining.

Decanting from the pond is via fixed pumping station that supplies mill make-up water:

- 680 m^3/hr pump subject to pump availability and pond level controls, which is able to supply 59 % of the total mill make-up water demand;
- Supplies approximately 45 % of the mill make-up water annually; and
- Prior to the winter, the MRP will be drawn down to the minimum pond volume (5,000 m^3) to reduce ice losses.

If the MRP MOWL (356.8m) is exceeded, pumping into the MRP from the open pit / future underground mine will cease and pumps will pump water toward the plant site/WMP/TMA. The ECA approval requires that there will be no direct discharge from the pond to the environment.

Table 5-3; Mine Rock Pond Stage-Storage Relationship

Elevation (m)	Volume (m^3)	Notes
351.0	0.0	
352.0	3,104	
353.0	25,569	
354.0	82,650	
355.0	176,903	
356.0	332,548	
356.8	525,000	MOWL
357.0	579,383	
358.0	931,120	
358.9	1,300,000	Spillway elevation
359.0	1,382,836	
360.0	1,930,022	
360.2	2,048,496	Dam Crest
Source; RRP-GEO-REP-007 Sept 14, 2016		

5.4 Water Treatment

For this revision of the OMS the WDP and CW have yet to be constructed or approved for construction (LRIA and MMER Schedule 2), however information is included in this revision for completeness and will be updated prior to operation of the WMP/CW, or as specified in regulatory approvals. Ahead of any discharges this section will be updated and a contaminant release plan, consistent with MOECC requirements will be developed.

The TMA has been designed to optimize natural degradation processes to provide further water treatment, by ensuring there is sufficient retention time to allow these reactions to occur. The natural degradation processes are most effective during warm weather conditions when biophysical activity is optimal, and are also augmented by exposure to sunlight. Effluents that are planned for discharge to the environment will be held for a sufficient period of time under warm weather conditions, to maximize the effects of natural degradation. Such effluent aging will take place mainly in the summer months (June through mid-September) in both the TMA and WMP.

To optimize both water quality and river flow effects, final effluent is released to the Pinewood River at two separate locations:

- Through the constructed wetland to the Pinewood River at the Loslo Creek outflow (via lower Loslo Creek); and
- Directly to the Pinewood River just downstream of the McCallum Creek outflow, by pipeline.

The rationale for using two separate discharge locations derives from the need to achieve effective water quality treatment while minimizing adverse flow effects on the Pinewood River, under varying hydrologic operating conditions. The constructed wetland is located further

upstream on the Pinewood River pumphouse, and will help to maintain flow in the Pinewood River, however has a lower assimilative capacity. All effluent from the water management pond which is not discharged through the constructed wetland will be discharged by pipeline to the Pinewood River downstream of McCallum to take advantage of increased river assimilative capacity at this point, since wetland polishing would not be available for this portion of the discharged effluent.

The transfer of water from the TMA to the WMP (for discharge to the environment) will normally occur during the months of June through August. To facilitate this process, the water in the WMP would be drawn down by the end of May in each year. The release of WMP effluent to Pinewood River downstream of McCallum Creek outflow would occur during the spring and fall, to take advantage of extended aging in the TMA and WMP, and higher receiver assimilative capacity. Water which is not discharged from the WMP in the fall would be held over, without any further inputs from the TMA pond, until the following spring for release.

Effluent from the WMP will be discharged to the constructed wetland (as bleed flow) during all months of the year, except February and March, with more limited discharge in December and January. The bleed flow through the wetland represents the larger quantity of water that is discharged throughout the year (except in a very wet year). In low runoff years, virtually all final effluent discharge would be through the constructed wetland.

In conjunction with effluent aging and wetland treatment, final effluent quality is expected to be consistent with water quality discharge limits. Each discharge has specific discharge criteria as specified in MOECC ECA #5178-9TUPD9 which must be met prior to discharge.

5.4.1 Water Discharge Pond and Constructed Wetlands

The WDP collects runoff from natural ground catchment south of the TMA dam, seepage from the seepage collection ditch and the bleed flow from the WMP (maximum rate of 10,000 m^3/day) for discharge to the constructed wetland. The Water Discharge Pond (Drawing 3098004-004410-A1-D70-0002) will also provide erosion and sediment control south of the TMA dam.

The Constructed Wetlands are designed to provide a target of 30 days of retention time of 10,000 m3/day following discharge from the WMP into the WDP. The Constructed Wetlands are comprised of five ponds (Pond A, B, C, D, E). The downstream pond (Pond A), will contain a control structure to stop discharge to the environment in the event that water quality does not meet discharge criteria (in this case water from Pond A could be pumped back to the TMA or WMP).

5.4.2 Sediment Ponds 1 and 2

Sediment ponds are designed to provide a 12-day hydraulic retention time for all events up to and including the 25-year return period, 24-hour storm.

Sediment Pond #1 (Drawing 3098004-004430-A1-D70-0002)

- Collects runoff from the overburden stockpile;
- Will also receive additional inflow from overflow from West Creek Diversion during storm events large than the 25 year 24-hour storm event;
- The low flow outlet is designed to achieve the required retention time for the 25-year 24-hour storm event; and

- To prevent dam overtopping emergency spillway is designed for the 100-year storm event discharging to the West Creek Diversion Channel.

Sediment Pond #2 (Drawing 3098004-004440-A1-D70-0002)

- Collects runoff from the west mine rock pile (Non-Potentially Acid Generating [NPAG]) and is closer to the Pinewood River;
- The low flow outlet is designed to achieve the required retention time for the 25-year 24-hour storm event; and
- To prevent dam overtopping the high flow spillway is designed for the Regional Storm Event (Timmins storm event), discharging directly to the Pinewood River.

5.5 Freshwater Diversions

The freshwater diversion structures (dams and diversion channels) are designed to be operated passively. Clark and Teeple Ponds are full and the diversions are flowing naturally. Stockpile pond is currently filling and will flow through the stockpile diversion once the water level is above the invert to the diversion. West Creek is being allowed to slowly fill, however a terminal plug remains in place and pumps are being used to dewater the diversion.

In summer/fall 2017, the plug will be removed and the plug area will stabilise prior to water flowing through location of the former plug.

Culverts at Georgeson Lane and Marr Creek are below the design specification of the West Creek Diversion below the hydraulic control. Pending Schedule 2 approval (anticipated January 2018) these two culverts will be removed prior to freshet 2018 and the channel stabilised consistent with the design outlined in section 4.

5.6 Progressive Reclamation and Closure

Some progressive reclamation with respect to the TMA is proposed as part of mine operations. By the end of the operations phase a low permeability overburden cover of approximately 150 m in width will be placed on the upstream side of the TMA dam. The overburden cover will cover approximately two thirds of the ultimate perimeter, with the remaining approximately one third of the length to be reclaimed at closure. This cover is intended to prevent the tailings permanent water cover from coming into contact with the TMA dams, and will also serve a secondary function of limiting oxygen diffusion into the uppermost portion of the tailings underneath. The overburden cover will be seeded or hydroseeded with a native seed mix or equivalent, and will be armoured with NPAG rock at the transition zone of the cover with the tailings to prevent suspension and oxidation of solids.

Closure of the RRM in respect to tailings, process water and freshwater management will include but is not limited to the following:

- Flooding of the TMA with a 2 m or deeper water cover;
- A perimeter zone of tailings beach will be maintained to keep the central pond away from the dams, this zone will be covered with a low permeability cover;
- NPAG rock will be placed at the TMA transition zone with the tailings to prevent erosion and suspension and oxidation of solids;
- Dam structures containing the TMA have been designed with adequate safety factors to provide overall long term safety and stability;

- The water management pond dams will be breached to prevent retention of water; upstream dam faces that become exposed will be revegetated;
- The water discharge pond dam will be breached once it no longer has a water management function;
- The constructed wetland will be left in place as this system is designed to operate passively, and will have stabilized as a wetland complex during operations;
- At closure the MRP will collect runoff and seepage from the EMRS which will then be directed to the Open Pit to help flooding;
- Clark Creek Pond, West Creek Pond, Teeple Pond, Stockpile Pond, West Creek Diversion Channel, Clark Creek Diversion Channel, Teeple Pond Diversion Channel and Stockpile Pond Diversion Channel support the creation of fish habitat for compensation purposes as such they will remain in place at closure; and
- Sediment Ponds #1 and #2 will be maintained until such time as the site (or if applicable individual site components) become a recognized closed mine such that monitoring associated with the Metal Mining Effluent Regulation is no longer required, at such a time, pond impoundment structures will be breached and the residual pond sites will be stabilized and restored.

5.7 Safety and Security

The site safety and security will be following the RRM Health and Safety Management System including but not limited to the following:

- The site will be gated with restricted access to authorized personnel only;
- The TMA will be fenced along portions of the old highway 600 and access will be restricted to authorized personnel only;
- No public access;
- Construction Management provided security measures; and
- Onsite health and safety policies for working around bodies of water, working alone or crossing ice.

5.8 Environmental Protection

The Environmental Department has oversight over the EMS which contains tailings operations related environmental aspects including:

- Fugitive and point source dust emissions;
- Hydrocarbon Spills and Leaks;
- Pipeline Rupture and Leaks;
- Surface and ground water quantity and quality; and
- Wildlife management (including species at risk).

An environmental aspect register is a comprehensive inventory of tailings operations activities, environment aspects, assessment of risk and identification of controls. Tailings personnel have responsibility to implement and maintain the controls including monitoring and inspection. Refer

to the Environment Department for the environmental aspect register (in prep) and environmental related procedures.

As outlined in orientation training, it is every RRM employee's responsibility to report a suspected spill or uncontrolled release event to their supervisor. This includes suspicious flows of water out of the area, escaping tailings, etc. The sooner appropriate persons can begin to correct a situation, the less likely it is that severe impacts will follow.

Table 5-3 provides a summary of the MOECC effluent discharge limits that must be met to discharge from the WMP.

Table 5-4; MOECC Effluent Discharge Limits from the WMP

Constructed Wetland Final Discharge and Water Management Pond Pipeline Discharge (to the Pinewood River) as stated in MOECC ECA 5178-9TUPD9		
Effluent Parameter	**Daily Maximum Concentration (mg/l)**	**Monthly Average (mg/l)**
Cadmium	-	0.0010
Cobalt	-	0.0044
CBOD5	-	25.0
E.coli	-	100/100ml geometric mean density
Total Suspended Solids	30	15
Total Phosphorus	-	0.10
Cyanide (total)	0.1	0.05
Cyanide (free)	0.02	0.01
Total Arsenic	0.034	0.017
Total Copper*	0.028	0.014
Total Nickel	0.094	0.047
Total Lead*	0.030	0.015
Total Zinc*	0.348	0.174
Un-ionized Ammonia	0.08	0.04
Acute Toxicity (Rainbow Trout and Daphnia Magna)	Non-acutely lethal (not greater than 50% mortality in undiluted effluent)	
pH of the effluent maintained between 6.0 to 9.5, inclusive, at all times		

Notes:

1. *Proposed effluent criteria for Total Copper, Total Lead, and Total Zinc are based on a hardness of 200 mg/L CaCO3. In the event that water quality sampling indicates that 75th percentile hardness concentrations are less than 200 mg/L CaCO3, the effluent limits may be changed by the District Manager in writing, consistent with achieving no impairment for receiving waters.
2. Additional effluent limits for sediments 1&2 are stated in MOECC ECA 5178-9TUPD9
3. The effluent discharge rate from the Constructed Wetland Final Discharge and the Water Management Pond Pipeline Discharge such that at all times the ratio of the combined flow rate of these effluents to the flow rate of the receiving surface water (Pinewood River) is less than or equal to 1:1 (i.e. the cumulative flow rate of the effluent must be less than or equal to the flow rate of the receiving surface water).
4. Prior to commencing Operations Phase discharges (Constructed Wetland Final Discharge, Water Management Pond Pipeline Discharge, Sediment Pond #1, and Sediment Pond #2), the method for determining daily effluent to receiver flow mixing ratios shall be approved by the District Manager.
5. For sampling frequencies and full parameter list refer to MOECC ECA 5178-9TUPD9; sampling frequency varies from thrice weekly to quarterly depending on the parameter

5.9 Reporting Requirements

An Operations Report will be prepared by the Mill Manager or designate. The report will include metrics and information collected as part of normal operation. Examples of information contained in the Operations report include:

- Total monthly tailings deposition tonnage and slurry water volume;
- Total monthly reclaim volume;
- Pond level and freeboard;
- Updated water balance;
- Water quality results; and
- Intake / Discharge quantities.

Each of the regulatory approval requirements related to the construction, operation and eventual reclamation of the Site have specific compliance reporting requirements with defined deadlines or reporting periodicity. In general, the reporting includes:

- Operation, Maintenance and Surveillance Plan(s) for dams, water management (water quality) and air/noise emissions;
- Emergency Preparedness Plan(s);
- As-Built Drawings and related Construction Reports;
- Dam Safety Inspection and Review Reports
- Environmental Monitoring Plans; and
- Environmental Monitoring and Performance Reports.

The environmental approvals and permits received from the government that are maintained by the New Gold Environmental Department should be referred to for details of monitoring, inspection and reporting requirements.

In addition, the New Gold Environmental Department should be notified of any proposed major modification to RRM facilities, in order that they can liaise with the appropriate government ministries to determine if additional approvals or amendments to existing approvals are required.

6.0 MAINTENANCE

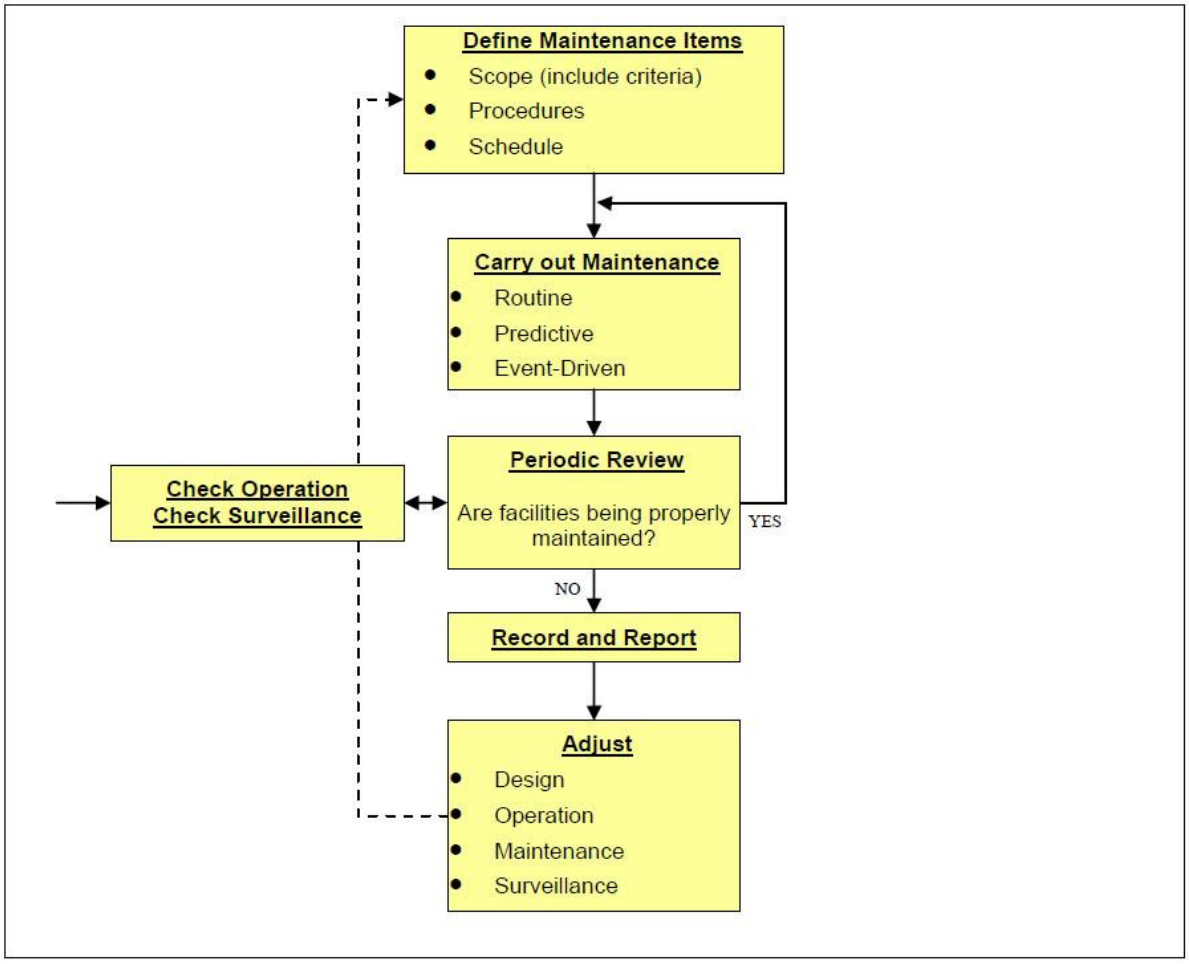
The following periodic maintenance is required:

1. Maintain the tailings and reclaim pumps and associated lines and containment;
2. Clear debris, snow and ice which may block flow from through the decant facility or emergency spillways;
3. Maintain water management structures including spillways, ditches and diversions;
4. Maintain equipment, power and water lines, and instrumentation;
5. Repair any deficiencies as noted in the Dam Safety Inspections (DSI); and
6. Reconstruct the support for tailings discharge pipelines wherever washouts occur.

Maintenance records are retained by maintenance personnel performing the work in accordance with the procedures described in this document. Timing of maintenance actions for unusual conditions should be based on specific recommendations from surveillance findings. Scope and time frames for routine maintenance activities are determined and scheduled by the Maintenance Department and based on manufacturer's recommendations and best practices.

The maintenance flowchart is illustrated in Figure 6-1.

Figure 6-1; Maintenance Flow Chart



6.1 Routine and Predictive Maintenance

Routine and predictive maintenance includes removal of vegetation, beaver dams, ice blockage or sediment accumulation that would otherwise affect the performance of a structure when required.

6.1.1 Dams

The following are examples of specific maintenance activities:

- Regularly check diversion ditches, spillways and culverts for accumulation of debris or sediment, or any other form of blockage including ice, and remove if required;
- Visually inspect diversions, spillways, seepage collection sumps, dams and all ditches for cracking, bulging, slumping, and any other indications of slope movement (note, any indications of slope movement shall be reported to a qualified geotechnical engineer);

- Re-grade the dam crest, as required, to prevent local ponding and direct surface runoff towards the pond;
- Repair erosion gullies, local slumps or slides in the dam face, diversion ditches or spillway channels; and
- Regularly check diversion ditches for accumulation of debris or sediment, or any other forms of blockage, and remove if required.
- If annual survey determines necessary, correct dam crest, overflow spill way and diversion channel invert irregularities to avoid concentrated runoff.

6.1.2 Ditches and spillways

Ditch maintenance includes replacement or enhancement of erosion protection to prevent sediment generation or sloughing of slopes, as required.

6.1.3 Diversions

There are approximately 10 km of diversions associated with the Clark and West Creek diversion. Maintenance activities required include;

- Repair erosion and bank stability particularly in areas of concentrated flow e.g., culverts;
- Remove debris, and where required and approved beaver dams, that aren't part of natural progression of channel development
- Repair/modify fish habitat features if monitoring determines they are not meeting the success criteria per Fisheries Act Authorization 15-HCAA-00039, including dam crest/slope

Specifically, for the Clark Creek diversion, as per the as built report, the following maintenance will be conducted;

- Repair riffles in the Teeple Road Diversion, directly downstream of the inlet in fall 2017.

6.1.4 Geotechnical and Water Monitoring Instrumentation

Instrumentation is calibrated by the manufacturer prior to shipment. Calibration certificates will be maintained by maintenance department. Following instrument installation, initial reading procedures will be followed. Subsequent calibration will follow manufacturers recommendations.

Malfunctioning or damaged instruments may require repair or replacement per manufacturer guidelines or approved procedure. In the event of replacement of dam instrumentation, several overlapping readings of the old and new instrument are required to ensure continuity of the data records.

6.1.5 Pumping Systems and Pipelines

Maintenance of the tailing delivery, water recirculation systems and seepage pumps will include:

- Perform regular performance tests of the Pinewood Pumphouse pumps and inspections of pump fish screens to remove any debris;
- Perform regular performance tests on seepage pond pumps
- Perform annual calibration and maintenance as required on flow meters;

- Perform regular non-destructive testing appropriate for components of the tailings delivery system, including for example, periodic measurement of pipeline thickness to identify areas of wear and to schedule pipeline replacement if necessary and repair liners as required;
- Replace pipe work, bends and fitting components as required;
- Remove accumulated debris from valves, reducers and off takes;
- Carry out maintenance as recommended by fitting and valve suppliers;
- Regularly inspect major wear components;
- Maintain emergency dump ponds in a dewatered/empty state; and
- Maintain and replace system instrumentation as required.

6.1.6 Mobile Equipment

Mobile equipment is maintained on the basis of a planned reliability program and as otherwise required. Equipment in question includes:

- Dozers;
- Excavators;
- Water truck;
- Pickup trucks;
- Mobile crane;
- Flatbed and picker truck; and
- Replacement of mobile equipment as required.

6.2 Event-Driven Maintenance

In the event of unusual conditions or incidents that require immediate maintenance actions but are not considered an emergency, repairs and replacement of facility components are made as required and activities are documented. RRM staff will provide a means to assess event driven maintenance needs through response action planning. Response planning is based on risk prioritization, maintenance crew mobilization or “call out” procedures, required repairs and replacement material availability. Event driven maintenance actions will follow applicable safety and performance procedures. Normal documentation and maintenance records will be maintained as a result of any event driven maintenance actions. Unusual conditions that require maintenance are also communicated to maintenance staff as they occur.

6.2.1 Pipeline Leaks or Breaks

In the event of a pipeline leak or break the system in question is de-energized and repaired as follows:

- Inspect entire pipeline;
- Repair or replace affected components;
- Perform opportune and scheduled maintenance;
- Repair any collateral damage caused by a leak or break;

- Collect any released tailings and place in the tailings impoundment;
- Reclaim any disturbed areas; and
- Follow any spill reporting that may be required pending type of spill and following documentation procedures.

6.2.2 Earthquake Occurrence

Following an earthquake, the following are undertaken:

- Inspect dam and beach areas for sign of distress due to deformation;
- Inspect dam for signs of liquefaction (e.g., local sand boils, etc.);
- Measure freeboard for compliance with design requirements;
- Inspect toe area of dam for signs of deformation or piping of fines;
- Inspect diversions, ditches and spillways for sign of slumping or changes in geometry;
- Inspect seepage collection areas; and
- Collect instrumentation data and submit to EOR for analysis.

6.2.3 Flood Event

Following extreme storms (as defined in section 7) the following are undertaken:

- Measure freeboard for compliance with design requirements;
- Inspect dam, diversions, ditches, spillways and diversions for signs of excessive erosion and repair if required;
- Inspect seepage return system for adequacy; and
- Implement appropriate response based on observations/measurements as defined in this manual.

6.3 Reporting Requirements

Maintenance information will be communicated internally through formal and informal meetings, interaction between various levels of the organization (department and/or crew meetings), through information posted at the site and through this OMS Manual.

Communications with applicable contractors involved in tailings management will be conducted daily and weekly during tailings activity meetings, as appropriate. All employees and contractors are encouraged to communicate openly with site management about operational conditions requiring maintenance and reporting any significant observations such as event-driven maintenance or any maintenance requirements that exceed expected norms.

Equipment logs and manuals will be maintained for reference and use by responsible staff.

Maintenance diaries and logs shall be maintained and accessible for review by other parties.

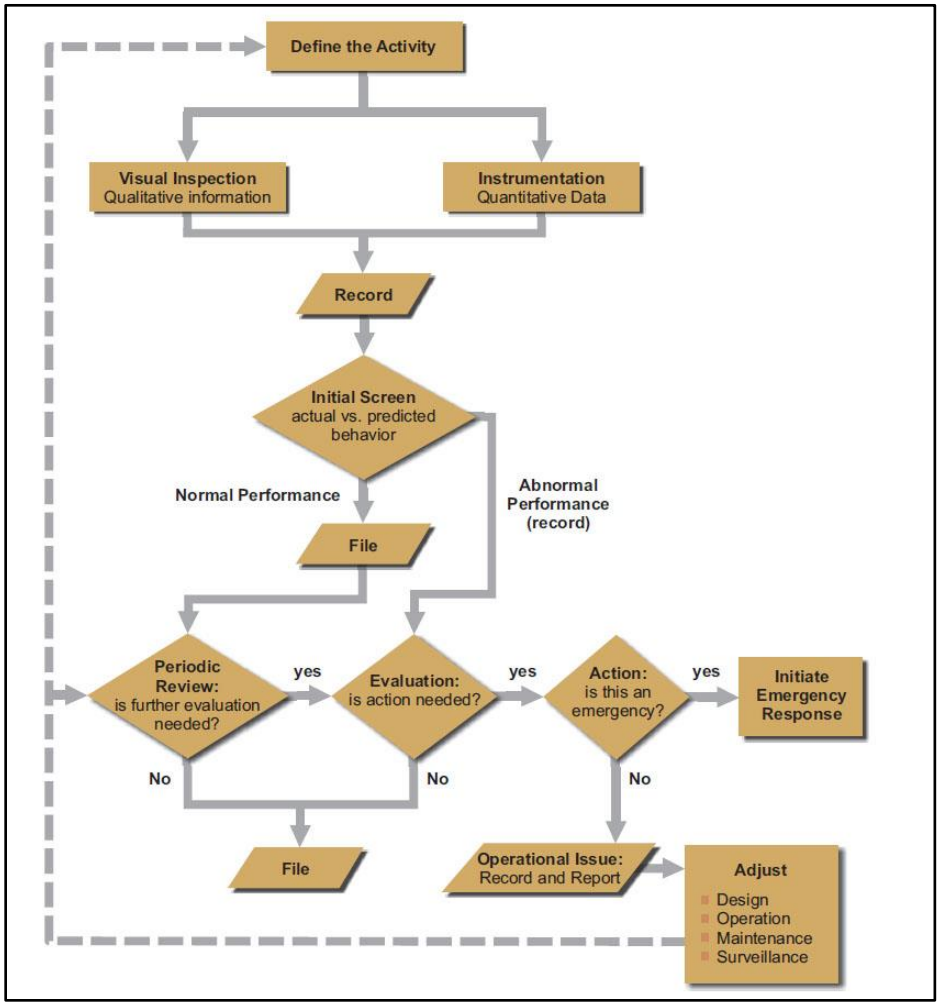
7.0 DAM SAFETY AND SURVEILLANCE

The RRM tailings and water management surveillance activities involve inspection and monitoring of the operation, structural integrity and safety of a facility. Regular review of surveillance information can provide an early indication of performance trends that, although within specifications, warrant further evaluation or action. The objectives of our surveillance program are as follows:

- Monitoring the operation, safety and environmental performance of tailings and water management facilities;
- Promptly identifying and evaluating deviations from expected behavior that affect operational safety, structural integrity and environmental performance of the facility; and
- Reporting significant observations for response.

The flow chat for surveillance is shown in Figure 7-1. Surveillance is undertaken in two primary methods – visual inspection and reading of instruments. Results of these qualitative and quantitative observations are compared to the expected performance of the TMA and water management facilities. If observations are within the expected range or performance, the results of the surveillance are simply recorded. If observations are outside the expected range, further evaluation is completed to determine if remedial action is necessary. If necessary, this action is taken and may range from a minor adjustment to operational procedures to initiation of emergency response, depending on the severity and nature of the deviation from expected performance.

Figure 7-1; Surveillance Flow Chart



7.1 Surveillance and Inspections by Mine, Mill and Environment Operations Staff

The purpose of the surveillance program is to identify and classify problems and/or unsafe conditions that are visually evident. Visual inspections are an integral part of proper maintenance and performance of monitoring programs for the TMA and water management facilities. Failure to correct identified maintenance and repair items, or potential adverse behaviour, could result in unsafe conditions or lead to a failure of operating systems or cause an adverse environmental effect.

The surveillance program will consist of making regular observations relating to:

- The conditions and performance of the dams including indications of cracking, bulging, depressions, sinkholes, vegetation, surface erosion and seepage;
- Water levels and pump intake zones;
- Function of ancillary hydraulic structures (diversions, spillways, pipelines etc.);
- Discharge pipeline operations and tailings beach development; and

- Total facility performance.

During inspections, observations will be made at the upstream slope, crest and downstream slope with respect to signs of erosion, scouring, cracking, settlement, deformation, and any instability and abnormality. Seepage rates will be visually estimated and recorded on the inspection forms. Changes in the seepage rate or clarity (i.e., turbidity) require immediate reporting to the Engineer-of-Record.

7.1.1 Daily Inspections

During first filling of all dams except the TMA dams Surveillance records will be maintained in logs at site and submitted to the EOR for review daily and on a monthly basis thereafter, or more frequently as warranted. Any abnormal behaviour including slope slumping, erosion of crest settlement will be reported immediately to the Engineer-of-Record.

Routine daily visual inspections of critical dams (TMA, WMP and MRP), spillways, pipelines, pipeline containment and pumping infrastructure will be carried out on an on-going basis to confirm normal operations and identify unusual or anomalous conditions such as pipeline leaks, pump intake blockages, etc. All active pipelines will be inspected twice per 12 h shift, consistent with EA conditions.

Daily inspection sheets and provided in Appendix F.

7.1.2 Weekly Inspections

Physical inspections of the TMA, process water, water treatment and diversion dams will be conducted on a weekly basis. The weekly inspections will include those discussed in Section 7.1.1 and the following tasks:

- Photographic record of key features;
- Physical inspection of dams, dykes, diversion, ditches and spillways:
    - Indicating and reporting any seepage and erosion.
- Pond levels and freeboard:
    - Additional monitoring maybe required during spring freshet of the dams.

Weekly inspection sheets and SOPs are provided in Appendix F. All weekly inspections will be documented in a report and will be compiled as part of the annual DSI (Section 7.4).

7.1.3 Other Inspections

7.1.3.1 Diversions

The Clark and West Creek diversions, while designed to operate passively, have specific surveillance requirements as part of the approved Fisheries Act authorizations. Further, impediments to water flow in diversions have the potential to alter water levels in the ponds. For the diversions, in addition to requirements specified above, and following the as built report for the Clark Creek Diversion these surveillance requirements will be conducted;

- Inspection of fish habitat features, as per Fisheries Act Authorization 15-HCAA-00039;
- Complete a survey of the Clark and Teeple dam crests and diversion channel inverts annually, observations of crest irregularity will require correction to avoid concentrated runoff in the overflow spillway;

- Monitoring pond levels include Teeple and Stockpile ponds (by staff gauge, transducer or other suitable means) daily. The frequency will be re-evaluated after one year of operation (May 2018).

7.1.3.2 Water Treatment

The water treatment facilities, WDP, CW and sediment ponds 1 and 2 will be inspected consistent with LRIA approvals (pending) and the MOECC ECA approval. This section will be updated in future revisions, to describe surveillance requirements in addition to those outlined above which may include;

- Discharge pipeline and mixing structure;
- Up to thrice weekly water quality sampling from discharge points; and
- Inspections to confirm the absence of oil/sheen.

7.2 Inspection Required After an Unusual Event

Several potential failure modes exist for the various tailings and water management and water diversion storage facilities. These potential failure modes, along with likely triggers, observable visual and instrumentation indicators of the failure mode are presented in Table 9-1. Special inspections will be carried out immediately if any of the following events occur:

- Events such as an earthquake, large rainfall (greater than 1:2 year rainfall (51mm)) or large snowfall/snowpack;
- Operating events such as rupture of a pipeline, particularly if on the slope or crest of the dam, sudden loss of pond water, sudden rapid rise of pond water;
- Observations such as cracks, excessive settlements, sinkholes, large slope or foundation deformations, increased seepage, turbidity of seepage water; and
- Instrument readings that deviate from historical trends, or are within “alert” action levels (e.g., trigger levels).

Special inspections after unusual events are necessary as summarized in Tables 7-1 to evaluate whether there has been any damage requiring correction, any safety measures or special operating procedures that need to be implemented, or if there is a need to initiate emergency procedures as described in Section 9.0.

Table 7-1; Maintenance Requirements following an Unusual Event

Unusual Event	Post – Event Inspection/Surveillance
Earthquakes	Carry out a detailed walkover of all dam structures, including crests, downstream and upstream (visible) slopes and dam toes, and all spillways, looking for signs of cracks, bulging, settlement and/or other deformations. Look for and note any changes in seepage, particularly with respect to the rate of seepage flows at dam slopes and seepage clarity. Read all piezometers. Inspect downstream toes of dams for sand boils and dam slopes for sinkholes. Inspect ponds upstream of the dams looking for 'whirlpools'. Inspect all pump stations and pipelines. Discuss findings with the Dam Safety Inspector.
Rapid snowmelt and/or heavy rainstorms exceeding a 1:2 year rainfall (51 mm)	Inspect the (visible) slopes and the crests of all the tailings dams looking for areas of concentrated runoff and erosion. Make note of saturated ground/soft ground conditions at dam slopes and toes. Examine dam slopes for indications of localized slumping/instability. Inspect all pump stations and pipelines. Check the water levels in all ponds/reservoirs against the critical levels, and keep checking these levels until the pond/reservoir inflows subside. Discuss findings with the Dam Safety Inspector. Check piezometric levels at dam sites if instructed to do so.
Unusually high winds (exceeding 60 kph i.e., 75 % of maximum likely used in design)	Check the condition of erosion protection on the upstream slopes of the dams.
Extreme snow pack (170cm cumulative snowfall) (i.e., 120% or greater than normal snowfall at Barwick)	Check the water levels in all ponds/reservoirs against the critical levels, and keep checking these levels until the spring freshet is over. Evaluate the situation in terms of possible snowmelt scenarios. Make predictions as to the expected storage capacity available in ponds/reservoirs. If deemed necessary, mobilize pumping and mobile treatment equipment to site.
Significant, relatively rapid erosion (any cause) of dam slope of 'sudden' seepage break at dam slope or downstream of dam in form of continuous seepage or boils	Inspect clarity of seepage, rate of seepage and amount of material sloughed. Notify tailings coordinator – site engineering and EOR. Consider initiating Emergency Response Plan
Pond level close to, or approaching a critical level	Notify Manager. Consider initiating Emergency Response Plan
Significant change in an instrumentation reading – see table below for definition of significant change	Check the historical readings paying special attention to seasonal changes and check the measurement again. Carry out visual inspection of all areas in the vicinity of the instrument of interest. Contact the Engineer of Record.

7.3 Dam Instrumentation and Monitoring

The instrumentation data is reviewed regularly to identify anomalous readings that could indicate a change in the conditions of the tailings and water management facilities. Dam instrumentation lists are provided in section 4.6. Instrumentation reading and reporting frequencies are outlined in Table 7.2. Responsible parties' record notes and takes pictures of any potential anomalies to provide further information to the EOR. Instrument trigger and alert levels are provided in Table

7.3. Additional details on instrument reading frequencies can be found in the *Geotechnical Monitoring Plan* (Amec Foster Wheeler, 2016b).

Piezometers:

- Vibrating Wire Piezometers shall have a reading frequency every hour and recorded by a data logger, with data collected daily during construction. Post-construction after the readings have stabilized, the reading frequency will be reduced to every 12 hours, as defined in the table below;
- Standpipe piezometers shall be measured weekly during construction and monthly following construction;
- The following are considered anomalous:
    - Sudden increases or decreases that do not correlate with seasonal variations (e.g., groundwater recharge during snowmelt affecting foundation piezometers);
    - Trend of piezometric increase that approaches or exceeds the rate of rise of the tailings pond; and
    - Pattern of sudden and large increases followed by rapid declines.

Inclinometers:

- Inclinometers shall be monitored semi-weekly during construction and monthly following construction;
- Anomalous data includes:
    - Sudden increases in cumulative displacement/rate of movement of the inclinometers;
    - Zones of concentrated or discrete displacement; and
    - Blockages of the inclinometer casing.

Settlement Plates and Survey Pins/Monuments:

- Settlement Plates and Survey Pins/Monuments shall have a reading frequency of semi-weekly during construction and monthly following construction;
- Anomalous data includes:
    - Sudden displacements of the settlement monuments (x, y, z directions); and
    - Accelerating displacement trends (over two or more readings).

If anomalous readings are observed, the following actions should be taken:

- Check data, reductions and calculations for accuracy and correctness;
- If no errors are found in the calculations, notify the EOR, Geotechnical Engineer and Environmental Manager that an anomalous reading has been observed and that further assessment is going to be conducted;
- Check readout equipment to verify that it is functioning correctly; verify calibration;
- Re-read all instrumentation of the type for which the anomalous reading was observed, in order to check the reading and reading in adjacent instruments;

- If it is observed that an instrument or piece of readout equipment has stopped functioning, notify the Mill Manager and/or Superintendent, and the EOR immediately. If considered critical, a replacement instrument should be installed;
- If the anomalous reading is confirmed, notify the Superintendent and EOR immediately; and
- A detailed review of the effects of the reading should be carried out and the monitoring frequency of the instruments in the area of the anomaly increased to assess the progression of the anomaly. Design or remedial actions should be implemented if determined necessary.

All results are downloaded and provided to the EOR. Any anomalies are noted and a request for an additional reading may occur. The EOR will review the data in quarterly monitoring reports, and make any recommendations, such as increased reading frequencies, pertaining to anomalous readings. The EOR, will also assess the trigger and alert levels and update them as necessary, once per year, as part of the DSI.

Table 7-2; Dam Instrumentation Surveillance Requirements

Type	Frequency
Routine Inspection:	
Dam	Weekly
Diversions	Weekly
Ditches	Weekly
Seepage collection system	Weekly
Spillways	Weekly
Pipelines	Twice per 12 h shift – per EA commitments
Tailings Pond Monitoring:	Weekly
Pump intake	Weekly
Staff gauges	Weekly (initially every ~12h) in Cell 1 borrow
Inflows, Outflows, Condition	Monthly
Dam Instrumentation:	Monthly
TMA, WMP and MRP Comprehensive (and water diversions during initial filling)	• Daily during construction and initial filling • Weekly, during initial operations depending on trend • Monthly during routine operation
Annual Dam Inspection	Annually, with no snow cover
Event Driven Inspection	Following unusual events (defined in table 7.1)
Comprehensive Review (DSR):	
Low and Moderate HPC dams	Every 10 years and prior to decommissioning
Very High HPC dams	Every 5 years and prior to decommissioning

Notes:

1. Dam Hazard Potential Classification (HPC) requires review when changes are made or downstream conditions change.
2. Monthly facility inspections should be carried out by the same staff or small group of staff such that subtle changes in the conditions can be detected.

Table 7-3; Instrument Trigger and Alert Levels

Instrument	Parameter	Trigger Level	Alert Level	Remarks
VWP/STP	Pore Pressure Ratio	r_u = 0.4	r_u = 0.5	Pore pressure data to be evaluated with corresponding fill elevation, and monitored movements at SPs and INs
Survey Pin	Lateral Movement Rate	Uniform (but less than max 75 mm magnitude)	Accelerating	To be evaluated with IN data to define zones of movement
Slope Inclinometer	Lateral Movement Rate	Uniform	Accelerating	Deformation rates will be associated with rate of construction and post construction movements
	Share Strain Magnitude	2%	5%	If specific plane(s) of shearing is observed within the foundation, the construction shall be limited, progressed with caution or ceased depending on the observed phenomena

Notes:
1. r_u of 0.4 corresponds to a piezometric head at 80% of the dam height. r_u 0.5 is at pietometric head at the crest of the dam.
2. r_u of 0.5 is a design criteria to meet dam stability requirements.

Source; Geotechnical Monitoring Plan (AMECFW, August 2016)

7.4 Dam Safety Inspections (DSIs) and Dam Safety Reviews (DSRs)

Consistent with MOECC ECA approvals, with the regulatory exception of the Clark and West Creek Diversions, engineering inspections will be conduct following best management practices as per the Canadian Dam Association's (CDA) Dam Safety Guidelines (2007, revised 2013, as amended from time to time), and the 2014 CDA Technical Bulletin: Application of Dam Safety Guidelines to Mining Dams (as amended from time to time).

7.4.1 Dam Safety Inspections

Annual inspections are intended to be part of a more thorough review of the condition of the facility, and are carried out by the EOR. The inspections will include the following key items:

- Visual inspection of the facility by the engineer, including taking appropriate photographs of the observed conditions;
- Review of routine inspection records prepared by operating personnel in the past year;
- Review whether or not recommendations from previous year's inspection(s) have been addressed, and any incidents or actions arising from those previous recommendations;
- Review of instrumentation and monitoring data;
- Review of tailings deposition and water management operations of the facility including reconciliation of the annual water and mass balance. Review of pond levels (and depth) and freeboard, and reports of any incidents (and remedial measures) that may have occurred;

- An evaluation and interpretation of the structural performance of the dam and related components, and identify any potential safety deficiencies or recommended items that need to be addressed in the coming year;
- Review construction records, QA/QC data and as-built information on dam construction and beaching; and
- Evaluation of the OMS Manual to assess the need for updating.

The results of the inspection and review will be documented in a report.

7.4.2 Dam Safety Review

The Canadian Dam Association (CDA) Dam Safety Guidelines (CDA, 2007) recommend a comprehensive dam safety review be carried out every 5 years during operations, prior to decommissioning and following closure, by a qualified 3rd party consultant.

The comprehensive review provides independent verification of:

- Safety and environmental performance of the facility;
- Adequacy of the surveillance program;
- Adequacy of delivery of OMS Manual requirements;
- Design basis with respect to current standards and possible failure modes; and
- Compliance with new engineering standards (including analysis to confirm if necessary).

7.5 Documentation

Documentation of surveillance and monitoring activities shall be maintained by the Mill Manger, or as designated, as described in the preceding sections and will include recording of:

- Routine visual observations (departures from normal conditions);
- Photographs;
- Instrumentation monitoring and testing;
- Analyses and evaluations; and
- Reviews.

Documentation will include, as a minimum, the following:

- Weekly routine inspection log;
- Monthly tailings facility and process water pond monitoring report;
- Quarterly instrumentation reports;
- Annual Dam Safety Inspection reports; and
- Comprehensive Dam Safety Review report every 5 years.

Documentation will include a hard copy (paper) and electronic filing system for inspection reports, photographic and video records, incident reports, instrumentation readings, instrumentation plots, annual inspections and third-party reviews, so that they can be quickly retrieved for review and in case of an emergency.

7.6 Reporting

The Mill Manager, or designated responsible party, and Geotechnical Engineer will review collected data records from facility monitoring and assess the need for maintenance activities or response. Corrective actions will be identified and tracked to closure. The Environmental Manager is responsible for overseeing sample and data collection and analysis. Reporting will meet MOECC requirements and the annual DSI report will also be submitted to the MRNF. Reporting includes;

- As built reports of the dams, excluding the Clark and West Creek diversions, will be submitted to MOECC within 90 days of completion;
- An annual report based on the DSI including ECA approval requirements;
- Monthly water quality monitoring report; and
- Annual report including any operating problems and corrective actions, a summary of calibration and maintenance works, use of contingency plans, surface water and groundwater monitoring reports including water balance, ML/ARD updates, discharge volumes and quality.

Additional reporting requirements may be developed as the RRM progresses.

8.0 CLOSURE PLAN

This section summarizes the objectives of the Closure Plan. The *Rainy River Project – Closure Plan* (Amec Foster Wheeler, 2015c) provides the closure plan and includes temporary closure options for short and medium-term shut-down of site facilities.

8.1 Tailings Management Area

Closure of the TMA will include, but is not limited to, the following:

- Flooding of the TMA with a 2 m or deeper water cover;
- A perimeter zone of tailings beach will be maintained to keep the central pond away from the dams, this zone will be covered with a low permeability cover;
- NPAG rock will be placed at the TMA transition zone with the tailings to prevent erosion and suspension and oxidation of solids; and
- Dam structures containing the TMA have been designed with adequate safety factors to provide overall long term safety and stability.

8.2 Embankments

Closure of the embankments will typically involve, but is not limited to reaching of embankments to prevent ponding of water and revegetating slopes to reclaim the area. Some embankment

structures will still have a role during the closure phase and these will not be breached. The following structures will continue to be operated during the closure phase:

- MRP will collect runoff and seepage from EMRS, which will be directed to the Open Pit to help flooding;
- Sediment Ponds #1 and #2 will be maintained until site is recognized as a closed mine and monitoring associated with the Metal Mining Effluent Regulation is no longer required

Freshwater diversion and constructed wetland structures are designed to operate passively and will remain in place at closure.

8.3 Monitoring

Monitoring requirements are described in the *Rainy River Project – Closure Plan* (Amec Foster Wheeler, 2017c).

9.0 EMERGENCY PREPAREDNESS

The objectives of this section is to describe procedures to prevent the occurrence of emergencies and reduce the impact, should they arise. This manual covers only those emergency situations that could potentially pose a threat to the structural integrity of the dams or result in the release of tailings and/or supernatant pond water into the surrounding environment. This document was developed to work in conjunction with the Emergency Preparedness and Response Plan (EPRP) (as reviewed annually and maintained by New Gold H&S team – latest revision February 2017).

The ultimate goal is to protect human life and health, the social well-being of the local community and employees, public infrastructure and company facilities; and environmental conditions and habitats.

9.1 Definition and Classification of Emergencies

An emergency is defined as:

> *"A situation or a set of circumstances which, if not promptly eliminated, controlled or contained, results or could result in a significant injury to people (including the community) and/or damage to the tailings facility, property and/or the environment."*

9.2 Potential Dam Failure Modes

The containment dams at the RRM are predominately zoned embankments with clay cores and rock fill shells. The primary method of dam construction uses the centreline method which is considered to be a stable form of construction. Adherence to design drawings and specifications is critical to minimize the risk of failure.

Several potential failure modes exist for the various tailings storage and water management facilities. These potential failure modes, along with likely triggers, observable visual and instrumentation indicators of the failure mode are presented in Table 9-1. A preliminary dam break inundation map is provided in Figure 9-1.

External hazards originate outside the boundary of the dam and reservoir system and are beyond the control of the dam owner. External hazards include the following:

- Meteorological events, such as floods, intense rainstorms (causing local erosion or landslides), temperature extremes, ice, lightning strikes, and windstorms;
- Seismic events, either natural, cause by economic activity such as mining, or even reservoir induced;
- The reservoir environment, including rim features, such as upstream dams and slopes around the reservoir that pose a threat; and
- Vandalism and security threats.

Internal hazards may arise from the ageing process or from errors and omissions in the design, construction, operation, and maintenance of the dam and water conveyance structures. Internal hazards can be subdivided by source:

- Components that retain or interfere with the body of water;
- Water conveyance structures required to direct water around or through the dam in a controlled way;
- Mechanical, electrical, and control subsystems;

- Infrastructure and plans, including instruments, operating orders, maintenance strategies and procedures, surveillance procedures, and emergency plans, as well as inflow forecasts.

A failure mode describes how a component failure occurs to cause loss of the system function. Failure modes may be interdependent and change in nature and significance at different stages of a dam's life. In any analysis, the failure characteristics, including extent and rate of development, should be determined to an appropriate level of detail. At a general level, there are three dam failure modes:

- Overtopping – water flows over the crest of the dam, contrary to design intent;
- Collapse – internal resistance to the applied forces is inadequate; and
- Contaminated seepage – contaminated fluid escapes to the natural environment.

Dam safety risk management is directed to (1) prevention of the initiation of a failure sequence; (2) control of a deteriorating situation, and (3) mitigation of situations where the failure sequence cannot be stopped.

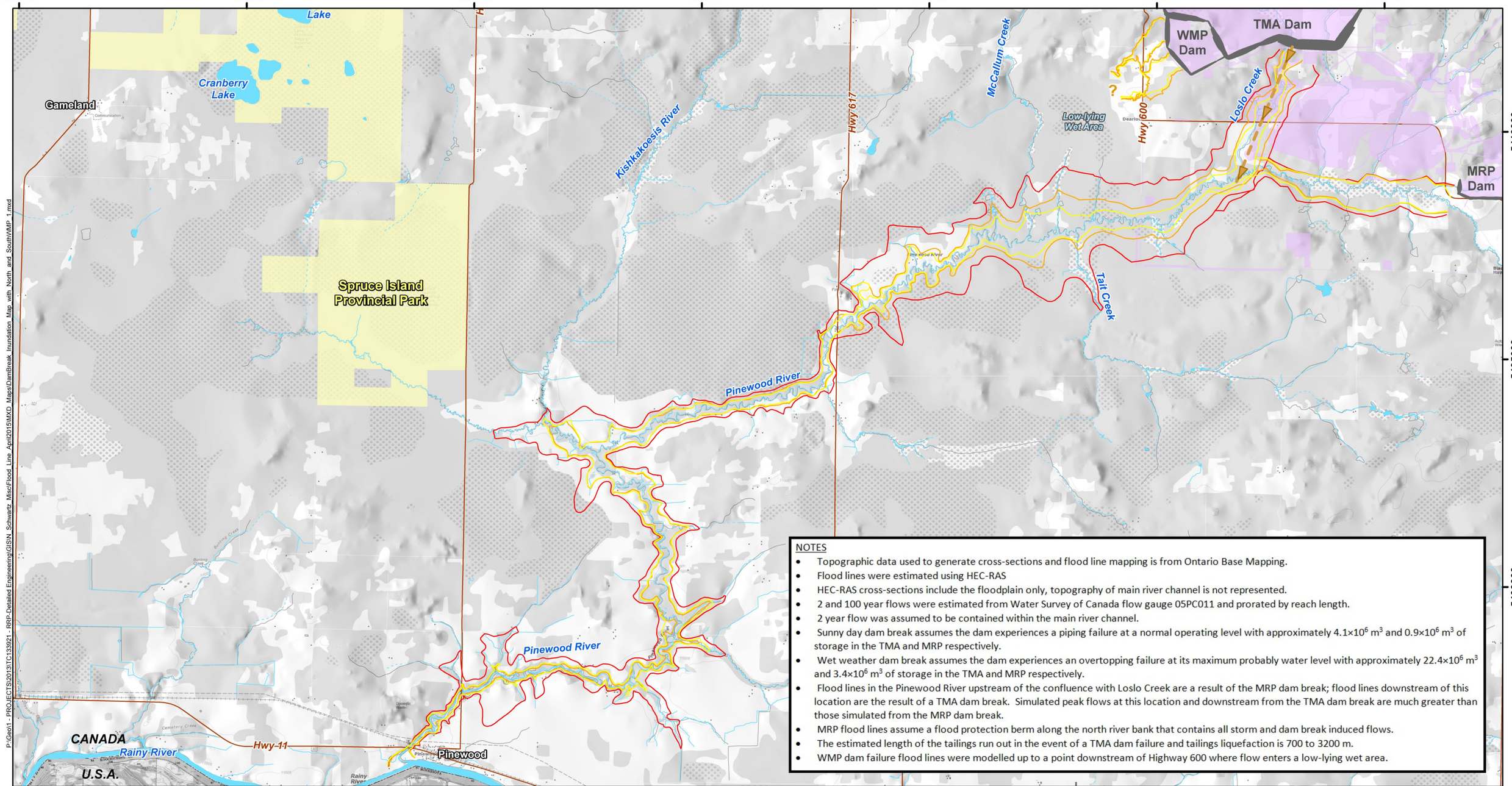
Table 9-1; Potential Failure Modes, Triggers and Observable Effects

Potential Failure Modes	Possible Causes	Visual Indications	Instrumentation Effects
Break down of pump stations	Blockages, lack of maintenance	No flows	Test on pumps and other related components
Pipeline damage, cracking, blocking, or freezing	Flows blocked by excessively turbid water, debris or ice blockages, extreme weather	No or partial flows; pipeline leaking, cracking or bulging	Pipeline thickness; line pressures; pipeline flow rates
Overtopping	Excessive foundation movements, high wind and wave erosion of beach landslide generated wave, erosion of freeboard, settlement of crest, gully growth towards upstream crest due to seepage, surface runoff or pipe ruptures	Instability in reservoir slopes – slumping, sliding, etc. Damage to upstream face of dam, breach of crest	None
Slope Failure	Changes to porewater pressure within the dam (filters becoming non-functional, earthquake included)	Bulging, slumping, sliding or cracking of dam, increase in volume of seepage	Increase in porewater pressures measured within dam
Foundation Failure	Changes to pore water pressure in the foundation or increases to load applied to foundation (Increase in dam height or pond elevation)	Bulging, slumping, sliding or cracking of dam, or natural ground surrounding the dam	Increase in porewater pressures measured within dam and/or foundation, increase in rate of movement observed in inclinometers and/or survey prisms

Potential Failure Modes	Possible Causes	Visual Indications	Instrumentation Effects
Surface Erosion	Waves, wind or precipitation	Slumping or raveling of upstream or downstream faces of dam	None
Internal Erosion	Erosion of core, creating a pipe/conduit for water flow through dam, growth of a gully behind the crest of dam, turbid seepage water	Rapid increase or unexplained cloudy appearance of seepage through the tailings dams and/or their foundations; appearance of seepage in new locations; formation of sinkholes in dam or on tailings beach	Rapid change if the in porewater pressures measured within dam and/or foundation
Cracking	Differential settlement of dam, earthquake induced	Cracks on dam crest or faces; bulging or slumping of dam	Increase to rate of movement observed in inclinometers or survey monuments or prisms

Other failure modes might also include the following:

- Slumping, sliding, cracking or bulging of the tailings dam
- Rapid increase or unexplained cloudy appearance of seepage through the tailings dam and/or its foundation
- Formation of sinkholes on the tailings beach or dam
- Breakage of tailings pipelines, which may result in dam erosion and/or release of tailings slurry
- Earthquakes
- Major storm events or flood
- Sabotage and other criminal activities



P:\Geo\1 - PROJECTS\2013\TC133921 - RRP-Detailed Engineering\GIS\N_Schwartz_Misc\Flood_Line_April2015\MXD_Maps\DamBreak_Inundation_Map_with_North_and_SouthVMP_1.mxd

NOTES

- Topographic data used to generate cross-sections and flood line mapping is from Ontario Base Mapping.
- Flood lines were estimated using HEC-RAS
- HEC-RAS cross-sections include the floodplain only, topography of main river channel is not represented.
- 2 and 100 year flows were estimated from Water Survey of Canada flow gauge 05PC011 and prorated by reach length.
- 2 year flow was assumed to be contained within the main river channel.
- Sunny day dam break assumes the dam experiences a piping failure at a normal operating level with approximately 4.1×10^6 m^3 and 0.9×10^6 m^3 of storage in the TMA and MRP respectively.
- Wet weather dam break assumes the dam experiences an overtopping failure at its maximum probably water level with approximately 22.4×10^6 m^3 and 3.4×10^6 m^3 of storage in the TMA and MRP respectively.
- Flood lines in the Pinewood River upstream of the confluence with Loslo Creek are a result of the MRP dam break; flood lines downstream of this location are the result of a TMA dam break. Simulated peak flows at this location and downstream from the TMA dam break are much greater than those simulated from the MRP dam break.
- MRP flood lines assume a flood protection berm along the north river bank that contains all storm and dam break induced flows.
- The estimated length of the tailings run out in the event of a TMA dam failure and tailings liquefaction is 700 to 3200 m.
- WMP dam failure flood lines were modelled up to a point downstream of Highway 600 where flow enters a low-lying wet area.

LEGEND

- Principal RRP Facilities
- Regional Road / Highway
- Permanent Watercourse
- Intermittent Watercourse

TMA and MRP Flood Scenarios

- Approximate Flood Line for 100 Year Flow
- Approximate Flood Line for 2 Year Flow + Sunny Day Dam Break
- Approximate Flood Line for 100 Year Flow + Wet Weather Dam Break
- Possible Tailings Run Out (estimate extent shown: 3,200 m)

WMP Flood Scenarios

- Approximate Flood Line for Piping Failure (north and south dam scenarios shown)
- Approximate Flood Line for Overtopping Failure (north and south dam scenarios shown)

PRELIMINARY

NOTES:
-

Datum: NAD83
Projection: UTM Zone 15N

0 2 4 8 12 16 20 Kilometres

newgold™ Rainy River Project

amec foster wheeler

RAINY RIVER PROJECT

Dam Break Inundation Map

DRAFT

PROJECT N°: TC133921 | **FIGURE:** 9-1

SCALE: 1:80,000 | DATE: May 2015

9.3 Warning Signs and Threshold Criteria

The warning signs for an emergency are defined below:

- Level I: Conditions that do not yet represent a potential emergency but that do require investigation and resolution on a prompt basis, along with intensified surveillance.
- Level II: Conditions that represent a potential emergency if allowed to continue to progress, but no such emergency is imminent.
- Level III: An obvious emergency has occurred or is imminent.

Table 9-2 discusses potential warning signs, consequences and actions to be taken.

Table 9-2; Warning Signs, Level of Emergency and Responses

Level	Warning Sign/Situation	Actual or Potential Consequences	Action(s) to be Taken
1	Unusually high, one-time reading from a single piezometer.	Possible early warning sign of worsening piezometric/seepage conditions.	• Check piezometer reading, and check for infilling of piezometer. • If reading confirmed, check all other piezometers, and examine downstream area of dam for changed seepage conditions. • Intensify piezometer readings.
	Decreased seepage discharge accompanied by gradually increasing piezometer levels.	Possible sign of clogging of internal drainage system of dam.	• Check chemistry of seepage discharge for any changes relative to normal. • Request tailings dam engineer to re-evaluate slope stability at this location.
	Increase in size of erosion gullies.	Possible erosion resulting from seepage and/overland runoff. May lead to accelerated erosion and result in dam failure.	• Backfill gullies with filter material and fine rockfill.
2	Increase in seepage discharge, accompanied by discharge of tailings within seepage (dirty water).	Possible indication of a developing internal erosion (piping), that could eventually lead to dam breach/pond release, or excessively high levels of saturation that could result in slope instability.	• Initiate chain of communication (Figure 9-2) and monitor the situation. • Discontinue tailings discharge in the seepage area. • Intensify monitoring of seepage at this location. • Note if the seepage discharge and/or turbidity continue to increase. • Read piezometers. • Be prepared to place filter material in area of discharge from emergency stockpiles.

Level	Warning Sign/Situation	Actual or Potential Consequences	Action(s) to be Taken
	Seepage on dam abutments, causing localized erosion and slumping of dam slope.	Could lead to progressive slope failure on abutment, resulting in dam failure and breach of pond.	• Discontinue tailings discharge in the seepage area. • Place filter material over seepage area using emergency stockpiles. • Continue to monitor area on an intensified basis. • Initiate chain of communications if situation does not improve.
	Extended period of unusually heavy rainfall, or unusually large snowmelt.	Could lead to raised levels of saturation within the dam slope, which could in turn lead to slope instability.	• Increase frequency of piezometer readings to weekly. • Intensify inspections of downstream dam slope, looking for signs of localized instability/concentrated gully erosion, and for soft ground (saturated slope) conditions.
	Relatively high, unexplained, and ongoing increase in piezometer levels within the dam and/or foundation – threshold limits being approached.	Probable sign of progressive deterioration of toe drainage provided by starter dams. Could, if left unattended eventually lead to failure of the dam.	• Assess rate of rise and determine if it is steady or accelerating. • If piezometer level increase was sudden, check the reading (repeat it) to eliminate the possibility of a reading error. • Sound bottoms of piezometers to check for infilling. • Send piezometer readings to the tailings dam engineer. • Inspect downstream area for increased seepage and/or turbidity of seepage discharge.
	Long term or sudden increase in rate of inclinometer movements.	Possible sign of impending slope instability.	• Check reading, and contact the Geotechnical Engineer and EOR if confirmed. • Inspect area for any visible signs of instability, bulging on outer slope or at toe, or tension cracks on dam crest. • If tailings discharge is occurring near the inclinometer that indicates unexplained movement, relocate discharge point further away. • Increase frequency of inclinometer readings. • Read nearby piezometers.
	Ongoing cracking and evidence of dam and/or foundation movement.	Possible sign of impending failure of dam, especially if the rate of movement/cracking is accelerating.	• Check inclinometer readings. • If rate of deformation is accelerating, initiate chain of communication. • Read piezometers. • Check for water inflow into tension cracks. • Regrade to channel runoff away from tension cracks, as water inflow can result in accelerated movement.

Level	Warning Sign/Situation	Actual or Potential Consequences	Action(s) to be Taken
	Highly turbidity discharge from decant outlet.	Possible sign of collapse of a portion of the decant, allowing tailings into outlet. Can, if left unattended, lead to internal erosion failure and eventual dam breach.	• Check decant inlet to see if water turbidity matches that in discharge. • If water at inlet is clear, then close off decant inlet to prevent further discharge. • Notify tailings dam engineer and develop alternate decant arrangements. • Inform Mill.
	Rupture of tailings and/or water pipelines on crest of dam, resulting in erosion of downstream dam slope	Could lead to erosive failure of dam, and pond breach, if allowed to continue.	• Contact Mill and have discharge of tailings stopped. • Repair the rupture. • Inspect and repair the washed-out portion of the dam slope. • Do not discharge tailings into the area of the washout. • Notify tailings dam engineer to design slope re-construction.
	Seepage daylighting from tailings slope at a significantly higher elevation than had previously been observed at that particular location.	Could lead to erosion, and progressive slope failure, resulting in dam failure and breach of pond.	• Read piezometers. • Assess rate of seepage and whether or not internal erosion is occurring. • If piezometers confirm high phreatic levels, initiate chain of communication. • Carry out weekly monitoring of the seepage discharge area of concern. • Avoid discharge of tailings into the impoundment adjacent to the area.
	Severe flood/intense rainstorm or rapid snowmelt.	Overtopping and washout of dam, and release of pond. Concentrated erosion of tailings slopes, resulting in localized gullying, over-steepening, and potential slope failure. Raising of phreatic surface as a result of infiltration possible.	• Initiate chain of communications (Figure 9-2). • Check the minimum width of tailings beaches. • Inspect spillway for flow and condition. • Stop tailings discharge and slowly lower tailings pond by removing stop logs. • Carry out detailed inspection of dam and pond. • Inspect dam slopes for areas of concentrated erosion, and repair. • Read all piezometers. • Mobilize emergency pumps if needed.
3	Failure or suspected imminent failure of a dam.	Catastrophic breach and release of pond.	• Initiate chain of communications (Figure 9-3). • Stop tailings discharge and lower tailings pond by removing stop logs.

Level	Warning Sign/Situation	Actual or Potential Consequences	Action(s) to be Taken
	Slumping, sliding, or bulging of a dam slope or adjacent ground.	Catastrophic breach and release of pond.	• Initiate chain of communications (Figure 9-3). • Lower pond by removing stop logs. • Do not attempt construction (e.g., construction of a stabilizing berm) until the EOR is on the site (earthmoving equipment should be mobilized).
	Water vortex (whirlpool) within the tailings pond.	Indicates an internal erosion failure in progress, with potential breach of the tailings dam.	• Initiate chain of communications (Figure 9-3). • Stop tailings discharge and lower tailings pond by removing stop logs. • Check downstream area of dam for areas of increased and/or turbid seepage discharge. • Place granular filter buttress against any such areas, using emergency stockpiles. • Go directly to decant outlets if vortex is on a decant line; plug decant outlet with granular material if tailings are discharging through decant.
	Sinkhole observed on tailings beach or on a downstream dam slope.	Indicative of internal erosion, which could progress to the point where dam breach results.	• Initiate chain of communications (Figure 9-3). • Stop tailings discharge and lower tailings pond by removing stop logs. • Immediately check dam toe areas/decant outlets for heavy seepage that is transporting tailings solids. • Place granular filter buttress against any such areas, using emergency stockpiles.
	Large earthquake.	Dam failure, breach and release of pond.	• Initiate chain of communications (Figure 9-3). • Carry out detailed post-earthquake inspection of the dam. • Read all instrumentation (piezometers and inclinometers).
	Rapid, unexplained, orders of magnitude increase in seepage rate and turbidity (dirty water indicating transport of tailings) at a dam slope seepage location and/or foundation.	Internal erosion (piping) failure leading to dam breach and release of pond. Elevation of pore pressure conditions that could initiate a slope failure.	• Initiate chain of communications (Figure 9-2). • Place stockpiled filter materials over seepage discharge area to prevent further erosion of material. • Read piezometers in area of seepage discharge.

9.4 Incident Notifications Procedures

Roles and responsibilities:

- Any individual who observes an incident shall initiate the appropriate notification procedure.
- All members listed on the notification procedures shall be familiar with established protocol and familiar with the OMS Manual (as per training Section 2.5).
- If a member of the team on the notification procedures is not contactable then the Incident Commander shall be notified and proceed with the notification procedure.

Notification procedures have been developed for Level I, II and III emergencies provided below to ensure quick onsite responses in the event of an identified emergency. The Mill Manager will be in charge of initiating the site wide EPRP (NG, 2017) in the event of a Level III emergency.

The notification procedures for a Level I and Level II emergency are illustrated on Figure 9-2. The notification procedure and initiation of the EPRP in the event of a Level III emergency is shown on Figure 9-3. Rapid response to Level III emergencies is critical to ensuring that staff, contractors and site visitors safely reach a muster station and that timely notification is made to appropriate local and provincial authorities as well as external stakeholders.

Figure 9-2; Levels I and II Emergency Notification Procedure Flowchart

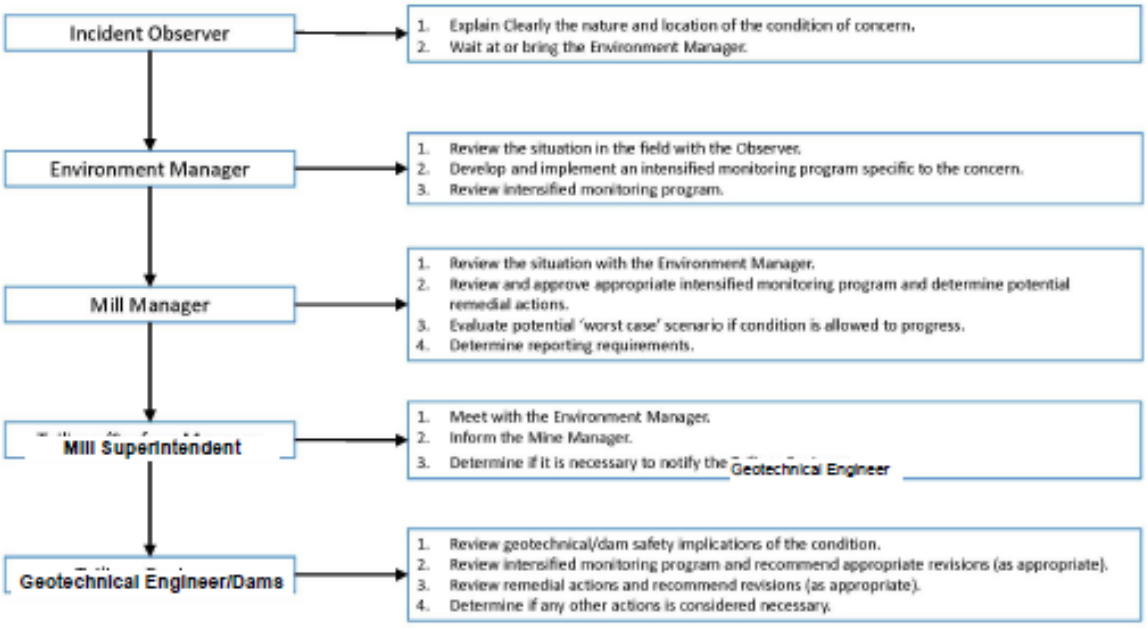
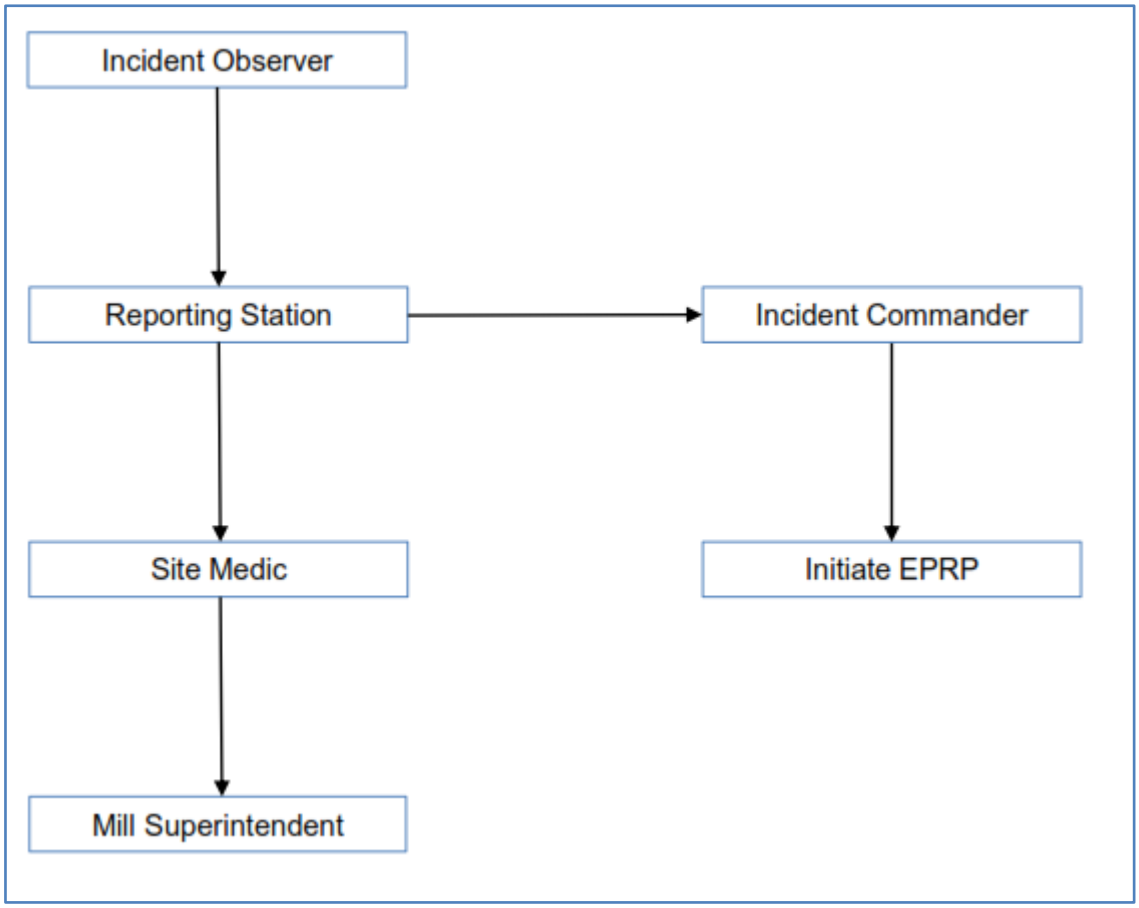


Figure 9-3; Level III Emergency Notification Procedure Flowchart



9.5 Emergency Contacts

Internal emergency contact information is provided RRM EPRP. An emergency response can be initiated through;

- RRM radio channel 4 – state 'Emergency, Emergency, Emergency' and describe the type and location of the emergency
- RRM internal phone system – dial 8888
- RRM security direct line – 1-807-708-0646
-

9.6 Emergency Preparedness Procedures

All employees, including contractors working at the RRM must be familiar with the procedures outlined in the EPRP for the site and TMA to the extent required to perform their functional role. All supervisors and contact persons for contractors must ensure their employees understand those procedures relevant to their work area and ensure that their employees are familiar with,

and recognize the proper course of action in the event of an emergency. The supervisor must also ensure that all employees are made aware of any revisions to the EPRP for the site and TMA.

The EPRP is the site and TMA's guidance document relating to emergency responses and protocols to be followed during upset conditions, unusual events or incidents. A preliminary dam break inundation map is provided in figure 9-3.

Emergency preparedness measures with regard to dam safety include: maintenance of access to dam locations; availability of fill materials and equipment required in the event that remedial works are required; and the ability to access and traffic control measures to ensure safety of workers and public.

10.0 CONTINGENCIES

The operations are sensitive to water balance and water quality in discharges. The following are contingencies based on water management and functioning of the diversions.

10.1 TMA

10.1.1 Cell 1 contingency

- Maintain or add additional pumping capacity to the WMP to drain the cell if required due to the MOWL being exceeded;
- Manage filling of the WMP to consider additional storage capacity of the EDF from cell 1; and
- Accelerate construction of cell 2, where permitted.

10.1.2 Cell 2/3 Contingency

- The TMA has been designed to operate with a pond volume of 4-6 Mm^3, with additional capacity for up to 8 Mm^3. In a wet year pumping to the WMP can be extended longer than planned and discharged from the WMP, pending receptor capacity (Pinewood River flow)
- Any additional precipitation events after the EDF, prior to dewatering, could cause an uncontrolled release of untreated water to the environment, and alternative contingency measures would be required to reduce the water level at a faster rate (i.e. such as pumping excess water to the open pit or transferring TMA Cell 2 water into the WMP with no treatment).
- Pumping will be considered directly from the WMP to TMA Cell 3 to reduce WMP volumesto 1.0 Mm^3 prior to discharge from Cell 2 through the WTP into the WMP.
- Water treatment plant to be completed in September 2018 to allow pumping from cell 2, if required
- TMA raises to be sequenced to avoid a water deficit, however, reduction in discharges to the CW and additional takings from the Pinewood River, West Creek and Clark Diversions will be considered, subject to maintaining minimum flows

10.2 Process Water

10.2.1 Water Management Pond

- Accelerate, where permitted, completion of TMA to enable draining of WMP;
- Additional pumping capacity to cell 2/3; and
- Implement contingencies for Water Quality as outlined below (Water Treatment).

10.2.2 Mine Rock Pond

- If the MRP MOWL (356.8m) is exceeded, then pumping into the MRP from the open pit will cease and pumps will pump water toward the plant site/WMP/TMA at 680 m^3.
- Overtopping of the Clark Creek Dam was considered in the design of the MRP. The Clark Creek Dam and Pond are designed for a 1:100 year 24h event, if this is exceeded

then water will spill from the dam and flow toward the EMRS. Water on the eastern side of the EMRS reports to a sump and flows through NAG rock under the EMRS to the MRP. Given this flow path the contribution of this flow is not significant on the peak inflows to the MRP.

10.3 Water Treatment

Two contingency plans have been developed as part of MOECC approvals for water treatment;

- Pinewood River Quality Contingency Plan, Version 1 August 2016; and
- Groundwater and Surface Water Contingency Plan, Version 2 October 2015.

Contingency options are to limit discharges, acceleration of TMA dam raises, add water quality treatment, additional monitoring, provision of water to affect areas and increased mixing ratios/improved mixing. The trigger for implementation of contingency in surface water is if protection of aquatic life criteria are not achieved 90 % of the time. The trigger for contingencies in groundwater is if water quality parameters exceed background metals concentrations in groundwater at the mining lease boundary or groundwater wells outside of the zone of influence are affected.

10.4 Freshwater Diversions

There are specific contingencies required, based on the Fisheries Act authorization (application Table 6) for the freshwater diversion that relate to the OMS i.e., not biological. These are provided in the following table.

Table 10-1; Contingencies for Freshwater Diversions

Attribute	Mode of Failure	Contingency
Physical construction of offset measures	• Dam not constructed as per plans • Channel not constructed as per plan. • Water area, depths and or habitat structures not in place or present as per the plans.	• Engineer to assess failure and recommend corrective actions. • Proponent to take required corrective action.
Physical function of offset measures	• Conditions do not provide for fish passage	• Engineer / biologist to assess cause of failure and recommend corrective actions. • Take required corrective action
	• Water level not consistent with those specified in plans.	• Adjust grades of structures to alter • water levels • Excavate pools to specified depths.
Stability of structures	• Constructed habitat features (log and boulder structures) missing or not functional	• Repair or replace structures
	• Shorelines and graded offset features not stable (less than 80% of features are considered stable)	• Assess cause and areas of instability • Add permanent erosion control (rock, vegetation) in areas of erosion • Grade channel or shore to decrease velocity
	• Riparian vegetation cover and plantings are less than 80% coverage of area, and or survival of planted stock	• Apply seed and replacement plantings where required • Substitute species, and/or use soil amendments if conditions require.

11.0 REFERENCES

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New Gold, 2017c. Rainy River Project – Emergency Preparedness & Response Plan, prepared by New Gold Inc., February, 2017.

APPENDIX A

DRAWING LIST
(List of Current Revisions)

No.	Drawing Number	Drawing Title	Rev.
100 Series			
101	3098004-004000-A1-D20-0003	Title Sheet	1
102	3098004-000000-A1-D20-0003	General Arrangement Plan at Start Up	C-01
103	3098004-000000-A1-D20-0005	Watershed Map	00
104	3098004-000000-A1-D20-0004	Site Investigations & Surficial Geology Plan	00
105	3098004-004000-A1-D20-0004	TMA & WMP - General Arrangement Plan - Start Up Conditions	C-05
106	3098004-004000-A1-D50-0001-1	TMA Dam - Layout and Foundation Preparation Plan & Details (Sheet 1 of 3)	C-02
107	3098004-004000-A1-D50-0001-2	TMA Dam - Layout and Foundation Preparation Plan & Details (Sheet 2 of 3)	C-01
108	3098004-004000-A1-D50-0001-3	TMA Dam - Layout and Foundation Preparation Plan & Details (Sheet 3 of 3)	C-04
109	3098004-004000-A1-D60-0006-1	TMA Dam - Profile (Sheet 1 of 2)	C-02
110	3098004-004000-A1-D60-0006-2	TMA Dam - Profile (Sheet 2 of 2)	C-01
111-1	3098004-004000-A1-D60-0007-1	TMA Dam - Typical Cross Sections	C-05
111-2	3098004-004000-A1-D60-0007-2	TMA West Dam - Typical Cross Sections	C-01
112	3098004-004000-A1-D70-0003	TMA Dam - Emergency Spillway - Plan and Sections	C-01
113	3098004-004000-A1-D70-0004	TMA Dam - Construction Diversion - Plan, Profile and Section	C-01
114	3098004-004300-A1-D50-0001	WMP Dam - Layout and Foundation Preparation Plan & Details	01
115	3098004-004300-A1-D60-0003	WMP Dam - Profile	00
116	3098004-004300-A1-D60-0004	WMP Dam - Typical Cross Section	C-02
119	3098004-004300-A1-D70-0004	WMP Dam - Emergency Spillway - Plan and Sections	00
120	3098004-004410-A1-D70-0002	Water Discharge Pond Dam - Plan and Typical Cross Sections	00
121	3098004-004420-A1-D70-0002	Constructed Wetland - Plan, Profiles & Section	00
121A	3098004-004420-A1-D70-0003	Constructed Wetland - Level Control Structure	AA
122	3098004-002510-A1-D70-0002	West Creek Pond Dam - Plan, Typical Section and Profile	C-03
122A	3098004-002510-A1-D70-0013	Temporary Open Pit Protection Berm - Plan, Profile & Cross Section	00
122B	3098004-002510-A1-D70-0014	West Creek Pond Dam - Temporary Overflow Spillway - Typical Section, Profile and Details	C-00
123	3098004-002510-A1-D50-0001	West Creek Pond Dam - Layout and Foundation Preparation - Plan & Details	C-00
123A	3098004-002510-A1-D70-0004	West Creek Dam Spillway - Plan, Profile and Sections	C-01
124	3098004-002510-A1-D70-0003	West Creek Diversion Channel - Plan and Profile	C-02
124A	3098004-002510-A1-D70-0005	West Creek Diversion Channel - Overflow Diversion Structure - Section and Details	C-01
124B	3098004-002510-A1-D70-0006	West Creek Diversion Channel - Culvert C11 - Plan, Section and Profile	00
124C	3098004-002510-A1-D70-0007	West Creek Diversion Channel - Culvert C12 - Plan, Section and Profile	00
124D	3098004-002510-A1-D70-0008	West Creek Diversion Channel - Culvert C13 - Plan, Section and Profile	00
124E	3098004-002510-A1-D70-0009	West Creek Diversion Channel - Culvert C14 - Plan, Section and Profile	01
124F	3098004-002510-A1-D70-0010	West Creek Diversion Channel - Culvert C15 - Plan, Section and Profile	00
124G	3098004-002510-A1-D70-0011	West Creek Diversion Channel - Culvert C16 - Plan, Section and Profile	00
124H	3098004-002510-A1-D70-0012	West Creek Diversion Channel Temporary Side Spillway Plan, Profile and Sections	AA
125	3098004-002590-A1-D70-0002	Mine Rock Pond Dam - General Arrangement Plan	C-01
126	3098004-002590-A1-D50-0001	Mine Rock Pond Dam - Layout and Foundation Preparation - Plan & Details	C-01
127	3098004-002590-A1-D70-0003	Mine Rock Pond Dam - Profile	C-01
128	3098004-002590-A1-D70-0004	Mine Rock Pond Dam - Typical Cross Section	C-02
129	3098004-002590-A1-D70-0005	Mine Rock Pond Dam - Emergency Spillway - Plan and Sections	C-01
130	3098004-002580-A1-D70-0002	Stockpile Pond Dam - Plan, Typical Section and Profile	C-02
131	3098004-002580-A1-D70-0003	Stockpile Pond Dam - Layout and Foundation Preparation - Plan & Details	C-00
132	3098004-002580-A1-D70-0004	Stockpile Pond Diversion Channel - Plan and Profile	C-00
133	3098004-004400-A1-D70-0001	Clark Creek Pond Dam - Plan, Typical Section and Profile	C-03
134	3098004-004400-A1-D70-0002	Clark Creek Pond Diversion Channel - Plan and Profile	C-01
135	3098004-004400-A1-D70-0003	Teeple Road Dam - Plan, Typical Section and Profile	C-01
135A	3098004-004400-A1-D70-0005	Teeple Road Dam - Overflow Section - Permanent Repairs	C-00
135B	3098004-004400-A1-D70-0006	Teeple Road Dam - Overflow Section - Permanent Repairs	C-00
135C	3098004-004400-A1-D70-0007	Teeple Road Dam - Non-Overflow Section - Permanent Repairs	C-00
136	3098004-004400-A1-D70-0004	Teeple Road Pond Diversion Channel - Plan and Profile	C-00
137	3098004-004000-A1-D02-0001	TMA & WMP Dam Instrumentation Locations	AA
137-1	3098004-004000-A1-D02-0001-1	TMA & WMP Dam Instrumentation Locations	C-00
137-2	3098004-004000-A1-D02-0001-2	TMA & WMP Dam Instrumentation Locations	C-00
138	3098004-004000-A1-D02-0002	Mine Rock & West Creek Dam Instrumentation Locations	C-00
139	3098004-004000-A1-D02-0003	Typical Instrumentation Sections	C-00
140	3098004-004000-A1-D02-0004	Typical Instrumentation Details	C-00
141	3098004-004300-A1-D70-0005	Water Treatment Plant - Settling Pond - Plan	00
142	3098004-004300-A1-D70-0006	Water Treatment Plant - Settling Pond - Typical Cross Section and Profiles	00
143	3098004-004000-A1-D20-0012-1	TMA Divider Dyke - At Start Up	AB
144-1	3098004-004000-A1-D02-0005-1	TMA South Dam Vibrating Wire Instrumentation Locations in Dam Foundation	C-00
144-2	3098004-004000-A1-D02-0005-2	TMA West Dam Vibrating Wire Instrumentation Locations in Dam Foundation	C-00
144-3	3098004-004000-A1-D02-0005-3	TMA North Dam Vibrating Wire Instrumentation Locations in Dam Foundation	C-00
144-4	3098004-004000-A1-D02-0005-4	TMA Start-Up Dam Vibrating Wire Instrumentation Locations in Dam Foundation	C-00
144-5	3098004-004000-A1-D02-0005-5	TMA Start-Up Dam Vibrating Wire Instrumentation Locations in Dam Foundation	00
145	3098004-004000-A1-D02-0006	TMA South Dam Prefabricated Vertical Drains Plan, Profile and Details	AA
200 Series - Fisheries Drawings			
200	3098004-004400-A1-D50-0001	Typical Details for Fish Habitat Structures	02
201	3098004-002510-A1-D50-0002	West Creek Pond - Plan View	03
202	3098004-002510-A1-D50-0003	West Creek Pond - Cross Sections	01
203	3098004-002510-A1-D50-0004	West Creek Diversion Channel - 3m Bottom Width Typical Cross Sections	01
204	3098004-002510-A1-D50-0005	West Creek Diversion - 3m Bottom Width Typical Plan and Profile	02
205	3098004-002510-A1-D50-0006	West Creek Diversion - 5m & 8m Bottom Width Typical Cross Sections	01
205A	3098004-002510-A1-D50-0008	West Creek Diversion - 8m Bottom Width Typical Cross Sections	00
206	3098004-002510-A1-D50-0007	West Creek Diversion - 5m & 8m Bottom Width Typical Plan and Profile	02
207	3098004-004400-A1-D50-0002	Clark Creek Pond - Plan View	01
208	3098004-004400-A1-D50-0003	Clark Creek Pond - Cross Sections	01

No.	Drawing Number	Drawing Title	Rev.
200 Series			
209	3098004-004400-A1-D50-0004	Clark Creek Diversion - Typical Cross Sections	02
210	3098004-004400-A1-D50-0005	Clark Creek Diversion - Typical Plan and Profile	01
211	3098004-004400-A1-D50-0006	Teeple Road Pond - Plan View	01
212	3098004-004400-A1-D50-0007	Teeple Road Pond - Cross Sections	01
213	3098004-004400-A1-D50-0008	Teeple Road Pond Outlet Channel - Typical Cross Sections	01
214	3098004-004400-A1-D50-0009	Teeple Road Pond Outlet Channel - Typical Plan and Profile	01
215	3098004-002580-A1-D50-0001	Stockpile Pond - Plan View	02
216	3098004-002580-A1-D50-0002	Stockpile Pond - Cross Sections	02
217	3098004-002580-A1-D50-0003	Stockpile Diversion Typical Cross Sections in Overburden	02
218	3098004-002580-A1-D50-0004	Stockpile Diversion Plan and Profile in Overburden	02
219	3098004-002580-A1-D50-0005	Stockpile Diversion Typical Cross Sections in Rock	03
220	3098004-002580-A1-D50-0006	Stockpile Diversion Plan and Profile in Rock	02
221	3098004-002580-A1-D50-0007	West Creek Tributary 2 Confluence with Stockpile Diversion	02
300 Series			
301	3098004-001120-A1-D20-0001	West Stockpile Arrangement Plan	AC
302	3098004-001120-A1-D50-0001	West Mine Rock Stockpile - Typical Section & Details	AC
303	3098004-001130-A1-D20-0001	East Stockpile Arrangement Plan	AC
304	3098004-001130-A1-D50-0001	East Mine Rock Stockpile - Typical Section & Details	AC
305	3098004-002590-A1-D50-0006	Interim Mine Rock Pond - Plan, Cross Sections and Details	00
306	3098004-004430-A1-D70-0001	Early Works - Temporary Sedimentation Sump Details	AC
307	3098004-004440-A1-D70-0001	Temporary Sedimentation Pond - Plan & Details	00
308	3098004-004430-A1-D70-0002	Sediment Pond #1 - Sections & Details	01
309	3098004-004440-A1-D70-0002	Sediment Pond 2 - Plan, Cross Sections and Details	00
310	3098004-004450-A1-D50-0001	Protection Berm Plan & Section	01
311	3098004-004000-A1-D70-0005	TMA Seepage Collection System - Plan & Details	C-02
311A	3098004-004000-A1-D70-0006	Water Management Pond - Seepage Collection Pond #1 - Plan & Typical Cross Section & Details	C-01
311B	3098004-004000-A1-D70-0007	Water Management Pond - Seepage Collection Pond #2 - Plan & Typical Cross Section & Details	C-01
311C	3098004-004000-A1-D70-0008	Tailings Management Area - Seepage Collection Pond #3 - Plan & Typical Cross Section & Details	C-02
312	3098004-004520-A1-D70-0001	Reclaim Wet Well Concept	AB
313	3098004-006200-A1-D20-0002	Pinewood Water Intake / Discharge Earthworks General Arrangement	00
314	3098004-006200-A1-D70-0002	Pinewood Water Intake / Discharge Earthworks - Pump Station	00
315	3098004-006200-A1-D70-0003	Pinewood Water Intake / Discharge Earthworks - Channel	00
316	3098004-002100-A1-D20-0001	Plant Site Construction Water Management - General Arrangement	00
317	3098004-002100-A1-D70-0002	Plant Site Construction Water Management - Plant Site Sedimentation Pond - Plan & Sections	00
318	3098004-002100-A1-D70-0003	Plant Site Construction Water Management - Overburden Stockpile Pond - Plan & Sections	00
319	3098004-002100-A1-D70-0004	Plant Site Construction Water Management - Details	00
320	3098004-001210-A1-D70-0001	West Mine Rock Stockpile - Perimeter Ditch - Plan, Profile and Typical Cross Section	01
321	3098004-001210-A1-D70-0001	West Mine Rock Stockpile - Temporary Sump #1 and #2 - Plan & Typical Cross Section	00
322	3098004-001210-A1-D70-0001	Open Pit Layout - At Start-Up	00
323	3098004-001210-A1-D70-0001	Open Pit Temporary Sump #3 and #4 - Plan & Typical Section	00
324	3098004-004430-A1-D70-0007	Open Pit Temporary Sump #5 and #6 - Plan & Typical Section	AA
325	3098004-001210-A1-D70-0003	West Mine Rock Stockpile - Internal Seepage Plan Section	00
326-1	3098004-001210-A1-D70-000-1	West Mine Rock Stockpile - Internal Collection System - Sump A1 Ditching and Details	01
326-2	3098004-001210-A1-D70-000-2	West Mine Rock Stockpile - Internal Collection System - Sump A2 Ditching and Details	01
326-3	3098004-001210-A1-D70-000-3	West Mine Rock Stockpile - Internal Collection System - Sump A3 Ditching and Details	01
327	3098004-001210-A1-D70-0005	West Mine Rock Stockpile - Internal Collection System - Sump B1 Ditching and Details	01
328	3098004-001210-A1-D70-0006	West Mine Rock Stockpile - Internal Collection System - Sump C1 Ditching and Details	
329-1	3098004-001130-A1-D70-0001-1	East Mine Rock Stockpile - Internal Collection System - Plan, Profiel and Typical Cross Section	AB
329 -2	3098004-001130-A1-D70-0001-2	East Mine Rock Stockpile - Internal Collection System - Plan, Profiel and Typical Cross Section	AB
400 Series			
401	3098004-004900-A1-D20-0001	TMA Start-Up Cell - Title Sheet	C-00
402	3098004-004900-A1-D20-0002	General Arrangement Plan - TMA Start-Up Cell	C-00
403	3098004-004900-A1-D50-0001	TMA Start-Upp Cell - Layout and Foundation Preparation	C-01
404	3098004-004900-A1-D60-0001	TMA Start-Up Cell - Profile	C-00
405	3098004-004900-A1-D60-0002	TMA Start-Up Cell - Typical Cross Sections	C-01
406	3098004-004900-A1-D60-0003	TMA West & South Dam - Typical Cross Sections	C-01
407	3098004-004900-A1-D70-0001	TMA Start-Up Cell - Emergency Spillway - Plan & Sections	C-00
408	3098004-004900-A1-D70-0002	WMP Dam - Emergency Spillway - Plan and Sections	C-00
409	3098004-004900-A1-D70-0003	TMA Start Up Cell Temporary Seepage Collection Pond SU #1	C-00
410	3098004-004900-A1-D70-0004	TMA Start Up Cell Temporary Seepage Collection Pond SU #2	C-00
500 Series			
501	3098004-004910-A1-D20-0001	TMA Cell 2 - Title Sheet	AB
502	3098004-004910-A1-D20-0002	Detailed Design TMA Cell 2 Dam General Arrangement Plan	00
503	3098004-004910-A1-D50-0001	Detailed Design TMA Cell 2 Dam Layout Foundation Preparation and Profile	00
504	3098004-004910-A1-D60-0001	Detailed Design TMA Cell 2 Dam Typical Cross Sections	00
505	3098004-004910-A1-D70-0001	TMA Cell 2 Dam Construction Diversion System	00
506	3098004-004910-A1-D70-0002	TMA Cell 2 Dam Temporary Seepage Collection Plan, Profile and Sections	00
507	3098004-004910-A1-D70-0003	TMA Cell 2 - Emergency Spillway - Plan & Sections	00
508	3098004-004910-A1-D70-0004	TMA Cell 3 - Overflow Spillway - Plan, Profiles and Section	00
509	3098004-004910-A1-D70-0005	TMA Reclaimed Dyke	00
510	3098004-004910-A1-D70-0006	TMA Cell 2 Dam Details For Optional Sheet Pile Configuration	00
Pinewood Intake			
	3098004-006200-A1-D20-0003	Pinewood Water Intake - Structural - General Arrangement	00
	3098004-006200-A1-D20-0004	Pinewood Water Intake/Discharge - Mechanical - General Arrangement	00
	3098004-006200-A1-D30-0001	Pinewood Water Intake/Discharge - Mechanical - Details	00
	3098004-006200-A1-D30-0002	Pinewood Water Intake - Mechanical - Specifications	00
	3098004-006200-A1-D70-0004	Pinewood Water Intake - Structural - Details	00

APPENDIX B

WATER PUMPING DATA
(Simple List of Pumps, Capacity, PFDs, Other)

STREAM NO.			1120	1120A
DESCRIPTION		Units		5918
GAS	AVERAGE FLOWRATE	Nm³/h	11 836	
		SCFM		

STREAM NO.			465	512	562	620	625	660	880	880A	885	886	965	970
DESCRIPTION		Units												
NOMINAL	SOLID	TPH	951			952	952	0	0.46	0.23	0	0	0	0
	WATER	TPH	1052			1064	1080	0	2.09	1.05	0.66	0	6	6
	PULP	TPH	2003			2015	2031	0	2.55	1.28	0.66	0	6	6
	PULP FLOW	m³/h	1386			1398	1414	0	2.28	1.14	0.6	0	6	6
PULP	PULP DENSITY	% solids	47.5			47.2	46.8	0	18	18	15	0	0	0
	SPECIFIC DENSITY - SOLIDS	t/m³	2.85	0.00	0.00	2.85	2.85	0.00	2.40	2.40	2.28	0.00	0.00	0.00
	SPECIFIC DENSITY - PULP	t/m³	1.45	1.00	1.00	1.44	1.44	0.00	1.12	1.12	1.09	0.00	1.00	1.00
BATCH	OPERATION TIME	hrs/day		4	2									
	SOLID	TPH		0	0									
	WATER	TPH		42	70									
	PULP FLOW	m³/h		42	70									

NOTES

1. FUTURE TAILINGS BOOSTER PUMPS DELETED

CARBON TRANSFER WATER PFD-0014 (562)
COPPER SULPHATE PFD-0019 (885)
LIME PFD-0019 (880)
SODIUM METABISULPHITE PFD-0019 (886)
FROM SULPHUR DIOXIDE VENTING PFD-0018
FROM CuSO2 & NA2S2O5 AREA SUMP PUMP PFD-0015
FROM SAFETY SCREEN U/F PFD-0016 (465)
POTABLE WATER
SULPHER DIOXIDE PFD-0018
SULPHUR DIOXIDE PFD-0018 (890)
PROCESS AIR PFD-0020 (1120)
RECLAIM WATER PFD-0021 (698)
MINE ROCK POND WATER PFD-0022 (660)
FROM GRINDING AREA SUMP PUMP PFD-0022
FROM DILUTE ACID WASH TANK PFD-0012 (512)
FROM ACID WASH AREA SUMP PUMP PFD-0012
SEWAGE TREATMENT PLANT
POTABLE WATER
LP GLAND SEAL WATER PFD-0021 (965)
HIGH PRESSURE GLAND SEAL WATER PFD-0021 (970)

3250-TK-0052
CYANIDE DESTRUCTION TANK
NO. 1
CS ; 11.5m DIA 13.5m H

3250-AG-0052
CYANIDE DESTRUCTION TANK
NO.1 AGITATOR
3937mm/3988mm DIA IMPELLER
224.00kW

3250-SF-1052
EYEWASH / SHOWER NO.52

3250-FD-0035
CYANIDE DESTRUCTION TANK
FEED DISTRIBUTOR

3250-TK-0053
CYANIDE DESTRUCTION TANK
NO. 2
CS ; 11.5m DIA 13.5m H

3250-AG-0053
CYANIDE DESTRUCTION TANK
NO.2 AGITATOR
3937mm/3988mm DIA IMPELLER
224.00kW

3250-SA-0030
CYANIDE DESTRUCTION O/F
PRIMARY SAMPLER
24" x 2"

3250-SA-0031
CYANIDE DESTRUCTION O/F
SECONDARY SAMPLER
2" x 2.5"

SAMPLE BIN (620)

3250-PU-0089
CYANIDE DESTRUCTION AREA
SUMP PUMP
4"
22.00kW

3250-AR-0035
TAILINGS AREA
AIR RECEIVER
1.2m DIA x 3.7m H; 6" ANSI

3250-PU-0081
TAILINGS PUMP NO.1
14" x 12"
525.00kW

3250-PU-0082
TAILINGS PUMP NO.2
14" x 12"
525.00kW

3250-PU-0083
TAILINGS PUMP NO.3
14" x 12"
525.00kW

3250-PU-0084
TAILINGS PUMP NO.4
14" x 12"
525.00kW

3250-PU-0090
TAILINGS AREA
SUMP PUMP
4"
22.00kW

3250-BX-0020
TAILINGS PUMP BOX

3250-SF-1053
EYEWASH STATION
NO.53

NOTE 1 → (625) TO TAILINGS MANAGEMENT AREA PFD-0022

Pump capacities should be confirmed with the Mechanical Equipment List (100126-3200-DE10-LST-0001) kept on file with New Gold

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
0	22JUN2015	ISSUED FOR USE	SBW	CL	KC	GC		
F	01MAY2015	RE-ISSUED FOR DESIGN	SBW	CL	KC	GC		
E	12DEC2014	RE-ISSUED FOR DESIGN	SBW	CL	KC	GC		
D	15AUG2014	ISSUED FOR DESIGN	SBW	JR	KC	GC		
C	17JUL2014	RE-ISSUED FOR APPROVAL	SBW	JR	KC	GC		
B	04JUL2014	ISSUED FOR APPROVAL	SBW	JR	KC	GC		
A	20MAY2014	ISSUED FOR CLIENT REVIEW/SQUAD CHECK	SBW	JR	KC	GC		

REF	NUMBER	TITLE
REFERENCES		

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STAMP/SEAL: NOT TO BE USED FOR CONSTRUCTION

APPROVED FOR _____

CLIENT PROJECT MGR. | DEPARTMENT MGR. | PROJECT MGR.

PROJECT PHASE: RAINY RIVER GOLD PROJECT

PROJECT NO.	ACTIVITY NO.
100126	7000
SCALE: NTS	PACKAGE CODE

	BY	DDMMMYY
DES	J.RUST	22MAY14
DRN	SBW	22MAY14
CHK		
APP		

newgold™ Rainy River Project

amec

SUBJECT: PROCESS
PROCESS FLOW DIAGRAM
TAILING & CYANIDE DESTRUCTION
SHEET NO.2 21,000 TPD

AREA

CLIENT DWG. NO.

DRAWING NO. 100126-3200-DC00-PFD-0017.001 REV. 0

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SAVED: 22-Jun-15 3:28 PM PLOTTED: 26-Jun-15 4:32 PM USER: BATCHPLOT, GI
CAD FILE: \\EDCO1\PROJECTS\AMEC.COM\SITES\PD0100126\CAD\PFD\100126-3200-DC00-PFD-0017.DWG
ISO A1 - 594x841

TENTHS 0 INCHES 1 2 3 4 5 6 7 8 9 10 EIGHTHS

0 MM 10 20 30 40 50 60 70 80 90 100

TAILINGS RECLAIM WATER PFD-0022

MINE ROCK POND WATER PFD-0022

SAMPLE POINT

3280-FL-0020 RECLAIM WATER STRAINER NO.1 1.5kW

3280-FL-0021 RECLAIM WATER STRAINER NO.2 1.5kW

3280-FL-0018 RECLAIM WATER BY-PASS STRAINER NO.1

3280-FL-0019 RECLAIM WATER BY-PASS STRAINER NO.2

ANITSCALANT PFD-0018

O/F

3280-TK-0090 RECLAIM WATER TANK

7.2 dia 10.0 H

3280-PU-0161 RECLAIM WATER DISTRIBUTION PUMP NO.2 10" x 8" 75kW

3280-PU-0160 RECLAIM WATER DISTRIBUTION PUMP NO.1 10" x 8" 75kW

3280-FL-0026 GLAND SEAL WATER FILTER

COOLING WATER DISTRIBUTION

TO TAILINGS PUMPBOX PFD-0017

TO PROCESS WATER TANK PFD-0009

TO ACID WASH VESSEL PFD-0012

940 TO QUENCH TANK PFD-0014

945 TO FINE CARBON COLLECTOR TANK PFD-0014

955 TO SLUDGE TANK PFD-0011

642 TO COOLING WATER LOOP PFD-0020

3280-PU-0169 GLAND SEAL LOW PRESSURE PUMP NO.2 4" x 3" 22kW

3280-PU-0168 GLAND SEAL LOW PRESSURE PUMP NO.1 4" x 3" 22kW

904

3280-PU-0170 GLAND SEAL BOOSTER PUMP NO.1 3" x 1.5" 44.76kW

3280-PU-0171 GLAND SEAL BOOSTER PUMP NO.2 3" x 1.5" 44.76kW

TO LIME RECIRCULATION PUMP PFD-0019

TO CYCLONE FEED PUMP PFD-0006

970 TO TAILINGS PUMPS PFD-0013

GLAND SEAL WATER DISTRIBUTION TO PLANT

3280-PU-0174 REAGENT SUPPLY WATER PUMP 4" x 3" 37kW

643

938 TO DILUTE ACID TANK PFD-0012

935 TO BARRON SOLUTION TANK PFD-0013

920 TO ICU PFD-0008

3280-PU-0175 GRAVITY CONCENTRATOR FLUIDIZATION PUMP NO.1 4" x 3" 37kW

3280-PU-0176 GRAVITY CONCENTRATOR FLUIDIZATION PUMP NO.2 4" x 3" 37kW

915

TO GRAVITY CONCENTRATOR NO.1 PFD-0008

TO GRAVITY CONCENTRATOR NO.2 PFD-0008

COOLING WATER RETURN

TO REAGENT WATER PFD-0018/19

TO PROCESS WATER TANK PFD-0009

TO PRE-LEACH THICKENER FEED TANK PFD-0009

3280-PU-0172 CLEAN WATER AREA SUMP PUMP 2.5" 5.60kW

FRESH WATER PFD-0022

918

DEDICATED FIRE WATER TANK

FIRE WATER

2530-TK-1001 FIRE WATER TANK

11.5 M (DIA) x 11.58 M (H)

2530-PU-1001 MAIN ELECTRIC FIRE PUMP

2530-PU-1003 FIRE WATER JOCKEY PUMP

2530-PU-1002 STANDBY DIESEL FIREPUMP

FIRE WATER DISTRIBUTION

Pump capacities should be confirmed with the Mechanical Equipment List (100126-3200-DE10-LST-0001) kept on file with New Gold

STREAM NO.			642	643	904	915	918	920	935	938	940	945	955	970
DESCRIPTION		Units												
NOMINAL	SOLID	TPH	0.0		0.0	0.0								0.0
	WATER	TPH	651.6		67	129.3								40.0
	PULP	TPH	651.6		67	129.3								40.0
	PULP FLOW	m³/h	651.6		67	129.3								40.0
PULP	PULP DENSITY	% solids	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SPECIFIC DENSITY - SOLIDS	t/m³	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SPECIFIC DENSITY - PULP	t/m³	1.0	1.0	1.0	1.0		1.0	1.0	1.0	1.0	1.0	1.0	1.0
BATCH	OPERATION TIME	hrs/day		1.0				0.5	1.0	1.0	2.0	2.5	2.0	
	SOLID	TPH		0.0			0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	WATER	TPH		40			118.5	12.0	36.5	18	70	70	20	
	PULP FLOW	m³/h		67			118.5	12.0	36.5	18	70	70	20	

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
0	22JAN2015	ISSUED FOR USE	SBW	CL	KC	GC		
F	01MAY2015	RE-ISSUED FOR DESIGN	SBW	CL	KC	GC		
E	12DEC2014	RE-ISSUED FOR DESIGN	SBW	CL	KC	GC		
D	15AUG2014	ISSUED FOR DESIGN	SBW	JR	KC	GC		
C	17JUL2014	RE-ISSUED FOR APPROVAL	SBW	JR	KC	GC		
B	04JUL2014	ISSUED FOR APPROVAL	SBW	JR	KC	GC		
A	20MAY2014	ISSUED FOR CLIENT REVIEW/SQUAD CHECK	SBW	JR	KC	GC		

REF	NUMBER	TITLE
REFERENCES		

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STAMP/SEAL

NOT TO BE USED FOR CONSTRUCTION

APPROVED FOR _____

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE: RAINY RIVER GOLD PROJECT

PROJECT NO.	ACTIVITY NO.
100126	7000
SCALE	PACKAGE CODE
NTS	

	BY	DDMMMYY
DES	J.RUST	22MAY14
DRN	SBW	22MAY14
CHK		
APP		

newgold™ Rainy River Project

amec

SUBJECT: PROCESS
PROCESS FLOW DIAGRAM
WATER RECLAIM SHEET NO.1
21,000 TPD

AREA

CLIENT DWG. NO.

DRAWING NO. 100126-3200-DC00-PFD-0021.001 REV. 0

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CAD FILE: \\EDC01\PROJECTS\AMEC.COM\SITES\VP\100126\PGA\PFD\100126-3200-DC00-PFD-0021.DWG

SAVED: 26-Jun-15 3:28 PM PLOTTED: 26-Jun-15 4:35 PM USER: BATCHPLOT, GI

ISO A1-594x841

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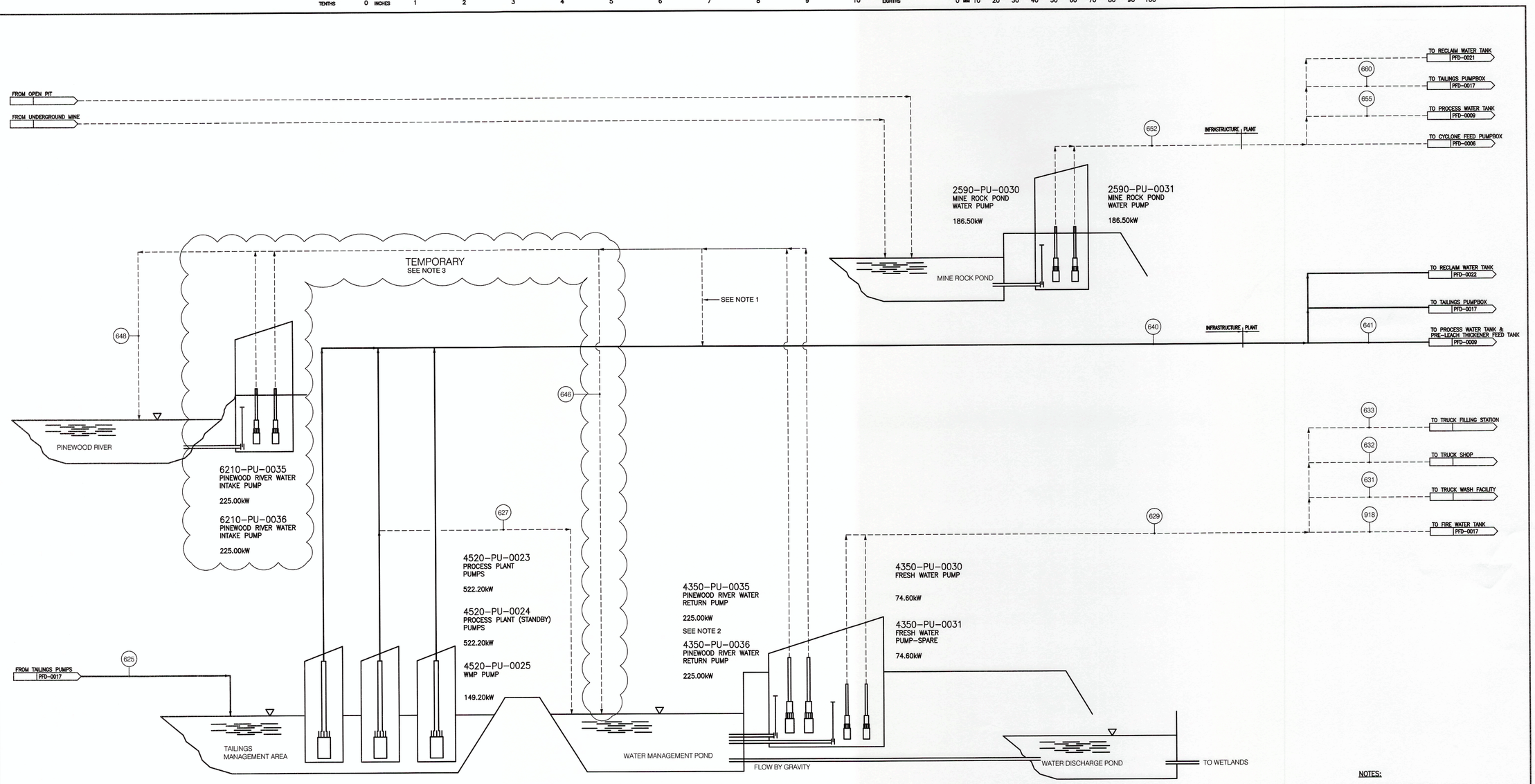

STREAM NO.			625	627	629	631	632	633	640	641	646	648	652	665	660	918
DESCRIPTION		Units														
NOMINAL	SOLID	TPH	952		0	0	0		0	0			0	0		
	WATER	TPH	1080		160	25	8		1080	0			535	535		
	PULP	TPH	2031		160	25	8		1080	0			535	535		
	PULP FLOW	m³/h	1414		160	25	8		1080	0			535	535		
PULP	PULP DENSITY	% solids	46.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SPECIFIC DENSITY - SOLIDS	t/m³	2.85	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SPECIFIC DENSITY - PULP	t/m³	1.44	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
BATCH	OPERATION TIME	hrs/day														
	SOLID	TPH		0.0	0.0	0.0	0.0	0.0			0.0	0.0				0.0
	WATER	TPH		3190	200	31	10	152			1041.7	1458.3			535	119
	PULP FLOW	m³/h		3190	200	31	10	152			1041.7	1458.3			535	119

Pump capacities should be confirmed with the Mechanical Equipment List (100126-3200-DE10-LST-0001) kept on file with New Gold

NOTES:

1. FOR START–UP INSTALL PUMP 4520–PU–0023 AT THE DESIGNATED LOCATION OF PUMP 4350–PU–0035 OR 4350–PU–0036.
2. PUMP 4350–PU–0035 AND 4350–PU–0036 ARE RETROFITTED FROM PUMP 6210–PU–0035 AND 6210–PU–0036 PRIOR TO PLANT START–UP.
3. PINEWOOD RIVER WATER PIPELINE TO REMAIN UNCHANGED AFTER TEMPORARY SERVICE.

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
0	22JUN2015	ISSUED FOR USE	SBW	CL	KC	GC		
G	01MAY2015	RE–ISSUED FOR DESIGN	SBW	CL	KC	GC		
F	23MAR2015	RE–ISSED FOR DESIGN	SBW	CL	KC	GC		
E	12DEC2014	RE–ISSUED FOR DESIGN	SBW	CL	KC	GC		
D	15AUG2014	ISSUED FOR DESIGN	SBW	JR	KC	GC		
C	17JUL2014	RE–ISSUED FOR APPROVAL	SBW	JR	KC	GC		
B	04JUL2014	ISSUED FOR APPROVAL	SBW	JR	KC	GC		
A	20MAY2014	ISSUED FOR CLIENT REVIEW/SQUAD CHECK	SBW	JR	KC	GC		

REF	NUMBER	TITLE

REFERENCES

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APPROVED FOR

CLIENT PROJECT MGR.	DEPARTMENT MGR.	PROJECT MGR.
	GC	JTA

PROJECT PHASE: RAINY RIVER GOLD PROJECT

PROJECT NO.	ACTIVITY NO.
100126	7000

SCALE: NTS

PACKAGE CODE:

	BY	DDMMMYY
DES	J.RUST	22MAY14
DRN	SBW	22MAY14
CHK		
APP		

newgold™ Rainy River Project

amec

SUBJECT: PROCESS PROCESS FLOW DIAGRAM WATER RECLAIM SHEET NO.2 21,000 TPD

AREA:

CLIENT DWG. NO.:

DRAWING NO. 100126–3200–DC00–PFD–0022.001 REV. 0

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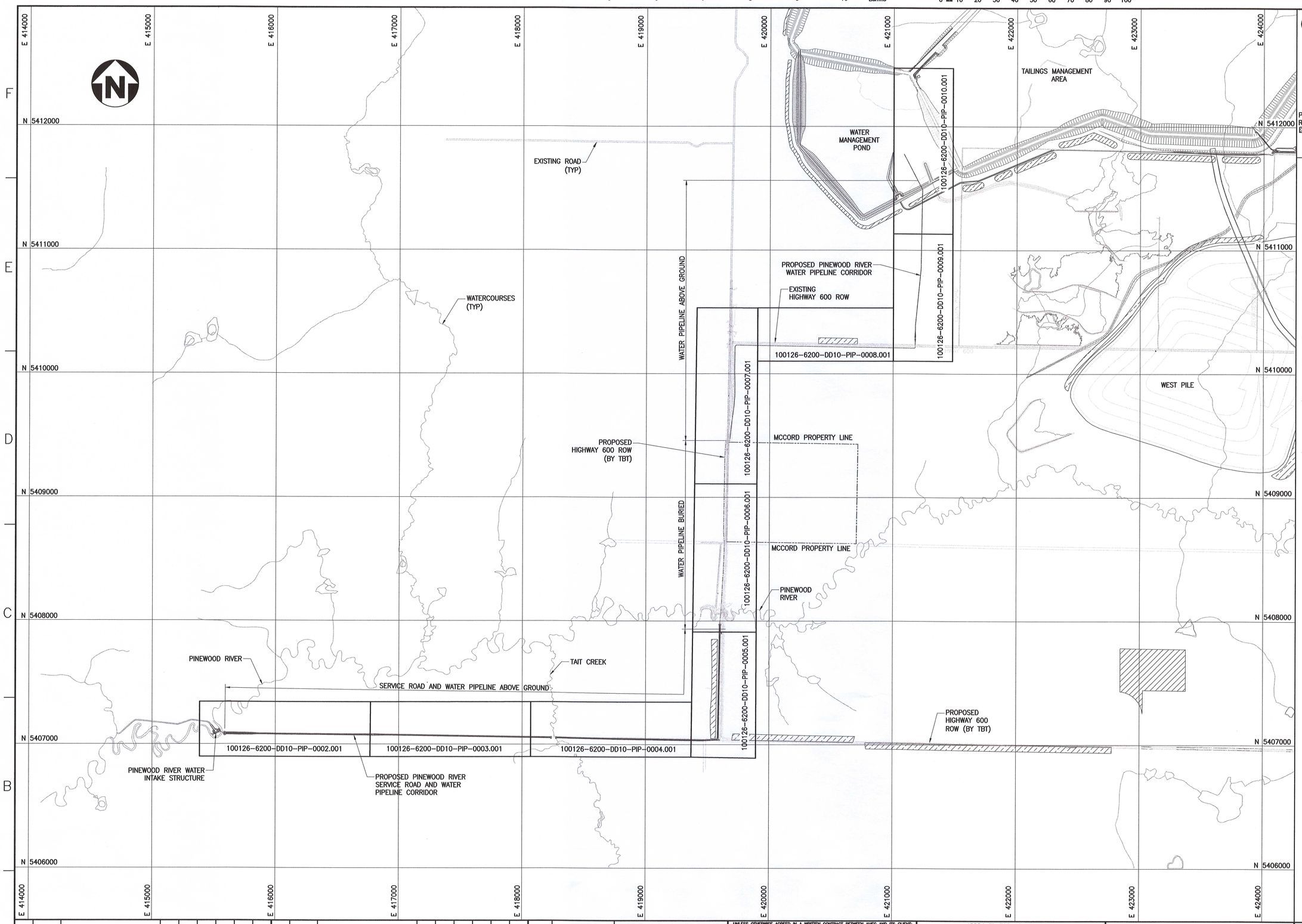
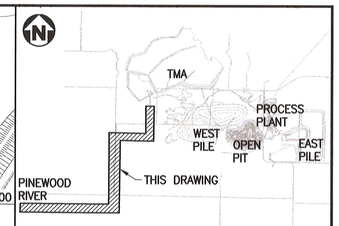
ISO A1–594x841





KEY PLAN

GENERAL NOTES:

1. GEOGRAPHIC COORDINATE SYSTEM SHOWN IS IN UTM NAD83, ZONE 15.
2. ALL COORDINATES, DIMENSIONS, AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. TOPOGRAPHIC DATA (LIDAR SURVEY) ARE FROM AERIAL DIGITAL PICTURES AND LASER SURVEY (LIDAR) PROVIDED BY LIDAR SERVICES INTERNATIONAL INC. OCTOBER, 2009. GROUND SURVEY FOR PINEWOOD RIVER WATER PIPELINE & SERVICE ROAD CORRIDOR PROVIDED BY TBT ENGINEERING.
4. CONTOURS ARE AT 1m INTERVALS.
5. TAILINGS, WATERCOURSE DIVERSIONS AND DAMS DRAWINGS PROVIDED BY AMEC E & I.
6. HIGHWAY 600 RELOCATION DRAWINGS PROVIDED BY TBT ENGINEERING.
7. INSTALL 4"ø KNIFE GATE DRAIN VALVES AT LOW POINTS, AND 4"ø CLASS 150 AIR RELEASE/ VACUUM BREAK VALVES AT HIGH POINTS.
8. INSTALL CULVERT-EQUALIZERS OVER SWAMPY TYPE 3 AND TYPE 4 ROAD SECTIONS. CULVERT-EQUALIZERS TO BE SPACED AT 150m (MAX), 2 X 300mmø HDPE AT EACH CROSSING.

LEGEND:

374 — LIDAR SURVEY CONTOUR

CULVERT

ABBREVIATIONS:

N	–	NORTHING
E	–	EASTING
m	–	METRE
H	–	HORIZONTAL
V	–	VERTICAL
ø	–	DIAMETER
℄	–	CENTERLINE
"	–	INCH
EL	–	ELEVATION
OD	–	OUTSIDE DIAMETER
HDPE	–	HIGH-DENSITY POLYETHYLENE

0m 150 300 450 600 750

1:15000

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REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
2	30APR15	PIPELINE CORRIDOR ALIGNMENT REVISED	SW	EM	AV	JJ	MO	
1	20NOV14	RE-ISSUED FOR CONSTRUCTION	SW	JJ	AV	JJ	MO	
0	24SEP14	ISSUED FOR CONSTRUCTION	KT	AB	AV	JJ	MO	
B	28AUG14	ISSUED FOR APPROVAL	AR	AB	AV	JJ	MO	
A	30JUL14	ISSUED FOR SQUAD CHECK/CLIENT REVIEW	AR	AB	AV	JJ	MO	

REF	NUMBER	TITLE
10	6200-DD10-PIP-0010.001	ROAD PLAN AND PROFILE STA 9+300 TO 10+300
9	6200-DD10-PIP-0009.001	ROAD PLAN AND PROFILE STA 8+460 TO 9+300
8	6200-DD10-PIP-0008.001	ROAD PLAN AND PROFILE STA 7+180 TO 8+460
7	6200-DD10-PIP-0007.001	ROAD PLAN AND PROFILE STA 6+400 TO 7+180
6	6200-DD10-PIP-0006.001	ROAD PLAN AND PROFILE STA 5+120 TO 6+400
5	6200-DD10-PIP-0005.001	ROAD PLAN AND PROFILE STA 3+840 TO 5+120
4	6200-DD10-PIP-0004.001	ROAD PLAN AND PROFILE STA 2+560 TO 3+840
3	6200-DD10-PIP-0003.001	ROAD PLAN AND PROFILE STA 1+280 TO 2+560
2	6200-DD10-PIP-0002.001	ROAD PLAN AND PROFILE STA 0+000 TO 1+280
1	2000-DD10-PLN-0001.001	GENERAL SITE PLAN

REFERENCES

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STAMP/SEAL

LICENSED PROFESSIONAL ENGINEER J. J. JACKSON 4/30/15 PROVINCE OF ONTARIO

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE: EPCM

PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
100126		DES	AV	30JUL14
		DRN	AR	30JUL14
SCALE	PACKAGE CODE	CHK	AB	30JUL14
1:15000		APP	JJ	30JUL14

newgold™ Rainy River Project

amec

SUBJECT: RAINY RIVER PROJECT PINEWOOD RIVER WATER INTAKE PIPELINE KEY PLAN

AREA 6200

CLIENT DWG. NO.

DRAWING NO. 100126-6200-DD10-PIP-0001.001 REV. 2

SAVED: 29-Apr-15 4:31 PM PLOTTED: 29-Apr-15 5:13 PM USER: WENG, SOPHIA

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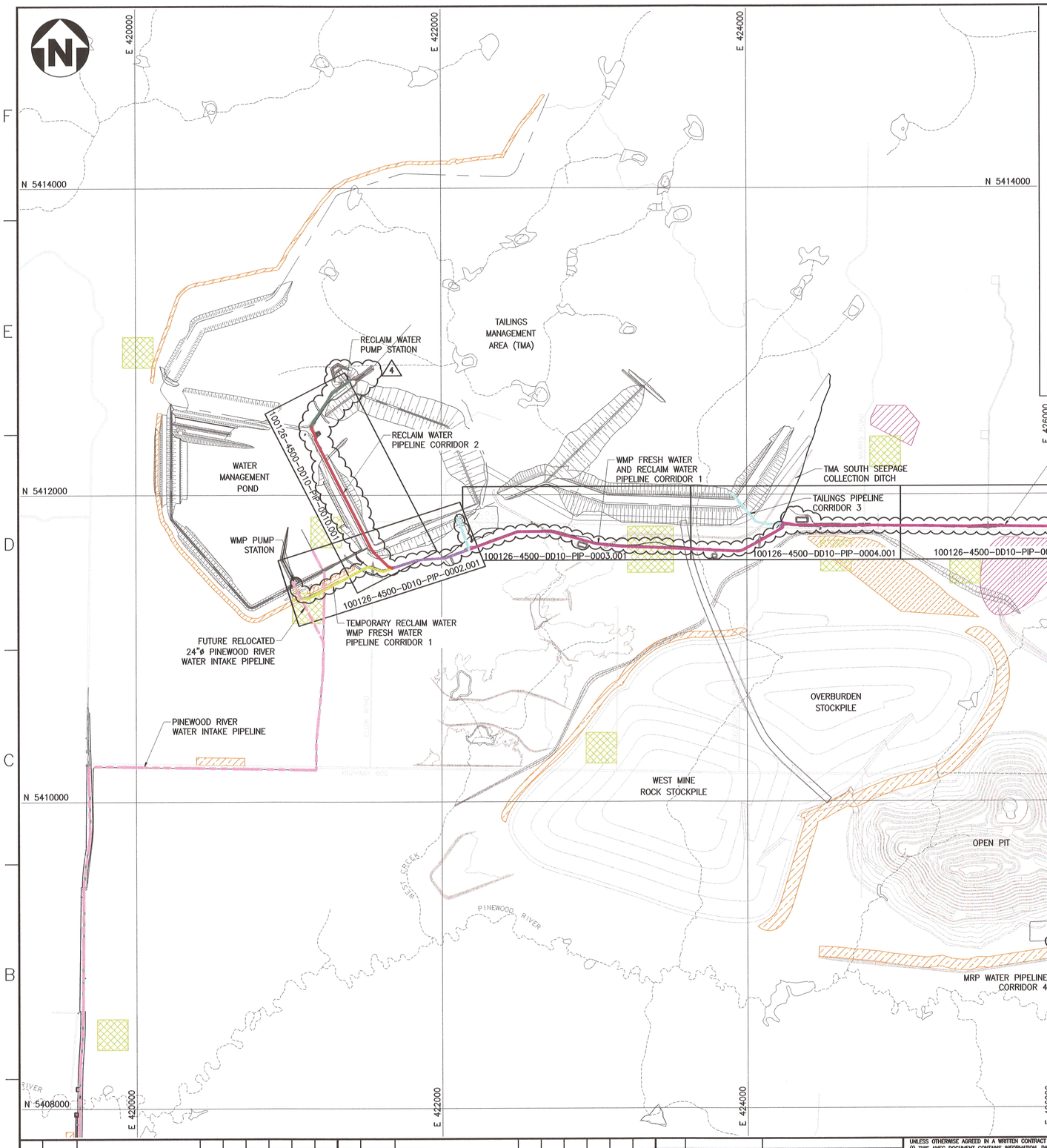
ISO A1 (594x841)

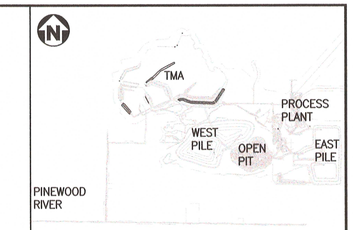


PIPELINE NOTES:

1. TAILINGS PIPELINES SHALL BE HDPE SDR9 (UP TO TMA) OR SDR11 (PIPING WITHIN TMA OR "ON-DAM") AS NOTED, PE4710.
2. RECLAIM PIPELINES SHALL BE HDPE SDR13.5, PE4710.
3. MINE ROCK POND PIPELINE SHALL BE HDPE SDR13.5, PE4710.
4. FRESH WATER PIPELINE SHALL BE HDPE SDR11, PE4710.
5. ALL HDPE PIPE JOINTS SHALL BE HEAT FUSED ON-SITE.
6. AIR RELEASE VALVES FOR THE TAILINGS PIPELINE SHALL BE 4" EZI-VAC AIR RELEASE/VACUUM BREAKER, EV100-20-UL-ANSI150 C/W FLUSH PORT AND ANTI-SURGE OPTIONS, OR APPROVED EQUIVALENT.
7. DRAIN VALVES FOR TAILINGS PIPELINE SHALL BE 6" KNIFE GATE VALVES AS PER ITEM CODE V4D3AA (HOLD) OF PIPING DESIGN STANDARD DOCUMENT PPE2JS, AS MANUFACTURED BY CLARKSON (MODEL KGF LUGGED CLASS 150 BOLT PATTERN), TECHNIGATE OR APPROVED EQUIVALENT.
8. SURGE SUPPRESSION VALVES FOR THE RECLAIM PIPELINE SHALL BE 4" VAL-MATIC 204C.2SV/1204FBE/4DPT, OR APPROVED EQUIVALENT.
9. COMBINATION AIR VALVES FOR THE RECLAIM, MRP AND FRESH WATER PIPELINES SHALL BE 4" AS PER ITEM CODE V9S2FA OF PIPING DESIGN STANDARD DOCUMENT PPE2JW, VENT-O-MAT SERIES RBX MODEL 2531 OR APPROVED EQUIVALENT.
10. DRAIN VALVES FOR THE RECLAIM PIPELINE SHALL BE 6" BUTTERFLY VALVES AS PER ITEM CODE V7J2AM OF PIPING DESIGN STANDARD DOCUMENT PPE2JW, BRAY SERIES 31 LUGGED OR APPROVED EQUIVALENT.
11. SURGE SUPPRESSION VALVES FOR THE MINE ROCK POND (MRP) PIPELINE SHALL BE 4" VAL-MATIC 804ASV/1204FBE/4DPT, OR APPROVED EQUIVALENT.
12. SURGE SUPPRESSION VALVES FOR THE FRESH WATER PIPELINE SHALL BE 3" VAL-MATIC 203C.2SV/1203FBE/3DPT, OR APPROVED EQUIVALENT.
13. ALL VALVES SHALL MEET THE REQUIRED DESIGN PRESSURE RATING.
14. THE TAILINGS PIPELINE SHALL BE LOCATED IN CONFINED CORRIDORS, WITH ALL STORMWATER RUNOFF OR SPILLAGE FROM THESE CORRIDORS DIRECTED TO THE CONTAINMENT PONDS. THE CORRIDORS WILL USE CONTINUOUS EARTH BERMS TO PROVIDE THE CONTAINMENT. NO EXTERNAL STORMWATER RUNOFF WILL BE DIRECTED TO THESE TAILINGS CORRIDORS.

ABBREVIATIONS:

N	–	NORTH
E	–	EAST
℄	–	CENTRELINE
"	–	INCH
ø	–	DIAMETER
R	–	RADIUS
L	–	LENGTH
ø	–	DIAMETRE
m	–	METRE
mm	–	MILLIMETRE
EX.	–	EXISTING
PROP	–	PROPOSED
TYP.	–	TYPICAL
EL.	–	ELEVATION
%	–	SLOPE PERCENT
H:V	–	HORIZONTAL : VERTICAL
C/W	–	COMPLETE WITH
D∞	–	MEDIUM VALUE OF PARTICLE SIZE DISTRIBUTION
STA	–	STATION
BVCS	–	BEGINNING OF VERTICAL CURVE STATION
BVCE	–	BEGINNING OF VERTICAL CURVE ELEVATION
EVCS	–	END OF VERTICAL CURVE STATION
EVCE	–	END OF VERTICAL CURVE ELEVATION
LVC	–	LENGTH OF VERTICAL CURVE
PVI	–	POINT OF VERTICAL INTERSECTION
K	–	RATE OF VERTICAL CURVE
PI	–	POINT OF INTERSECTION
CSP	–	CORRUGATED STEEL PIPE
TMA	–	TAILINGS MANAGEMENT AREA
WMP	–	WATER MANAGEMENT POND
MRP	–	MINE ROCK POND
NAD	–	NORTH AMERICAN DATUM
UTM	–	UNIVERSAL TRANSVERSE MERCATOR GEOGRAPHIC COORDINATE SYSTEM
NTS	–	NOT TO SCALE
CPL	–	STORMWATER CULVERT CROSSING PIPELINE
CP	–	PIPELINE CULVERT FOR CROSSING ROAD



KEY PLAN SCALE: NTS

GENERAL NOTES:

1. GEOGRAPHIC COORDINATE SYSTEM SHOWN IS IN UTM NAD83, ZONE 15.
2. ALL COORDINATES, DIMENSIONS, AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
3. TOPOGRAPHIC DATA (GROUND SURVEY) ARE FROM TBT ENGINEERING CONSULTING GROUP, REF. DWG. PLANT SITE TOPO 13251-1-0001, DATED DEC. 9, 2013.
4. TOPOGRAPHIC DATA (LIDAR SURVEY) ARE FROM AERIAL DIGITAL PICTURES AND LASER SURVEY (LiDAR) PROVIDED BY LIDAR SERVICES INTERNATIONAL INC. OCTOBER, 2009.
6. FOR GEOTECHNICAL INFORMATION REFER TO: GEOTECHNICAL DESIGN RECOMMENDATIONS REPORT 3098004-003000-A1-ETR-0001-00 BY AMEC ENVIRONMENT AND INFRASTRUCTURE, DATED JULY 2014.

LEGEND:

- QUARRIES
- TOPSOIL STOCKPILES
- LAYDOWN AREAS
- 24"ø TEMPORARY RECLAIM WATER PIPELINE (ABOVE GROUND) 10"ø WMP FRESH WATER PIPELINE (UNDERGROUND)
- 24"ø RECLAIM WATER PIPELINE (ABOVE GROUND) 10"ø WMP FRESH WATER PIPELINE (UNDERGROUND)
- 24"ø RECLAIM WATER PIPELINE (ABOVE GROUND) 24"ø TAILINGS PIPELINE (ABOVE GROUND) 10"ø WMP FRESH WATER PIPELINE (UNDERGROUND)
- 24"ø RECLAIM WATER PIPELINE (ABOVE GROUND) 24"ø TAILINGS PIPELINE (ABOVE GROUND) 20"ø MRP WATER PIPELINE (ABOVE GROUND)
- 24"ø RECLAIM WATER PIPELINE (ABOVE GROUND)
- 24"ø TAILINGS PIPELINE (ABOVE GROUND)
- 10"ø WMP FRESH WATER PIPELINE (UNDERGROUND) 20"ø MRP WATER PIPELINE (UNDERGROUND)
- 20"ø MRP WATER PIPELINE (UNDERGROUND)
- 20"ø MRP WATER PIPELINE (ABOVE GROUND)
- 2 x 24"ø RECLAIM WATER PIPELINE (ABOVE GROUND) 30" TMA-WMP RECLAIM WATER PIPELINE (ABOVE GROUND)
- 24"ø PINEWOOD RIVER WATER INTAKE PIPELINE

0m 150 300 450 600 750
1:15000

REV	DDMMMYY	REVISION / ISSUE DESCRIPTION	DRN	CHK	APP	APP	APP	APP
4	15MAY17	RE-ISSUED FOR CONSTRUCTION	AR	JJ	MK			
3	29APR16	PIPELINE CORRIDOR 1 RE-ALIGNMENT	AR	JJ	GC			
2	22OCT15	SOUTH RUNOFF POND REVISED	AR	JJ	GC			
1	05JUN15	RE-ISSUED FOR CONSTRUCTION	AR	SW	JJ	GC		
0	13FEB15	ISSUED FOR CONSTRUCTION	SW	LA	AV	JJ	MO	
A	19NOV14	ISSUED FOR SQUAD CHECK/CLIENT REVIEW	AR	JJ	AV	JJ	MO	

REF	NUMBER	TITLE
11	6200-DD10-PIP-0001.001	PINEWOOD RIVER WATER INTAKE PIPELINE
10	4500-DD10-PIP-0010.001	PLAN & PROFILE
9	4500-DD10-PIP-0009.001	PLAN & PROFILE
8	4500-DD10-PIP-0008.001	PLAN & PROFILE
7	4500-DD10-PIP-0007.001	PLAN & PROFILE
6	4500-DD10-PIP-0006.001	PLAN & PROFILE
5	4500-DD10-PIP-0005.001	PLAN & PROFILE
4	4500-DD10-PIP-0004.001	PLAN & PROFILE
3	4500-DD10-PIP-0003.001	PLAN & PROFILE
2	4500-DD10-PIP-0002.001	PLAN & PROFILE
1	2000-DD10-PLN-0001.001	GENERAL SITE PLAN

REFERENCES

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STAMP/SEAL

LICENSED PROFESSIONAL ENGINEER J. J. JACKSON 5/17/17 PROVINCE OF ONTARIO

APPROVED FOR CONSTRUCTION

CLIENT PROJECT MGR. DEPARTMENT MGR. PROJECT MGR.

PROJECT PHASE: EPCM

PROJECT NO.	ACTIVITY NO.		BY	DDMMMYY
100126		DES	AV	19NOV14
SCALE	PACKAGE CODE	DRN	AR	19NOV14
1:15000		CHK	JJ	19NOV14
		APP	JJ	19NOV14

newgold™ Rainy River Project

amec

SUBJECT: RAINY RIVER PROJECT TAILINGS & RECLAIM WATER PIPELINES KEY PLAN

AREA 4500

CLIENT DWG. NO.

DRAWING NO. 100126-4500-DD10-PIP-0001.001 REV. 4

SAVED: 15-May-17 10:37 AM PLOTTED: 15-May-17 10:48 AM USER: RODRIGUEZ, ACHILLES

CAD FILE: P:\CAD\CIVIL\DWG\100126-4500-DD10-PIP-0001.001.DWG

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APPENDIX C

NEW GOLD TAILINGS, HEAP LEACH AND WASTE ROCK FACILITIES MANAGEMENT POLICY

newgold

Tailings, Heap Leach and Waste Rock Facilities Management Policy

New Gold Inc. and its subsidiaries (together "**New Gold**") are committed to excellence in the management of tailings, heap leach and waste rock storage facilities. We will accomplish this by adopting internationally recognized standards including the Mining Association of Canada's *Towards Sustainable Mining* Tailings Management protocol wherever applicable.

New Gold makes the following commitments at all of its operations and projects:

- Identifying, assessing and controlling risks associated with tailings, heap leach and waste rock storage facilities.
- Ensuring that all aspects of our tailings, heap leach and waste rock storage facilities comply with regulatory requirements, sound engineering practice and company standards through regular inspection, program review and external audit.
- Locating, designing, constructing, operating, decommissioning and closing our tailings, heap leach and waste rock storage facilities so that all structures are stable and that all solids and water within the designated areas are managed to minimize or prevent possible pollution.
- Training our employees to enable them to carry out their responsibilities with regard to tailings, heap leach and waste rock storage facilities management.
- Communicating with Communities of Interest in order to take into account their concerns and considerations with regard to tailings, heap leach and waste rock storage.

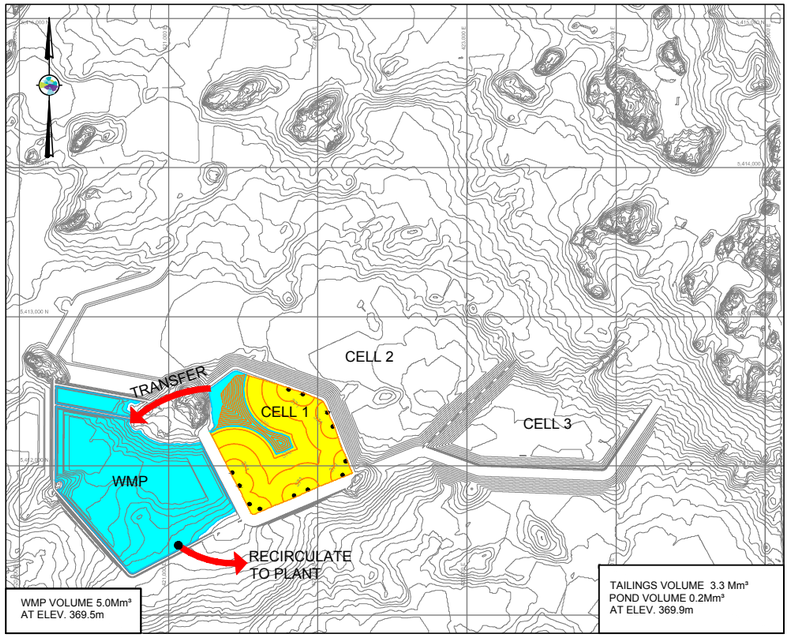
New Gold believes that by adopting these commitments, the safe storage of tailings, ore and waste rock will be achieved and future Communities of Interest will not be adversely impacted by their existence.

<Original signed by>

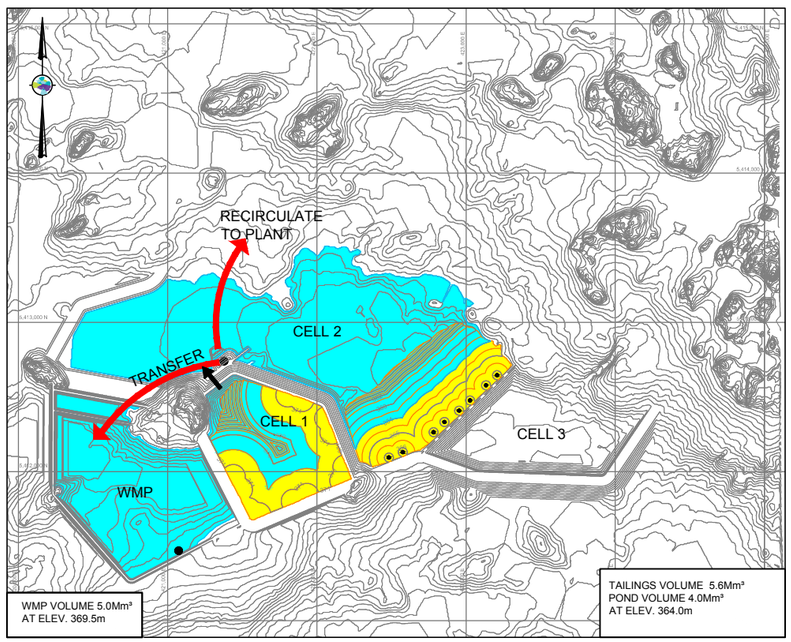
Hannes Portmann
President and CEO

APPENDIX D

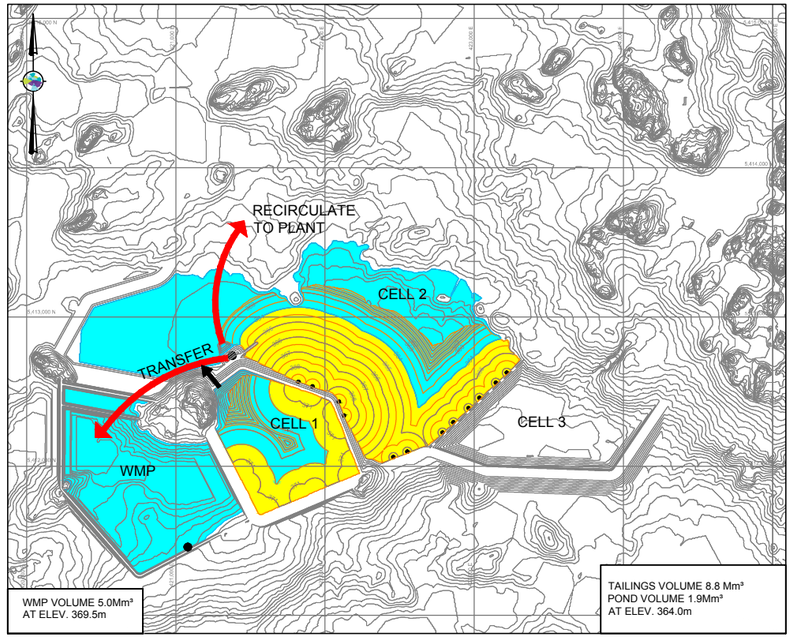
TAILINGS DEPOSITION PLAN



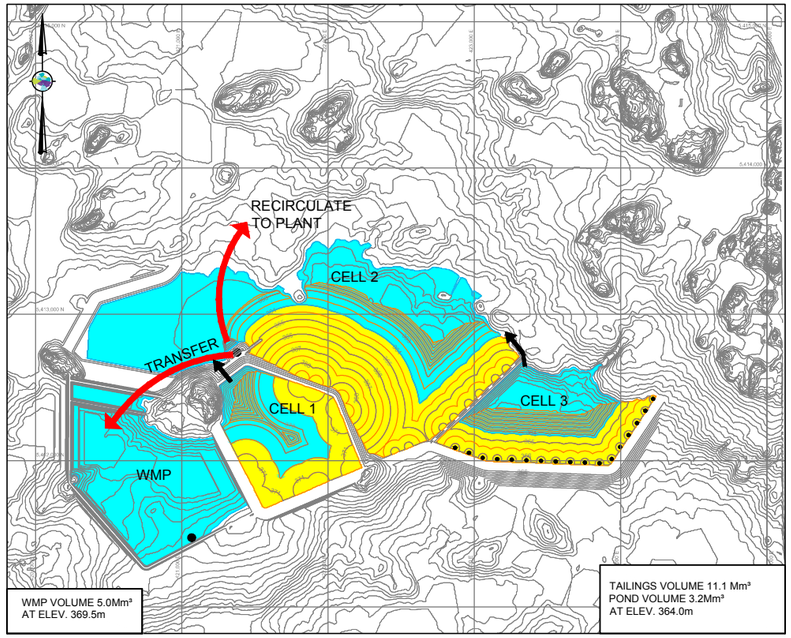
A) TAILINGS DEPOSITION PLAN CELL 1 - 6 MONTHS



B) TAILINGS DEPOSITION PLAN CELL 2 - 11 MONTHS



C) TAILINGS DEPOSITION PLAN CELL 2 - 18 MONTHS



D) TAILINGS DEPOSITION PLAN CELL 3 - 23 MONTHS

NOTES:

1. RECIRCULATION TO THE PROCESSING PLANT VIA FIXED PUMPING STATION.
2. EXCESS WATER WILL BE TRANSFERRED TO THE WATER MANAGEMENT POND ANNUALLY BY PUMPING.
3. THE NORMAL POND VOLUME WILL FLUCTUATE SEASONALLY.

ASSUMED TAILINGS DEPOSITION PERAMETERS

- CELL 1:
- BEACH SLOPE ABOVE POND - 0.5%
- SLOPE BELOW POND - 4%
- TAILINGS DRY DENSITY - 1.1 t/m³

- CELL 2 AND CELL 3:
- BEACH SLOPE ABOVE POND - 1%
- SLOPE BELOW POND - 4%
- TAILINGS DRY DENSITY - 1.41 t/m³

- TAILINGS PRODUCTION: 21,000 t/day

LEGEND:

- DEPOSITED TAILINGS
- POND
- PUMPING STATION (WET WELLS)
- TAILING SPIGOTS
- OVERFLOW SPILLWAY

0 0.5 1 2Km
SCALE

CLIENT LOGO: newgold Rainy River Project

CLIENT: NEW GOLD INC.

Amec Foster Wheeler Environment & Infrastructure
160 Traders Boulevard East
Mississauga, Ontario, Canada L4Z 3K7

DWN BY:	SC
CHK'D BY:	DR
DATUM:	NAD 83
PROJECTION:	UTM
SCALE:	AS SHOWN

COMPANY LOGO: amec foster wheeler

PROJECT: RAINY RIVER PROJECT
DETAILED DESIGN

TITLE: TAILINGS DEPOSITION PLAN

DATE:	APRIL 2017
PROJECT NO:	TC150321
REV. NO.:	A
FIGURE No.	3

P:\2015\Projects\TC150321_New Gold_ Dam&Site_Eng\11_CAD\03_FIGURES\05-TMA TAILINGD DEPO CELL 1,2,3\TMA TAILINGS DEPO PLAN.dwg – Layout1 – Apr. 27, 2017 10:51am – svetlana.cronkhite

APPENDIX E

PROCESS WATER BALANCE OVERVIEW

Memorandum

Date: April 28, 2017

To: Design Brief – Appendix A

From: Norman Schwartz

Ref: TC150321.10000B

Re: **Rainy River Project Development**
TMA Cell 2 and WMP Water Balance
RRP-GEO-REP-026 R1 **ISSUED FOR USE**

1.0 INTRODUCTION

Amec Foster Wheeler Environment & Infrastructure, a Division of Amec Foster Wheeler Americas Limited (Amec Foster Wheeler) was retained by New Gold Inc. (New Gold) to provide engineering services to prepare the detailed design of an internal tailings depositional cell (TMA Cell 2) located within the footprint on the ultimate Tailings Management Area (TMA) at the Rainy River Project near Fort Frances, Ontario. This includes preparing a water balance for TMA Cell 2 to evaluate water availability, water storage capacity and requirements for tailings deposition in TMA Cell 2. This memorandum presents the input data, calculations, operational and design considerations and results for the water balance.

2.0 DESIGN BASIS

- Commissioning Begins — September 14, 2017
- Commercial Production — October 31, 2017
- Assumed Production — October 1, 2017 (for water balance analysis)

Mine Production

- Start Date — October 2017 (into TMA Cell 1)
- Production Rate — 21,000 t/day

Amec Foster Wheeler Environment & Infrastructure
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amecfw.com

Tailings Properties

- Solids content of slurry — 46.9 % solids by mass
- Specific gravity of solid tailings particles — 2.82
- Void ratio of deposited tailings — 1.0
- Tailings water content at saturation — 35.5%
- Dry density of settled tailings — 1.41 t/m^3

TMA Cell 2

- Design capacity — 12 months
- Dam crest elevation — 366.5 m
- Spillway invert elevation — 364.7 m
- Minimum operational pond volume — 500,000 m^3 (for settling of solids)
- Slope of tailings beach and pond — 1.0% and 4%
- Tailings slurry inflow rate — 23,776 m^3/day
- Reclaim rate to mill — 23,556 m^3/day
- Tailings pore water losses — 7,447 m^3/day
- TMA Cell 2 begins impounding runoff — April 2018
- Initial TMA Cell 2 water level — 357.00 m (0 m^3 of storage)
- Tailings deposition begins — April 2018
- Reclaim from TMA Cell 2 begins — After WMP volume is less than 1.0 Mm^3
- TMA Cell 2 to WMP transfer rate (treat) — 40,000 m^3/day
- TMA Cell 2 to TMA Cell 3 transfer rate — 40,000 m^3/day

TMA Cell 3

- Cell 3 begins impounding runoff — June 2018
- Cell 3 is available for pumping from Cell 2 — July 2018
- Cell 3 Dam attains full storage capacity — September 2018

WMP

- Dam crest elevation — 371.5 m
- Spillway invert elevation — 370.5 m
- Maximum allowable water level — 369.5 m (5.0 Mm^3 of storage)
- Initial WMP water level — 365.10 m (2.0 Mm^3 of storage)
- Reclaim rate to mill — 23,556 m^3/day (starting April 1, 2018)
- Reclaim from WMP — Until WMP volume < 1.0 Mm^3

Note: All dates provided in design basis are the first of the month

3.0 DESIGN CRITERIA

This water balance evaluation was completed to determine operating rules for TMA Cell 2 and the WMP during the operating life of TMA Cell 2 (April 2018 – April 2019). The water balance was used to evaluate and determine the necessary conditions so that sufficient water inventory will be available for processing plant operation in the winter of 2018, and so that adequate storage will be provided below the spillway invert to contain the Environmental Design Flood (EDF). The water balance evaluation was carried out for average, 1:20 wet and 1:20 dry climatic and streamflow conditions.

Water contained in the WMP needs to be of a suitable quality for discharge to the environment. During the initial 6 months of operation, the WMP will receive tailings-contact water from TMA Cell 1 (operating months: 1 October 2017 to 31 March 2018), with a projected water inventory of 2 Mm^3 (1.0 Mm^3 of free water and 1.0 Mm^3 as ice) at the end of this period. At the start of TMA Cell 2 operation (April 2018), TMA Cell 2 is expected to fill quickly due to the typically high runoff in April, May and June. To manage the increase in TMA Cell 2 water volume, it is proposed to transfer water from TMA Cell 2 to the WMP in this period, which will increase the WMP volume. In addition, it is planned to pump from the Pinewood River (to the extent permitted) to increase the WMP inventory as a contingency against possible dry conditions in summer or fall. The WMP will be maintained below its maximum operating water level (MOWL) by reclaiming water from it to the processing plant during the first few months of TMA Cell 2 operation. During the drawdown of the WMP, storage in TMA Cell 3 will become available to transfer TMA Cell 2 excess water. Once the Water Treatment Plant (WTP) becomes available it will be used to treat and transfer excess water from TMA Cell 2 to the WMP. From that point on, there will be blending of untreated residual effluent (minimized to the extent possible) with treated TMA Cell 2 effluent in the WMP.

In order to provide the system with sufficient flexibility to discharge to the environment in the spring of 2019, the WTP should be available in September 2018 to treat water entering the WMP from TMA Cell 2. Delaying startup of the WTP could result in filling both TMA Cell 2 and the WMP with untreated water, which is not recommended due to the project risk of discharging out of compliance water if high runoff events occur with both ponds nearly full. A flow schematic for site water management is provided in Figure 1.

4.0 AVAILABLE STORAGE

Capacity for water storage in the TMA Cell 2 will reduce during the 12-month period with progressive tailings deposition. Stage-storage curves for end of month 2, month 6, and month 12 were developed based on tailings deposition modelling. For intermediate months, stage-storage curves were interpolated for use in the water balance. The stage-storage relationships for the TMA Cell 2 and WMP are provided in Figures 2 and 3, respectively.

New Gold has indicated that TMA Cell 3 will be completed and available to impound water on June 1, 2018. For the purposes of this water balance analysis, it has been assumed that TMA Cell 3 storage will become available progressively between June 1 and September 1, 2018.

5.0 METEOROLOGICAL DATA

Site runoff is represented in the water balance based on mean annual precipitation of 694.8 mm. Annual precipitation was re-distributed using the monthly distribution of streamflow from the Pinewood River to account for snowmelt (distribution based on WSC gauge 05PC023). Return period estimates for the 1:20 wet and dry years were generated using the Gumbel double exponential distribution for annual extremes. Mean annual pond evaporation is 538 mm. The meteorological data used for the water balance are listed in Table 1.

Table 1: Mean Annual Meteorological Data

Month	Average Year Available Precipitation (mm)[1]	1:20 Wet Year Available Precipitation (mm)[2]	1:20 Dry Year Available Precipitation (mm)[2]	Pond Evaporation (mm)[1]
Jan	4.51	6.20	2.66	0
Feb	2.72	3.75	1.60	0
Mar	61.12	84.01	35.99	0
Apr	221.10	303.92	130.20	0
May	117.31	161.25	69.08	109
Jun	118.97	163.54	70.06	110
Jul	59.29	81.49	34.91	129
Aug	8.16	11.22	4.81	104
Sep	20.41	28.05	12.02	63
Oct	34.89	47.96	20.55	23
Nov	38.37	52.75	22.60	0
Dec	7.95	10.93	4.68	0
Year	694.8	955.1	409.2	538

Notes:

1. Reference: Precipitation was distributed according to average streamflow at Pinewood River WSC gauge 05PC023 in order to simulate runoff
2. 1:20 wet year and 1:20 dry year estimates are based on Barwick, Ontario climate data from Environment Canada and were derived using the Gumbel double exponential distribution for annual extremes.

6.0 HYDROLOGY

Runoff was calculated as the product of monthly precipitation, catchment area, and runoff coefficient. The catchment areas and runoff coefficients used are provided in Table 2. Runoff from the open pit and Mine Rock Pond (MRP) areas were assumed to be pumped to TMA Cell 2. Runoff from the Start-Up Cell (TMA Cell 1) will passively overflow to TMA Cell 2.

Table 2: Hydrologic Parameters for Water Balance

Parameter	TMA Cell 1	TMA Cell 2	TMA Cell 3	WMP	Open Pit	Mine Rock Pond
Area (km^2)	0.68	8.22	2.11	1.11	3.17	5.34
Runoff Coefficient	99.2%	54.0%	53.5%	83.6%	44.5%	45.8%

Runoff coefficients for the water balance are the same as those utilized in the detailed design water balance (AMEC, 2014). The MRP drainage area has a pond area of approximately 0.66 km^2, and the remaining area was assumed to be 75% natural ground cover and 25% waste rock. The open pit area (including upstream catchment area) of 3.17 km^2 consists of 0.54 km^2 is open pit (Phase 1 open pit area) and the remainder natural ground cover. A constant seepage inflow of 3,000 m^3/day has been assumed as groundwater inflow into the open pit (ultimately pumped to TMA Cell 2).

7.0 INITIAL CONDITIONS

TMA Cell 2 is assumed to be empty April 1, 2018 and to begin impounding water immediately. The WMP is expected to have approximately 2.0 Mm^3 of water on April 1, 2018 based on the pre-winter inventory calculation from the TMA Cell 1 water balance (Amec Foster Wheeler, 2016b). The pre-winter inventory was the minimum amount of water required to run the mill through the winter of 2017/2018. TMA Cell 3 is assumed to be empty June 1, 2018 and to begin impounding runoff immediately.

8.0 PUMPING FROM PINEWOOD RIVER

Depending on the volume stored in the WMP on April 1, 2018, it may be advisable to pump water from the Pinewood River to the WMP to build inventory for processing needs to offset a possible shortfall in the event of dry conditions later in the year. This water balance assessment indicates that pumping from the Pinewood River is recommended if the total water volume in the WMP and TMA Cell 2 is below 4 Mm^3. The pumped volume was estimated based on the following rules which reflect PTTW water taking restrictions and the Pinewood River pumphouse capacity (Amec Foster Wheeler, 2016a):

- Water taking from the Pinewood River is restricted to not more than 20% of the river flow from the period of March 1 through July 31, and to not more than 15% of the river flow for the period from August 1 through November 30, as measured at the Pinewood River pumphouse location;

- Pinewood River water takings must take into consideration watershed capture at the Mine site (i.e., water captured at the Mine site is to be considered as part of the 20%/15% Pinewood River water taking);

- Additional to the 20%/15% water taking restrictions, direct water taking from the Pinewood River is not to reduce downstream flows in the river to a value of <10,000 m^3/d during the spring period, or to less than 5,000 m^3/d during the summer/fall period;

- No water is to be directly taken from the Pinewood River during the winter period (December 1 to February 28); and

- The Pinewood River pumphouse capacity is restricted (by the equipment) to approximately 25,000 m^3/d.

The simulated pumped flows from the Pinewood River are provided in Table 3.

Table 3: Available Water Takings from Pinewood River to WMP

Month	Average Year (1984)	Wet Year (1992)	Dry Year (1987)
	m^3/month	m^3/month	m^3/month
Apr-2018	750,000	750,000	107,932
May-2018	0	0	317,708
Jun-2018	0	0	190,393
Jul-2018	0	0	-
Aug-2018	0	0	-
Sep-2018	0	0	17,683
Oct-2018	483,386	0	15,652
Total	1,233,386	750,000	633,716

Notes:
- Volume of water pumped from the Pinewood River may vary depending on wet or dry conditions for precipitation
- Pumping from Pinewood River only occurs if volume in TMA Cell 2 and WMP is less than 4.0 Mm^3

9.0 MILL RECLAIM

During the initial months of TMA Cell 2 tailings deposition starting on April 1, 2018, mill reclaim will be taken from the WMP (similar to during TMA Cell 1 deposition, where all reclaim was taken from the WMP). Reclaiming from the WMP will continue until the WMP volume is reduced to below 1.0 Mm^3 in order to help build an initial pond inventory in TMA Cell 2, and will also help extract tailings-contact water from WMP to the extent possible. After the WMP volume is reduced to below 1.0 Mm^3, mill reclaim will be shifted to TMA Cell 2 to limit the TMA Cell 2 tailings pond volume as tailings deposition continues to reduce available storage.

10.0 WATER TREATMENT

During the initial stages of tailings deposition in TMA Cell 2 there will be no discharge from the WMP since water quality is not anticipated to be acceptable for release to the environment (note that during tailings deposition in TMA Cell 1, all reclaim was taken from the WMP for this reason). Once reclaim is shifted to TMA Cell 2, the WMP should have a relatively small volume; however water quality will still not be suitable for discharge to the environment, and water treatment will be necessary prior to discharge (either through bleed flow to the wetland, or through the effluent pipeline to the Pinewood River).

The proposed Water Treatment Plant (WTP) will be located within the WMP and will provide treatment as water is transferred from TMA Cell 2 to the WMP (for ultimate discharge to the environment). The proposed WTP is designed to operate at 40,000 m^3/day for 6 months of the year (AMEC, 2014). The timing on the need for water treatment will vary depending on the climactic conditions of 2018, however it is expected to be required by November 1, 2018 if precipitation is above average. As a contingency to deal with the possibility of significant wet conditions, it is recommended that the WTP be operational by September 1, 2018. This accounts for the use of storage in TMA Cell 3 which will delay the need for the treatment plant from the early summer of 2018 to the fall of 2018. The treatment plant is needed due to TMA Cell 2 having a relatively limited storage volume combined with its large catchment area (almost as large as the ultimate TMA). Once the treatment plant is operational, the water management strategy for the TMA would be similar to the original design (TMA transfer to WMP in the summer, and WMP discharge to the environment in the spring and fall).

11.0 EFFLUENT DISCHARGE

Following the commissioning of the WTP, water in the WMP will be suitable for discharge to the environment, provided that no discharge occur until the WMP fills to a volume of approximately 5.0 Mm^3 to provide sufficient dilution of its remaining 1Mm^3 of tailings contact water with treated water. During a wet year it would be necessary to pump water from the WMP to the Pinewood River in the spring of 2019 (following the duration of this simulation). The timing of the commissioning of the WTP in the fall of 2018 is critical to ensuring that the water in the WMP is of sufficient quality for discharge to the Pinewood River.

12.0 RESULTS

The following results of the water balance evaluation are based on TMA Cell 3 being available for water storage by June 1, 2018, and the WTP being available by September 1, 2018. In this evaluation, all pumped withdrawals from TMA Cell 2 (whether to the WMP, to the WTP, or to TMA Cell 3) are assumed to be at a rate of 40,000 m^3/day. The timing of these withdrawals should be determined based on the storage available in TMA Cell 2, TMA Cell 3 and the WMP (further details are provided in Section 14 below).

Table 4 provides a summary of the cumulative water inputs to the TMA during TMA Cell 2 operation. This is the net inflow (i.e. inflow minus outflow) on a cumulative basis, representing the total water in the system that requires storage (or discharge).

Table 4: Cumulative Net Water Inputs to TMA during TMA Cell 2 Operation

End of Month	Cumulative Inputs - Average Year	Cumulative Inputs - 1:20 Wet	Cumulative Inputs - 1:20 Dry
April 2018	2,000,000	2,000,000	2,000,000
May 2018	4,737,729	5,535,560	3,220,060
June 2018	5,374,749	6,595,891	3,710,215

End of Month	Cumulative Inputs - Average Year	Cumulative Inputs - 1:20 Wet	Cumulative Inputs - 1:20 Dry
July 2018	6,086,384	7,787,172	4,085,840
August 2018	6,078,090	8,017,892	3,866,379
September 2018	5,650,139	7,589,852	3,490,708
October 2018	5,484,569	7,506,546	3,283,697
November 2018	6,109,474	7,788,731	3,286,492
December 2018	6,380,357	8,214,318	3,387,591
January 2019	6,319,059	8,185,064	3,291,125
February 2019	6,220,785	8,104,984	3,172,884
March 2019	6,117,479	8,012,662	3,057,522
April 2019	6,847,735	8,973,362	3,301,749
	Cumulative net water inputs to the TMA consist of inputs minus outputs. Inputs consist of runoff (TMA Cell 1, TMA Cell 2, TMA Cell 3, MRP, open pit), open pit groundwater, and water in tailings slurry Outputs consist of pond evaporation (TMA Cell 1, TMA Cell 2, TMA Cell 3, MRP), reclaim to mill, and tailings pore water losses		

Figure 4 is a summary chart which shows the cumulative net inflow as shown in Table 4 versus total available storage in TMA Cell 2, TMA Cell 3 and the WMP. Note that the total storage available is below the MOWL providing an allowance for storage of the EDF event. The total storage in the WMP will be reduced from around 5.0 Mm^3 to 1.0 Mm^3 in the fall of 2018 to ensure acceptable water quality in the WMP once treated effluent is available for 4:1 dilution of tailings contact water. Figure 4 indicates that the cumulative net inflow volume can be managed below the MOWL by sharing the storage volume available in TMA Cell 2, TMA Cell 3 and the WMP, provided that treatment is available September 1, 2018. Under the average and 1:20 wet year scenario, water will need to be stored in TMA Cell 3 prior to the WTP coming online in September 2018. The timing of TMA Cell 3 storage becoming available and the WTP are critical items. Sufficient pumping infrastructure between TMA Cell 2, TMA Cell 3 and the WMP will be required to ensure the storage volumes can be fully utilized (especially in the 1:20 wet scenario).

13.0 CONCLUSIONS

The results of the analysis indicate that TMA Cell 2 and the WMP can be operated under a variety of climatic conditions. The analysis assumes an initial inventory of 2.0 Mm^3 of storage in the WMP, however should there be more water in the WMP on April 1, 2018 the WTP may be required earlier than September 2018. In such a case of a higher initial inventory in the WMP, no water from the Pinewood River should be taken in the spring of 2018. TMA Cell 3 must become available for water storage over the period of June 1 - September 1, 2018 prior to the commissioning of the WTP in September 2018.

14.0 RECOMMENDATIONS FOR TMA CELL 2 OPERATION

During the operating life of TMA Cell 2, reclaim water will be sourced from the WMP and TMA Cell 2. The Water Treatment Plant should be available in September 2018 to limit the volume of water in TMA Cell 2 in the event of above average precipitation conditions in 2018. Without the WTP, the ongoing tailings deposition would reduce the available water storage such that the Environmental Design Flood event may not be contained. Discharge from the WMP to the Pinewood River is not expected to be required until the spring of 2019.

The following water management strategy has been developed to maintain the pond volume in TMA Cell 2 below its maximum operating level by maximizing the use of available storage in other areas:

1. In the early months of TMA Cell 2 operations (up to July) excess water collected in TMA Cell 2 should be transferred to the WMP (Continuing this transfer longer is not suggested as this could increase the WMP volume close to its maximum operating level in the event of wet conditions).

2. Starting in July or August as required, excess water collected in TMA Cell 2 should be transferred to TMA Cell 3. For average conditions, this transfer would continue until about October, after which reclaim will control the TMA Cell 2 volume. For wet conditions, the transfer to TMA Cell 3 can continue until the available storage in TMA Cell 3 has been filled, expected around September.

3. Starting as early as September 2018 (in the event of wet conditions) or later (March for average conditions) excess water collected in TMA Cell 2 should be pumped to the WTP for water treatment, and the treated effluent transferred to the WMP for discharge once the water quality is acceptable (total WMP volume is above 5.0 Mm^3).

To implement this strategy, the following operating guidelines are suggested for TMA Cell 2 and the WMP during the operating life of TMA Cell 2:

- Water for mill reclaim should be taken from the WMP until the WMP volume is reduced to below 1.0 Mm^3, then shifted to TMA Cell 2. Sufficient pumping infrastructure should be installed to allow mill reclaim from either WMP or TMA Cell 2 for the duration of TMA Cell 2 operation.

- Pumping from the Pinewood River to the WMP should occur if the total combined storage in TMA Cell 2 and the WMP is less than 4 Mm^3, so ensure there is sufficient water for mill processing for the winter of 2018/2019.

- All pumped discharges from TMA Cell 2 (to the WMP, to the WTP, and to TMA Cell 3) to reduce the water level in TMA Cell 2 should be regulated and planned to start once the TMA Cell 2 pond volume increases to within approximately 800,000 m^3 of the MOWL. The

discharges should continue until TMA Cell 2 pond volume is lowered by about 400,000 m^3 (1,200,000 m^3 below the MOWL).

- Pumping infrastructure should be installed to allow for pumping at a rate of approximately 40,000 m^3/day between TMA Cell 2, 3 and the WMP even at low water levels. This will allow full utilization of the available storage volumes in TMA Cells 2, 3 and the WMP. In a wet year scenario it may also be necessary to pump directly from the WMP to TMA Cell 3, to reduce WMP volumes to below 1.0 Mm^3, prior to the implementation of the WTP.

- Effluent discharge of treated water from the WMP to the Pinewood River or treatment wetlands should only occur if the total storage in the WMP is above 5.0 Mm^3 (not anticipated during the life of TMA Cell 2). This effluent discharge strategy only applies to the first batch of discharge, as the 1.0 Mm^3 of residual contact water in the WMP requires dilution prior to discharge.

15.0 LIMITATIONS OF RESULTS

The applicability of the results of this assessment depend on the following conditions and assumptions:

- TMA Cell 2 will start impounding water on April 1, 2018;
- TMA Cell 3 will start impounding water on June 1, 2108, will be able to receive pumped inflows from TMA Cell 2 on July 1, 2108, and will reach its full storage capacity on September 1, 2018.
- Drainage areas collected and sent to TMA Cell 2 will be as described in this memo;
- The WMP will have 2.0 Mm^3 of water on April 1, 2018;
- Mill production will be at 100% for the 12-month life of TMA Cell 2; and
- Tailings properties in terms of the water storage volume available above tailings, and pore water losses, will be as described.

16.0 CLOSING REMARKS

This memorandum was prepared by Norman Schwartz, P.Eng., and reviewed by Mark Sullivan, P.Eng. Please do not hesitate to contact either individual should you have any questions regarding the information contained in this memorandum.

17.0 REFERENCES

AMEC, 2014. Rainy River Project – Feasibility Level Treatment Plant Design. 3098004-000000-A1-ETR-0003 Rev. 00. January, 2014.

AMEC, 2014. Rainy River Project – Detailed Design – Tailings Management Design Brief. 3098004-004000-A1-ETR-0006-AB. May 2014.

AMEC, 2014. Rainy River Project – Detailed Design – Technical Memorandum: Revised Process Water Balance. October 3, 2014.

AMEC, 2015. Rainy River Project – Detailed Design – Water Management Plan for Operations. Issued for Use. 3098004-004400-A1-ETR-0003-00. March 2015.

Amec Foster Wheeler, 2016a. Memo April 4, 2016 Draft for Discussion. Rainy River Project – Processing Plant Start-up Water Source Options following delayed Operation of the Water Management Pond.

Amec Foster Wheeler, 2016b. Design Brief – Tailings Management Area Start-Up Cell. Rainy River Project. New Gold Inc. August, 2016.

Figures:

Figure 1 – Water Balance Schematic for TMA Cells 2, 3 and WMP
Figure 2 – Stage-Storage Curve for TMA Cell 2
Figure 3 – Stage-Storage Curve for WMP
Figure 4 – Total Available Storage versus Net System Inflow for TMA Cells 2, 3 and WMP

Attachment 1:

Attachment Summary
Figure 1.1 – Pond Levels for the TMA Cell 2 for Average Year
Figure 1.2 – Pond Levels for the TMA Cell 2 for 1:20 Wet Year
Figure 1.3 – Pond Levels for the TMA Cell 2 for 1:20 Dry Year
Figure 1.4 – Pond Levels for the WMP for Average Year
Figure 1.5 – Pond Levels for the WMP for 1:20 Wet Year
Figure 1.6 – Pond Levels for the WMP for 1:20 Dry Year
Figure 1.7 – Pond Volumes for the TMA Cell 2 for Average Year
Figure 1.8 – Pond Volumes for the TMA Cell 2 for 1:20 Wet Year
Figure 1.9 – Pond Volumes for the TMA Cell 2 for 1:20 Dry Year
Figure 1.10 – Pond Volumes for the WMP for Average Year
Figure 1.11 – Pond Volumes for the WMP for 1:20 Wet Year
Figure 1.12 – Pond Volumes for the WMP for 1:20 Dry Year

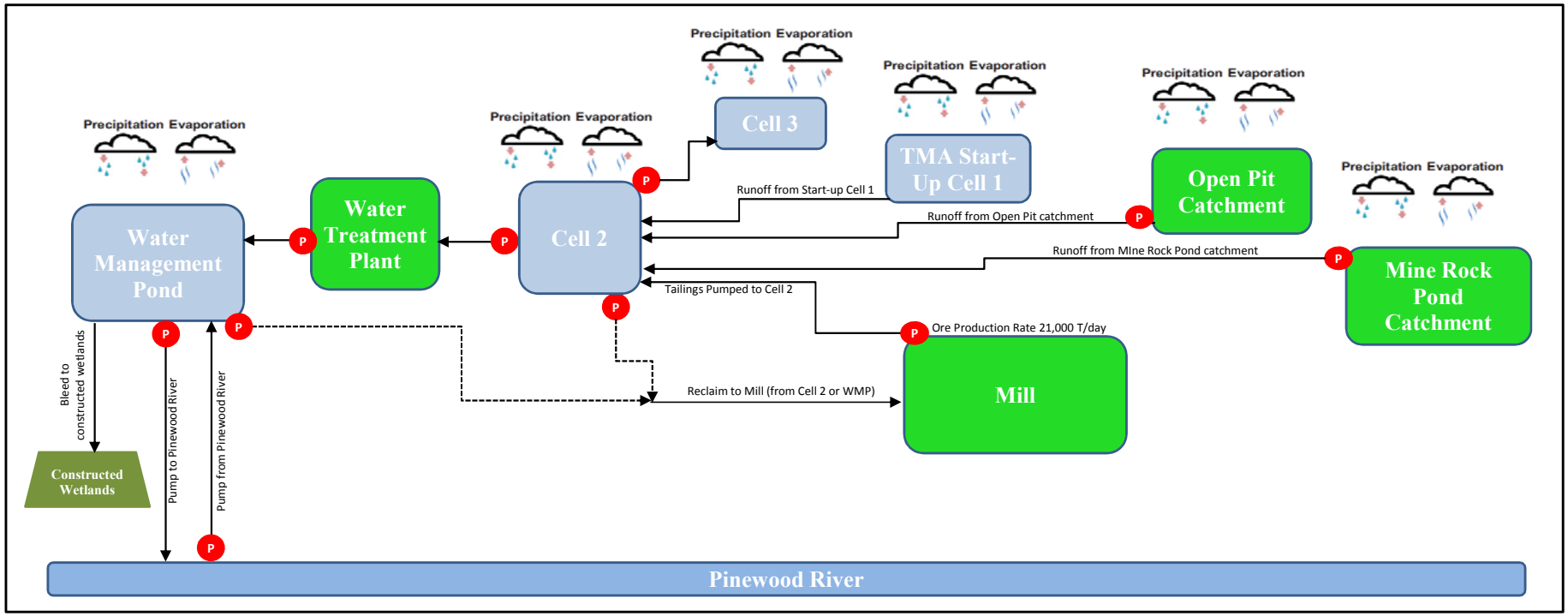


Figure 1: Water Balance Schematic for TMA Cell 2, Cell 3 and WMP

Figure 2: Cell 2 TMA Pond Stage-Storage

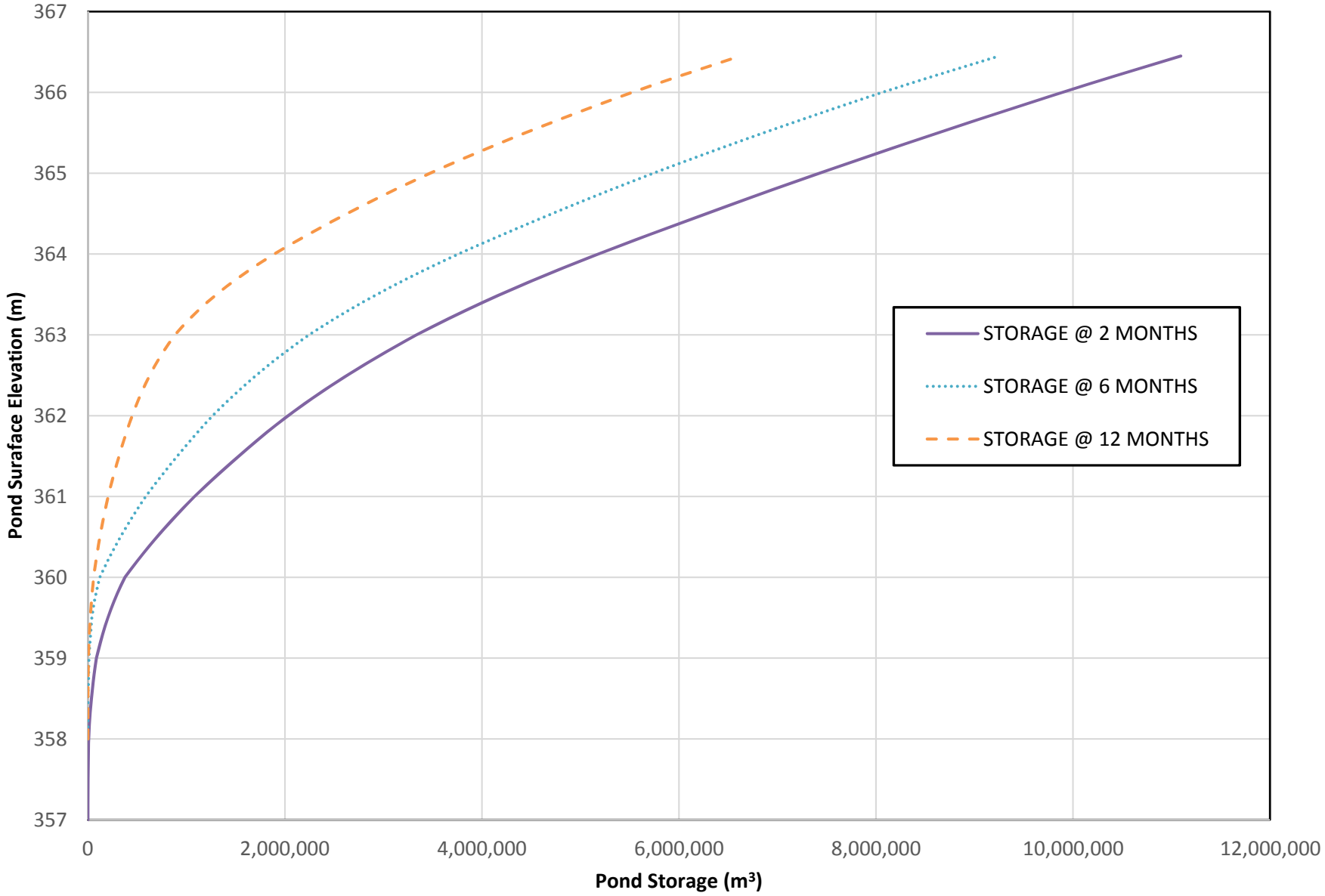


Figure 3: WMP Pond Stage-Storage

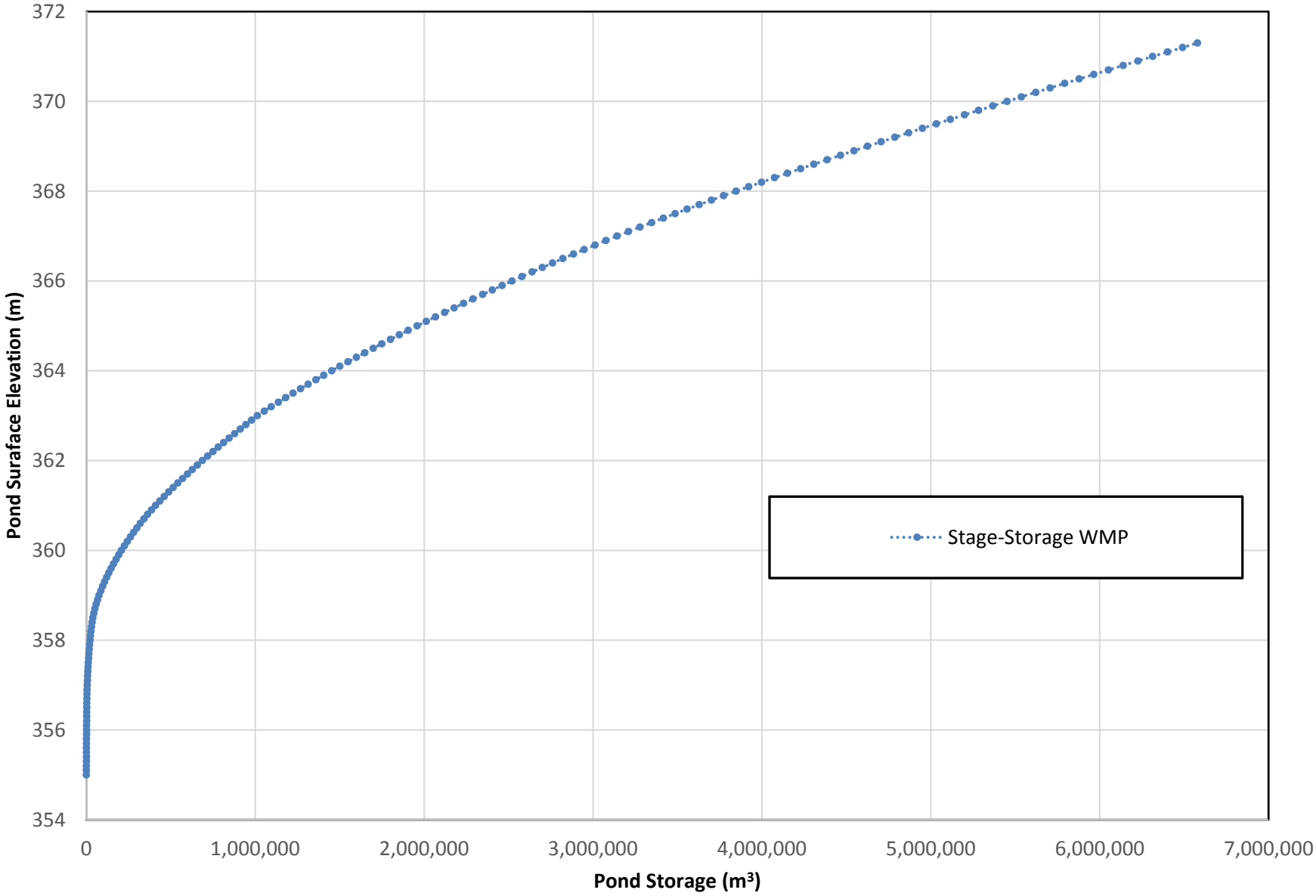
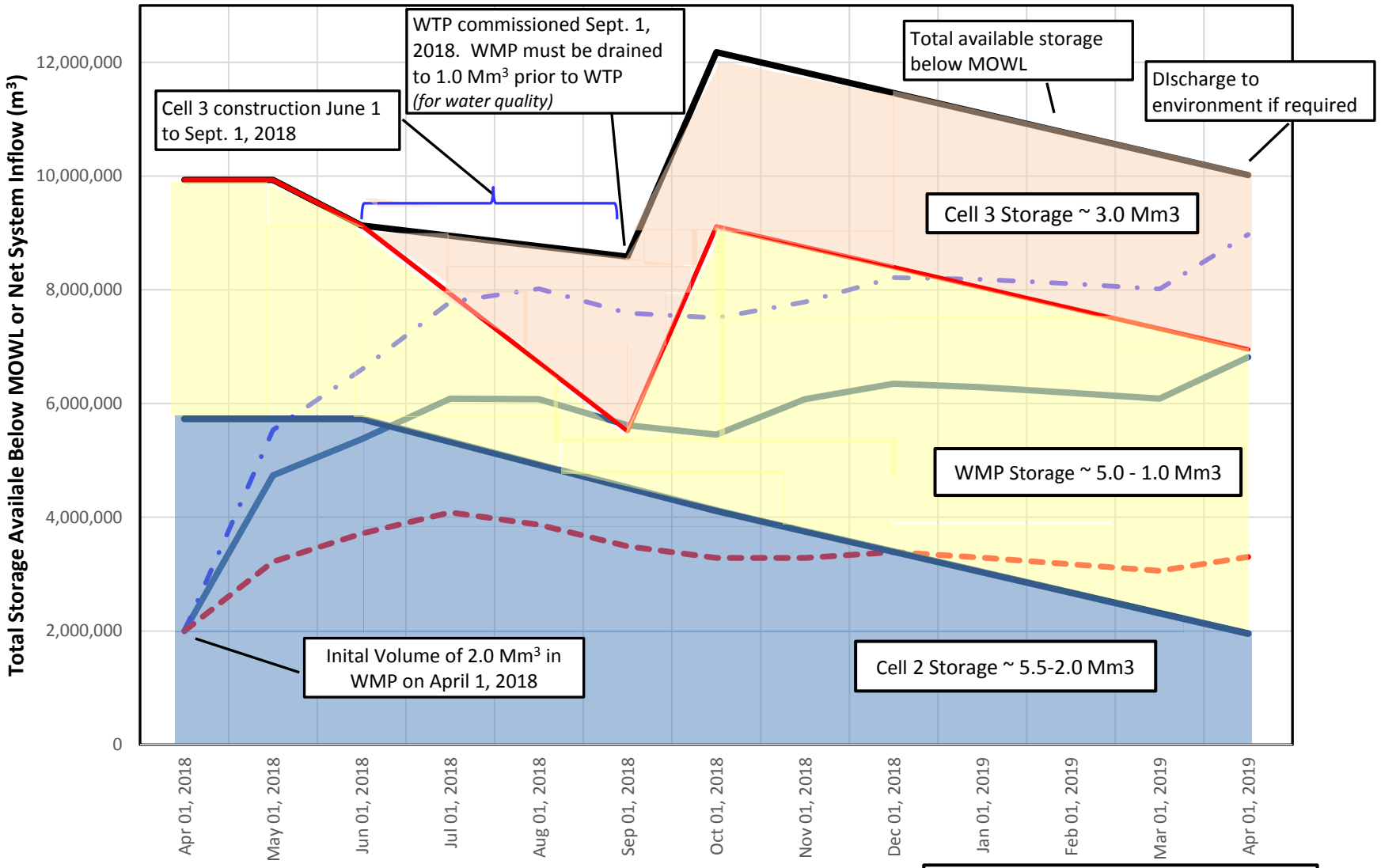


Figure 4: Total Available Storage versus Net System Inflow for TMA Cell 2, 3 and WMP



Notes

- WMP initial storage capacity of 5.0 Mm3 for mine contact water should be drawn down to 1.0 Mm3 prior to startup of WTP
- Cell 3 is closed off June 1, 2018 and storage becomes available at constant rate until completion Sept. 1, 2018

ATTACHMENT 1

Attachment 1 provides a more detailed discussion of the results of the water balance modelling and the water management schemes which were developed for average, 1:20 wet year, and 1:20 dry year conditions. Detailed graphs of water levels, pond volumes and pumping transfers for TMA Cell 2 and the WMP for average, wet and dry year conditions are provided as Figures 1.1 through 1.12.

- During an average year, it will be required to transfer water from TMA Cell 2 to the WMP in June 2018 to manage the volume increase in TMA Cell 2. In July and August 2018 this transfer should switch to TMA Cell 3 in order to limit the volume increase in the WMP. Reclaim can be taken from the WMP until the end of July, at which point the WMP is expected to be reduced below 1.0 Mm^3. At this point reclaim would switch to TMA Cell 2. Although it is assumed that the WTP will be available in September, it is expected that taking reclaim from TMA Cell 2 can control the TMA Cell 2 volume in an average year until spring 2019 when ongoing tailings deposition will reduce the available water storage capacity in TMA Cell 2, and discharge to the WTP will be required. The WMP volume will be reduced further, possibly as low as 0.5 Mm^3 due to ice formation, prior to the discharge of treated effluent from the WTP to the WMP. No discharge to the environment is required in the average year.

- During a 1:20 wet year, it will be required to transfer water from TMA Cell 2 to the WMP earlier, starting in May and continuing to June 2018, to manage the volume increase in TMA Cell 2. June should be the latest month to transfer to WMP in order to limit the volume increase in the WMP. July 2018 is when transfer to TMA Cell 3 should start. The latter should continue until September 2018, when TMA Cell 3 would be filled to its capacity. Once the WTP comes on line starting in September 2018, the TMA Cell 2 volume can be controlled by pumping TMA Cell 2 to the WTP. The availability of the WTP (and the supplemental storage in TMA Cell 3), is required for TMA Cell 2 to provide the required storage for the Environmental Design Flood (EDF) below the spillway invert. Reclaim for the 1:20 wet year is always taken from the WMP as the water volume in the WMP would remain above 1.0 Mm^3 (minimum volume of approximately 1.3 Mm^3 reached in the WMP prior to WTP commissioning, however additional storage is still available in TMA Cell 2 to allow WMP to be pumped down to approximately 1.0 Mm^3 storage. Sufficient pumping infrastructure should be available to readily pump between the WMP, TMA Cell 2 and TMA Cell 3 to fully utilize all available storage. At the end of March 2019, the water level in TMA Cell 2 should be below the MOWL, so the EDF event could be fully contained. No discharge to the environment is required in the 1:20 wet year, however discharge in the spring of 2019 (May) would be necessary.

- During a 1:20 dry year the WTP would not be required for the duration of TMA Cell 2 operation, since reclaim will switch from the WMP to TMA Cell 2 after June. This would will keep the water level in TMA Cell 2 significantly below the MOWL until March 2019. At that time the effect of ongoing tailings deposition will reduce the available water storage capacity significantly, however TMA Cell 3 will have sufficient capacity for storage of any excess volume. The results indicate that there is enough water to operate the mill through the winter of 2018/2019 in the 1:20 dry year, however the WMP may freeze solid, as there is less than 0.5 Mm^3, prior to the winter. All reclaim during the winter would be taken from

TMA Cell 2. The minimum volume of free water in TMA Cell 2 is approximately 0.5 Mm^3 in February of 2018, which is expected to be adequate to operate pumps and limit suspended solids. A transfer to TMA Cell 3 is shown in March 2019 (reducing the TMA Cell 2 volume to 0.25 Mm^3), however this water would likely be sent to the WTP for treatment to reduce the TMA Cell 2 volume.

The following Tables 1.1 and 1.2 provide annual summaries of input volumes, output volumes, and volumes of water transferred between the ponds for the three precipitation scenarios.

Table 1.1: Water Balance Summary for TMA Cell 2

		Average Year	1:20 Wet Year	1:20 Dry Year
SYSTEM INPUTS (m^3)				
	TMA Runoff	3,097,557	4,257,896	1,824,112
	MRP Runoff	1,596,192	2,194,122	939,977
	Open Pit Runoff	885,870	1,217,715	521,678
	Groundwater pumped from Open Pit	912,500	912,500	912,500
	TMA Cell 1 Runoff	468,684	644,252	276,002
	TMA Ice Melting	819,756	819,756	819,756
	Water in Tailings Slurry	8,678,284	8,678,284	8,678,284
SYSTEM OUTPUTS (m^3)				
	TMA Pond Evap	521,771	521,771	521,771
	MRP Pond Evap	355,080	355,080	355,080
	TMA Cell 1 Pond Evap	365,840	365,840	365,840
	Reclaim Pumping from TMA to Mill	5,726,567	-	6,457,117
	TMA Ice Formation (1 m)	819,756	819,756	819,756
	Tailings Pore Water Losses	2,718,085	2,718,085	2,718,085
	Pump Out TMA Cell 2 (Transfer) to WMP	900,000	1,830,000	-
	Pump Out TMA Cell 2 (Transfer) to WTP	620,000	7,300,000	-
	Pump Out TMA Cell 2 (Transfer) to TMA Cell 3	3,095,996	3,031,574	2,480,000
STORAGE (m^3)				
	Initial TMA Cell 2	-	-	-
	Final TMA Cell 2	1,335,747	1,782,418	254,659
	Increase In Storage	1,335,747	1,782,418	254,659
SUM INPUTS		16,458,843	16,458,843	18,724,525
SUM OUTPUTS		16,458,843	16,458,843	18,724,525
BALANCE		-	-	-

Table 1.2: Water Balance Summary for WMP

		Average Year	1:20 Wet Year	1:20 Dry Year
SYSTEM INPUTS (m^3)				
	WMP Runoff	644,747	886,267	379,683
	Treated Effluent from WTP	620,000	7,300,000	-
	Pump In Water Transferred from TMA Cell 2	900,000	1,830,000	-
	WMP Ice Melting	850,000	850,000	850,000
	Pump From Pinewood	1,452,724	953,386	706,089
SYSTEM OUTPUTS (m^3)				
	WMP Pond Evap	457,300	457,300	457,300
	WMP Ice Formation (1 m)	850,000	850,000	850,000
	Reclaim Pumping from WMP to Mill	2,875,067	8,601,634	2,144,517
	WMP "bleed" to wetland	-	-	-
	WMP Pumped to Pinewood River	-	-	-
STORAGE (m^3)				
	Initial WMP	2,000,000	2,000,000	2,000,000
	Final WMP	2,285,104	3,910,720	895,419
	Increase In Storage	285,104	1,910,720	-1,104,581
SUM INPUTS		6,627,470	4,467,470	11,819,654
SUM OUTPUTS		6,627,470	4,467,470	11,819,654
BALANCE		-	-	-

Figures 1.1 to 1.12

Figure 1.1: Pond Levels for TMA Cell 2 for Average Year

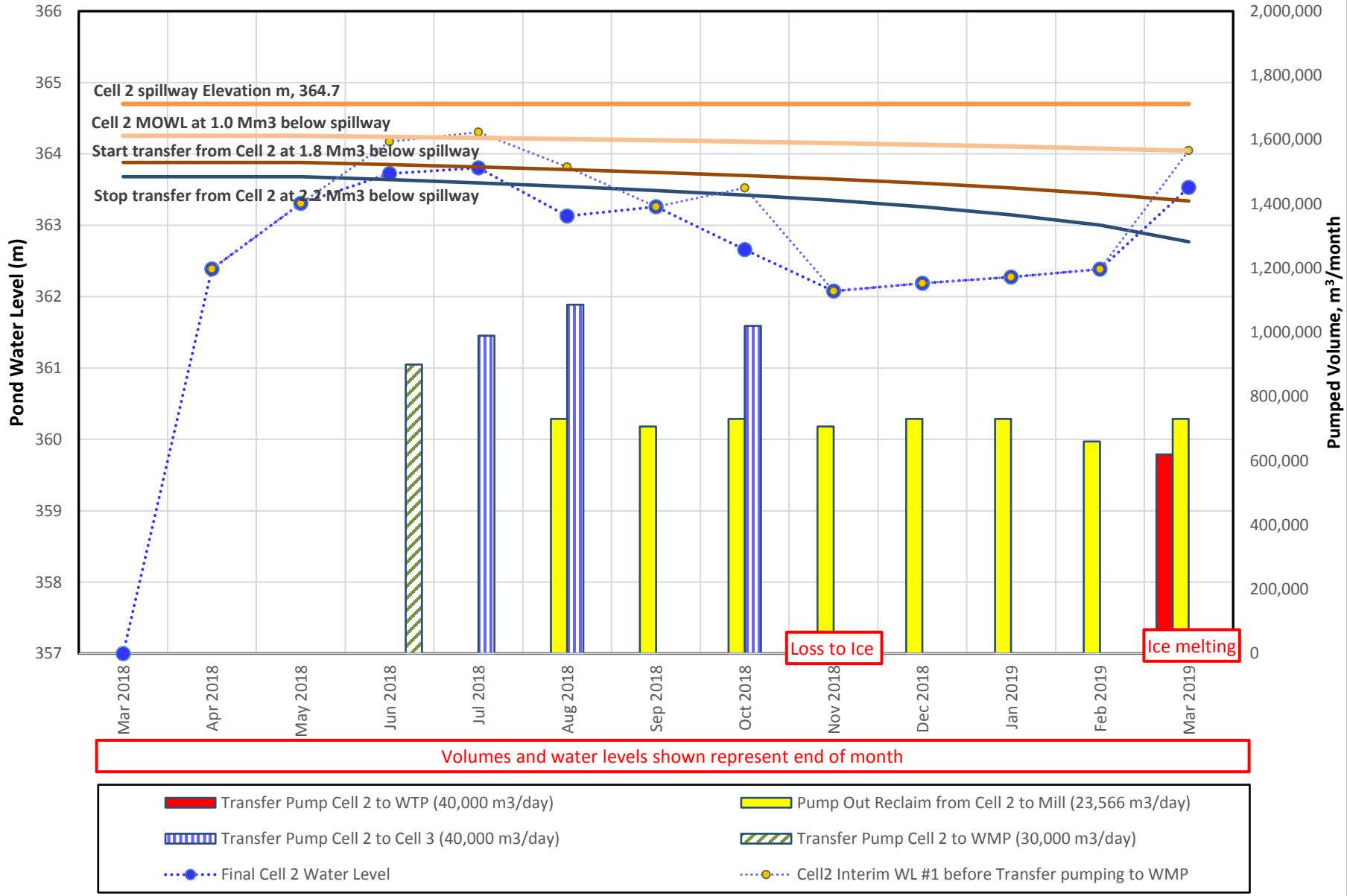


Figure 1.2: Pond Levels for TMA Cell 2 for 1:20 Wet Year

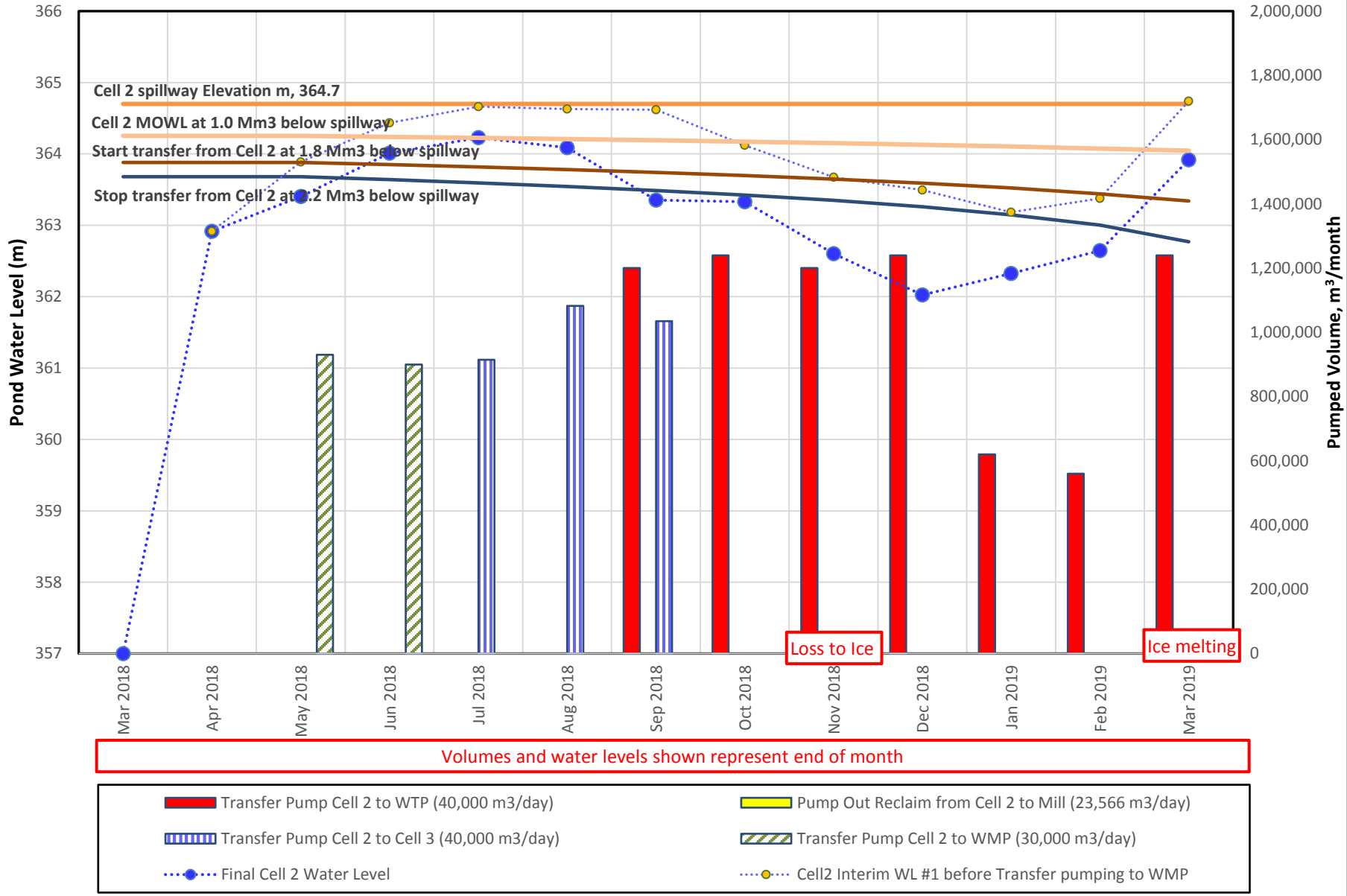


Figure 1.3: Pond Levels for TMA Cell 2 for 1:20 Dry Year

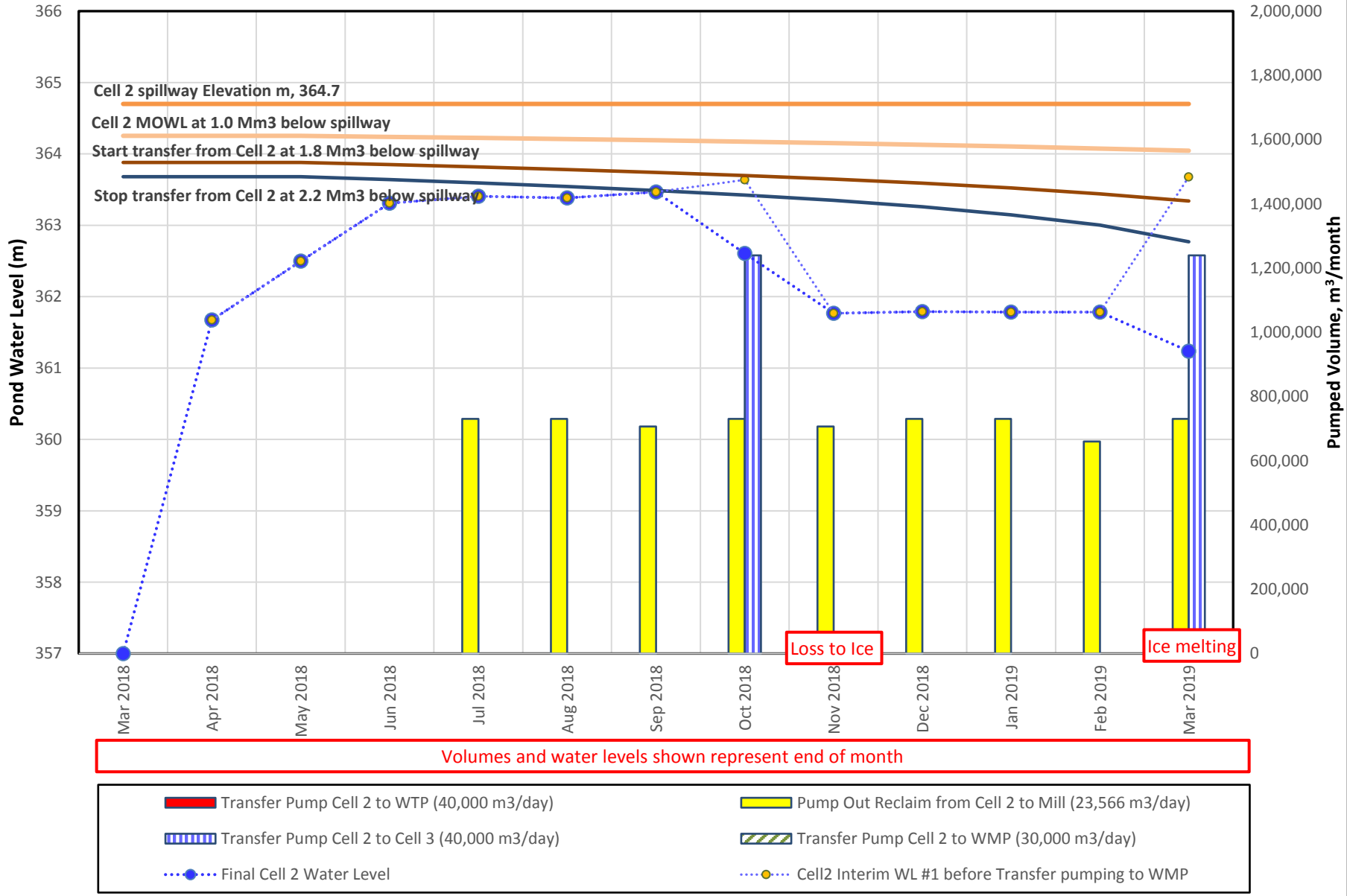


Figure 1.4: Pond Levels for WMP for Average Year

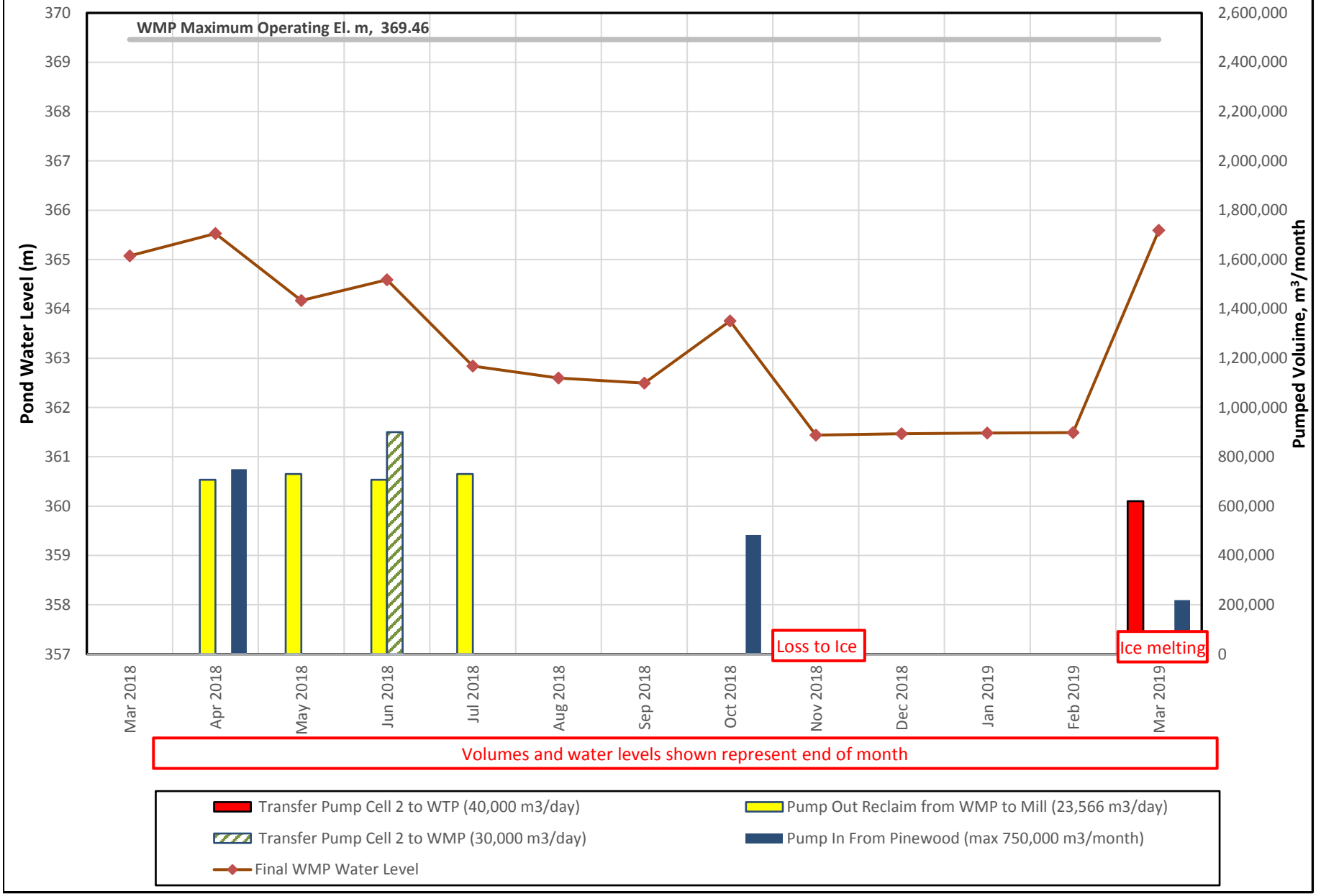


Figure 1.5: Pond Levels for WMP for 1:20 Wet Year

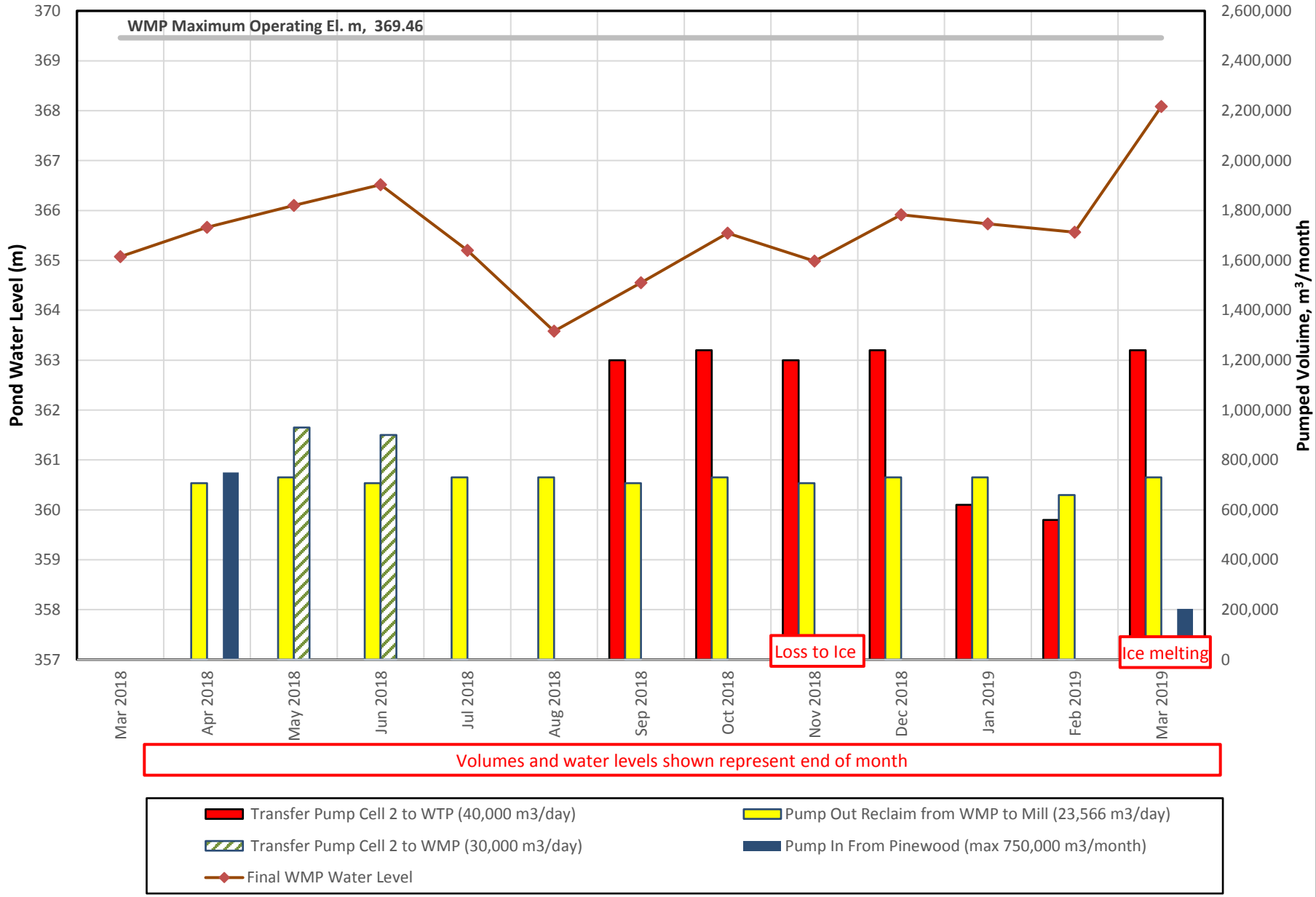


Figure 1.6: Pond Levels for WMP for 1:20 Dry Year

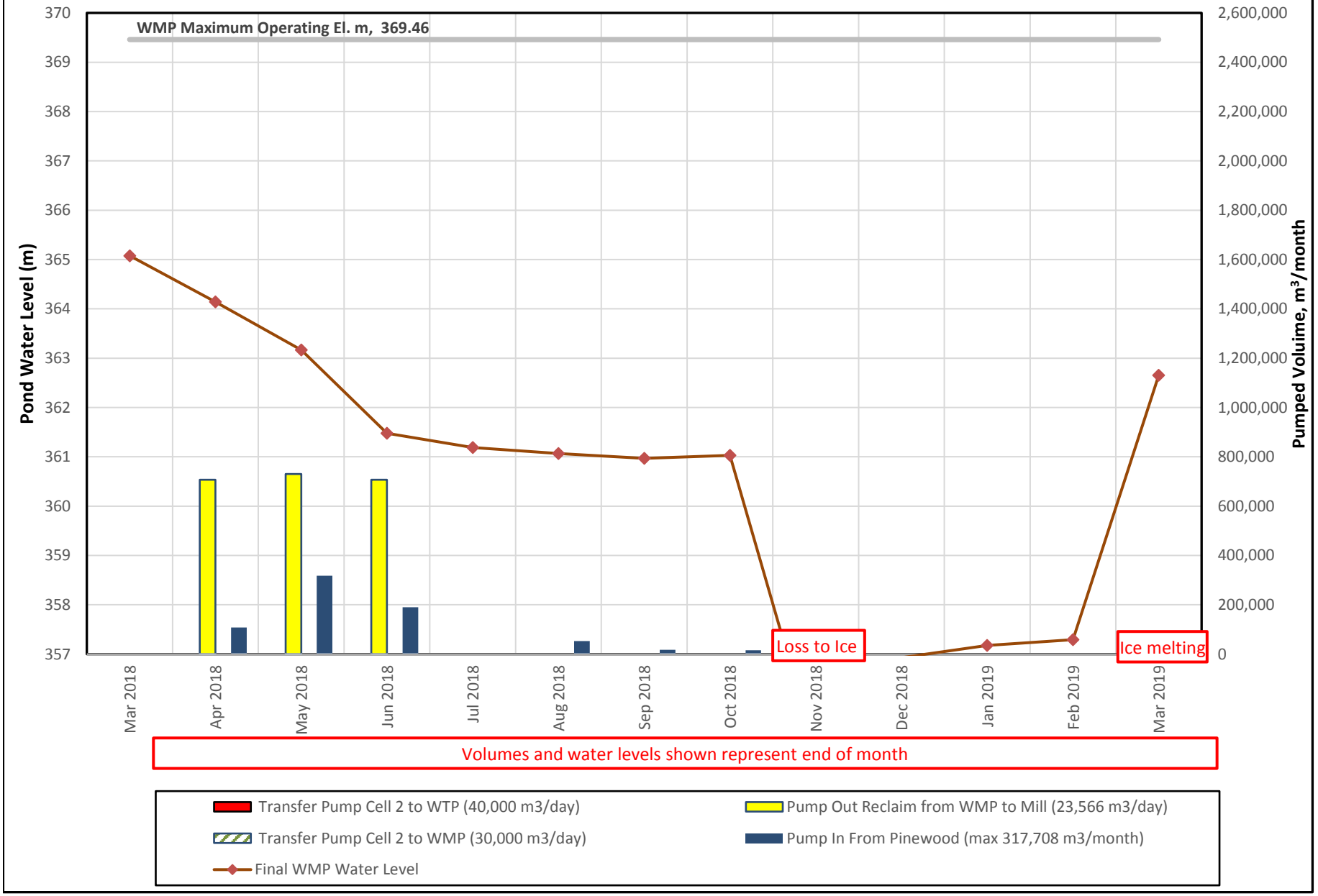


Figure 1.7: Pond Volumes for TMA Cell 2 for Average Year

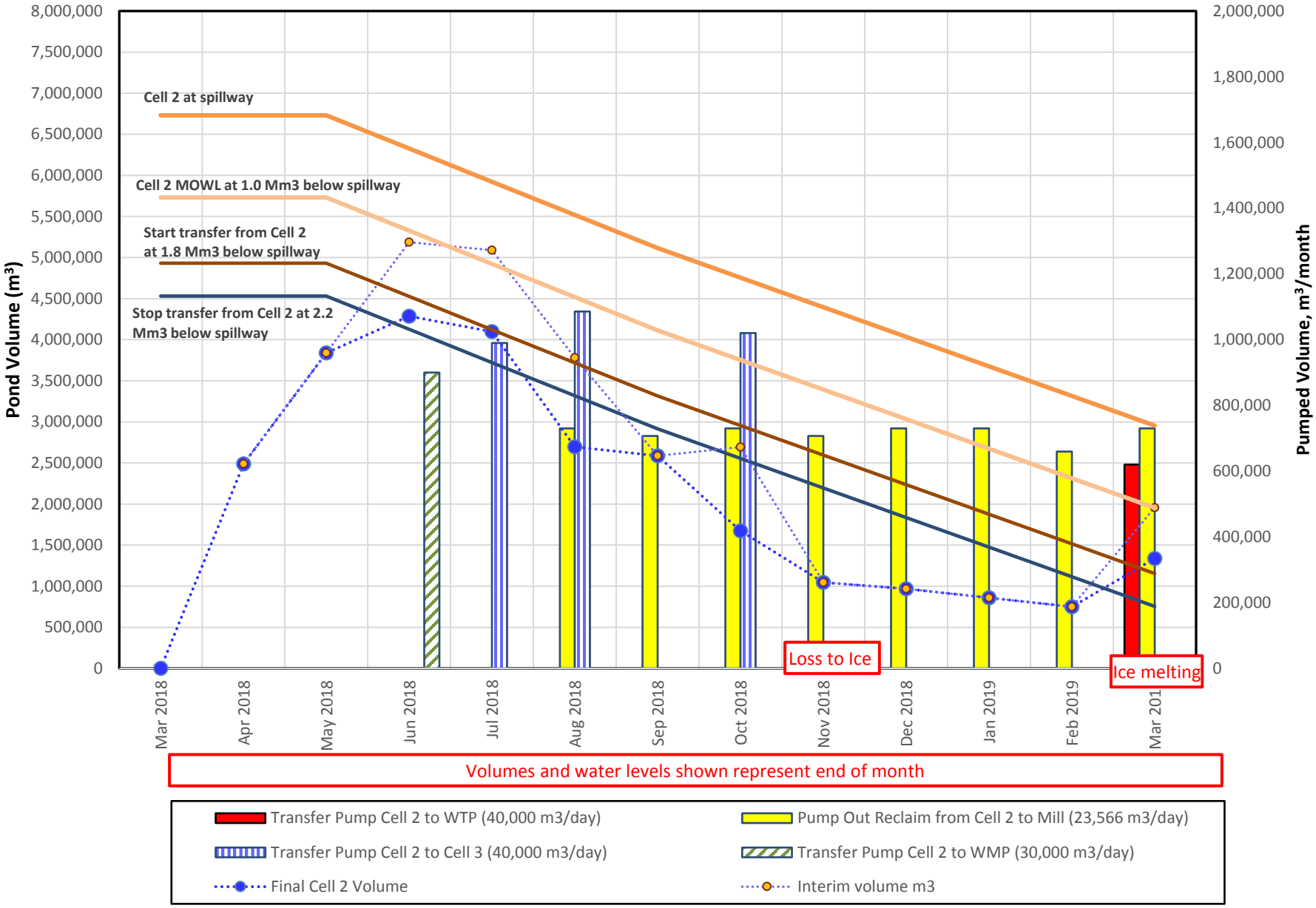


Figure 1.8: Pond Volumes for TMA Cell 2 for 1:20 Wet Year

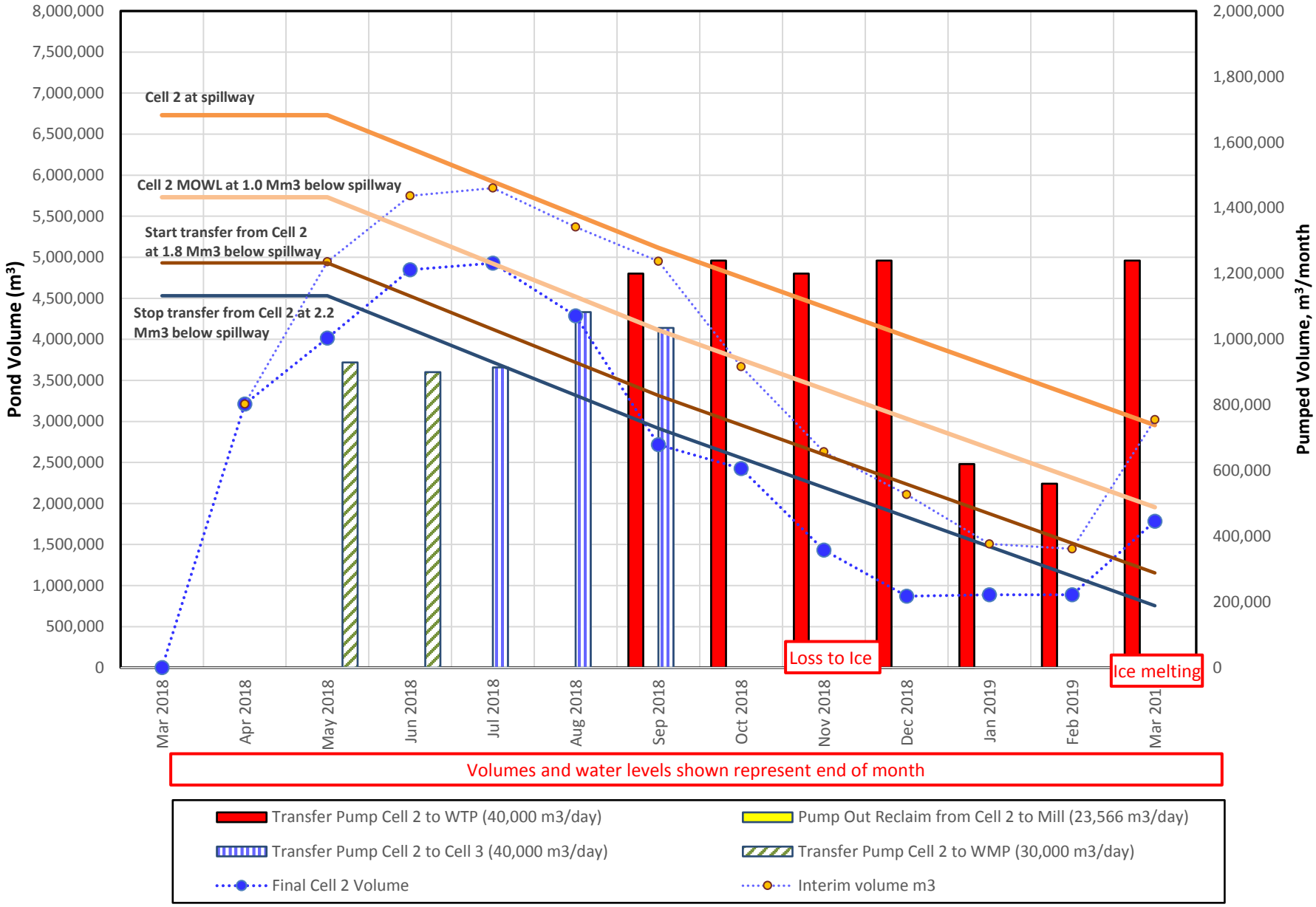


Figure 1.9: Pond Volumes for TMA Cell 2 for 1:20 Dry Year

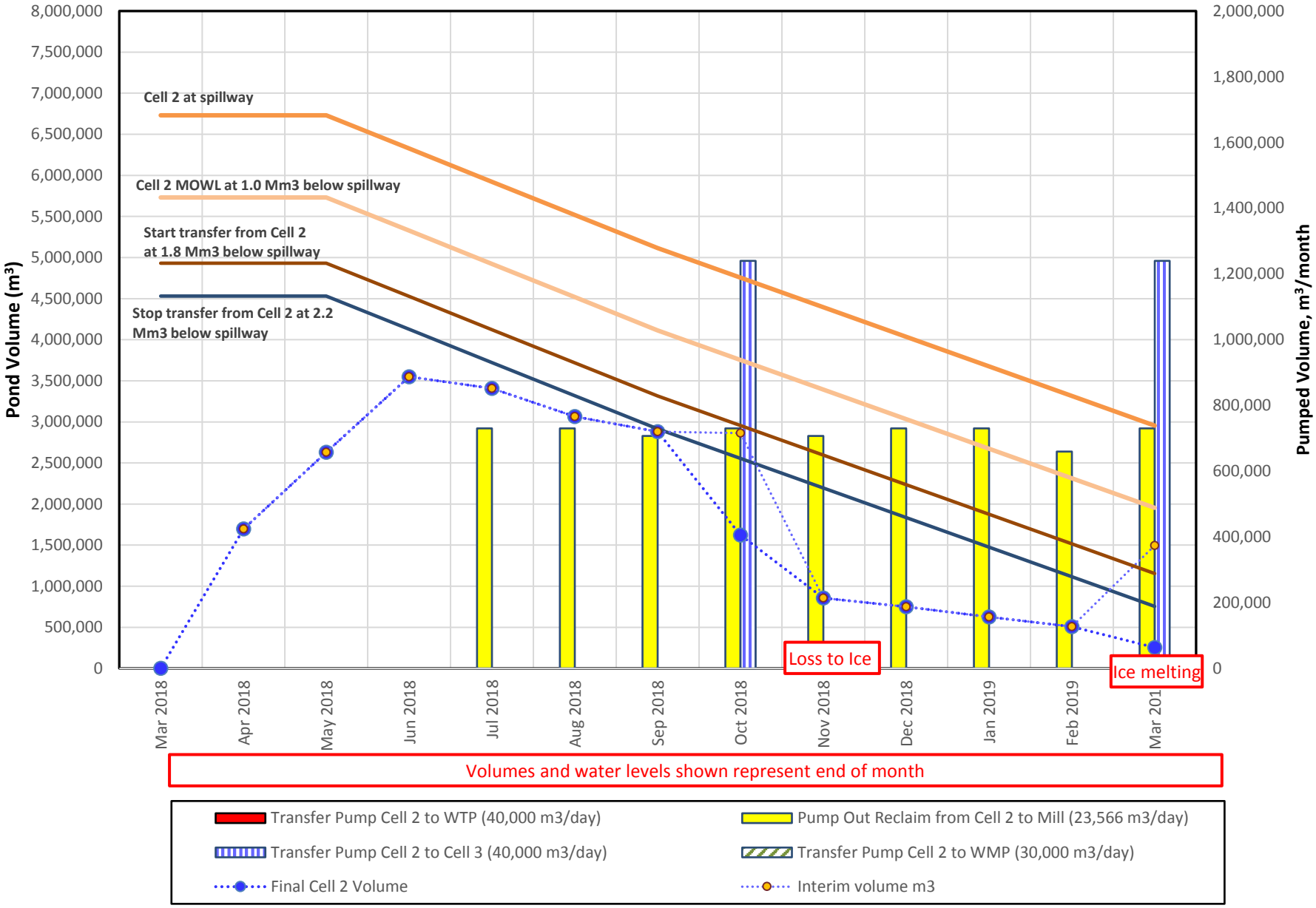


Figure 1.10: Pond Volumes for WMP for Average Year

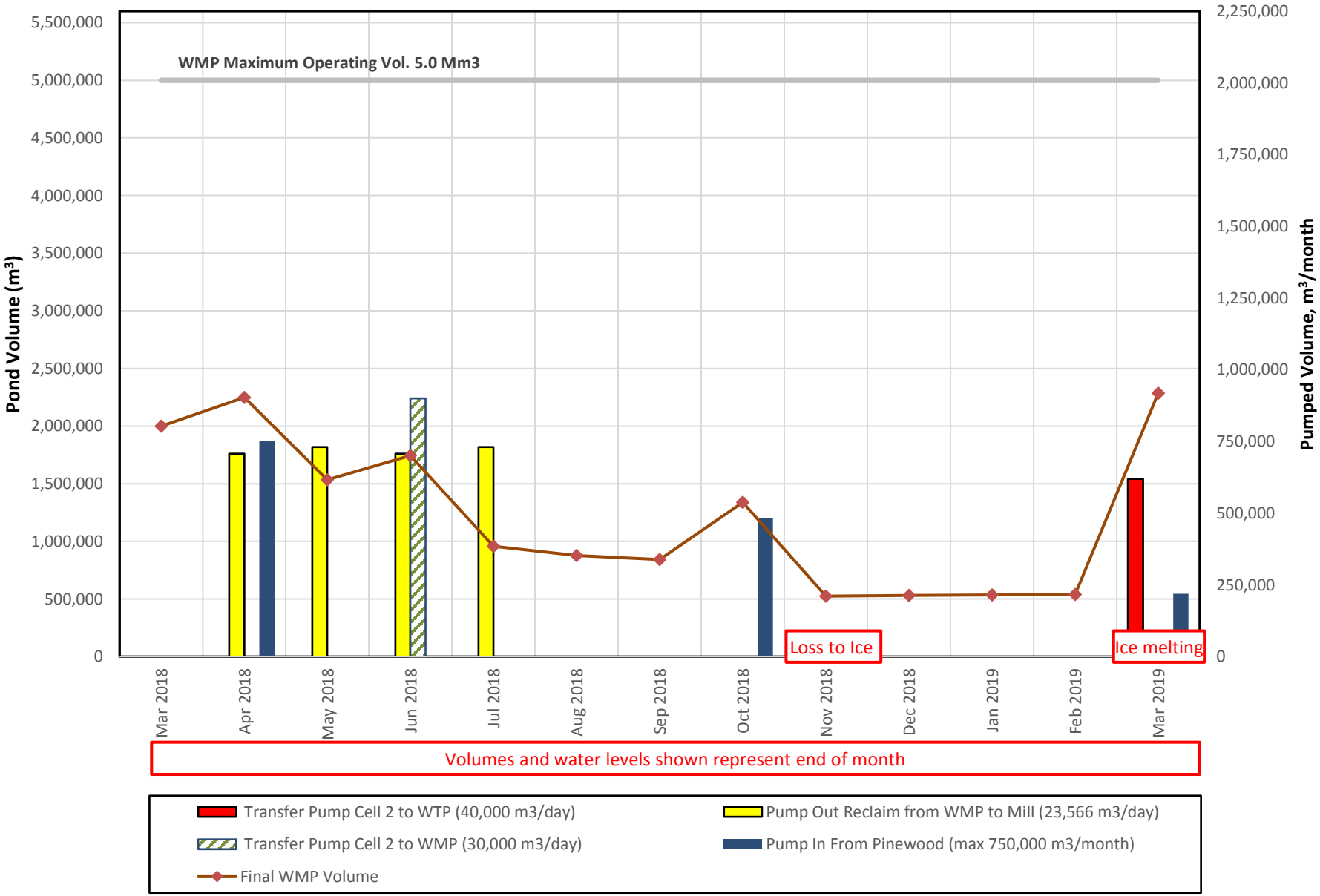


Figure 1.11: Pond Volumes for WMP for 1:20 Wet Year

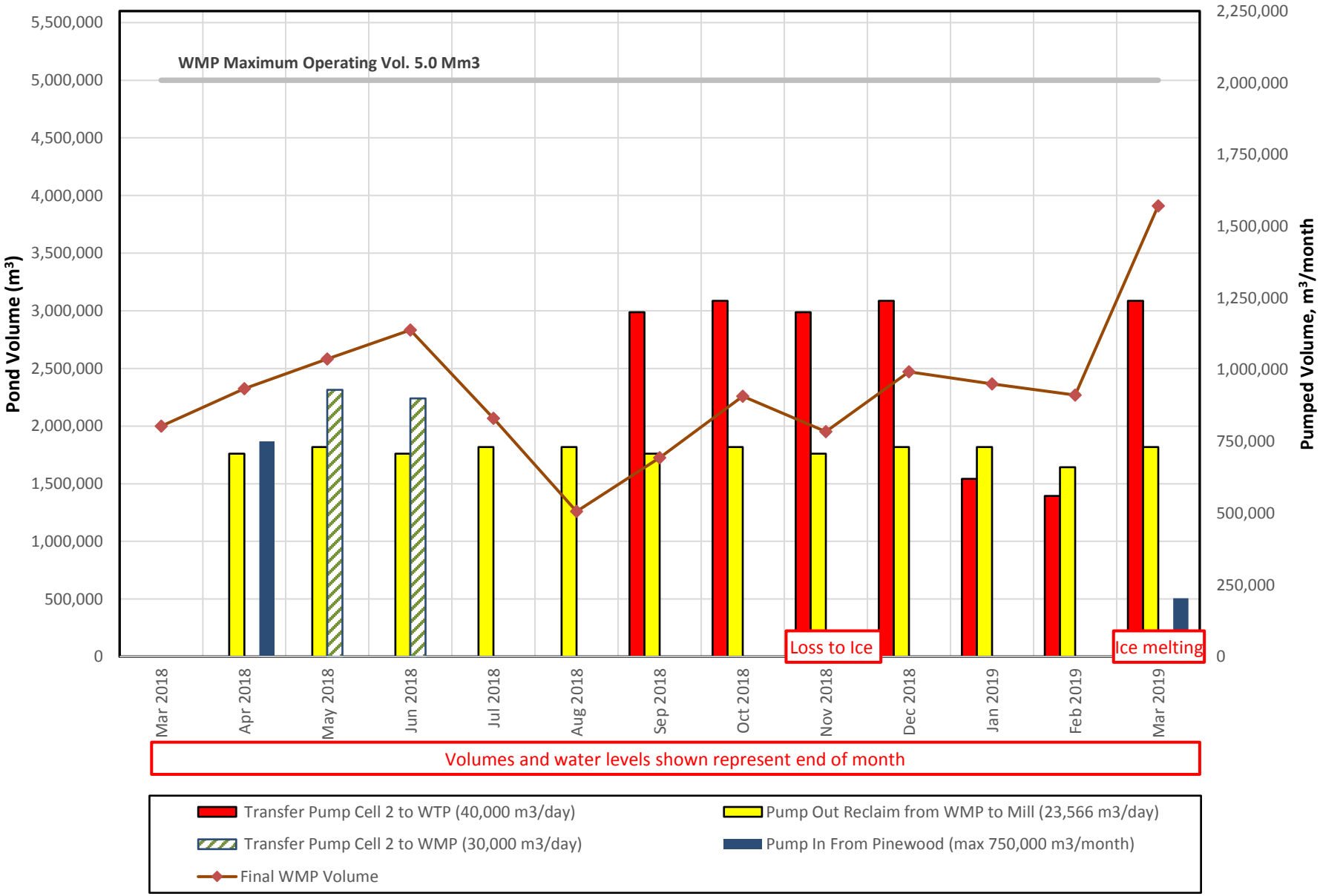
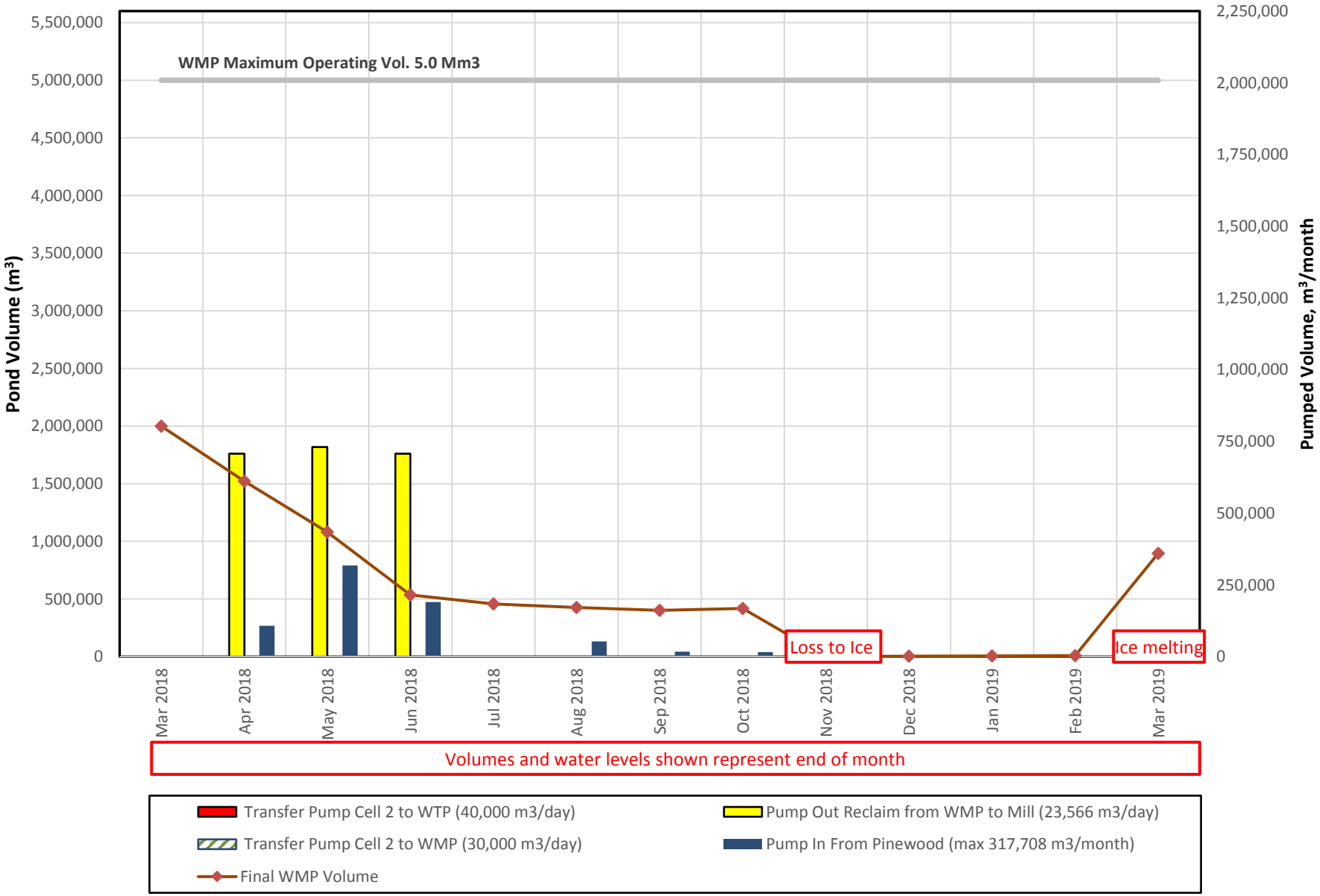


Figure 1.12: Pond Volumes for WMP for 1:20 Dry Year



APPENDIX F

INSPECTION SHEETS

Daily Inspection Form (Dam)
Weekly Inspection Sheets (Dam)
Diversion Channel Inspection Form
Inspection Sheets for Unusual Events

Daily Inspection Form (Dam)			
Dam:			
Name:			
Date and Time:			
Weather Conditions:			
Visual Inspection of dams:		Notes:	
Seepage Collection Visual Inspection:		Notes:	
Pipeline Visual Inspection:		Notes:	
General Notes:			

Weekly Inspection Sheets (Dam)				
Dam:				
Name:				
Date and Time:				
Weather Conditions:				
Pond Level (m):				
Freeboard (m):				
Pond Water Characteristics:	Clear:	Turbid:	Snow/Ice Covered:	
Pond Inflow Characteristics	Clear:	Turbid:	Comments:	
Estimated Inflow:	Minor:	Moderate:	Significant:	
Pond Level Rising/Falling:				
No. Pumps running				
Physical Inspection of dams:		Notes:		
Water Quality Sample:	Yes:		No:	
Seepage Collection Visual Inspection:		Notes:		
Pipeline Visual Inspection:		Notes:		
Exterior Dams:	Weeping/Slumping Y/N and Location	Underdrain Flow Y/N	Sample Collected Y/N	Comments
Locations pending construction				
Instrumentation:	To be developed further following construction and insulation of instrumentation			
Number of Photos:				
General Notes:				

Diversion Channel Inspection Form				
Dam:				
Name:				
Date and Time:				
Weather Conditions:				
Estimated flow:	None::	Minor:	Moderate:	Significant:
Physical Inspection of diversion channel:		Notes:		
Number of Photos:				
General Notes:				

Inspection Sheets for Unusual Events				
Dam:				
Name:				
Date and Time:				
Unusual Event:				
Pond Level (m):				
Freeboard (m):				
Pond Water Characteristics:	Clear:	Turbid:	Snow/Ice Covered:	
Pond Inflow Characteristics	Clear:	Turbid:	Comments:	
Estimated Inflow:	Minor:	Moderate:	Significant:	
Pond Level Rising/Falling:				
No. Pumps running				
Physical Inspection of dams:		Notes:		
Water Quality Sample:	Yes:		No:	
Seepage Collection Visual Inspection:		Notes:		
Pipeline Visual Inspection:		Notes:		
Spillway Visual Inspection:		Notes:		
Exterior Dams:	Weeping/Slumping Y/N and Location	Underdrain Flow Y/N	Sample Collected Y/N	Comments
Locations pending construction				
Instrumentation:	To be developed further following construction and insulation of instrumentation			
General Notes:				

APPENDIX G

MNRF Comments on the Pre-Production OMS Manual and New Gold Responses on revision AG (October 2016)
&
ITRB Review Comments on Pre-Production Version (July 2017)

October 6, 2016
TC150321

Delivered by e-mail

Mr. Paul Hosford, Project Director
New Gold Inc.
Two Bentall Centre
Suite 1800 – 555 Burrard Street, Vancouver
British Columbia, Canada, V7X 1M9

Dear Mr. Hosford:

Re: Rainy River Project Development,
Operation, Maintenance and Surveillance Manual – Tailings and Water Management Structures
3098004-000000-A1-EMA-0001-00
Comments and Responses

Below please find the responses to comments received for the OMS / EPP from the MNRF:

1. *General*

   a. *Appendix C; tailings, heap leach and waste rock. Confirm the term heap leach.*

      Response:
      Appendix C is a New Gold's corporate policy document. Even though the policy applies to tailings, heap leach and waste rock facilities, heap leaching does not apply to this project. The text in section 1.6 describes that Heap Leaching is not applicable to the project.

   b. *Table 1-1 and 2-1 are specific to MNRF. NGD should ensure the OMS/EPP is circulated to the appropriate agencies*.

      Response:
      New Gold has no objections in sharing the OMS with other agencies and contacts at the MNDM will be added to Table 2-1.

   c. *Page 42 – Contingency. Section is incomplete.*

      Response:
      Relevant contingency measures have been added to Section 7.7.

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d. *Operations: Please confirm whether a stand-alone Operating Plan has been developed for the WMP. The operations plan should provide complete, clear and step by step instructions for operation of the pond. The current OMS is currently missing the following information with regard to operations:*

- *Instructions on routine and general operation of the pond, including maximum water levels permitted at each time of year.*

  Response:
  This is included in the WMP Fill Plan which is incorporated as an Appendix D in the OMS.

- *Max. and min. storage in the pond (in terms of volume AND elevation).*

  Response:
  This is included in the WMP Fill Plan which is incorporated as an Appendix D in the OMS.

- *Max/min inflows and outflows/discharge (Water quality objectives, reference MOECC's C of A),*

  Response:
  Information about inflows and discharge quantities are included in the WMP Fill Plan which is incorporated as an Appendix in the OMS. Any discharge will meet the limits as described in the ECA # 5781-9VJQ2J.

- *Stage-storage curves.*

  Response:
  This is included in the WMP Fill Plan which is incorporated as an Appendix D in the OMS.

- *Other pond constraints.*

  Response:
  This is included in the WMP Fill Plan which is incorporated as Appendix D in the OMS.

- *Upstream and downstream constraints (in terms of spillway releases).*

  Response:
  WMP see Table 3-3 of the OMS.

- *Operation of structure in emergency situations/flood operating procedures*

  Response:
  See section 7.0 of the OMS.

- *Ice and debris handling.*

  Response:
  Not applicable during pre-production phase for the WMP is filling. For other channels debris will be removed.

- *Information on flood forecasting.*

  Response:
  Information on managing flood scenarios is provided in Section 3.0.

2. *Maintenance*:

   Provide more details on roles and responsibilities for emergency, major and minor maintenance.

   Response:
   Section 5.0 of the OMS describes the overall maintenance however, the details on responsibilities for maintenance and other tasks are discussed in section 2.0 Roles and Responsibilities of the OMS.

3. Section 1.4

   Provide more detail on the annual review of the OMS manual, including:

   Describe the process by which necessary changes will be evaluated.

   Response:
   This manual will be updated to the production version prior to the annual review process and this will be evaluated at that time.

   Who will be designated to evaluate and update the OMS?

   Response:
   Dave Hall, Mill Manager will be responsible for evaluating and updating the OMS.
   Note that working draft manuals must be made available in advance of commissioning any new system.
   Copies of the OMS will be made available at the site and to MNRF.

4. Section 2.4

   Complete the contact list in table 2-1 with all known information.

   Response:
   Table 2-1 has been updated.

5. Section 2.6

   Add that changes, modifications, alterations or improvements to the design and operations of the systems shall be screened by the MNRF.

   Response:
   Requested text has been added to section 2.6.

   *Working draft manuals must be made available **in advance of** any changes or start of operations, not just "within 90 days"*

   Response:
   Text revised accordingly.

   Provide clarity to define what "important events" trigger an update to the OMS manual (i.e. the important events listed in table 6-2).

   Response:
   Text revised accordingly.

6. Section 3.0

   Provide most up-to-date site layout and not conceptual plan.

   Response:
   The site plan/general arrangement is now current.

7. Section 3.3

   *Add "Subject to **MNRF** approvals…" in discussion of WMP filling during the pre-production phase.*

   Response:
   Text added as requested.

8. Section 6 (page 32)

   States that the surveillance plan is "conceptual".

   Response:
   The word conceptual has been removed.

   Cover letter recommends that Standard Operating procedures should be developed for dam inspections for daily, weekly and monthly inspections. These procedures should be developed PRIOR to any operation of the WMP.

   Response:
   SOPs will be developed and implemented prior to production.

9. Section 6.1.2

   Clarify frequency of inspections. Section 6.1.2 sets bi-weekly standard which conflicts with table 6-1 which indicates "at least once a week"

   Response:
   Text revised.

10. Section 7.0 – Emergency Response

    It is unclear which section in the EPRP relates directly to dam failure as outlined in this section.

    Response:
    A new section 12.0 - Environmental Risks and Responses has been created in the updated EPRP manual.

Comments on EPRP:

11. General

    a) *Provide detail on environmental concerns and response associated with:*

    - *Open Pit Failure*
    - *Stockpile Slope Failure*
    - *Tailings Dam Failure*
    - *Pond Dam Failure*
    - *Watercourse Diversion Failure*
    - *Tailings Pipeline failures*

    Response:
    A new section 12.0 has been added to the EPRP that addresses environmental concerns and responses with the facilities as requested above.

    b) *Please provide detail relating to the management of wildlife related emergencies (i.e. wolf, bear) or provide reference to plans already in place.*

    Response:
    Included reference to wildlife attack in EPRP Manual, Part 2 Section 1.0 Serious Injuries & Fatalities

1. PART I

   Section 3.2 – Include LRIA in the list of Legislation and Industry Standards

   Response:
   Updated Section 3.2 of the EPRP to include LRIA

Section 5.4 – Provide detail on the process that ensures the regular review of the EPRP manual.

- *Describe the process by which necessary changes will be evaluated*
- *Who will be designated to evaluate and update the EPRP?*

Response:
Revised and updated section 5.4

2. PART II

Section 5.1.2 – Provide more detail (i.e. actions, trigger levels) to do with Winter Wind Chill

Response:
Wind Chill calculation table and Wind Chill Hazard tables from Environment Canada are now included in EPRP

Section 9.6 – Update table 14 – reporting guidelines to include tailings and other contaminated water

Response:
Table 14 in Section 9.6 has been updated as follows:

a) Tailings – Report all unplanned releases that escape secondary containment.
b) Contaminated Water - Report all unplanned releases that escape secondary containment.

We trust this letter provides sufficient detail for your present needs. Do not hesitate to contact us if you need any further clarifications.

Yours sincerely,
Amec Foster Wheeler Environment & Infrastructure
a Division of Amec Foster Wheeler Americas Limited

<Original signed by>

Stephan Theben, M.Eng.
Associate Project Manager

<Original signed by>

Heather Lindsay, M.Sc., P.Eng
Geoenvironmental Engineer

Independent Technical Review Board
Rainy River Project

Mr. Darrel Martindale
Environmental Manager
Rainy River Project
New Gold Inc.
5967 Highway 11/71, P.O. Box 5
Emo, Ontario
P0W 1E0

August 2, 2017

Re: Review of the Operations, Maintenance and Surveillance Manual for Rainy River Project

Dear Sir:

The ITRB was asked by Ms Andrea St-Pierre in an email dated July 27, 2017 to comment on the OMS manual for the site tailings and surface water control structures. This is an interim document meant to describe primarily the operation, maintenance, and surveillance of the surface water control dams and ditches that are complete or near complete. The starter dams for the tailings operation are not yet complete so the OMS procedures cannot be described. Preparation of an OMS manual at the construction stage of a mining project is a difficult undertaking as the structures themselves evolve at during writing of the document. We commend the Rainy River project(RRP) for this difficult undertaking.

The RRP recognizes that the OMS manual will have to be updated as the structures are completed and come into operation. Some of the report sections in the OMS can be kept while others will have to be completely rewritten for the next update. In the current document, the date of submission of the document, July 2017, is well after the status description of some structures. This should be clarified in the document by stating that "this document describes the status of the project at the end of May, 2017 (for instance)" in the Introduction.

The ITRB considers that the OMS document needs to be updated before submission to the MNRF.

- For example, the Emergency Response Contact list requires updating to reflect changes in personnel, and a commitment to the environment is signed by a president long departed;
- The manual contains a description of the geology that omits the presence of high plastic clay tills (that is described a silt) , with low residual strength and high pore pressure response. The ITRB considers this to be misleading and recommends updating;
- The OMS plan provides a general outline of procedures to be followed but note the absence of trigger levels and details. The OMS plan currently provides rough guidelines such as 'when there is a big rainfall… check the dam.' or 'When is a significant change in the readings of a

piezometer, check the instrument then report to EOR' etc but there is no clarity on what constitutes significant or big.

- Section 2 does not state who updates and checks the OMS. Clearly, the Mill Manager is responsible for this but would not normally do this personally. Normally, the site geotechnical engineer would do this work.
- Section 2.5 , bottom of Page 8, states that the OMS will be "screened" by the MNRF. This is unusual. Normally regulatory agencies receive submissions for comment, not screening.

The ITRB would like to be appraised of the changes made and be provided with a summary of instrument readings versus pond level with time at the next ITRB meeting in the fall.
With the above proposed changes included, The ITRB can support the OMS plan.

Yours truly,
On behalf of the ITRB

<Original signed by>

Bryan Watts, M.Sc., P.Eng (BC), P.Geo (BC)

<Original signed by>

Iain Bruce, Ph.D., P.Eng.

NEW GOLD RAINY RIVER MINE
APPENDIX R
ENVIRONMENTAL EFFECTS MONITORING INTERPRETIVE REPORT

Phase 1 Environmental Effects Monitoring Interpretive Report for the New Gold Rainy River Project

Prepared for:
New Gold Inc.
Emo, Ontario

Prepared by:
Minnow Environmental Inc.
Georgetown, Ontario

March 2018

Phase 1 Environmental Effects Monitoring Interpretive Report for the New Gold Rainy River Project

<Original signed by>

Tyrell Worrall, M.Sc.
Project Manager

<Original signed by>

Pierre Stecko, M.Sc., EP, R.P.Bio.
Senior Project Advisor

EXECUTIVE SUMMARY

The Rainy River Project (RRP), operated by New Gold Inc., is an open pit and underground gold mine located approximately 65 km northwest of Fort Frances, and approximately 420 km west of Thunder Bay, Ontario. Commercial production started in late 2017 and ore is milled and refined on site to produce doré bars at an estimated annual rate of approximately 325,000 ounces. Mill tailings are treated to destroy cyanide and conveyed to the RRP tailings management area (TMA). Reclaimed water from the TMA is returned to the mill for re-use. Excess water is treated in a polishing pond prior to discharge into a constructed wetland at Loslo Creek or by direct pipeline to the Pinewood River downstream of McCallum Creek. The constructed wetland is the primary effluent discharge path. The pipeline is available to discharge excess effluent if necessary in order to maintain wetland water retention time and reduce wetland erosion. Under average effluent discharge rates and Pinewood River flow, the effluent concentration in the Pinewood River is calculated to be up to approximately 14% after mixing.

Sublethal toxicity tests conducted on grab samples of RRP final effluent at Final Discharge Point 2 (FDP2) and Final Discharge Point 3 (FDP3) over the Phase 1 EEM period (2016 to 2017) indicated that effluent was generally of high quality with the lowest reported effects occurring at effluent concentrations of 37% and 95% for FDP2 and FDP3 respectively. Overall, sublethal toxicity data indicate good effluent quality and the observed responses occurred at effluent concentrations well above those expected in the receiving environment.

Water quality of the Pinewood River downstream of RRP was only moderately influenced by effluent discharge. Influence of RRP effluent was evident in higher conductivity, hardness, calcium, potassium, and sodium in the effluent-exposed area relative to upstream. Nitrite was elevated in the effluent-exposed area compared to both the reference area and the water quality guideline for the protection of aquatic life on one occasion in 2016. Additionally, aluminum and iron were the only other parameters measured that did not meet water quality guidelines for the protection of aquatic life, however, this occurred at both the effluent-exposed and reference areas, indicating that these substances are naturally elevated in this area. Overall, water quality data collected during the EEM study were consistent with the routine monitoring data and indicated a detectable, but minor, effect of RRP effluent on water quality of the Pinewood River, confirmed during the April and September field studies on the basis of measured *in situ* measurements.

The inorganic sediment fraction was composed predominantly of silt (37-69%) and clay (25-41%), with some sand (2-31%). There were significant differences between the effluent-exposed and reference area sediments on the basis of total organic carbon, as well as the silt and clay fractions, with significantly more TOC and silt in the effluent-exposed area, and significantly less clay.

Sediment concentrations of chromium and nickel were elevated in both the effluent-exposed and reference areas, compared to Provincial Sediment Quality Guideline (PSWQG) Lowest Effect Levels (LEL). Additionally, effluent-exposed sediment concentrations of manganese and phosphorus were elevated compared to reference area concentrations and the PSQG LEL. Total organic carbon (TOC) was above the PSQG LEL in both areas. There were no Severe Effects Level (SEL) exceedances except for total Kjeldahl nitrogen (TKN) at the effluent-exposed area; TKN was greater than LEL at the reference area.

The benthic invertebrate community survey showed only subtle differences between the effluent-exposed area and the reference area. At the family level of taxonomic resolution, the benthic invertebrate community of the Pinewood River effluent-exposed area did not differ significantly from the Sturgeon Creek reference area on the basis of density, richness, or Simpson's E. The Bray-Curtis distance was significantly higher at the exposed area of Pinewood River compared to the reference area of Sturgeon Creek, likely due to a difference in the habitat between the two areas rather than an effluent related influence.

No major differences in fish community composition were observed between the two areas, although the effluent-exposed area on Pinewood River supported a higher species diversity. Female brook stickleback downstream of the RRP differed significantly from reference female brook stickleback based on relative gonad size, relative liver size, and body condition, with the magnitude of differences exceeding the applicable critical effect sizes (CES). A similar pattern was observed for effluent-exposed female central mudminnow, with significant differences in relative gonad size, relative liver size, and body condition, although only relative gonad size exceeded the applicable CES. Effluent-exposed male brook stickleback differed significantly from males captured at the Sturgeon Creek reference based on larger relative liver size and body condition, with the magnitude of difference outside of the applicable CES for both endpoints. Similarly, male effluent-exposed central mudminnow showed the same pattern as the male brook stickleback (larger relative liver size and body condition) in terms of significance and magnitude of difference outside of applicable CES.

Based on the findings of the Phase 1 RRP EEM study conducted in April and September 2017, it is recommended that the mine implements the Phase 2 EEM biological study ("periodic monitoring – surveillance") three years after Phase 1.

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1 INTRODUCTION

1.1 Site Description

New Gold Inc. owns the Rainy River Project (RRP), located in northwestern Ontario in the Township of Chapple and District of Rainy River, approximately 65 km northwest of Fort Frances, and approximately 420 km west of Thunder Bay (Figure 1.1). The RRP is located within the Pinewood River watershed. The Pinewood River flows past the RRP and drains into the Rainy River approximately 37 km downstream.

Earliest exploration of the RRP began in 1967. Rainy River Resources Ltd. acquired the project in 2005 and began conducting baseline studies in 2008. The RRP was acquired by New Gold Inc. in 2013 and an Environmental Assessment (EA) report was submitted in 2014 (AMEC 2014). Site construction began following provincial and federal EA approvals in 2015. Upon completion, the RRP site construction will include an open pit mine, an underground mine, ore storage facilities, a process plant, a Tailings Management Area (TMA), watercourse diversions, site drainage works, a fuel tank farm, explosives manufacturing facilities, and explosives storage facilities (Figure 1.2). Mine commissioning occurred in September 2017.

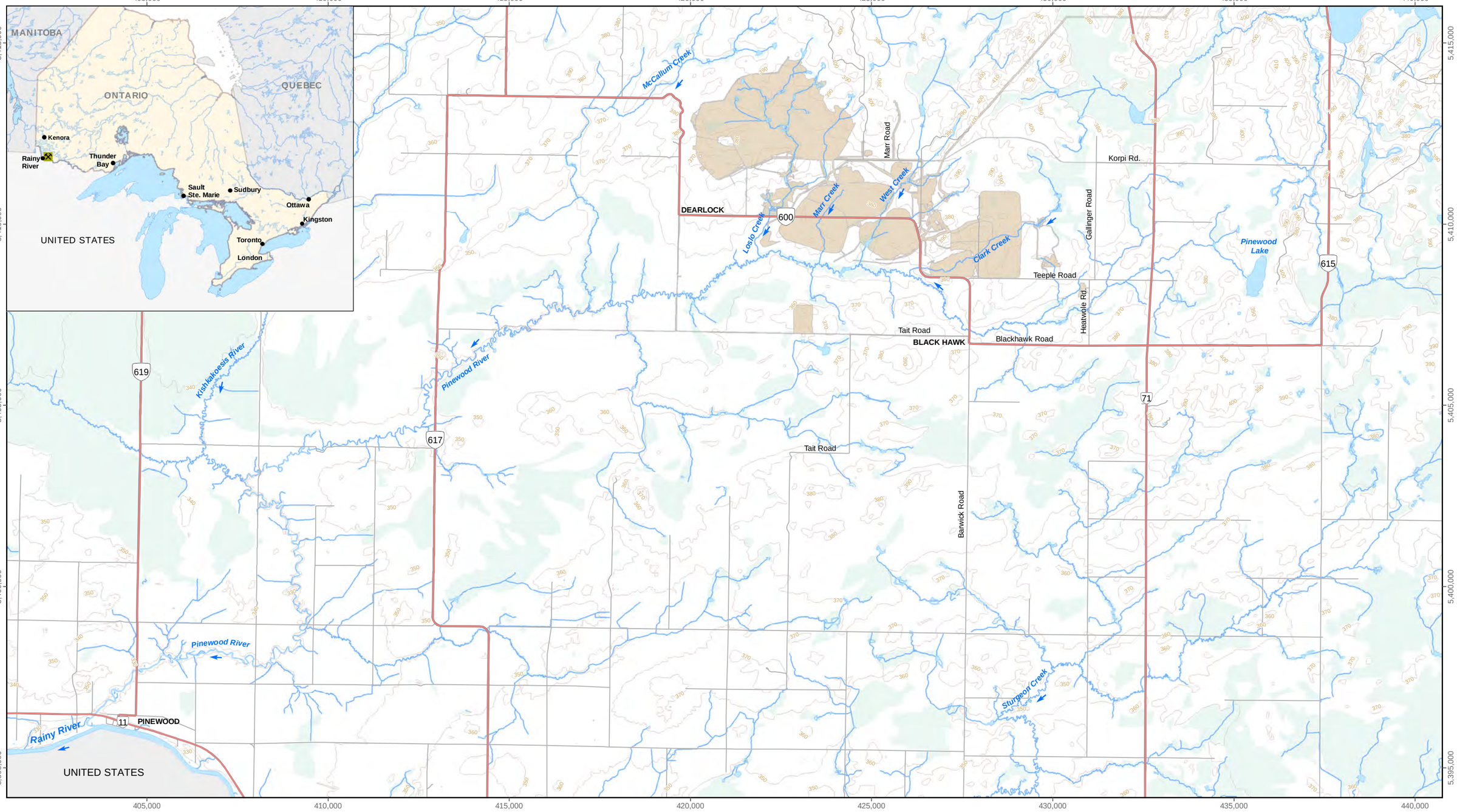
The RRP is expected to sustain mining operations for approximately 16 years, with an anticipated ore production capacity of 27,000 tonnes per day (tpd) as well as an anticipated milling capacity of 21,000 tpd (CEAA 2015).

1.2 Effluent Characteristics

Under the MMER, RRP was required to conduct effluent characterization, sublethal toxicity testing, and water quality monitoring starting not later than six months after the day on which the mine became subject to the MMER. RRP became subject to the MMER on September 17th, 2015 and thus was required to start monitoring on March 17th, 2016.

Treated effluent from the RRP's s seven discharges has complied with the MMER (Table 1.1), with only three exceptions during the Phase 1 EEM time period (2016 to 2017). Three incidences of elevated Total Suspended Solids (TSS) occurred, on April 15, 2016 at FDP2 (42 mg/L), September 28, 2016 at FDP6 (31 mg/L), and January 28, 2017 at FDP7 (39 mg/L; Table 1.1).

Effluent discharge is intermittent for all seven Final Discharge Point (FDP)s usually related to increased precipitation, this was especially relevant in 2016 as this was during the construction phase, so the mine pits needed periodic pumping (Figure 1.3). The nature of this unpredictable discharge schedule meant that effluent characterization could not always occur a minimum of 30 days apart (Table 1.1). The mean annual discharge in 2017 was increased compared to 2015 or 2016 for five of the seven FDPs (Table 1.2). However, two of the FDPs (FDP 6 and 7), had



LEGEND

- Mine Infrastructure
- Contour (10 m)

0 1.5 3 6
km

N
W E
S

Map Projection: UTM Zone 15 NAD 1983
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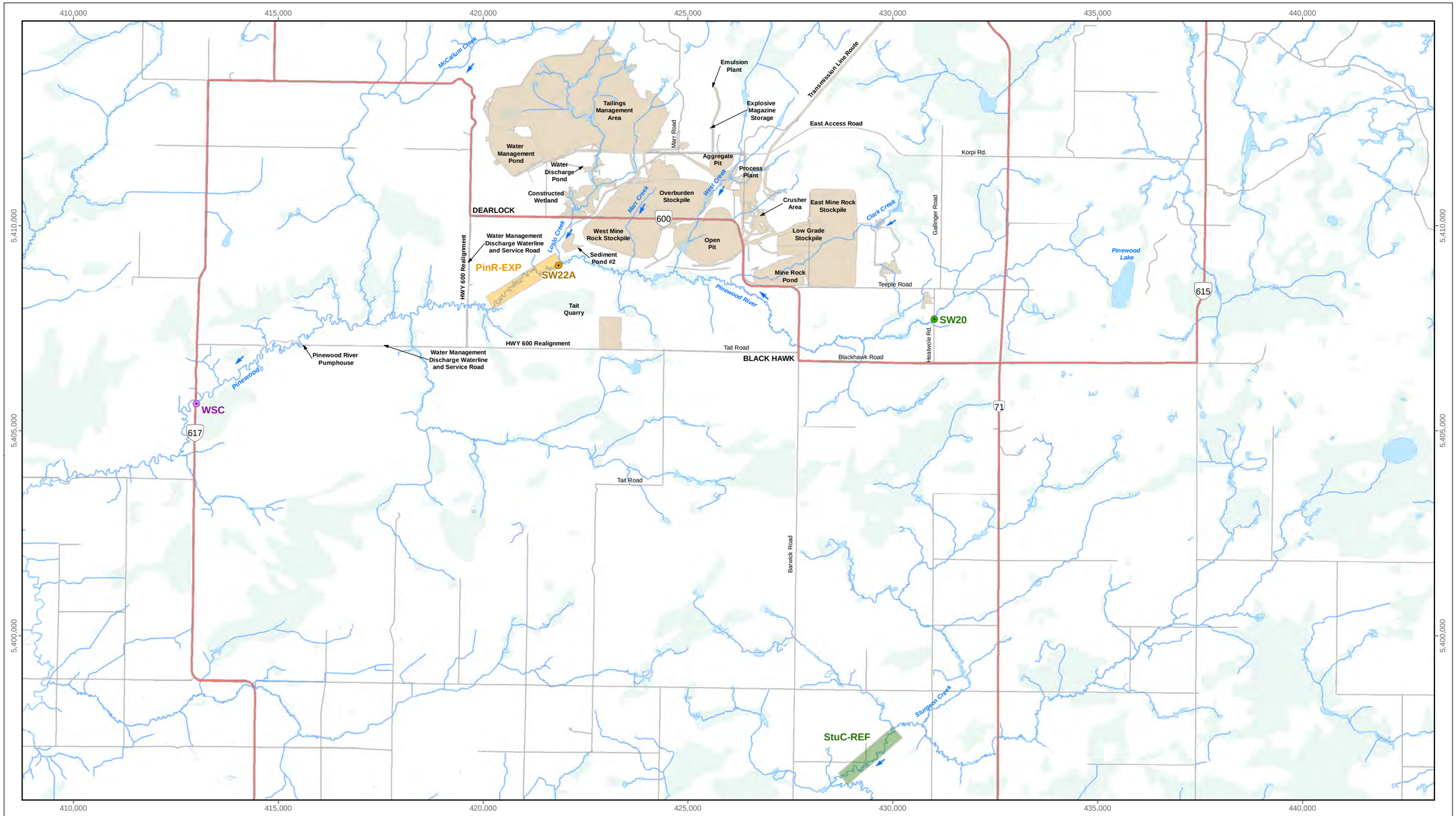
Location and Future Layout of the Rainy River Project

Date: March 2018
Project 177202.0012

minnow environmental inc.

Figure 1.1

Document Path: S:\Projects\177202\177202.0012 - RRP Phase 1 EEM Implementation\6 - GIS Mapping\Report\17-12 Fig 1.1 Layout.mxd



LEGEND

- Mine-exposed Water Monitoring Area
- Reference Water Monitoring Area
- WSC Station 05PC023
- Effluent-exposed
- Reference
- Mine Infrastructure

0 1.25 2.5 5 km

N W E S

Map Projection: UTM Zone 15 NAD 1983
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Anticipated Future Mine Infrastructure, Rainy River Project

Date: March 2018
Project 177202.0012

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Figure 1.2

Document Path: S:\Projects\177202\177202.0012 - RRP Phase 1 EEM Implementation\6 - GIS Mapping\Report\17-12 Fig 1.2 Location and Layout.mxd

Table 1.1: Effluent Characterization, Mean Annual Effluent Flow, and Effluent Acute Toxicity for the RRP for Phase 1

a) FDP2 (Sump 3,6)

Variables	Units	Regulatory Limits				Phase 1											
		MMER		ECA		2015				2016				2017			
		Daily	Monthly	Daily	Monthly	13-Dec	-	-	-	15-Apr	27-Jun	28-Aug	30-Sep	22-Mar	25-Apr	28-May	17-Oct
Mean Annual Flow Rate	m^3/day					17				375				367			
Non-metals																	
Alkalinity	mg/L					344	-	-	-	243	164	252	306	336	278	349	333
Ammonia	mg/L					0.02	-	-	-	4.3	0.1	5.9	11.9	4.5	3.5	0.7	0.4
Cyanide	mg/L	2	1			-	-	-	-	-	-	-	-	0.037	0.004	0.003	<0.002
Hardness	mg/L					341	-	-	-	283	212	302	327	365	327	374	392
Lab pH	pH unit	6.0 - 9.5	6.0 - 9.5		6.0 - 9.5	-	-	-	-	7.98	8.34	8.09	7.78	7.14	8.13	7.96	7.87
Nitrate	mg/L					0.025	-	-	-	6.87	1.25	8.19	17.80	5.37	4.73	0.67	0.83
Total Suspended Solids (TSS)	mg/L	30	15	30	15	-	-	-	-	42	14	25	3	7	1	14	5
Metals																	
Aluminum	mg/L					-	-	-	-	<0.0050	0.250	0.380	0.091	0.194	0.020	0.290	0.083
Arsenic	mg/L	1	0.5	0.0340	0.0170	-	-	-	-	0.0032	0.0027	0.0016	0.0035	0.004	0.0037	0.0026	0.0018
Cadmium	mg/L					<0.000017	-	-	-	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	0.000075
Copper	mg/L	0.6	0.3	0.028	0.014	-	-	-	-	0.0059	0.0013	0.0010	0.0019	0.0051	0.0010	0.0013	0.0034
Iron	mg/L					-	-	-	-	<0.01	0.29	0.31	0.09	0.19	0.01	0.39	0.24
Lead	mg/L	0.4	0.2	0.030	0.015	-	-	-	-	<0.02	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury	mg/L					-	-	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L					-	-	-	-	0.0178	0.0144	0.0135	0.0298	0.0138	0.0144	0.0061	0.0054
Nickel	mg/L	1	0.5	0.094	0.047	-	-	-	-	0.0047	<0.002	0.0015	0.0028	0.0034	0.0024	0.0016	0.0032
Radium^{226}	Bq/L	1.1	0.37			-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	1	0.5	0.348	0.174	-	-	-	-	0.076	0.132	0.005	0.007	0.004	0.0015	0.0025	0.0045
Acute Toxicity in 100% Effluent																	
Daphnia magna	% mortality	50%		50%		-	-	-	-	-	-	0	0	0	0	0	0
Rainbow Trout	% mortality	50%		50%		-	-	-	-	-	-	0	0	0	0	0	0

MMER - Metal Mining Effluent Regulations.

ECA - Environmental Compliance Approval.

Table 1.1: Effluent Characterization, Mean Annual Effluent Flow, and Effluent Acute Toxicity for the RRP for Phase 1

b) FDP3 (Sump 4, 5)

Variables	Units	Regulatory Limits				Phase 1											
		MMER		ECA		2015				2016				2017			
		Daily	Monthly	Daily	Monthly	-	-	-	-	30-May	30-Jun	24-Aug	22-Sep	19-Jan	3-Apr	6-May	13-Oct
Mean Annual Flow Rate	m^3/day					-				630				607			
Non-metals																	
Alkalinity	mg/L					-	-	-	-	279	221	311	286	418	333	352	309
Ammonia	mg/L					-	-	-	-	3.7	1.6	5.3	5.5	5.4	3.4	3.46	2.6
Cyanide	mg/L	2	1			-	-	-	-	-	-	-	-	0.061	0.013	0.011	<0.002
Hardness	mg/L					-	-	-	-	327	269	385	403	447	366	384	384
Lab pH	pH unit	6.0 - 9.5	6.0 - 9.5		6.0 - 9.5	-	-	-	-	8.26	8.19	7.89	7.05	7.35	7.90	8.12	8.08
Nitrate	mg/L					-	-	-	-	3.22	2.37	6.72	8.30	5.1	4.0	4.08	6.57
Total Suspended Solids (TSS)	mg/L	30	15	30	15	-	-	-	-	4	5	7	5	5	<2	10	5
Metals																	
Aluminum	mg/L					-	-	-	-	0.0800	0.105	0.148	0.369	0.078	0.071	0.177	0.044
Arsenic	mg/L	1	0.5	0.0340	0.0170	-	-	-	-	0.0034	0.0027	0.0028	0.0039	0.0035	0.0032	0.0041	0.0023
Cadmium	mg/L					-	-	-	-	<0.000017	<0.000017	<0.000017	0.000025	0.000025	<0.000017	<0.000017	0.00004
Copper	mg/L	0.6	0.3	0.028	0.014	-	-	-	-	0.0010	0.0014	0.0015	0.0031	0.0016	0.0035	0.0035	0.0030
Iron	mg/L					-	-	-	-	0.11	0.13	0.19	0.42	0.12	0.08	0.20	0.06
Lead	mg/L	0.4	0.2	0.030	0.015	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury	mg/L					-	-	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L					-	-	-	-	0.0113	0.0158	0.0145	0.0179	0.0191	0.0121	0.0133	0.0124
Nickel	mg/L	1	0.5	0.094	0.047	-	-	-	-	0.0028	<0.0020	0.0032	0.0039	0.0071	0.0034	0.0052	0.0027
Radium^{226}	Bq/L	1.1	0.37			-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	1	0.5	0.348	0.174	-	-	-	-	<0.003	<0.003	0.010	0.010	0.0155	0.0065	0.006	0.0035
Acute Toxicity in 100% Effluent																	
Daphnia magna	% mortality	50%		50%		-	-	-	-	0	0	0	0	0	10	0	0
Rainbow Trout	% mortality	50%		50%		-	-	-	-	0	0	0	0	0	0	0	0

MMER - Metal Mining Effluent Regulations.

ECA - Environmental Compliance Approval.

Table 1.1: Effluent Characterization, Mean Annual Effluent Flow, and Effluent Acute Toxicity for the RRP for Phase 1

c) FDP5 (Process Plant Overburden Pile)

Variables	Units	Regulatory Limits				Phase 1											
		MMER		ECA		2015				2016				2017			
		Daily	Monthly	Daily	Monthly	-	-	-	-	6-Jun	25-Jul	24-Aug	23-Nov	6-May	5-Jul	17-Aug	17-Sep
Mean Annual Flow Rate	m^3/day					-				50				190			
Non-metals																	
Alkalinity	mg/L					-	-	-	-	156	127	117	131	155	244	188	201
Ammonia	mg/L					-	-	-	-	<0.02	<0.02	<0.02	<0.02	0.008	0.038	0.416	0.122
Cyanide	mg/L	2	1			-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Hardness	mg/L					-	-	-	-	189	207	202	286	249	362	376	411
Lab pH	pH unit	6.0 - 9.5	6.0 - 9.5		6.0 - 9.5	-	-	-	-	8.39	8.43	8.54	8.05	8.28	8.47	8.56	8.46
Nitrate	mg/L					-	-	-	-	<0.02	0.25	<0.04	0.01	0.765	1.42	3.99	2.2
Total Suspended Solids (TSS)	mg/L	30	15	30	15	-	-	-	-	13	7	7	4	8	14	5	10
Metals																	
Aluminum	mg/L					-	-	-	-	0.373	0.102	0.094	0.028	0.259	0.341	0.065	0.461
Arsenic	mg/L	1	0.5	0.0340	0.0170	-	-	-	-	0.0012	0.0016	0.0020	0.0014	0.0010	0.0018	0.0021	0.0027
Cadmium	mg/L					-	-	-	-	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017
Copper	mg/L	0.6	0.3	0.028	0.014	-	-	-	-	0.0021	0.0022	0.0019	0.0022	0.0024	0.0036	0.0034	0.0033
Iron	mg/L					-	-	-	-	0.28	0.10	0.11	0.03	0.24	0.39	0.06	0.26
Lead	mg/L	0.4	0.2	0.030	0.015	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury	mg/L					-	-	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L					-	-	-	-	0.0077	0.0088	0.0092	0.0086	0.0044	0.0042	0.0059	0.0054
Nickel	mg/L	1	0.5	0.094	0.047	-	-	-	-	<0.002	<0.002	<0.002	<0.002	<0.002	0.0025	0.0024	0.0025
Radium^{226}	Bq/L	1.1	0.37			-	-	-	-	-	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	1	0.5	0.348	0.174	-	-	-	-	0.003	0.002	0.002	0.002	0.005	0.0035	0.004	0.0035
Acute Toxicity in 100% Effluent																	
Daphnia magna	% mortality	50%		50%		-	-	-	-	-	-	-	0	-	-	0	0
Rainbow Trout	% mortality	50%		50%		-	-	-	-	-	-	-	0	-	-	0	0

MMER - Metal Mining Effluent Regulations.
ECA - Environmental Compliance Approval.

Table 1.1: Effluent Characterization, Mean Annual Effluent Flow, and Effluent Acute Toxicity for the RRP for Phase 1

d) FDP6 (Process Plant Site)

Variables	Units	Regulatory Limits				Phase 1											
		MMER		ECA		2015				2016				2017			
		Daily	Monthly	Daily	Monthly	17-Sep	19-Oct	7-Nov	8-Dec	24-Mar	2-May	25-Jul	28-Sep	3-Apr	6-Apr	12-Apr	-
Mean Annual Flow Rate	m^3/day					82				147				31			
Non-metals																	
Alkalinity	mg/L					217	218	218	230	228	237	165	168	161	186	180	
Ammonia	mg/L					2.06	1.17	0.004	0.604	0.2	0.1	0.1	0.2	0.1	0.1	0.134	
Cyanide	mg/L	2	1			-	-	-	-	-	-	-	<0.002	<0.002	<0.002	<0.002	
Hardness	mg/L					275	273	275	298	257	248	221	214	195	232	204	
Lab pH	pH unit	6.0 - 9.5	6.0 - 9.5		6.0 - 9.5	-	-	-	-	8.00	8.39	8.32	8.33	7.99	8.14	8.31	
Nitrate	mg/L					10.6	-	-	8.36	2.04	0.79	7.46	7.73	3.75	6.1	2.8	
Total Suspended Solids (TSS)	mg/L	30	15	30	15	-	-	-	-	11	17	10	31	8	6	17	
Metals																	
Aluminum	mg/L					0.186	-	-	0.250	0.2730	0.395	-	1.510	0.236	0.218	0.553	
Arsenic	mg/L	1	0.5	0.0340	0.0170	-	-	-	-	<0.001	0.0014	0.0014	0.0015	<0.001	<0.001	<0.001	
Cadmium	mg/L					0.00002	0.00002	<0.000017	0.00002	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	<0.000017	0.00002	
Copper	mg/L	0.6	0.3	0.028	0.014	-	-	-	-	0.0035	0.0032	0.0026	0.0034	0.0034	0.0042	0.0059	
Iron	mg/L					0.28	-	-	0.24	0.31	0.36	-	1.29	0.19	0.24	0.58	
Lead	mg/L	0.4	0.2	0.030	0.015	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Mercury	mg/L					<0.00001	-	-	<0.00001	<0.00001	<0.00001	-	<0.00001	<0.00001	<0.00001	<0.00001	
Molybdenum	mg/L					0.0147	-	-	0.013	0.0055	0.0038	-	0.0072	0.0037	0.0055	0.004	
Nickel	mg/L	1	0.5	0.094	0.047	-	-	-	-	0.0023	0.0020	<0.0020	0.0021	<0.0020	0.0024	0.0028	
Radium^{226}	Bq/L	1.1	0.37			-	-	-	-	-	-	-	-	<0.01	<0.01	<0.01	
Zinc	mg/L	1	0.5	0.348	0.174	-	-	-	-	0.081	0.004	<0.0030	0.006	0.017	0.017	0.02	
Acute Toxicity in 100% Effluent																	
Daphnia magna	% mortality	50%		50%		-	-	-	-	-	-	-	-	-	0	-	
Rainbow Trout	% mortality	50%		50%		-	-	-	-	-	-	-	-	-	0	-	

MMER - Metal Mining Effluent Regulations.
ECA - Environmental Compliance Approval.

Table 1.1: Effluent Characterization, Mean Annual Effluent Flow, and Effluent Acute Toxicity for the RRP for Phase 1

e) FDP7 (South Pond)

Variables	Units	Regulatory Limits				Phase 1											
		MMER		ECA		2015				2016				2017			
		Daily	Monthly	Daily	Monthly	-	-	-	-	9-Jun	18-Jul	11-Oct	11-Dec	28-Jan	30-Jan	2-Apr	-
Mean Annual Flow Rate	m^3/day					-				231				65			
Non-metals																	
Alkalinity	mg/L					-	-	-	-	166	132	152	216	275	269	162	
Ammonia	mg/L					-	-	-	-	<0.002	<0.002	0.202	<0.020	0.226	0.074	0.092	
Cyanide	mg/L	2	1			-	-	-	-	-	-	<0.002	<0.002	0.002	<0.002	<0.002	
Hardness	mg/L					-	-	-	-	213	180	216	272	302	312	203	
Lab pH	pH unit	6.0 - 9.5	6.0 - 9.5		6.0 - 9.5	-	-	-	-	8.48	8.24	8.36	7.97	7.86	7.88	7.89	
Nitrate	mg/L					-	-	-	-	0.82	2.28	2.47	1.51	3.08	3.66	3.82	
Total Suspended Solids (TSS)	mg/L	30	15	30	15	-	-	-	-	4	16	7	4	39	2	19	
Metals																	
Aluminum	mg/L					-	-	-	-	0.404	0.491	0.105	0.120	0.594	0.032	0.35	
Arsenic	mg/L	1	0.5	0.0340	0.0170	-	-	-	-	0.0012	0.0014	0.0011	0.0010	0.0011	<0.0010	<0.0010	
Cadmium	mg/L					-	-	-	-	<0.000017	<0.000017	<0.000017	<0.000017	0.00003	0.00002	0.00002	
Copper	mg/L	0.6	0.3	0.028	0.014	-	-	-	-	0.0037	0.0046	0.0041	0.0058	0.0081	0.0067	0.0045	
Iron	mg/L					-	-	-	-	0.28	0.52	0.10	0.14	1.06	0.06	0.40	
Lead	mg/L	0.4	0.2	0.030	0.015	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	
Mercury	mg/L					-	-	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	
Molybdenum	mg/L					-	-	-	-	0.0074	0.0057	0.0073	0.0052	0.0041	0.0048	0.0045	
Nickel	mg/L	1	0.5	0.094	0.047	-	-	-	-	<0.0020	0.0022	<0.0020	0.0026	0.0038	0.0029	0.0024	
Radium^{226}	Bq/L	1.1	0.37			-	-	-	-	-	-	-	-	<0.010	<0.010	<0.01	
Zinc	mg/L	1	0.5	0.348	0.174	-	-	-	-	0.009	0.006	0.008	0.023	0.109	0.036	0.024	
Acute Toxicity in 100% Effluent																	
Daphnia magna	% mortality	50%		50%		-	-	-	-	0	-	-	-	0	-	0	
Rainbow Trout	% mortality	50%		50%		-	-	-	-	0	-	-	-	0	-	0	

MMER - Metal Mining Effluent Regulations.

ECA - Environmental Compliance Approval.

Table 1.1: Effluent Characterization, Mean Annual Effluent Flow, and Effluent Acute Toxicity for the RRP for Phase 1

f) FDP8 (North Pond)

Variables	Units	Regulatory Limits				Phase 1											
		MMER		ECA		2015				2016				2017			
		Daily	Monthly	Daily	Monthly	-	-	-	-	-	-	-	-	12-Jun	-	-	-
Mean Annual Flow Rate	m^3/day					-				-				38			
Non-Metals																	
Alkalinity	mg/L					-	-	-	-	-	-	-	-	141	-	-	-
Ammonia	mg/L					-	-	-	-	-	-	-	-	0.15	-	-	-
Cyanide	mg/L	2	1			-	-	-	-	-	-	-	-	<0.002	-	-	-
Hardness	mg/L					-	-	-	-	-	-	-	-	184	-	-	-
Lab pH	pH unit	6.0 - 9.5	6.0 - 9.5		6.0 - 9.5	-	-	-	-	-	-	-	-	8.2	-	-	-
Nitrate	mg/L					-	-	-	-	-	-	-	-	2.48	-	-	-
Total Suspended Solids (TSS)	mg/L	30	15	30	15	-	-	-	-	-	-	-	-	8	-	-	-
Metals																	
Aluminum	mg/L					-	-	-	-	-	-	-	-	0.136	-	-	-
Arsenic	mg/L	1	0.5	0.0340	0.0170	-	-	-	-	-	-	-	-	0.0011	-	-	-
Cadmium	mg/L					-	-	-	-	-	-	-	-	<0.000017	-	-	-
Copper	mg/L	0.6	0.3	0.028	0.014	-	-	-	-	-	-	-	-	<0.001	-	-	-
Iron	mg/L					-	-	-	-	-	-	-	-	0.12	-	-	-
Lead	mg/L	0.4	0.2	0.030	0.015	-	-	-	-	-	-	-	-	<0.001	-	-	-
Mercury	mg/L					-	-	-	-	-	-	-	-	<0.00001	-	-	-
Molybdenum	mg/L					-	-	-	-	-	-	-	-	0.0064	-	-	-
Nickel	mg/L	1	0.5	0.094	0.047	-	-	-	-	-	-	-	-	<0.002	-	-	-
Radium^{226}	Bq/L	1.1	0.37			-	-	-	-	-	-	-	-	<0.01	-	-	-
Zinc	mg/L	1	0.5	0.348	0.174	-	-	-	-	-	-	-	-	0.006	-	-	-
Acute Toxicity in 100% Effluent																	
Daphnia magna	% mortality	50%		50%		-	-	-	-	-	-	-	-	-	-	-	-
Rainbow Trout	% mortality	50%		50%		-	-	-	-	-	-	-	-	-	-	-	-

MMER - Metal Mining Effluent Regulations.
ECA - Environmental Compliance Approval.

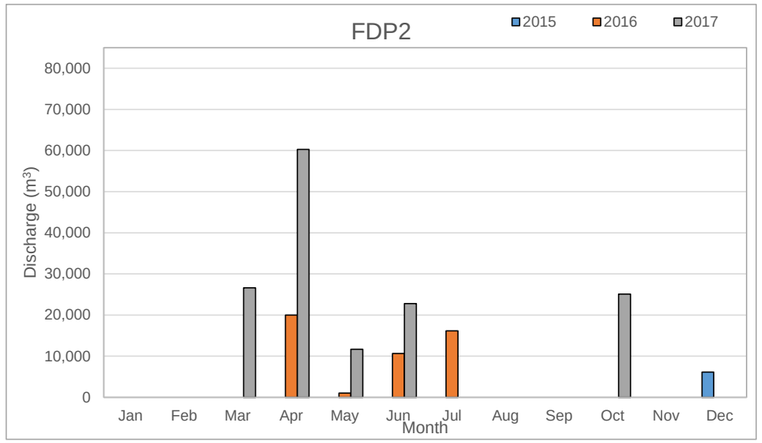
Table 1.1: Effluent Characterization, Mean Annual Effluent Flow, and Effluent Acute Toxicity for the RRP for Phase 1

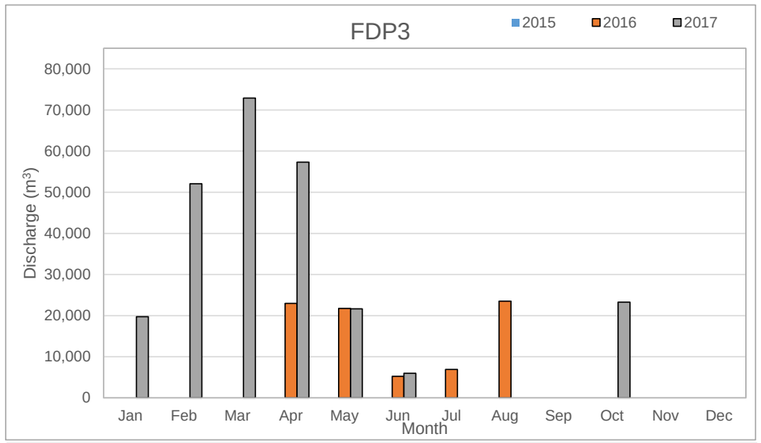
g) FDP9 (Overburden and West Mine Rock Stockpile Temp Ponds, Sump 1, 2)

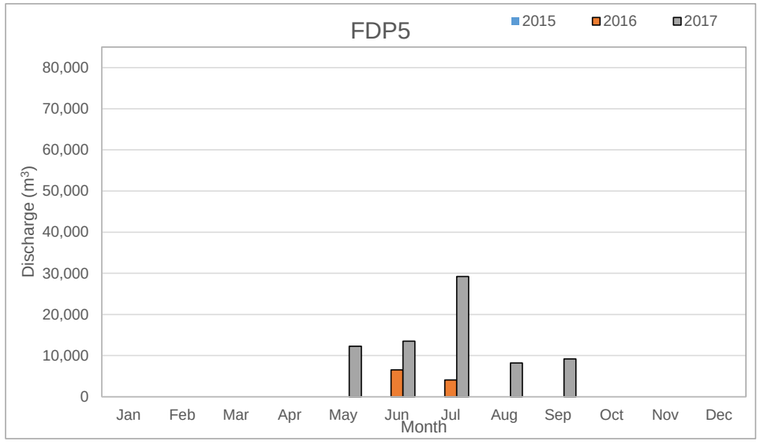
Variables	Units	Regulatory Limits				Phase 1											
		MMER		ECA		2015				2016				2017			
		Daily	Monthly	Daily	Monthly	-	-	-	-	4-Sep	4-Oct	11-Nov	21-Nov	27-Jan	7-Apr	23-Aug	12-Oct
Mean Annual Flow Rate	m^3/day					-				127				393			
Non-metals																	
Alkalinity	mg/L					-	-	-	-	257	185	346	367	407	284	174	173
Ammonia	mg/L					-	-	-	-	2.89	1.15	4.5	4.4	5.9	3.3	0.058	0.178
Cyanide	mg/L	2	1			-	-	-	-	<0.002	<0.002	0.009	0.008	0.052	0.029	<0.002	<0.002
Hardness	mg/L					-	-	-	-	275	222	395	389	420	300	190	217
Lab pH	pH unit	6.0 - 9.5	6.0 - 9.5		6.0 - 9.5	-	-	-	-	7.89	8.26	7.24	7.20	7.68	7.48	8.62	8.08
Nitrate	mg/L					-	-	-	-	5.24	6.02	6.79	6.75	6.05	3.86	0.01	0.22
Total Suspended Solids (TSS)	mg/L	30	15	30	15	-	-	-	-	2	19	8	8	7	3	5	4
Metals																	
Aluminum	mg/L					-	-	-	-	0.082	0.520	0.072	0.084	0.068	0.200	0.177	0.27
Arsenic	mg/L	1	0.5	0.0340	0.0170	-	-	-	-	0.0018	0.0017	0.0020	0.0020	0.0052	0.0026	0.0052	0.0021
Cadmium	mg/L					-	-	-	-	<0.000017	<0.000017	<0.000017	<0.000017	0.000025	0.000025	<0.000017	<0.000017
Copper	mg/L	0.6	0.3	0.028	0.014	-	-	-	-	0.0012	0.0022	0.0011	<0.001	<0.001	0.0025	0.002	0.0023
Iron	mg/L					-	-	-	-	0.08	0.59	0.11	0.10	0.10	0.19	0.17	0.26
Lead	mg/L	0.4	0.2	0.030	0.015	-	-	-	-	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Mercury	mg/L					-	-	-	-	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001	<0.00001
Molybdenum	mg/L					-	-	-	-	0.0137	0.0135	0.0148	0.0182	0.0192	0.0103	0.0083	0.0049
Nickel	mg/L	1	0.5	0.094	0.047	-	-	-	-	<0.002	<0.002	0.0034	0.0029	0.0074	0.0038	<0.002	<0.002
Radium^{226}	Bq/L	1.1	0.37			-	-	-	-	<0.01	-	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Zinc	mg/L	1	0.5	0.348	0.174	-	-	-	-	0.006	0.004	0.006	0.005	0.013	0.015	<0.003	0.003
Acute Toxicity in 100% Effluent																	
Daphnia magna	% mortality	50%		50%		-	-	-	-	-	-	0	0	-	0	0	0
Rainbow Trout	% mortality	50%		50%		-	-	-	-	-	-	0	0	-	0	0	0

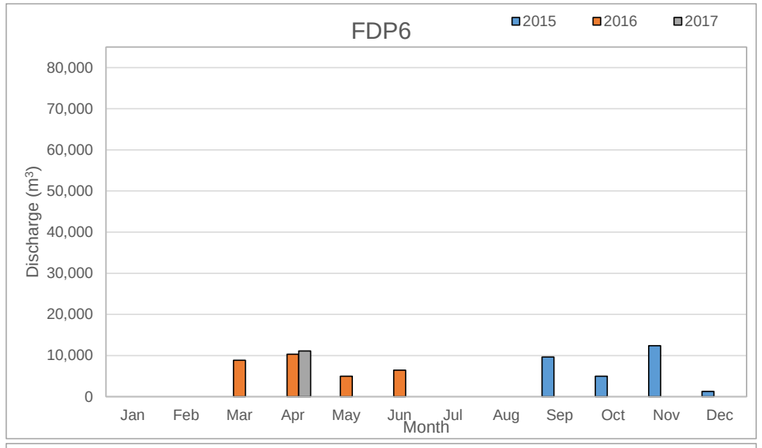
MMER - Metal Mining Effluent Regulations.

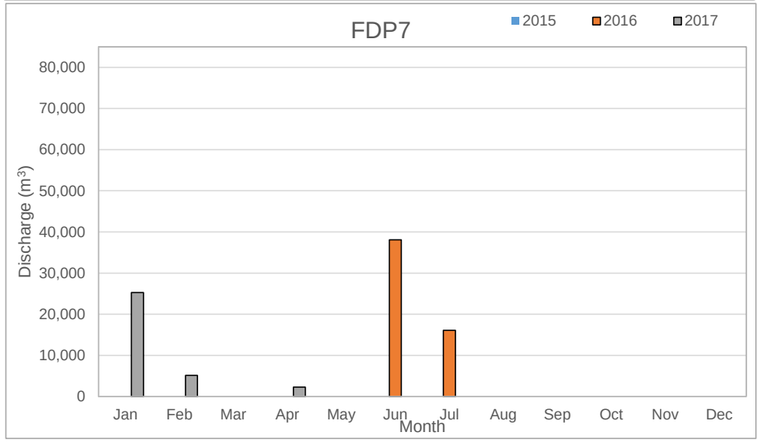
ECA - Environmental Compliance Approval.

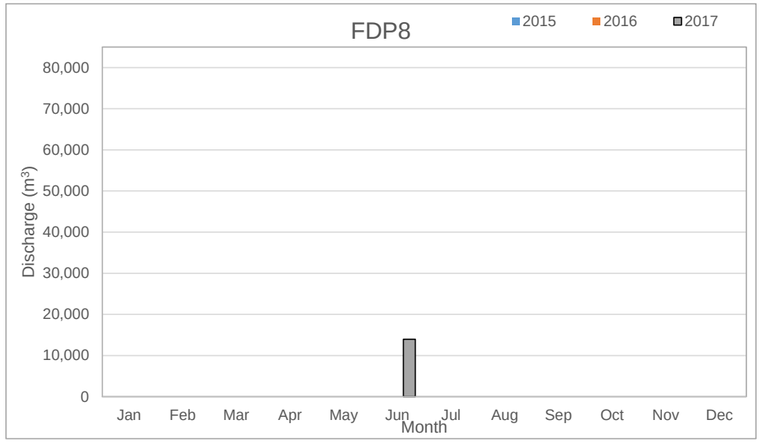












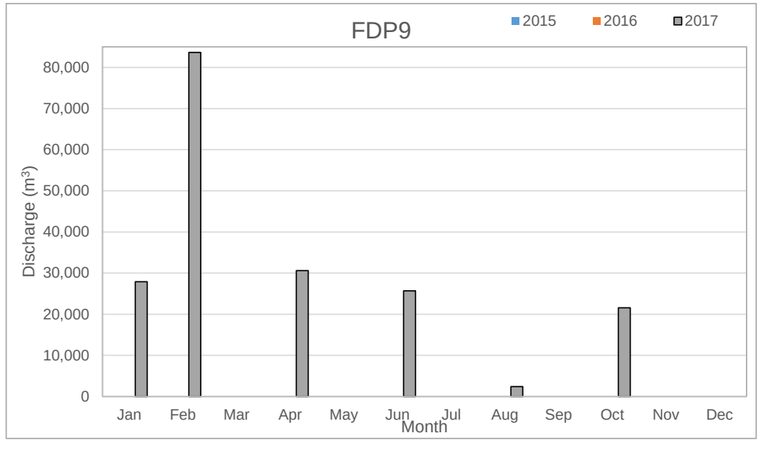


Figure 1.3: **Rainy River Final Discharge Points Average Monthly Effluent Discharge During the Phase 1 EEM Study Period, 2015 to 2017**

decreased discharge volumes in 2017 (Table 1.2). Additionally, RRP plans on reducing the number of FDPs in the future, however this will be determined at a later date.

Table 1.2: Annual MMER Effluent Discharge Totals for the New Gold RRP, 2015 to 2017

Final Discharge Point	Year		
	2015	2016	2017
FDP2	6,158	47,854	146,513
FDP3	0	80,445	252,911
FDP5	0	6,540	72,393
FDP6	29,752	30,601	11,138
FDP7	0	54,148	32,686
FDP8	0	0	3,600
FDP9	0	0	191,830

RRP Mine effluent was usually non-lethal (< 50% mortality in 100% effluent) to *Daphnia magna* and rainbow trout during the Phase 1 EEM acute toxicity bioassay tests, however there were two failed tests due to rainbow trout mortalities (Table 1.3). New Gold retained Minnow to perform a preliminary review of the effluent chemistry data associated with toxicity testing at RRP following these rainbow trout (*Oncorhynchus mykiss*) mortality events (ranging from 10 to 90% mortality). Note that 10% mortality is a level acceptable in test controls (Environment Canada 2007a). The review of effluent chemistry results identified ammonia as the most likely toxicant.

For the review, the effluent chemistry data associated with mortality events were first screened against guidelines to identify any possible toxicants. Effluent concentrations consistently achieved water quality guidelines for the protection of aquatic life and therefore this initial screening did not identify any toxicants. However, in Minnow's experience, ammonia is often a contributor to acute toxicity in mine effluents (due to blasting using ammonium nitrate). Furthermore, fish mortalities in laboratory tests of mine effluent are often due to changes in ammonia toxicity over the duration of the test.

The toxicity of ammonia in aqueous solutions is dependent on the equilibrium between the un-ionized (NH_3) and ionized (NH_4^+) species. The speciation of ammonia in water is largely determined by pH and temperature, with higher proportions of the toxic un-ionized species being associated with higher pH and higher temperature (CCME 2010). Within a bioassay test, the experimental pH and temperature of the effluent solution can be different from *in situ* conditions, and may change over the duration of the 96 hour test. The toxicity of ammonia (i.e., proportion of un-ionized ammonia) may increase during the test due to a progressive increase in pH as a

Table 1.3: Acute Toxicity Results as Percent Mortality, RRP Phase 1 EEM

Location	Date	*Dapnia magna*	Rainbow Trout
FDP2	15-Jul-16	0	0
	16-Oct-16	0	0
	8-Nov-16	0	0
	22-Nov-16	0	0
	7-Dec-16	0	0
	20-Dec-16	0	0
	22-Mar-17	0	0
	28-Mar-17	0	40
	4-Apr-17	0	10
	11-Apr-17	0	0
	17-Apr-17	0	0
	25-Apr-17	0	0
	5-May-17	0	0
	28-May-17	0	0
	17-Oct-17	0	0
	29-Oct-17	0	0
FDP3	30-May-16	0	0
	24-Aug-16	0	0
	22-Sep-16	0	0
	6-Nov-16	0	0
	16-Nov-16	0	0
	11-Dec-16	0	0
	29-Dec-16	0	60
	14-Jan-17	0	0
	19-Jan-17	0	0
	23-Jan-17	0	10
	30-Jan-17	0	0
	6-Feb-17	0	0
	15-Feb-17	0	0
	23-Feb-17	0	0
	24-Feb-17	0	10
	4-Mar-17	0	0
	4-Mar-17	0	0
	12-Mar-17	0	0
	16-Mar-17	0	0
	18-Mar-17	0	0
	22-Mar-17	0	0
	25-Mar-17	0	0
	30-Mar-17	7	0
	3-Apr-17	0	10
	7-Apr-17	0	0
	10-Apr-17	0	0
	16-Apr-17	0	10
	20-Apr-17	0	0
	30-Apr-17	0	0
	6-May-17	0	0
	10-May-17	0	0
	30-May-17	0	0
	19-Jun-17	0	0
	13-Oct-17	0	0

Denotes a failed acute toxicity result (> 50%)

Table 1.3: Acute Toxicity Results as Percent Mortality, RRP Phase 1 EEM

Location	Date	*Dapnia magna*	Rainbow Trout
FDP5	23-Nov-16	0	0
	5-May-17	0	0
	4-Jun-17	0	0
	21-Jun-17	0	0
	6-Jul-17	0	0
	16-Jul-17	0	0
	31-Jul-17	0	10
	17-Aug-17	0	0
	17-Sep-17	0	0
FDP6	24-Mar-16	0	10
	4-Jun-16	0	0
	23-Nov-16	0	0
	6-Apr-17	0	0
FDP7	9-Jun-16	0	0
	12-Oct-16	0	0
	11-Dec-16	0	0
	28-Jan-17	0	0
	2-Apr-17	0	0
FDP8	27-Nov-16	0	0
FDP9	4-Sep-16	0	0
	3-Oct-16	0	0
	17-Oct-16	0	0
	21-Oct-16	0	0
	11-Nov-16	0	0
	21-Nov-16	0	0
	27-Jan-17	0	0
	28-Jan-17	0	0
	5-Feb-17	0	0
	10-Feb-17	0	0
	17-Feb-17	0	0
	20-Feb-17	0	90
	23-Feb-17	0	0
	24-Feb-17	3	20
	25-Feb-17	0	0
	4-Mar-17	0	0
	5-Mar-17	0	0
	7-Mar-17	0	0
	12-Mar-17	0	0
	24-Mar-17	53	0
	3-Apr-17	0	0
	7-Apr-17	0	0
	22-Apr-17	0	0
	27-Apr-17	0	0
	18-Jun-17	0	0
	23-Aug-17	0	0
	12-Oct-17	0	0

Denotes a failed acute toxicity result (> 50%)

result of aeration and the associated decline in dissolved CO_2 (Environment Canada 2007a). As expected, the pH of RRP bioassay test solutions increased over the test duration.

Un-ionized ammonia concentrations in bioassay tests were calculated using total ammonia concentrations as well as the pH and temperature for three condition scenarios: (1) *in situ* field conditions, (2) the initial bioassay conditions at the start of the test, and (3) the final bioassay conditions at the end of the test. Calculation of un-ionized ammonia for these three scenarios indicated that, over the duration of the bioassay test, pH levels in RRP bioassay tests increase to levels where concentrations of un-ionized ammonia exceed 96 hour acute mortality LC_{50} levels for juvenile rainbow trout (i.e., 0.4 - 0.673 mg/L HN_3; Figure 1.4; CCME 2010, USEPA 1984), but this would not occur *in situ* with the conditions naturally found in the Pinewood River.

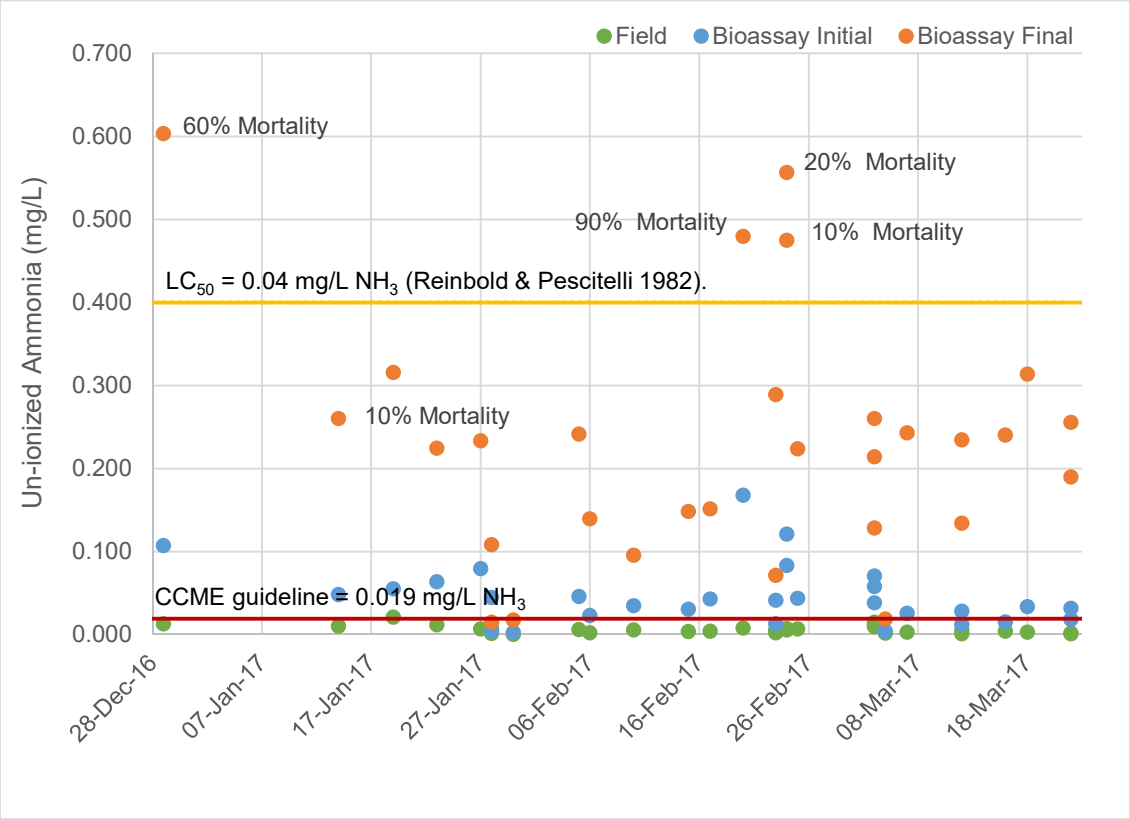


Figure 1.4: Calculated Un-ionized Ammonia Concentrations in Bioassay Test Solutions and Corresponding Mortality Events

This pH drift under test conditions can be controlled in the laboratory. The Environment Canada guidance document indicates that, if effluent samples contain an appreciable quantity of ammonia or other constituent whose toxicity is highly pH-dependent, and concern exists about pH drift

during testing and its contribution to sample toxicity, a second (concurrent) test may be conducted. This second test could be undertaken using various means (e.g., oxygenating rather than aerating solutions, addition of CO_2 to test solutions or enclosed atmospheres above the solutions, testing solutions in sealed containers with oxygen atmospheres) to reduce or prevent pH drift during the test (Environment Canada 2007a).

Therefore, it was recommend that RRP speak to their bioassay laboratory about running a second (concurrent) pH-controlled test for future acute toxicity tests.

Overall the effluent from RRP is of high quality and should have minimal impact on the receiving environment, especially at calculated concentrations found within the Pinewood River (~14% total volume; Minnow 2016).

1.3 Receiving Environment Characteristics

The Pinewood River is the secondary receiver of the RRP's effluent discharge from Process Plant Site, South Pond, Sump 3, and Sump 4, as well as from PPOP via Clark Creek. Currently, all discharge is controlled by pumping. Fish and benthic invertebrate sampling was conducted downstream of the primary FDP, at water quality monitoring station SW22A and downstream, with specific locations based on accessibility and habitat conditions. The effluent-exposed biological monitoring area will be referred to as PinR-EXP (Figure 1.2). SW22A is approximately 5 km downstream of the confluence of West Creek (which receives effluent from the current primary FDP) and the Pinewood River (2.9 km downstream in a direct line). SW22A is also approximately 150 m downstream of Loslo Creek, which will receive effluent discharge from the TMA once the mine is fully operational (Figure 1.2).

The Pinewood River originates at the outlet of Pinewood Lake (24.2 km upstream of SW22A, or approximately 13.5 km east overland) and flows southwest into the Rainy River, which then drains into the southern end of Lake of the Woods. The Rainy River forms part of the international border between Ontario, Canada and Minnesota, United States. Total length of the main stem of the Pinewood River is 75 km. At the confluence of the Pinewood River and the Rainy River, the Pinewood River drains a watershed of approximately 576 km^2. Flow in the Pinewood River is highly variable, with highest flows occurring during freshet and low flows during winter (Government of Canada 2016). The Pinewood River has a mean annual flow of 4.60 m^3/s at the confluence with Rainy River. The mean annual flows at the WSC station 05PC023 and the water quality monitoring station SW22A are and 1.85 m^3/s and 0.83 m^3/s, respectively (Government of Canada 2016, SDI 2015).

The Pinewood River is a relatively shallow, meandering river, with a low gradient (average < 0.1%; KCB 2011). The substrate is predominantly fines, clay, silt, and detritus, with

some sand and, in some areas, sparse gravel, and boulder (AMEC 2014). Average wetted width varies along the river, from 1.5 m to as much as approximately 40 m at the widest part near the confluence with the Rainy River (AMEC 2012, KCB 2011). Near the RRP site, wetted width is generally around 10 m, while the depths were 0.3 to 1 m in July (AMEC 2012; KCB 2011). Stream cover is mostly provided by overgrowth, and to some extent large woody debris.

The effluent-exposed area of the Pinewood River is generally comprised of flat morphology with some pools (AMEC 2014) and contains two main habitat types. The first habitat type has narrower floodplain widths, with forested riparian vegetation extending close to the channel edge (AMEC 2014). Aquatic vegetation is dominated by red-head pondweed (*Potamogeton richardsonii*) and hornwort coontail (*Ceratophyllum demersum*; AMEC 2014). The second main habitat type has relatively open channels, with maximum floodplain widths of 50 m and a riparian zone of sedge species (Cyperaceae), speckled alder (*Alnus incana*), and willow species (*Salix* sp.; AMEC 2014). Aquatic vegetation is dominated by yellow cowlily (*Nuphar lutea*), broadleaf arrowhead (*Sagittaria latifolia*), tape grass (*Vallisneria spiralis*), and hornwort coontail. Mixed forest species associated with the upper Pinewood River (effluent-exposed area) included: black spruce (*Picea mariana*), larch (*Larix* sp.), balsam poplar (*Populus balsamiferous*), white elm (*Ulmus americana*), and white birch (*Betula papyrifera*; AMEC 2014). Beaver dams are present in many locations in the Pinewood River and, although not considered permanent barriers to fish movement, may act as obstacles, particularly to larger-bodied fish (AMEC 2014). In 2010, beaver dams were observed at approximately 1 km, 1.8 km, and 3.7 km downstream of SW22A (i.e., potentially downstream of or within the PinR-EXP area; KCB 2011). Manmade water crossings along the Pinewood River have been observed to allow for sufficient river flow and thus did not present as a barrier to fish movement (AMEC 2014).

In the lower Pinewood River, widths and depths increase as the river approaches the Rainy River, reaching maximum bankfull depths of 4.5 m (AMEC 2014). Here the substrate, although still predominantly clay and fines, has a larger proportion of coble, gravel, and boulder (AMEC 2014). The riparian zone is comprised of mixed forest including black spruce, larch, balsam poplar, white birch, and white elm (AMEC 2014).

Gravel and cobble shoals provide fish spawning and nursery habitat for numerous species, including walleye. This type of spawning habitat has only been identified in the lower Pinewood River (downstream of the confluence with McCallum Creek; AMEC 2014). Spawning habitat for northern pike and yellow perch is shallow vegetation, particularly the heavily vegetated floodplains of streams or lakes (Holm et al. 2010). This type of habitat is abundant in the upper Pinewood River (upstream of McCallum Creek) and its upper tributaries (AMEC 2014), in part as a result of flooding by beaver ponds.

1.4 Summary of the Approved Phase 1 Design

The Study Design for the Phase 1 EEM was submitted to Environment and Climate Change Canada (ECCC) in September 2016 (Minnow 2016).

1.5 Report Organization

Methods of sample collection, sample analysis, and data analysis during the Phase 1 EEM study for RRP are presented in Section 2. Section 3 presents a summary of the effluent sub-lethal toxicity test data collected to date. Supporting field measures and water quality data are presented in Section 4. Sediment quality data are presented in Section 5 and the benthic invertebrate community survey results are presented in Section 6. Section 7 presents the findings of the fish survey and the conclusions of the RRP Phase 1 EEM and recommendations for the next Phase are provided in Section 8. All the references cited throughout this document are listed in Section 9.

2 METHODS

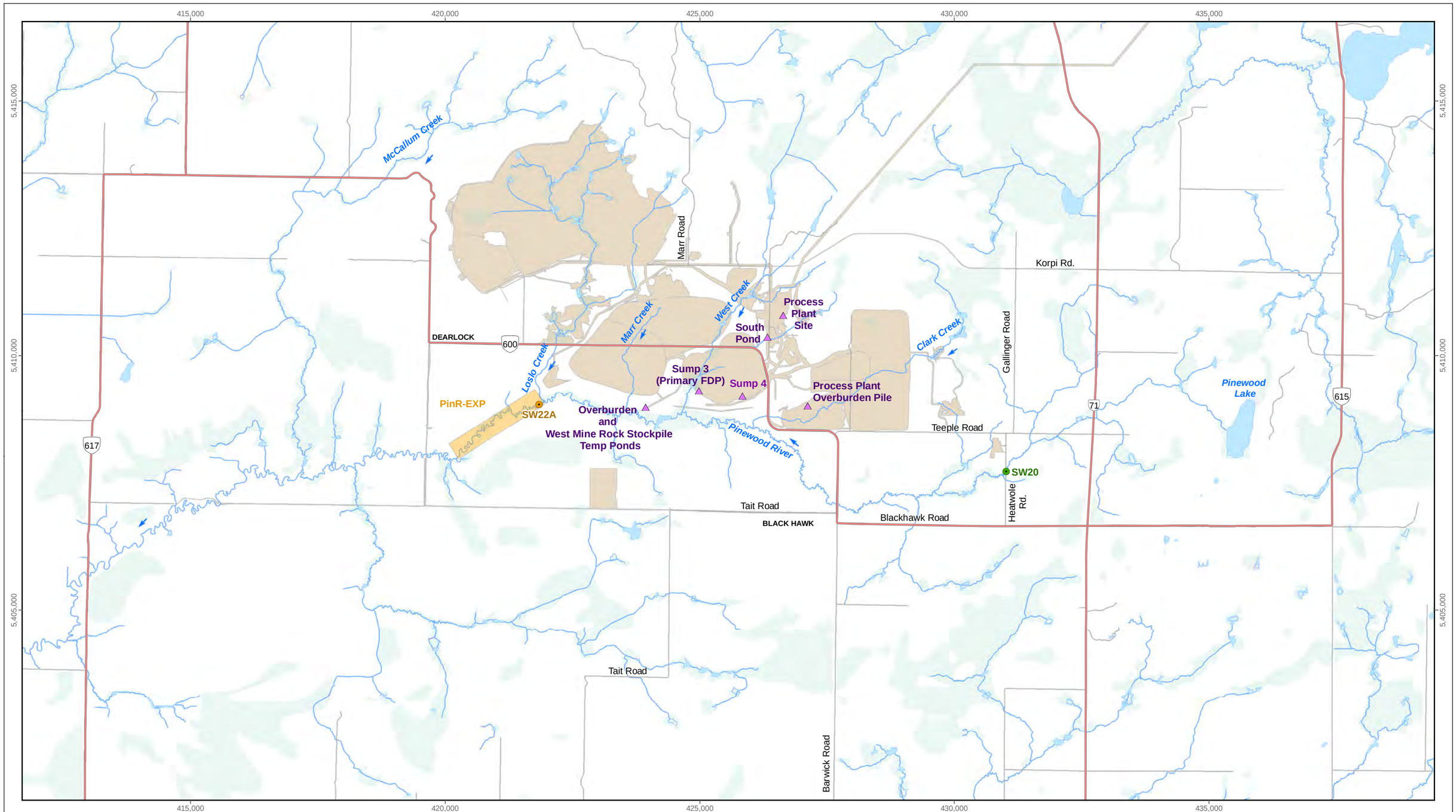
2.1 Overview

The RRP Phase 1 EEM consisted of effluent sublethal toxicity testing, water quality monitoring, sediment quality monitoring, benthic invertebrate community monitoring and fish population monitoring. RRP conducts semi-annual sublethal toxicity testing of its primary final effluent and monitors water quality in effluent-exposed and reference areas a minimum of four times per year in accordance with EEM requirements (Environment Canada 2012) and the Environmental Compliance Approval (No. 5781-9VJQ2J) monitoring requirements for the Pinewood River. Fish community monitoring was conducted from April 21st to 25th, 2017 and the benthic invertebrate community monitoring was completed from September 13th to 17th, 2017. This monitoring, supported by a number of field measures and observations, was undertaken in effluent-exposed Pinewood River and the upstream Pinewood River and Sturgeon Creek reference areas (Figure 2.1).

2.2 Effluent Sublethal Toxicity

Sublethal toxicity tests were conducted on effluent from the RRP primary FDPs. Samples were collected into labelled HDPE (High Density Polyethylene) containers. Following collections, samples were put on ice inside coolers and shipped to AquaTox Testing and Consulting Inc. in Guelph, Ontario. Sample arrival time, temperature, dissolved oxygen, conductivity, pH and hardness were recorded upon arrival at the laboratory, and any unusual characteristics were also noted.

Sublethal toxicity tests were conducted on fathead minnow (*Pimephales promelas*; 7-d survival and growth test), a cladoceran invertebrate (*Ceriodaphnia dubia*; 7-d survival and reproduction test), an algae (*Psuedokirchneriella subcapitata*; formerly referred to as *Selenastrum capricornutum*; 3-d inhibition test) and duckweed (*Lemna minor*; 7-d growth inhibition test) using standard test methods (i.e., Environment Canada 2011, 2007b,c,d). For fathead minnow and *C. dubia* chronic toxicity tests, LC_{50} (i.e., lethal concentration to 50% of test organisms) was calculated from the mortality data by the laboratory (e.g., Stephan 1977). Chronic toxicity test IC_{25} (inhibitory concentration that reduced larval fathead minnow growth by 25%, reduced the number of *C. dubia* neonates produced by 25%, inhibited *P. subcapitata* and *L. minor* growth and/or frond production by 25%) values were calculated from the growth or reproduction data. Reference toxicant testing was employed to ensure that all test systems met protocol criteria during effluent testing. All IC_{25} data were derived by the toxicity laboratory using linear interpolation aided by Comprehensive Environmental Toxicity Information System (CETIS) software (Tidepool Scientific Software, McKinleyville, CA). Sublethal toxicity data were



LEGEND

Proposed Benthic Invertebrate and Fishing Sampling Area

- Effluent-exposed
- Reference

- Final Discharge Point
- Effluent-exposed Water Monitoring Area
- Reference Water Monitoring Area
- Mine Infrastructure

0 1 2 4 km

N W E S

Map Projection: UTM Zone 15 NAD 1983

Data Source: Reproduced under licence from Her Majesty the Queen in Right of Canada, Department of Natural Resources Canada. All rights reserved.

Rainy River Project Phase 1 EEM Biological Sampling Areas, Final Discharge Points (FDPs), and Water Quality Monitoring Areas

Date: March 2018
Project 177202.0012

minnow environmental inc.

Figure 2.1

Document Path: S:\Projects\177202\177202.0012 - RRP Phase 1 EEM Implementation\6 - GIS Mapping\Report\17-12 Fig 2.1 Phase 1 EEM.mxd

subsequently reported to Environment Canada as part of RRP annual reporting and have been summarized in this report.

2.3 Receiving Water Quality

In accordance with the approved Study Design, routine receiving environment water sampling was conducted by the mine at the Pinewood River effluent-exposed area (SW22A) and a Pinewood River reference area upstream of the RRP (SW20; Figure 2.1). Water sampling for the biological survey was undertaken at the Pinewood River effluent-exposed area (PinR-EXP), and the Sturgeon Creek reference area (StuC-REF) during both the spring and fall surveys. This included an assessment of chemical parameters as well as supporting measures.

2.3.1 Sample Collection and Laboratory Analysis

Routine receiving water samples were collected at least four times per year at areas designated as reference (SW20) and effluent-exposed area (SW22A) to meet the EEM monitoring requirements (Figure 1.2). Routine water quality samples were collected at arm's length below the water surface to avoid floating material and facing upstream to avoid any potential influence of the individual collecting the sample. Samples were collected into pre-labelled and pre-preserved (if required) bottles provided by ALS Thunder Bay laboratory. Immediately after sampling, the samples were placed into coolers on ice for transport to the mine environmental laboratory for immediate shipment to ALS Thunder Bay. In the event that the samples were not shipped immediately, they were placed in a refrigerator at the mine environmental laboratory for shipment the next day. Analytes included those required under EEM: hardness, alkalinity, aluminum, arsenic, cadmium, copper, iron, lead, mercury, molybdenum, nickel, selenium, zinc, conductivity, total suspended solids, ammonia, nitrate, pH, cyanide, and radium-226 (Environment Canada 2012).

In accordance with the approved Study Design, water quality samples were collected at each of the study areas (Pinewood River effluent-exposed area and Sturgeon Creek reference) during the biological sampling in April and September 2017 (Figure 2.1). These water quality samples were collected as described above and were shipped the day after collection to ALS Environmental in Thunder Bay, Ontario for analysis of the EEM analytes listed above. Field duplicates were sampled to permit assessment of field precision (see Appendix B).

2.3.2 Supporting Measures

A number of environmental variables were monitored to support the EEM. The location of each sample and each fishing effort was recorded using a Geographic Position System (GPS) with coordinates recorded in latitudes and longitudes (degrees, minutes and seconds to one-tenth of a second using the North American Datum of 1983). Field-based measurements were collected

at all ten benthic invertebrate community stations and at the fish sampling areas. These included pH, dissolved oxygen, specific conductance, and temperature that were measured using a YSI 556 MPS (Multiprobe System) equipped with a multi-parameter Sonde. In addition, station depth, sediment texture, sediment odour and presence of plants or algae were recorded for each station. Sediment samples were also collected for chemical analyses (see Section 2.4). All observations associated with the sampling station or the samples were recorded on field sheets.

2.3.3 Data Analysis

All water quality data were evaluated by qualitative comparison of concentrations among areas (i.e., comparison of concentrations at the effluent-exposed area to reference area) and by comparison to water quality objectives for the protection of aquatic life. Provincial Water Quality Objectives (PWQO; OMOEE 1994) and Canadian Water Quality Guidelines (CWQG; CCME 2017) were both considered in the evaluation of water quality data for the RRP. Supporting measures were also statistically compared using Studentized T-test comparisons based on assumptions of normality and homogeneity of variance.

2.4 Sediment Quality

In accordance with the approved Study Design, sediment sampling was undertaken at all benthic invertebrate community sampling stations in both the effluent-exposed area (PinR-EXP) and reference (StuC-REF) areas (Figure 2.1). This included an assessment of physical and chemical parameters as well as supporting measures.

2.4.1 Sample Collection

Sediment samples were collected for analyses using a stainless steel Petite Ponar sampler (0.023 m^2 sampling area). A composite sample was created at each station by collecting the top five centimetres of surficial sediment from each of three acceptable Petite Ponar grabs (i.e., full to each edge of sampler) into a plastic tub. The composite sample was homogenized before being spooned (using a stainless steel spoon) directly into polyethylene bags. The top 5 cm was selected because it is the fraction in which most benthic fauna reside. Details about samples (e.g., sample penetration, depth, substrate characteristics) were recorded on field sheets. One duplicate sample was also assessed for quality assurance (see Appendix B).

Immediately after collection, samples were placed in a cooler on ice, and later placed in a refrigerator at the mine environmental laboratory at approximately 4 °C until submission for analysis. Sediment samples were submitted to ALS Environmental, Thunder Bay, Ontario for

analysis of total organic carbon (TOC), particle size[1], total Kjeldahl nitrogen (TKN), total phosphorus, and metals.

Additional supporting sediment measurements and observations collected at all benthic invertebrate monitoring stations included sediment texture and colour, and presence of algae or plants on or in the sediment.

2.4.2 Data Evaluation

The sediment quality data for the Pinewood River effluent-exposed area was evaluated relative to: 1) concentrations measured at the reference area, and 2) applicable Provincial Sediment Quality Guidelines (PSQG). PSQG are numerical criteria that are protective of sediment-dwelling organisms based on long-term exposure (OMOE 1993). The PSQG include lowest effect level (LEL) and severe effect level (SEL) values. LEL is defined as a concentration that can be tolerated by the majority of benthic organisms (i.e., at least 90-95% of species) and reflects sediments that can be considered clean to moderately polluted (OMOE 1993). The SEL is the concentration at which pronounced disturbance of the benthic community (i.e., 90-95% of benthic species) can be expected (OMOE 1993) and is typically about five times higher than the LEL. However, natural background concentrations, particularly in mineralized areas of the Canadian Shield, can be higher than LELs for many substances. Therefore, sediment concentrations at the EEM sampling stations were compared to both the PSQG LEL and SEL.

Principal component analysis (PCA) was also used to assist with the interpretation of general trends and patterns of variability in the sediment quality data among study areas. Data were screened to ensure that any variables with no variation (i.e., all less than detect) were removed from the data matrix. Principal component axes were then generated from the correlation matrix of the original sediment quality variables. PCA scores for each station were subsequently plotted and used as summary variables to test for differences among study areas using ANOVA with post-hoc comparisons as well as the correlation analysis.

2.5 Benthic Invertebrate Community Survey

In accordance with the approved study design, benthic invertebrate sampling was undertaken in the Pinewood River effluent-exposed area and Sturgeon Creek reference area (Figure 2.1). Target sampling station characteristics included a depth of approximately 1 m, bottom water velocity of less than 0.02 m/s and fine sediment with little to no gravel.

[1] Particle size determination was based on the Wentworth scale. Prior to particle size analysis, organic content was burned off (loss on ignition) to eliminate any chance of misclassification of small organic debris.

2.5.1 Sample Collection

Benthic invertebrate samples were collected using a steel petite-Ponar sampler (15.24 cm x 15.24 cm). Five stations were sampled in each area, at a minimum of three bankfull widths apart, to provide adequate statistical power to detect differences of +/- two standard deviation at an α and β of 0.10 which is consistent with EEM guidance (Environment Canada 2012). One sample was collected at each station and was composed of a three-grab composite (0.0697 m^2 of bottom area in total), to ensure each sample was representative of the station. Upon retrieval, all samples were closely examined to ensure that only high quality, comparable samples were retained (based on factors such as particle size, organic matter, presence, or absence of plants or algae). Each grab was placed into a tub to evaluate whether the grab was complete (i.e., that the grab captured the surface material and was full to each edge) and to evaluate the depth to which the grab penetrated. Unacceptable grabs were discarded. If the grab was acceptable, the Ponar was rinsed into the tub to ensure complete removal of all material. The sample was then placed into a 500 µm mesh sieve bag and sieved free of material less than 500 µm in diameter. Sampling was repeated until three acceptable grabs were collected. Details about each acceptable grab were recorded on field sheets. The retained sample from the three composited grabs was carefully transferred to one or more labelled 2-L wide mouth plastic jars using a stainless steel spoon and wash bottle while working over a plastic tub to avoid any potential loss of organisms. Any organisms still adhering to the sieve bag were removed with tweezers and added to the sample. All samples were labelled internally (using wooden sticks) and externally with the station number, area identifier, Minnow project number, date and field personnel in order to ensure correct identification at the laboratory. Samples were preserved with buffered formalin solution to achieve a nominal concentration of 10%. Supporting measures (GPS coordinates, station depth, water quality, and sediment quality) were collected at each benthic station as previously described.

2.5.2 Sample Processing

All benthic invertebrate samples were shipped to Zaranko Environmental Assessment Services (ZEAS), Nobleton, Ontario. Upon arrival at the laboratory, each benthic invertebrate sample was inspected to verify adequate preservation and a biological stain was added to improve sorting efficiency. Prior to sorting, benthic samples were washed free of formalin in a 500 µm sieve under well-ventilated conditions. Samples were then examined by a technician under a stereomicroscope at a magnification of at least ten times. All benthic organisms were removed from the sample debris and placed into vials containing 70% ethanol. A senior taxonomist then enumerated and identified the benthic organisms to the lowest practical level (typically genus or species) utilizing the most up-to-date taxonomic keys. Following identification, representative

specimens of each species were preserved in 75% ethanol (with 3% glycerol) in separately labelled vials to form a voucher collection.

Quality assurance/quality control (QA/QC) for benthic laboratory operations was conducted as recommended by Environment Canada (Environment Canada 2013, Glozier et al. 2002; Appendix B). Comparisons of fractions sorted were assessed for 10% of samples to verify that sub-sampling precision was within 20%. In addition, 10% of samples were re-sorted to verify that less than 10% of total organisms were missed (Environment Canada 2012). See Appendix B for full QA/QC analysis.

2.5.3 Data Analysis

Benthic invertebrate communities were evaluated at the Family Level [FL][2] using summary metrics of mean taxon richness, mean invertebrate abundance (or "density"; average number of organisms per m^2), Simpson's Evenness Index (E) and the Bray-Curtis Index of Dissimilarity as required under the MMER (Environment Canada 2012). Taxon richness included all separate 19 taxa identified to the lowest practical level, excluding any life stages that could not be conclusively identified as separate taxa. In some instances, for the purposes of data analysis, invertebrate taxa were combined at a generic taxonomic level in order to incorporate abundance associated with indeterminate taxa. This was only done when there were few species in the genus and indeterminates made up a significant proportion of generic abundance.

Simpson's indices of diversity ("D") and evenness ("E"), and the Bray-Curtis (B-C) index were computed from custom MS Excel macros and spreadsheets following the formulae presented by Environment Canada (2012). The B-C metric takes into account the abundance of each taxon at each station compared to the median abundance computed from the reference station data to compute an index of the relative "distance" of each station from a hypothetical reference median station. Larger B-C index values indicate greater dissimilarity from reference.

The relative proportions of the most abundant taxa were also computed (calculated as the abundance of each respective dominant/indicator taxon relative of the total number of organisms in the sample). Dominant/indicator taxon groups were defined as those groups representing greater than 25% of total organism abundance in at least one replicate sample or any groups considered to be important indicators of environmental stress. In the Phase 1 EEM, chironomids, bivalves, EPT taxa (Ephemeroptera, Plecoptera, and Trichoptera taxa), and oligochaetes were examined.

[2] Summary metrics were also calculated based on organisms sorted to lowest practical level [LPL] results can be found in Appendix D.

Community structure was also assessed using a multivariate technique known as correspondence analysis (CA). CA is used to calculate synthetic axes, which can be thought of as new variables summarizing variation in the relative abundance of benthic taxa. When depicted in two-dimensional plots, taxa that tend to co-occur will have similar CA axis scores and will plot together, while those that rarely co-occur plot farther apart. Similarly, stations sharing many taxa plot closest to one another, while those with little in common plot farther apart. The greatest variation among either taxa or stations is explained by the first axis, with other axes accounting for progressively less variation. Therefore, this type of multivariate analysis describes not only which stations have distinct benthic invertebrate communities but also how these communities differ among stations (i.e., which particular taxa differ). Prior to CA, the data were screened for rare taxa, and taxa occurring at 10% or fewer of the stations were removed as these can distort results. After screening and data reduction, abundances were log (x+1) transformed. Scores for both stations and for taxa were calculated using the ADE-4 package (Thioulouse et al. 1997).

All required and supplementary endpoints were summarized by separately reporting mean, median, minimum, maximum, standard deviation, standard error, and sample size for each sampling area (Environment Canada 2012). These endpoints were also plotted to explore spatial patterns and differences between effluent-exposed and reference areas to assist in data interpretation. Statistical comparisons between effluent-exposed and reference areas were conducted for each endpoint using Studentized T-tests. Data were assessed for normality and transformed as required to stabilize variances and satisfy assumptions of the T-Tests. Non-parametric techniques were used in instances in which transformation was unsuccessful in normalizing data or homogenizing variances. Statistical tests and plots were generated using SPSS Version 12 (SPSS Inc., Chicago, IL). Interpretation of benthic community metrics was enhanced by inspection of raw data and taxonomic proportions to detect patterns of ecologically relevant differences between effluent-exposed and reference areas. Benthic metrics calculated as explained above were then plotted to explore spatial patterns in the benthic community data with respect to the location of stations. Ecological and habitat requirements of taxa were assessed using standard references (Clarke 1981, Edmunds et al. 1976, Merritt and Cummins 1984, Merritt et al. 2008, Weiderholm 1983, Wiggins 1996).

The Technical Guidance Document (Environment Canada 2012) states that the benthic invertebrate community survey should minimally have sufficient power to detect a difference (effect size) of ± two standard deviations (SDs). Therefore, the magnitude of the difference between area means in each planned comparison was calculated for each benthic metric where a significant difference was detected. The magnitude of the difference was expressed as the number of reference mean SDs as follows:

magnitude of difference = (exposure mean – reference mean) / SD of the reference mean

If a significant difference between areas was not detected for a benthic metric, then the minimum effect size that could have been detected (had a large enough effect existed) was calculated using the mean square error generated from the ANOVA as an estimate of variability, with alpha and beta equal to 0.10. The minimum detectable effect size was based on the minimum number of reference area SDs, according to the following equation:

$$\delta = [(t_\alpha + t_\beta)(\sqrt{MSE})(\sqrt{2/n})]/SDref$$

where, δ = minimum detectable effect size,

MSE = mean square error,
n = sample size per area (in this case = 5), and
SDref = standard deviation of the reference area mean.

Possible relationships among the significant benthic invertebrate community indices and the supporting physical and chemical data observed were then examined using correlation analysis. A Bonferroni-type correction was applied to minimize the risk of declaring false positive correlations since at least 5% of derived correlations would be expected to occur by chance alone. Any significant correlations found at the adjusted p-value and/or at a p-level <0.05 were further investigated using scatter plots to determine if a continuous distribution of data was realized (possible causal relationships) or if these relationships were “leveraged” by outlying points (or groups of points).

2.6 Fish Survey

In accordance with the approved study design, a traditional lethal EEM fish population survey was undertaken in the effluent-exposed area of Pinewood River (PinR-EXP) and one reference area: Sturgeon Creek (StuC-REF; Figure 2.1). Following initial fish catches and consultation with Environment Canada during the field survey, it was determined that the sentinel species targeted would be brook stickleback and central mudminnow.

2.6.1 Sample Collection

Brook stickleback and central mudminnow were targeted from the effluent-exposed area on the Pinewood River and the Sturgeon Creek reference using backpack electrofishing, fine-mesh seine nets and minnow traps. All fishing was conducted under a License to Collect Fish for Scientific Purposes obtained from the Ontario Ministry of Natural Resources and Forestry (1086615; Appendix E). Supporting information recorded for each seine haul, backpack electrofishing pass, and minnow trap set included deployment and retrieval time (minnow traps),

seine haul distance, electrofishing seconds, water depth, GPS coordinates and habitat description. Upon net retrieval, all fish were identified, counted, and recorded on the appropriate field sheets. Twenty adult male and 20 adult female brook stickleback and central mudminnow were targeted in each area for the survey. All captured fish not utilized in the fish health assessment were identified, enumerated, and released.

2.6.2 Sample Processing

Sentinel species collected were held in aerated buckets and processed in an offsite laboratory. Sampled fish were individually sacrificed in a strong clove oil solution immediately prior to dissection. Lengths were measured using electronic calipers (to the nearest 0.01 mm) and weight was measured with a Scout Pro Balance (Model PSE-123) to the nearest 0.001 g with ± 1% precision. Both measures were recorded on data sheets. The presence of any external lesions, tumours, parasites or other abnormalities was also noted. Fish were opened using dissecting scissors and any internal abnormalities were noted. Processing involved removal of gonads and livers using dissecting tweezers and scissors, and measurement of gonad and liver weight to the nearest 0.001 g using an electronic balance surrounded by a draft shield. Whole female gonads were then preserved in 10% buffered formalin in containers labelled with the fish identification. Following processing, fish heads were frozen separately in labelled whirl-pak™ bags, for later extraction of otoliths for ageing (see Section 2.6.3 below).

Ovary samples were subsequently shipped to Zaranko Environmental Assessment Services (ZEAS) Laboratory in Nobleton, Ontario, for determination of fecundity and egg weight. All samples retained for ageing were shipped (frozen) to AAE Tech Services (Winnipeg, Manitoba), where otoliths were extracted for age determination using the crack and burn methodology.

2.6.3 Laboratory Analysis

2.6.3.1 Fecundity and Egg Weight

At ZEAS Laboratory in Nobleton, Ontario, whole ovary samples were drained into an 18-µm sieve to remove the preservative and then weighed to the nearest 0.001 g to determine the preserved gonad sample weight. Three sub-samples, each consisting of at least 100 eggs, were then removed and weighed. The weights of each subsample were recorded and the numbers of eggs in each sub-sample were counted under a microscope. The remainder of each sample was re-preserved and archived. Ten percent of egg samples were recounted to verify the precision of fecundity estimates. The number of eggs in the whole gonad was calculated as follows (for each sample):

$$gonad\ \ fecundity = \frac{total\ \ weight\ of\ \ preserved\ \ gonad\ sample}{weight\ of\ \ preserved\ \ sample}\ x\ number\ of\ \ eggs\ in\ \ preserved\ \ sample$$

The final fecundity estimate for each female was calculated as an average of the fecundity estimates from the three sub-samples.

Individual egg weights for each female were calculated as follows:

$$individual\ egg\ weight = \frac{weight\ of\ unpreserved\ gonad}{total\ fecundity}$$

2.6.3.2 Aging

AAE Tech Services Inc. estimated fish age by analyses of otoliths. Preparation of the otoliths for ageing was done using a Crack and Burn methodology. Briefly, the otoliths were mounted in epoxy resin and, after the epoxy hardened, sliced into micro-sections using a low-speed isomet diamond saw. Micro-sections were mounted onto glass slides using a mounting medium and read under a compound microscope using transmitted light. For each otolith, the age and edge condition was recorded along with the confidence rating for the age determination.

2.6.4 Data Analysis

Raw fish survey data collected in the field were transcribed from field sheets into electronic spreadsheets. The data were then checked by a separate individual for entry errors as part of the routine QA/QC procedures. Methods of data analysis recommended for EEM (Environment Canada 2012) were employed in the fish survey. Tabulated catch data were used to calculate catch-per-unit-effort (CPUE) for each area and fish collection method. Fish population data were summarized by separately calculating the mean, standard deviation, standard error, minimum, maximum and sample size of each measured variable by area, species, and gender.

Eight endpoints were used to evaluate the health of central mudminnow populations from the effluent-exposed (Pinewood River) and the reference area (Sturgeon Creek). Age was used as an indicator of survival. Weight-at-age, length-at-age, relative gonad weight, relative egg weight, and relative fecundity were used as indicators of energy use. Condition and relative liver weight were used as indicators of energy storage. The same endpoints (with the exception of the endpoints containing age) were used to evaluate the health of brook stickleback populations from the effluent-exposed and the reference area. All health endpoints were analyzed separately for males and females. Prior to statistical analyses, the raw body weight for each fish was adjusted to account for the gonad and liver weights of each fish (i.e., adjusted body weight = raw body weight – gonad weight – liver weight). Of the endpoints assessed, EEM effect endpoints for a lethal fish survey include weight-at-age, relative gonad weight, condition, and relative liver weight, while the remaining comparisons are considered supporting endpoints (Environment Canada 2012).

Statistical comparisons of age between areas were conducted using the two-sample t-test when residuals for the assumption of normality or homogeneity of variances were met (Shapiro-Wilks' test and Levene's test, respectively ($\alpha = 0.05$). When the assumption of equal variances was not met but the assumption of normality was met, the t-test for unequal variances was used (Ruxton 2006). Data were $\log_{10}$-transformed as necessary to meet the assumptions. When the assumptions of normality could not be met, then the Mann-Whitney test was used. Area comparisons were assessed using a significance level ($\alpha = 0.1$).

Statistical comparisons of weight-at-age and length-at-age between areas were conducted using analysis of covariance (ANCOVA) with $\log_{10}$-transformed body size as the response, area as a factor, and $\log_{10}$-transformed age as a covariate. Few fish were aged greater than 2 years old for central mudminnow so the analysis was conducted using age 1 and 2 fish only so the ANCOVA was equivalent to a two-way analysis of variance (ANOVA) with age as the second factor.

Statistical comparisons of relative liver weight, relative gonad weight, relative egg weight, and relative fecundity between areas were conducted using ANCOVA with $\log_{10}$-transformed response variables and adjusted body weight ($\log_{10}$-transformed) as a covariate. Condition was analyzed using ANCOVA with $\log_{10}$-transformed adjusted body weight ($\log_{10}$-transformed) as the response and fork length ($\log_{10}$-transformed) as a covariate.

Significant interactions between the area and the covariate (i.e. the assumption of homogeneity of regression slopes between areas) in the ANCOVA were assessed using $\alpha = 0.05$. When the interaction term was significant, the coefficients of determination (R^2) of the interaction model and parallel slope model were compared to assess whether the slopes were practically significant. If the R^2 was > 0.8 and within 0.002 between the two models, the conclusion was that the interaction model and parallel slope models were practically the same (Environment Canada 2012) and the ANCOVA proceeded with the parallel slope model. Influence was also assessed using Cook's distance statistic when a significant interaction was detected. If the interaction was driven by influential points, these were removed from the analysis (Environment Canada 2012). When the interaction could not be removed by comparison of R^2 values or removal of influential points, the conclusion was that the difference in the response variable between areas was dependent on the covariate values. When the interaction term was not significant, the interaction term was removed from the model and the parallel slope ANCOVA model was fit. When the covariate was not a significant predictor of the response variable in the parallel slope ANCOVA model, the analysis proceeded as a t-test or Mann-Whitney test (as described for age). Area comparisons in the ANCOVA analyses were assessed using a significance level ($\alpha = 0.1$).

The data were plotted using individual value plots for univariate endpoints and scatterplots for bivariate endpoints prior to analysis. Statistical outliers were defined to be observations with

Studentized residuals with magnitude > 4 (Environment Canada 2012). Statistical analyses were reported for comparisons with and without the outliers to assess the influence of the outlier on statistical significance and the magnitude of difference. All statistical analyses were conducted using Minitab 18 software (Minitab 2017).

A magnitude of difference between the effluent-exposed area and reference area was calculated for each endpoint as a percentage of the reference area as:

$$\text{Magnitude of Difference} = (\text{Exp} - \text{Ref})/\text{Ref} \times 100\%$$

using either medians (Mann-Whitney), means (t-test), or the covariate-adjusted means (ANCOVA, without interaction). When an interaction was observed, the magnitude of difference was estimated for small and large fish at the minimum and maximum values of the overlap in covariate values between areas using the predicted values of the response variables from the interaction ANCOVA regression model (Environmental Canada 2012). When response variables are $\log_{10}$-transformed, the means are reported in the original data units (i.e. anti-logged), equivalent to geometric means.

An estimated minimum detectable difference (MDD) using $\alpha=\beta=0.1$ was calculated for each endpoint using either the coefficient of variation (pooled standard deviation divided by reference mean) for untransformed data or the pooled standard deviation of regression residuals for $\log_{10}$-transformed data, and reported as a percentage difference relative to the reference mean. The MDD percentage was reported as both a percentage increase, and a percentage decrease because MDD differs with respect to the direction of $\log_{10}$-transformed measures. The MDD calculations for the M-W test were estimated based on a two-sample t-test using sample sizes multiplied by 0.864 and rounded up to the nearest integer. The 0.864 is the lower bound of the asymptotic relative efficiency of the Mann-Whitney test and the two-sample t-test (Hodges and Lehmann 1956). The MDD calculations were conducted using the two-sample t-test power analysis function in Minitab 18 software (Minitab 2017).

An *a priori* power analysis was conducted for each endpoint using the observed variability from the 2017 data analyses to estimate the sample sizes required to detect a range of effect sizes. The analyses were conducted using the two-sample t-test power analysis function in Minitab 18 software (Minitab 2017) using the same estimates of variability and assumptions for the M-W test as described for the MDD calculations.

3 EFFLUENT SUBLETHAL TOXICITY

3.1 Toxicity Test Results

Sublethal toxicity tests conducted on grab samples of RRP final effluent at Final Discharge Point 2 (FDP2) and Final Discharge Point 3 (FDP3) over the Phase 1 EEM period (2016 to 2017) indicated that effluent was generally of high quality with the lowest reported effects occurring at effluent concentrations of 37% and 95% for FDP2 and FDP3 respectively.

FDP2 sublethal toxicity tests did not elicit effects on fathead minnow survival or on growth of the green algae *Pseudokerchneriella subcapitata* (*P. subcapitata*) at any point during the Phase 1 EEM (Table 3.1). However, FDP2 effluent impaired the survival and growth of the invertebrate *Ceriodaphnia dubia* in 2016 (92% and 72% effluent, respectively; Table 3.1), but not in 2017. This same pattern was observed for the growth of fathead minnow and duckweed (*Lemna minor*) frond size (i.e. weight) with impairment occurring in 2016 (37% and 76%, respectively, Table 3.1) but not 2017. Conversely, frond production for *L. minor* was consistently impaired by FDP2 effluent in both years of the Phase 1 EEM (55% and 64%, respectively; Table 3.1).

FDP3 effluent was of excellent quality with virtually no impairment for any of the test organisms (Table 3.1). It is noteworthy that *P. subcapitata*, usually being the most sensitive species, was not affected by exposure to effluent from either FDP (Table 3.1).

3.2 Predicted Receiving Environment Influence

When sublethal effects are reported at effluent concentrations lower than 30% it is recommended that mines calculate the implied geographic extent of the effect (Environment Canada 2012). Since the geometric mean effect concentrations for effluent sublethal toxicity tests were above 30% in the Phase 1 EEM period, this was not required.

Generally, adverse effects on resident aquatic biota would not be predicted in the Pinewood River based on the lowest effluent concentration effect occurring at 37% (fathead minnow growth), since effluent concentrations in the receiving environment have been estimated to be ≤14% (Minnow 2016).

Table 3.1: Sublethal Toxicity Test Results for RRP Effluent (as % effluent)

a) FDP2 (Sump 3, 6)

Date	*Ceriodaphnia dubia*		Fathead Minnow		*Lemna minor*		*Pseudokerchneriella subcapitata*
	Survival LC50 [a]	Reproduction IC25 [b]	Survival LC50 [a]	Growth IC25 [b]	Frond Increase IC25 [b]	Dry Weight IC25[b]	Growth IC25 [b]
25-Jul-16	91.7 (30 - DNC[c])	71.4 (43.6 - 100)	> 100	37.1 (22.5 - 53.7)	55 (33.1 - 80.0)	76.22 (38 - 100)	> 90.9
28-Aug-17	> 100	> 100	>100	>100	63.7 (50.8 - 75.3)	> 97.0	> 90.9
Cycle 1 Geometric Mean	**96**	**84**	**>100**	**61**	**59**	**86**	**>91**

b) FDP3 (Sump 4)

Date	*Ceriodaphnia dubia*		Fathead Minnow		*Lemna minor*		*Pseudokerchneriella subcapitata*
	Survival LC50 [a]	Reproduction IC25 [b]	Survival LC50 [a]	Growth IC25 [b]	Frond Increase IC25 [b]	Dry Weight IC25[b]	Growth IC25 [b]
27-Sep-16	> 100	> 100	> 100	> 100	95.3 (26.4 - 96.7)	> 97.0	> 90.9
20-Jun-17	> 100	> 100	Indeterminate[d]	Indeterminate[e]	>97.0	> 97.0	> 90.9
Cycle 1 Geometric Mean	**>100**	**>100**	**>100**	**>100**	**96**	**>97**	**>91**

[a] Effluent concentration causing 50% mortality among exposed organisms.

[b] Effluent concentration at which a 25% inhibition/reduction in endpoint was observed among effluent-exposed organisms relative to control group.

[c] Range could not be calculated.

[d] A statistically reasonable estimate could not be calculated. However, according to Equal Variance t two-sample Test (CETIS), there was no significant reduction in growth between the control and the 100% test concentration.

[e] A statistically reasonable estimate could not be calculated. However, according to Fisher Exact Test (CETIS), mortality in the 100% effluent concentration (0%) was not significantly higher than in control (10%).

4 RECEIVING WATER QUALITY

4.1 Water Quality during the EEM

Physico-chemical measurements taken in April showed that water quality was generally similar in the effluent-exposed and reference sampling areas with the exception of higher specific conductivity and pH in the effluent-exposed area (Table 4.1; Appendix Table C.1).

Table 4.1: In Situ Surface Water Quality Data Collected during the Fish Survey for RRP Phase 1 EEM, 2017

Area Idenifier	Date	Temperature (°C)	pH	Dissolved Oxygen		Specific Conductivity (µS/cm)
				(mg/L)	(% sat)	
StuC-REF	24-Apr-17	5.9	6.90	11.86	94.3	153
PinR-EXP	24-Apr-17	5.6	7.46	11.86	93.6	303

In situ water quality measurements were also taken in September at all benthic community survey stations and indicated significant differences in temperature and specific conductance between areas (Figure 4.1; Appendix Tables C.1, and C.2). Differences observed in temperature likely reflect the time of day the measurements were taken (e.g., early morning versus mid-afternoon). Whereas the difference in specific conductance was likely due to mine effluent (Figure 4.1; Appendix Tables C.1, and C.2).

Laboratory analysis of water samples indicated that chromium and iron were slightly elevated in the reference area compared to effluent-exposed area and Provincial Water Quality Objectives (PWQO; Table 4.2). Hardness, calcium, potassium, and sodium, were elevated in the effluent-exposed area relative to reference area concentrations (Table 4.2) and likely contributed to observed elevations in specific conductance in the effluent-exposed area (Figure 4.1). Lastly, aluminum was elevated compared to PWQO both in the effluent-exposed and reference areas indicative of naturally elevated background concentrations of this substance (Table 4.2).

4.2 Routine Water Quality Monitoring

RRP collects water samples and supporting measures a minimum of four times per year at locations upstream (SW20) and downstream (SW22A) of the mine effluent discharge in the Pinewood River (Figure 2.1).

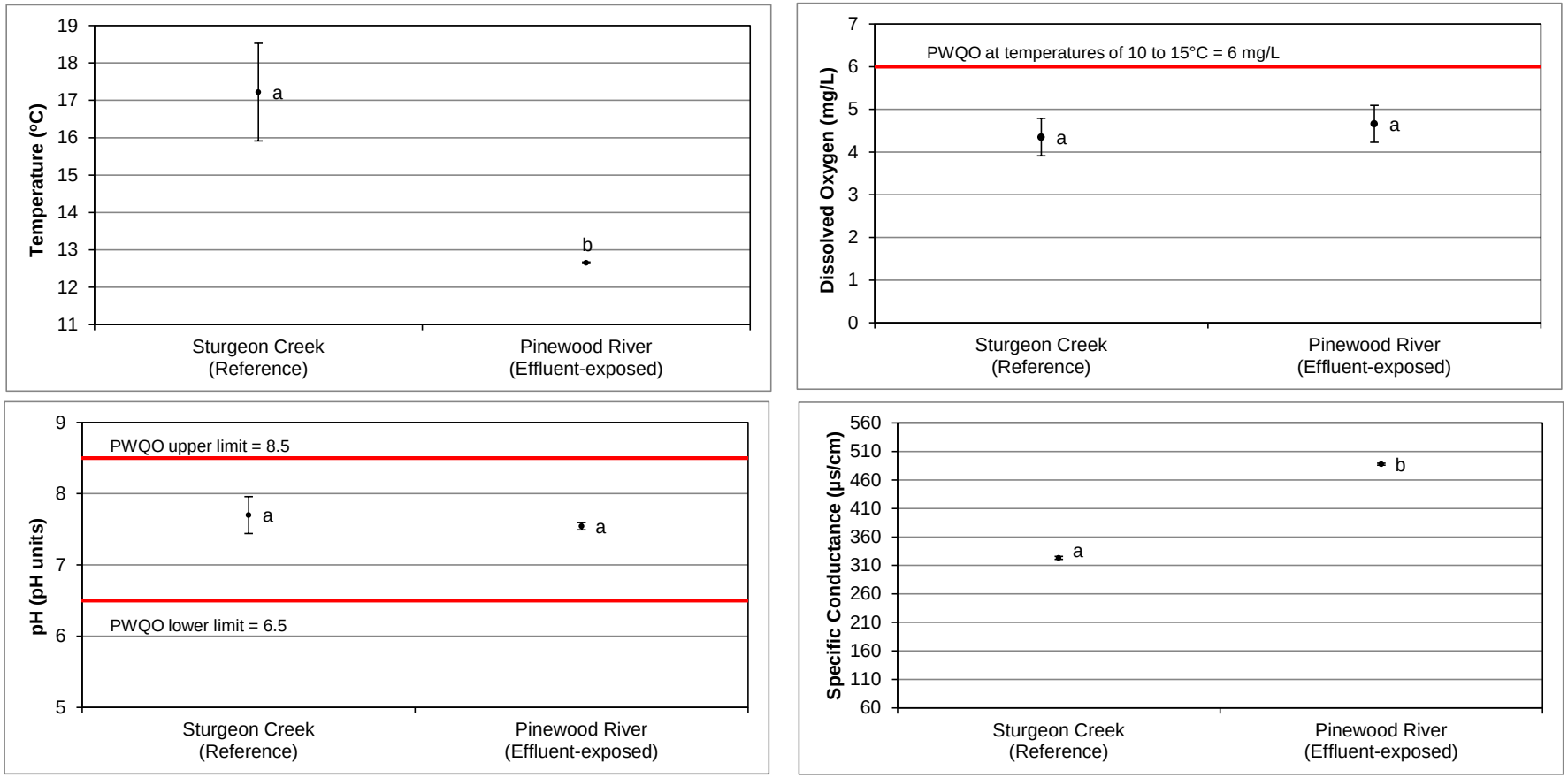


Figure 4.1: ***In Situ*** **Water Quality Measures at Benthic Sampling Stations, RRP Phase 1 EEM, September 2017**

Notes: Area mean ± standard deviation (n=5) are shown. Same letters above error bars indicate no significant difference.

Table 4.2: Total Metal Concentrations in Sturgeon Creek and Pinewood River, RRP Phase 1 EEM, 2017

Parameter	Units	PWQO	Sturgeon Creek (Reference)		Pinewood River (Effluent-exposed)	
			StuC-REF	StuC-REF	PinR-EXP	PinR-EXP
			24-Apr-17	13-Sep-17	24-Apr-17	13-Sep-17
Physical Tests						
Hardness	mg/L	-	98.1	174	191	257
Total Suspended Solids	mg/L	-	9.4	14.5	<2.0	4.6
Total Dissolved Solids	mg/L	-	225	239	236	308
Anions and Nutrients						
Alkalinity, Total (as $CaCO_3$)	mg/L	-	83.1	166	190	260
Ammonia, Total (as N)	mg/L	10.25	<0.020	0.097	0.077	0.027
Chloride (Cl)	mg/L	-	6.19	6.26	10.9	12.5
Fluoride (F)	mg/L	-	0.041	0.073	0.070	0.081
Nitrate and Nitrite (as N)	mg/L	-	<0.040	-	0.913	-
Nitrate (as N)	mg/L	-	<0.020	0.078	0.890	0.102
Nitrite (as N)	mg/L	-	<0.010	<0.010	0.023	<0.010
Total Phosphorus (P)	mg/L	0.30	0.040	0.107	0.019	0.032
Sulphate (SO_4)	mg/L	-	9.38	1.33	16.8	1.79
Cyanide, Weak Acid Diss	mg/L	0.0050[a]	<0.0020	<0.0020	<0.0020	<0.0020
Cyanide, Total	mg/L	0.0050[a]	<0.0020	<0.0020	<0.0020	<0.0020
Dissolved Organic Carbon	mg/L	-	28.3	35.7	16.6	28.7
Total Organic Carbon	mg/L	-	28.8	37.3	16.7	29.1
Dissolved Metals						
Calcium	mg/L	-	22.0	39.9	43.5	56.4
Magnesium	mg/L	-	10.5	18.0	19.9	28.2
Total Metals						
Aluminum	mg/L	0.075	0.552	0.435	0.062	0.092
Antimony	mg/L	0.020	<0.00010	0.00017	0.00121	0.00017
Arsenic	mg/L	0.0050	0.00086	0.00217	0.00076	0.00145
Barium	mg/L	-	0.0171	0.0237	0.0223	0.0220
Beryllium	mg/L	11	<0.00010	<0.00010	<0.00010	<0.00010
Bismuth	mg/L	-	<0.000050	<0.000050	<0.000050	<0.000050
Boron	mg/L	0.20	0.011	0.016	0.026	0.015
Cadmium	mg/L	0.00050	0.000015	0.000009	0.000006	0.000006
Calcium	mg/L	-	22.7	40.9	42.0	58.4
Cesium	mg/L	-	0.000075	0.000054	0.000013	0.000011
Chromium	mg/L	0.0010	0.00124	0.00091	0.00023	0.00032
Cobalt	mg/L	0.00090	0.00044	0.00065	0.00015	0.00025
Copper	mg/L	0.0050	0.0019	0.0011	0.0010	<0.00050
Iron	mg/L	0.30	0.83	0.87	0.20	0.20
Lead	mg/L	0.0050	0.00037	0.00037	0.00006	0.00007
Lithium	mg/L	-	0.0043	0.0072	0.0097	0.0115
Magnesium	mg/L	-	10.7	18.9	18.5	28.5
Manganese	mg/L	-	0.050	0.220	0.028	0.084
Mercury	mg/L	0.00020	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Molybdenum	mg/L	0.040	0.00041	0.00052	0.00263	0.00019
Nickel	mg/L	0.025	0.0021	0.0024	0.0012	0.0011
Phosphorus	mg/L	0.30	0.051	0.150	<0.050	0.053
Potassium	mg/L	-	1.83	1.78	3.08	2.13
Rubidium	mg/L	-	0.0022	0.0020	0.0019	0.0016

[a] Guideline for free cyanide. Applied to weak acid dissociable and total cyanide as a conservative limit.

Indicates concentration was greater than the PWQO (Provincial Water Quality Objective) Lowest Effect Level (LEL).

Table 4.2: Total Metal Concentrations in Sturgeon Creek and Pinewood River, RRP Phase 1 EEM, 2017

Parameter	Units	PWQO	Sturgeon Creek (Reference)		Pinewood River (Effluent-exposed)	
			StuC-REF	StuC-REF	PinR-EXP	PinR-EXP
			24-Apr-17	13-Sep-17	24-Apr-17	13-Sep-17
Selenium	mg/L	0.1	0.00019	0.00024	0.00017	0.00018
Silicon	mg/L	-	2.98	2.92	1.40	2.66
Silver	mg/L	0.00010	<0.000010	<0.000010	<0.000010	<0.000010
Sodium	mg/L	-	4.00	5.63	8.92	9.17
Strontium	mg/L	-	0.06	0.11	0.16	0.12
Sulphur	mg/L	-	3.38	1.01	6.06	1.20
Tellurium	mg/L	-	<0.00020	<0.00020	<0.00020	<0.00020
Thallium	mg/L	0.00030	<0.000010	<0.000010	<0.000010	<0.000010
Thorium	mg/L	-	0.00011	<0.00010	<0.00010	<0.00010
Tin	mg/L	-	0.00011	<0.00010	<0.00010	<0.00010
Titanium	mg/L	-	0.0162	0.0127	0.0022	0.0028
Tungsten	mg/L	0.030	<0.00010	<0.00010	<0.00010	<0.00010
Uranium	mg/L	0.0050	0.00089	0.00152	0.00184	0.00053
Vanadium	mg/L	0.0060	0.0023	0.0024	0.00079	0.00079
Zinc	mg/L	0.020	0.009	0.004	<0.0030	0.004
Zirconium	mg/L	0.0040	0.00065	0.00052	0.00024	0.00017
Radiological Parameters						
Ra-226	Bq/L	1.0	<0.010	<0.010	<0.010	<0.010

[a] Guideline for free cyanide. Applied to weak acid dissociable and total cyanide as a conservative limit.

Indicates concentration was greater than the PWQO (Provincial Water Quality Objective) Lowest Effect Level (LEL).

Mean concentrations of aluminum and iron were elevated above PWQOs for the protection of aquatic life at routine water quality monitoring stations located both upstream and downstream of the RRP effluent outfall (Table 4.3). Downstream concentrations of nitrite were elevated relative to both upstream levels and PWQOs, indicative of mine influence (Table 4.3; Appendix Table C.4). However, nitrite was only elevated substance relative to PWQO downstream of the RRP Mine effluent in 2016 and is likely indicative of use of explosives from active blasting during the construction phase of the mine (Table 4.3). As seen in the water samples collected during the EEM study, aluminum and iron are elevated at relative to PWQO at effluent-exposed and reference areas, indicating these substances are naturally elevated within the Pinewood River.

Overall, the RRP Mine effluent is detectable in Pinewood River, through elevated conductivity, hardness, calcium, potassium, and sodium in the effluent-exposed area relative to upstream.

Table 4.3: Summary of Routine Water Quality Data [a], RRP Phase 1 EEM, 2015 to 2017

Parameters		Units	PWQO [b]	Pinewood River Reference (SW20)			Pinewood River Effluent-exposed (SW22A)		
				2015	2016	2017	2015	2016	2017
Non-metals	Alkalinity	mg/L $CaCO_3$	-	115	113	133	-	159	211
	pH	units	6.5 - 8.5	7.17	7.17	7.25	-	7.64	7.43
	Conductivity	µS/cm	-	254	256	305	-	328	415
	TSS	mg/L	-	3.63	3.40	3.32	-	3.30	4.0
	Nitrite (NO_2)	as N mg/L	0.06	0.001	0.002	0.002	-	0.95[d]	0.011
	Ammonia (NH_3+NH_4)	as N mg/L	-	0.013	0.054	0.040	-	0.048	0.118
	Mercury (Hg)	mg/L	0.0002	0.000002	0.000003	0.000003	-	0.000003	0.000003
	Hardness	mg/L $CaCO_3$	-	124	127	140	-	172	209
ICP Scan	Aluminium (Al)	mg/L	0.075 [c]	0.177	0.278	0.158	-	0.134	0.122
	Arsenic (As)	mg/L	0.005	0.0011	0.0008	0.0009	-	0.0012	0.0012
	Cadmium (Cd)	mg/L	0.0001 [c]	0.00001	0.00001	0.00001	-	0.00001	0.00001
	Cyanide (CN)	mg/L	0.005			0.001	-	<0.001	0.001
	Cobalt (Co)	mg/L	0.0009	0.0002	0.0004	0.0003	-	0.0004	0.0003
	Copper (Cu)	mg/L	0.005 [c]	0.0008	0.0011	0.0008	-	0.0009	0.0009
	Iron (Fe)	mg/L	0.3	0.55	0.83	0.53	-	0.59	0.44
	Molybdenum (Mo)	mg/L	0.04	0.0003	0.0004	0.0003	-	0.0009	0.0013
	Nickle (Ni)	mg/L	0.025	0.0016	0.0014	0.0014	-	0.0015	0.0015
	Lead (Pb)	mg/L	0.003 [c]	0.0001	0.0002	0.0001	-	0.0001	0.0001
	Selenium (Se)	mg/L	0.001 [a]	0.0002	0.0002	0.0002	-	0.0002	0.0002
	Thallium (Tl)	mg/L	0.0003	0.000003	0.000004	0.000006	-	0.000005	0.000005
	Zinc (Zn)	mg/L	0.02	0.003	0.003	0.010	-	0.002	0.005
Other	Radium-226	Bq/L	1	-	-	<0.01	-	<0.01	<0.01

Concentration exceeds PWQO.

[a] Mean of monthly samples collected during discharge (n=8 in 2015, n=10 in 2016, and n=11 in 2017).

[b] All guidelines reference Provincial Water Quality Objectives. Ministry of Environment and Energy, July 1994, re-issued in 1999 (OMOEE 1994), with the exception of nitrite and selenium which reference Canadian Water Quality Guidelines for the protection of aquatic life. Canadian Council of Ministers of the Environment. http://st-ts.ccme.ca/. accessed February 2018 (CCME 2018).

[c] Aluminum guideline depends on pH; cadmium, copper and lead guidelines depend on hardness; guidelines in table assume: pH = 7, temperature = 15°C, hardness = 130 mg/L as $CaCO_3$ based on the average background concentration at reference station SW20 (see Appendix Table C.4).

[d] All values but one (March 23, 2016; 5.66 mg/L) are < PWQO, with 3 below the lowest reported level.

5 SEDIMENT QUALITY

5.1 Overview

Sediment samples were collected in the effluent-exposed area of the Pinewood River and the Sturgeon Creek reference area concurrent with benthic invertebrate sampling (Figure 2.1). A total of five stations were sampled within each area as described in Section 2.

5.2 Sediment Composition

The inorganic sediment fraction was composed predominantly of silt (37-69%) and clay (25-41%), with some sand (2-31%; Figure 5.1, and Table 5.1; Appendix Table C.5). There were significant differences between the effluent-exposed and reference areas for total organic carbon, as well as the silt and clay fractions, with significantly more TOC and silt in the effluent-exposed area, and significantly less clay when compared to the reference area (Table 5.1 and Figure 5.1; Appendix Table C.3). All stations had a low proportion of gravel <5% (Table 5.1; Appendix Table C.5).

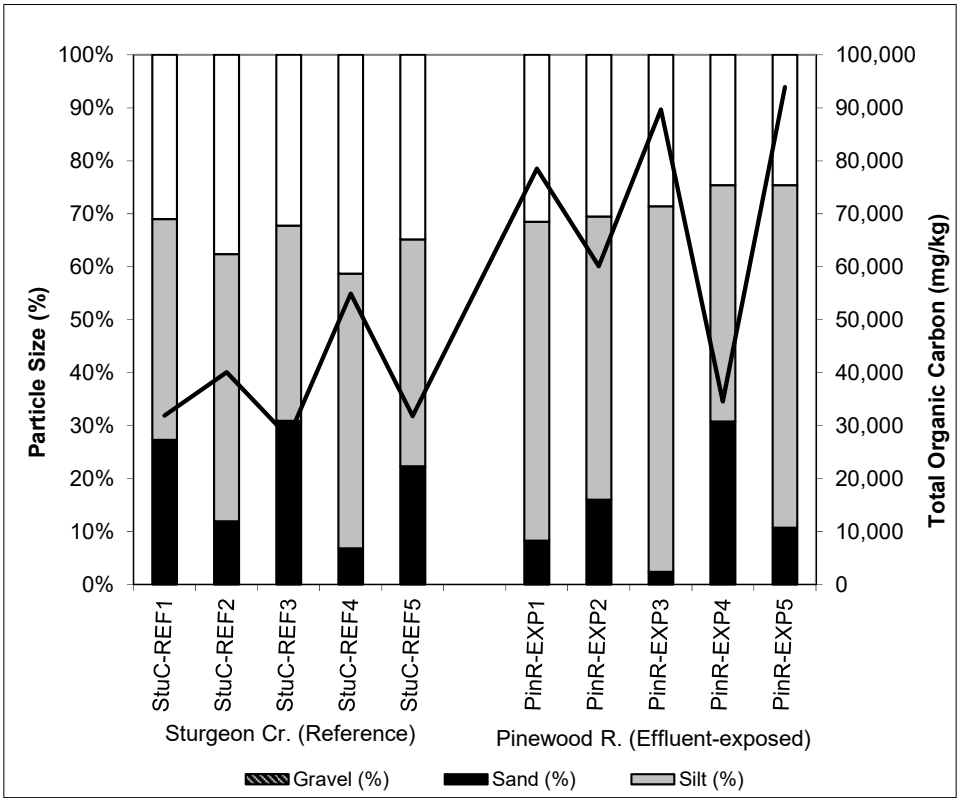


Figure 5.1: Particle Size and Total Organic Carbon Content in Sediments, RRP Phase 1 EEM, September 2017

Table 5.1: Summary of Sediment Quality (Mean ± Standard Deviation), RRP Phase 1 EEM, 2017

Parameter	PSQG		Units	Sturgeon Creek (Reference)		Pinewood River (Effluent-exposed)	
	LEL	SEL		Mean	Standard Deviation	Mean	Standard Deviation
Inorganics							
% Moisture	-	-	%	62.7	8.8	74.0	12.5
Total Kjeldahl Nitrogen	0.055	0.48	%	0.276	0.1	0.523	0.2
Total Organic Carbon	10,000	100,000	mg/kg	37,300	10,808	71,360	24,359
% Gravel	-	-	%	<1.0	0.0	<1.0	0.0
% Sand	-	-	%	19.8	10.2	13.6	10.8
% Silt	-	-	%	44.8	6.3	58.4	9.6
% Clay	-	-	%	35.4	4.2	28.0	3.2
Metals							
Aluminum	-	-	mg/kg	13,620	1,675	13,310	2,683
Antimony	-	-	mg/kg	0.11	0.02	0.15	0.03
Arsenic	6	33	mg/kg	2.63	0.48	3.60	1.07
Barium	-	-	mg/kg	87	17	103	27
Beryllium	-	-	mg/kg	0.53	0.06	0.56	0.08
Bismuth	-	-	mg/kg	<0.20	0.0	<0.20	0.0
Boron	-	-	mg/kg	8.2	0.8	9.5	1.9
Cadmium	0.6	10	mg/kg	0.27	0.08	0.35	0.09
Calcium	-	-	mg/kg	6,952	681	14,840	4,343
Chromium	26	110	mg/kg	33.8	7.2	30.6	6.3
Cobalt	-	-	mg/kg	9.9	1.3	9.6	2.5
Copper	16	110	mg/kg	11.6	2.0	15.3	3.7
Iron	20,000	40,000	mg/kg	15,540	2,123	16,920	2,952
Lead	31	250	mg/kg	7.60	1.1	7.72	0.9
Lithium	-	-	mg/kg	16.6	2.3	15.6	2.6
Magnesium	-	-	mg/kg	5,294	551	8,010	2,331
Manganese	460	1,100	mg/kg	346	62	476	151
Mercury	0.2	2	mg/kg	0.048	0.009	0.055	0.006
Molybdenum	-	-	mg/kg	0.84	0.42	0.96	0.42
Nickel	16	75	mg/kg	20.7	4.4	21.7	4.7
Phosphorus	600	2,000	mg/kg	519	42	676	117
Potassium	-	-	mg/kg	1,634	240	1,494	325
Selenium	-	-	mg/kg	0.35	0.1	0.50	0.1
Silver	-	-	mg/kg	<0.10	0.0	<0.10	0.0
Sodium	-	-	mg/kg	96	11	132	29
Strontium	-	-	mg/kg	25.4	3.1	31.8	6.2
Sulphur	-	-	mg/kg	1,100	212	1,620	435
Thallium	-	-	mg/kg	0.159	0.019	0.160	0.029
Tin	-	-	mg/kg	<1.0	0.0	<1.0	0.0
Titanium	-	-	mg/kg	152	6.6	128	20.3
Tungsten	-	-	mg/kg	<0.50	0.0	<0.50	0.0
Uranium	-	-	mg/kg	1.7	0.3	1.7	0.4
Vanadium	-	-	mg/kg	37.0	5.2	36.4	7.2
Zinc	120	820	mg/kg	72	13.4	74	18.0
Zirconium	-	-	mg/kg	6.0	1.0	4.7	0.6

Indicates concentration greater than the PSQG (Provincial Sediment Quality Guideline) Lowest Effect Level (LEL).
Indicates concentration greater than the PSQG (Provincial Sediment Quality Guideline) Severe Effect Level (SEL).

5.3 Sediment Quality

Sediment concentrations of chromium, and nickel were elevated in both the effluent-exposed and reference areas, compared to Provincial Sediment Quality Guideline (PSWQG) Lowest Effect Levels (LEL; Table 5.1; Appendix Table C.5). Additionally, effluent-exposed sediment concentrations of manganese and phosphorus were elevated compared to reference area concentrations and the PSQG LEL (Table 5.1 and Appendix Table C.5). Total organic carbon (TOC) was above the PSQG LEL in both areas, there were no Severe Effects Level (SEL) exceedances except for total Kjeldahl nitrogen (TKN) at the effluent-exposed area, TKN was also greater than LEL at the reference area (Table 5.1).

Principal Components Analysis (PCA) identified arsenic, barium, beryllium, boron, copper, iron, molybdenum, nickel, titanium, vanadium, and zinc as the main analytes distinguishing the effluent-exposed sediment chemistry from that of the reference area along PC-Axis 1 (Appendix Tables C.5 and C.6). Sediment PC-Axis 2 scores were compared between the effluent-exposed and reference areas and largely described the higher sediment concentrations of antimony, calcium, magnesium, phosphorus, selenium, sodium, strontium, and sulphur in the effluent-exposed area, and higher zirconium concentrations in the in the reference area (Appendix Tables C.5 and C.6).

Overall, sediment chemistry was very similar between the effluent-exposed and reference areas, with slightly elevated concentrations of TOC, TKN, manganese, and phosphorus in the effluent-exposed sediments relative to both reference and provincial sediment quality guidelines.

6 BENTHIC INVERTEBRATE COMMUNITY

6.1 Overview

The benthic invertebrate community of the effluent-exposed area on Pinewood River (PinR-EXP) was compared to that of one reference area: on the Sturgeon Creek (StuC-REF; Figure 2.1).

6.2 Primary Metrics

Organism density, taxon richness, and Simpson's evenness (E) did not differ between areas (Table 6.1 and Figure 6.1). Bray-Curtis (B-C) index (distance) at the effluent-exposed area was significantly greater that at the reference area (Table 6.1; Figure 6.1), suggesting community composition differences that are investigated further in the following section.

Table 6.1: Summary of Benthic Invertebrate Community Characteristics and Statistical Comparisons Between Areas, RRP Phase 1 EEM, 2017

Type	Benthic Community Metric	Significantly Different? (effect size expressed as # reference area standard deviations) [a]
		StuC Reference vs PinR Effluent-exposed
Metrics for evaluating effect under MMER (Family Level)	Density (Ind./m^2)	No
	Number of Taxa	No
	Simpson's E	No
	B-C Distance	**Yes (6.7)**
Supporting Metrics	Oligochaeta (%)	No
	Ephemeroptera (%)	No
	Tichoptera (%)	No
	Chaoboridae (%)	**Yes (-1.8)**
	Chironomids (%)	No
	Bivalvia (%)	No
	CA Axis-1 (26.5%)	**Yes (2.8)**
	CA Axis-2 (25.6%)	No
	CA Axis-3 (17.9%)	No

[a] Where a statistically significant difference was found, the value represents the number of standard deviations and direction of change (positive or negative) by which the exposure area differed from reference.

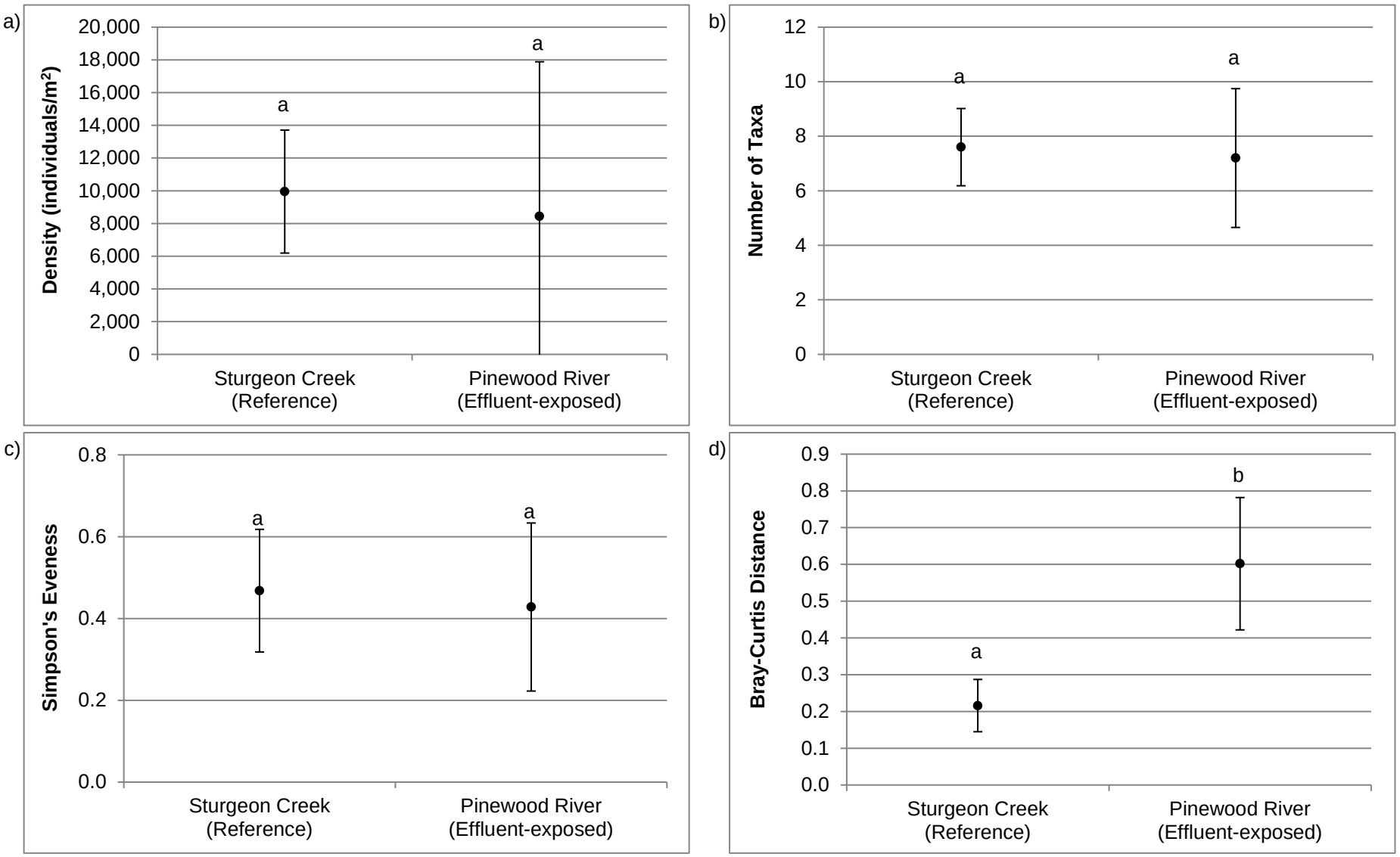


Figure 6.1: Comparison of: a) Benthic Invertebrate Density, b) Number of Taxa, c) Simpson's Evenness and d) Bray-Curtis Distance to Reference Median, RRP Phase 1 EEM, 2017

Data Represent Area Means and 95% Confidence Intervals (n=5 in all areas). Areas with the Same Letter do not Differ Significantly (p>0.1).

6.3 Taxon Group Composition

Benthic community composition was assessed based on percent representation of major taxon groups to highlight any differences between exposed and reference areas and their environmental significance. Chironomids and Oligochaeta showed comparable percent abundances between areas (Figure 6.2 and Table 6.1; Appendix Tables D.3 to D.5). The pollution-intolerant EPT (Ephemeroptera, Plecoptera[3], and Trichoptera) taxa were found in very low abundances in both the reference and effluent-exposed areas which is likely a result of the nature of the habitat found in these areas (i.e. low flow depositional areas; Table 6.1; Appendix Table D.4). Overall, community composition of the effluent-exposed area was similar to reference with no compelling evidence of an effluent-related effect.

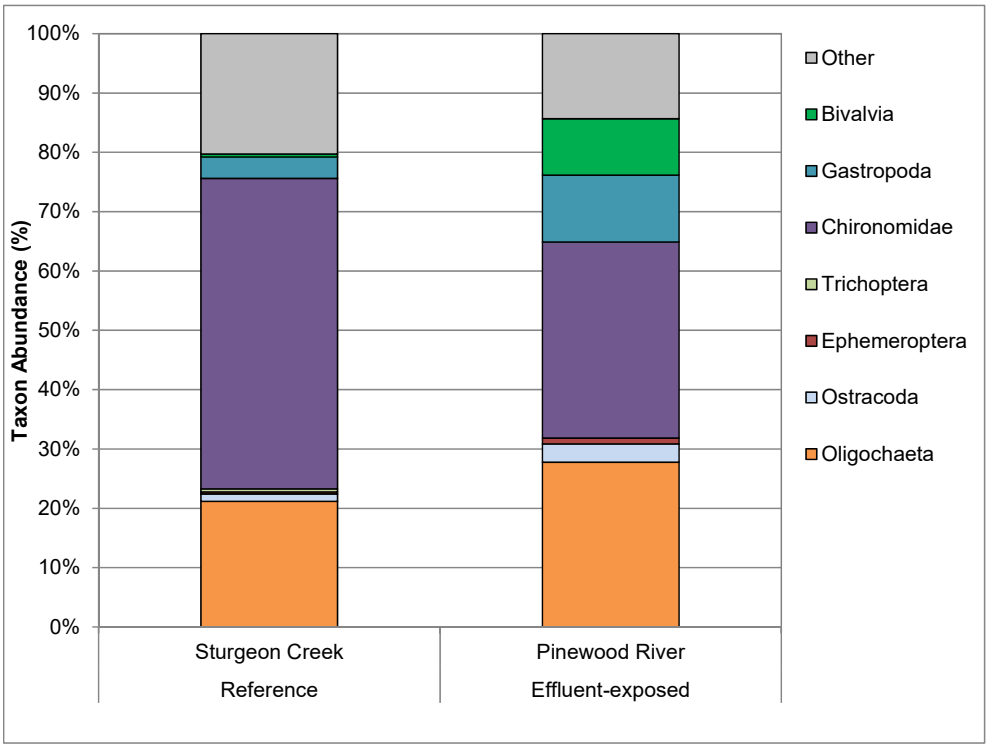


Figure 6.2: Percent Composition of Dominant Benthic Groups, RRP Phase 1 EEM, 2017

Correspondence Analysis (CA) was also used to examine community composition. Unlike the B-C distance metric and Simpson's Indices, this multivariate technique can identify the individual taxa that most contribute to community variation. In the present study, CA explained 52.1% of the total community variance in the first two CA axes and differed between areas (Figure 6.3 and

[3] Plecoptera (stoneflies), were not found at either area.

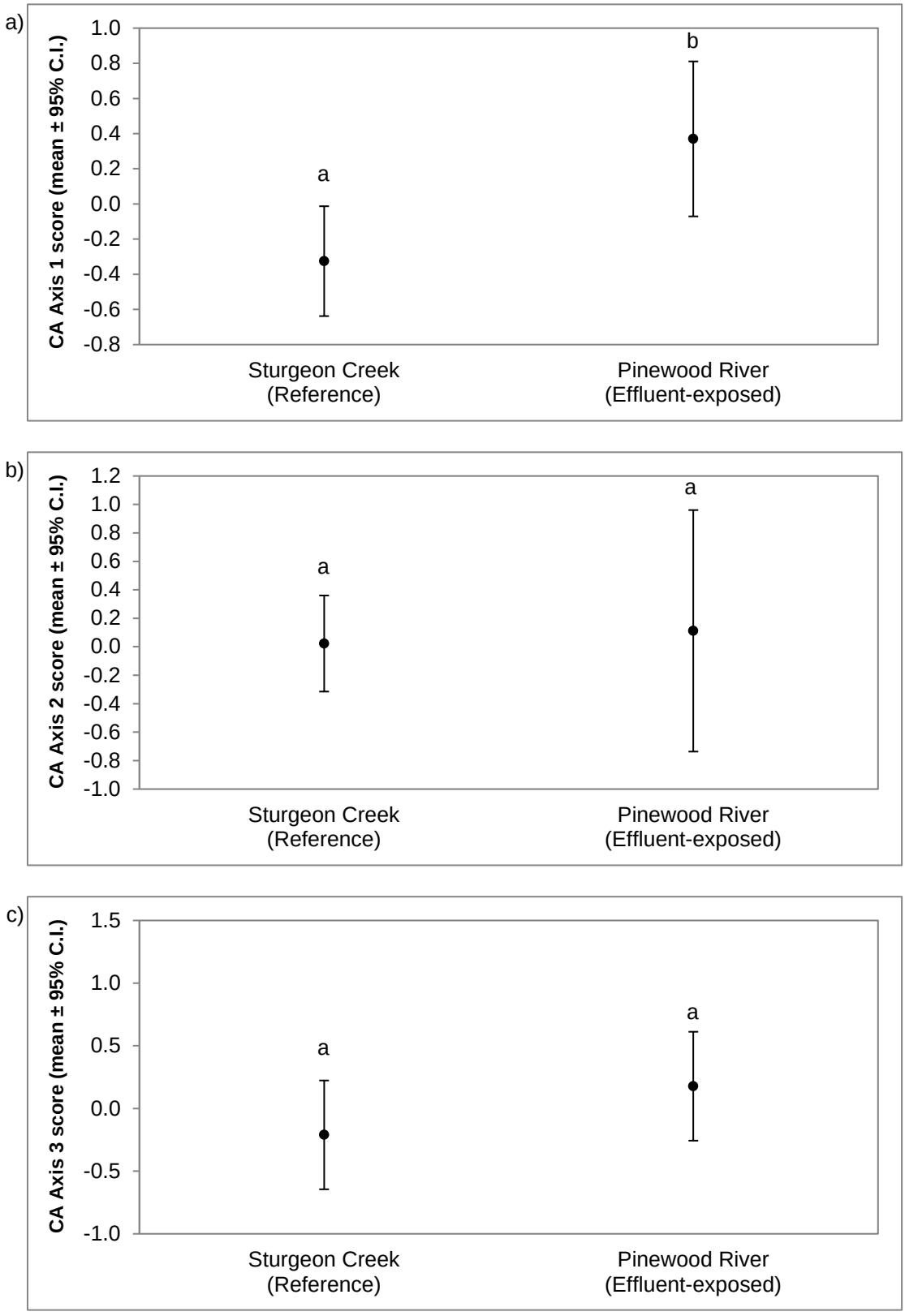


Figure 6.3: Results of Correspondence Analysis of Benthic Invertebrate Communities, RRP Phase 1 EEM, 2017

Note: Areas with the same letter do not differ significantly.

Table 6.1; Appendix Tables D.6 and D.7). CA axis-2 and -3 showed no difference between areas, (Figure 6.3 and Table 6.1). This was largely due to the presence of harpacticoids[4] in the reference area, but absence from the effluent-exposed area, as well as the presence of the snail family Hydrobiidae and bivalve Sphaeriidae at the effluent-exposed area, and absence from the reference area (Figure 6.4 and Appendix Table D.7).

In general, the Sturgeon Creek reference area demonstrated less within area variability relative to the Pinewood River effluent-exposed area (Figure 6.4). The effluent-exposed area and Sturgeon Creek reference area had a statistically different community structure as defined by CA axis-1.

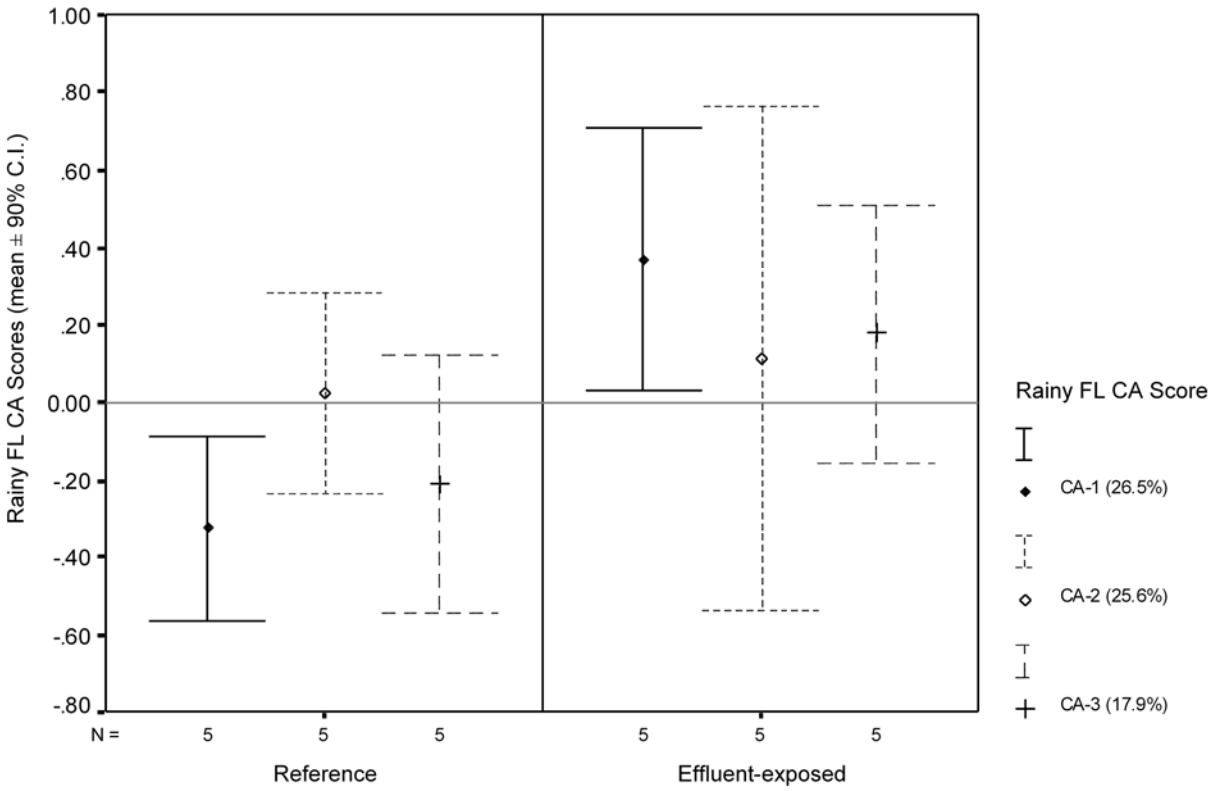


Figure 6.4: Family Level (FL) Correspondence Analysis (CA) Scores at RRP Phase 1 EEM, 2017

[4] Due to their small size harpacticoids can sometimes be lost in the screening process, and because they are commonly found attached to algae or other organic material organism retention can vary with substrate type. Substrate type and volumes of organic material in samples did not vary between exposure and reference areas and therefore it is unlikely that any variation in harpacticoid abundances between areas is the result of loss during screening.

6.4 Influence of Physico-Chemical Variables

Correlation analysis was performed between benthic indices and supporting physico-chemical variables that demonstrated statistically significant differences between areas. A statistically significant correlation between two variables may, but does not necessarily, indicate a cause-and-effect relationship. Three correlations were significant at an adjusted p-level that accounted for the number of comparisons made ($p = 0.05/70 = 0.00071$; Table 6.2). After inspection of data distributions in scatter plots (Appendix Figure D.1a, b, and c), the significant correlations appear to be due to spatial autocorrelation of replicates within areas and is likely not a function of effluent related effects.

6.5 Summary

In summary, the effluent-exposed area was similar to the reference area concerning three EEM metrics for the current EEM Phase, these are density, Simpson's evenness, and taxon richness. The sole EEM benthic endpoint that differed significantly between the effluent-exposed and reference areas is the Bray-Curtis Index. In addition, the community structure as defined by CA differed significantly between the effluent exposed and reference areas. This difference may be attributed to variations between the sampling areas such as stream width: the Sturgeon Creek reference area is much smaller compared to that of the effluent-exposed area, as well as extensive beaver activity in the vicinity of the effluent-exposed area, these habitat differences may result in certain families being present in one area but not in the other (i.e. Chaoboridae), as they are found in the reference area in relatively high abundances, but have very little representation in the effluent-exposed area (Appendix Table D.2).Therefore these differences are likely a result of dissimilarities in habitat between the effluent-exposed and reference areas, rather than a direct effluent effect.

Table 6.2: Correlations Between Benthic Metrics that were Significantly (p < 0.05) Different Between Areas with Environmental Supporting Measurements that were also Significantly (p < 0.05) Different Between Areas, RRP Phase 1 EEM, 2017

		Temperature (°C; bottom)	pH (bottom)	Conductivity (µS/cm; bottom)	Specific Conductance (µS/cm; bottom)	Total Kjeldahl Nitrogen (%)	FOC (log10 [mg/g])	Total Organic Carbon (%)	% Silt (%)	% Clay (%)	Sediment Metal PC-2 (16.2%)
LPL BC Dissimilarity	Pearson Correlation	-0.85440	-0.49703	0.90509	0.88954	0.50572	0.51802	0.49685	0.52204	-0.64874	-0.84160
	Sig. (2-tailed)	0.00164	0.14387	0.00032	0.00057	0.13590	0.12508	0.14404	0.12167	0.04243	0.00227
LPL CA-1 (29.0%)	Pearson Correlation	-0.63709	-0.26911	0.70681	0.68104	0.57110	0.53488	0.52611	0.61917	-0.40359	-0.63151
	Sig. (2-tailed)	0.04758	0.45213	0.02229	0.03015	0.08463	0.11115	0.11827	0.05628	0.24745	0.05018
FL BC Dissimilarity	Pearson Correlation	-0.84069	-0.45257	0.89404	0.87508	0.45838	0.46050	0.44692	0.47844	-0.67752	-0.83840
	Sig. (2-tailed)	0.00231	0.18907	0.00048	0.00091	0.18274	0.18046	0.19535	0.16187	0.03135	0.00244
FL CA-1 (26.5%)	Pearson Correlation	-0.75944	-0.39454	0.74536	0.73859	0.31493	0.32570	0.33601	0.35219	-0.69490	-0.76675
	Sig. (2-tailed)	0.01083	0.25920	0.01335	0.01469	0.37544	0.35843	0.34249	0.31824	0.02572	0.00967
% Chaoboridae	Pearson Correlation	0.74903	0.47442	-0.80052	-0.79027	-0.45897	-0.48096	-0.45935	-0.43950	0.57467	0.75556
	Sig. (2-tailed)	0.01266	0.16594	0.00540	0.00652	0.18211	0.15936	0.18170	0.20377	0.08227	0.01149

correlation suggestive; p < 0.05 (NOT adjusted for False Discovery Rate)

correlation scatterplot inspected: p < 0.0100

significant; p < 0.00071 (p = 0.05 adjusted for 70 comparisons)

Note: n = 10 for all correlations

7 FISH COMMUNITY SURVEY

7.1 Overview

Fish were sampled from the effluent-exposed area on the Pinewood River, as well as a reference area on Sturgeon Creek (Figure 2.1). Brook stickleback and central mudminnow were sampled from both the reference and effluent-exposed areas. Detailed data are provided in Appendix E.

7.2 Fish Community

Fish communities were evaluated in two areas: the effluent-exposed area of the Pinewood River, and the Sturgeon Creek reference area (Figure 2.1). A total of eleven species were caught in the two areas, with the greatest diversity found in the effluent-exposed area (Table 7.1; Appendix Tables E.1 to E.3).

Table 7.1: Summary of Fish Caught in the Sturgeon Creek Reference and the Effluent-exposed Areas, RRP Phase 1 EEM, 2017

Species	Sturgeon Creek (Reference)	Pinewood River (Effluent-exposed)
Total No. of Species	**7**	**11**
Sentinel Species		
Brook stickleback	224	1,757
Central mudminnow	100	81
Other		
Brown bullhead	-	1
Brassy minnow	6	91
Creek chub	11	-
Dace spp.	-	104
Finescale dace	2	3
Johnny darter	-	2
Lake chub	3	10
Pearl dace	-	4
Northern redbelly dace	48	27
White sucker	-	9
Total Fish Caught	**394**	**2,089**

Pinewood River supports a variety of fish species, ranging from the large-bodied species such as northern pike (*Esox lucius*), walleye (*sander vitreus*), and white sucker (*Catostomus*

commersonii), to a number of small-bodied species (Table 7.1). During the spring sampling, brook stickleback were the most abundant species found in both sampling areas (Table 7.1). Brown bullhead (*Ameiurus natalis*), johnny darter (*Etheostoma nigrum*), pearl dace (*Margariscus margarita*), and white sucker were only observed in the Pinewood River whereas creek chub (*Semotilus atromaculatus*) were only found in Sturgeon Creek. Overall, species composition was similar between areas, with the fish community predominantly being made up of brook stickleback, central mudminnow, and northern redbelly dace (*Chrosomus eos*).

Overall catch-per-unit-effort (CPUE) for seines (# fish/m^3), minnow traps (# fish/trap day) and backpack electrofishing (#fish/ minute) were highest in the Pinewood River effluent-exposed area (Table 7.2). Minnow trapping was the most effective method employed during the spring survey (Table 7.2).

Brook stickleback CPUE for minnow trapping was highest in the effluent-exposed and central mudminnow CPUE was highest at the reference area (Table 7.2).

Overall, no major differences in community composition were observed among areas although the effluent-exposed area of the Pinewood River supported the highest species diversity.

7.3 Brook Stickleback

Twenty three female brook stickleback from the Pinewood River (effluent-exposed) and 23 from Sturgeon Creek reference area were collected during the Phase 1 spring fish survey (Appendix Tables E.4 and E.5). In addition, 21 male brook stickleback from the Pinewood River (effluent-exposed), and 22 from the Sturgeon Creek reference area were collected (Appendix Tables E.6 and E.7). All collected brook stickleback were subject to measurements needed to calculate the required EEM metrics, which were summarized by sex and area (Appendix Tables E.4 to E.7).

7.3.1 Female Brook Stickleback

Female brook stickleback from the Pinewood River effluent-exposed and Sturgeon Creek reference areas were of similar age (Figure 7.1a and Table 7.3). Females captured in both areas were predominantly one year old (Figure 7.1a; Appendix Tables E.4 and E.5). Accordingly, there was insufficient age distribution for analysis of body weight at age (Appendix Tables E.4 and E.5).

Gonad size relative to adjusted body weight was significantly larger in female brook stickleback captured in the Pinewood River than in those from Sturgeon Creek, with the magnitude of difference greater than the applicable critical effect size (CES) of ±25% (Table 7.3 and Figure 7.2; Appendix Tables E.4 and E.5). Egg weight relative to adjusted body weight was significantly smaller in effluent-exposed females compared to reference females, however the magnitude of difference was very small (0.13%) and is not ecologically meaningful. These data indicated that

Table 7.2: Catch-per-unit-effort (CPUE) Summary for Sentinel Fish Caught during the RRP Phase 1 EEM, Arpil 2017

a) CPUE by Seine [a]

Location	Total Effort (Area m^2)	Brook Stickleback CPUE	Central Mudminnow CPUE	Total Sentinel Species	
				Catch	CPUE
Sturgeon Creek Reference	0	0	0	0	0
Pinewood River Effluent-exposed	221	1.70	0.06	389	1.76

b) CPUE by Minnow Trap [b]

Location	Effort (Trap Days)	Brook Stickleback CPUE	Central Mudminnow CPUE	Total Sentinel Species	
				Catch	CPUE
Sturgeon Creek Reference	22	10.20	4.55	324	14.73
Pinewood River Effluent-exposed	80	17.30	0.60	1,429	17.91

c) CPUE by Backpack Electrofishing [c]

Location	Effort (Seconds)	Brook Stickleback CPUE	Central Mudminnow CPUE	Total Sentinel Species	
				Catch	CPUE
Sturgeon Creek Reference	0	0	0	0	0
Pinewood River Effluent-exposed	756	0	1.60	20	1.59

[a] Seine netting CPUE based on number of fish caught per area seined (m^2) (# of fish/m^2).

[b] Minnow trapping CPUE based on number of fish caught per trap day (24 hours) per trap (# of fish/trap/day).

[c] Backpack electrofishing CPUE based on number of fish caught per minute (# of fish/minute).

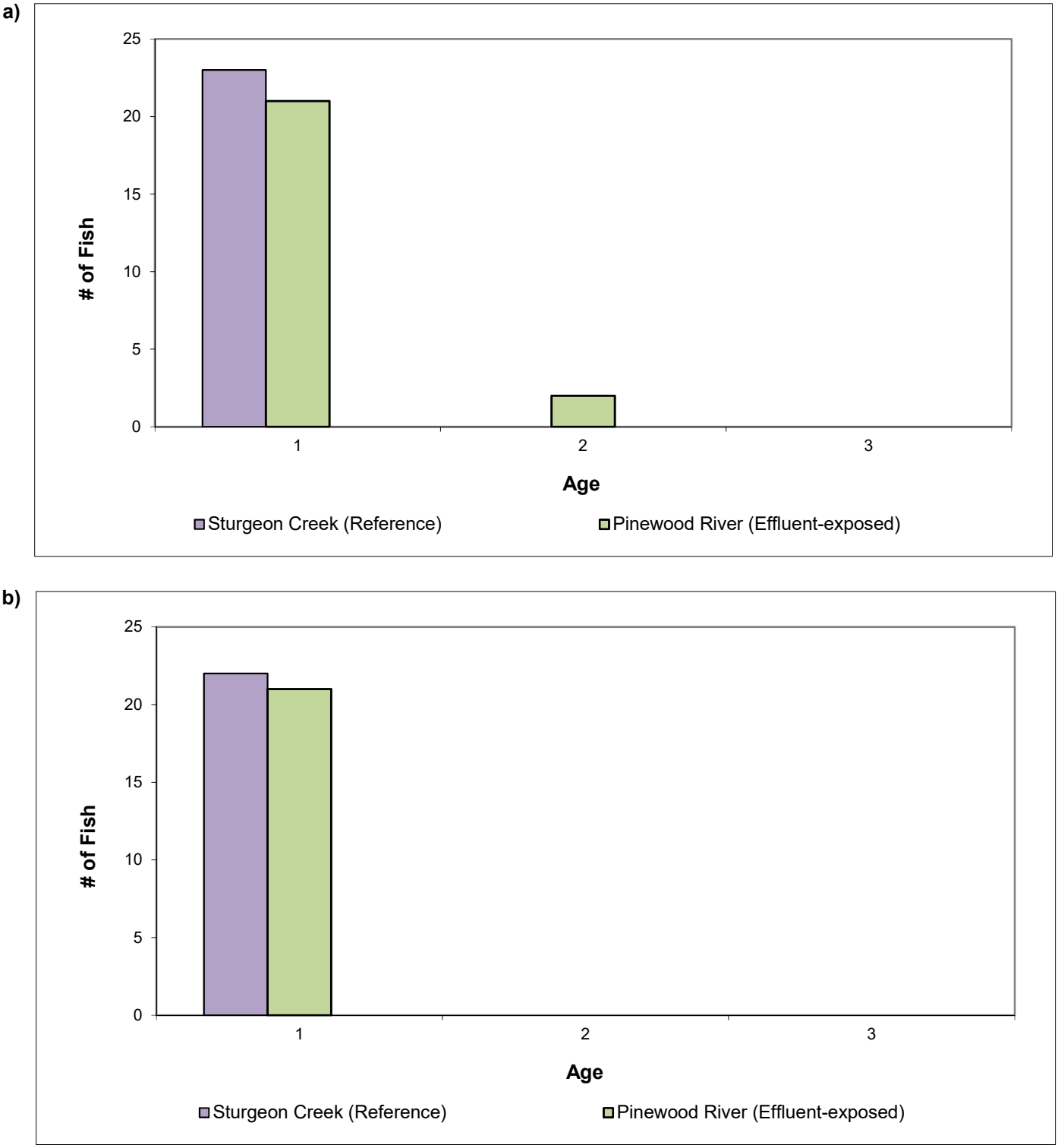


Figure 7.1: Age frequency Distributions of a) Female and b) Male Brook Stickleback in Sturgeon Creek and Pinewood River, RRP Phase 1 EEM, April 2017

Table 7.3: Statistical Comparisons For Brook Stickleback Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference) Areas,RRP Phase 1 EEM, 2017

Sex	Indicator	Endpoint	Variables		Sample Size		Test	ANCOVA Model Statistics			Summary Statistics[b]			Test P-value (Location)	Magnitude of Difference (%)[c]	Estimated Minimum Detectable Difference (% Relative to Reference) with α=β=0.1	
			Response	Covariate	Reference	Effluent-exposed		Interaction Model	Parallel Slope Model	Covariate Value for Comparisons[a]	Statistic	Reference Area	Effluent-exposed Area		Effluent-exposed	Decrease	Increase
					Sturgeon	Pinewood		Interaction p-value	Covariate p-value								
Female	Energy Usage	Relative Gonad Weight	log[Gonad Weight (g)]	log[Adjusted Body Weight (g)]	23	22	ANCOVA	0.962	<0.001	0.797	Adjusted Mean	0.0308	0.0892	<0.001	190	-28	39
		Egg Weight	log[Egg Weight (mg)]	log[Adjusted Body Weight (g)]	23	22	$T\text{-test}_{unequal}$	0.639	0.109	-	Geometic Mean	0.989	0.990	<0.001	0.13	-0.072	0.072
					23	18[d]	$T\text{-test}_{unequal}$	0.995	0.086	-	Geometic Mean	0.989	0.990	<0.001	0.10	-0.046	0.046
		Relative Fecundity	log[Fecundity]	log[Adjusted Body Weight (g)]	23	22	ANCOVA	0.524	0.035	0.797	Adjusted Mean	1,914	1,599	0.197	-16	-33	50
					23	18[d]	ANCOVA	0.899	<0.001	0.788	Adjusted Mean	1,908	2,051	0.274	7.5	-19	23
	Energy Storage	Relative Liver Weight	log[Liver Weight (g)]	log[Adjusted Body Weight (g)]	23	22	ANCOVA	0.068	<0.001	0.797	Adjusted Mean	0.0291	0.0708	<0.001	144	-18	22
		Condition	log[Adjusted Body Weight (g)]	log[Total Length (mm)]	23	22	ANCOVA	0.856	<0.001	46.8	Adjusted Mean	0.745	0.856	<0.001	15	-6.6	7.1
Male	Energy Usage	Relative Gonad Weight	log[Gonad Weight (g)]	log[Adjusted Body Weight (g)]	22	21	ANCOVA	0.378	0.004	0.882	Adjusted Mean	0.00305	0.00286	0.679	-6.3	-35	54
	Energy Storage	Relative Liver Weight	log[Liver Weight (g)]	log[Adjusted Body Weight (g)]	22	21	ANCOVA	0.827	<0.001	0.882	Adjusted Mean	0.0245	0.0380	<0.001	55	-26	34
		Condition	log[Adjusted Body Weight (g)]	log[Total Length (mm)]	22	21	ANCOVA	0.487	<0.001	47.2	Adjusted Mean	0.800	0.977	<0.001	22	-7.2	7.8

Location P-value < 0.1 or Interaction P-value < 0.05

Magnitude of Difference > 25% (or > 10% for Condition), EEM effect endpoints only.

Covariate P-value > 0.05

Note: Three large fish had high leverage on the regressions so these observations were removed from the ANCOVAs

[a] The mean value of the covariate (that corresponds to the adjusted means for the response variable) for the parallel slope ANCOVA model or the minimum and maximum values of the overlap in covariate values for the interaction ANCOVA model.

[b] The median, mean, and adjusted mean are reported for Mann-Whitney, t-test and ANCOVA, respectively, and the predicted values of the regression line equations for minimum and maximum values of the covariate (where the data sets overlap) for ANCOVAs where a significant interaction (i.e., different slopes) occurs.

[c] The magnitude of difference calculated as: [(exposed area mean - reference area mean) /reference area mean] x 100. When there is a significant interaction in the ANCOVA, the magnitude of difference is calcaulated at the minimum and maximum values of overlap in covariate values as as: [(exposed area predicted value - reference area predicted value) / reference area predicted value] x 100.

[d] Four fish from Pinewood River had large egg weights and lower fecundity. The results of the analyses for egg weight and fecundity are shown for the datasets that include and exclude these four fish.

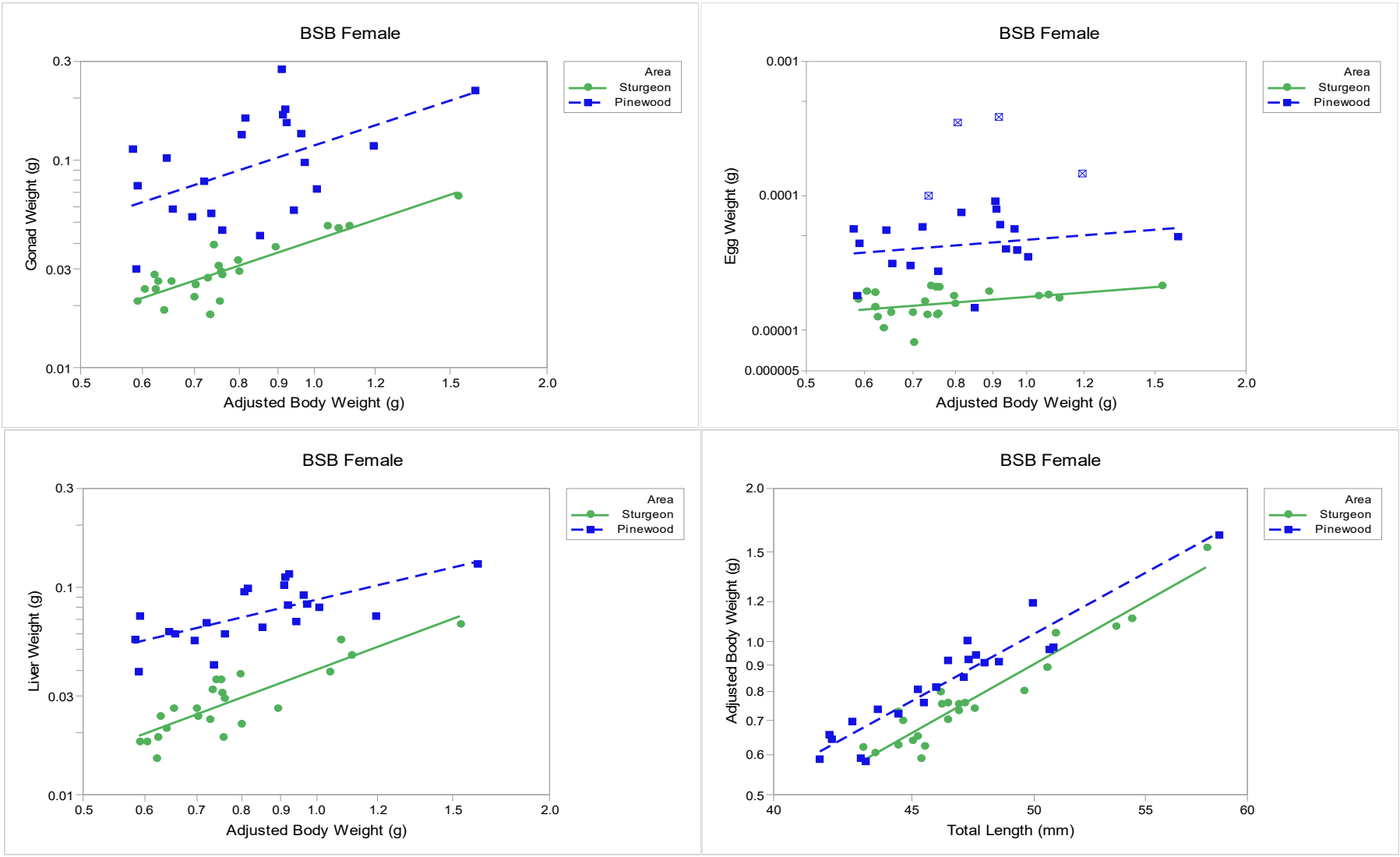


Figure 7.2: Scatterplot and Linear Regressions For Female Brook Stickleback Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference), RRP Phase 1 EEM, 2017

Notes: outliers are plotted as open symbols with an × through them

Pinewood River females had proportionately larger ovaries compared to those at Sturgeon Creek, suggesting greater energy allocation towards reproduction in the Pinewood River female brook stickleback population. Relative liver size and body condition of female brook stickleback from the Pinewood River were both significantly greater than those captured at Sturgeon Creek, with the magnitude of difference for both endpoints outside of the applicable CES (± 25% for liver weight and ±10% for condition; Table 7.3 and Figure 7.2). There were low incidences of abnormalities noted for both areas. These data indicate that Pinewood River females devote more resources to energy storage than those from the Sturgeon Creek, possibly indicative that food resources available to brook stickleback at Pinewood River differed from resources available at Sturgeon Creek.

Overall, female brook stickleback collected at Pinewood River effluent-exposed area showed no difference in age, but significantly larger relative gonad size, larger relative liver weight, and higher condition compared to those captured at Sturgeon Creek.

7.3.2 Male Brook Stickleback

Male brook stickleback from the Pinewood River effluent-exposed area did not differ in age relative to those from the Surgeon Creek reference (Figure 7.1b). Males captured in both areas were all one year old (Figure 7.1b; Appendix Tables E.6 and E.7).

Gonad weight relative to adjusted body weight was similar between effluent-exposed male brook stickleback and Sturgeon Creek reference males (Table 7.3; Appendix Tables E.6 and E.7). Relative liver size and body condition of male brook stickleback were both significantly greater than those captured at Sturgeon Creek, with the magnitude of difference for both endpoints outside the CES (Table 7.3 and Figure 7.3; Appendix Tables E.6 and E.7). Similar to the female brook stickleback, there was a very low occurrence of abnormalities noted.

Overall, male brook stickleback collected at Pinewood River showed no difference in age, but significantly larger livers and body condition compared to those captured at Sturgeon Creek. The survival (age) and energy storage responses of male brook stickleback were very similar to those of females between Pinewood River and Sturgeon Creek. These responses may have reflected differences of food resources/assemblages, and/or differential energy allocation between Pinewood River and the Sturgeon Creek reference area.

7.4 Central Mudminnow

Twenty-one female central mudminnow from Pinewood River (effluent-exposed) and 22 from the Sturgeon Creek were collected during the Phase 1 spring fish survey (Appendix Tables E.8 and E.9). In addition, 22 male central mudminnow from Pinewood River (effluent-exposed) and 22 males from Sturgeon Creek were collected (Table 7.4; Appendix Tables E.10 to E.11). All

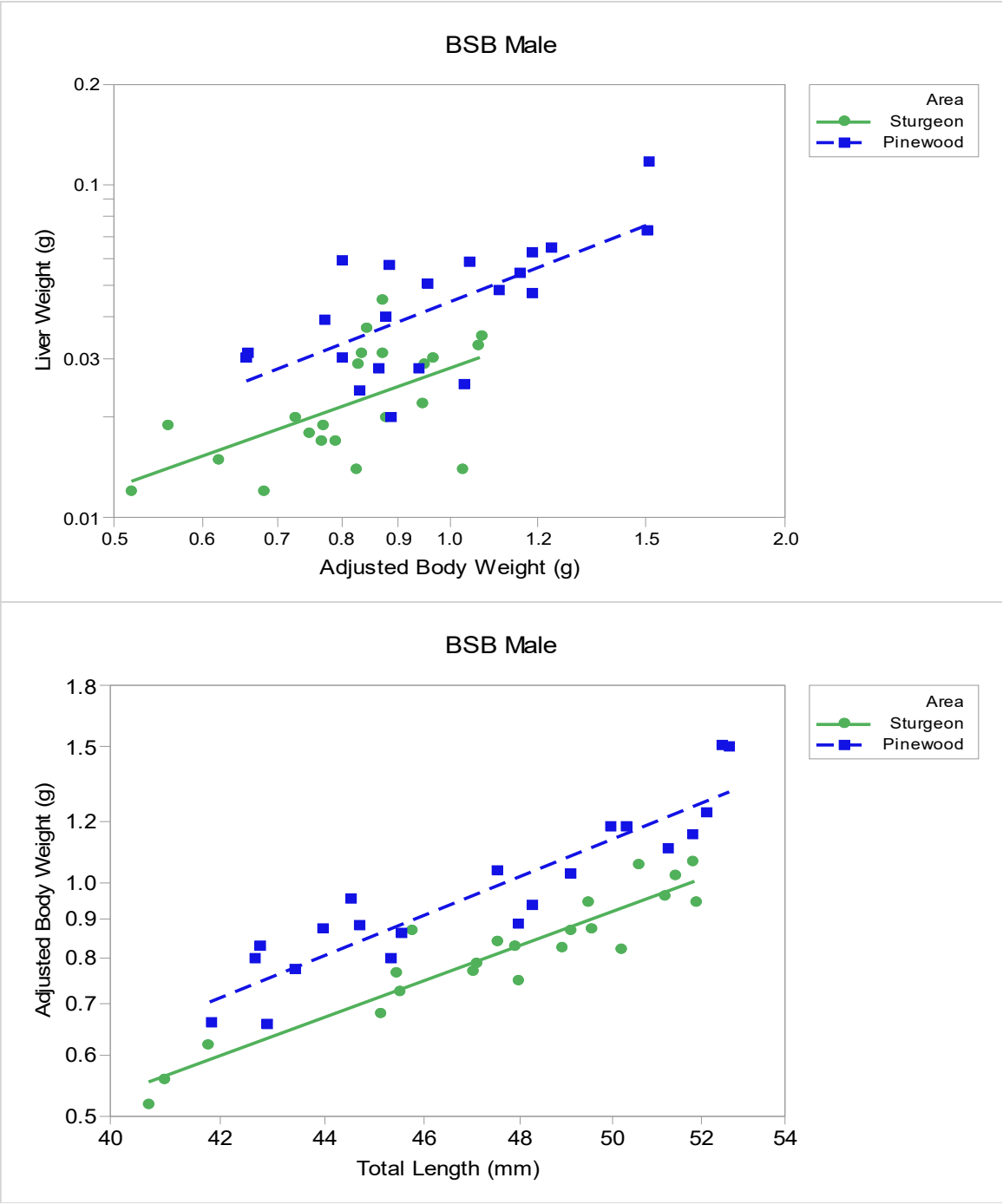


Figure 7.3: Scatterplot and Linear Regressions For Male Brook Stickleback Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference), RRP Phase 1 EEM, 2017

Notes: outliers are plotted as open symbols with an × through them

Table 7.4: Statistical Comparisons For Central Mudminnow Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference) Areas, RRP Phase 1 EEM, 2017

Sex	Indicator	Endpoint	Variables		Sample Size		Test	ANCOVA Model Statistics			Summary Statistics[b]			Test P-value (Location)	Magnitude of Difference (%)[c]	Estimated Minimum Detectable Difference (% Relative to Reference) with α=β=0.1	
			Response	Covariate	Reference	Effluent-exposed		Interaction Model	Parallel Slope Model	Covariate Value for Comparisons[a]	Statistic	Reference Area	Effluent-exposed Area		Effluent-exposed	Decrease	Increase
					Sturgeon	Pinewood		Interaction P-value	Covariate p-value								
Female	Survival	Age	Age (years)	-	22	21	M-W	-	-	-	Median	2	2	0.978	0	-38	38
	Energy Usage	Weight-at-age (Age 1 and 2 fish)	log[Adjusted Body Weight (g)]	Age	20	19	ANCOVA	0.052	<0.001	1	Predicted Mean	2.418	3.687	0.043	53	-33	50
										2		6.589	5.853		-11.2		
		Length-at-age (Age 1 and 2 fish)	log[Total Length (mm)]	Age	20	19	ANCOVA	0.038	<0.001	1	Predicted Mean	70.44	70.03	0.892	-0.6	-12	13
										2		90.64	90.12		-0.6		
		Relative Gonad Weight	log[Gonad Weight (g)]	log[Adjusted Body Weight (g)]	22	21	ANCOVA	0.955	<0.001	5.15	Adjusted Mean	0.496	0.677	0.016	37	-31	45
		Egg Weight	log[Egg Weight (mg)]	log[Adjusted Body Weight (g)]	22	21	ANCOVA	0.991	0.001	5.15	Adjusted Mean	0.993	0.994	0.004	0.038	-0.037	0.037
		Relative Fecundity	log[Fecundity]	log[Adjusted Body Weight (g)]	22	21	ANCOVA	0.901	<0.001	5.15	Adjusted Mean	460	428	0.292	-7.0	-18	22
	Energy Storage	Relative Liver Weight	log[Liver Weight (g)]	log[Adjusted Body Weight (g)]	22	21	ANCOVA	0.301	<0.001	5.15	Adjusted Mean	0.139	0.158	0.022	14	-15	18
		Condition	log[Adjusted Body Weight (g)]	log[Total Length (mm)]	22	21	ANCOVA	0.382	<0.001	84.3	Adjusted Mean	4.92	5.40	<0.001	9.7	-6.8	7.3
Male	Survival	Age	Age (years)	-	22	22	M-W	-	-	-	Median	1	1	0.356	0	-31	31
	Energy Usage	Weight-at-age (Age 1 and 2 fish)	log[Adjusted Body Weight (g)]	Age	20	19	ANCOVA	0.969	<0.001	1	Predicted Mean	2.102	2.257	0.618	7	-34	51
										2		5.051	5.423		7.3		
		Length-at-age (Age 1 and 2 fish)	log[Total Length (mm)]	Age	20	19	ANCOVA	0.908	<0.001	1	Predicted Mean	62.07	61.77	0.913	-0.48	-12	14
										2		82.38	81.98		-0.48		
		Relative Gonad Weight	log[Gonad Weight (g)]	log[Adjusted Body Weight (g)]	22	22	ANCOVA	0.895	<0.001	3.17	Adjusted Mean	0.0460	0.0429	0.554	-6.7	-29	42
	Energy Storage	Relative Liver Weight	log[Liver Weight (g)]	log[Adjusted Body Weight (g)]	22	22	ANCOVA	0.282	<0.001	3.17	Adjusted Mean	0.0454	0.0703	<0.001	55	-24	31
		Condition	log[Adjusted Body Weight (g)]	log[Total Length (mm)]	22	22	ANCOVA	0.126	<0.001	69.8	Adjusted Mean	3.01	3.35	<0.001	11	-5.9	6.3

Location P-value < 0.1 or Interaction P-value < 0.05

Magnitude of Difference > 25% (or > 10% for Condition), EEM effect endpoints only.

Covariate P-value > 0.05

[a] The mean value of the covariate (that corresponds to the adjusted means for the response variable) for the parallel slope ANCOVA model or the minimum and maximum values of the overlap in covariate values for the interaction ANCOVA model.

[b] The median, mean, and adjusted mean are reported for Mann-Whitney, t-test and ANCOVA, respectively, and the predicted values of the regression line equations for minimum and maximum values of the covariate (where the data sets overlap) for ANCOVAs where a significant interaction (i.e., different slopes) occurs.

[c] The magnitude of difference calculated as: [(exposed area mean - reference area mean) /reference area mean] x 100. When there is a significant interaction in the ANCOVA, the magnitude of difference is calcaulated at the minimum and maximum values of overlap in covariate values as as: [(exposed area predicted value - reference area predicted value) / reference area predicted value] x 100.

collected central mudminnow were subject to measurements needed to calculate the required EEM metrics, which were summarized by sex and area (Appendix Tables E.8 to E.11).

7.4.1 Female Central Mudminnow

Female central mudminnow from the effluent-exposed area did not differ in age relative to those from Sturgeon Creek (Figure 7.4a and Table 7.4). Effluent-exposed female central mudminnow ranged from age 1 to 4 years and the Sturgeon Creek females ranged from 1 to 3 years (Figure 7.4a; Appendix Tables E.8 and E.9).

Growth, as assessed using adjusted body weight-at-age was significantly greater for females captured at Pinewood River when comparing one year olds, but two year old females were slightly smaller and therefore the results are equivocal (Table 7.4 and Figure 7.5).

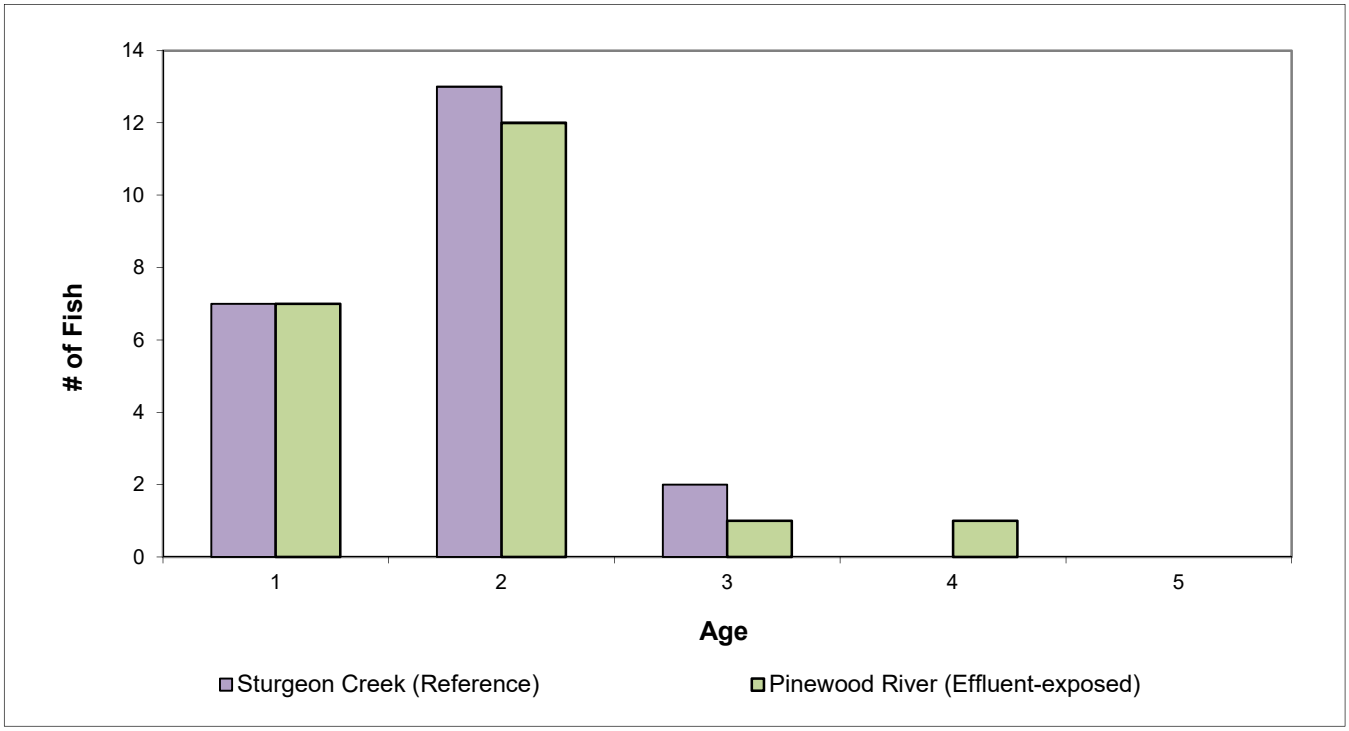
Relative gonad size and egg weight were both significantly larger in female central mudminnow captured in the Pinewood River than at Sturgeon Creek, with the magnitude of difference outside of applicable CES for overall gonad weight but not for egg weight, with egg weights being effectively identical (Table 7.4 and Figure 7.5; Appendix Tables E.8 and E.9). These data indicated that Pinewood River females possessed proportionally larger ovaries at a given body weight compared to those at Sturgeon Creek, suggesting greater energy allocation towards reproduction. Relative liver size and body condition of female central mudminnow captured at Pinewood River were both significantly greater than those captured at Sturgeon Creek, however the magnitude of difference for both were within the applicable CES suggesting that they may not be ecologically meaningful (Table 7.4 and Figure 7.5; Appendix Tables E.8 and E.9).

Overall, female central mudminnow collected at Pinewood River showed no difference in age, significantly larger relative gonad size, larger relative liver size, and greater body condition compared to those captured at Sturgeon Creek. The survival, reproductive, and energy storage responses in female central mudminnow were very similar to those of brook stickleback between Pinewood River and Sturgeon Creek. As indicated previously, the responses shown in female central mudminnow may have reflected differing food resources/assemblages and/or differential energy allocation between the Pinewood River and the Sturgeon Creek reference area.

7.4.2 Male Central Mudminnow

Male central mudminnow from the effluent-exposed area were of similar age to those from the reference area (Figure 7.4b and Table 7.4). Male central mudminnow ranged from 1 to 4 years at the effluent-exposed area and 1 to 3 years at the reference area (Figure 7.4b; Appendix Tables E.10 and E.11).

a)



b)

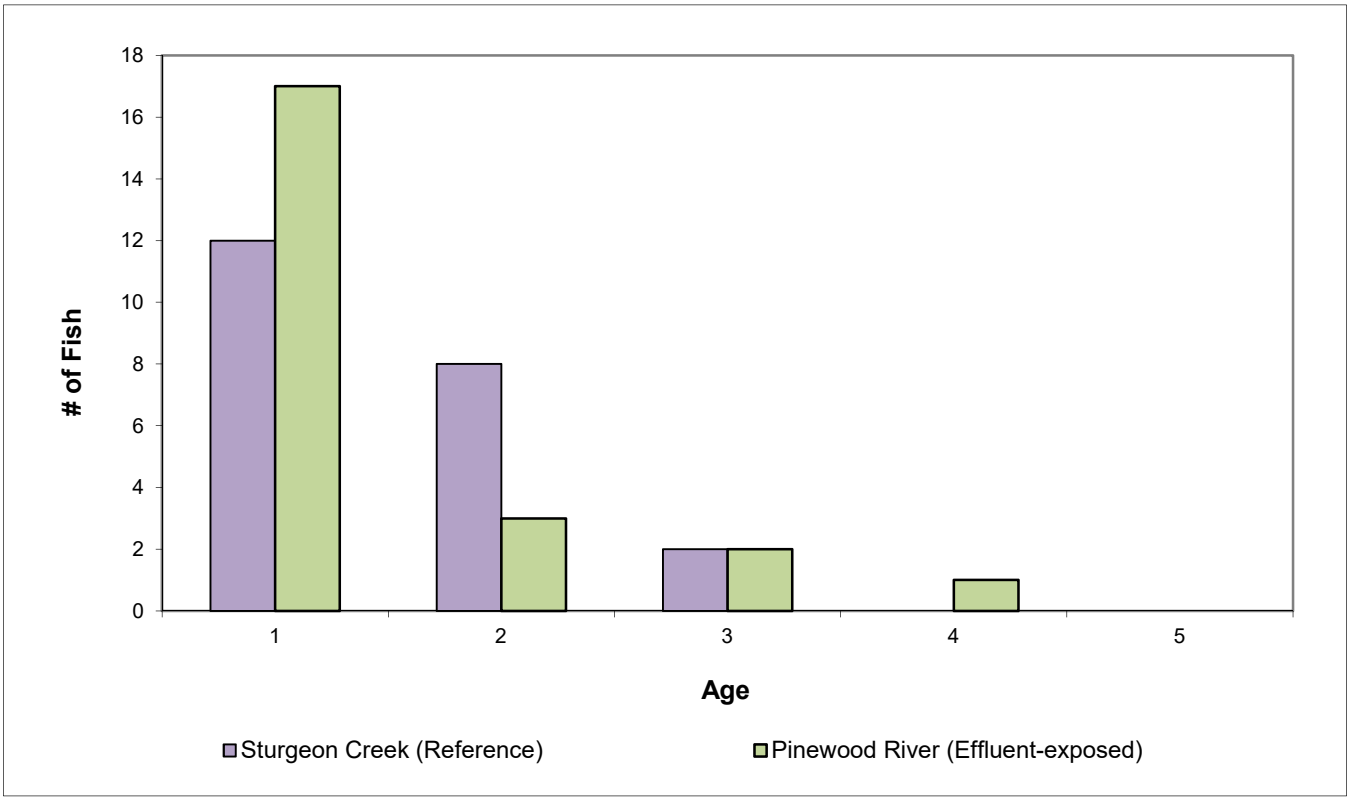


Figure 7.4: Age frequency Distributions of a) Female and b) Male Central Mudminnow in Sturgeon Creek and Pinewood River, RRP Phase 1 EEM, April 2017

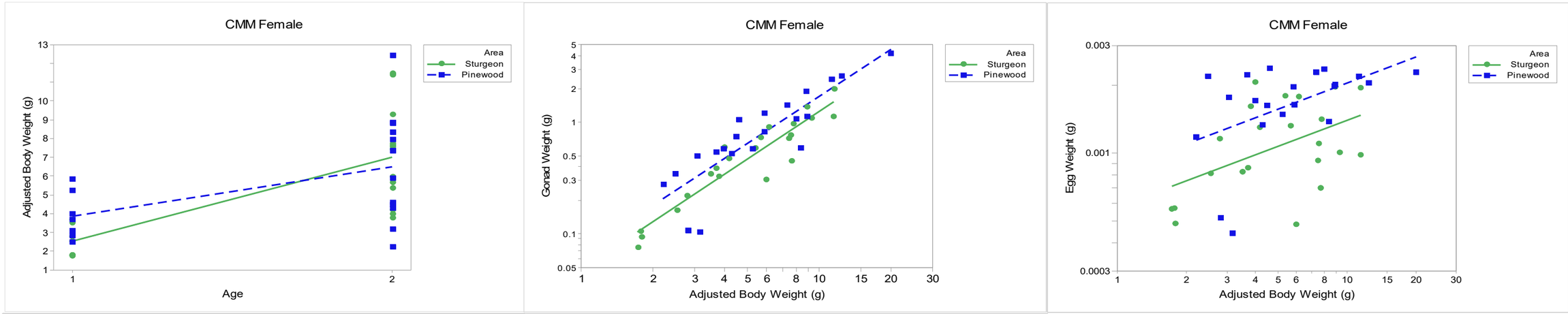


Figure 7.5: Scatterplot and Linear Regressions For Female Central Mudminnow Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference), RRP Phase 1 EEM, 2017

Notes: outliers are plotted as open symbols with an × through them

Relative gonad size was not significantly different for male central mudminnow from the Pinewood River compared to those from the reference area (Table 7.4). Relative liver size and body condition of male central mudminnow were both significantly greater than those captured at Sturgeon Creek, with the magnitude of difference for both endpoints outside the applicable CES (Table 7.4 and Figure 7.6; Appendix Tables E.10 and E.11). No abnormalities were observed in the male central mudminnow during the spring survey.

Overall, male central mudminnow collected at the Pinewood River showed no difference in age, but significantly larger livers and body condition compared to those captured at Sturgeon Creek. The survival (age) and energy storage responses shown in male central mudminnow were very similar to those shown in female central mudminnow and both sexes of brook stickleback between Pinewood River and Sturgeon Creek. As indicated previously, the responses shown in male central mudminnow may have reflected differences of food resources/assemblages, and/or differential energy allocation between Pinewood River and the Sturgeon Creek reference area.

7.5 Summary

No major differences in community composition were observed between the two fishing areas, although the effluent-exposed area on the Pinewood River supported the highest species diversity.

Female brook stickleback downstream of the RRP differed significantly from reference female brook stickleback on the basis of relative gonad size, relative live size, and body condition, with the magnitude of differences exceeding the applicable CES. A similar pattern was observed for effluent-exposed female central mudminnow with significant differences in relative gonad size, relative liver size, and body condition; however only relative gonad size was outside of the applicable CES. Effluent-exposed male brook stickleback differed significantly from males captured at the Sturgeon Creek reference on the basis of larger relative liver size and body condition, with the magnitude of difference exceeding the applicable CES for both endpoints. Similarly, male effluent-exposed central mudminnow showed the exact same pattern as the male brook stickleback in terms of significance and magnitude of difference outside of applicable CES.

Overall, fish downstream of the RRP site during the Phase 1 EEM generally showed a similar pattern of survival, reproductive, and energy storage responses when compared to fish captured at the Sturgeon Creek reference area that is suggestive of greater food resource availability.

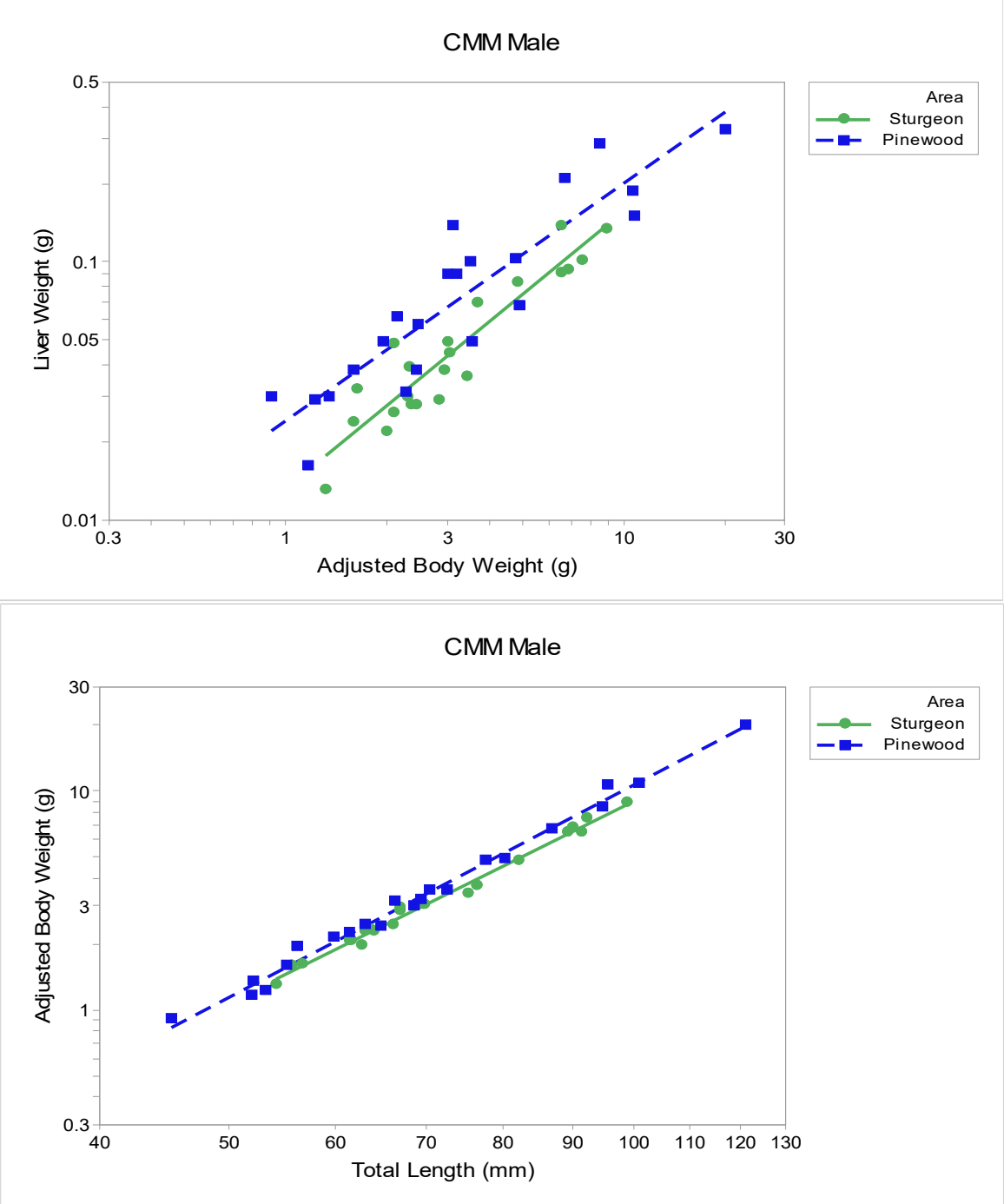


Figure 7.6: Scatterplot and Linear Regressions For Male Central Mudminnow Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference), RRP Phase 1 EEM, 2017

Notes: outliers are plotted as open symbols with an × through them

8 SUMMARY AND CONCLUSIONS

8.1 Conclusions

The RRP Phase 1 EEM field study was implemented in April and September 2017 and provided an integrated assessment of the influence of effluent discharge on the chemical and biological condition of the aquatic receiving environment. The effluent-exposed area on Pinewood River was compared to a reference area located on the Sturgeon Creek, south east of the mine.

Sublethal toxicity tests conducted on grab samples of RRP final effluent at Final Discharge Point 2 (FDP2), and Final Discharge Point 3 (FDP3) over the Phase 1 EEM period (2016 to 2017) indicated that effluent was generally of high quality with the lowest reported effects occurring at effluent concentrations of 37% and 95% for FDP2 and FDP3 respectively, which is above calculated effluent concentrations in the Pinewood River.

Routine water quality monitoring data show that the mine effluent is detectable in Pinewood River, particularly through higher hardness, conductivity, calcium, potassium, and sodium in the effluent-exposed area relative to upstream. Effects on water quality during the field surveys followed a similar pattern that was observed during the routine water quality.

The inorganic sediment fraction was composed predominantly of silt and clay with some sand. There were significant differences between the effluent-exposed and reference area sediments on the basis of total organic carbon, as well as the silt and clay fractions, with significantly more TOC and silt in the effluent-exposed area, and significantly less clay. Sediment chemistry showed two analytes were greater in the effluent-exposed area than in both the reference area and PSQG LEL values (manganese and phosphorus) however this maybe a natural difference between the two areas rather than a mine-related effect. Concentrations of TKN, chromium, and nickel were similar between both areas as well as being elevated compared to PSQG values indicating that these substances are also naturally elevated in these two watercourses.

The benthic invertebrate community in the effluent-exposed area was similar to the reference area for all EEM metrics (mean organism density, number of taxa, and Simpson's Evenness) except Bray-Curtis. Also, Chironomids and Oligochaeta showed comparable percent abundances and were not significantly different among areas. The proportion of pollution-intolerant EPT (Ephemeroptera, Plecoptera, Tricoptera) were similar in percent abundance in the effluent-exposed area compared to the Surgeon Creek, however they were in low abundances for both areas. Correspondence Analysis showed a difference in the Pinewood River effluent-exposed area compared to the community in Sturgeon Creek. The subtle differences observed in the community structure between the areas were most likely related to differences in natural

habitat factors between watersheds (i.e., factors not controlled for in this study) rather than mine-related impacts.

The fish survey showed no major differences in community composition between the two areas although the effluent-exposed area on Pinewood River supported the highest diversity. Female brook stickleback downstream of the RRP differed significantly from reference female brook stickleback for relative gonad size, relative liver size, and body condition, with the magnitude of differences outside of the applicable CES. A similar pattern was observed for effluent-exposed female central mudminnow with significant differences in relative gonad size, relative liver size, and body condition, however only relative gonad size was outside of the applicable CES. Effluent-exposed male brook stickleback were significantly different from male brook stickleback captured at the Sturgeon Creek reference based on larger relative liver size and body condition, with the magnitude of difference outside of the applicable CES for both endpoints. Similarly, male effluent-exposed central mudminnow showed the exact same pattern as the male brook stickleback (larger relative liver size and body condition) in terms of significance and magnitude of difference outside of applicable CES. Although significant differences for several endpoints for both sexes and species were outside of the applicable CES, these differences may be a result of differing food resources/assemblages between the Pinewood River and Sturgeon Creek and not a result of mine-effluent.

8.2 Recommendations

Based on the findings of the Phase 1 RRP EEM study conducted in April and September 2017, it is recommended that the mine implements the Phase 2 EEM biological study ("periodic monitoring - surveillance") three years after Phase 1. A specific recommendation for RRP's Phase 2 EEM is to use the same sentinel fish species and reference areas used in the Phase 1 EEM. This will allow for consistent Phase to Phase comparisons. Additionally, once a permanent final discharge point has been established, the effluent plume should be fully characterized to determine the magnitude and extent of the effluent within the Pinewood River.

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APPENDIX A
CORRESPONDENCE RELATED TO THE PHASE 1 EEM STUDY DESIGN

APPENDIX B
DATA QUALITY ASSESSMENT

APPENDIX B DATA QUALITY ASSESSMENT

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B1 INTRODUCTION

B1.1 Overview

Data Quality Assessment (DQA) was conducted on data collected as part of Phase 1 Environmental Effects Monitoring study implemented for the New Gold Rainy River Project. The objective of DQA is to define the overall quality of the data presented in the report, and, by extension, the confidence with which the data can be used to derive conclusions

B1.2 Background

A variety of factors can influence the chemical and biological measurements made in an environmental study and thus affect the accuracy and/or precision of the data. Inconsistencies in sampling or laboratory methods, use of instruments that are inadequately calibrated or which cannot measure to the desired level of accuracy or precision, and contamination of samples in the field or laboratory are just some of the potential factors that can lead to the reporting of data that do not accurately reflect actual environmental conditions. Depending on the magnitude of the problem, inaccuracy or imprecision have the potential to affect the reliability of any conclusions made from the data. Therefore, it is important to ensure that monitoring programs incorporate appropriate steps to control the non-natural sources of data variability (i.e., minimize the variability that does not reflect natural spatial and temporal variability in the environment) and thus assure the quality of the data.

Data quality as a concept is meaningful only when it relates to the intended use of the data. That is, one must know the context in which the data will be interpreted in order to establish a relevant basis for judging whether or not the data set is adequate. DQA involves comparison of actual field and laboratory measurement performance to data quality objectives (DQOs) established for a particular study, such as evaluation of lowest detection limits, and data precision (based on field duplicate samples), along with proper scrutiny of all laboratory data reports.

DQOs were established at the outset of the field program that reflect reasonable and achievable performance expectations (Appendix Table B.1). Programs involving a large amount of samples and analytes usually result in some results that exceed the DQOs. This is particularly so for multi-element scans (e.g., ICP scans for metals) since the analytical conditions are not necessarily optimal for every element included in the scan. Generally, scan results may be considered acceptable if no more than 20% of the parameters fail to meet the DQOs. Overall, the intent of comparing data to DQOs was not to reject any measurement that did not meet the DQO, but to ensure any questionable data received more scrutiny to

determine what effect, if any, this had on interpretation of results within the context of this project.

B1.3 Types of Quality Control Samples

Several types of quality control (QC) samples were assessed based on samples collected (or prepared) in the field and laboratory. These samples, and a description of each, include the following:

- **Blanks** are samples of de-ionized water and/or appropriate reagent(s) that are handled and analyzed the same way as regular samples. These samples will reflect any contamination of samples occurring in the laboratory (in the case of laboratory or method blanks). Analyte concentrations should be non-detectable although a data quality objective of twice the method detection limit allows for slight "noise" around the detection limit.
- **Field Duplicates** are replicate samples collected from a randomly selected field station using identical collection and handling methods or by splitting the same sample which are then analyzed separately in the laboratory. The duplicate samples are handled and analyzed in an identical manner in the laboratory. The data from field replicate samples reflect natural variability, as well as the variability associated with sample collection methods, and therefore provide a measure of field precision.
- **Laboratory Duplicates** are replicate sub-samples created in the laboratory from randomly selected field samples which are sub-sampled and then analyzed independently using identical analytical methods. For fish tissue, laboratory duplicates represent separate aliquots of material collected after sample homogenization. The laboratory duplicate sample results reflect any variability introduced during laboratory sample handling and analysis and thus provide a measure of laboratory precision.
- **Spike Recovery Samples** are created in the laboratory by adding a known amount/concentration of a given analyte (or mixture of analytes) to a randomly selected test sample previously divided to create two sub-samples. The spiked and regular sub-samples are then analyzed in an identical manner. The spike recovery represents the difference between the measured spike amount (total amount in spiked sample minus amount in original sample) relative to the known spike amount (as a percentage). Two types of spike recovery samples are commonly analyzed. Spiked blanks (or blank spikes) are created using laboratory control materials whereas matrix spikes are created using field-collected samples. The analysis of spiked samples provides an indication of the accuracy of analytical results.

- **Certified Reference Materials and QC Standards** are samples containing known chemical concentrations that are processed and analyzed along with batches of environmental samples. The sample results are then compared to target results to provide a measure of analytical accuracy. The results are reported as the percent of the known amount that was recovered in the analysis.

Two types of QC were applied to benthic invertebrate community samples as follows:

- **Organism Recovery** Checks for benthic invertebrate community samples involve the re-processing of previously sorted material from a randomly selected sample to determine the number of invertebrates that were not recovered during the original sample processing. The reprocessing is conducted by an analyst not involved during the original processing to reduce any bias. This check allows the determination of accuracy through assessment of recovery efficiency.
- **Sub-Sampling Error** is assessed for studies in which benthic invertebrate community samples require sub-sampling (due to excessive sample volume and/or invertebrate density). By comparing the numbers of benthic invertebrates recovered between at least two sub-samples, this measure provides an evaluation of how effective the sub-sampling method was in evenly dividing the original sample. Therefore, sub-sampling error provides a measure of analytical accuracy and precision. The processing of entire benthic invertebrate community samples in representative sample fractions also allows an evaluation of sub-sampling accuracy.

One additional types of QC measures was applied to the fish fecundity samples as follows:

- **Egg Re-count** for collected fish gonad tissue involves the reprocessing of previously counted eggs to ensure that the initial count was accurate. The re-count is completed on a randomly selected sample and reprocessing is conducted by an analyst not involved during the original count to reduce any bias.

B2 WATER SAMPLES

B2.1 Lowest Detection Limits

Target laboratory lowest detection limits (LDL) for water sample analyses were established at levels below all potentially applicable water quality guidelines (Appendix Table B.2). All reported LDLs were at or below the applicable water quality guidelines meaning that sample data for this project could be reliably interpreted relative to the guidelines.

B2.2 Field Duplicate Samples

Two sets of duplicate water samples were collected in the field (one in April and one in the September), which showed good agreement in analyte concentrations (Appendix Table B.3). In the April sample, one analyte that did not achieve the DQO, this was total dissolved solids. In the September sample, four analytes did not achieve the DQO; total ammonia, nitrate, sulfate, and sulfur. Although total dissolved solids, total ammonia, sulfate, and sulfur did not achieve the DQO, the absolute difference in concentration between the duplicate samples was very low. Nitrate also failed to meet the DQO and had relatively high absolute differences in concentration; this is possibly because the duplicate sample was not fully preserved, therefore microbial action continued, leading to continued nitrogen fixation (i.e. increased nitrate). Overall, the data suggest that reported sample data were reasonably precise representations of conditions at the time of sampling.

B3 SEDIMENT SAMPLES

B3.1 Lowest Detection Limits

Target laboratory lowest detection limits (LDL) for sediment sample analyses were established at levels below all potentially applicable sediment quality guidelines (Appendix Table B.4). None of the reported LDLs were at or above the target concentrations meaning that sample data for this project could be reliably interpreted relative to the guidelines (Sediment Quality Guidelines; Appendix Table B.4).

B3.2 Field Duplicate Samples

One field duplicate sediment sample was collected for this project. All parameters achieved close agreement indicating good precision (Appendix Table B.5).

B4 BENTHIC MACROINVERTEBRATE SAMPLES

B4.1 Subsampling Accuracy and Precision

Three samples were fractioned and sorted in its entirety for QC purposes. The DQO of 20% was met for both precision and accuracy for two of the three samples, the lab indicated that the probability of meeting the accuracy criteria is reduced, due to the low organism densities. (Appendix Table B.6a and Table B.6c). Overall, the number of organisms in each fraction showed close agreement.

B4.2 Organism Recovery

The data quality objective for percent organism recovery was met for both samples that were re-sorted (Appendix Table B.6b).

B5 FISH SAMPLES

B5.1 Fecundity

The relative percent differences between original and resorted fecundity estimates, based on five brook stickleback and four central mudminnow ovaries, were good (Appendix Table B.7). All but three samples achieved the DQO. Overall, the duplicate results indicated good precision.

B6 DATA QUALITY STATEMENT

The quality of data for this project was adequate to serve the project objective.

Table B.1: Data Quality Objectives for Environmental Samples Collected for the RRP Phase 1 EEM, 2017

Quality Control Measure	Quality Control Sample Type	Study Component			
		Water Quality	Sediment Quality	Benthic Invertebrate Community	Fish Fecundity
Lowest Detection Limits (LDL)	Comparison actual LDL versus target LDL	LDL for each variable should be at least as low as applicable guidelines, ideally ≤1/10th guideline valuea	LDL for each variable should be at least as low as applicable guidelines, ideally ≤1/10th guideline valuea	n/a	n/a
Field Precision	Field Duplicates	≤25% RPD[b]	≤40% RPD	n/a	n/a
Laboratory Precision	Sub-Sampling Precision	n/a	n/a	≤20% difference between sub-samples	n/a
	Fecundity Estimate	n/a	n/a	n/a	±5% RPD
Accuracy	Sub-Sampling Accuracy	n/a	n/a	Subsample estimate is within 20% of total abundance	n/a
	Organism Recovery	n/a	n/a	≥ 90%	n/a

[a] or below predictions, if applicable and no guideline exists for the substance.
[b] RPD - Relative Percent Difference
Note: n/a - not applicable

Table B.2: Laboratory Lowest Detection Limits (LDLs) Relative to Targets and to Water Quality Guidelines

	Analytes	Units	Lowest Detection Limit	Water Quality Criteria
			Achieved	Ontario Water Quality Objective[a]
Non-Metals	Radium-226	Bq/L	0.010	1.0
	Hardness ($CaCO_3$)	mg/L	0.5	-
	Total Ammonia-N	mg/L	0.02	10.25
	Total Dissolved Solids	mg/L	10	-
	Total Suspended Solids	mg/L	2	-
	Alkalinity (Total as $CaCO_3$)	mg/L	2	-
	Strong Acid Dissoc. Cyanide (CN)	mg/L	0.0020	0.005
	Nitrate (N)	mg/L	0.020	-
	Nitrate plus Nitrite (N)	mg/L	0.040	-
	Nitrite (N)	mg/L	0.010	-
	Phosphorus (P)	mg/L	0.050	0.30
ICP Metals	Total Aluminum (Al)	mg/L	0.003	0.075
	Total Antimony (Sb)	mg/L	0.0001	0.020
	Total Arsenic (As)	mg/L	0.0001	0.005
	Total Barium (Ba)	mg/L	0.00005	-
	Total Beryllium (Be)	mg/L	0.0001	11
	Total Bismuth (Bi)	mg/L	0.00005	-
	Total Boron (B)	mg/L	0.01	0.20
	Total Cadmium (Cd)	mg/L	0.00001	0.00050
	Total Chromium (Cr)	mg/L	0.0001	0.0010
	Total Cobalt (Co)	mg/L	0.00010	0.00090
	Total Copper (Cu)	mg/L	0.0005	0.0050
	Total Iron (Fe)	mg/L	0.01	0.30
	Total Lead (Pb)	mg/L	0.0001	0.0050
	Total Lithium (Li)	mg/L	0.001	-
	Total Manganese (Mn)	mg/L	0.0001	-
	Total Mercury (Hg)	mg/L	0.00001	0.00020
	Total Molybdenum (Mo)	mg/L	0.0001	0.040
	Total Nickel (Ni)	mg/L	0.0005	0.025
	Total Selenium (Se)	mg/L	0.00005	0.1
	Total Silicon (Si)	mg/L	0.1	-
	Total Silver (Ag)	mg/L	0.00001	0.00010
	Total Strontium (Sr)	mg/L	0.0002	-
	Total Thallium (Tl)	mg/L	0.00001	0.00030
	Total Tin (Sn)	mg/L	0.0001	-
	Total Titanium (Ti)	mg/L	0.0003	-
	Tungsten (W)	mg/L	0.00010	0.030
	Total Uranium (U)	mg/L	0.00001	0.0050
	Total Vanadium (V)	mg/L	0.0005	0.0060
	Total Zinc (Zn)	mg/L	0.003	0.020
	Total Zirconium (Zr)	mg/L	0.00006	0.0040
	Total Calcium (Ca)	mg/L	0.05	-
	Total Magnesium (Mg)	mg/L	0.005	-
	Total Potassium (K)	mg/L	0.05	-
	Total Sodium (Na)	mg/L	0.05	-
	Total Sulphur (S)	mg/L	0.5	-

Note: Highlighted Values Indicate LDLs that were Above the Water Quality Guideline.

[a] PWQO (Ontario Provincial Water Quality Objective).

Table B.3: Field Duplicate Results for Analysis of Water Samples

Analytes		Units	ALS Job Number L1917630			ALS Job Number L1991701		
			Station: PinR-EXP (Apr. 24, 2017)			Station: PinR-EXP (Sept. 13, 2017)		
			Replicate 1	Replicate 2	RPD[a,b]	Replicate 1	Replicate 2	RPD[a,b]
Non-Metals	Alkalinity, Total (as CaCO3)	mg/L	190	187	2	260	245	6
	Ammonia, Total (as N)	mg/L	0.077	0.078	1	0.027	0.053	65
	Chloride (Cl)	mg/L	10.9	10.7	2	12.5	12.4	1
	Fluoride (F)	mg/L	0.07	0.07	4	0.081	0.08	0
	Nitrate (as N)	mg/L	0.89	0.88	2	0.102	2.95	187
	Nitrite (as N)	mg/L	0.023	0.023	0	<0.010	<0.010	0
	Phosphorus (P)-Total	mg/L	0.0185	0.0163	13	0.0324	0.0337	4
	Sulfate (SO4)	mg/L	16.8	16.5	2	1.79	2.44	31
	Hardness (as CaCO3)	mg/L	191	182	5	257	262	2
	Total Suspended Solids	mg/L	<2.0	2	0	4.6	4.3	7
	Total Dissolved Solids	mg/L	236	163	37	308	305	1
	Cyanide, Weak Acid Diss	mg/L	<0.0020	<0.0020	0	<0.0020	<0.0020	0
	Cyanide, Total	mg/L	<0.0020	<0.0020	0	<0.0020	<0.0020	0
	Dissolved Organic Carbon	mg/L	16.6	16.3	2	28.7	29.3	2
	Total Organic Carbon	mg/L	16.7	17.0	2	29.1	29.5	1
	Radium	Bq/L	<0.010	<0.010	0	<0.010	<0.010	0
ICP Metals	Aluminum (Al)-Total	mg/L	0	0	0	0	0	3
	Antimony (Sb)-Total	mg/L	0.0012	0.0013	4	0.0002	0.0002	6
	Arsenic (As)-Total	mg/L	0.001	0.001	5	0.001	0.002	5
	Barium (Ba)-Total	mg/L	0.02	0.02	3	0.02	0.02	3
	Beryllium (Be)-Total	mg/L	<0.00010	<0.00010	0	<0.00010	<0.00010	0
	Bismuth (Bi)-Total	mg/L	<0.000050	<0.000050	0	<0.000050	<0.000050	0
	Boron (B)-Total	mg/L	0.026	0.027	4	0.015	0.015	0
	Cadmium (Cd)-Total	mg/L	0.000	0.000	24	0.0000056	<0.0000050	6
	Calcium (Ca)-Total	mg/L	42.0	42.7	2	58.4	57.9	1
	Cesium (Cs)-Total	mg/L	0.000013	0.000013	0	0.000011	0.000013	17
	Chromium (Cr)-Total	mg/L	0.00023	0.00024	4	0.00032	0.00034	6
	Cobalt (Co)-Total	mg/L	0.00015	0.00015	0	0.00025	0.00027	8
	Copper (Cu)-Total	mg/L	0.001	0.001	3	<0.00050	<0.00050	0
	Iron (Fe)-Total	mg/L	0.196	0.2	3	0.201	0.2	9
	Lead (Pb)-Total	mg/L	0.000059	0.000052	13	0.000074	0.000068	8
	Lithium (Li)-Total	mg/L	0.0097	0.0101	4	0.0115	0.0119	3
	Magnesium (Mg)-Total	mg/L	18.500	19.700	6	28.500	29.700	4
	Manganese (Mn)-Total	mg/L	0.028	0.029	1	0.084	0.092	9
	Mercury (Hg)-Total	mg/L	<0.0000050	<0.0000050	0	<0.0000050	<0.0000050	0
	Molybdenum (Mo)-Total	mg/L	0.0026	0.0026	0	0.000185	0.000187	1
	Nickel (Ni)-Total	mg/L	0.00117	0.00122	4	0.00111	0.00114	3
	Phosphorus (P)-Total	mg/L	<0.050	<0.050	0	0.1	0.1	19
	Potassium (K)-Total	mg/L	3.080	3.130	2	2.130	2.190	3
	Rubidium (Rb)-Total	mg/L	0.0019	0.00195	3	0.00158	0.00156	1
	Selenium (Se)-Total	mg/L	0.0002	0.0002	7	0.00018	0.00017	3
	Silicon (Si)-Total	mg/L	1.40	1.43	2	2.66	2.79	5
	Silver (Ag)-Total	mg/L	<0.000010	<0.000010	0	<0.000010	<0.000010	0
	Sodium (Na)-Total	mg/L	8.92	9.15	3	9.17	9.45	3
	Strontium (Sr)-Total	mg/L	0.158	0.155	2	0.124	0.124	0
	Sulfur (S)-Total	mg/L	6.06	5.75	5	1.20	1.67	33
	Tellurium (Te)-Total	mg/L	<0.00020	<0.00020	0	<0.00020	<0.00020	0
	Thallium (Tl)-Total	mg/L	<0.000010	<0.000010	0	<0.000010	<0.000010	0
	Thorium (Th)-Total	mg/L	<0.00010	<0.00010	0	<0.00010	<0.00010	0
	Tin (Sn)-Total	mg/L	<0.00010	<0.00010	0	<0.00010	<0.00010	0
	Titanium (Ti)-Total	mg/L	0.00217	0.0026	18	0.00279	0.00303	8
	Tungsten (W)-Total	mg/L	<0.00010	<0.00010	0	<0.00010	<0.00010	0
	Uranium (U)-Total	mg/L	0.00184	0.00187	2	0.000525	0.000516	2
	Vanadium (V)-Total	mg/L	0.00079	0.00078	1	0.00079	0.00082	4
	Zinc (Zn)-Total	mg/L	<0.0030	<0.0030	0	0.0038	<0.0030	12
	Zirconium (Zr)-Total	mg/L	0.00024	0.000243	1	0.00017	0.000165	3

Note: Highlighted Values did not Meet the Data Quality Objective of ≤ 25% Relative Percent Difference.

[a] Relative Percent Difference = [absolute (replicate1-replicate2)/average (replicate1,replicate2)]*100

[b] The lowest detection limit (LDL) value was used in instances where values less than the LDL were reported.

Table B.4: Laboratory Lowest Detection Limits (LDL) for Sediment Samples Relative to Targets and to Guidelines

Analytes		Units	Achieved LDL	Sediment Quality Guidelines	
				Ontario[a]	
				LEL[b]	SEL[c]
Non-Metals	Moisture	%	0.1	-	-
	Total Organic Carbon	%	0.05	1.0	10.0
	Gravel	%	1.0	-	-
	Sand	%	1.0	-	-
	Silt	%	1.0	-	-
	Clay	%	1.0	-	-
ICP Metals	Aluminum (Al)	µg/g	50	-	-
	Antimony (Sb)	µg/g	0.1	-	-
	Arsenic (As)	µg/g	0.1	6	33
	Barium (Ba)	µg/g	0.5	-	-
	Beryllium (Be)	µg/g	0.1	-	-
	Bismuth (Bi)	µg/g	0.2	-	-
	Boron (B)	µg/g	5	-	-
	Cadmium (Cd)	µg/g	0.02	0.6	10
	Calcium (Ca)	µg/g	50	-	-
	Chromium (Cr)	µg/g	0.5	26	110
	Cobalt (Co)	µg/g	0.1	-	-
	Copper (Cu)	µg/g	0.5	16	110
	Iron (Fe)	µg/g	50	20,000	40,000
	Lead (Pb)	µg/g	0.5	31	250
	Lithium (Li)	µg/g	2	-	-
	Magnesium (Mg)	µg/g	20	-	-
	Manganese (Mn)	µg/g	1	460	1,100
	Mercury (Hg)	µg/g	0.005	0.2	2
	Molybdenum (Mo)	µg/g	0.1	-	-
	Nickel (Ni)	µg/g	0.5	16	75
	Phosphorus (P)	µg/g	50	600	2,000
	Potassium (K)	µg/g	100	-	-
	Selenium (Se)	µg/g	0.2	-	-
	Silver (Ag)	µg/g	0.1	-	-
	Sodium (Na)	µg/g	50	-	-
	Strontium (Sr)	µg/g	0.5	-	-
	Sulfur (S)	µg/g	1,000	-	-
	Thallium (Tl)	µg/g	0.05	-	-
	Tin (Sn)	µg/g	1.0	-	-
	Titanium (Ti)	µg/g	1	-	-
	Tungsten (W)	µg/g	0.5	-	-
	Uranium (U)	µg/g	0.05	-	-
	Vanadium (V)	µg/g	0.2	-	-
	Zinc (Zn)	µg/g	2	120	820
	Zirconium (Zr)	µg/g	1	-	-

Note: Highlighted Values Indicate Target LDL was not Achieved.

[a] Ontario Provincial Sediment Quality Criteria (PSQG)

[b] Lowest effect level (LEL)

[c] Severe effect level (SEL)

Table B.5: Field Duplicate Results for Analysis of Sediment Samples

Analytes		Units	ALS Job Number L1995196		
			Station ID PinR-EXP-4 (September 14, 2017)		
			Replicate 1	Replicate 2	RPD[a,b]
Non-Metals	Moisture	%	54	60	11
	Total Organic Carbon	mg/kg	3.46	3.26	6
	Gravel	%	<1.0	<1.0	0
	Sand	%	31	32	5
	Silt	%	45	41	9
	Clay	%	25	27	8
ICP Metals	Aluminum (Al)	µg/g	9,350	9,590	3
	Antimony (Sb)	µg/g	0.11	0.10	10
	Arsenic (As)	µg/g	2.2	2.1	6
	Barium (Ba)	µg/g	61	62	1
	Beryllium (Be)	µg/g	0.44	0.40	10
	Bismuth (Bi)	µg/g	<0.20	<0.20	0
	Boron (B)	µg/g	7	6	17
	Cadmium (Cd)	µg/g	0.20	0.19	7
	Calcium (Ca)	µg/g	11,600	9,080	24
	Chromium (Cr)	µg/g	21	21	0
	Cobalt (Co)	µg/g	7	7	2
	Copper (Cu)	µg/g	10	10	2
	Iron (Fe)	µg/g	12,600	12,500	1
	Lead (Pb)	µg/g	6	6	7
	Lithium (Li)	µg/g	12	12	4
	Magnesium (Mg)	µg/g	6,770	6,100	10
	Manganese (Mn)	µg/g	315	303	4
	Mercury (Hg)	µg/g	0.05	0.03	40
	Molybdenum (Mo)	µg/g	0.35	0.29	19
	Nickel (Ni)	µg/g	15	15	0
	Phosphorus (P)	µg/g	496	469	6
	Potassium (K)	µg/g	1,040	1,060	2
	Selenium (Se)	µg/g	0.34	0.28	19
	Silver (Ag)	µg/g	<0.10	<0.10	0
	Sodium (Na)	µg/g	96	84	13
	Strontium (Sr)	µg/g	22	20	10
	Sulfur (S)	µg/g	<1,000	<1,000	0
	Thallium (Tl)	µg/g	0.12	0.11	10
	Tin (Sn)	µg/g	<1.0	<1.0	0
	Titanium (Ti)	µg/g	137	128	7
	Tungsten (W)	µg/g	<0.50	<0.50	0
	Uranium (U)	µg/g	1	1	12
	Vanadium (V)	µg/g	25	26	2
	Zinc (Zn)	µg/g	50	48	4
	Zirconium (Zr)	µg/g	5	4	7

Note: Highlighted Values did not Meet the Data Quality Objective of ≤ 40% Relative Percent Difference.

[a] Relative Percent Difference = [absolute (replicate1-replicate2)/average (replicate1,replicate2)]*100

[b] The laboratory detection limit (LDL) value was used in instances where values less than the LDL were reported.

Table B.6a: Calculation of Subsampling Error for Benthic Macroinvertebrate Samples

Station ID	Whole Organisms	Number of Organisms in Fraction 1	Number of Organisms in Fraction 2	Number of Organisms in Fraction 3	Number of Organisms in Fraction 4	Actual Density	Precision % range		Accuracy	
									min	max
StuC-REF-2	0	36	38	0	0	74	5.3	-	2.7	2.7
StuC-REF-3	0	24	31	0	0	55	22.6	-	12.7	12.7
PinR-EXP-5	0	14	24	0	0	38	41.7	-	26.3	26.3

Note: Highlighted Values did not Meet the Data Quality Objective of ≤ 20% Difference.
min = minimum absolute % error; max = maximum absolute % error.

Table B.6b: Percent Recovery of Benthic Macroinvertebrates

Station ID	Number of Organisms Recovered (initial sort)	Number of Organisms in Re-sort	Percent Recovery
StuC-REF-4	42	42	100.0%
PinR-EXP-2	89	94	94.7%
		Average % Recovery	97.4%

Note: Highlighted Values did not Meet the Data Quality Objective of 90% Recovery.

Table B.6c: Sample Fractions Sorted from RRP Phase 1 EEM Samples

Station ID	Fraction Sorted	Station	Fraction Sorted
StuC-REF-1	1/16	PinR-EXP-1	1/16
StuC-REF-2	1/8[a]	PinR-EXP-2	1/16
StuC-REF-3	1/8[a]	PinR-EXP-3	1/16
StuC-REF-4	1/16	PinR-EXP-4	1/16
StuC-REF-5	1/16	PinR-EXP-5	1/8[a]

[a] three eighths sorted for subsampling error calculations.

QA/QC Notes

Reported fractions averaged 4 hours to sort due to high quantities of organic matter. ZEAS has shown that subsampling precision and accuracy are density dependent (Zaranko and Keene 2005). Specifically, small absolute differences between subsampled fractions become increasingly large, when expressed as a percentage of total organisms, as organism densities decline. Therefore, the probability of meeting precision and accuracy criteria is reduced in samples with low organism densities (i.e., <150 organisms/subsample). It would take an extaordinary effort (>20 hours) to report accuracy on 1/8ths or smaller fractions. Based on the low densities, there would be a low probability of attaining the accuracy criteria.

Zaranko, D.T. and J. Keene. 2005. Are the costs to meet environmental effects monitoring (EEM) benthic sample precision and accuracy criteria justified? In Dixon, D.G., S. Munro and A.J. Niimi (eds). Proceedings of the 32nd Annual Aquatic Toxicity Workshop: October 3 to 5, 2005, Waterloo, Ontario. Can. Tech. Rep. Fish. Aquat. Sci: 2617. 120p.

Table B.7: Relative Percent Difference Between Original Egg Count and Recount Values

Sample	Egg Count (min. 100 eggs counted)			Egg Re-count			Relative Percent Difference[a]		
	1	2	3	1	2	3	1	2	3
PinR-BSB-03	124	130	103	121	125	101	2	4	2
PinR-BSB-21	142	114	122	146	108	114	3	5	7
StuC-BSB-01	167	101	109	154	103	114	8	2	4
StuC-BSB-16	122	102	101	117	100	97	4	2	4
StuC- BSB-32	111	108	122	114	109	119	3	1	2
PinR-CMM-14	388	-	-	390	-	-	1	-	-
PinR-CMM-23	123	101	101	124	101	100	1	0	1
StuC-CMM-17	646	-	-	652	-	-	1	-	-
StuC-CMM-31	694	-	-	690	-	-	1	-	-

Note: Highlighted Values did not Meet the Data Quality Objectives of ≤ 5% Relative Percent Difference.

[a] Relative Percent Difference = [absolute (replicate1-replicate2)/average (replicate1,replicate2)]*100

APPENDIX C
WATER AND SEDIMENT QUALITY DATA

Laboratory Reports

Table C.1: *In Situ* Surface Water Quality Data Collected during the Fish Survey for RRP Phase 1 EEM, 2017

Station ID	Date	Time	Latitude (dd mm ss.s) [a]	Longitude (dd mm ss.s) [a]	Temperature (°C)	pH	Dissolved Oxygen		Specific Conductivity (µS/cm)
							(mg/L)	(% sat)	
StuC-REF	24-Apr-17	14:30	48 43 16.6	-93 57 38.3	5.9	6.90	11.86	94.3	153
PinR-EXP	24-Apr-17	13:00	48 49 46.6	-94 03 53.0	5.6	7.46	11.86	93.6	303

[a] d-degrees, m-minutes, s-seconds
Note: Map Datum (NAD) 83

Table C.2: Supporting Water Characteristics at Reference and Effluent-exposed Stations, RRP Phase 1 EEM, September 2017

Medium	Parameter	Reference Stations					Effluent-exposed Stations				
		StuC-REF1	StuC-REF2	StuC-REF3	StuC-REF4	StuC-REF5	PinR-EXP1	PinR-EXP2	PinR-EXP3	PinR-EXP4	PinR-EXP5
Habitat Parameters	Depth (m)	0.96	0.98	0.94	0.94	0.98	0.96	0.82	0.98	0.98	0.82
	Velocity (m/s)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Water (Surface)	Temperature (ºC)	18.70	18.60	16.30	16.20	16.30	12.65	12.65	12.63	12.67	12.68
	pH	8.03	7.92	7.59	7.45	7.51	7.57	7.58	7.59	7.48	7.50
	D.O. (% sat)	45.9	46.2	42.3	37.9	49.9	41.1	47.3	49.4	41.3	40.9
	D.O (mg/L)	4.48	4.53	4.14	3.72	4.88	4.35	5.01	5.24	4.37	4.33
	Specific Conductance (µS/cm)	321	321	327	324	324	488	488	485	489	488
Water (Bottom)	Temperature (ºC)	17.70	17.10	16.20	15.90	16.30	12.08	12.22	12.59	12.67	12.66
	pH	7.77	7.57	7.44	7.33	7.50	7.02	7.30	7.36	7.31	7.26
	D.O. (% sat)	38.2	42.0	41.1	34.6	43.2	25.2	29.4	44.6	38.5	38.8
	D.O (mg/L)	3.74	4.11	4.02	3.39	4.23	2.70	3.11	4.73	4.08	4.11
	Specific Conductance (µS/cm)	327	326	329	326	324	524	495	506	486	490

Table C.3: Benthic Analyses and Supporting Measures - ANOVA results, Rainy River Phase 1 EEM, 2017

Dependent Variable	Mean Square	F (ANOVA)	P-value	Observed Power
Density (Ind./m2)	5,661,058	0.1691	0.6917	0.1240
LPL Number of Taxa	19.6000	1.2366	0.2984	0.2694
LPL Simpson's D	0.0063	0.9682	0.3539	0.2341
LPL Simpson's E	0.0137	0.4250	0.5328	0.1600
LPL BC Dissimilarity	0.4840	34.3750	0.0004	0.9999
Rainy LPL CA-1 (29.0%)	1.8332	6.8400	0.0309	0.7706
Rainy LPL CA-2 (17.0%)	0.8106	2.1204	0.1834	0.3789
Rainy LPL CA-3 (16.4%)	0.0129	0.0423	0.8422	0.1060
Rainy LPL CA-4 (12.0%)	0.4422	2.2569	0.1714	0.3948
FL Number of Taxa	0.4000	0.1455	0.7128	0.1207
FL Simpson's D	0.0137	2.3502	0.1638	0.4055
FL Simpson's E	0.0040	0.1907	0.6738	0.1271
FL BC Dissimilarity	0.3725	30.6576	0.0005	0.9996
Rainy FL CA-1 (26.5%)	1.2090	12.7705	0.0073	0.9458
Rainy FL CA-2 (25.6%)	0.0199	0.0735	0.7931	0.1105
Rainy FL CA-3 (17.9%)	0.3771	3.0832	0.1172	0.4849
Rainy FL CA-4 (14.4%)	0.0232	0.1729	0.6885	0.1246
% Oligochaeta	306.4730	0.7179	0.4214	0.2004
% Ostracoda	10.4244	0.8873	0.3738	0.2233
% Ephemeroptera	1.1628	0.4750	0.5102	0.1669
% Trichoptera	0.3312	1.0000	0.3466	0.2383
% Chaoboridae	1,232.5440	13.2452	0.0066	0.9520
% Chironomidae	122.0105	0.2673	0.6191	0.1379
% Metal Sensitive Chironomidae	0.8880	0.1743	0.6873	0.1248
% Gastropoda	168.0180	0.9757	0.3522	0.2351
% Bivalvia	193.9522	1.4200	0.2676	0.2931
% Collector Gatherers	745.4596	1.8525	0.2106	0.3469
% Filterers	223.4453	1.8252	0.2137	0.3436
% Scrapers	153.4289	0.8913	0.3728	0.2238
% Shredders	206.5703	7.0070	0.0294	0.7792
% Clingers	6.8393	0.0267	0.8743	0.1038
% Sprawlers	1,749	9.8036	0.0140	0.8863
% Burrowers	639	1.7130	0.2269	0.3298
Station Depth (m)	0.0058	1.5319	0.2509	0.1942
Temperature (°C; bottom)	44.0160	141.2060	0.0000	1.0000
Dissolved Oxygen (mg/L; bottom)	0.0578	0.1460	0.7123	0.0632
Dissolved Oxygen (% sat.; bottom)	51.0760	1.3922	0.2719	0.1808
pH (bottom)	0.1850	8.2627	0.0207	0.7122
Conductivity (µS/cm; bottom)	43,047	449.1754	0.0000	1.0000
Specific Conductance (µS/cm; bottom)	75,847	639.5005	0.0000	1.0000
Moisture (%)	318.0960	2.7368	0.1367	0.3084
Total Kjeldahl Nitrogen (%)	0.1520	7.5777	0.0250	0.6753
FOC (log10 [mg/g])	0.1810	8.0061	0.0222	0.6988
Total Organic Carbon (%)	29.0021	8.1675	0.0212	0.7073
% Gravel (%)	0.0000	.	.	.
% Sand (%)	96.1000	0.8730	0.3775	0.1312
% Silt (%)	463.7610	7.0049	0.0294	0.6416
% Clay (%)	137.6410	9.8685	0.0138	0.7853
Rainy River Sediment Metal PC-1 (69.7%)	1.0119	1.0134	0.3436	0.1445
Rainy River Sediment Metal PC-2 (16.2%)	7.4188	37.5344	0.0003	0.9996
Rainy River Sediment Metal PC-3 (6.2%)	0.0176	0.0157	0.9034	0.0514

P-value < 0.1.

Table C.4: Surface Water Quality at SW20 (Pinewood River reference area) and SW22A (Pinewood River Effluent-exposed area), 2015 to 2017

Analytes		Field pH	Field Temperature (°C)	Field Dissolved Oxygen (mg/L)	Colour	Conductivity	Hardness	Lab pH	TSS	TDS	Turbidity	Alkalinity (Total as $CaCO_3$)	Acidity (as $CaCO_3$)	Total Ammonia-N	Unionized Ammonia	Chloride (Cl)	Fluoride (F-)	Nitrate (N)
Location	**Sample Date**				TCU	µS/cm	mg/L		mg/L	mg/L	NTU	mg/L	mg/L	mg/L	mg/L		mg/L	mg/L
SW20 (Reference)	14-May-15	6.79	6.7	33	120	217	100	7.8	5	160	5		4.6	0.024			0.035	0.015
	09-Jun-15	6.85	14.16	64	187	176	84	7.5	5	250	5	79	3.6	0.010			0.040	0.010
	21-Jul-15	7.24	18	46	247	203	104	7.4	2	170	4	92	5.8	0.022			0.039	0.015
	25-Aug-15	7.39	13.24	34	155	295	156	7.7	2	225	3	147	7.6	0.014			0.050	0.005
	15-Sep-15	7.14	13.2	8	124	299	154	7.4	5	225	3	151	6.2	0.004			0.043	0.010
	27-Oct-15	7.13	4.2	63	79	343	159	7.6	6	225	7	149	5.0	0.008	0.0010	17.8	0.033	0.040
	18-Nov-15	7.38	5.9	76	104	280	128	7.5	4	195	7	99	5.0	0.006	0.0010	23.6	0.022	0.145
	17-Dec-15	7.42	0.1	71	101	220	103	7.5	2	165	4	90	6.0	0.016	0.0010	10.1	0.028	0.030
	27-Jan-16	7.25	0.8	29	118	306	157	7.4	1	220	9	142	8.8	0.068	0.0010	7.9	0.032	0.060
	29-Feb-16	7.40	0.6	26	76	319	166	7.5	4	210	11	160	10.0	0.118	0.0010	6.5	0.035	0.085
	23-Mar-16	7.47	20.0		108	189	94	7.5	6	135	6	77	5.8	0.022		11.1	0.033	0.060
	18-Apr-16	6.59	3.0		87	196	91	7.6	5	130	7	77	4.6	0.034	0.0010	9.9	0.037	0.055
	18-May-16	7.12	7.9		89	269	127	7.7	2	160	3	110	4.8	0.027	0.0010	14.8	0.045	0.005
	25-Jan-17	6.71	1.0	6	79	305	141	7.2	3	200	7	148	14.6	0.068	<0.001	11.0	0.029	0.075
	15-Feb-17	7.60	0.3	8	89	368	181	7.4	8	235	9	180	11.2	0.098	<0.001	14.3	0.032	0.065
	29-Mar-17	7.26	0.1	6	82	161	71	7.3	7	120	7	72	4.6	0.038	<0.001	7.4	0.025	0.045
	26-Apr-17	7.55	1.0	14	99	251	117	7.6	2	170	4	104	4.8	0.008	<0.001	17.2	0.043	0.015
	24-May-17	7.35	10.0	7	116	302	145	7.9	3	210	3	127	1.0	0.034	<0.001	19.8	0.059	<0.005
	21-Jun-17	7.25	15.0	2	116	345	154	7.4	2	220	1	177	13.8	0.008	<0.001	27.3	0.050	<0.005
	18-Jul-17	7.14	16.0	1	122	313	154	7.3	3	235	1	135	13.6	0.026	<0.001	23.3	0.043	<0.005
	16-Aug-17	6.65	18.0	1	99	351	164	7.4	5	215	3	164	8.0	0.024	<0.001	23.7	0.051	0.005
	26-Sep-17	7.06	13.0	2	89	434	179	7.8	2	275	2	158	8.6	0.060	<0.001	34.4	0.055	0.010
	30-Oct-17	7.57	3.0	6	81	250	111	7.6	1	175	3	93	6.0	0.014	<0.001	18.5	0.030	<0.005
	20-Nov-17	7.65	0.8	7	87	278	124	7.4	2	185	3	104	5.2	0.060	<0.001	19.3	0.026	0.010
SW22 (Effluent-exposed)	27-Jan-16	7.35	0.7		91	380	200	7.4	4	265	7	190	13.0	0.084	<0.001	5.8	0.041	0.055
	29-Feb-16	7.22	1.4		96	405	219	7.4	4	260	9	210	19.6	0.130	<0.001	5.6	0.050	0.090
	23-Mar-16	7.59	20.0		85	202	97	7.6	8	145	11	99	5.6	0.014	0.1000	4.4	0.041	0.001
	18-Apr-16	7.38	6.8	80	70	267	136	7.8	5	170	5	123	4.2	0.032	<0.001	7.4	0.059	0.110
	18-May-16	7.85	14.0	6	84	293	158	7.9	4	180	2	142	4.0	<0.020	<0.001	2.5	0.062	<0.005
	22-Jun-16	7.32	17.0	4	145	235	145	7.8	1	185	3	122	4.2	0.018	<0.001	5.0	0.059	0.025
	15-Jul-16	6.18	21.0	5	147	240	131	7.7	1	180	2	123	3.8	0.044	<0.001	3.3	0.065	0.020
	16-Aug-16	6.77	22.0	1	97	343	177	7.7	3	250	2	172	11.4	0.056	<0.001	8.2	0.060	<0.005
	19-Sep-16	7.36	14.0	3		501	248		2			216		0.034	<0.001			0.355
	21-Sep-16	7.38	14.0	4	65	418	207	7.6	4	290	3	198	8.2	0.020	<0.001	9.5	0.076	0.150
	25-Jan-17	6.99	0.5	4	82	451	228	7.3	5	285	7	247	15.0	0.214	<0.001	12.2	0.055	0.310
	15-Feb-17	7.93	0.1	10	57	580	287	7.4	6	355	5	279	23.8	0.676	0.0050	16.9	0.060	0.745
	29-Mar-17	7.32	0.2	6	54	193	92	7.6	9	130	10	95	4.8	0.058	<0.001	4.0	0.032	0.145
	26-Apr-17	7.43	1.0	14	80	317	159	7.9	4	190	2	154	3.6	0.012	<0.001	11.1	0.061	0.160
	24-May-17	7.56	15.0	9	79	347	171	7.8	3	220	2	195	<0.2	0.026	<0.001	9.1	0.076	<0.005
	21-Jun-17	7.70	17.0	7	66	423	225	7.8	5	280	4	295	6.6	0.028	<0.001	13.7	0.077	<0.005
	18-Jul-17				82	397	215	7.8	2	280	2	233	7.8	0.062		12.1	<1.0	0.010
	16-Aug-17	7.27	19.0	2	67	493	260	7.5	6	320	5	272	8.0	0.146	0.0010	9.8	0.093	0.010
	26-Sep-17	7.21	13.0	2	95	480	221	7.9	2	330	2	163	5.0	0.042	<0.001	12.1	0.066	0.245
	30-Oct-17	7.58	2.0	5	55	480	244	7.9	2	315	2	215	4.4	0.028	<0.001	14.7	0.059	1.490
	20-Nov-17	7.27	0.7	5	80	409	197	7.6	3	265	3	170	5.4	0.010	<0.001	17.3	0.044	0.105

Table C.4: Surface Water Quality at SW20 (Pinewood River reference area) and SW22A (Pinewood River Effluent-exposed area), 2015 to 2017

Analytes		Nitrite (N)	Orthophosphate (P)	Sulphate	DOC	TOC	T. Aluminum (Al)	T. Antimony (Sb)	T. Arsenic (As)	T. Barium (Ba)	T. Beryllium (Be)	T. Bismuth (Bi)	T. Boron (B)	T. Cadmium (Cd)	T. Calcium (Ca)
Location	Sample Date	mg/L	mg/L		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW20 (Reference)	14-May-15	0.003	0.0030	5.92	22.9	26.0	0.25	0.00005	0.0006	0.0148	0.000010	0.000020	0.006	0.0000100	22.5
	09-Jun-15	0.001	0.0088	1.18	29.2	33.3	0.24	0.00005	0.0009	0.0159	0.000020	0.000020	0.015	0.0000150	20.4
	21-Jul-15	0.001	0.0222	0.56	37.6	35.8	0.18	0.00007	0.0017	0.0175	0.000020	0.000060	0.014	0.0000150	23.8
	25-Aug-15	0.001	0.0284	2.40	30.5	32.6	0.05	0.00007	0.0018	0.0127	0.000020	0.000040	0.016	0.0000050	38.6
	15-Sep-15	0.001	0.0056	1.46	32.0	32.1	0.03	0.00006	0.0013	0.0138	0.000020	0.000020	0.017	0.0000050	37.3
	27-Oct-15	0.001	0.0137	7.92	23.3	24.1	0.18	0.00005	0.0008	0.0145	0.000020	0.000220	0.018	0.0000050	38.6
	18-Nov-15	0.001	0.0128	11.70	22.9	22.7	0.30	0.00004	0.0008	0.0172	0.000020	0.000020	0.014	0.0000100	28.2
	17-Dec-15	0.001	0.0078	5.80	24.3	23.6	0.17	0.00005	0.0006	0.0132	0.000010	0.000020	0.007	0.0000050	23.4
	27-Jan-16	0.001	0.0199	6.82	28.8	28.5	0.28	0.00011	0.0010	0.0185	0.000020	0.000020	0.016	0.0000200	39.2
	29-Feb-16	0.002	0.0166	6.18	21.6	22.3	0.31	0.00007	0.0009	0.0200	0.000020	0.000020	0.015	0.0000150	36.0
	23-Mar-16	0.001	0.0043	6.64	24.0	22.3	0.32	0.00006	0.0005	0.0155	0.000020	0.000020	0.012	0.0000100	21.8
	18-Apr-16	0.004	0.0046	7.10	18.6	19.5	0.42	0.00006	0.0006	0.0166	0.000020	0.000020	0.012	0.0000150	21.9
	18-May-16	0.001	0.0059	5.90	22.3	25.9	0.07	0.00007	0.0008	0.0170	0.000010	0.000020	0.017	0.0000050	31.6
	25-Jan-17	0.002	0.0135	5.98	24.6	22.6	0.20	0.00008	0.0008	0.0180	0.000030	<0.00002	0.012	0.0000200	31.8
	15-Feb-17	<0.001	0.0183	8.04	22.4	24.6	0.25	0.00005	0.0008	0.0190	0.000020	<0.00002	0.014	0.0000150	42.9
	29-Mar-17	0.001	0.0053	4.62	15.1	16.1	0.54	0.00005	0.0005	0.0150	0.000020	<0.00002	0.010	0.0000150	17.1
	26-Apr-17	<0.001	<0.0030	8.24	22.0	21.9	0.31	0.00006	0.0005	0.0170	0.000030	<0.00002	0.010	0.0000100	26.8
	24-May-17	<0.001	0.0073	5.38	23.4	24.0	0.13	0.00006	0.0008	0.0176	0.000020	<0.000005	0.014	0.0000072	31.0
	21-Jun-17	0.011	0.0178	2.44	26.4	28.1	0.02	0.00006	0.0015	0.0170	0.000020	<0.00002	0.016	<0.000005	33.7
	18-Jul-17	<0.001	0.0188	2.32	28.2	28.2	0.02	0.00006	0.0016	0.0160	0.000010	<0.00002	0.016	0.0000050	36.0
	16-Aug-17	<0.001	0.0075	0.50	33.8	32.2	0.01	0.00006	0.0014	0.0160	<0.00001	<0.00002	0.018	<0.000005	40.0
	26-Sep-17	0.002	0.0135	14.60	23.6	27.5	0.07	0.00008	0.0011	0.0210	0.000010	<0.00002	0.025	<0.000005	43.5
	30-Oct-17	<0.001	0.0052	8.12	22.3	23.1	0.07	0.00005	0.0006	0.0140	<0.00001	<0.00002	0.012	0.0000050	26.7
	20-Nov-17	<0.001	0.0047	10.50	20.8	22.7	0.13	0.00006	0.0006	0.0170	0.000010	<0.00002	0.009	0.0000050	28.8
SW22 (Effluent-exposed)	27-Jan-16	0.001	0.0432	4.80	26.7	27.1	0.18	0.00020	0.0010	0.0230	0.000030	<0.00002	0.014	0.0000150	49.0
	29-Feb-16	0.001	0.0551	5.72	24.2	25.6	0.19	0.00014	0.0011	0.0230	0.000020	<0.00002	0.014	0.0000150	47.7
	23-Mar-16	5.660	0.0091		19.8	20.1	0.45	0.00008	0.0006	0.0180	0.000020	<0.00002	0.013	0.0000100	26.2
	18-Apr-16	0.013	0.0050	6.88	16.9	18.5	0.17	0.00021	0.0006	0.0200	0.000010	<0.00002	0.016	0.0000100	33.4
	18-May-16	<0.001	0.0095	2.84	21.9	23.8	0.05	0.00012	0.0010	0.0190	0.000010	<0.00002	0.017	0.0000200	41.3
	22-Jun-16	<0.001	0.0259	3.32	25.1	28.6	0.11	0.00006	0.0012	0.0200	0.000020	<0.00002	0.018	0.0000100	29.4
	15-Jul-16	0.001	0.0494	2.26	27.6	27.5	0.06	0.00009	0.0017	0.0180	0.000020	<0.00002	0.016	0.0000100	29.5
	16-Aug-16	<0.001	0.0343	2.52	29.6	30.9	0.02	0.00012	0.0021	0.0210	0.000010	<0.00002	0.021	<0.000005	42.0
	19-Sep-16						0.03		0.0011					<0.000005	58.5
	21-Sep-16	0.025	0.0101	13.90	22.4	23.0	0.09	0.00086	0.0011	0.0240	<0.00001	<0.00002	0.025	<0.000005	52.1
	25-Jan-17	0.006	0.0371	9.38	24.5	23.9	0.15	0.00060	0.0010	0.0250	0.000030	<0.00002	0.019	0.0000200	48.5
	15-Feb-17	0.023	0.0223	21.40	16.9	19.1	0.12	0.00268	0.0011	0.0310	<0.00001	0.000020	0.040	0.0000100	70.6
	29-Mar-17	0.007	0.0102	4.86	12.8	12.6	0.42	0.00019	0.0005	0.0170	0.000020	<0.00002	0.012	0.0000200	21.4
	26-Apr-17	0.003	<0.0030	11.20	19.3	19.3	0.10	0.00032	0.0007	0.0190	<0.00001	<0.00002	0.015	0.0000050	37.4
	24-May-17	<0.001	0.0140	8.08	19.7	22.1	0.05	0.00011	0.0010	0.0210	0.000010	<0.000005	0.016	0.0000036	41.4
	21-Jun-17	0.002	0.0139	14.10	18.9	21.6	0.08	0.00045	0.0014	0.0250	0.000010	<0.00002	0.025	<0.000005	47.8
	18-Jul-17	<0.001	0.0377	14.20	23.7	24.6	0.05	0.00012	0.0020	0.0210	<0.00001	<0.00002	0.019	<0.000005	49.2
	16-Aug-17	0.001	0.0523	2.50	26.8	28.8	0.13	0.00010	0.0030	0.0150	<0.00001	<0.00002	0.026	0.0000050	64.3
	26-Sep-17	0.026	0.0172	73.10	24.0	27.2	0.07	0.00031	0.0011	0.0290	<0.00001	<0.00002	0.020	0.0000100	50.7
	30-Oct-17	0.030	0.0067	36.40	19.4	19.2	0.06	0.00038	0.0008	0.0270	<0.00001	<0.00002	0.020	0.0000050	55.3
	20-Nov-17	0.001	0.0091	21.60	21.0	22.6	0.12	0.00010	0.0008	0.0250	<0.00001	<0.00002	0.014	0.0000050	46.0

Table C.4: Surface Water Quality at SW20 (Pinewood River reference area) and SW22A (Pinewood River Effluent-exposed area), 2015 to 2017

Analytes		T. Chromium (Cr)	T. Cobalt (Co)	T. Copper (Cu)	T. Iron (Fe)	T. Lead (Pb)	T. Lithium (Li)	T. Magnesium (Mg)	T. Manganese (Mn)	T. Mercury (Hg)	T. Molybdenum (Mo)	T. Nickel (Ni)	T. Potassium (K)	T. Selenium (Se)	T. Silver (Ag)	T. Sodium (Na)
Location	Sample Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW20 (Reference)	14-May-15	0.0005	0.00018	0.0008	0.35	0.00010	0.002	9.8	0.017	0.000002	0.00042	0.0015	1.23	0.00020	0.000010	7.64
	09-Jun-15	0.0007	0.00023	0.0009	0.48	0.00016	0.003	8.3	0.025	0.000002	0.00038	0.0016	0.88	0.00020	0.000010	4.74
	21-Jul-15	0.0006	0.00032	0.0014	0.79	0.00017	0.003	9.2	0.052	0.000004	0.00042	0.0019	0.97	0.00020	0.000010	5.14
	25-Aug-15	0.0004	0.00023	0.0004	0.79	0.00008	0.004	15.9	0.044	0.000002	0.00026	0.0020	1.44	0.00020	0.000010	7.46
	15-Sep-15	0.0003	0.00021	0.0004	0.42	0.00001	0.006	15.7	0.052	0.000002	0.00024	0.0017	1.40	0.00020	0.000010	8.76
	27-Oct-15	0.0004	0.00020	0.0007	0.53	0.00010	0.008	16.2	0.039	0.000002	0.00034	0.0014	2.09	0.00020	0.000010	10.00
	18-Nov-15	0.0006	0.00023	0.0011	0.56	0.00015	0.005	13.1	0.030	0.000002	0.00044	0.0014	2.14	0.00020	0.000010	10.10
	17-Dec-15	0.0004	0.00016	0.0006	0.47	0.00009	0.003	10.4	0.034	0.000002	0.00022	0.0010	1.23	0.00020	0.000010	5.16
	27-Jan-16	0.0006	0.00068	0.0008	1.57	0.00025	0.006	15.9	0.309	0.000002	0.00028	0.0016	1.76	0.00020	0.000010	6.00
	29-Feb-16	0.0007	0.00067	0.0012	1.35	0.00021	0.007	16.0	0.263	0.000002	0.00032	0.0014	1.91	0.00020	0.000010	6.12
	23-Mar-16	0.0006	0.00024	0.0012	0.46	0.00017	0.003	10.0	0.037	0.000004	0.00036	0.0012	1.85	0.00020	0.000010	6.08
	18-Apr-16	0.0008	0.00025	0.0012	0.48	0.00020	0.003	9.7	0.029	0.000004	0.00048	0.0014	1.60	0.00020	0.000010	5.70
	18-May-16	0.0003	0.00016	0.0009	0.29	0.00004	0.005	13.4	0.042	0.000002	0.00042	0.0014	1.37	0.00020	0.000010	8.64
	25-Jan-17	0.0011	0.00044	0.0010	0.88	0.00020	0.006	14.8	0.138	0.000004	0.00030	0.0015	1.70	<0.0002	<0.00001	6.36
	15-Feb-17	0.0007	0.00057	0.0009	1.19	0.00020	0.007	18.3	0.204	0.000002	0.00030	0.0017	1.91	<0.0002	<0.00001	8.28
	29-Mar-17	0.0008	0.00033	0.0010	0.55	0.00020	0.003	7.9	0.073	0.000002	0.00030	0.0011	2.17	<0.0002	<0.00001	4.74
	26-Apr-17	0.0006	0.00019	0.0020	0.41	0.00020	0.004	12.0	0.020	0.000002	0.00040	0.0014	1.49	<0.0002	<0.00001	8.90
	24-May-17	0.0004	0.00019	0.0009	0.37	0.00008	0.006	14.0	0.045	0.000004	0.00038	0.0015	1.21	0.00015	0.000001	9.87
	21-Jun-17	0.0003	0.00035	0.0005	0.54	0.00005	0.006	15.7	0.169	0.000002	0.00030	0.0016	1.01	<0.0002	<0.00001	13.10
	18-Jul-17	0.0003	0.00039	0.0004	0.45	0.00003	0.006	14.7	0.339	0.000004	0.00030	0.0017	0.85	0.00020	<0.00001	11.70
	16-Aug-17	0.0003	0.00031	0.0002	0.53	0.00002	0.006	17.0	0.147	0.000002	0.00010	0.0012	0.41	<0.0002	<0.00001	12.60
	26-Sep-17	0.0008	0.00021	0.0008	0.35	<0.00001	0.008	18.3	0.041	0.000004	0.00060	0.0017	2.45	<0.0002	<0.00001	19.00
	30-Oct-17	0.0003	0.00010	0.0006	0.21	0.00005	0.005	11.7	0.013	0.000002	0.00030	0.0010	1.70	<0.0002	<0.00001	8.74
	20-Nov-17	0.0006	0.00013	0.0007	0.34	0.00007	0.005	13.6	0.015	0.000004	0.00030	0.0011	1.27	<0.0002	<0.00001	8.52
SW22 (Effluent-exposed)	27-Jan-16	0.0005	0.00081	0.0009	1.31	0.00020	0.006	19.5	0.604	0.000002	0.00040	0.0016	1.78	<0.0002	<0.00001	4.84
	29-Feb-16	0.0005	0.00083	0.0009	1.58	0.00020	0.006	21.4	0.546	0.000002	0.00040	0.0018	1.82	<0.0002	<0.00001	5.74
	23-Mar-16	0.0008	0.00028	0.0015	0.62	0.00030	0.003	11.7	0.032	0.000004	0.00060	0.0014	2.03	<0.0002	<0.00001	3.28
	18-Apr-16	0.0005	0.00019	0.0011	0.29	0.00010	0.005	13.6	0.025	0.000004	0.00100	0.0012	1.95	<0.0002	<0.00001	4.20
	18-May-16	0.0003	0.00023	0.0009	0.29	0.00003	0.006	16.6	0.071	<0.000002	0.00070	0.0015	1.38	<0.0002	<0.00001	4.90
	22-Jun-16	0.0004	0.00022	0.0012	0.42	0.00008	0.003	13.4	0.040	<0.000002	0.00060	0.0017	1.28	0.00020	<0.00001	3.56
	15-Jul-16	0.0002	0.00023	0.0007	0.54	0.00005	0.004	14.1	0.064	0.000002	0.00060	0.0016	1.09	0.00020	<0.00001	3.22
	16-Aug-16	0.0002	0.00033	0.0004	0.37	0.00001	0.006	17.1	0.337	0.000004	0.00060	0.0015	1.20	0.00020	<0.00001	5.00
	19-Sep-16				0.20	0.00003		26.1		<0.000002	0.00260	0.0011		<0.0002		
	21-Sep-16	0.0002	0.00025	0.0004	0.28	0.00006	0.010	22.6	0.087	<0.000002	0.00160	0.0014	2.67	<0.0002	<0.00001	8.00
	25-Jan-17	0.0005	0.00056	0.0009	1.07	0.00020	0.009	21.9	0.312	0.000002	0.00090	0.0016	2.27	<0.0002	<0.00001	7.34
	15-Feb-17	0.0009	0.00045	0.0009	0.78	0.00010	0.015	29.7	0.295	<0.000002	0.00320	0.0024	3.83	<0.0002	<0.00001	12.60
	29-Mar-17	0.0008	0.00032	0.0013	0.55	0.00020	0.004	9.3	0.074	<0.000002	0.00070	0.0011	2.33	<0.0002	<0.00001	2.68
	26-Apr-17	0.0003	0.00015	0.0009	0.24	0.00006	0.008	16.4	0.022	0.000002	0.00120	0.0012	2.36	<0.0002	<0.00001	6.56
	24-May-17	0.0007	0.00021	0.0009	0.37	0.00004	0.007	18.3	0.072	<0.000002	0.00070	0.0016	1.64	0.00014	0.000001	5.87
	21-Jun-17	0.0003	0.00026	0.0007	0.29	0.00008	0.012	22.0	0.101	0.000002	0.00150	0.0015	2.01	<0.0002	<0.00001	8.58
	18-Jul-17	0.0002	0.00024	0.0003	0.24	0.00007	0.008	23.1	0.108	0.000004	0.00050	0.0014	1.52	0.00020	<0.00001	7.78
	16-Aug-17	0.0005	0.00046	0.0005	0.51	0.00010	0.010	28.1	0.947	0.000004	0.00120	0.0021	1.55	0.00020	<0.00001	8.98
	26-Sep-17	0.0003	0.00025	0.0010	0.27	<0.00001	0.009	23.0	0.034	0.000004	0.00170	0.0013	4.77	0.00040	<0.00001	9.72
	30-Oct-17	0.0004	0.00030	0.0010	0.24	0.00004	0.011	24.7	0.030	0.000002	0.00170	0.0012	4.07	<0.0002	<0.00001	10.40
	20-Nov-17	0.0004	0.00021	0.0010	0.31	0.00008	0.007	21.7	0.066	0.000002	0.00070	0.0015	2.67	<0.0002	<0.00001	8.62

Table C.4: Surface Water Quality at SW20 (Pinewood River reference area) and SW22A (Pinewood River Effluent-exposed area), 2015 to 2017

Analytes		T. Strontium (Sr)	T. Tellurium (Te)	T. Thallium (Tl)	T. Tin (Sn)	T. Titanium (Ti)	T. Tungsten (W)	T. Uranium (U)	T. Vanadium (V)	T. Zinc (Zn)	T. Zirconium (Zr)
Location	Sample Date	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
SW20 (Reference)	14-May-15	0.059	0.000010	0.0000020	0.000040	0.0066	0.000010	0.0005	0.00105	0.0015	0.00044
	09-Jun-15	0.053	0.000010	0.0000040	0.000060	0.0061	0.000010	0.0002	0.00120	0.0035	0.00050
	21-Jul-15	0.061	0.000020	0.0000060	0.000040	0.0051	0.000010	0.0002	0.00130	0.0040	0.00050
	25-Aug-15	0.097	0.000020	0.0000020	0.000080		0.000010	0.0003	0.00075	0.0020	0.00042
	15-Sep-15	0.102	0.000010	0.0000020	0.000040		0.000010	0.0003	0.00050	0.0025	0.00030
	27-Oct-15	0.104	0.000010	0.0000020	0.000040		0.000010	0.0006	0.00080	0.0030	0.00032
	18-Nov-15	0.071	0.000010	0.0000020	0.000100		0.000010	0.0006	0.00115	0.0030	0.00038
	17-Dec-15	0.057	0.000020	0.0000020	0.000020		0.000010	0.0003	0.00070	0.0015	0.00034
	27-Jan-16	0.100	0.000020	0.0000040	0.000040		0.000010	0.0005	0.00135	0.0025	0.00060
	29-Feb-16	0.100	0.000010	0.0000060	0.000020		0.000010	0.0007	0.00130	0.0040	0.00036
	23-Mar-16	0.052	0.000010	0.0000040	0.000120		0.000010	0.0005	0.00120	0.0035	0.00036
	18-Apr-16	0.055									
	18-May-16	0.077	0.000010	0.0000020	0.000040	0.0023	0.000010	0.0005	0.00065	0.0015	0.00032
	25-Jan-17	0.087	0.000060	0.0000100	0.000200	0.0067	0.000020	0.0008	0.00095	0.0480	0.00040
	15-Feb-17	0.105	0.000020	0.0000060	0.000200	0.0072	<0.00001	0.0009	0.00120	0.0055	0.00040
	29-Mar-17	0.043	0.000010	0.0000080	0.000040	0.0153	0.000020	0.0002	0.00160	0.0035	0.00050
	26-Apr-17	0.069	0.000030	0.0000060	0.000060	0.0108	0.000010	0.0009	0.00120	0.0030	0.00050
	24-May-17	0.084	0.000040	0.0000020	0.000020	0.0042	0.000004	0.0007	0.00092	0.0016	0.00036
	21-Jun-17	0.088	0.000030	<0.000002	0.000040	0.0009	<0.00001	0.0004	0.00050	0.0225	0.00020
	18-Jul-17	0.093	0.000020	<0.000002	0.000100	0.0009	<0.00001	0.0003	0.00040	0.0040	0.00030
	16-Aug-17	0.101	0.000030	<0.000002	0.000100	0.0005	<0.00001	0.0001	0.00030	0.0055	0.00010
	26-Sep-17	0.117	0.000020	<0.000002	0.001100	0.0022	<0.00001	0.0007	0.00070	0.0025	0.00030
	30-Oct-17	0.067	0.000010	<0.000002	0.000040	0.0023	<0.00001	0.0003	0.00050	0.0020	0.00020
	20-Nov-17	0.070	<0.00001	<0.000002	0.000040	0.0035	<0.00001	0.0004	0.00070	0.0085	0.00030
SW22 (Effluent-exposed)	27-Jan-16	0.111	0.000020	0.0000040	0.000020		<0.00001	0.0011	0.00120	0.0050	0.00040
	29-Feb-16	0.113	<0.00001	0.0000040	0.000020		<0.00001	0.0014	0.00110	0.0050	0.00050
	23-Mar-16	0.055	<0.00001	0.0000060	0.000300		<0.00001	0.0008	0.00170	0.0035	0.00040
	18-Apr-16	0.079	0.000020	0.0000040			0.000020	0.0012	0.00095	0.0015	0.00030
	18-May-16	0.093	0.000020	<0.000002	0.000040		0.000010	0.0010	0.00070	0.0010	0.00030
	22-Jun-16	0.066	<0.00001	0.0000060	0.000040		0.000010	0.0004	0.00110	0.0030	0.00030
	15-Jul-16	0.067	0.000100	0.0000060	<0.00002		0.000020	0.0003	0.00095	0.0015	0.00030
	16-Aug-16	0.117	0.000020	<0.000002	<0.00002		<0.00001	0.0004	0.00040	<0.0005	0.00020
	19-Sep-16									0.0005	
	21-Sep-16	0.138	0.000020	0.0000020	0.000100		<0.00001	0.0009	0.00070	0.0005	0.00020
	25-Jan-17	0.137	0.000020	0.0000080	0.000040	0.0053	0.000020	0.0018	0.00100	0.0075	0.00050
	15-Feb-17	0.242	0.000040	0.0000060	0.000040	0.0040	0.000180	0.0024	0.00080	0.0095	0.00040
	29-Mar-17	0.056	0.000030	0.0000080	0.000060	0.0120	0.000030	0.0006	0.00150	0.0040	0.00060
	26-Apr-17	0.111	0.000020	<0.000002	0.000020	0.0033	0.000020	0.0015	0.00060	0.0015	0.00030
	24-May-17	0.105	0.000030	0.0000020	0.000030	0.0020	0.000020	0.0011	0.00072	0.0016	0.00023
	21-Jun-17	0.142	0.000030	<0.000002	0.000060	0.0025	0.000020	0.0011	0.00090	0.0035	0.00020
	18-Jul-17	0.125	0.000020	0.0000040	0.000100	0.0020	0.000010	0.0005	0.00060	0.0025	0.00030
	16-Aug-17	0.142	0.000050	0.0000040	0.000100	0.0046	<0.00001	0.0005	0.00100	0.0040	0.00050
	26-Sep-17	0.131	0.000030	<0.000002	0.000080	0.0023	<0.00001	0.0009	0.00080	0.0030	0.00020
	30-Oct-17	0.162	0.000020	0.0000020	0.000020	0.0022	0.000030	0.0036	0.00060	0.0030	0.00030
	20-Nov-17	0.113	0.000010	0.0000040	<0.00002	0.0037	<0.00001	0.0017	0.00070	0.0150	0.00030

Table C.5: **Sediment Metal Concentrations in Sturgeon Creek and Pinewood River, RRP Phase 1 EEM, 2017**

Parameter	PSQG		Units	Sturgeon Creek						Pinewood River					
				StuC-REF-1	StuC-REF-2	StuC-REF-3	StuC-REF-4	StuC-REF-5	Mean	PinR-EXP-1	PinR-EXP-2	PinR-EXP-3	PinR-EXP-4	PinR-EXP-5	Mean
	LEL	SEL		14-Sep-17	14-Sep-17	15-Sep-17	15-Sep-17	15-Sep-17		14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	14-Sep-17	
Inorganics															
% Moisture	-	-	%	62.5	65.0	51.5	75.5	59.0	62.7	81.8	76.5	85.5	53.5	72.6	74.0
Total Kjeldahl Nitrogen	0.055	0.48	%	0.239	0.320	0.197	0.390	0.234	0.276	0.610	0.430	0.690	0.243	0.640	0.523
Total Organic Carbon	10,000	100,000	mg/kg	31,900	40,100	27,800	54,900	31,800	37,300	78,500	60,100	89,700	34,600	93,900	71,360
% Gravel	-	-	%	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
% Sand	-	-	%	27.3	11.9	30.9	6.8	22.3	19.8	8.3	16.0	2.4	30.8	10.7	13.6
% Silt	-	-	%	41.7	50.5	36.9	51.9	42.8	44.8	60.2	53.4	69.0	44.6	64.7	58.4
% Clay	-	-	%	31.0	37.6	32.2	41.3	34.8	35.4	31.5	30.5	28.6	24.6	24.6	28.0
Metals															
Aluminum	-	-	mg/kg	11,900	15,000	11,800	15,300	14,100	13,620	16,700	13,900	14,100	9,350	12,500	13,310
Antimony	-	-	mg/kg	<0.10	0.11	0.10	0.13	<0.10	0.11	0.14	0.19	0.16	0.11	0.15	0.15
Arsenic	-	-	mg/kg	2.47	2.87	2.13	3.34	2.32	2.63	4.36	3.75	4.83	2.23	2.85	3.60
Barium	-	-	mg/kg	71.4	98.6	68.4	106	90	87	129	120	111	61	93	103
Beryllium	-	-	mg/kg	0.45	0.56	0.51	0.62	0.53	0.53	0.62	0.65	0.56	0.44	0.52	0.56
Bismuth	-	-	mg/kg	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20
Boron	-	-	mg/kg	7.6	8.7	7.8	9.5	7.6	8.2	10.4	11.5	10.8	7.1	7.8	9.5
Cadmium	0.6	10	mg/kg	0.242	0.322	0.213	0.388	0.201	0.273	0.448	0.323	0.401	0.200	0.364	0.347
Calcium	-	-	mg/kg	6,330	7,330	6,670	7,960	6,470	6,952	13,700	20,200	18,500	11,600	10,200	14,840
Chromium	26	110	mg/kg	27.0	37.9	27.3	43.8	33.1	33.8	34.8	36.1	33.8	21.2	27.1	30.6
Cobalt	-	-	mg/kg	8.9	10.6	8.8	11.8	9.3	9.9	12.1	10.9	11.2	6.7	7.3	9.6
Copper	16	110	mg/kg	9.8	12.7	9.5	14.4	11.4	11.6	19.3	16.4	17.5	9.8	13.3	15.3
Iron	20,000	40,000	mg/kg	13,500	17,000	13,200	18,000	16,000	15,540	20,000	18,300	18,400	12,600	15,300	16,920
Lead	31	250	mg/kg	6.24	7.96	7.23	9.15	7.43	7.60	8.60	8.45	7.65	6.25	7.67	7.72
Lithium	-	-	mg/kg	14.0	19.1	14.7	18.8	16.4	16.6	18.2	16.3	17.7	12.2	13.8	15.6
Magnesium	-	-	mg/kg	4,880	5,670	4,660	6,000	5,260	5,294	7,950	10,100	10,400	6,770	4,830	8,010
Manganese	460	1,100	mg/kg	319	374	264	431	343	346	609	657	438	315	362	476
Mercury	0.2	2	mg/kg	0.039	0.051	0.041	0.061	0.048	0.048	0.063	0.051	0.059	0.049	0.054	0.055
Molybdenum	-	-	mg/kg	0.51	1.05	0.54	1.48	0.63	0.84	1.02	1.23	1.44	0.35	0.76	0.96
Nickel	16	75	mg/kg	16.9	23.4	16.5	26.8	19.8	20.7	24.8	25.2	25.0	14.9	18.8	21.7
Phosphorus	600	2,000	mg/kg	493	554	471	571	508	519	781	648	777	496	676	676
Potassium	-	-	mg/kg	1,440	1,780	1,380	1,960	1,610	1,634	1,790	1,600	1,760	1,040	1,280	1,494
Selenium	-	-	mg/kg	0.27	0.38	0.27	0.48	0.34	0.35	0.56	0.45	0.62	0.34	0.53	0.50
Silver	-	-	mg/kg	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Sodium	-	-	mg/kg	88	103	85	111	95	96	148	131	171	96	113	132
Strontium	-	-	mg/kg	23.4	26.0	23.7	30.5	23.2	25.4	32.0	36.2	37.6	21.7	31.5	31.8
Sulphur	-	-	mg/kg	<1000	1,100	<1000	1,400	<1000	1100	1,700	1,400	2,400	<1000	1,600	1620
Thallium	-	-	mg/kg	0.135	0.166	0.156	0.186	0.154	0.159	0.187	0.178	0.177	0.122	0.135	0.160
Tin	-	-	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
Titanium	-	-	mg/kg	155	152	162	148	145	152	118	149	138	137	98	128
Tungsten	-	-	mg/kg	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Uranium	-	-	mg/kg	1.4	1.8	1.6	2.2	1.6	1.7	1.9	1.5	2.1	1.1	2.1	1.7
Vanadium	-	-	mg/kg	32.4	40.2	31.8	44.1	36.6	37.0	42.9	39.8	40.5	25.0	34.0	36.4
Zinc	120	820	mg/kg	61	79	59	91	67	72	94	76	89	50	64	74
Zirconium	-	-	mg/kg	5.1	6.6	6.0	7.3	5.1	6.0	4.9	5.3	3.7	4.7	4.9	4.7

ndicates concentration was greater than the PSQG (Provincial Sediment Quality Guideline) Lowest Effect Level (LEL).
ndicates concentration was greater than the PSQG (Provincial Sediment Quality Guideline) Severe Effect Level (SEL).

Table C.6: Principal Components Analysis (PCA) of Sediment Metals at RRP Phase 1 EEM Benthic Stations, 2017

Water Chemistry Parameter	Sediment Chemistry PC-1 (69.7%)	Sediment Chemistry PC-2 (16.2%)	Sediment Chemistry PC-3 (6.2%)
Aluminum (log10 [ng/kg])	0.850	0.428	-0.126
Antimony (log10 [ng/kg])	0.752	-0.506	0.106
Arsenic (log10 [ng/kg])	0.933	-0.273	0.095
Barium (log10 [ng/kg])	0.972	0.030	-0.021
Beryllium (log10 [ng/kg])	0.905	0.230	0.091
Boron (log10 [ng/kg])	0.920	-0.082	0.351
Cadmium (log10 [ng/kg])	0.895	-0.133	-0.290
Calcium (log10 [ng/kg])	0.599	-0.697	0.352
Chromium (log10 [ng/kg])	0.806	0.566	0.023
Cobalt (log10 [ng/kg])	0.840	0.428	0.242
Copper (log10 [ng/kg])	0.965	-0.223	-0.003
Iron (log10 [ng/kg])	0.977	0.089	0.010
Lead (log10 [ng/kg])	0.864	0.306	-0.150
Lithium (log10 [ng/kg])	0.810	0.527	0.016
Magnesium (log10 [ng/kg])	0.671	-0.458	0.550
Manganese (log10 [ng/kg])	0.851	-0.182	0.261
Mercury (log10 [ng/kg])	0.812	-0.185	-0.293
Molybdenum (log10 [ng/kg])	0.947	0.176	-0.010
Nickel (log10 [ng/kg])	0.961	0.225	0.059
Phosphorus (log10 [ng/kg])	0.846	-0.477	-0.160
Potassium (log10 [ng/kg])	0.799	0.552	0.034
Selenium (log10 [ng/kg])	0.851	-0.411	-0.277
Sodium (log10 [ng/kg])	0.867	-0.455	0.070
Strontium (log10 [ng/kg])	0.893	-0.323	0.007
Sulphur (log10 [ng/kg])	0.805	-0.472	-0.166
Thallium (log10 [ng/kg])	0.881	0.368	0.186
Titanium (log10 [ng/kg])	-0.227	0.604	0.702
Uranium (log10 [ng/kg])	0.745	0.183	-0.558
Vanadium (log10 [ng/kg])	0.905	0.391	-0.063
Zinc (log10 [ng/kg])	0.947	0.245	-0.041
Zirconium (log10 [ng/kg])	-0.045	0.825	-0.131

Note: Shading Indicates Heavy Positive or Negative Weighting.

WATER AND SEDIMENT QUALITY DATA

Laboratory Reports

MINNOW ENVIRONMENTAL INC.
ATTN: Jess Tester
2 Lamb Street
Georgetown ON L7G 3M9

Date Received: 26-APR-17
Report Date: 15-MAY-17 10:26 (MT)
Version: FINAL

Client Phone: 905-873-3371

Certificate of Analysis

Lab Work Order #: L1917630

Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers:
Legal Site Desc:

<Original signed by>

Christine Paradis
Project Manager

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ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1917630-1 TRIP BLANK Sampled By: KB, KM on 24-APR-17 @ 00:01 Matrix: Water							
Physical Tests							
Hardness (as CaCO3)	<0.50		0.50	mg/L		29-APR-17	
Total Suspended Solids	<2.0		2.0	mg/L		27-APR-17	R3710052
Total Dissolved Solids	<10		10	mg/L		28-APR-17	R3710285
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		28-APR-17	R3710141
Ammonia, Total (as N)	<0.020		0.020	mg/L		28-APR-17	R3709907
Chloride (Cl)	<0.10		0.10	mg/L		27-APR-17	R3709534
Fluoride (F)	<0.020		0.020	mg/L		27-APR-17	R3709534
Nitrate and Nitrite as N	<0.040		0.040	mg/L		03-MAY-17	
Nitrate (as N)	<0.020		0.020	mg/L		27-APR-17	R3709534
Nitrite (as N)	<0.010		0.010	mg/L		27-APR-17	R3709534
Phosphorus (P)-Total	<0.0030		0.0030	mg/L	27-APR-17	28-APR-17	R3709801
Sulfate (SO4)	<0.30		0.30	mg/L		27-APR-17	R3709534
Cyanides							
Cyanide, Weak Acid Diss	<0.0020		0.0020	mg/L		27-APR-17	R3709375
Cyanide, Total	<0.0020		0.0020	mg/L		27-APR-17	R3709375
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-APR-17	R3709199
Dissolved Organic Carbon	<1.0		1.0	mg/L	27-APR-17	27-APR-17	R3709687
Total Organic Carbon	<1.0		1.0	mg/L		27-APR-17	R3709678
Total Metals							
Aluminum (Al)-Total	<0.0030		0.0030	mg/L	27-APR-17	28-APR-17	R3710164
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Arsenic (As)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Barium (Ba)-Total	<0.000050		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Boron (B)-Total	<0.010		0.010	mg/L	27-APR-17	28-APR-17	R3710164
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	27-APR-17	28-APR-17	R3710164
Calcium (Ca)-Total	<0.050		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Chromium (Cr)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Copper (Cu)-Total	<0.00050		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Iron (Fe)-Total	<0.010		0.010	mg/L	27-APR-17	28-APR-17	R3710164
Lead (Pb)-Total	<0.000050		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Lithium (Li)-Total	<0.0010		0.0010	mg/L	27-APR-17	28-APR-17	R3710164
Magnesium (Mg)-Total	<0.0050		0.0050	mg/L	27-APR-17	28-APR-17	R3710164
Manganese (Mn)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-APR-17	R3709180
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	27-APR-17	28-APR-17	R3710164

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1917630-1 TRIP BLANK Sampled By: KB, KM on 24-APR-17 @ 00:01 Matrix: Water							
Total Metals							
Phosphorus (P)-Total	<0.050		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Potassium (K)-Total	<0.050		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Selenium (Se)-Total	<0.000050		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Silicon (Si)-Total	<0.10		0.10	mg/L	27-APR-17	28-APR-17	R3710164
Silver (Ag)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Sodium (Na)-Total	<0.050		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Strontium (Sr)-Total	<0.00020		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Sulfur (S)-Total	<0.50		0.50	mg/L	27-APR-17	28-APR-17	R3710164
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Thorium (Th)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Tin (Sn)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	27-APR-17	28-APR-17	R3710164
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Uranium (U)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Vanadium (V)-Total	<0.00050		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	27-APR-17	28-APR-17	R3710164
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	27-APR-17	28-APR-17	R3710164
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					27-APR-17	R3709282
Calcium (Ca)-Dissolved	<0.050		0.050	mg/L	27-APR-17	28-APR-17	R3710183
Magnesium (Mg)-Dissolved	<0.0050		0.0050	mg/L	27-APR-17	28-APR-17	R3710183
Radiological Parameters							
Ra-226	<0.010		0.010	Bq/L		10-MAY-17	R3719745
L1917630-2 PINR-EXP Sampled By: KB, KM on 24-APR-17 @ 13:00 Matrix: Water							
Physical Tests							
Hardness (as CaCO3)	191		0.50	mg/L		29-APR-17	
Total Suspended Solids	<2.0		2.0	mg/L		27-APR-17	R3710052
Total Dissolved Solids	236		20	mg/L		28-APR-17	R3710285
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	190		2.0	mg/L		28-APR-17	R3710141
Ammonia, Total (as N)	0.077		0.020	mg/L		27-APR-17	R3709259
Chloride (Cl)	10.9		0.10	mg/L		27-APR-17	R3709534
Fluoride (F)	0.070		0.020	mg/L		27-APR-17	R3709534
Nitrate and Nitrite as N	0.913		0.040	mg/L		03-MAY-17	
Nitrate (as N)	0.890		0.020	mg/L		27-APR-17	R3709534
Nitrite (as N)	0.023		0.010	mg/L		27-APR-17	R3709534
Phosphorus (P)-Total	0.0185		0.0030	mg/L	27-APR-17	28-APR-17	R3709801
Sulfate (SO4)	16.8		0.30	mg/L		27-APR-17	R3709534

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1917630-2 PINR-EXP Sampled By: KB, KM on 24-APR-17 @ 13:00 Matrix: Water							
Anions and Nutrients							
Cyanides							
Cyanide, Weak Acid Diss	<0.0020		0.0020	mg/L		27-APR-17	R3709375
Cyanide, Total	<0.0020		0.0020	mg/L		27-APR-17	R3709375
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-APR-17	R3709199
Dissolved Organic Carbon	16.6		1.0	mg/L	27-APR-17	27-APR-17	R3709687
Total Organic Carbon	16.7		1.0	mg/L		27-APR-17	R3709678
Total Metals							
Aluminum (Al)-Total	0.0624		0.0030	mg/L	27-APR-17	28-APR-17	R3710164
Antimony (Sb)-Total	0.00121		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Arsenic (As)-Total	0.00076		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Barium (Ba)-Total	0.0223		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Boron (B)-Total	0.026		0.010	mg/L	27-APR-17	28-APR-17	R3710164
Cadmium (Cd)-Total	0.0000056		0.0000050	mg/L	27-APR-17	28-APR-17	R3710164
Calcium (Ca)-Total	42.0		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Cesium (Cs)-Total	0.000013		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Chromium (Cr)-Total	0.00023		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Cobalt (Co)-Total	0.00015		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Copper (Cu)-Total	0.00095		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Iron (Fe)-Total	0.196		0.010	mg/L	27-APR-17	28-APR-17	R3710164
Lead (Pb)-Total	0.000059		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Lithium (Li)-Total	0.0097		0.0010	mg/L	27-APR-17	28-APR-17	R3710164
Magnesium (Mg)-Total	18.5		0.0050	mg/L	27-APR-17	28-APR-17	R3710164
Manganese (Mn)-Total	0.0284		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-APR-17	R3709180
Molybdenum (Mo)-Total	0.00263		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Nickel (Ni)-Total	0.00117		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Phosphorus (P)-Total	<0.050		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Potassium (K)-Total	3.08		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Rubidium (Rb)-Total	0.00190		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Selenium (Se)-Total	0.000170		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Silicon (Si)-Total	1.40		0.10	mg/L	27-APR-17	28-APR-17	R3710164
Silver (Ag)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Sodium (Na)-Total	8.92		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Strontium (Sr)-Total	0.158		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Sulfur (S)-Total	6.06		0.50	mg/L	27-APR-17	28-APR-17	R3710164
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Thorium (Th)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Tin (Sn)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1917630-2 PINR-EXP Sampled By: KB, KM on 24-APR-17 @ 13:00 Matrix: Water							
Total Metals							
Titanium (Ti)-Total	0.00217		0.00030	mg/L	27-APR-17	28-APR-17	R3710164
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Uranium (U)-Total	0.00184		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Vanadium (V)-Total	0.00079		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	27-APR-17	28-APR-17	R3710164
Zirconium (Zr)-Total	0.000240		0.000060	mg/L	27-APR-17	28-APR-17	R3710164
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					27-APR-17	R3709282
Calcium (Ca)-Dissolved	43.5		0.050	mg/L	27-APR-17	28-APR-17	R3710183
Magnesium (Mg)-Dissolved	19.9		0.0050	mg/L	27-APR-17	28-APR-17	R3710183
Radiological Parameters							
Ra-226	<0.010		0.010	Bq/L		10-MAY-17	R3719745
L1917630-3 PINR-DUP Sampled By: KB, KM on 24-APR-17 @ 13:00 Matrix: Water							
Physical Tests							
Hardness (as CaCO3)	182		0.50	mg/L		29-APR-17	
Total Suspended Solids	2.3		2.0	mg/L		27-APR-17	R3710052
Total Dissolved Solids	163		20	mg/L		28-APR-17	R3710285
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	187		2.0	mg/L		28-APR-17	R3710141
Ammonia, Total (as N)	0.078		0.020	mg/L		27-APR-17	R3709259
Chloride (Cl)	10.7		0.10	mg/L		27-APR-17	R3709534
Fluoride (F)	0.067		0.020	mg/L		27-APR-17	R3709534
Nitrate and Nitrite as N	0.899		0.040	mg/L		03-MAY-17	
Nitrate (as N)	0.876		0.020	mg/L		27-APR-17	R3709534
Nitrite (as N)	0.023		0.010	mg/L		27-APR-17	R3709534
Phosphorus (P)-Total	0.0163		0.0030	mg/L	27-APR-17	28-APR-17	R3709801
Sulfate (SO4)	16.5		0.30	mg/L		27-APR-17	R3709534
Cyanides							
Cyanide, Weak Acid Diss	<0.0020		0.0020	mg/L		27-APR-17	R3709375
Cyanide, Total	<0.0020		0.0020	mg/L		27-APR-17	R3709375
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-APR-17	R3709199
Dissolved Organic Carbon	16.3		1.0	mg/L	27-APR-17	27-APR-17	R3709687
Total Organic Carbon	17.0		1.0	mg/L		27-APR-17	R3709678
Total Metals							
Aluminum (Al)-Total	0.0625		0.0030	mg/L	27-APR-17	28-APR-17	R3710164
Antimony (Sb)-Total	0.00126		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Arsenic (As)-Total	0.00080		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Barium (Ba)-Total	0.0229		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1917630-3 PINR-DUP Sampled By: KB, KM on 24-APR-17 @ 13:00 Matrix: Water							
Total Metals							
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Boron (B)-Total	0.027		0.010	mg/L	27-APR-17	28-APR-17	R3710164
Cadmium (Cd)-Total	0.0000071		0.0000050	mg/L	27-APR-17	28-APR-17	R3710164
Calcium (Ca)-Total	42.7		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Cesium (Cs)-Total	0.000013		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Chromium (Cr)-Total	0.00024		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Cobalt (Co)-Total	0.00015		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Copper (Cu)-Total	0.00098		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Iron (Fe)-Total	0.201		0.010	mg/L	27-APR-17	28-APR-17	R3710164
Lead (Pb)-Total	0.000052		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Lithium (Li)-Total	0.0101		0.0010	mg/L	27-APR-17	28-APR-17	R3710164
Magnesium (Mg)-Total	19.7		0.0050	mg/L	27-APR-17	28-APR-17	R3710164
Manganese (Mn)-Total	0.0288		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-APR-17	R3709180
Molybdenum (Mo)-Total	0.00263		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Nickel (Ni)-Total	0.00122		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Phosphorus (P)-Total	<0.050		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Potassium (K)-Total	3.13		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Rubidium (Rb)-Total	0.00195		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Selenium (Se)-Total	0.000183		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Silicon (Si)-Total	1.43		0.10	mg/L	27-APR-17	28-APR-17	R3710164
Silver (Ag)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Sodium (Na)-Total	9.15		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Strontium (Sr)-Total	0.155		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Sulfur (S)-Total	5.75		0.50	mg/L	27-APR-17	28-APR-17	R3710164
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Thorium (Th)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Tin (Sn)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Titanium (Ti)-Total	0.00260		0.00030	mg/L	27-APR-17	28-APR-17	R3710164
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Uranium (U)-Total	0.00187		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Vanadium (V)-Total	0.00078		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	27-APR-17	28-APR-17	R3710164
Zirconium (Zr)-Total	0.000243		0.000060	mg/L	27-APR-17	28-APR-17	R3710164
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					27-APR-17	R3709282
Calcium (Ca)-Dissolved	41.6		0.050	mg/L	27-APR-17	28-APR-17	R3710183
Magnesium (Mg)-Dissolved	19.1		0.0050	mg/L	27-APR-17	28-APR-17	R3710183
Radiological Parameters							
Ra-226	<0.010		0.010	Bq/L		10-MAY-17	R3719745

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1917630-4 STUC-REF Sampled By: KB, KM on 24-APR-17 @ 14:40 Matrix: Water							
Physical Tests							
Hardness (as CaCO3)	98.1		0.50	mg/L		29-APR-17	
Total Suspended Solids	9.4		2.0	mg/L		27-APR-17	R3710052
Total Dissolved Solids	225		13	mg/L		28-APR-17	R3710285
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	83.1		2.0	mg/L		28-APR-17	R3710141
Ammonia, Total (as N)	<0.020		0.020	mg/L		27-APR-17	R3709259
Chloride (Cl)	6.19		0.10	mg/L		27-APR-17	R3709534
Fluoride (F)	0.041		0.020	mg/L		27-APR-17	R3709534
Nitrate and Nitrite as N	<0.040		0.040	mg/L		03-MAY-17	
Nitrate (as N)	<0.020		0.020	mg/L		27-APR-17	R3709534
Nitrite (as N)	<0.010		0.010	mg/L		27-APR-17	R3709534
Phosphorus (P)-Total	0.0402		0.0030	mg/L	27-APR-17	28-APR-17	R3709801
Sulfate (SO4)	9.38		0.30	mg/L		27-APR-17	R3709534
Cyanides							
Cyanide, Weak Acid Diss	<0.0020		0.0020	mg/L		27-APR-17	R3709375
Cyanide, Total	<0.0020		0.0020	mg/L		27-APR-17	R3709375
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					27-APR-17	R3709199
Dissolved Organic Carbon	28.3		1.0	mg/L	27-APR-17	27-APR-17	R3709687
Total Organic Carbon	28.8		1.0	mg/L		27-APR-17	R3709678
Total Metals							
Aluminum (Al)-Total	0.552		0.0030	mg/L	27-APR-17	28-APR-17	R3710164
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Arsenic (As)-Total	0.00086		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Barium (Ba)-Total	0.0171		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Boron (B)-Total	0.011		0.010	mg/L	27-APR-17	28-APR-17	R3710164
Cadmium (Cd)-Total	0.0000152		0.0000050	mg/L	27-APR-17	28-APR-17	R3710164
Calcium (Ca)-Total	22.7		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Cesium (Cs)-Total	0.000075		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Chromium (Cr)-Total	0.00124		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Cobalt (Co)-Total	0.00044		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Copper (Cu)-Total	0.00185		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Iron (Fe)-Total	0.829		0.010	mg/L	27-APR-17	28-APR-17	R3710164
Lead (Pb)-Total	0.000367		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Lithium (Li)-Total	0.0043		0.0010	mg/L	27-APR-17	28-APR-17	R3710164
Magnesium (Mg)-Total	10.7		0.0050	mg/L	27-APR-17	28-APR-17	R3710164
Manganese (Mn)-Total	0.0502		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		27-APR-17	R3709180
Molybdenum (Mo)-Total	0.000414		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Nickel (Ni)-Total	0.00207		0.00050	mg/L	27-APR-17	28-APR-17	R3710164

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1917630-4 STUC-REF Sampled By: KB, KM on 24-APR-17 @ 14:40 Matrix: Water							
Total Metals							
Phosphorus (P)-Total	0.051		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Potassium (K)-Total	1.83		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Rubidium (Rb)-Total	0.00224		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Selenium (Se)-Total	0.000185		0.000050	mg/L	27-APR-17	28-APR-17	R3710164
Silicon (Si)-Total	2.98		0.10	mg/L	27-APR-17	28-APR-17	R3710164
Silver (Ag)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Sodium (Na)-Total	4.00		0.050	mg/L	27-APR-17	28-APR-17	R3710164
Strontium (Sr)-Total	0.0580		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Sulfur (S)-Total	3.38		0.50	mg/L	27-APR-17	28-APR-17	R3710164
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	27-APR-17	28-APR-17	R3710164
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Thorium (Th)-Total	0.00011		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Tin (Sn)-Total	0.00011		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Titanium (Ti)-Total	0.0162		0.00030	mg/L	27-APR-17	28-APR-17	R3710164
Tungsten (W)-Total	<0.00010		0.00010	mg/L	27-APR-17	28-APR-17	R3710164
Uranium (U)-Total	0.000887		0.000010	mg/L	27-APR-17	28-APR-17	R3710164
Vanadium (V)-Total	0.00225		0.00050	mg/L	27-APR-17	28-APR-17	R3710164
Zinc (Zn)-Total	0.0086		0.0030	mg/L	27-APR-17	28-APR-17	R3710164
Zirconium (Zr)-Total	0.000648		0.000060	mg/L	27-APR-17	28-APR-17	R3710164
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					27-APR-17	R3709282
Calcium (Ca)-Dissolved	22.0		0.050	mg/L	27-APR-17	28-APR-17	R3710183
Magnesium (Mg)-Dissolved	10.5		0.0050	mg/L	27-APR-17	28-APR-17	R3710183
Radiological Parameters							
Ra-226	<0.010		0.010	Bq/L		10-MAY-17	R3719745

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Matrix Spike	Dissolved Organic Carbon	MS-B	L1917630-1, -2, -3, -4
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1917630-1, -2, -3, -4
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1917630-1, -2, -3, -4
Matrix Spike	Total Organic Carbon	MS-B	L1917630-1, -2, -3, -4

Sample Parameter Qualifier key listed:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TITR-TB	Water	Alkalinity	APHA 2320B modified

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

CL-L-IC-N-TB	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CN-T-CFA-TB	Water	Total Cyanide by CFA	ISO 14403-2:2012 (modified)

This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis.
Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero.

CN-WAD-CFA-TB	Water	Weak Acid Dissociable Cyanide by CFA	APHA 4500-CN CYANIDE (modified)

This analysis is carried out using procedures adapted from APHA Method 4500-CN I. "Weak Acid Dissociable Cyanide". Weak Acid Dissociable (WAD) cyanide is determined by in-line sample distillation with final determination by colourimetric analysis.

DOC-TB	Water	Dissolved Organic Carbon	APHA 5310 B modified

Water samples are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis. Analyzed by converting all carbonaceous material to carbon dioxide (CO2) by catalytic combustion at 850?C. The CO2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

ETL-N2N3-TB	Water	Calculate from NO2 + NO3	Calculation
F-IC-N-TB	Water	Fluoride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-TB	Water	Hardness (as CaCO3)	CALCULATION
HG-T-CVAF-TB	Water	Total Mercury in Water by CVAFS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAFS.

MET-D-CCMS-TB	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-TB	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

NH3-COL-TB	Water	Ammonia by Discrete Analyzer	APHA 4500-NH3 G. (modified)

Ammonia in aqueous matrices is analyzed using discrete analyzer with colourimetric detection.

NO2-IC-N-TB	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-TB	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-TB	Water	Total Phosphorus by Discrete Analyzer	APHA 4500-P B, F, G (modified)

Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

SO4-IC-N-TB	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

Reference Information

TDS-TB	Water	Total Dissolved Solids	APHA 2540 C (modified)

Aqueous matrices are analyzed using gravimetry and evaporation

TOC-TB	Water	Total Organic Carbon (TOC)	APHA 5310 B modified

Water samples are analyzed by converting all carbonaceous material to carbon dioxide (CO2) by catalytic combustion at 850?C. The CO2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

TSS-TB	Water	Total Suspended Solids	APHA 2540 D (modified)

Aqueous matrices are analyzed using gravimetry

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-TB	**Water**							
Batch R3710141								
WG2518890-2 LCS								
Alkalinity, Total (as CaCO3)			104.5		%		85-115	28-APR-17
WG2518890-1 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	28-APR-17
CL-L-IC-N-TB	**Water**							
Batch R3709534								
WG2517980-3 DUP		**L1917630-2**						
Chloride (Cl)		10.9	10.8		mg/L	1.4	20	27-APR-17
WG2517980-2 LCS								
Chloride (Cl)			103.2		%		90-110	27-APR-17
WG2517980-1 MB								
Chloride (Cl)			<0.10		mg/L		0.1	27-APR-17
WG2517980-4 MS		**L1917630-2**						
Chloride (Cl)			94.8		%		75-125	27-APR-17
CN-T-CFA-TB	**Water**							
Batch R3709375								
WG2518143-3 DUP		**L1917630-2**						
Cyanide, Total		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	27-APR-17
WG2518143-2 LCS								
Cyanide, Total			89.8		%		80-120	27-APR-17
WG2518143-1 MB								
Cyanide, Total			<0.0020		mg/L		0.002	27-APR-17
WG2518143-4 MS		**L1917630-2**						
Cyanide, Total			88.4		%		75-125	27-APR-17
CN-WAD-CFA-TB	**Water**							
Batch R3709375								
WG2518143-3 DUP		**L1917630-2**						
Cyanide, Weak Acid Diss		<0.0020	<0.0020	RPD-NA	mg/L	N/A	20	27-APR-17
WG2518143-2 LCS								
Cyanide, Weak Acid Diss			108.3		%		80-120	27-APR-17
WG2518143-1 MB								
Cyanide, Weak Acid Diss			<0.0020		mg/L		0.002	27-APR-17
WG2518143-4 MS		**L1917630-2**						
Cyanide, Weak Acid Diss			104.4		%		75-125	27-APR-17
DOC-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
DOC-TB	**Water**							
Batch R3709687								
WG2518230-3 DUP		**L1917630-4**						
Dissolved Organic Carbon		28.3	28.4		mg/L	0.6	20	27-APR-17
WG2518230-2 LCS								
Dissolved Organic Carbon			103.0		%		80-120	27-APR-17
WG2518230-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	27-APR-17
WG2518230-4 MS		**L1917630-4**						
Dissolved Organic Carbon			N/A	MS-B	%		-	27-APR-17
F-IC-N-TB	**Water**							
Batch R3709534								
WG2517980-3 DUP		**L1917630-2**						
Fluoride (F)		0.070	0.068		mg/L	2.9	20	27-APR-17
WG2517980-2 LCS								
Fluoride (F)			102.1		%		90-110	27-APR-17
WG2517980-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	27-APR-17
WG2517980-4 MS		**L1917630-2**						
Fluoride (F)			86.4		%		75-125	27-APR-17
HG-T-CVAF-TB	**Water**							
Batch R3709180								
WG2518150-3 DUP		**L1917630-1**						
Mercury (Hg)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	27-APR-17
WG2518150-2 LCS								
Mercury (Hg)-Total			95.5		%		80-120	27-APR-17
WG2518150-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	27-APR-17
WG2518150-4 MS		**L1917630-2**						
Mercury (Hg)-Total			93.8		%		70-130	27-APR-17
MET-D-CCMS-TB	**Water**							
Batch R3710183								
WG2518212-3 DUP		**L1917630-2**						
Calcium (Ca)-Dissolved		43.5	43.5		mg/L	0.1	20	28-APR-17
Magnesium (Mg)-Dissolved		19.9	20.3		mg/L	1.8	20	28-APR-17
WG2518212-2 LCS								
Calcium (Ca)-Dissolved			104.7		%		80-120	28-APR-17
Magnesium (Mg)-Dissolved			109.6		%		80-120	28-APR-17
WG2518212-1 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	28-APR-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-D-CCMS-TB	**Water**							
Batch R3710183								
WG2518212-1 MB								
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	28-APR-17
WG2518212-4 MS		**L1917630-2**						
Calcium (Ca)-Dissolved			N/A	MS-B	%		-	28-APR-17
Magnesium (Mg)-Dissolved			N/A	MS-B	%		-	28-APR-17
MET-T-CCMS-TB	**Water**							
Batch R3710164								
WG2518004-2 LCS								
Aluminum (Al)-Total			103.8		%		80-120	28-APR-17
Antimony (Sb)-Total			101.7		%		80-120	28-APR-17
Arsenic (As)-Total			99.4		%		80-120	28-APR-17
Barium (Ba)-Total			93.9		%		80-120	28-APR-17
Beryllium (Be)-Total			105.0		%		80-120	28-APR-17
Bismuth (Bi)-Total			100.6		%		80-120	28-APR-17
Boron (B)-Total			104.0		%		80-120	28-APR-17
Cadmium (Cd)-Total			97.1		%		80-120	28-APR-17
Calcium (Ca)-Total			99.9		%		80-120	28-APR-17
Cesium (Cs)-Total			102.5		%		80-120	28-APR-17
Chromium (Cr)-Total			99.2		%		80-120	28-APR-17
Cobalt (Co)-Total			100.3		%		80-120	28-APR-17
Copper (Cu)-Total			98.9		%		80-120	28-APR-17
Iron (Fe)-Total			104.2		%		80-120	28-APR-17
Lead (Pb)-Total			102.2		%		80-120	28-APR-17
Lithium (Li)-Total			105.8		%		80-120	28-APR-17
Magnesium (Mg)-Total			104.6		%		80-120	28-APR-17
Manganese (Mn)-Total			99.8		%		80-120	28-APR-17
Molybdenum (Mo)-Total			93.8		%		80-120	28-APR-17
Nickel (Ni)-Total			99.4		%		80-120	28-APR-17
Phosphorus (P)-Total			106.2		%		70-130	28-APR-17
Potassium (K)-Total			109.2		%		80-120	28-APR-17
Rubidium (Rb)-Total			98.8		%		80-120	28-APR-17
Selenium (Se)-Total			94.9		%		80-120	28-APR-17
Silicon (Si)-Total			111.5		%		60-140	28-APR-17
Silver (Ag)-Total			103.0		%		80-120	28-APR-17
Sodium (Na)-Total			107.6		%		80-120	28-APR-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R3710164								
WG2518004-2 LCS								
Strontium (Sr)-Total			97.6		%		80-120	28-APR-17
Sulfur (S)-Total			102.8		%		80-120	28-APR-17
Tellurium (Te)-Total			91.7		%		80-120	28-APR-17
Thallium (Tl)-Total			100.3		%		80-120	28-APR-17
Thorium (Th)-Total			104.1		%		80-120	28-APR-17
Tin (Sn)-Total			95.9		%		80-120	28-APR-17
Titanium (Ti)-Total			100.9		%		80-120	28-APR-17
Tungsten (W)-Total			101.7		%		80-120	28-APR-17
Uranium (U)-Total			107.8		%		80-120	28-APR-17
Vanadium (V)-Total			101.1		%		80-120	28-APR-17
Zinc (Zn)-Total			92.9		%		80-120	28-APR-17
Zirconium (Zr)-Total			93.5		%		80-120	28-APR-17
WG2518004-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	28-APR-17
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	28-APR-17
Arsenic (As)-Total			<0.00010		mg/L		0.0001	28-APR-17
Barium (Ba)-Total			<0.000050		mg/L		0.00005	28-APR-17
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	28-APR-17
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	28-APR-17
Boron (B)-Total			<0.010		mg/L		0.01	28-APR-17
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	28-APR-17
Calcium (Ca)-Total			<0.050		mg/L		0.05	28-APR-17
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	28-APR-17
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	28-APR-17
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	28-APR-17
Copper (Cu)-Total			<0.00050		mg/L		0.0005	28-APR-17
Iron (Fe)-Total			<0.010		mg/L		0.01	28-APR-17
Lead (Pb)-Total			<0.000050		mg/L		0.00005	28-APR-17
Lithium (Li)-Total			<0.0010		mg/L		0.001	28-APR-17
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	28-APR-17
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	28-APR-17
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	28-APR-17
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	28-APR-17
Phosphorus (P)-Total			<0.050		mg/L		0.05	28-APR-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R3710164								
WG2518004-1 MB								
Potassium (K)-Total			<0.050		mg/L		0.05	28-APR-17
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	28-APR-17
Selenium (Se)-Total			<0.000050		mg/L		0.00005	28-APR-17
Silicon (Si)-Total			<0.10		mg/L		0.1	28-APR-17
Silver (Ag)-Total			<0.000010		mg/L		0.00001	28-APR-17
Sodium (Na)-Total			<0.050		mg/L		0.05	28-APR-17
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	28-APR-17
Sulfur (S)-Total			<0.50		mg/L		0.5	28-APR-17
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	28-APR-17
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	28-APR-17
Thorium (Th)-Total			<0.00010		mg/L		0.0001	28-APR-17
Tin (Sn)-Total			<0.00010		mg/L		0.0001	28-APR-17
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	28-APR-17
Tungsten (W)-Total			<0.00010		mg/L		0.0001	28-APR-17
Uranium (U)-Total			<0.000010		mg/L		0.00001	28-APR-17
Vanadium (V)-Total			<0.00050		mg/L		0.0005	28-APR-17
Zinc (Zn)-Total			<0.0030		mg/L		0.003	28-APR-17
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	28-APR-17
NH3-COL-TB	**Water**							
Batch R3709259								
WG2518112-2 LCS								
Ammonia, Total (as N)			99.2		%		85-115	27-APR-17
WG2518112-1 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	27-APR-17
Batch R3709907								
WG2518804-2 LCS								
Ammonia, Total (as N)			101.4		%		85-115	28-APR-17
WG2518804-1 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	28-APR-17
NO2-IC-N-TB	**Water**							
Batch R3709534								
WG2517980-3 DUP		**L1917630-2**						
Nitrite (as N)		0.023	0.022		mg/L	3.4	20	27-APR-17
WG2517980-2 LCS								
Nitrite (as N)			103.3		%		90-110	27-APR-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NO2-IC-N-TB	**Water**							
Batch R3709534								
WG2517980-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	27-APR-17
WG2517980-4 MS		**L1917630-2**						
Nitrite (as N)			96.2		%		75-125	27-APR-17
NO3-IC-N-TB	**Water**							
Batch R3709534								
WG2517980-3 DUP		**L1917630-2**						
Nitrate (as N)		0.890	0.868		mg/L	2.5	20	27-APR-17
WG2517980-2 LCS								
Nitrate (as N)			100.7		%		90-110	27-APR-17
WG2517980-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	27-APR-17
WG2517980-4 MS		**L1917630-2**						
Nitrate (as N)			93.5		%		75-125	27-APR-17
P-T-COL-TB	**Water**							
Batch R3709801								
WG2518015-2 LCS								
Phosphorus (P)-Total			92.3		%		80-120	28-APR-17
WG2518015-1 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	28-APR-17
SO4-IC-N-TB	**Water**							
Batch R3709534								
WG2517980-3 DUP		**L1917630-2**						
Sulfate (SO4)		16.8	16.5		mg/L	2.2	20	27-APR-17
WG2517980-2 LCS								
Sulfate (SO4)			103.6		%		90-110	27-APR-17
WG2517980-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	27-APR-17
WG2517980-4 MS		**L1917630-2**						
Sulfate (SO4)			91.5		%		75-125	27-APR-17
TDS-TB	**Water**							
Batch R3710285								
WG2519146-2 LCS								
Total Dissolved Solids			97.0		%		85-115	28-APR-17
WG2519146-1 MB								
Total Dissolved Solids			<10		mg/L		10	28-APR-17
TOC-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
TOC-TB	**Water**							
Batch R3709678								
WG2517867-3 DUP		**L1917630-2**						
Total Organic Carbon		16.7	16.6		mg/L	0.7	20	27-APR-17
WG2517867-2 LCS								
Total Organic Carbon			101.9		%		80-120	27-APR-17
WG2517867-1 MB								
Total Organic Carbon			<1.0		mg/L		1	27-APR-17
WG2517867-4 MS		**L1917630-2**						
Total Organic Carbon			N/A	MS-B	%		-	27-APR-17
TSS-TB	**Water**							
Batch R3710052								
WG2517986-3 DUP		**L1917630-4**						
Total Suspended Solids		9.4	8.4		mg/L	10	20	27-APR-17
WG2517986-2 LCS								
Total Suspended Solids			96.9		%		85-115	27-APR-17
WG2517986-1 MB								
Total Suspended Solids			<2.0		mg/L		2	27-APR-17

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Your P.O. #: L1917630

Attention:Bobbie Caratti

ALS Laboratory Group
Environmental Div.
1081 Barton St.
Thunder Bay, ON
Canada P7B 5N3

Report Date: 2017/05/12
Report #: R4458453
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B786605
Received: 2017/05/01, 09:45

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Radium Isotopes by Alpha Spectrometry (1)	4	N/A	2017/05/10	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Radium-226 results have not been corrected for blanks.

Your P.O. #: L1917630

Attention:Bobbie Caratti

ALS Laboratory Group
Environmental Div.
1081 Barton St.
Thunder Bay, ON
Canada P7B 5N3

Report Date: 2017/05/12
Report #: R4458453
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B786605
Received: 2017/05/01, 09:45

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Simona Vatamanescu, Project Manager
Email: SVatamanescu@maxxam.ca
Phone# (905)826-3080

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B786605
Report Date: 2017/05/12

ALS Laboratory Group
Your P.O. #: L1917630

RESULTS OF ANALYSES OF WATER

Maxxam ID		EHM962	EHM963	EHM964	EHM965		
Sampling Date		2017/04/24	2017/04/24	2017/04/24	2017/04/24		
	UNITS	**L1917630-1 TRIP BLANK**	**L1917630-2 PINR EXP**	**L1917630-3 PINR DUP**	**L1917630-4 STUC REF**	**RDL**	**QC Batch**
Radium-226	Bq/L	<0.010	<0.010	<0.010	<0.010	0.010	4965003

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

Maxxam Analytics International Corporation o/a Maxxam Analytics 6790 Kitimat Rd, Unit 4, Mississauga, ON L5N 5L9 Phone: (905) 826-3080 Fax: (905) 826-4151 Toll Free: 1 877-726-3080 www.maxxam.ca

Maxxam Job #: B786605
Report Date: 2017/05/12

ALS Laboratory Group
Your P.O. #: L1917630

TEST SUMMARY

Maxxam ID: EHM962
Sample ID: L1917630-1 TRIP BLANK
Matrix: Water

Collected: 2017/04/24
Shipped:
Received: 2017/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Radium Isotopes by Alpha Spectrometry	AS	4965003	N/A	2017/05/10	Faiz Ahmed

Maxxam ID: EHM963
Sample ID: L1917630-2 PINR EXP
Matrix: Water

Collected: 2017/04/24
Shipped:
Received: 2017/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Radium Isotopes by Alpha Spectrometry	AS	4965003	N/A	2017/05/10	Faiz Ahmed

Maxxam ID: EHM964
Sample ID: L1917630-3 PINR DUP
Matrix: Water

Collected: 2017/04/24
Shipped:
Received: 2017/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Radium Isotopes by Alpha Spectrometry	AS	4965003	N/A	2017/05/10	Faiz Ahmed

Maxxam ID: EHM965
Sample ID: L1917630-4 STUC REF
Matrix: Water

Collected: 2017/04/24
Shipped:
Received: 2017/05/01

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Radium Isotopes by Alpha Spectrometry	AS	4965003	N/A	2017/05/10	Faiz Ahmed

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GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B786605
Report Date: 2017/05/12

ALS Laboratory Group
Your P.O. #: L1917630

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
4965003	FA5	Spiked Blank	Radium-226	2017/05/09		92	%	85 - 115
4965003	FA5	Method Blank	Radium-226	2017/05/09	<0.010		Bq/L	
4965003	FA5	RPD	Radium-226	2017/05/09	NC		%	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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Maxxam Job #: B786605
Report Date: 2017/05/12

ALS Laboratory Group
Your P.O. #: L1917630

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Donald Burgess, Senior Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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ALS Environmental

Chain of Custody (COC) / Analytical Request Form

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1917630-COFC

Number: 15 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Minnow Environmental Inc.
Contact:	Jess Tester
Phone:	905-873-3371
	Company address below will appear on the final report
Street:	2 Lamb Street
City/Province:	Georgetown, ON
Postal Code:	L7G 3M9
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ YES ☐ NO
☐ Compare Results to Criteria on Report - provide details below if box checked
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: jtester@minnow.ca
Email 2:
Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax: jtester@minnow.ca
Email 2:

Project Information

ALS Account # / Quote #: Q59584
Job #:
PO / AFE:
LSD:

Oil and Gas Required Fields (client use)

AFE/Cost Center: PO#:
Major/Minor Code: Routing Code:
Requisitioner:
Location:

ALS Lab Work Order # (lab use only): L1917630
ALS Contact:
Sampler: KB, KM

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4] ☐ | 3 day [P3] ☐ | 2 day [P2] ☐
EMERGENCY: 1 Business day [E1] ☐ | Same Day, Weekend or Statutory holiday [E0] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Alkalinity, Cl, F, SO4, NO2, NO3 (NO2+NO3)	Total Metals	Total Mercury	Dissolved Ca, Mg, Hardness (3D Dissolved Metals) F/P	Total Ammonia, Total Phosphorus, TOC	Total Cyanide, WAD Cyanide	TSS, TDS	DOC F	Radium 226	Supplies				Number of Containers
	Trip Blank	24-Apr-17	—	Water	x	x	x	x	x	x	x	x	x	x				9
	PinR-EXP	24-Apr-17	13:00	Water	x	x	x	x	x	x	x	x	x					9
	PinR-DUP	24-Apr-17	13:00	Water	x	x	x	x	x	x	x	x	x					9
	StuC-REF	24-Apr-17	14:40	Water	x	x	x	x	x	x	x	x	x					9

Drinking Water (DW) Samples [1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO
Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

DOC and dissolved metals field filtered. Trip Blank unopened.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☑ No ☐
Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
1.5					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
<Original signed by>	Date: 2017-04-25	Time: 11:00	Received by: SD	Date: April 26/17	Time: 12:55	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System please submit using an Authorized DW COC form

SD

MINNOW ENVIRONMENTAL INC.
ATTN: Jess Tester
2 Lamb Street
Georgetown ON L7G 3M9

Date Received: 14-SEP-17
Report Date: 10-OCT-17 14:26 (MT)
Version: FINAL

Client Phone: 905-873-3371

Certificate of Analysis

Lab Work Order #: L1991701

Project P.O. #: NOT SUBMITTED
Job Reference: 17-12
C of C Numbers:
Legal Site Desc:

<Original signed by>

Christine Paradis
Project Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1991701-1 PINR-EXP Sampled By: KB/PS on 13-SEP-17 @ 16:05 Matrix: WATER							
Physical Tests							
Hardness (as CaCO3)	257		0.50	mg/L		23-SEP-17	
Total Suspended Solids	4.6		2.0	mg/L		16-SEP-17	R3830323
Total Dissolved Solids	308		20	mg/L		16-SEP-17	R3830357
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	260		2.0	mg/L		15-SEP-17	R3829746
Ammonia, Total (as N)	0.027		0.020	mg/L		15-SEP-17	R3830865
Chloride (Cl)	12.5		0.10	mg/L		15-SEP-17	R3829990
Fluoride (F)	0.081		0.020	mg/L		15-SEP-17	R3829990
Nitrate (as N)	0.102		0.020	mg/L		15-SEP-17	R3829990
Nitrite (as N)	<0.010		0.010	mg/L		15-SEP-17	R3829990
Phosphorus (P)-Total	0.0324		0.0030	mg/L	15-SEP-17	18-SEP-17	R3831652
Sulfate (SO4)	1.79		0.30	mg/L		15-SEP-17	R3829990
Cyanides							
Cyanide, Weak Acid Diss	<0.0020		0.0020	mg/L		19-SEP-17	R3833513
Cyanide, Total	<0.0020		0.0020	mg/L		19-SEP-17	R3833513
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					18-SEP-17	R3831015
Dissolved Organic Carbon	28.7		1.0	mg/L	18-SEP-17	18-SEP-17	R3831540
Total Organic Carbon	29.1		1.0	mg/L		18-SEP-17	R3831570
Total Metals							
Aluminum (Al)-Total	0.0915		0.0030	mg/L	17-SEP-17	22-SEP-17	R3836532
Antimony (Sb)-Total	0.00017		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Arsenic (As)-Total	0.00145		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Barium (Ba)-Total	0.0220		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Boron (B)-Total	0.015		0.010	mg/L	17-SEP-17	22-SEP-17	R3836532
Cadmium (Cd)-Total	0.0000056		0.0000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Calcium (Ca)-Total	58.4		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Cesium (Cs)-Total	0.000011		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Chromium (Cr)-Total	0.00032		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Cobalt (Co)-Total	0.00025		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Copper (Cu)-Total	<0.00050		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Iron (Fe)-Total	0.201		0.010	mg/L	17-SEP-17	22-SEP-17	R3836532
Lead (Pb)-Total	0.000074		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Lithium (Li)-Total	0.0115		0.0010	mg/L	17-SEP-17	22-SEP-17	R3836532
Magnesium (Mg)-Total	28.5		0.0050	mg/L	17-SEP-17	22-SEP-17	R3836532
Manganese (Mn)-Total	0.0840		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		17-SEP-17	R3830424
Molybdenum (Mo)-Total	0.000185		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Nickel (Ni)-Total	0.00111		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Phosphorus (P)-Total	0.053		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1991701-1 PINR-EXP Sampled By: KB/PS on 13-SEP-17 @ 16:05 Matrix: WATER							
Total Metals							
Potassium (K)-Total	2.13		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Rubidium (Rb)-Total	0.00158		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Selenium (Se)-Total	0.000177		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Silicon (Si)-Total	2.66		0.10	mg/L	17-SEP-17	22-SEP-17	R3836532
Silver (Ag)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Sodium (Na)-Total	9.17		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Strontium (Sr)-Total	0.124		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Sulfur (S)-Total	1.20		0.50	mg/L	17-SEP-17	22-SEP-17	R3836532
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Thorium (Th)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Tin (Sn)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Titanium (Ti)-Total	0.00279		0.00030	mg/L	17-SEP-17	22-SEP-17	R3836532
Tungsten (W)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Uranium (U)-Total	0.000525		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Vanadium (V)-Total	0.00079		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Zinc (Zn)-Total	0.0038		0.0030	mg/L	17-SEP-17	22-SEP-17	R3836532
Zirconium (Zr)-Total	0.000170		0.000060	mg/L	17-SEP-17	22-SEP-17	R3836532
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					21-SEP-17	R3835536
Calcium (Ca)-Dissolved	56.4		0.050	mg/L	21-SEP-17	21-SEP-17	R3835809
Magnesium (Mg)-Dissolved	28.2		0.0050	mg/L	21-SEP-17	21-SEP-17	R3835809
Radiological Parameters							
Ra-226	<0.010		0.010	Bq/L		27-SEP-17	R3840929
L1991701-2 PINR-DUP Sampled By: KB/PS on 13-SEP-17 @ 16:05 Matrix: WATER							
Physical Tests							
Hardness (as CaCO3)	262		0.50	mg/L		23-SEP-17	
Total Suspended Solids	4.3		2.0	mg/L		16-SEP-17	R3830323
Total Dissolved Solids	305		20	mg/L		16-SEP-17	R3830357
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	245		2.0	mg/L		15-SEP-17	R3829746
Ammonia, Total (as N)	0.053		0.020	mg/L		15-SEP-17	R3830865
Chloride (Cl)	12.4		0.10	mg/L		15-SEP-17	R3829990
Fluoride (F)	0.081		0.020	mg/L		15-SEP-17	R3829990
Nitrate (as N)	2.95		0.020	mg/L		15-SEP-17	R3829990
Nitrite (as N)	<0.010		0.010	mg/L		15-SEP-17	R3829990
Phosphorus (P)-Total	0.0337		0.0030	mg/L	15-SEP-17	18-SEP-17	R3831652
Sulfate (SO4)	2.44		0.30	mg/L		15-SEP-17	R3829990
Cyanides							
Cyanide, Weak Acid Diss	<0.0020		0.0020	mg/L		19-SEP-17	R3833513

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1991701-2 PINR-DUP Sampled By: KB/PS on 13-SEP-17 @ 16:05 Matrix: WATER							
Cyanides							
Cyanide, Total	<0.0020		0.0020	mg/L		19-SEP-17	R3833513
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					18-SEP-17	R3831015
Dissolved Organic Carbon	29.3		1.0	mg/L	18-SEP-17	18-SEP-17	R3831540
Total Organic Carbon	29.5		1.0	mg/L		18-SEP-17	R3831570
Total Metals							
Aluminum (Al)-Total	0.0947		0.0030	mg/L	17-SEP-17	22-SEP-17	R3836532
Antimony (Sb)-Total	0.00018		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Arsenic (As)-Total	0.00153		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Barium (Ba)-Total	0.0226		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Boron (B)-Total	0.015		0.010	mg/L	17-SEP-17	22-SEP-17	R3836532
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Calcium (Ca)-Total	57.9		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Cesium (Cs)-Total	0.000013		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Chromium (Cr)-Total	0.00034		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Cobalt (Co)-Total	0.00027		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Copper (Cu)-Total	<0.00050		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Iron (Fe)-Total	0.219		0.010	mg/L	17-SEP-17	22-SEP-17	R3836532
Lead (Pb)-Total	0.000068		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Lithium (Li)-Total	0.0119		0.0010	mg/L	17-SEP-17	22-SEP-17	R3836532
Magnesium (Mg)-Total	29.7		0.0050	mg/L	17-SEP-17	22-SEP-17	R3836532
Manganese (Mn)-Total	0.0921		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		17-SEP-17	R3830424
Molybdenum (Mo)-Total	0.000187		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Nickel (Ni)-Total	0.00114		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Phosphorus (P)-Total	0.064		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Potassium (K)-Total	2.19		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Rubidium (Rb)-Total	0.00156		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Selenium (Se)-Total	0.000172		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Silicon (Si)-Total	2.79		0.10	mg/L	17-SEP-17	22-SEP-17	R3836532
Silver (Ag)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Sodium (Na)-Total	9.45		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Strontium (Sr)-Total	0.124		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Sulfur (S)-Total	1.67		0.50	mg/L	17-SEP-17	22-SEP-17	R3836532
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Thorium (Th)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Tin (Sn)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Titanium (Ti)-Total	0.00303		0.00030	mg/L	17-SEP-17	22-SEP-17	R3836532

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1991701-2 PINR-DUP Sampled By: KB/PS on 13-SEP-17 @ 16:05 Matrix: WATER							
Total Metals							
Tungsten (W)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Uranium (U)-Total	0.000516		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Vanadium (V)-Total	0.00082		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	17-SEP-17	22-SEP-17	R3836532
Zirconium (Zr)-Total	0.000165		0.000060	mg/L	17-SEP-17	22-SEP-17	R3836532
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					21-SEP-17	R3835536
Calcium (Ca)-Dissolved	57.8		0.050	mg/L	21-SEP-17	21-SEP-17	R3835809
Magnesium (Mg)-Dissolved	28.5		0.0050	mg/L	21-SEP-17	21-SEP-17	R3835809
Radiological Parameters							
Ra-226	<0.010		0.010	Bq/L		27-SEP-17	R3840929
L1991701-3 STUC-REF Sampled By: KB/PS on 13-SEP-17 @ 14:09 Matrix: WATER							
Physical Tests							
Hardness (as CaCO3)	174		0.50	mg/L		23-SEP-17	
Total Suspended Solids	14.5		2.0	mg/L		16-SEP-17	R3830323
Total Dissolved Solids	239		20	mg/L		16-SEP-17	R3830357
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	166		2.0	mg/L		15-SEP-17	R3829746
Ammonia, Total (as N)	0.097		0.020	mg/L		15-SEP-17	R3830865
Chloride (Cl)	6.26		0.10	mg/L		15-SEP-17	R3829990
Fluoride (F)	0.073		0.020	mg/L		15-SEP-17	R3829990
Nitrate (as N)	0.078		0.020	mg/L		15-SEP-17	R3829990
Nitrite (as N)	<0.010		0.010	mg/L		15-SEP-17	R3829990
Phosphorus (P)-Total	0.107		0.030	mg/L	15-SEP-17	18-SEP-17	R3831652
Sulfate (SO4)	1.33		0.30	mg/L		15-SEP-17	R3829990
Cyanides							
Cyanide, Weak Acid Diss	<0.0020		0.0020	mg/L		19-SEP-17	R3833513
Cyanide, Total	<0.0020		0.0020	mg/L		19-SEP-17	R3833513
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					18-SEP-17	R3831015
Dissolved Organic Carbon	35.7		1.0	mg/L	18-SEP-17	18-SEP-17	R3831540
Total Organic Carbon	37.3		1.0	mg/L		18-SEP-17	R3831570
Total Metals							
Aluminum (Al)-Total	0.435		0.0030	mg/L	17-SEP-17	22-SEP-17	R3836532
Antimony (Sb)-Total	0.00017		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Arsenic (As)-Total	0.00217		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Barium (Ba)-Total	0.0237		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Boron (B)-Total	0.016		0.010	mg/L	17-SEP-17	22-SEP-17	R3836532

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1991701-3 STUC-REF Sampled By: KB/PS on 13-SEP-17 @ 14:09 Matrix: WATER							
Total Metals							
Cadmium (Cd)-Total	0.0000089		0.0000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Calcium (Ca)-Total	40.9		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Cesium (Cs)-Total	0.000054		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Chromium (Cr)-Total	0.00091		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Cobalt (Co)-Total	0.00065		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Copper (Cu)-Total	0.00110		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Iron (Fe)-Total	0.870		0.010	mg/L	17-SEP-17	22-SEP-17	R3836532
Lead (Pb)-Total	0.000369		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Lithium (Li)-Total	0.0072		0.0010	mg/L	17-SEP-17	22-SEP-17	R3836532
Magnesium (Mg)-Total	18.9		0.0050	mg/L	17-SEP-17	22-SEP-17	R3836532
Manganese (Mn)-Total	0.220		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		17-SEP-17	R3830424
Molybdenum (Mo)-Total	0.000516		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Nickel (Ni)-Total	0.00237		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Phosphorus (P)-Total	0.150		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Potassium (K)-Total	1.78		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Rubidium (Rb)-Total	0.00196		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Selenium (Se)-Total	0.000241		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Silicon (Si)-Total	2.92		0.10	mg/L	17-SEP-17	22-SEP-17	R3836532
Silver (Ag)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Sodium (Na)-Total	5.63		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Strontium (Sr)-Total	0.105		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Sulfur (S)-Total	1.01		0.50	mg/L	17-SEP-17	22-SEP-17	R3836532
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Thorium (Th)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Tin (Sn)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Titanium (Ti)-Total	0.0127		0.00030	mg/L	17-SEP-17	22-SEP-17	R3836532
Tungsten (W)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Uranium (U)-Total	0.00152		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Vanadium (V)-Total	0.00242		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Zinc (Zn)-Total	0.0038		0.0030	mg/L	17-SEP-17	22-SEP-17	R3836532
Zirconium (Zr)-Total	0.000521		0.000060	mg/L	17-SEP-17	22-SEP-17	R3836532
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					21-SEP-17	R3835536
Calcium (Ca)-Dissolved	39.9		0.050	mg/L	21-SEP-17	21-SEP-17	R3835809
Magnesium (Mg)-Dissolved	18.0		0.0050	mg/L	21-SEP-17	21-SEP-17	R3835809
Radiological Parameters							
Ra-226	<0.010		0.010	Bq/L		27-SEP-17	R3840929
L1991701-4 FIELD BLANK Sampled By: KB/PS on 13-SEP-17 @ 14:09 Matrix: WATER							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1991701-4 FIELD BLANK Sampled By: KB/PS on 13-SEP-17 @ 14:09 Matrix: WATER							
Physical Tests							
Hardness (as CaCO3)	<0.50		0.50	mg/L		23-SEP-17	
Total Suspended Solids	<2.0		2.0	mg/L		16-SEP-17	R3830323
Total Dissolved Solids	<10		10	mg/L		16-SEP-17	R3830357
Anions and Nutrients							
Alkalinity, Total (as CaCO3)	<2.0		2.0	mg/L		15-SEP-17	R3829746
Ammonia, Total (as N)	0.102	RRV	0.020	mg/L		19-SEP-17	R3831519
Chloride (Cl)	<0.10		0.10	mg/L		15-SEP-17	R3829990
Fluoride (F)	<0.020		0.020	mg/L		15-SEP-17	R3829990
Nitrate (as N)	<0.020		0.020	mg/L		15-SEP-17	R3829990
Nitrite (as N)	<0.010		0.010	mg/L		15-SEP-17	R3829990
Phosphorus (P)-Total	<0.0030		0.0030	mg/L	15-SEP-17	18-SEP-17	R3831652
Sulfate (SO4)	<0.30		0.30	mg/L		15-SEP-17	R3829990
Cyanides							
Cyanide, Weak Acid Diss	<0.0020		0.0020	mg/L		19-SEP-17	R3833513
Cyanide, Total	<0.0020		0.0020	mg/L		19-SEP-17	R3833513
Organic / Inorganic Carbon							
Dissolved Carbon Filtration Location	FIELD					18-SEP-17	R3831015
Dissolved Organic Carbon	<1.0		1.0	mg/L	18-SEP-17	18-SEP-17	R3831540
Total Organic Carbon	<1.0		1.0	mg/L		18-SEP-17	R3831570
Total Metals							
Aluminum (Al)-Total	<0.0030		0.0030	mg/L	17-SEP-17	22-SEP-17	R3836532
Antimony (Sb)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Arsenic (As)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Barium (Ba)-Total	<0.000050		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Beryllium (Be)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Bismuth (Bi)-Total	<0.000050		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Boron (B)-Total	<0.010		0.010	mg/L	17-SEP-17	22-SEP-17	R3836532
Cadmium (Cd)-Total	<0.0000050		0.0000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Calcium (Ca)-Total	<0.050		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Cesium (Cs)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Chromium (Cr)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Cobalt (Co)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Copper (Cu)-Total	<0.00050		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Iron (Fe)-Total	<0.010		0.010	mg/L	17-SEP-17	22-SEP-17	R3836532
Lead (Pb)-Total	<0.000050		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Lithium (Li)-Total	<0.0010		0.0010	mg/L	17-SEP-17	22-SEP-17	R3836532
Magnesium (Mg)-Total	<0.0050		0.0050	mg/L	17-SEP-17	22-SEP-17	R3836532
Manganese (Mn)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Mercury (Hg)-Total	<0.0000050		0.0000050	mg/L		17-SEP-17	R3830424
Molybdenum (Mo)-Total	<0.000050		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Nickel (Ni)-Total	<0.00050		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Phosphorus (P)-Total	<0.050		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1991701-4 FIELD BLANK Sampled By: KB/PS on 13-SEP-17 @ 14:09 Matrix: WATER							
Total Metals							
Potassium (K)-Total	<0.050		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Rubidium (Rb)-Total	<0.00020		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Selenium (Se)-Total	<0.000050		0.000050	mg/L	17-SEP-17	22-SEP-17	R3836532
Silicon (Si)-Total	<0.10		0.10	mg/L	17-SEP-17	22-SEP-17	R3836532
Silver (Ag)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Sodium (Na)-Total	<0.050		0.050	mg/L	17-SEP-17	22-SEP-17	R3836532
Strontium (Sr)-Total	<0.00020		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Sulfur (S)-Total	<0.50		0.50	mg/L	17-SEP-17	22-SEP-17	R3836532
Tellurium (Te)-Total	<0.00020		0.00020	mg/L	17-SEP-17	22-SEP-17	R3836532
Thallium (Tl)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Thorium (Th)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Tin (Sn)-Total	0.00032	RRV	0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Titanium (Ti)-Total	<0.00030		0.00030	mg/L	17-SEP-17	22-SEP-17	R3836532
Tungsten (W)-Total	<0.00010		0.00010	mg/L	17-SEP-17	22-SEP-17	R3836532
Uranium (U)-Total	<0.000010		0.000010	mg/L	17-SEP-17	22-SEP-17	R3836532
Vanadium (V)-Total	<0.00050		0.00050	mg/L	17-SEP-17	22-SEP-17	R3836532
Zinc (Zn)-Total	<0.0030		0.0030	mg/L	17-SEP-17	22-SEP-17	R3836532
Zirconium (Zr)-Total	<0.000060		0.000060	mg/L	17-SEP-17	22-SEP-17	R3836532
Dissolved Metals							
Dissolved Metals Filtration Location	FIELD					21-SEP-17	R3835536
Calcium (Ca)-Dissolved	<0.050		0.050	mg/L	21-SEP-17	21-SEP-17	R3835809
Magnesium (Mg)-Dissolved	<0.0050		0.0050	mg/L	21-SEP-17	21-SEP-17	R3835809
Radiological Parameters							
Ra-226	<0.010		0.010	Bq/L		27-SEP-17	R3840929

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

QC Samples with Qualifiers & Comments:

QC Type Description	Parameter	Qualifier	Applies to Sample Number(s)
Method Blank	Total Dissolved Solids	B	L1991701-1, -2, -3, -4
Matrix Spike	Dissolved Organic Carbon	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Calcium (Ca)-Dissolved	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Magnesium (Mg)-Dissolved	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Barium (Ba)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Boron (B)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Calcium (Ca)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Magnesium (Mg)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Manganese (Mn)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Potassium (K)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Rubidium (Rb)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Sodium (Na)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Strontium (Sr)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Tungsten (W)-Total	MS-B	L1991701-1, -2, -3, -4
Matrix Spike	Total Organic Carbon	MS-B	L1991701-1, -2, -3, -4

Sample Parameter Qualifier key listed:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RRV	Reported Result Verified By Repeat Analysis

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
ALK-TITR-TB	Water	Alkalinity	APHA 2320B modified

This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values.

CL-L-IC-N-TB	Water	Chloride in Water by IC (Low Level)	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

CN-TOT-WT	Water	Cyanide, Total	ISO 14403-2

Total cyanide is determined by the combination of UV digestion and distillation. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

When using this method, high levels of thiocyanate in samples can cause false positives at ~1-2% of the thiocyanate concentration. For samples with detectable cyanide analyzed by this method, ALS recommends analysis for thiocyanate to check for this potential interference

CN-WAD-WT	Water	Cyanide, Weak Acid Diss	APHA 4500CN I-Weak acid Dist Colorimet

Weak acid dissociable cyanide (WAD) is determined by undergoing a distillation procedure. Cyanide is converted to cyanogen chloride by reacting with chloramine-T, the cyanogen chloride then reacts with a combination of barbituric acid and isonicotinic acid to form a highly colored complex.

DOC-TB	Water	Dissolved Organic Carbon	APHA 5310 B modified

Water samples are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis. Analyzed by converting all carbonaceous material to carbon dioxide (CO2) by catalytic combustion at 850?C. The CO2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

F-IC-N-TB	Water	Fluoride in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

HARDNESS-CALC-TB	Water	Hardness (as CaCO3)	CALCULATION

HG-T-CVAF-TB	Water	Total Mercury in Water by CVAFS	EPA 1631E (mod)

Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAFS.

MET-D-CCMS-TB	Water	Dissolved Metals in Water by CRC ICPMS	APHA 3030B/6020A (mod)

Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

MET-T-CCMS-TB	Water	Total Metals in Water by CRC ICPMS	EPA 200.2/6020A (mod)

Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS.

Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.

Reference Information

NH3-COL-TB	Water	Ammonia by Discrete Analyzer	APHA 4500-NH3 G. (modified)

Ammonia in aqueous matrices is analyzed using discrete analyzer with colourimetric detection.

NO2-IC-N-TB	Water	Nitrite in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

NO3-IC-N-TB	Water	Nitrate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

P-T-COL-TB	Water	Total Phosphorus by Discrete Analyzer	APHA 4500-P B, F, G (modified)

Phosphorus in aqueous matrices is analyzed using discrete Analyzer with colourimetric detection.

SO4-IC-N-TB	Water	Sulfate in Water by IC	EPA 300.1 (mod)

Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.

TDS-TB	Water	Total Dissolved Solids	APHA 2540 C (modified)

Aqueous matrices are analyzed using gravimetry and evaporation

TOC-TB	Water	Total Organic Carbon (TOC)	APHA 5310 B modified

Water samples are analyzed by converting all carbonaceous material to carbon dioxide (CO_2) by catalytic combustion at 850?C. The CO_2 generated is measured by an infrared detector and is directly proportional to concentration of carbonaceous material in the sample

TSS-TB	Water	Total Suspended Solids	APHA 2540 D (modified)

Aqueous matrices are analyzed using gravimetry

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
WT	ALS ENVIRONMENTAL - WATERLOO, ONTARIO, CANADA
TB	ALS ENVIRONMENTAL - THUNDER BAY, ONTARIO, CANADA

Chain of Custody Numbers:

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L1991701 Report Date: 10-OCT-17

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
ALK-TITR-TB	**Water**							
Batch R3829746								
WG2617112-5 LCS								
Alkalinity, Total (as CaCO3)			101.3		%		85-115	15-SEP-17
WG2617112-4 MB								
Alkalinity, Total (as CaCO3)			<2.0		mg/L		2	15-SEP-17
CL-L-IC-N-TB	**Water**							
Batch R3829990								
WG2616930-2 LCS								
Chloride (Cl)			100.1		%		90-110	15-SEP-17
WG2616930-1 MB								
Chloride (Cl)			<0.10		mg/L		0.1	15-SEP-17
CN-TOT-WT	**Water**							
Batch R3833513								
WG2619208-6 LCS								
Cyanide, Total			93.2		%		80-120	19-SEP-17
WG2619208-5 MB								
Cyanide, Total			<0.0020		mg/L		0.002	19-SEP-17
CN-WAD-WT	**Water**							
Batch R3833513								
WG2619208-6 LCS								
Cyanide, Weak Acid Diss			98.3		%		80-120	19-SEP-17
WG2619208-5 MB								
Cyanide, Weak Acid Diss			<0.0020		mg/L		0.002	19-SEP-17
DOC-TB	**Water**							
Batch R3831540								
WG2618669-3 DUP		**L1991701-1**						
Dissolved Organic Carbon		28.7	28.7		mg/L	0.1	20	18-SEP-17
WG2618669-2 LCS								
Dissolved Organic Carbon			105.5		%		80-120	18-SEP-17
WG2618669-1 MB								
Dissolved Organic Carbon			<1.0		mg/L		1	18-SEP-17
WG2618669-4 MS		**L1991701-1**						
Dissolved Organic Carbon			N/A	MS-B	%		-	18-SEP-17
F-IC-N-TB	**Water**							
Batch R3829990								
WG2616930-2 LCS								
Fluoride (F)			107.4		%		90-110	15-SEP-17
WG2616930-1 MB								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
F-IC-N-TB	**Water**							
Batch R3829990								
WG2616930-1 MB								
Fluoride (F)			<0.020		mg/L		0.02	15-SEP-17
HG-T-CVAF-TB	**Water**							
Batch R3830424								
WG2617985-3 DUP		**L1991701-1**						
Mercury (Hg)-Total		<0.0000050	<0.000005C	RPD-NA	mg/L	N/A	20	17-SEP-17
WG2617985-2 LCS								
Mercury (Hg)-Total			99.5		%		80-120	17-SEP-17
WG2617985-1 MB								
Mercury (Hg)-Total			<0.000005C		mg/L		0.000005	17-SEP-17
WG2617985-4 MS		**L1991701-2**						
Mercury (Hg)-Total			106.8		%		70-130	17-SEP-17
MET-D-CCMS-TB	**Water**							
Batch R3835809								
WG2620478-2 LCS								
Calcium (Ca)-Dissolved			101.2		%		80-120	21-SEP-17
Magnesium (Mg)-Dissolved			110.4		%		80-120	21-SEP-17
WG2620478-1 MB								
Calcium (Ca)-Dissolved			<0.050		mg/L		0.05	21-SEP-17
Magnesium (Mg)-Dissolved			<0.0050		mg/L		0.005	21-SEP-17
MET-T-CCMS-TB	**Water**							
Batch R3836532								
WG2617916-2 LCS								
Aluminum (Al)-Total			105.4		%		80-120	22-SEP-17
Antimony (Sb)-Total			103.7		%		80-120	22-SEP-17
Arsenic (As)-Total			102.6		%		80-120	22-SEP-17
Barium (Ba)-Total			102.0		%		80-120	22-SEP-17
Beryllium (Be)-Total			104.6		%		80-120	22-SEP-17
Bismuth (Bi)-Total			102.9		%		80-120	22-SEP-17
Boron (B)-Total			93.3		%		80-120	22-SEP-17
Cadmium (Cd)-Total			101.9		%		80-120	22-SEP-17
Calcium (Ca)-Total			103.9		%		80-120	22-SEP-17
Cesium (Cs)-Total			101.0		%		80-120	22-SEP-17
Chromium (Cr)-Total			104.3		%		80-120	22-SEP-17
Cobalt (Co)-Total			105.1		%		80-120	22-SEP-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R3836532								
WG2617916-2 LCS								
Copper (Cu)-Total			102.6		%		80-120	22-SEP-17
Iron (Fe)-Total			101.9		%		80-120	22-SEP-17
Lead (Pb)-Total			101.1		%		80-120	22-SEP-17
Lithium (Li)-Total			106.2		%		80-120	22-SEP-17
Magnesium (Mg)-Total			111.2		%		80-120	22-SEP-17
Manganese (Mn)-Total			102.3		%		80-120	22-SEP-17
Molybdenum (Mo)-Total			102.2		%		80-120	22-SEP-17
Nickel (Ni)-Total			103.3		%		80-120	22-SEP-17
Phosphorus (P)-Total			101.4		%		70-130	22-SEP-17
Potassium (K)-Total			108.2		%		80-120	22-SEP-17
Rubidium (Rb)-Total			104.5		%		80-120	22-SEP-17
Selenium (Se)-Total			101.1		%		80-120	22-SEP-17
Silicon (Si)-Total			108.3		%		60-140	22-SEP-17
Silver (Ag)-Total			101.5		%		80-120	22-SEP-17
Sodium (Na)-Total			106.0		%		80-120	22-SEP-17
Strontium (Sr)-Total			104.2		%		80-120	22-SEP-17
Sulfur (S)-Total			100.4		%		80-120	22-SEP-17
Tellurium (Te)-Total			95.9		%		80-120	22-SEP-17
Thallium (Tl)-Total			101.6		%		80-120	22-SEP-17
Thorium (Th)-Total			100.1		%		80-120	22-SEP-17
Tin (Sn)-Total			101.7		%		80-120	22-SEP-17
Titanium (Ti)-Total			103.0		%		80-120	22-SEP-17
Tungsten (W)-Total			103.4		%		80-120	22-SEP-17
Uranium (U)-Total			102.4		%		80-120	22-SEP-17
Vanadium (V)-Total			105.7		%		80-120	22-SEP-17
Zinc (Zn)-Total			102.0		%		80-120	22-SEP-17
Zirconium (Zr)-Total			101.0		%		80-120	22-SEP-17
WG2617916-1 MB								
Aluminum (Al)-Total			<0.0030		mg/L		0.003	22-SEP-17
Antimony (Sb)-Total			<0.00010		mg/L		0.0001	22-SEP-17
Arsenic (As)-Total			<0.00010		mg/L		0.0001	22-SEP-17
Barium (Ba)-Total			<0.000050		mg/L		0.00005	22-SEP-17
Beryllium (Be)-Total			<0.00010		mg/L		0.0001	22-SEP-17
Bismuth (Bi)-Total			<0.000050		mg/L		0.00005	22-SEP-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-T-CCMS-TB	**Water**							
Batch R3836532								
WG2617916-1 MB								
Boron (B)-Total			<0.010		mg/L		0.01	22-SEP-17
Cadmium (Cd)-Total			<0.000005(		mg/L		0.000005	22-SEP-17
Calcium (Ca)-Total			<0.050		mg/L		0.05	22-SEP-17
Cesium (Cs)-Total			<0.000010		mg/L		0.00001	22-SEP-17
Chromium (Cr)-Total			<0.00010		mg/L		0.0001	22-SEP-17
Cobalt (Co)-Total			<0.00010		mg/L		0.0001	22-SEP-17
Copper (Cu)-Total			<0.00050		mg/L		0.0005	22-SEP-17
Iron (Fe)-Total			<0.010		mg/L		0.01	22-SEP-17
Lead (Pb)-Total			<0.000050		mg/L		0.00005	22-SEP-17
Lithium (Li)-Total			<0.0010		mg/L		0.001	22-SEP-17
Magnesium (Mg)-Total			<0.0050		mg/L		0.005	22-SEP-17
Manganese (Mn)-Total			<0.00010		mg/L		0.0001	22-SEP-17
Molybdenum (Mo)-Total			<0.000050		mg/L		0.00005	22-SEP-17
Nickel (Ni)-Total			<0.00050		mg/L		0.0005	22-SEP-17
Phosphorus (P)-Total			<0.050		mg/L		0.05	22-SEP-17
Potassium (K)-Total			<0.050		mg/L		0.05	22-SEP-17
Rubidium (Rb)-Total			<0.00020		mg/L		0.0002	22-SEP-17
Selenium (Se)-Total			<0.000050		mg/L		0.00005	22-SEP-17
Silicon (Si)-Total			<0.10		mg/L		0.1	22-SEP-17
Silver (Ag)-Total			<0.000010		mg/L		0.00001	22-SEP-17
Sodium (Na)-Total			<0.050		mg/L		0.05	22-SEP-17
Strontium (Sr)-Total			<0.00020		mg/L		0.0002	22-SEP-17
Sulfur (S)-Total			<0.50		mg/L		0.5	22-SEP-17
Tellurium (Te)-Total			<0.00020		mg/L		0.0002	22-SEP-17
Thallium (Tl)-Total			<0.000010		mg/L		0.00001	22-SEP-17
Thorium (Th)-Total			<0.00010		mg/L		0.0001	22-SEP-17
Tin (Sn)-Total			<0.00010		mg/L		0.0001	22-SEP-17
Titanium (Ti)-Total			<0.00030		mg/L		0.0003	22-SEP-17
Tungsten (W)-Total			<0.00010		mg/L		0.0001	22-SEP-17
Uranium (U)-Total			<0.000010		mg/L		0.00001	22-SEP-17
Vanadium (V)-Total			<0.00050		mg/L		0.0005	22-SEP-17
Zinc (Zn)-Total			<0.0030		mg/L		0.003	22-SEP-17
Zirconium (Zr)-Total			<0.000060		mg/L		0.00006	22-SEP-17
NH3-COL-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
NH3-COL-TB	**Water**							
Batch R3830865								
WG2617082-3 DUP		**L1991701-1**						
Ammonia, Total (as N)		0.027	0.027		mg/L	0.8	20	15-SEP-17
WG2617082-2 LCS								
Ammonia, Total (as N)			97.3		%		85-115	15-SEP-17
WG2617082-1 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	15-SEP-17
WG2617082-4 MS		**L1991701-1**						
Ammonia, Total (as N)			89.0		%		75-125	15-SEP-17
Batch R3831519								
WG2619165-2 LCS								
Ammonia, Total (as N)			94.2		%		85-115	19-SEP-17
WG2619165-1 MB								
Ammonia, Total (as N)			<0.020		mg/L		0.02	19-SEP-17
NO2-IC-N-TB	**Water**							
Batch R3829990								
WG2616930-2 LCS								
Nitrite (as N)			105.6		%		90-110	15-SEP-17
WG2616930-1 MB								
Nitrite (as N)			<0.010		mg/L		0.01	15-SEP-17
NO3-IC-N-TB	**Water**							
Batch R3829990								
WG2616930-2 LCS								
Nitrate (as N)			99.2		%		90-110	15-SEP-17
WG2616930-1 MB								
Nitrate (as N)			<0.020		mg/L		0.02	15-SEP-17
P-T-COL-TB	**Water**							
Batch R3831652								
WG2616841-3 DUP		**L1991701-1**						
Phosphorus (P)-Total		0.0324	0.0358		mg/L	10	20	18-SEP-17
WG2616841-2 LCS								
Phosphorus (P)-Total			103.4		%		80-120	18-SEP-17
WG2616841-1 MB								
Phosphorus (P)-Total			<0.0030		mg/L		0.003	18-SEP-17
WG2616841-4 MS		**L1991701-1**						
Phosphorus (P)-Total			81.7		%		70-130	18-SEP-17
SO4-IC-N-TB	**Water**							

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
SO4-IC-N-TB	**Water**							
Batch R3829990								
WG2616930-2 LCS								
Sulfate (SO4)			100.9		%		90-110	15-SEP-17
WG2616930-1 MB								
Sulfate (SO4)			<0.30		mg/L		0.3	15-SEP-17
TDS-TB	**Water**							
Batch R3830357								
WG2617611-2 LCS								
Total Dissolved Solids			99.4		%		85-115	16-SEP-17
WG2617611-1 MB								
Total Dissolved Solids			10	B	mg/L		10	16-SEP-17
TOC-TB	**Water**							
Batch R3831570								
WG2618316-3 DUP		**L1991701-1**						
Total Organic Carbon		29.1	30.2		mg/L	3.6	20	18-SEP-17
WG2618316-2 LCS								
Total Organic Carbon			110.1		%		80-120	18-SEP-17
WG2618316-1 MB								
Total Organic Carbon			<1.0		mg/L		1	18-SEP-17
WG2618316-4 MS		**L1991701-1**						
Total Organic Carbon			N/A	MS-B	%		-	18-SEP-17
TSS-TB	**Water**							
Batch R3830323								
WG2617757-2 LCS								
Total Suspended Solids			96.4		%		85-115	16-SEP-17
WG2617757-1 MB								
Total Suspended Solids			<2.0		mg/L		2	16-SEP-17

Quality Control Report

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
B	Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable.
MS-B	Matrix Spike recovery could not be accurately calculated due to high analyte background in sample.
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Maxxam
A Bureau Veritas Group Company

Your P.O. #: L1991701

Attention:Christine Paradis

ALS Laboratory Group
Environmental Div.
1081 Barton St.
Thunder Bay, ON
Canada P7B 5N3

Report Date: 2017/09/29
Report #: R4744993
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7K2765
Received: 2017/09/18, 09:50

Sample Matrix: Water
Samples Received: 4

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Reference
Radium Isotopes by Alpha Spectrometry (1)	4	N/A	2017/09/27	BQL SOP-00006 BQL SOP-00017 BQL SOP-00032	Alpha Spectrometry

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported: unless indicated otherwise, associated sample data are not blank corrected.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
(1) Radium-226 results have not been corrected for blanks.

Maxxam Analytics International Corporation o/a Maxxam Analytics 6790 Kitimat Rd, Unit 4, Mississauga, ON L5N 5L9 Phone: (905) 826-3080 Fax: (905) 826-4151 Toll Free: 1 877-726-3080 www.maxxam.ca

Your P.O. #: L1991701

Attention:Christine Paradis

ALS Laboratory Group
Environmental Div.
1081 Barton St.
Thunder Bay, ON
Canada P7B 5N3

Report Date: 2017/09/29
Report #: R4744993
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B7K2765
Received: 2017/09/18, 09:50

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Simona Vatamanescu, Project Manager
Email: SVatamanescu@maxxam.ca
Phone# (905)826-3080

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B7K2765
Report Date: 2017/09/29

ALS Laboratory Group
Your P.O. #: L1991701

RESULTS OF ANALYSES OF WATER

Maxxam ID		FDH376	FDH377	FDH378	FDH379		
Sampling Date		2017/09/13	2017/09/13	2017/09/13	2017/09/13		
	UNITS	**L1991701-1 PINR-EXP**	**L1991701-2 PINR-DUP**	**L1991701-3 STUC-REF**	**L1991701-4 FIELD BLANK**	**RDL**	**QC Batch**
Radium-226	Bq/L	<0.010	<0.010	<0.010	<0.010	0.010	5173929

RDL = Reportable Detection Limit
QC Batch = Quality Control Batch

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Maxxam Job #: B7K2765
Report Date: 2017/09/29

ALS Laboratory Group
Your P.O. #: L1991701

TEST SUMMARY

Maxxam ID: FDH376
Sample ID: L1991701-1 PINR-EXP
Matrix: Water

Collected: 2017/09/13
Shipped:
Received: 2017/09/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Radium Isotopes by Alpha Spectrometry	AS	5173929	N/A	2017/09/27	Faiz Ahmed

Maxxam ID: FDH377
Sample ID: L1991701-2 PINR-DUP
Matrix: Water

Collected: 2017/09/13
Shipped:
Received: 2017/09/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Radium Isotopes by Alpha Spectrometry	AS	5173929	N/A	2017/09/27	Faiz Ahmed

Maxxam ID: FDH378
Sample ID: L1991701-3 STUC-REF
Matrix: Water

Collected: 2017/09/13
Shipped:
Received: 2017/09/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Radium Isotopes by Alpha Spectrometry	AS	5173929	N/A	2017/09/27	Faiz Ahmed

Maxxam ID: FDH379
Sample ID: L1991701-4 FIELD BLANK
Matrix: Water

Collected: 2017/09/13
Shipped:
Received: 2017/09/18

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Radium Isotopes by Alpha Spectrometry	AS	5173929	N/A	2017/09/27	Faiz Ahmed

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Maxxam Job #: B7K2765
Report Date: 2017/09/29

ALS Laboratory Group
Your P.O. #: L1991701

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B7K2765
Report Date: 2017/09/29

ALS Laboratory Group
Your P.O. #: L1991701

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
5173929	FA5	Spiked Blank	Radium-226	2017/09/27		91	%	85 - 115
5173929	FA5	Method Blank	Radium-226	2017/09/27	<0.010		Bq/L	
5173929	FA5	RPD	Radium-226	2017/09/27	NC		%	N/A

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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Maxxam Job #: B7K2765
Report Date: 2017/09/29

ALS Laboratory Group
Your P.O. #: L1991701

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

<Original signed by>

Kurt Headrick, Ph.D., C. Chem., Laboratory Manager

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Chain of Custody (COC) / Analytical Request Form

ALS Environmental

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

L1991701-COFC

COC Number: 15 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Minnow Environmental Inc.
Contact:	Jess Tester
Phone:	905-873-3371
	Company address below will appear on the final report
Street:	2 Lamb Street
City/Province:	Georgetown, ON
Postal Code:	L7G 3M9
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: jtester@minnow.ca

Email 2: kbatchelar@minnow.ca

Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: jtester@minnow.ca

Email 2: kbatchelar@minnow.ca

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4] ☐ | 3 day [P3] ☐ | 2 day [P2] ☐

EMERGENCY: 1 Business day [E1] ☐ | Same Day, Weekend or Statutory holiday [E0] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	Q59584
Job #:	17-12
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#:
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L1991701

ALS Contact: Christine Paradis

Sampler: KB, PS

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Alkalinity, Cl, F, SO4, NO2, NO3 (NO2+NO3) (P)	Total Metals (F/P)	Total Mercury (P)	Dissolved Ca, Mg, Hardness (F/P)	Total Ammonia, Total Phosphorus, TOC	Total Cyanide, WAD Cyanide (P)	TSS, TDS	DOC (F/P)	Radium 226 (P)	Supplies				Number of Containers
	PinR-EXP	13-Sept-17	16:05	Water	x	x	x	x	x	x	x	x	x	x				9
	PinR-DUP	13-Sept-17	16:05	Water	x	x	x	x	x	x	x	x	x					9
	StuC-REF	13-Sept-17	14:09	Water	x	x	x	x	x	x	x	x	x					9
	Field Blank	13-Sept-17	14:09	Water	x	x	x	x	x	x	x	x	x					9
	Trip Blank			Water	x	x	x	x	x	x	x	x	x	KB				

Drinking Water (DW) Samples [1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☑ NO

Are samples for human drinking water use? ☐ YES ☑ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

Do not analyse trip blank. Not needed, returned unopened.

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☑

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
5.9					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Katharina Batchelar	Date: Sept 14/17	Time: 11:00	Received by:	Date: Sept 14/17	Time: 5:15	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System please submit using an Authorized DW COC form

MINNOW ENVIRONMENTAL INC.
ATTN: Jess Tester
2 Lamb Street
Georgetown ON L7G 3M9

Date Received: 19-SEP-17
Report Date: 05-OCT-17 15:03 (MT)
Version: FINAL

Client Phone: 905-873-3371

Certificate of Analysis

Lab Work Order #: L1995196

Project P.O. #: NOT SUBMITTED
Job Reference: 17-13
C of C Numbers:
Legal Site Desc:

Christine Paradis
Project Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-1 PINR-EXP-1 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	81.8		0.10	%	27-SEP-17	27-SEP-17	R3839576
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	8.3		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	60.2		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	31.5		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Silt loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.61	DLHC	0.10	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0785		0.0010	g/g		30-SEP-17	
Total Organic Carbon	7.85		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	16700		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	0.14		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	4.36		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	129		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.62		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	10.4		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.448		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	13700		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	34.8		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	12.1		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	19.3		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	20000		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	8.60		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	18.2		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	7950		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	609		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0630		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	1.02		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	24.8		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	781		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1790		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.56		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	148		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	32.0		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	1700		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.187		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-1 PINR-EXP-1 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Titanium (Ti)	118		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	1.88		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	42.9		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	93.9		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	4.9		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-2 PINR-EXP-2 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	76.5		0.10	%	27-SEP-17	27-SEP-17	R3839576
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	16.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	53.4		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	30.5		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Silt loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.43	DLHC	0.10	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0601		0.0010	g/g		30-SEP-17	
Total Organic Carbon	6.01		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	13900		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	0.19		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	3.75		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	120		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.65		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	11.5		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.323		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	20200		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	36.1		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	10.9		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	16.4		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	18300		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	8.45		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	16.3		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	10100		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	657		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0505		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	1.23		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-2 PINR-EXP-2 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Nickel (Ni)	25.2		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	648		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1600		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.45		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	131		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	36.2		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	1400		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.178		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	149		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	1.49		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	39.8		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	75.8		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	5.3		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-3 PINR-EXP-3 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	85.5		0.10	%	27-SEP-17	27-SEP-17	R3839576
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	2.4		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	69.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	28.6		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Silt loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.69	DLHC	0.20	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0897		0.0010	g/g		30-SEP-17	
Total Organic Carbon	8.97		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	14100		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	0.16		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	4.83		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	111		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.56		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	10.8		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.401		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	18500		50	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-3 PINR-EXP-3 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Chromium (Cr)	33.8		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	11.2		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	17.5		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	18400		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	7.65		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	17.7		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	10400		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	438		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0587		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	1.44		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	25.0		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	777		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1760		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.62		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	171		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	37.6		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	2400		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.177		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	138		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	2.07		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	40.5		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	88.9		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	3.7		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-4 PINR-EXP-4 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	53.5		0.10	%	27-SEP-17	27-SEP-17	R3839576
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	30.8		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	44.6		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	24.6		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.243	DLHC	0.040	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0346		0.0010	g/g		30-SEP-17	
Total Organic Carbon	3.46		0.050	%		30-SEP-17	

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-4 PINR-EXP-4 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Organic / Inorganic Carbon							
Metals							
Aluminum (Al)	9350		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	0.11		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	2.23		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	61.2		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.44		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	7.1		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.200		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	11600		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	21.2		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	6.65		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	9.83		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	12600		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	6.25		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	12.2		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	6770		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	315		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0490		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	0.35		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	14.9		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	496		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1040		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.34		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	96		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	21.7		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	<1000		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.122		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	137		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	1.09		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	25.0		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	50.1		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	4.7		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-5 PINR-EXP-5 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	72.6		0.10	%	27-SEP-17	27-SEP-17	R3839576
Particle Size							

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-5 PINR-EXP-5 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	10.7		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	64.7		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	24.6		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Silt loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.64	DLHC	0.20	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0939		0.0010	g/g		30-SEP-17	
Total Organic Carbon	9.39		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	12500		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	0.15		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	2.85		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	93.0		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.52		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	7.8		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.364		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	10200		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	27.1		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	7.30		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	13.3		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	15300		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	7.67		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	13.8		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	4830		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	362		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0539		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	0.76		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	18.8		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	676		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1280		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.53		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	113		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	31.5		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	1600		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.135		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	97.6		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-5 PINR-EXP-5 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Uranium (U)	2.07		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	34.0		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	63.7		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	4.9		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-6 PINR-EXP-4X Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	59.6		0.10	%	27-SEP-17	27-SEP-17	R3839576
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	32.4		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	40.9		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	26.7		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.226	DLHC	0.040	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0326		0.0010	g/g		30-SEP-17	
Total Organic Carbon	3.26		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	9590		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	2.11		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	61.6		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.40		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	6.0		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.187		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	9080		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	21.1		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	6.52		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	9.62		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	12500		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	5.81		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	11.7		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	6100		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	303		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0328		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	0.29		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	14.9		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	469		50	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-6 PINR-EXP-4X Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Potassium (K)	1060		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.28		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	84		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	19.6		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	<1000		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.110		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	128		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	0.970		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	25.5		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	48.3		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	4.4		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-7 STUC-REF-1 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	62.5		0.10	%	27-SEP-17	27-SEP-17	R3839576
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	27.3		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	41.7		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	31.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Clay loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.239	DLHC	0.040	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0319		0.0010	g/g		30-SEP-17	
Total Organic Carbon	3.19		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	11900		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	2.47		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	71.4		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.45		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	7.6		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.242		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	6330		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	27.0		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	8.90		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-7 STUC-REF-1 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Copper (Cu)	9.82		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	13500		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	6.24		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	14.0		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	4880		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	319		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0389		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	0.51		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	16.9		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	493		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1440		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.27		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	88		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	23.4		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	<1000		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.135		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	155		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	1.36		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	32.4		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	61.2		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	5.1		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-8 STUC-REF-2 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	65.0		0.10	%	27-SEP-17	27-SEP-17	R3839576
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	11.9		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	50.5		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	37.6		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Silty clay loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.32	DLHC	0.10	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0401		0.0010	g/g		30-SEP-17	
Total Organic Carbon	4.01		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	15000		50	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-8 STUC-REF-2 Sampled By: KB/PS on 14-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Antimony (Sb)	0.11		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	2.87		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	98.6		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.56		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	8.7		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.322		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	7330		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	37.9		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	10.6		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	12.7		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	17000		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	7.96		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	19.1		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	5670		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	374		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0510		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	1.05		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	23.4		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	554		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1780		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.38		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	103		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	26.0		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	1100		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.166		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	152		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	1.80		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	40.2		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	79.0		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	6.6		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-9 STUC-REF-3 Sampled By: KB/PS on 15-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	51.5		0.10	%	27-SEP-17	27-SEP-17	R3839576
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	30.9		1.0	%	28-SEP-17	29-SEP-17	R3841635

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-9 STUC-REF-3 Sampled By: KB/PS on 15-SEP-17 @ 00:01 Matrix: Sediment							
Particle Size							
% Silt (0.063mm - 4um)	36.9		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	32.2		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Loam / Clay loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.197		0.020	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0278		0.0010	g/g		30-SEP-17	
Total Organic Carbon	2.78		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	11800		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	2.13		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	68.4		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.51		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	7.8		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.213		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	6670		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	27.3		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	8.77		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	9.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	13200		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	7.23		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	14.7		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	4660		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	264		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0407		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	0.54		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	16.5		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	471		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1380		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.27		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	85		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	23.7		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	<1000		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.156		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	162		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	1.56		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	31.8		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-9 STUC-REF-3 Sampled By: KB/PS on 15-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Zinc (Zn)	59.2		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	6.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-10 STUC-REF-4 Sampled By: KB/PS on 15-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	75.5		0.10	%	29-SEP-17	29-SEP-17	R3841080
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	6.8		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	51.9		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	41.3		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Silty clay loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.39	DLHC	0.10	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0549		0.0010	g/g		30-SEP-17	
Total Organic Carbon	5.49		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	15300		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	0.13		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	3.34		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	106		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.62		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	9.5		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.388		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	7960		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	43.8		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	11.8		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	14.4		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	18000		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lead (Pb)	9.15		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	18.8		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	6000		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	431		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0613		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	1.48		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	26.8		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	571		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1960		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.48		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-10 STUC-REF-4 Sampled By: KB/PS on 15-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	111		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	30.5		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	1400		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.186		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	148		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	2.19		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	44.1		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	91.2		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	7.3		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
L1995196-11 STUC-REF-5 Sampled By: KB/PS on 15-SEP-17 @ 00:01 Matrix: Sediment							
Physical Tests							
% Moisture	59.0		0.10	%	29-SEP-17	29-SEP-17	R3841080
Particle Size							
% Gravel (>2mm)	<1.0		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Sand (2.0mm - 0.063mm)	22.3		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Silt (0.063mm - 4um)	42.8		1.0	%	28-SEP-17	29-SEP-17	R3841635
% Clay (<4um)	34.8		1.0	%	28-SEP-17	29-SEP-17	R3841635
Texture	Clay loam				28-SEP-17	29-SEP-17	R3841635
Leachable Anions & Nutrients							
Total Kjeldahl Nitrogen	0.234	DLHC	0.040	%	02-OCT-17	03-OCT-17	R3845492
Organic / Inorganic Carbon							
FOC	0.0318		0.0010	g/g		30-SEP-17	
Total Organic Carbon	3.18		0.050	%		30-SEP-17	
Metals							
Aluminum (Al)	14100		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Antimony (Sb)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Arsenic (As)	2.32		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Barium (Ba)	90.0		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Beryllium (Be)	0.53		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Bismuth (Bi)	<0.20		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Boron (B)	7.6		5.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cadmium (Cd)	0.201		0.020	mg/kg	28-SEP-17	29-SEP-17	R3841942
Calcium (Ca)	6470		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Chromium (Cr)	33.1		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Cobalt (Co)	9.27		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Copper (Cu)	11.4		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Iron (Fe)	16000		50	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

Sample Details/Parameters	Result	Qualifier*	D.L.	Units	Extracted	Analyzed	Batch
L1995196-11 STUC-REF-5 Sampled By: KB/PS on 15-SEP-17 @ 00:01 Matrix: Sediment							
Metals							
Lead (Pb)	7.43		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Lithium (Li)	16.4		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Magnesium (Mg)	5260		20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Manganese (Mn)	343		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Mercury (Hg)	0.0482		0.0050	mg/kg	28-SEP-17	28-SEP-17	R3840575
Molybdenum (Mo)	0.63		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Nickel (Ni)	19.8		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Phosphorus (P)	508		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Potassium (K)	1610		100	mg/kg	28-SEP-17	29-SEP-17	R3841942
Selenium (Se)	0.34		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Silver (Ag)	<0.10		0.10	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sodium (Na)	95		50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Strontium (Sr)	23.2		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Sulfur (S)	<1000		1000	mg/kg	28-SEP-17	29-SEP-17	R3841942
Thallium (Tl)	0.154		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tin (Sn)	<1.0		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Titanium (Ti)	145		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Tungsten (W)	<0.50		0.50	mg/kg	28-SEP-17	29-SEP-17	R3841942
Uranium (U)	1.55		0.050	mg/kg	28-SEP-17	29-SEP-17	R3841942
Vanadium (V)	36.6		0.20	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zinc (Zn)	67.3		2.0	mg/kg	28-SEP-17	29-SEP-17	R3841942
Zirconium (Zr)	5.1		1.0	mg/kg	28-SEP-17	29-SEP-17	R3841942

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier key listed:

Qualifier	Description
DLHC	Detection Limit Raised: Dilution required due to high concentration of test analyte(s).

Test Method References:

ALS Test Code	Matrix	Test Description	Method Reference**
C-TIC-PCT-SK	Soil	Total Inorganic Carbon in Soil	CSSS (2008) P216-217
A known quantity of acetic acid is consumed by reaction with carbonates in the soil. The pH of the resulting solution is measured and compared against a standard curve relating pH to weight of carbonate.			
C-TOC-CALC-SK	Soil	Total Organic Carbon Calculation	CSSS (2008) 21.2
Total Organic Carbon (TOC) is calculated by the difference between total carbon (TC) and total inorganic carbon. (TIC)			
C-TOT-LECO-SK	Soil	Total Carbon by combustion method	CSSS (2008) 21.2
The sample is ignited in a combustion analyzer where carbon in the reduced CO2 gas is determined using a thermal conductivity detector.			
FOC-CALC-SK	Soil	Fraction of Organic Carbon - Calculation	AUTO CALCULATION
HG-200.2-CVAA-SK	Soil	Mercury in Soil by CVAAS	EPA 200.2/1631E (mod)
Soil samples are digested with nitric and hydrochloric acids, followed by analysis by CVAAS.			
IC-CACO3-CALC-SK	Soil	Inorganic Carbon as CaCO3 Equivalent	Calculation
MET-200.2-CCMS-SK	Soil	Metals in Soil by CRC ICPMS	EPA 200.2/6020A (mod)
This method uses a heated strong acid digestion with HNO3 and HCl and is intended to liberate metals that may be environmentally available. Silicate minerals are not solubilized. Dependent on sample matrix, some metals may be only partially recovered, including Al, Ba, Be, Cr, Sr, Ti, Tl, V, W, and Zr. Volatile forms of sulfur (including sulfide) may not be captured, as they may be lost during sampling, storage, or digestion. Analysis is by Collision/Reaction Cell ICPMS.			
MOIST-SK	Soil	Moisture Content	ASTM D2216-80
The weighed portion of soil is placed in a 105°C oven overnight. The dried soil is allowed to cooled to room temperature, weighed and the % moisture is calculated.			
N-TOTKJ-COL-SK	Soil	Total Kjeldahl Nitrogen	CSSS (2008) 22.2.3
The soil is digested with sulfuric acid in the presence of CuSO4 and K2SO4 catalysts. Ammonia in the soil extract is determined colrimetrically at 660 nm.			
PSA-PIPET+GRAVEL-SK	Soil	Particle size - Sieve and Pipette	SSIR-51 METHOD 3.2.1
Particle size distribution is determined by a combination of techniques. Dry sieving is performed for coarse particles, wet sieving for sand particles and the pipette sedimentation method for clay particles.			

Reference:

Burt, R. (2009). Soil Survey Field and Laboratory Methods Manual. Soil Survey Investigations Report No. 5. Method 3.2.1.2.2. United States Department of Agriculture Natural Resources Conservation Service.

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

Laboratory Definition Code	Laboratory Location
SK	ALS ENVIRONMENTAL - SASKATOON, SASKATCHEWAN, CANADA

Chain of Custody Numbers:

Reference Information

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.
mg/kg - milligrams per kilogram based on dry weight of sample
mg/kg wwt - milligrams per kilogram based on wet weight of sample
mg/kg lwt - milligrams per kilogram based on lipid weight of sample
mg/L - unit of concentration based on volume, parts per million.
< - Less than.
D.L. - The reporting limit.
N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.
Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.

Quality Control Report

Workorder: L1995196 Report Date: 05-OCT-17

Client: MINNOW ENVIRONMENTAL INC.
2 Lamb Street
Georgetown ON L7G 3M9
Contact: Jess Tester

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
C-TIC-PCT-SK	**Soil**							
Batch R3840401								
WG2624822-2 LCS								
Inorganic Carbon			98.1		%		80-120	28-SEP-17
WG2624822-3 MB								
Inorganic Carbon			<0.050		%		0.05	28-SEP-17
Batch R3841822								
WG2624824-2 LCS								
Inorganic Carbon			98.9		%		80-120	30-SEP-17
WG2624824-3 MB								
Inorganic Carbon			<0.050		%		0.05	30-SEP-17
C-TOT-LECO-SK	**Soil**							
Batch R3841699								
WG2625479-1 DUP		**L1995196-1**						
Total Carbon by Combustion		8.19	8.23		%	0.5	20	28-SEP-17
WG2625479-2 IRM		**08-109_SOIL**						
Total Carbon by Combustion			100.2		%		80-120	28-SEP-17
WG2625479-3 MB								
Total Carbon by Combustion			<0.05		%		0.05	28-SEP-17
HG-200.2-CVAA-SK	**Soil**							
Batch R3840575								
WG2627376-3 CRM		**TILL-1**						
Mercury (Hg)			99.2		%		70-130	28-SEP-17
WG2627376-2 DUP		**L1995196-7**						
Mercury (Hg)		0.0389	0.0414		mg/kg	6.0	40	28-SEP-17
WG2627376-4 LCS								
Mercury (Hg)			108.7		%		80-120	28-SEP-17
WG2627376-1 MB								
Mercury (Hg)			<0.0050		mg/kg		0.005	28-SEP-17
MET-200.2-CCMS-SK	**Soil**							
Batch R3841942								
WG2627376-3 CRM		**TILL-1**						
Aluminum (Al)			100.2		%		70-130	29-SEP-17
Antimony (Sb)			96.0		%		70-130	29-SEP-17
Arsenic (As)			98.2		%		70-130	29-SEP-17
Barium (Ba)			107.6		%		70-130	29-SEP-17
Beryllium (Be)			106.0		%		70-130	29-SEP-17
Boron (B)			3.7		mg/kg		0-8.2	29-SEP-17
Bismuth (Bi)			91.2		%		70-130	29-SEP-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R3841942								
WG2627376-3 CRM		**TILL-1**						
Cadmium (Cd)			92.2		%		70-130	29-SEP-17
Calcium (Ca)			98.0		%		70-130	29-SEP-17
Chromium (Cr)			96.0		%		70-130	29-SEP-17
Cobalt (Co)			99.0		%		70-130	29-SEP-17
Copper (Cu)			99.2		%		70-130	29-SEP-17
Iron (Fe)			102.3		%		70-130	29-SEP-17
Lead (Pb)			92.6		%		70-130	29-SEP-17
Lithium (Li)			103.6		%		70-130	29-SEP-17
Magnesium (Mg)			96.6		%		70-130	29-SEP-17
Manganese (Mn)			99.7		%		70-130	29-SEP-17
Molybdenum (Mo)			97.2		%		70-130	29-SEP-17
Nickel (Ni)			97.7		%		70-130	29-SEP-17
Phosphorus (P)			98.5		%		70-130	29-SEP-17
Potassium (K)			88.0		%		70-130	29-SEP-17
Selenium (Se)			0.31		mg/kg		0.11-0.51	29-SEP-17
Silver (Ag)			0.21		mg/kg		0.13-0.33	29-SEP-17
Sodium (Na)			88.8		%		70-130	29-SEP-17
Strontium (Sr)			95.5		%		70-130	29-SEP-17
Thallium (Tl)			0.110		mg/kg		0.077-0.18	29-SEP-17
Tin (Sn)			1.2		mg/kg		0-3.1	29-SEP-17
Titanium (Ti)			96.7		%		70-130	29-SEP-17
Tungsten (W)			0.18		mg/kg		0-0.66	29-SEP-17
Uranium (U)			85.9		%		70-130	29-SEP-17
Vanadium (V)			95.3		%		70-130	29-SEP-17
Zinc (Zn)			100.0		%		70-130	29-SEP-17
Zirconium (Zr)			0.8		mg/kg		0-1.8	29-SEP-17
WG2627376-2 DUP		**L1995196-7**						
Aluminum (Al)		11900	11900		mg/kg	0.2	40	29-SEP-17
Antimony (Sb)		<0.10	<0.10	RPD-NA	mg/kg	N/A	30	29-SEP-17
Arsenic (As)		2.47	2.42		mg/kg	2.0	30	29-SEP-17
Barium (Ba)		71.4	74.0		mg/kg	3.7	40	29-SEP-17
Beryllium (Be)		0.45	0.46		mg/kg	3.2	30	29-SEP-17
Boron (B)		7.6	7.5		mg/kg	1.6	30	29-SEP-17
Bismuth (Bi)		<0.20	<0.20	RPD-NA	mg/kg	N/A	30	29-SEP-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R3841942								
WG2627376-2 DUP		**L1995196-7**						
Cadmium (Cd)		0.242	0.244		mg/kg	1.0	30	29-SEP-17
Calcium (Ca)		6330	6200		mg/kg	2.1	30	29-SEP-17
Chromium (Cr)		27.0	27.2		mg/kg	1.1	30	29-SEP-17
Cobalt (Co)		8.90	8.94		mg/kg	0.4	30	29-SEP-17
Copper (Cu)		9.82	9.82		mg/kg	0.0	30	29-SEP-17
Iron (Fe)		13500	13900		mg/kg	3.0	30	29-SEP-17
Lead (Pb)		6.24	6.66		mg/kg	6.5	40	29-SEP-17
Lithium (Li)		14.0	14.2		mg/kg	1.5	30	29-SEP-17
Magnesium (Mg)		4880	4720		mg/kg	3.3	30	29-SEP-17
Manganese (Mn)		319	309		mg/kg	3.1	30	29-SEP-17
Molybdenum (Mo)		0.51	0.52		mg/kg	2.3	40	29-SEP-17
Nickel (Ni)		16.9	17.5		mg/kg	3.4	30	29-SEP-17
Phosphorus (P)		493	458		mg/kg	7.3	30	29-SEP-17
Potassium (K)		1440	1470		mg/kg	1.7	40	29-SEP-17
Selenium (Se)		0.27	0.32		mg/kg	15	30	29-SEP-17
Silver (Ag)		<0.10	<0.10	RPD-NA	mg/kg	N/A	40	29-SEP-17
Sodium (Na)		88	88		mg/kg	0.4	40	29-SEP-17
Strontium (Sr)		23.4	22.6		mg/kg	3.4	40	29-SEP-17
Sulfur (S)		<1000	<1000	RPD-NA	mg/kg	N/A	30	29-SEP-17
Thallium (Tl)		0.135	0.143		mg/kg	5.7	30	29-SEP-17
Tin (Sn)		<1.0	<1.0	RPD-NA	mg/kg	N/A	40	29-SEP-17
Titanium (Ti)		155	160		mg/kg	2.9	40	29-SEP-17
Tungsten (W)		<0.50	<0.50	RPD-NA	mg/kg	N/A	30	29-SEP-17
Uranium (U)		1.36	1.48		mg/kg	8.2	30	29-SEP-17
Vanadium (V)		32.4	33.1		mg/kg	2.1	30	29-SEP-17
Zinc (Zn)		61.2	62.2		mg/kg	1.6	30	29-SEP-17
Zirconium (Zr)		5.1	5.4		mg/kg	5.4	30	29-SEP-17
WG2627376-4 LCS								
Aluminum (Al)			98.1		%		80-120	29-SEP-17
Antimony (Sb)			95.0		%		80-120	29-SEP-17
Arsenic (As)			97.4		%		80-120	29-SEP-17
Barium (Ba)			102.5		%		80-120	29-SEP-17
Beryllium (Be)			100.1		%		80-120	29-SEP-17
Boron (B)			96.1		%		80-120	29-SEP-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R3841942								
WG2627376-4 LCS								
Bismuth (Bi)			93.7		%		80-120	29-SEP-17
Cadmium (Cd)			94.7		%		80-120	29-SEP-17
Calcium (Ca)			98.2		%		80-120	29-SEP-17
Chromium (Cr)			94.7		%		80-120	29-SEP-17
Cobalt (Co)			96.1		%		80-120	29-SEP-17
Copper (Cu)			93.2		%		80-120	29-SEP-17
Iron (Fe)			96.9		%		80-120	29-SEP-17
Lead (Pb)			92.1		%		80-120	29-SEP-17
Lithium (Li)			109.1		%		80-120	29-SEP-17
Magnesium (Mg)			94.3		%		80-120	29-SEP-17
Manganese (Mn)			97.6		%		80-120	29-SEP-17
Molybdenum (Mo)			96.7		%		80-120	29-SEP-17
Nickel (Ni)			94.9		%		80-120	29-SEP-17
Phosphorus (P)			109.2		%		80-120	29-SEP-17
Potassium (K)			101.8		%		80-120	29-SEP-17
Selenium (Se)			98.9		%		80-120	29-SEP-17
Silver (Ag)			98.1		%		80-120	29-SEP-17
Sodium (Na)			91.8		%		80-120	29-SEP-17
Strontium (Sr)			106.7		%		80-120	29-SEP-17
Sulfur (S)			96.8		%		80-120	29-SEP-17
Thallium (Tl)			91.9		%		80-120	29-SEP-17
Tin (Sn)			94.9		%		80-120	29-SEP-17
Titanium (Ti)			99.5		%		80-120	29-SEP-17
Tungsten (W)			91.3		%		80-120	29-SEP-17
Uranium (U)			94.2		%		80-120	29-SEP-17
Vanadium (V)			97.0		%		80-120	29-SEP-17
Zinc (Zn)			93.6		%		80-120	29-SEP-17
Zirconium (Zr)			96.6		%		80-120	29-SEP-17
WG2627376-1 MB								
Aluminum (Al)			<50		mg/kg		50	29-SEP-17
Antimony (Sb)			<0.10		mg/kg		0.1	29-SEP-17
Arsenic (As)			<0.10		mg/kg		0.1	29-SEP-17
Barium (Ba)			<0.50		mg/kg		0.5	29-SEP-17
Beryllium (Be)			<0.10		mg/kg		0.1	29-SEP-17

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MET-200.2-CCMS-SK	**Soil**							
Batch R3841942								
WG2627376-1 MB								
Boron (B)			<5.0		mg/kg		5	29-SEP-17
Bismuth (Bi)			<0.20		mg/kg		0.2	29-SEP-17
Cadmium (Cd)			<0.020		mg/kg		0.02	29-SEP-17
Calcium (Ca)			<50		mg/kg		50	29-SEP-17
Chromium (Cr)			<0.50		mg/kg		0.5	29-SEP-17
Cobalt (Co)			<0.10		mg/kg		0.1	29-SEP-17
Copper (Cu)			<0.50		mg/kg		0.5	29-SEP-17
Iron (Fe)			<50		mg/kg		50	29-SEP-17
Lead (Pb)			<0.50		mg/kg		0.5	29-SEP-17
Lithium (Li)			<2.0		mg/kg		2	29-SEP-17
Magnesium (Mg)			<20		mg/kg		20	29-SEP-17
Manganese (Mn)			<1.0		mg/kg		1	29-SEP-17
Molybdenum (Mo)			<0.10		mg/kg		0.1	29-SEP-17
Nickel (Ni)			<0.50		mg/kg		0.5	29-SEP-17
Phosphorus (P)			<50		mg/kg		50	29-SEP-17
Potassium (K)			<100		mg/kg		100	29-SEP-17
Selenium (Se)			<0.20		mg/kg		0.2	29-SEP-17
Silver (Ag)			<0.10		mg/kg		0.1	29-SEP-17
Sodium (Na)			<50		mg/kg		50	29-SEP-17
Strontium (Sr)			<0.50		mg/kg		0.5	29-SEP-17
Sulfur (S)			<1000		mg/kg		1000	29-SEP-17
Thallium (Tl)			<0.050		mg/kg		0.05	29-SEP-17
Tin (Sn)			<1.0		mg/kg		1	29-SEP-17
Titanium (Ti)			<1.0		mg/kg		1	29-SEP-17
Tungsten (W)			<0.50		mg/kg		0.5	29-SEP-17
Uranium (U)			<0.050		mg/kg		0.05	29-SEP-17
Vanadium (V)			<0.20		mg/kg		0.2	29-SEP-17
Zinc (Zn)			<2.0		mg/kg		2	29-SEP-17
Zirconium (Zr)			<1.0		mg/kg		1	29-SEP-17
MOIST-SK	**Soil**							
Batch R3839576								
WG2623587-1 DUP		**L1995196-3**						
% Moisture		85.5	85.3		%	0.2	20	27-SEP-17
WG2623587-3 LCS								

Quality Control Report

Test	Matrix	Reference	Result	Qualifier	Units	RPD	Limit	Analyzed
MOIST-SK	**Soil**							
Batch R3839576								
WG2623587-3 LCS								
% Moisture			103.1		%		90-110	27-SEP-17
WG2623587-2 MB								
% Moisture			<0.10		%		0.1	27-SEP-17
Batch R3841080								
WG2626810-3 LCS								
% Moisture			99.3		%		90-110	29-SEP-17
WG2626810-2 MB								
% Moisture			<0.10		%		0.1	29-SEP-17
N-TOTKJ-COL-SK	**Soil**							
Batch R3845492								
WG2624238-2 IRM		**08-109_SOIL**						
Total Kjeldahl Nitrogen			95.1		%		80-120	03-OCT-17
WG2624238-3 MB								
Total Kjeldahl Nitrogen			<0.020		%		0.02	03-OCT-17
PSA-PIPET+GRAVEL-SK	**Soil**							
Batch R3841635								
WG2623164-2 IRM		**2017-PSA**						
% Sand (2.0mm - 0.063mm)			45.0		%		39.1-49.1	29-SEP-17
% Silt (0.063mm - 4um)			36.6		%		32.5-42.5	29-SEP-17
% Clay (<4um)			18.4		%		13.4-23.4	29-SEP-17

Legend:

Limit	ALS Control Limit (Data Quality Objectives)
DUP	Duplicate
RPD	Relative Percent Difference
N/A	Not Available
LCS	Laboratory Control Sample
SRM	Standard Reference Material
MS	Matrix Spike
MSD	Matrix Spike Duplicate
ADE	Average Desorption Efficiency
MB	Method Blank
IRM	Internal Reference Material
CRM	Certified Reference Material
CCV	Continuing Calibration Verification
CVS	Calibration Verification Standard
LCSD	Laboratory Control Sample Duplicate

Sample Parameter Qualifier Definitions:

Qualifier	Description
RPD-NA	Relative Percent Difference Not Available due to result(s) being less than detection limit.

Hold Time Exceedances:

All test results reported with this submission were conducted within ALS recommended hold times.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.

Chain of Custody (COC) / Analytical Request Form

ALS Environmental

Canada Toll Free: 1 800 668 9878

www.alsglobal.com

L1995196-COFC

COC Number: 15 -

Page 1 of 1

Report To	Contact and company name below will appear on the final report
Company:	Minnow Environmental Inc.
Contact:	Katharina Batchelar
Phone:	250-595-1627
	Company address below will appear on the final report
Street:	101-1025 Hillside Avenue
City/Province:	Victoria, BC
Postal Code:	V8T 2A2
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)

Quality Control (QC) Report with Report ☑ YES ☐ NO

☐ Compare Results to Criteria on Report - provide details below if box checked

Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: kbatchelar@minnow.ca

Email 2: jtester@minnow.ca

Email 3:

Invoice Distribution

Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX

Email 1 or Fax: kbatchelar@minnow.ca

Email 2: jtester@minnow.ca

Select Service Level Below - Please confirm all E&P TATs with your AM - surcharges will apply

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days)		EMERGENCY	
	4 day [P4] ☐		1 Business day [E1] ☐
	3 day [P3] ☐		Same Day, Weekend or Statutory holiday [E0] ☐
	2 day [P2] ☐		

Date and Time Required for all E&P TATs:

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	Q62002
Job #:	17-13
PO / AFE:	
LSD:	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	

ALS Lab Work Order # (lab use only): L1995196

ALS Contact: Selam Worku Sampler: KB, PS

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	HG-200.2-CVAA-WT (Hg in Soil)	MET-200.2-CCMS-WT (Metals in Soil)	MOISTURE-WT (% Moisture)	N-TOTKJ-COL-SK (Total Kjeldahl Nitrogen)	PSA-PIPET+GRAVEL-SK (Particle Size)	TOC-WT (TOC and FOC in Solids)	Number of Containers
	PinR-EXP-1	14-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	PinR-EXP-2	14-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	PinR-EXP-3	14-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	PinR-EXP-4	14-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	PinR-EXP-5	14-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	PinR-EXP-4X	14-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	StuC-Ref-1	14-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	StuC-Ref-2	14-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	StuC-Ref-3	15-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	StuC-Ref-4	15-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
	StuC-Ref-5	15-Sept-17	—	Sediment	✓	✓	✓	✓	✓	✓	1
				Sediment							

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ YES ☐ NO

Are samples for human drinking water use? ☐ YES ☐ NO

Special Instructions / Specify Criteria to add on report by clicking on the drop-down list below (electronic COC only)

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐

Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐

Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		
4.9					

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
Released by: Batchelar	Date: 18-Sept-17	Time: 11:00	Received by: CS	Date: 09/19/17	Time: 15:20	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

OCTOBER 2015 FRONT

Please print clearly and legibly. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

[1] Drinking water samples must be submitted on an Authorized DW COC form.

APPENDIX D
BENTHIC INVERTEBRATE COMMUNITY DATA

Laboratory Reports

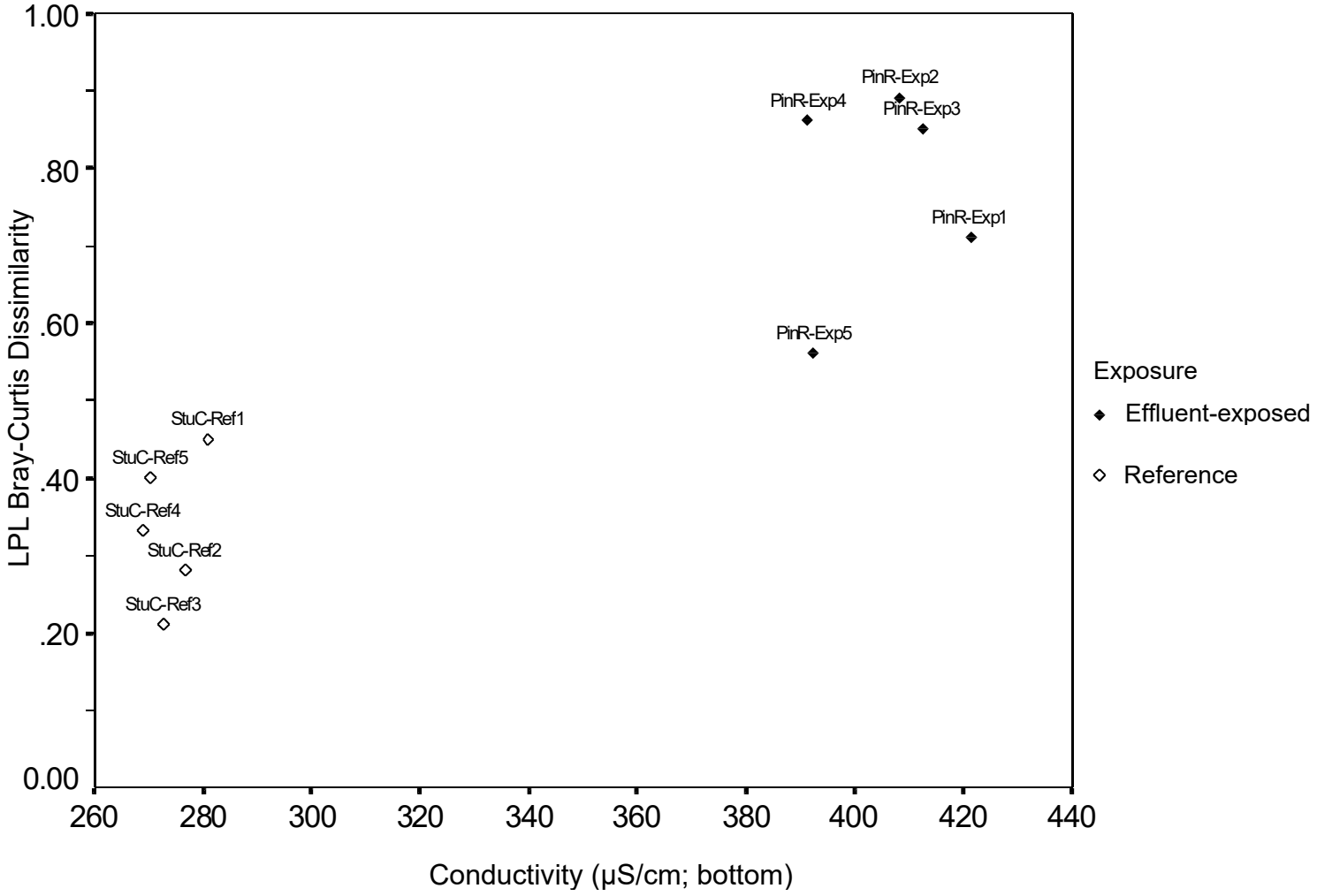


Figure D.1a: Benthic Metrics and Supporting Measures at RRP Stations, 2017

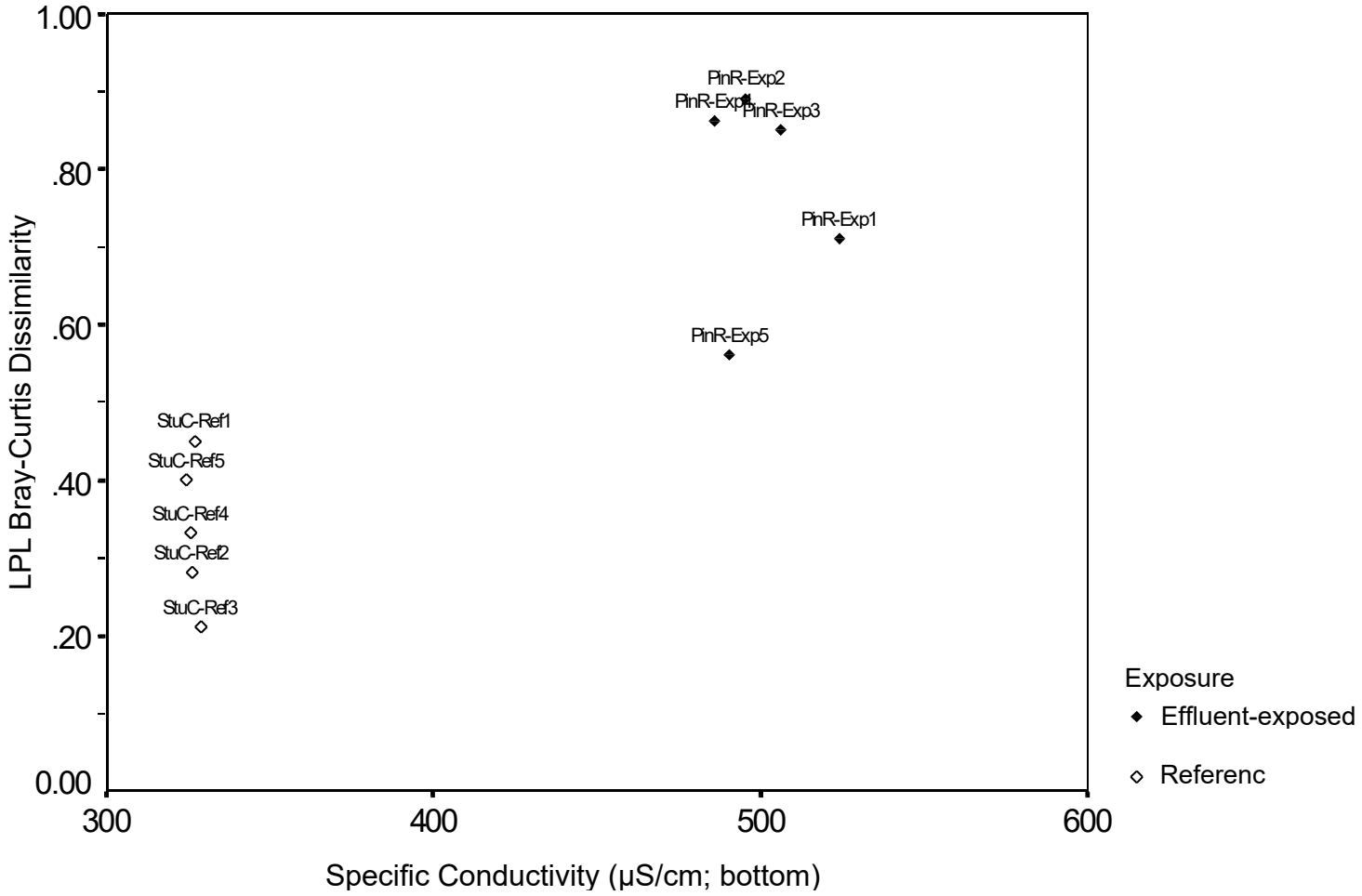


Figure D.1b: Benthic Metrics and Supporting Measures at RRP Stations, 2017

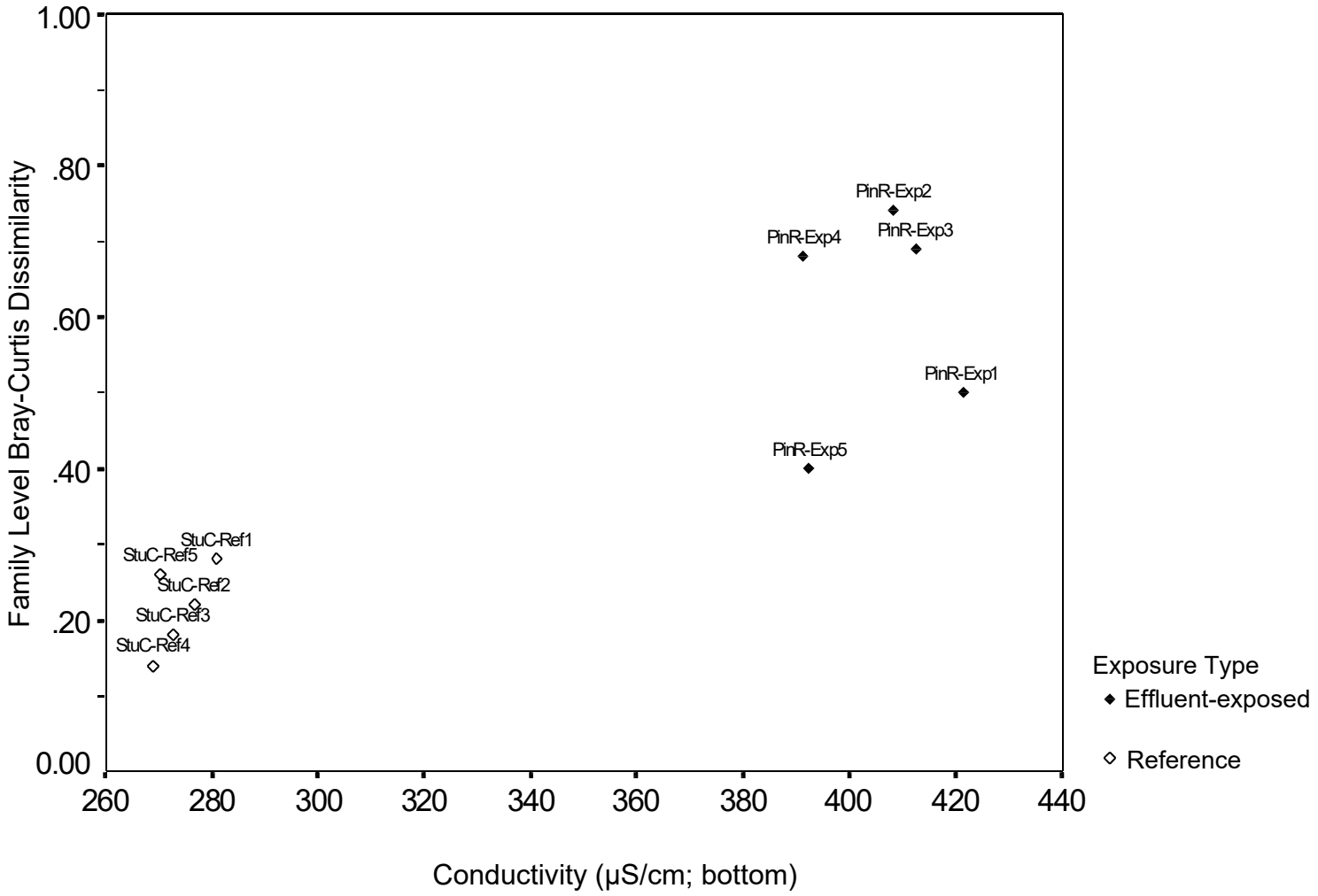


Figure D.1c: Benthic Metrics and Supporting Measures at RRP Stations, 2017

Table D.1: Latitudes and Longitudes of Benthic Invertebrate Sampling Stations, RRP Phase 1 EEM, 2017

Study Area	Station ID	Date Sampled	Latitude (dd mm ss.s)[a]	Longitude (dd mm ss.s)[a]
Sturgeon Creek (Reference)	StuC-REF1	14-Sep-17	48 43 18.8	-93 57 25.6
	StuC-REF2	14-Sep-17	48 43 19.1	-93 57 27.8
	StuC-REF3	15-Sep-17	48 43 17.9	-93 57 31.3
	StuC-REF4	15-Sep-17	48 43 17.3	-93 57 36.9
	StuC-REF5	15-Sep-17	48 43 16.2	-93 57 37.5
Pinewood River (Effluent-exposed)	PinR-EXP1	14-Sep-17	48 49 48.0	-94 03 48.1
	PinR-EXP2	14-Sep-17	48 49 48.3	-94 03 49.2
	PinR-EXP3	14-Sep-17	48 49 48.0	-94 03 48.1
	PinR-EXP4	14-Sep-17	48 49 47.5	-94 03 49.9
	PinR-EXP5	14-Sep-17	48 49 46.5	-94 03 50.4

[a] d-degrees, m-minutes, s-seconds
Note: Map Datum (NAD) 83

Table D.2: Number of Invertebrates per m^2, RRP Phase 1 EEM, 2017

Station	StuC-Ref					PinR-Exp				
Replicate	1	2	3	4	5	1	2	3	4	5
ROUNDWORMS										
P. Nemata	459	574	344	459	2,755	918	3,902	230	230	230
ANNELIDS										
P. Annelida										
WORMS										
Cl. Oligochaeta										
F. Naididae										
S.F. Naidinae										
Dero digitata	0	0	115	230	0	230	689	0	0	0
Dero nivea	459	0	0	0	0	0	0	0	0	0
Nais alpina/simplex	0	230	0	0	230	0	0	0	0	0
S.F. Tubificinae										
Aulodrilus pigueti	0	0	0	689	0	0	689	0	0	0
Limnodrilus udekemianus	230	1,263	115	0	2,984	0	4,132	230	1,377	344
immatures with hair chaetae	0	115	0	0	459	0	0	0	0	0
immatures without hair chaetae	230	230	0	459	689	0	8,264	0	0	344
LEECHES										
Cl. Hirudinea										
F. Glossiphoniidae										
Glossiphonia complanata	0	115	0	0	0	0	0	0	0	0
ARTHROPODS										
P. Arthropoda										
MITES										
Cl. Arachnida										
Subcl. Acari	0	0	0	0	0	0	230	0	0	0
O. Trombidiformes										
F. Arrenuridae										
Arrenurus	0	0	0	0	0	0	0	230	0	0
F. Limnesiidae										
Limnesia	0	115	115	0	230	0	0	0	0	0
F. Oxidae										
Oxus	0	0	115	0	0	0	0	0	0	0
F. Pionidae										
indeterminate	230	115	0	0	0	0	0	0	0	0
F. Unionicolidae										
Neumania	0	115	115	0	0	0	0	0	0	0
Unionicola	0	0	0	0	230	0	0	0	0	0
HARPACTICOIDS										
O. Harpacticoida	689	0	0	689	459	0	0	0	0	0
SEED SHRIMPS										
Cl. Ostracoda	230	0	0	230	0	918	230	0	0	115
INSECTS										
Cl. Insecta										
MAYFLIES										
O. Ephemeroptera										
F. Caenidae										
Caenis	0	115	0	0	0	0	0	230	0	0
O. Odonata										
DRAGONFLIES										
F. Corduliidae										
Epitheca	0	0	0	0	0	0	14	0	0	0
CADDISFLIES										
O. Trichoptera										
F. Hydroptilidae										
Oxyethira	0	0	115	0	0	0	0	0	0	0
TRUE FLIES										
O. Diptera										
BITING-MIDGE										
F. Ceratopogonidae										
Bezzia	0	0	0	0	0	230	0	230	0	0
Dasyhelea	0	0	0	0	0	0	230	230	0	0
Sphaeromias	0	0	0	0	230	0	0	0	0	0
pupae	0	0	0	0	0	0	0	0	0	115

Table D.2: Number of Invertebrates per m^2, RRP Phase 1 EEM, 2017

Station	StuC-Ref					PinR-Exp				
Replicate	1	2	3	4	5	1	2	3	4	5
PHANTOM MIDGE										
F. Chaoboridae										
Chaoborus flavicans	0	115	0	0	0	0	0	230	0	0
Chaoborus punctipennis	1,148	3,214	2,410	2,066	2,755	0	0	0	0	574
MIDGES										
F. Chironomidae										
chironomid pupae	0	0	0	0	0	230	0	0	0	0
S.F. Chironominae										
Chironomus	0	230	0	689	918	918	0	689	230	1,033
Cladopelma	0	0	230	0	230	0	0	0	0	0
Dicrotendipes	0	0	0	0	0	1,377	230	0	0	0
Einfeldia	1,836	230	0	2,525	689	459	0	0	0	574
Endochironomus	1,377	0	230	0	230	0	230	0	0	0
Glyptotendipes	689	344	574	689	230	459	0	0	0	0
Parachironomus	0	0	0	0	0	459	0	0	0	0
Paratanytarsus	0	0	0	0	0	0	230	0	0	0
Polypedilum sordens	0	0	230	0	0	0	0	0	0	0
Tanytarsus	459	115	0	0	0	459	459	0	0	0
S.F. Orthocladiinae										
Cricotopus (Isocladius)	0	0	0	0	230	0	0	0	0	0
S.F. Tanypodinae										
Ablabesmyia	0	0	0	0	0	0	230	230	0	0
Guttipelopia	1,148	230	230	0	0	689	0	0	0	115
Labrudinia	0	0	0	0	0	0	230	230	0	0
Procladius	230	803	1,148	918	918	230	230	0	0	344
Psectrotanypus	0	0	0	0	0	0	0	0	0	230
Tanypus	0	0	0	0	0	0	0	0	0	115
MOLLUSCS										
P. Mollusca										
SNAILS										
Cl. Gastropoda										
F. Ancylidae										
Ferrissia	230	230	115	0	0	459	0	0	0	0
F. Hydrobiidae										
Amnicola	0	0	0	0	0	0	689	1,836	0	0
F. Planorbidae										
Gyraulus	459	0	0	0	0	230	0	230	0	0
immature	230	0	0	0	0	0	0	0	0	0
CLAMS										
Cl. Bivalvia										
F. Sphaeriidae										
Cyclocalyx	0	0	115	0	0	0	0	0	0	0
Sphaerium (Musculium)	0	0	0	0	0	0	459	0	1,148	230
TOTAL NUMBER OF ORGANISMS	####	8,498	6,316	9,643	####	8,265	####	4,825	2,985	4,363
TOTAL NUMBER OF TAXA [a]	16	19	16	11	17	14	18	12	4	13

[a] Bold entries excluded from taxa count

Table D.3: Benthic Analyses: Index Values for Benthic Sample Stations, RRP Phase 1 EEM, 2017

Station ID	Density (Ind./m2)	LPL Number of Taxa	LPL Simpson's E	LPL BC Dissimilarity	LPL Simpson's D	% Oligochaeta	% Ostracoda	% Ephemeroptera	% Trichoptera	% Chaoboridae	% Chironomidae	% Metal Sensitive Chironomidae	% Gastropoda	% Bivalvia	% Collector Gatherers	% Filterers	% Scrapers	% Shredders	% Clingers	% Sprawlers	% Burrowers	LPLsimpEk
StuC-REF-1	10436	16.0000	0.6500	0.4500	0.9000	8.8900	2.2200	0.0000	0.0000	11.1100	55.5500	4.4500	8.8900	0.0000	40.0100	4.4500	9	20.0000	28.8900	31.1000	40.0100	0.9600
StuC-REF-2	8581	17.0000	0.3100	0.2800	0.8100	21.6200	0.0000	1.3500	0.0000	39.1800	22.9800	1.3500	2.7000	0.0000	35.1400	1.3500	3	4.0600	9.4600	52.7000	37.8400	0.8600
StuC-REF-3	6378	14.0000	0.3600	0.2100	0.8000	3.6400	0.0000	0.0000	1.8200	38.1800	41.8200	0.0000	1.8200	1.8200	12.7300	1.8200	4	16.3700	16.3700	59.9900	21.8300	0.8600
StuC-REF-4	9742	11.0000	0.6100	0.3300	0.8500	14.2900	2.3800	0.0000	0.0000	21.4200	50.0000	0.0000	0.0000	0.0000	61.9100	0.0000	0	7.1400	0.0000	38.0900	61.9100	0.9400
StuC-REF-5	14612	16.0000	0.4700	0.4000	0.8700	30.1500	0.0000	0.0000	0.0000	19.0500	23.8200	0.0000	0.0000	0.0000	65.0800	0.0000	0	4.7600	6.3500	28.5700	65.0800	0.9300
PinR-EXP-1	8351	14.0000	0.7500	0.7100	0.9000	2.7800	11.1100	0.0000	0.0000	0.0000	63.8800	5.5600	8.3300	0.0000	59.8400	5.8100	8	5.8100	14.1400	17.4400	68.4200	0.9700
PinR-EXP-2	21582	18.0000	0.2500	0.8900	0.7700	64.4700	1.0700	0.0000	0.0000	0.0000	8.6000	3.2200	3.2200	2.1500	85.9600	5.3700	3	1.0700	7.5900	5.3700	84.8900	0.8200
PinR-EXP-3	4871	12.0000	0.4400	0.8500	0.8100	4.7600	0.0000	4.7600	0.0000	4.7600	23.8100	0.0000	42.8500	0.0000	33.3400	0.0000	43	0.0000	47.6100	23.8100	28.5800	0.8900
PinR-EXP-4	3014	4.0000	0.6700	0.8600	0.6300	46.1500	0.0000	0.0000	0.0000	0.0000	7.7000	0.0000	0.0000	38.4500	61.5500	38.4500	0	0.0000	0.0000	0.0000	61.5500	0.8400
PinR-EXP-5	4407	12.0000	0.6600	0.5600	0.8700	15.7900	2.6300	0.0000	0.0000	13.1600	55.2500	0.0000	0.0000	5.2600	60.5200	5.2600	0	0.0000	0.0000	31.5900	63.1500	0.9500

Station ID	Rainy LPL CA-1 (22.1%)	Rainy LPL CA 2 (15.2%)	Rainy LPL CA-3 (14.4%)	Rainy LPL CA-4 (12.9%)	Rainy LPL CA 5 (10.9%)	FL Number of Taxa	FL Simpson's D	FL Simpson's E	FIsimpek	FL BC Dissimilarity	Rainy FL CA-1 (23.1%)	Rainy FL CA-2 (21.3%)	Rainy FL CA 3 (19.5%)	Rainy FL CA-4 (12.3%)	Rainy FL CA-5 (10.4%)	Station Depth (m)	% Gravel	% Sand and Finer	% Organic	Temperature (°C; bottom)	Dissolved Oxygen (mg/L; bottom)	Dissolved Oxygen (% sat.; bottom)
StuC-REF-1	0.3500	-0.0900	0.3500	0.2600	0.1900	9.0000	0.6600	0.3300	0.7400	0.2800	-0.4100	-0.2000	0.4300	0.1700	0.1000	0.9600	0.0000	90.0000	10.0000	17.7000	3.7400	38.2000
StuC-REF-2	0.2000	-0.1800	-0.4100	0.5700	-0.2400	8.0000	0.7400	0.4800	0.8500	0.2200	-0.7500	0.4000	-0.6100	-0.1200	-0.4900	0.9800	0.0000	95.0000	5.0000	17.1000	4.1100	42.0000
StuC-REF-3	0.7400	-0.9200	0.0600	-0.9700	-0.4800	8.0000	0.6700	0.3800	0.7700	0.1800	-0.1100	-0.4300	-0.7800	0.3600	0.5700	0.9400	0.0000	90.0000	10.0000	16.2000	4.0200	41.1000
StuC-REF-4	0.3100	0.3400	0.2400	0.0200	0.5700	6.0000	0.6800	0.5100	0.8100	0.1400	-0.2300	-0.5100	0.4300	-0.4500	-0.0200	0.9400	0.0000	90.0000	10.0000	15.9000	3.3900	34.6000
StuC-REF-5	0.6000	-0.0400	-0.7700	0.2300	0.4600	7.0000	0.7800	0.6400	0.9100	0.2600	-0.1700	-0.1800	0.1800	-0.5000	0.2200	0.9800	0.0000	90.0000	10.0000	16.3000	4.2300	43.2000
PinR-EXP-1	-0.0800	-0.0900	1.1100	0.4800	-0.2100	7.0000	0.5600	0.3300	0.6600	0.5000	-0.0400	0.0000	0.5200	0.7500	-0.2700	0.9600	0.0000	80.0000	20.0000	12.0800	2.7000	25.2000
PinR-EXP-2	-0.8500	0.1400	0.1100	-0.6200	0.5900	9.0000	0.5400	0.2400	0.6100	0.7400	0.8100	0.2800	0.0000	-0.0800	0.0000	0.8200	0.0000	80.0000	20.0000	12.2200	3.1100	29.4000
PinR-EXP-3	-1.5000	-0.5800	-0.4500	0.3400	-0.4100	9.0000	0.7800	0.5000	0.8700	0.6900	0.0800	0.9600	0.1100	-0.0500	0.3000	0.9800	0.0000	75.0000	25.0000	12.5900	4.7300	44.6000
PinR-EXP-4	-0.3400	1.1900	-0.5400	-0.6000	-0.7400	4.0000	0.6300	0.6700	0.8400	0.6800	0.7900	-0.5000	-0.5200	-0.0700	-0.4500	0.9800	0.0000	80.0000	20.0000	12.6700	4.0800	38.5000
PinR-EXP-5	0.2300	1.1800	-0.0500	-0.1700	-0.6700	7.0000	0.6500	0.4000	0.7500	0.4000	0.4100	-0.3000	-0.0100	-0.0500	-0.2600	0.8200	0.0000	80.0000	20.0000	12.6600	4.1100	38.8000

Station ID	pH (bottom)	Conductivity (µS/cm; bottom)	Specific Conductance (µS/cm; bottom)	Moisture (%)	Total Kjeldahl Nitrogen (%)	Total Organic Carbon (%)	% Gravel (%)	% Sand (%)	% Silt (%)	% Clay (%)	FOC (log10 [mg/g])	Aluminum (log10 [ng/kg])	Antimony (log10 [ng/kg])	Arsenic (log10 [ng/kg])	Barium (log10 [ng/kg])	Beryllium (log10 [ng/kg])	Bismuth (log10 [ng/kg])	Boron (log10 [ng/kg])	Cadmium (log10 [ng/kg])	Calcium (log10 [ng/kg])	Chromium (log10 [ng/kg])	Cobalt (log10 [ng/kg])
StuC-REF-1	7.7700	280.8000	326.6000	62.5000	0.2400	3.1900	1.0000	27.3000	41.7000	31.0000	1.5000	6.0800	1.0000	2.3900	3.8500	1.6500	1.3000	2.8800	1.3800	5.8000	3.4300	2.9500
StuC-REF-2	7.5700	276.6000	325.7000	65.0000	0.3200	4.0100	1.0000	11.9000	50.5000	37.6000	1.6000	6.1800	1.0400	2.4600	3.9900	1.7500	1.3000	2.9400	1.5100	5.8700	3.5800	3.0300
StuC-REF-3	7.4400	272.7000	328.5000	51.5000	0.2000	2.7800	1.0000	30.9000	36.9000	32.2000	1.4400	6.0700	1.0000	2.3300	3.8400	1.7100	1.3000	2.8900	1.3300	5.8200	3.4400	2.9400
StuC-REF-4	7.3300	268.9000	325.5000	75.5000	0.3900	5.4900	1.0000	6.8000	51.9000	41.3000	1.7400	6.1800	1.1100	2.5200	4.0300	1.7900	1.3000	2.9800	1.5900	5.9000	3.6400	3.0700
StuC-REF-5	7.5000	270.3000	324.0000	59.0000	0.2300	3.1800	1.0000	22.3000	42.8000	34.8000	1.5000	6.1500	1.0000	2.3700	3.9500	1.7200	1.3000	2.8800	1.3000	5.8100	3.5200	2.9700
PinR-EXP-1	7.0200	421.2000	524.1000	81.8000	0.6100	7.8500	1.0000	8.3000	60.2000	31.5000	1.8900	6.2200	1.1500	2.6400	4.1100	1.7900	1.3000	3.0200	1.6500	6.1400	3.5400	3.0800
PinR-EXP-2	7.3000	408.2000	495.2000	76.5000	0.4300	6.0100	1.0000	16.0000	53.4000	30.5000	1.7800	6.1400	1.2800	2.5700	4.0800	1.8100	1.3000	3.0600	1.5100	6.3100	3.5600	3.0400
PinR-EXP-3	7.3600	412.3000	505.9000	85.5000	0.6900	8.9700	1.0000	2.4000	69.0000	28.6000	1.9500	6.1500	1.2000	2.6800	4.0500	1.7500	1.3000	3.0300	1.6000	6.2700	3.5300	3.0500
PinR-EXP-4	7.3100	391.3000	485.6000	53.5000	0.2400	3.4600	1.0000	30.8000	44.6000	24.6000	1.5400	5.9700	1.0400	2.3500	3.7900	1.6400	1.3000	2.8500	1.3000	6.0600	3.3300	2.8200
PinR-EXP-5	7.2600	392.4000	490.4000	72.6000	0.6400	9.3900	1.0000	10.7000	64.7000	24.6000	1.9700	6.1000	1.1800	2.4500	3.9700	1.7200	1.3000	2.8900	1.5600	6.0100	3.4300	2.8600

Station ID	Copper (log10 [ng/kg])	Iron (log10 [ng/kg])	Lead (log10 [ng/kg])	Lithium (log10 [ng/kg])	Magnesium (log10 [ng/kg])	Manganese (log10 [ng/kg])	Mercury (log10 [ng/kg])	Molybdenum (log10 [ng/kg])	Nickel (log10 [ng/kg])	Phosphorus (log10 [ng/kg])	Potassium (log10 [ng/kg])	Selenium (log10 [ng/kg])	Silver (log10 [ng/kg])	Sodium (log10 [ng/kg])	Strontium (log10 [ng/kg])	Sulphur (log10 [ng/kg])	Thallium (log10 [ng/kg])	Tin (log10 [ng/kg])	Titanium (log10 [ng/kg])	Tungsten (log10 [ng/kg])	Uranium (log10 [ng/kg])	Vanadium (log10 [ng/kg])
StuC-REF-1	2.9900	6.1300	2.8000	3.1500	5.6900	4.5000	0.5900	1.7100	3.2300	4.6900	5.1600	1.4300	1.0000	3.9400	3.3700	5.0000	1.1300	2.0000	4.1900	1.7000	2.1300	3.5100
StuC-REF-2	3.1000	6.2300	2.9000	3.2800	5.7500	4.5700	0.7100	2.0200	3.3700	4.7400	5.2500	1.5800	1.0000	4.0100	3.4200	5.0400	1.2200	2.0000	4.1800	1.7000	2.2600	3.6000
StuC-REF-3	2.9800	6.1200	2.8600	3.1700	5.6700	4.4200	0.6100	1.7300	3.2200	4.6700	5.1400	1.4300	1.0000	3.9300	3.3700	5.0000	1.1900	2.0000	4.2100	1.7000	2.1900	3.5000
StuC-REF-4	3.1600	6.2600	2.9600	3.2700	5.7800	4.6300	0.7900	2.1700	3.4300	4.7600	5.2900	1.6800	1.0000	4.0500	3.4800	5.1500	1.2700	2.0000	4.1700	1.7000	2.3400	3.6400
StuC-REF-5	3.0600	6.2000	2.8700	3.2100	5.7200	4.5400	0.6800	1.8000	3.3000	4.7100	5.2100	1.5300	1.0000	3.9800	3.3700	5.0000	1.1900	2.0000	4.1600	1.7000	2.1900	3.5600
PinR-EXP-1	3.2900	6.3000	2.9300	3.2600	5.9000	4.7800	0.8000	2.0100	3.3900	4.8900	5.2500	1.7500	1.0000	4.1700	3.5100	5.2300	1.2700	2.0000	4.0700	1.7000	2.2700	3.6300
PinR-EXP-2	3.2100	6.2600	2.9300	3.2100	6.0000	4.8200	0.7000	2.0900	3.4000	4.8100	5.2000	1.6500	1.0000	4.1200	3.5600	5.1500	1.2500	2.0000	4.1700	1.7000	2.1700	3.6000
PinR-EXP-3	3.2400	6.2600	2.8800	3.2500	6.0200	4.6400	0.7700	2.1600	3.4000	4.8900	5.2500	1.7900	1.0000	4.2300	3.5800	5.3800	1.2500	2.0000	4.1400	1.7000	2.3200	3.6100
PinR-EXP-4	2.9900	6.1000	2.8000	3.0900	5.8300	4.5000	0.6900	1.5400	3.1700	4.7000	5.0200	1.5300	1.0000	3.9800	3.3400	5.0000	1.0900	2.0000	4.1400	1.7000	2.0400	3.4000
PinR-EXP-5	3.1200	6.1800	2.8800	3.1400	5.6800	4.5600	0.7300	1.8800	3.2700	4.8300	5.1100	1.7200	1.0000	4.0500	3.5000	5.2000	1.1300	2.0000	3.9900	1.7000	2.3200	3.5300

Table D.3: Benthic Analyses: Index Values for Benthic Sample Stations, RRP Phase 1 EEM, 2017

Station ID	Zinc (log10 [ng/kg])	Zirconium (log10 [ng/kg])	Rainy River Sediment Metal PC-1 (69.7%)	Rainy River Sediment Metal PC-2 (16.2%)	Rainy River Sediment Metal PC-3 (6.2%)
StuC-REF-1	3.7900	2.7100	-1.0889	0.2666	0.3844
StuC-REF-2	3.9000	2.8200	0.1808	1.2275	-0.1703
StuC-REF-3	3.7700	2.7800	-1.0389	0.7194	0.2220
StuC-REF-4	3.9600	2.8600	0.8311	1.3090	-0.5819
StuC-REF-5	3.8300	2.7100	-0.4747	0.7841	-0.0640
PinR-EXP-1	3.9700	2.6900	1.2149	-0.2937	-0.2957
PinR-EXP-2	3.8800	2.7200	0.8672	-0.4241	1.7616
PinR-EXP-3	3.9500	2.5700	1.1371	-1.1209	0.4109
PinR-EXP-4	3.7000	2.6700	-1.4996	-1.2993	0.5233
PinR-EXP-5	3.8000	2.6900	-0.1290	-1.1686	-2.1904

Table D.4: Statistical Characteristics of Benthic Metrics and Supporting Measures at RRP Phase 1 EEM Areas, 2017

Variable	Area ID	n	Median	Mean	Standard Deviation	Standard Error	95% Confidence Interval		Minimum	Maximum
							Lower Bound	Upper Bound		
Density (Ind./m2)	StuC-REF	5	9,742	9,950	3,027	1,354	6,191	13,708	6,378	14,612
	PinR-EXP	5	4,871	8,445	7,602	3,400	-994	17,884	3,014	21,582
LPL Number of Taxa	StuC-REF	5	16.00	14.80	2.39	1.07	11.84	17.76	11.00	17.00
	PinR-EXP	5	12.00	12.00	5.10	2.28	5.67	18.33	4.00	18.00
LPL Simpson's D	StuC-REF	5	0.85	0.85	0.04	0.02	0.79	0.90	0.80	0.90
	PinR-EXP	5	0.81	0.80	0.11	0.05	0.66	0.93	0.63	0.90
LPL Simpson's E	StuC-REF	5	0.47	0.48	0.15	0.07	0.29	0.67	0.31	0.65
	PinR-EXP	5	0.66	0.55	0.21	0.09	0.30	0.81	0.25	0.75
LPL BC Dissimilarity	StuC-REF	5	0.330	0.334	0.095	0.042	0.216	0.452	0.210	0.450
	PinR-EXP	5	0.850	0.774	0.138	0.062	0.602	0.946	0.560	0.890
% Oligochaeta	StuC-REF	5	14.290	15.718	10.460	4.678	2.730	28.706	3.640	30.150
	PinR-EXP	5	15.790	26.790	27.283	12.201	-7.086	60.666	2.780	64.470
% Chironomidae	StuC-REF	5	41.82	38.834	14.915	6.670	20.315	57.353	22.980	55.550
	PinR-EXP	5	23.81	31.848	26.277	11.751	-0.779	64.475	7.700	63.880
% Metal Sensitive Chironomidae	StuC-REF	5	0.00	1.160	1.930	0.863	-1.236	3.556	0.000	4.450
	PinR-EXP	5	0.00	1.756	2.543	1.137	-1.401	4.913	0.000	5.560
% Bivalvia	StuC-REF	5	0.000	0.364	0.814	0.364	-0.647	1.375	0.000	1.820
	PinR-EXP	5	2.150	9.172	16.508	7.383	-11.326	29.670	0.000	38.450
% Gastropoda	StuC-REF	5	1.82	2.682	3.663	1.638	-1.866	7.230	0.000	8.890
	PinR-EXP	5	3.22	10.880	18.193	8.136	-11.710	33.470	0.000	42.850
% Ostracoda	StuC-REF	5	0.000	0.920	1.261	0.564	-0.646	2.486	0.000	2.380
	PinR-EXP	5	1.070	2.962	4.680	2.093	-2.850	8.774	0.000	11.110
% Ephemeroptera	StuC-REF	5	0.00	0.270	0.604	0.270	-0.480	1.020	0.000	1.350
	PinR-EXP	5	0.00	0.952	2.129	0.952	-1.691	3.595	0.000	4.760
% Trichoptera	StuC-REF	5	0.000	0.364	0.814	0.364	-0.647	1.375	0.000	1.820
	PinR-EXP	5	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
% Chaoboridae	StuC-REF	5	21.420	25.788	12.378	5.535	10.419	41.157	11.110	39.180
	PinR-EXP	5	0.000	3.584	5.736	2.565	-3.539	10.707	0.000	13.160
Rainy LPL CA-1 (29.0%)	StuC-REF	5	-0.440	-0.411	0.131	0.058	-0.573	-0.249	-0.526	-0.200
	PinR-EXP	5	0.269	0.445	0.720	0.322	-0.449	1.340	-0.266	1.570
Rainy LPL CA-2 (17.0%)	StuC-REF	5	-0.217	-0.168	0.278	0.124	-0.513	0.177	-0.447	0.294
	PinR-EXP	5	0.486	0.402	0.829	0.371	-0.628	1.431	-0.552	1.606
Rainy LPL CA-3 (16.4%)	StuC-REF	5	-0.046	-0.099	0.414	0.185	-0.613	0.415	-0.594	0.317
	PinR-EXP	5	-0.164	-0.027	0.663	0.297	-0.851	0.797	-0.864	0.918
Rainy LPL CA-4 (12.0%)	StuC-REF	5	0.21	0.130	0.277	0.124	-0.214	0.475	-0.260	0.450
	PinR-EXP	5	-0.38	-0.290	0.561	0.251	-0.987	0.406	-0.925	0.553
FL Number of Taxa	StuC-REF	5	8.00	7.60	1.14	0.51	6.18	9.02	6.00	9.00
	PinR-EXP	5	7.00	7.20	2.05	0.92	4.66	9.74	4.00	9.00
FL Simpson's D	StuC-REF	5	0.680	0.706	0.052	0.023	0.642	0.770	0.660	0.780
	PinR-EXP	5	0.630	0.632	0.095	0.042	0.514	0.750	0.540	0.780
FL Simpson's E	StuC-REF	5	0.48	0.468	0.121	0.054	0.318	0.618	0.330	0.640
	PinR-EXP	5	0.40	0.428	0.165	0.074	0.223	0.633	0.240	0.670
FL BC Dissimilarity	StuC-REF	5	0.22	0.216	0.057	0.026	0.145	0.287	0.140	0.280
	PinR-EXP	5	0.68	0.602	0.145	0.065	0.422	0.782	0.400	0.740
Rainy FL CA-1 (26.5%)	StuC-REF	5	-0.29	-0.326	0.252	0.113	-0.638	-0.013	-0.583	-0.025
	PinR-EXP	5	0.50	0.370	0.355	0.159	-0.071	0.811	-0.183	0.671
Rainy FL CA-2 (25.6%)	StuC-REF	5	0.05	0.023	0.272	0.122	-0.315	0.360	-0.361	0.300
	PinR-EXP	5	0.11	0.112	0.683	0.306	-0.737	0.960	-0.867	0.957
Rainy FL CA-3 (17.9%)	StuC-REF	5	-0.208	-0.211	0.350	0.156	-0.645	0.223	-0.637	0.196
	PinR-EXP	5	0.127	0.178	0.350	0.156	-0.257	0.612	-0.196	0.734
Rainy FL CA-4 (14.4%)	StuC-REF	5	0.083	-0.029	0.422	0.189	-0.554	0.495	-0.478	0.364
	PinR-EXP	5	-0.024	0.067	0.300	0.134	-0.305	0.439	-0.193	0.505

Table D.5: Summary of Benthic Invertebrate Community Characteristics and Statistical Comparisons Among Areas RRP Phase 1 EEM, 2017

Metric	Comparison	2-group ANOVA; Magnitude of Difference; Estimation of Effect Size				
	ANOVA Comparison	Significant Difference Among Areas?	(P-value)[a]	Power	Magnitude of Difference (# of SDs)[b]	Minimum Detectable Effect Size (# of SDs)[c]
Density (Ind./m2)	StuC-REF vs. PinR-EXP	NO	0.692	0.124	~	4.1
FL Number of Taxa	StuC-REF vs. PinR-EXP	NO	0.713	0.121	~	3.2
FL Simpson's D	StuC-REF vs. PinR-EXP	NO	0.164	0.405	~	3.2
FL Simpson's E	StuC-REF vs. PinR-EXP	NO	0.674	0.127	~	2.6
FL BC Dissimilarity	StuC-REF vs. PinR-EXP	YES	0.001	1.000	6.7	~
Rainy FL CA-1 (26.5%)	StuC-REF vs. PinR-EXP	YES	0.007	0.946	2.8	~
Rainy FL CA-2 (25.6%)	StuC-REF vs. PinR-EXP	NO	0.793	0.110	~	4.2
Rainy FL CA-3 (17.9%)	StuC-REF vs. PinR-EXP	NO	0.117	0.485	~	2.2
Rainy FL CA-4 (14.4%)	StuC-REF vs. PinR-EXP	NO	0.688	0.125	~	1.9
% Oligochaeta	StuC-REF vs. PinR-EXP	NO	0.421	0.200	~	4.3
% Ostracoda	StuC-REF vs. PinR-EXP	NO	0.374	0.223	~	5.9
% Ephemeroptera	StuC-REF vs. PinR-EXP	NO	0.510	0.167	~	5.6
% Trichoptera	StuC-REF vs. PinR-EXP	NO	0.347	0.238	~	1.5
% Chaoboridae	StuC-REF vs. PinR-EXP	YES	0.007	0.952	-1.8	~
% Chironomidae	StuC-REF vs. PinR-EXP	NO	0.619	0.138	~	3.1
% Metal Sensitive Chironomidae	StuC-REF vs. PinR-EXP	NO	0.687	0.125	~	2.5
% Gastropoda	StuC-REF vs. PinR-EXP	NO	0.352	0.235	~	7.8
% Bivalvia	StuC-REF vs. PinR-EXP	NO	0.268	0.293	~	31.2
% Collector Gatherers	StuC-REF vs. PinR-EXP	NO	0.211	0.347	~	2.0
% Filterers	StuC-REF vs. PinR-EXP	NO	0.214	0.344	~	13.2
% Scrapers	StuC-REF vs. PinR-EXP	NO	0.373	0.224	~	7.8
% Shredders	StuC-REF vs. PinR-EXP	YES	0.029	0.779	-1.3	~
% Clingers	StuC-REF vs. PinR-EXP	NO	0.874	0.104	~	3.2
% Sprawlers	StuC-REF vs. PinR-EXP	YES	0.014	0.886	-1.9	~
% Burrowers	StuC-REF vs. PinR-EXP	NO	0.227	0.330	~	2.3

[a] p-value obtained from 1-way ANOVA

[b] Magnitude calculated by comparing the difference between the reference and exposure area means to the reference area standard deviation (SD) [(exposure mean - reference mean) / standard deviation of the reference mean]

[c] Minimum effect size detectable calculated based on variance as square root of MSE from ANOVA and alpha = beta = 0.10. Minimum effect size reported as the minimum number of standard deviations detectable based on reference area standard deviation.

Shading denotes significant interaction (P < 0.05).

Table D.6: Eigenvalues of Correspondence Analysis (CA) of Family Level (FL) Benthic Community Samples from RRP Phasee 1 EEM, 2017

	Rainy FL CA-1 (26.5%)	Rainy FL CA-2 (25.6%)	Rainy FL CA-3 (17.9%)	Rainy FL CA-4 (14.4%)
Eigenvalue	0.198	0.192	0.134	0.108
Relative Inertia (%)	26.48	25.58	17.85	14.35
Cumulative Inertia (%)	26.48	52.06	69.91	84.26

Table D.7a: Scores for Family Level (FL) Benthic Taxa from Correlation Analysis (CA), RRP Phase 1 EEM, 2017

	Rainy FL CA-1 (26.5%)	Rainy FL CA-2 (25.6%)	Rainy FL CA-3 (17.9%)	Rainy FL CA-4 (14.4%)
P. Nemata	0.0417	0.1368	-0.0142	0.0095
F. Naididae	0.0750	0.2010	-0.0670	-0.0338
Subcl. Acari	0.0273	-0.3436	-0.4367	-0.0267
O. Harpacticoida	-1.0952	0.1748	0.0603	-0.8697
Cl. Ostracoda	-0.2295	0.2481	0.8127	0.0146
F. Caenidae (Caenis)	0.4432	-1.4421	-0.8245	0.2033
F. Ceratopogonidae	0.4323	-0.2379	0.4700	-0.2383
F. Chaoboridae	-0.3601	-0.0373	-0.4255	-0.1365
F. Chironomidae	-0.0417	0.1107	-0.0025	0.0406
F. Ancylidae (Ferrissia)	-0.5399	-0.2323	-0.0156	1.0107
F. Hydrobiidae (Amnicola)	1.3036	-0.9407	0.2830	-0.5767
F. Planorbidae	-0.2670	-0.8113	0.8210	0.3988
F. Sphaeriidae	0.9306	1.0985	-0.1747	0.2674

Shading indicates an absolute Pearson Correlation r-value greater than 0.5.

Table D.7b: Scores for Lowest Practical Level (LPL) Benthic Taxa from Correlation Analysis (CA), RRP Phase 1 EEM, 2017

	Rainy LPL CA-1 (29.0%)	Rainy LPL CA-2 (17.0%)	Rainy LPL CA-3 (16.4%)	Rainy LPL CA-4 (12.0%)
P. Nemata	0.0138	0.2144	-0.0971	-0.1085
Dero digitata	-0.0360	0.2312	0.7829	0.4216
Nais alpina/simplex	-0.5775	-0.6485	-1.1060	0.0222
Aulodrilus pigueti	0.1900	0.8102	0.6101	1.2418
Limnodrilus udekemianus	0.1357	0.3659	-0.5386	-0.1708
immatures with hair chaetae	-0.6103	-0.6132	-1.1252	0.1065
immatures without hair chaetae	-0.1966	0.2778	-0.0824	0.3726
Subcl. Acari	0.1301	-0.4223	-0.3209	0.2724
O. Harpacticoida	-0.7131	-0.0633	0.0276	0.5762
Cl. Ostracoda	-0.1267	0.3677	0.7695	-0.0546
Caenis	1.1846	-1.0440	-0.7680	-0.4258
Bezzia	1.2287	-0.7491	0.6700	-0.8655
Dasyhelea	1.7883	-0.0683	-0.0280	0.5669
Chaoborus flavicans	1.1846	-1.0440	-0.7680	-0.4258
Chaoborus punctipennis	-0.6202	-0.1165	-0.2534	0.1420
Chironomus	0.0771	0.3113	-0.2792	-0.4996
Cladopelma	-0.8212	-0.4875	-0.6777	0.6042
Dicrotendipes	0.4409	0.2326	1.3453	-0.2650
Einfeldia	-0.5073	0.0048	0.1506	-0.1489
Endochironomus	-0.3175	-0.1303	-0.0054	0.5750
Glyptotendipes	-0.5520	-0.3362	0.1933	0.0261
Tanytarsus	0.0483	-0.1357	0.6207	-0.1835
Ablabesmyia	1.7883	-0.0683	-0.0280	0.5669
Guttipelopia	-0.4341	-0.2574	0.3247	-0.5267
Labrudinia	1.7883	-0.0683	-0.0280	0.5669
Procladius	-0.3717	0.0009	0.0742	0.1031
Ferrissia	-0.4193	-0.5759	0.4352	-0.4853
Amnicola	1.8376	-0.1433	-0.0681	0.5111
Gyraulus	0.5386	-0.6370	0.6398	-0.5660
Sphaerium (Musculium)	0.3938	1.9808	-0.6128	-0.6902

Shading indicates an absolute Pearson Correlation r-value greater than 0.5.

Table D.8: Number of Invertebrates (Family Level) per m^2, RRP Phase 1 EEM, 2017

Station	StuC-REF					PinR-EXP				
Replicate	1	2	3	4	5	1	2	3	4	5
ROUNDWORMS										
P. Nemata	464	580	348	464	2,783	928	3,942	232	232	232
ANNELIDS										
P. Annelida										
WORMS										
Cl. Oligochaeta										
F. Naididae	928	1,855	232	1,391	4,406	232	13,913	232	1,391	696
LEECHES										
Cl. Hirudinea										
F. Glossiphoniidae	0	116	0	0	0	0	0	0	0	0
ARTHROPODS										
P. Arthropoda										
MITES										
Cl. Arachnida										
Subcl. Acari	0	0	0	0	0	0	0	0	0	0
O. Trombidiformes										
F. Arrenuridae	0	0	0	0	0	0	0	232	0	0
F. Limnesiidae	0	116	116	0	232	0	232	0	0	0
F. Oxidae	0	0	116	0	0	0	0	0	0	0
F. Pionidae	232	116	0	0	0	0	0	0	0	0
F. Unionicolidae	0	116	116	0	232	0	0	0	0	0
HARPACTICOIDS										
O. Harpacticoida	696	0	0	696	464	0	0	0	0	0
SEED SHRIMPS										
Cl. Ostracoda	232	0	0	232	0	928	232	0	0	116
INSECTS										
Cl. Insecta										
MAYFLIES										
O. Ephemeroptera										
F. Caenidae	0	116	0	0	0	0	0	232	0	0
O. Odonata										
DRAGONFLIES										
F. Corduliidae	0	0	0	0	0	0	14	0	0	0
CADDISFLIES										
O. Trichoptera										
F. Hydroptilidae	0	0	116	0	0	0	0	0	0	0
TRUE FLIES										
O. Diptera										
BITING-MIDGE										
F. Ceratopogonidae	0	0	0	0	232	232	232	464	0	116
PHANTOM MIDGE										
F. Chaoboridae	1,159	3,362	2,435	2,087	2,783	0	0	232	0	580
MIDGES										
F. Chironomidae	5,797	1,971	2,667	4,870	3,478	5,333	1,855	1,159	232	2,435
MOLLUSCS										
P. Mollusca										
SNAILS										
Cl. Gastropoda										
F. Ancylidae	232	232	116	0	0	464	0	0	0	0
F. Hydrobiidae	0	0	0	0	0	0	696	1,855	0	0
F. Planorbidae	696	0	0	0	0	232	0	232	0	0
CLAMS										
Cl. Bivalvia										
F. Sphaeriidae	0	0	116	0	0	0	464	0	1,159	232
TOTAL NUMBER OF ORGANISMS	10,436	8,580	6,378	9,740	14,610	8,349	21,580	4,870	3,014	4,407

Table D.9: Statistical Comparisons of Benthic Invertebrate Community Characteristics (at the family level) Among Areas, RRP Phase 1 EEM, 2017

Metric	Comparison	2-group ANOVA; Magnitude of Difference; Estimation of Effect Size				
	ANOVA Comparison	Significant Difference Among Areas?	(P-value)[a]	Power	Magnitude of Difference (# of SDs)[b]	Minimum Detectable Effect Size (# of SDs)[c]
FL Number of Taxa	StuC-REF vs. PinR-EXP	NO	0.713	0.121	~	3.2
FL Simpson's D	StuC-REF vs. PinR-EXP	NO	0.164	0.405	~	3.2
FL Simpson's E	StuC-REF vs. PinR-EXP	NO	0.674	0.127	~	2.6
FL BC Dissimilarity	StuC-REF vs. PinR-EXP	YES	0.001	1.000	6.7	~
Rainy FL CA-1 (23.1%)	StuC-REF vs. PinR-EXP	YES	0.008	0.943	2.9	~
Rainy FL CA-2 (21.3%)	StuC-REF vs. PinR-EXP	NO	0.392	0.214	~	2.9
Rainy FL CA-3 (19.5%)	StuC-REF vs. PinR-EXP	NO	0.778	0.112	~	1.8
Rainy FL CA-4 (12.3%)	StuC-REF vs. PinR-EXP	NO	0.400	0.210	~	2.1

[a] p-value obtained from 1-way ANOVA

[b] Magnitude calculated by comparing the difference between the reference and exposure area means to the reference area standard deviation (SD) [(exposure mean - reference mean) / standard deviation of the reference mean]

[c] Minimum effect size detectable calculated based on variance as square root of MSE from ANOVA and alpha = beta = 0.10. Minimum effect size reported as the minimum number of standard deviations detectable based on reference area standard deviation.

BENTHIC INVERTEBRATE COMMUNITY DATA

Laboratory Reports

Table D.10: Number of Macroinvertebrates per m^2, RRP Phase 1 EEM, 2017

Station	StuC-Ref					PinR-Exp				
Replicate	1	2	3	4	5	1	2	3	4	5
ROUNDWORMS										
P. Nemata	32	40	24	32	192	64	272	16	16	16
ANNELIDS										
P. Annelida										
WORMS										
Cl. Oligochaeta										
F. Naididae										
S.F. Naidinae										
Dero digitata	-	-	8	16	-	16	48	-	-	-
Dero nivea	32	-	-	-	-	-	-	-	-	-
Nais alpina/simplex	-	16	-	-	16	-	-	-	-	-
S.F. Tubificinae										
Aulodrilus piqueti	-	-	-	48	-	-	48	-	-	-
Limnodrilus udekemianus	16	88	8	-	208	-	288	16	96	24
immatures with hair chaetae	-	8	-	-	32	-	-	-	-	-
immatures without hair chaetae	16	16	-	32	48	-	576	-	-	24
LEECHES										
Cl. Hirudinea										
F. Glossiphoniidae										
Glossiphonia complanata	-	8	-	-	-	-	-	-	-	-
ARTHROPODS										
P. Arthropoda										
MITES										
Cl. Arachnida										
Subcl. Acari	-	-	-	-	-	-	16	-	-	-
O. Trombidiformes										
F. Arrenuridae										
Arrenurus	-	-	-	-	-	-	-	16	-	-
F. Limnesiidae										
Limnesia	-	8	8	-	16	-	-	-	-	-
F. Oxidae										
Oxus	-	-	8	-	-	-	-	-	-	-
F. Pionidae										
indeterminate	16	8	-	-	-	-	-	-	-	-
F. Unionicolidae										
Neumania	-	8	8	-	-	-	-	-	-	-
Unionicola	-	-	-	-	16	-	-	-	-	-
HARPACTICOIDS										
O. Harpacticoida	48	-	-	48	32	-	-	-	-	-
SEED SHRIMPS										
Cl. Ostracoda	16	-	-	16	-	64	16	-	-	8
INSECTS										
Cl. Insecta										
MAYFLIES										
O. Ephemeroptera										
F. Caenidae										
Caenis	-	8	-	-	-	-	-	16	-	-
O. Odonata										
DRAGONFLIES										
F. Corduliidae										
Epitheca	-	-	-	-	-	-	1	-	-	-
CADDISFLIES										
O. Trichoptera										
F. Hydroptilidae										
Oxyethira	-	-	8	-	-	-	-	-	-	-
TRUE FLIES										
O. Diptera										
BITING-MIDGE										
F. Ceratopogonidae										
Bezzia	-	-	-	-	-	16	-	16	-	-
Dasyhelea	-	-	-	-	-	-	16	16	-	-
Sphaeromias	-	-	-	-	16	-	-	-	-	-
pupae	-	-	-	-	-	-	-	-	-	8
PHANTOM MIDGE										
F. Chaoboridae										
Chaoborus flavicans	-	8	-	-	-	-	-	16	-	-
Chaoborus punctipennis	80	224	168	144	192	-	-	-	-	40
MIDGES										
F. Chironomidae										
chironomid pupae	-	-	-	-	-	**16**	-	-	-	-
S.F. Chironominae										
Chironomus	-	16	-	48	64	64	-	48	16	72
Cladopelma	-	-	16	-	16	-	-	-	-	-
Dicrotendipes	-	-	-	-	-	96	16	-	-	-

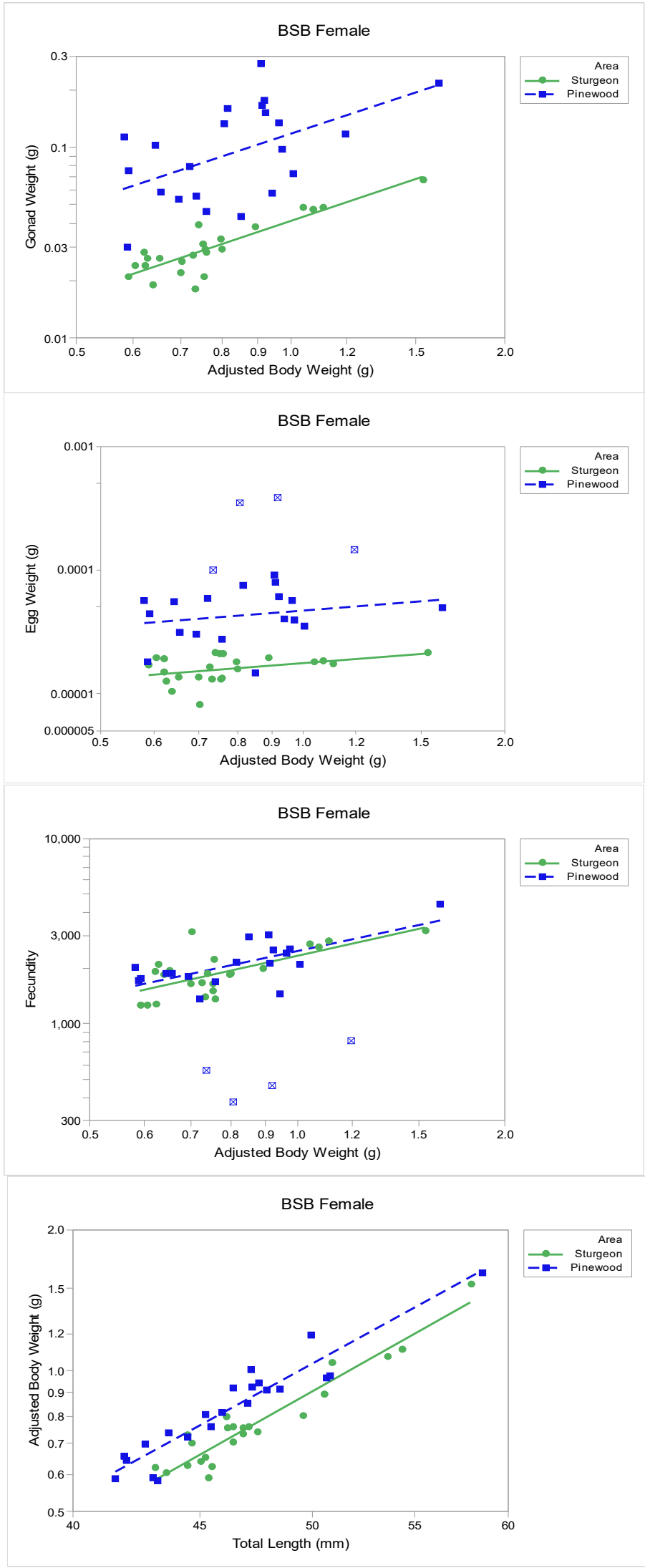
Table D.10: Number of Macroinvertebrates per m^2, RRP Phase 1 EEM, 2017

Station	StuC-Ref					PinR-Exp				
Replicate	1	2	3	4	5	1	2	3	4	5
Einfeldia	128	16	-	176	48	32	-	-	-	40
Endochironomus	96	-	16	-	16	-	16	-	-	-
Glyptotendipes	48	24	40	48	16	32	-	-	-	-
Parachironomus	-	-	-	-	-	32	-	-	-	-
Paratanytarsus	-	-	-	-	-	-	16	-	-	-
Polypedilum sordens	-	-	16	-	-	-	-	-	-	-
Tanytarsus	32	8	-	-	-	32	32	-	-	-
S.F. Orthocladiinae										
Cricotopus (Isocladius)	-	-	-	-	16	-	-	-	-	-
S.F. Tanypodinae										
Ablabesmyia	-	-	-	-	-	-	16	16	-	-
Guttipelopia	80	16	16	-	-	48	-	-	-	8
Labrudinia	-	-	-	-	-	-	16	16	-	-
Procladius	16	56	80	64	64	16	16	-	-	24
Psectrotanypus	-	-	-	-	-	-	-	-	-	16
Tanypus	-	-	-	-	-	-	-	-	-	8
MOLLUSCS										
P. Mollusca										
SNAILS										
Cl. Gastropoda										
F. Ancylidae										
Ferrissia	16	16	8	-	-	32	-	-	-	-
F. Hydrobiidae										
Amnicola	-	-	-	-	-	-	48	128	-	-
F. Planorbidae										
Gyraulus	32	-	-	-	-	16	-	16	-	-
immature	**16**	-	-	-	-	-	-	-	-	-
CLAMS										
Cl. Bivalvia										
F. Sphaeriidae										
Cyclocalyx	-	-	8	-	-	-	-	-	-	-
Sphaerium (Musculium)	-	-	-	-	-	-	32	-	80	16
TOTAL NUMBER OF ORGANISMS	720	592	440	672	1008	576	1489	336	208	304
TOTAL NUMBER OF TAXA [a]	16	19	16	11	17	14	18	12	4	13

[a] Bold entries excluded from taxa count

APPENDIX E
FISH COMMUNITY DATA

Fish Permit



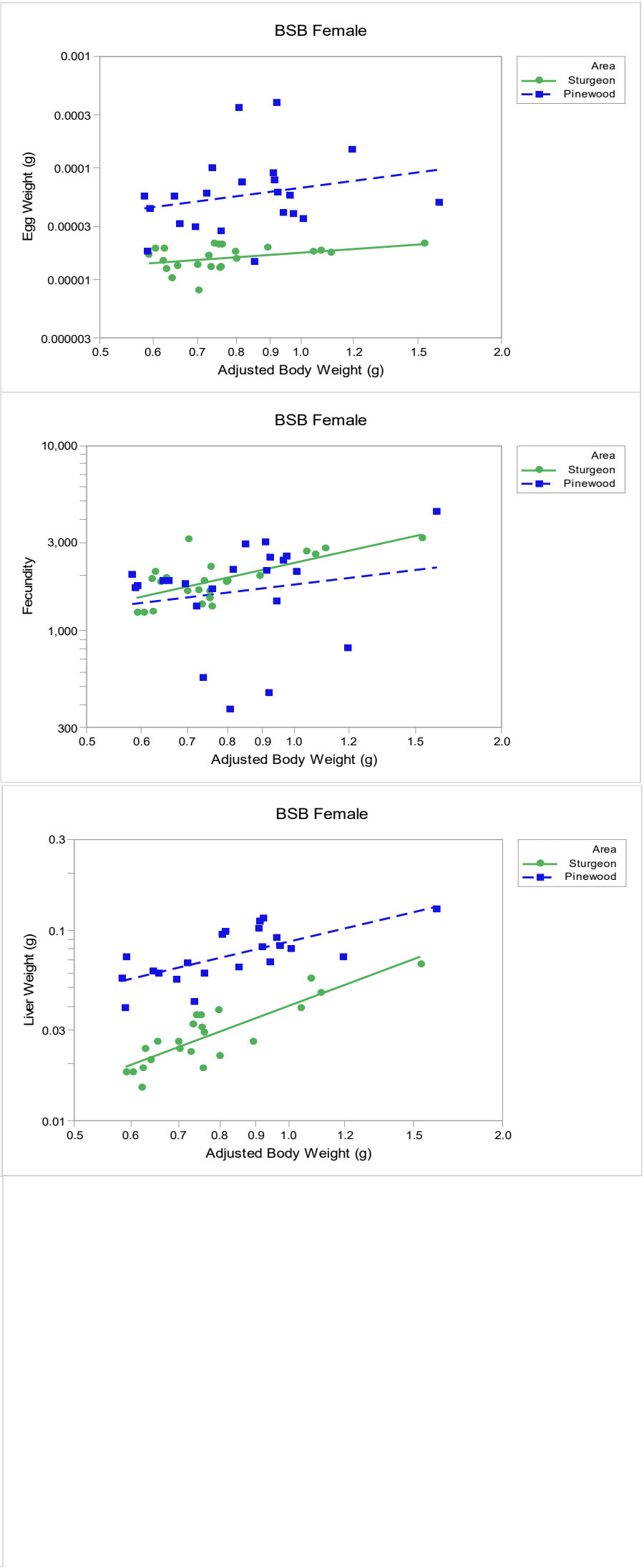


Figure E.1: Scatterplot and Linear Regressions For Female Brook Stickleback Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference), RRP Phase 1 EEM, 2017

Notes: outliers are plotted as open symbols with an × through them

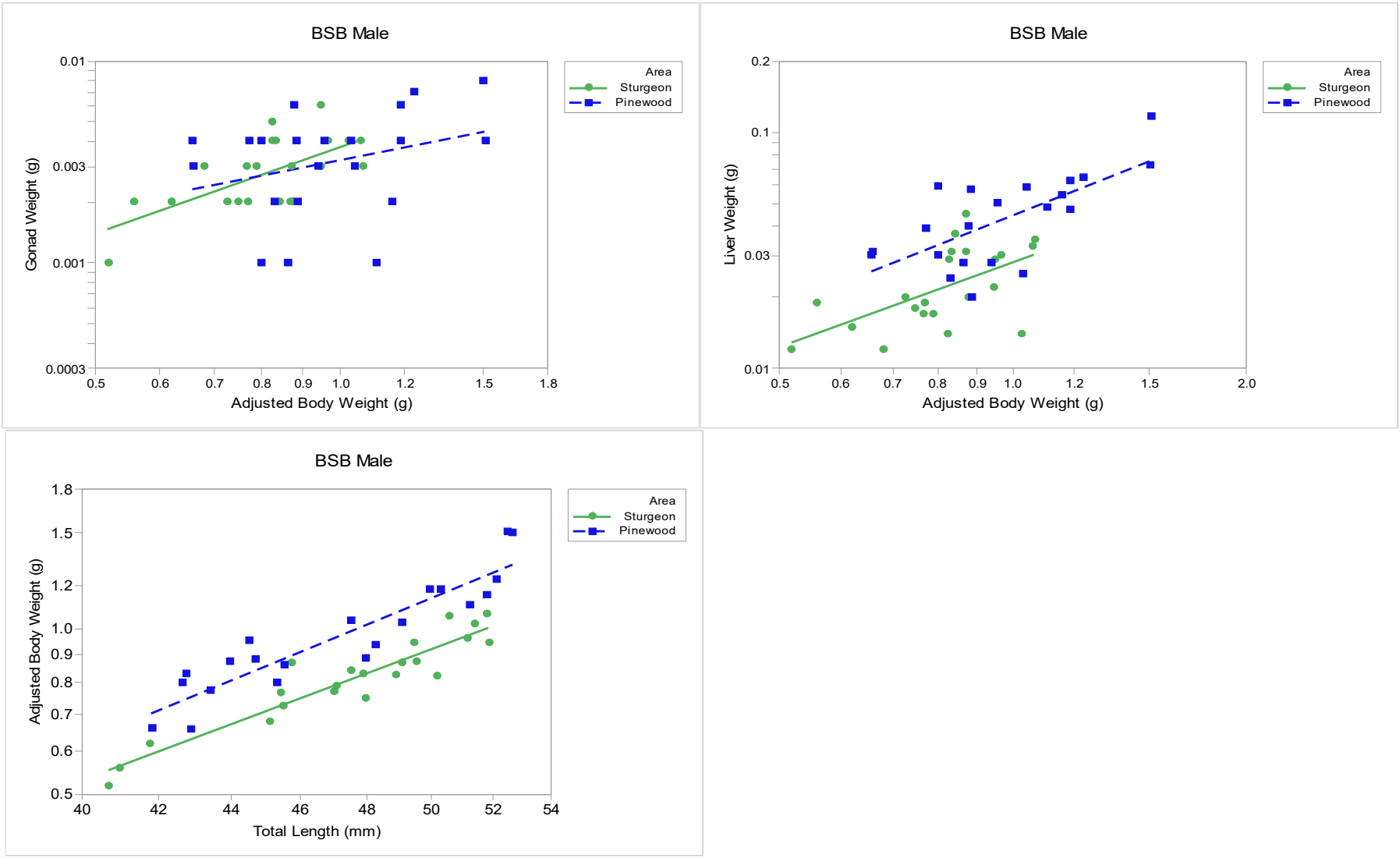
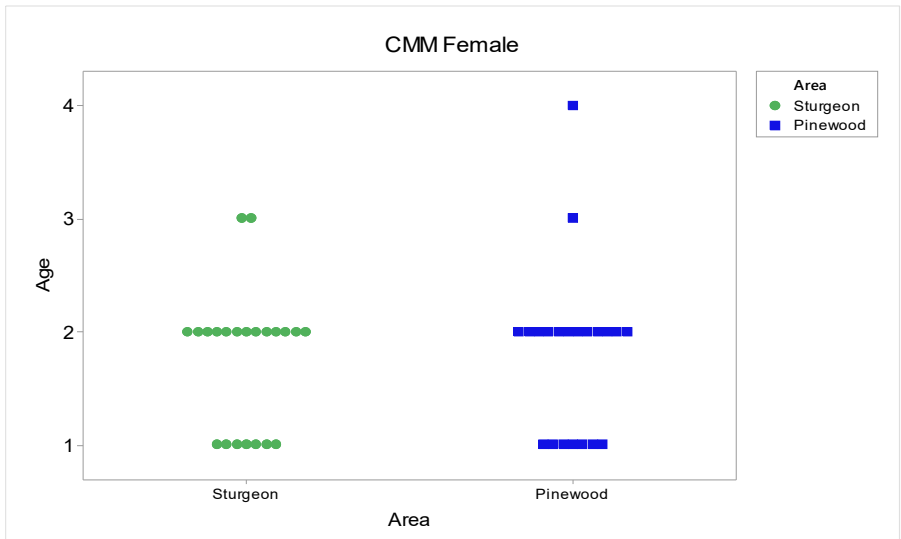
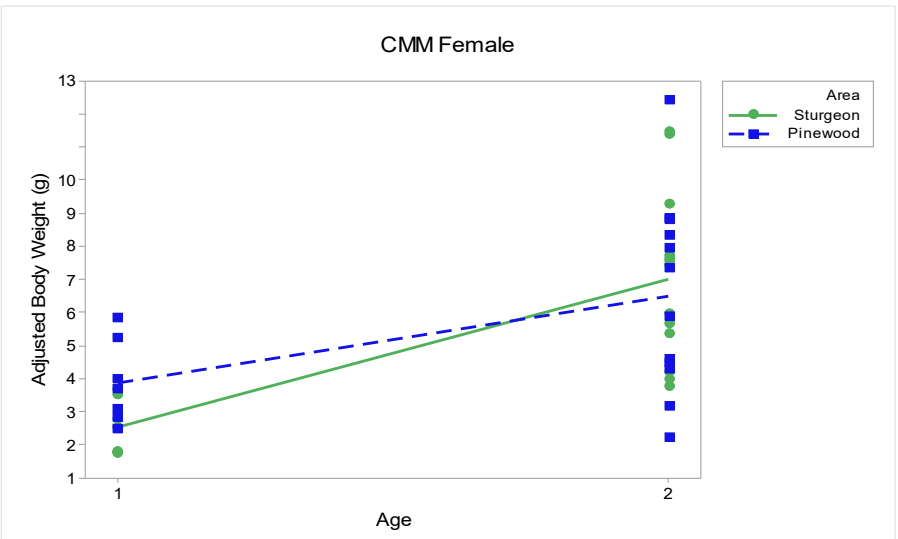
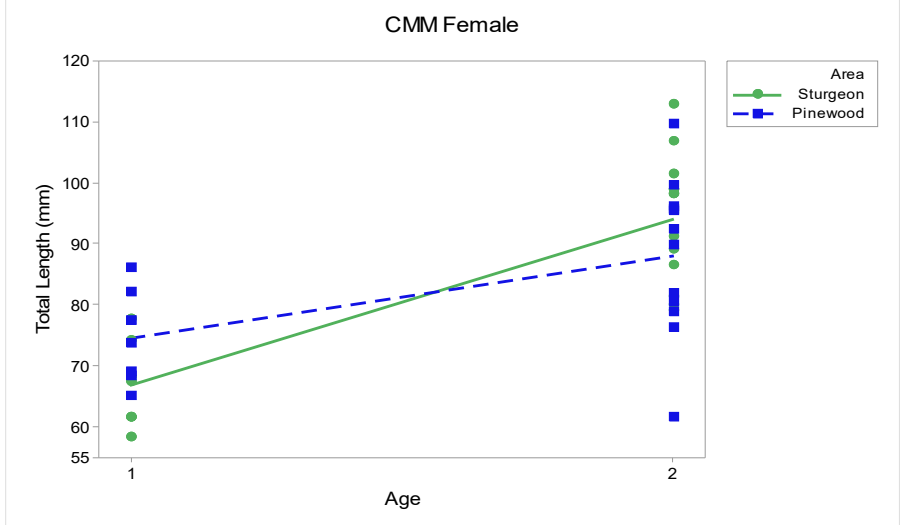


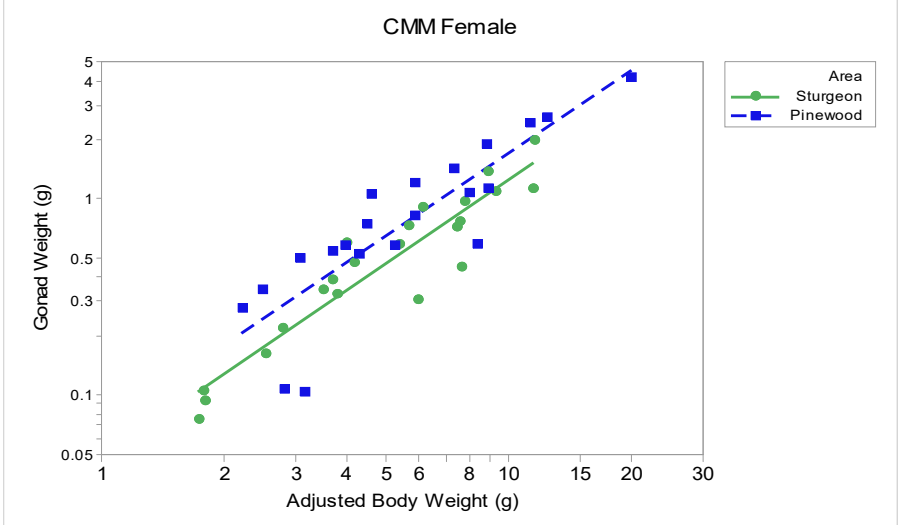
Figure E.2: Scatterplot and Linear Regressions For Male Brook Stickleback Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference), RRP Phase 1 EEM, 2017

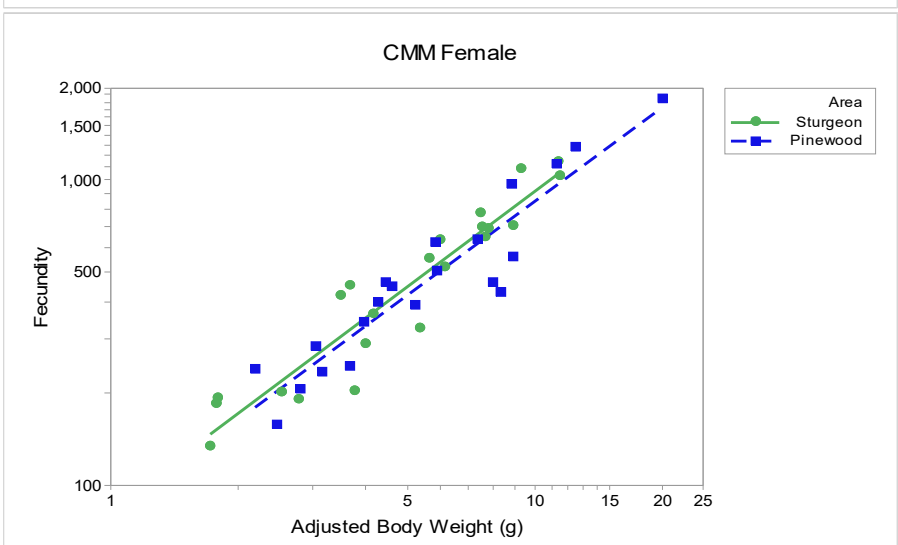
Notes: outliers are plotted as open symbols with an × through them

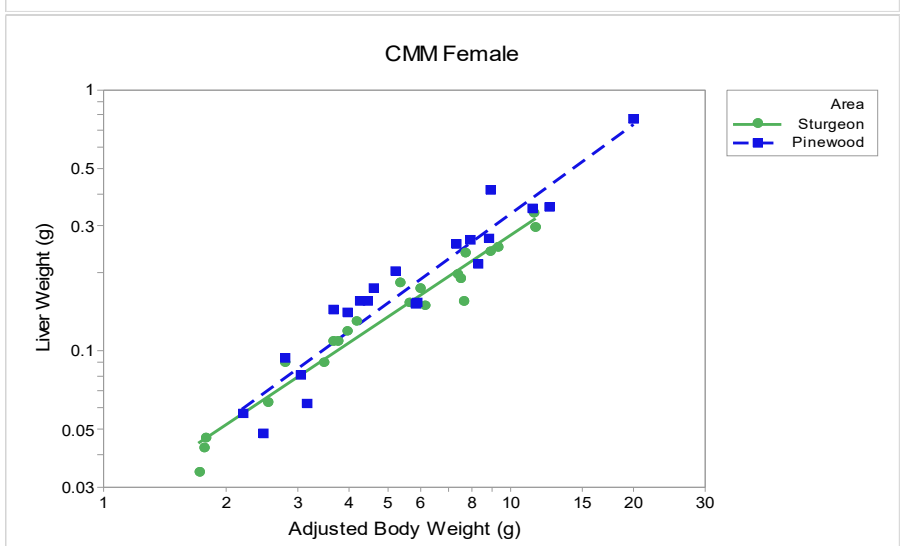












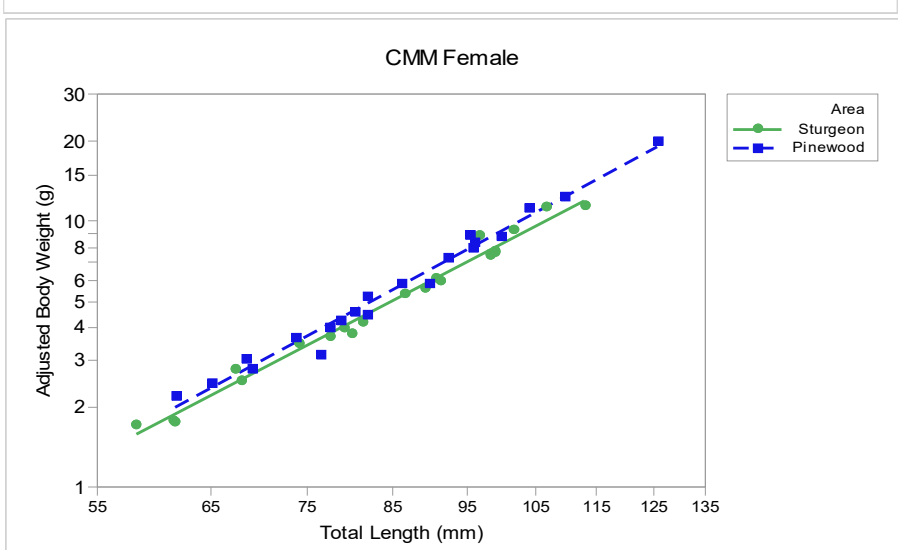
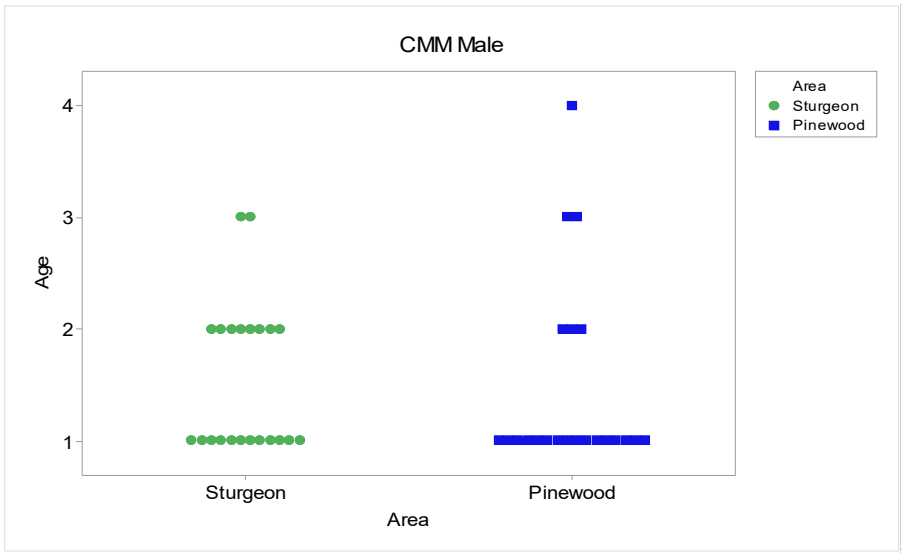
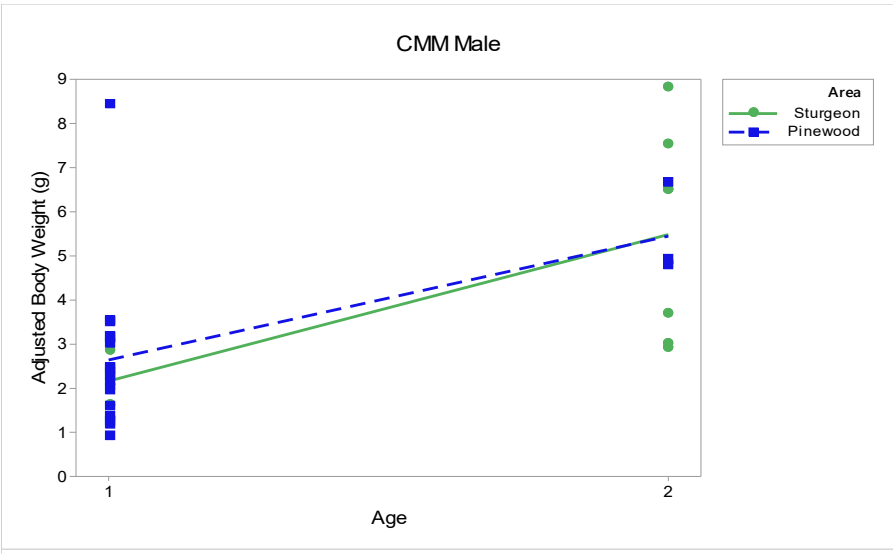
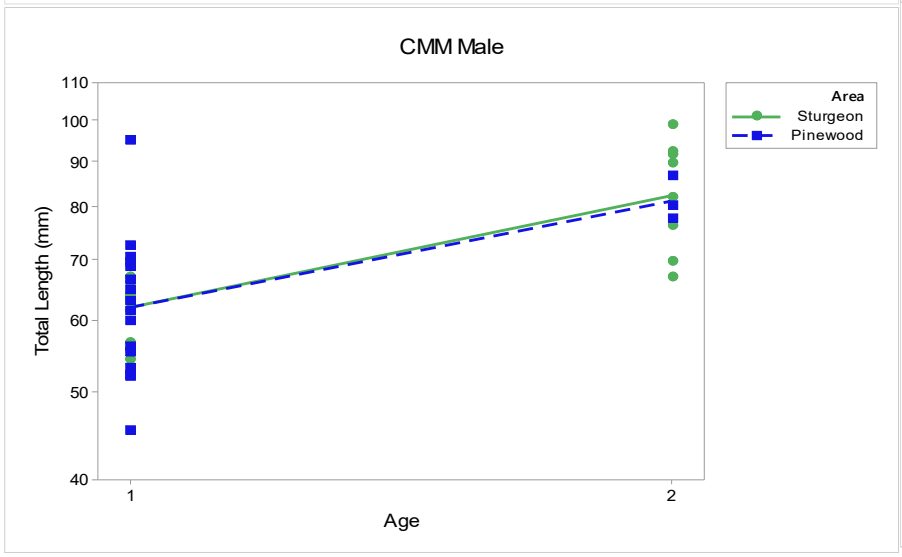


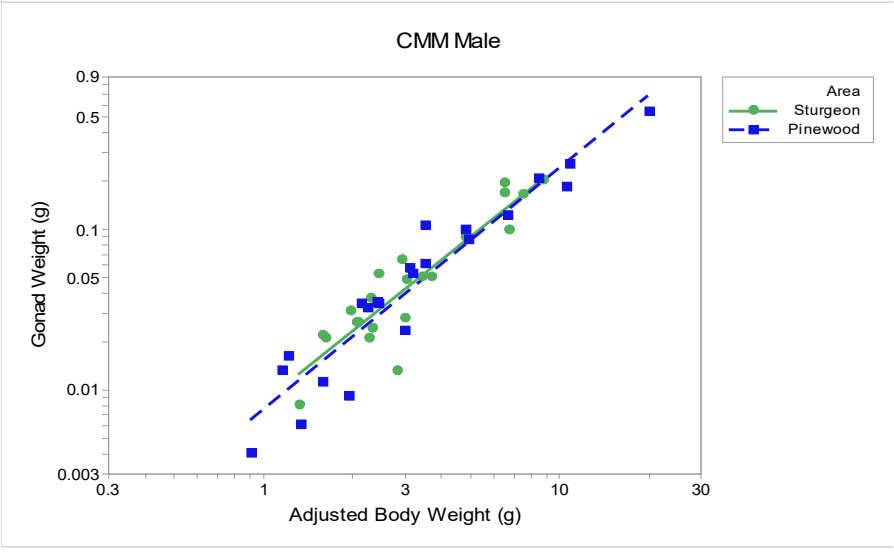
Figure E.3: Scatterplot and Linear Regressions For Female Central Mudminnow Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference), RRP Phase 1 EEM, 2017

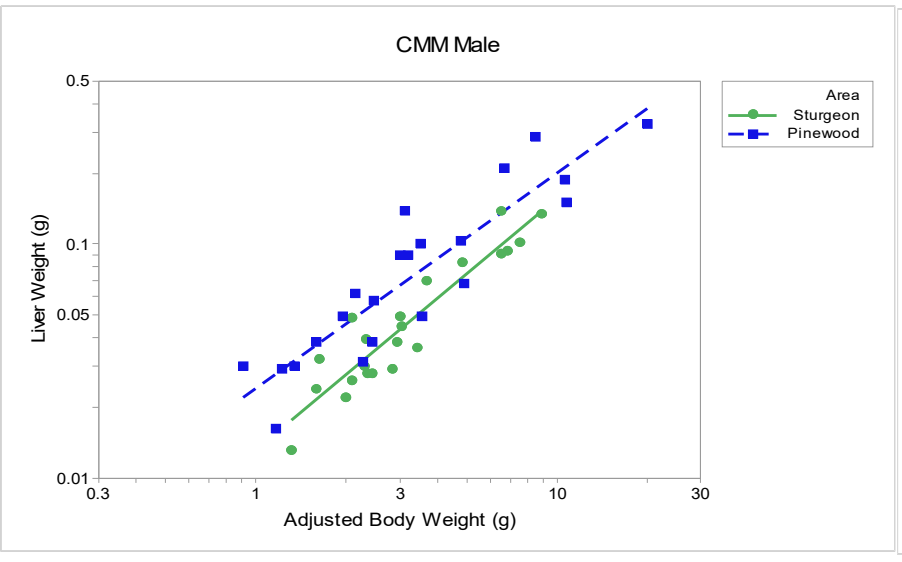
Notes: outliers are plotted as open symbols with an × through them











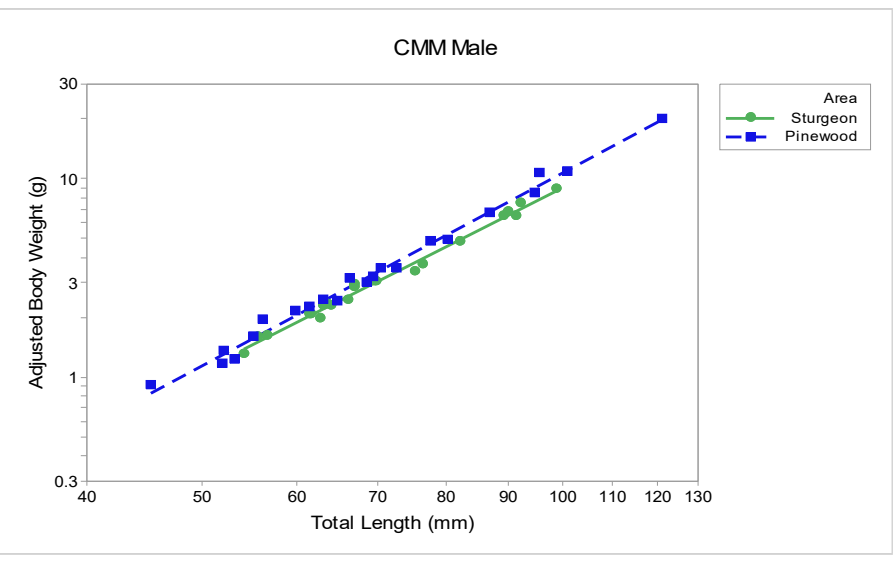


Figure E.4: Scatterplot and Linear Regressions For Male Central Mudminnow Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference), RRP Phase 1 EEM, 2017

Notes: outliers are plotted as open symbols with an × through them

Table E.1: Minnow Trapping Catch Records, RRP Phase 1 EEM, 2017

Effluent-exposed vs Reference	Area ID	Station ID	Location (dd mm ss.s)[a]		Set Date	Lift Date	Set Time	Lift Time	Trap Set Hours	Number of Traps	Effort (Total Trap Days)	Brook Stickleback					Central Mudminnow					Brown Bullhead				
			Latitude	Longitude								Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE
Mine-exposed	Pinewood River (PinR-EXP)	PinR-EXP-MT1	48 49 46.6	-94 03 51.8	21-Apr-17	22-Apr-17	18:30	10:00	15.50	14	9.04	184	50	0	134	20.4	10	10	0	0	1.11	0	0	0	0	0
		PinR-EXP-MT2	48 49 46.6	-94 03 51.8	22-Apr-17	23-Apr-17	10:20	8:30	22.17	14	12.9	296	0	0	296	22.9	2	2	0	0	0.15	0	0	0	0	0
		PinR-EXP-MT3	48 49 46.6	-94 03 51.8	23-Apr-17	24-Apr-17	9:40	9:10	23.50	14	13.7	498	0	0	498	36.3	12	12	0	0	0.88	1	0	0	1	0.07
		PinR-EXP-MT4	48 49 46.6	-94 03 51.8	24-Apr-17	25-Apr-17	9:10	9:00	23.83	14	13.9	222	0	0	222	16.0	10	10	0	0	0.72	0	0	0	0	0
		PinR-EXP-MT5	48 49 44.1	-94 03 51.8	24-Apr-17	25-Apr-17	9:30	9:20	23.83	15	14.9	134	0	0	134	9.0	14	14	0	0	0.94	0	0	0	0	0
		PinR-EXP-MT6	48 49 44.1	-94 03 51.8	25-Apr-17	25-Apr-17	9:30	12:30	3.00	15	1.88	27	0	0	27	14.4	0	0	0	0	0	0	0	0	0	0
		PinR-EXP-MT7	48 49 44.1	-94 03 51.8	25-Apr-17	26-Apr-17	9:50	12:45	26.92	12	13.5	20	0	0	20	1.49	0	0	0	0	0	0	0	0	0	0
										Total	**79.8**	**1,381**	**50**	**0**	**1,331**	**17.3**	**48**	**48**	**0**	**0**	**0.60**	**1**	**0**	**0**	**1**	**0.01**
Reference	Sturgeon Creek (StuC-REF)	StuC-REF-MT1	48 43 16.6	-93 57 08.3	21-Apr-17	22-Apr-17	19:20	8:50	13.50	15	8.44	129	50	0	79	15.3	56	56	0	0	6.64	0	0	0	0	0
		StuC-REF-MT2	48 43 16.6	-93 57 08.3	23-Apr-17	24-Apr-17	10:30	8:10	21.67	15	13.5	95	0	0	95	7.0	44	12	0	32	3.25	0	0	0	0	0
										Total	**22.0**	**224**	**50**	**0**	**174**	**10.2**	**100**	**68**	**0**	**32**	**4.55**	**0**	**0**	**0**	**0**	**0**

Note: CPUE = catch per unit effort (# fish per day per trap).
[a] d-degrees, m-minutes, s-seconds

Table E.1: Minnow Trapping Catch Records, RRP Phase 1 EEM, 2017

Effluent-exposed vs Reference	Area ID	Station ID	Location (dd mm ss.s)[a]		Brassy Minnow					Creek Chub					Finescale Dace					Johnny Darter					Lake Chub				
			Latitude	Longitude	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE
Mine-exposed	Pinewood River (PinR-EXP)	PinR-EXP-MT1	48 49 46.6	-94 03 51.8	1	0	0	1	0.11	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0.11	2	0	0	2	0.22
		PinR-EXP-MT2	48 49 46.6	-94 03 51.8	6	0	0	6	0.46	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	2	0.15
		PinR-EXP-MT3	48 49 46.6	-94 03 51.8	1	0	0	1	0.07	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PinR-EXP-MT4	48 49 46.6	-94 03 51.8	6	0	0	6	0.43	0	0	0	0	0	3	0	0	3	0.22	0	0	0	0	0	6	0	0	6	0.43
		PinR-EXP-MT5	48 49 44.1	-94 03 51.8	7	0	0	7	0.47	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PinR-EXP-MT6	48 49 44.1	-94 03 51.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		PinR-EXP-MT7	48 49 44.1	-94 03 51.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
					21	**0**	**0**	**21**	**0.26**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**0**	**3**	**0.04**	**1**	**0**	**0**	**1**	**0.01**	**10**	**0**	**0**	**10**	**0.13**
Reference	Sturgeon Creek (StuC-REF)	StuC-REF-MT1	48 43 16.6	-93 57 08.3	0	0	0	0	0	7	0	0	7	0.83	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
		StuC-REF-MT2	48 43 16.6	-93 57 08.3	6	0	6	0	0.44	4	0	4	0	0.30	2	0	2	0	0.15	0	0	0	0	0	3	0	3	0	0.22
					6	**0**	**6**	**0**	**0.27**	**11**	**0**	**4**	**7**	**0.50**	**2**	**0**	**2**	**0**	**0.09**	**0**	**0**	**0**	**0**	**0**	**3**	**0**	**3**	**0**	**0.14**

Note: CPUE = catch per unit effort (# fish per day per trap).
[a] d-degrees, m-minutes, s-seconds

Table E.1: Minnow Trapping Catch Records, RRP Phase 1 EEM, 2017

Effluent-exposed vs Reference	Area ID	Station ID	Location (dd mm ss.s)[a]		Pearl Dace					Northern Redbelly Dace					White Sucker					Total (all species)	
			Latitude	Longitude	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	No. Captured	CPUE
Mine-exposed	Pinewood River (PinR-EXP)	PinR-EXP-MT1	48 49 46.6	-94 03 51.8	0	0	0	0	0	1	0	0	1	0.11	4	0	0	4	0.44	203	22.5
		PinR-EXP-MT2	48 49 46.6	-94 03 51.8	0	0	0	0	0	16	15	0	1	1.24	0	0	0	0	0	322	24.9
		PinR-EXP-MT3	48 49 46.6	-94 03 51.8	3	0	0	3	0.22	5	0	0	5	0.36	1	0	0	1	0.07	521	38.0
		PinR-EXP-MT4	48 49 46.6	-94 03 51.8	1	0	0	1	0.07	5	0	0	5	0.36	2	0	0	2	0.14	255	18.3
		PinR-EXP-MT5	48 49 44.1	-94 03 51.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	155	10.4
		PinR-EXP-MT6	48 49 44.1	-94 03 51.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	14.4
		PinR-EXP-MT7	48 49 44.1	-94 03 51.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	1.49
					4	**0**	**0**	**4**	**0.05**	**27**	**15**	**0**	**12**	**0.34**	**7**	**0**	**0**	**7**	**0.09**	**1,503**	**18.8**
Reference	Sturgeon Creek (StuC-REF)	StuC-REF-MT1	48 43 16.6	-93 57 08.3	0	0	0	0	0	43	0	0	43	5.10	0	0	0	0	0	235	27.9
		StuC-REF-MT2	48 43 16.6	-93 57 08.3	0	0	0	0	0	5	0	5	0	0.37	0	0	0	0	0	159	11.7
					0	**0**	**0**	**0**	**0**	**48**	**0**	**5**	**43**	**2.18**	**0**	**0**	**0**	**0**	**0**	**394**	**17.9**

Note: CPUE = catch per unit effort (# fish per day per trap).
[a] d-degrees, m-minutes, s-seconds

Table E.2: Seine Net Catch Records, RRP Phase 1 EEM, 2017

Effluent-exposed vs Reference	Area ID	Station ID	Location (dd mm ss.s)[a]		Date	Time	Length (m)	Distance (m)	# of Hauls	Area Seined (m^2)	Brook Stickleback					Central Mudminnow					Brassy Minnow (juvenile)				
			Latitude	Longitude							Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE
Effluent-exposed	Pinewood River (PinR-EXP)	SN-1a	48 49 46.6	-94 03 51.8	23-Apr-17	16:00	5	2	1	10	7	0	0	7	0.70	8	8	0	0	0.80	0	0	0	0	0
		SN-1b					6	4	1	24	5	0	0	5	0.21	3	3	0	0	0.13	0	0	0	0	0
		SN-1c					6	4	1	24	6	0	0	6	0.25	0	0	0	0	0	0	0	0	0	0
		SN-2a	48 49 44.6	-94 03 55.7	23-Apr-17	16:30	10	5	1	50	4	0	0	4	0.08	0	0	0	0	0	0	0	0	0	0
		SN-2b					7	7	1	49	4	0	0	4	0.08	0	0	0	0	0	0	0	0	0	0
		SN-3	48 49 44.1	-94 03 57.9	23-Apr-17	17:00	8	8	1	64	350	0	0	350	5.5	2	2	0	0	0.03	70	0	0	70	1.1
									Total	**221**	**376**	**0**	**0**	**376**	**1.7**	**13**	**13**	**0**	**0**	**0.06**	**70**	**0**	**0**	**70**	**0.32**

Note: Total CPUE = # of fish / m^2.

[a] d-degrees, m-minutes, s-seconds

Table E.2: Seine Net Catch Records, RRP Phase 1 EEM, 2017

Effluent-exposed vs Reference	Area ID	Station ID	Location (dd mm ss.s)[a]		Date	Time	Length (m)	Distance (m)	# of Hauls	Area Seined (m^2)	Dace spp. (juvenile)					Johnny Darter					White Sucker					Total (all species)	
			Latitude	Longitude							Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	No. Captured	CPUE
Effluent-exposed	Pinewood River (PinR-EXP)	SN-1a	48 49 46.6	-94 03 51.8	23-Apr-17	16:00	5	2	1	10	1	0	0	1	0.10	0	0	0	0	0	0	0	0	0	0	16	1.6
		SN-1b					6	4	1	24	3	0	0	3	0.13	0	0	0	0	0	0	0	0	0	0	11	0.5
		SN-1c					6	4	1	24	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0.3
		SN-2a	48 49 44.6	-94 03 55.7	23-Apr-17	16:30	10	5	1	50	0	0	0	0	0	1	0	0	1	0.02	0	0	0	0	0	5	0.1
		SN-2b					7	7	1	49	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0.1
		SN-3	48 49 44.1	-94 03 57.9	23-Apr-17	17:00	8	8	1	64	100	0	0	100	1.6	0	0	0	0	0	2	0	0	2	0.03	524	8.2
									Total	**221**	**104**	**0**	**0**	**104**	**0.47**	**1**	**0**	**0**	**1**	**0**	**2**	**0**	**0**	**2**	**0.01**	**566**	**2.6**

Note: Total CPUE = # of fish / m^2.

[a] d-degrees, m-minutes, s-seconds

Table E.3: Backpack Electrofishing Catch Records, RRP Phase 1 EEM, 2017

Effluent-exposed vs Reference	Area ID	Station ID	Location (dd mm ss.s)[a]		Date	Electrofisher Settings			Effort (seconds)	Fish Species [b]					Total (all species)	
			Starting Location							Central Mudminnow						
			Latitude	Longitude		Output Voltage (volts)	Cycle Freq. (Hz)	Duty Cycle (%)		Total Catch	Number Retained	Additional Mortalities	Number Released Alive	CPUE	No. Captured	CPUE
Effluent-exposed	Pinewood River (PinR-EXP)	PinR-EXP-EF	48 49 47.1	-94 03 49.4	25-Apr-17	400	30	12	756	20	12	0	8	1.6	20	1.6
								Total	**756**	**20**	**12**	**0**	**8**	**1.6**	**20**	**1.6**

Note: CPUE = catch per unit effort (# fish per electrofishing minute).

[a] d-degrees, m-minutes, s-seconds

[b] Targeted fishing for central mudminnow. Brook stickleback, dace spp., and white sucker also observed but not captured.

Table E.4: Female Brook Stickleback Meristic Data from Sturgeon Creek, RRP Phase 1 EEM, 2017

Processing Date	Species	Fish ID Number	Total Length (mm)	Fork Length (mm)	Body Weight (g)	Age Structure Collected	Sex	Age	Gonad Weight (g)	Gonad Subsample Weight (g)	Liver Weight (g)	Fecundity	Egg Weight (g)	Abnormalities / Comments
22-Apr-17	BSB	StuC-BSB-01	46.38	-	0.751	whole body	F	1	0.025	-	0.024	3,114	0	-
22-Apr-17	BSB	StuC-BSB-02	53.57	-	1.174	whole body	F	1	0.047	-	0.056	2,584	0	-
22-Apr-17	BSB	StuC-BSB-05	54.29	-	1.202	whole body	F	1	0.048	-	0.047	2,768	0	-
22-Apr-17	BSB	StuC-BSB-06	57.90	-	1.663	whole body	F	1	0.067	-	0.066	3,146	0	-
22-Apr-17	BSB	StuC-BSB-07	50.87	-	1.127	whole body	F	1	0.048	-	0.039	2,667	0	-
22-Apr-17	BSB	StuC-BSB-08	46.38	-	0.804	whole body	F	1	0.029	-	0.019	2,204	0	-
22-Apr-17	BSB	StuC-BSB-15	43.15	-	0.664	whole body	F	1	0.028	-	0.015	1,894	0	-
22-Apr-17	BSB	StuC-BSB-16	44.64	-	0.747	whole body	F	1	0.022	-	0.026	1,636	0	-
22-Apr-17	BSB	StuC-BSB-17	45.51	-	0.665	whole body	F	1	0.024	-	0.019	1,266	0	-
22-Apr-17	BSB	StuC-BSB-18	45.20	-	0.704	whole body	F	1	0.026	-	0.026	1,936	0	-
22-Apr-17	BSB	StuC-BSB-20	45.37	-	0.629	whole body	F	1	0.021	-	0.018	1,253	0	-
22-Apr-17	BSB	StuC-BSB-22	44.46	-	0.776	whole body	F	1	0.027	-	0.023	1,662	0	-
22-Apr-17	BSB	StuC-BSB-23	46.83	-	0.782	whole body	F	1	0.018	-	0.032	1,388	0	worm
22-Apr-17	BSB	StuC-BSB-24	46.09	-	0.866	whole body	F	1	0.033	-	0.038	1,840	0	worm
22-Apr-17	BSB	StuC-BSB-25	49.52	-	0.850	whole body	F	1	0.029	-	0.022	1,865	0	worm
22-Apr-17	BSB	StuC-BSB-28	43.60	-	0.646	whole body	F	1	0.024	-	0.018	1,256	0	-
22-Apr-17	BSB	StuC-BSB-31	46.84	-	0.805	whole body	F	1	0.021	-	0.031	1,636	0	-
22-Apr-17	BSB	StuC-BSB-32	47.47	-	0.815	whole body	F	1	0.039	-	0.036	1,857	0	-
22-Apr-17	BSB	StuC-BSB-34	46.17	-	0.819	whole body	F	1	0.031	-	0.036	1,497	0	-
22-Apr-17	BSB	StuC-BSB-37	45.00	-	0.679	whole body	F	1	0.019	-	0.021	1,841	0	-
22-Apr-17	BSB	StuC-BSB-39	50.53	-	0.954	whole body	F	1	0.038	-	0.026	1,971	0	-
22-Apr-17	BSB	StuC-BSB-41	44.46	-	0.677	whole body	F	1	0.026	-	0.024	2,091	0	-
22-Apr-17	BSB	StuC-BSB-43	47.06	-	0.816	whole body	F	1	0.028	-	0.029	1,350	0	-
n			**23**	**-**	**23**	**-**	**-**	**23**	**23**	**-**	**23**	**23**	**23**	**-**
min			**43.15**	**-**	**0.629**	**-**	**-**	**1**	**0.018**	**-**	**0.015**	**1253**	**0.000008**	**-**
max			**57.90**	**-**	**1.663**	**-**	**-**	**1**	**0.067**	**-**	**0.066**	**3,146**	**0.000021**	**-**
mean			**47.45**	**-**	**0.853**	**-**	**-**	**1.000**	**0.031**	**-**	**0.030**	**1,944**	**0.000016**	**-**
median			**46.38**	**-**	**0.804**	**-**	**-**	**1.000**	**0.028**	**-**	**0.026**	**1,857**	**0.000017**	**-**
standard deviation			**3.716**	**-**	**0.239**	**-**	**-**	**0.000**	**0.012**	**-**	**0.013**	**568**	**0.000004**	**-**
standard error			**0.775**	**-**	**0.050**	**-**	**-**	**0.000**	**0.002**	**-**	**0.003**	**118.40**	**0.000001**	**-**

Notes: BSB = Brook Stickleback; F = Female.

Table E.5: Female Brook Stickleback Meristic Data from the Pinewood River, RRP Phase 1 EEM, 2017

Processing Date	Species	Fish ID Number	Total Length (mm)	Fork Length (mm)	Body Weight (g)	Age Structure Collected	Sex	Age	Gonad Weight (g)	Gonad Subsample Weight (g)	Liver Weight (g)	Fecundity	Egg Weight (g)	Abnormalities / Comments
22-Apr-17	BSB	PinR-BSB-02	48.47	-	1.186	whole body	F	1	0.165	-	0.111	2,117	0.00008	-
22-Apr-17	BSB	PinR-BSB-03	47.19	-	1.157	whole body	F	1	0.072	-	0.080	2,070	0.00003	-
22-Apr-17	BSB	PinR-BSB-04	45.20	-	1.031	whole body	F	1	0.131	-	0.095	379	0.00035	-
22-Apr-17	BSB	PinR-BSB-05	46.37	-	1.173	whole body	F	1	0.175	-	0.082	461	0.00038	-
22-Apr-17	BSB	PinR-BSB-06	45.93	-	1.069	whole body	F	1	0.158	-	0.098	2,127	0.00007	-
22-Apr-17	BSB	PinR-BSB-07	47.20	-	1.185	whole body	F	1	0.150	-	0.115	2,494	0.00006	-
22-Apr-17	BSB	PinR-BSB-09	53.31	-	1.160	whole body	F	1	0.035	-	0.035	-	-	undeveloped female
22-Apr-17	BSB	PinR-BSB-10	47.88	-	1.280	whole body	F	1	0.271	-	0.102	3,022	0.00009	-
22-Apr-17	BSB	PinR-BSB-11	43.70	-	0.832	whole body	F	1	0.055	-	0.042	558	0.00010	-
22-Apr-17	BSB	PinR-BSB-12	47.03	-	0.955	whole body	F	1	0.043	-	0.064	2,944	0.00001	-
22-Apr-17	BSB	PinR-BSB-13	41.92	-	0.773	whole body	F	1	0.058	-	0.059	1,861	0.00003	-
22-Apr-17	BSB	PinR-BSB-15	58.52	-	1.954	whole body	F	2	0.216	-	0.129	4,383	0.00005	-
22-Apr-17	BSB	PinR-BSB-16	45.44	-	0.863	whole body	F	1	0.046	-	0.059	1,683	0.00003	-
22-Apr-17	BSB	PinR-BSB-17	49.89	-	1.380	whole body	F	2	0.117	-	0.072	805	0.00015	-
22-Apr-17	BSB	PinR-BSB-18	42.01	-	0.806	whole body	F	1	0.102	-	0.061	1,852	0.00006	-
22-Apr-17	BSB	PinR-BSB-21	44.45	-	0.866	whole body	F	1	0.079	-	0.067	1,353	0.00006	-
22-Apr-17	BSB	PinR-BSB-22	43.04	-	0.738	whole body	F	1	0.075	-	0.072	1,735	0.00004	-
22-Apr-17	BSB	PinR-BSB-23	42.76	-	0.802	whole body	F	1	0.053	-	0.055	1,785	0.00003	-
22-Apr-17	BSB	PinR-BSB-24	50.77	-	1.151	whole body	F	1	0.097	-	0.083	2,502	0.00004	-
22-Apr-17	BSB	PinR-BSB-26	43.22	-	0.749	whole body	F	1	0.112	-	0.056	2,004	0.00006	-
22-Apr-17	BSB	PinR-BSB-27	41.58	-	0.656	whole body	F	1	0.030	-	0.039	1,695	0.00002	-
22-Apr-17	BSB	PinR-BSB-28	47.51	-	1.064	whole body	F	1	0.057	-	0.068	1,449	0.00004	-
22-Apr-17	BSB	PinR-BSB-29	50.60	-	1.186	whole body	F	1	0.134	-	0.091	2,388	0.00006	-
n			**23**	**-**	**23**	**-**	**-**	**23**	**23**	**-**	**23**	**22**	**22**	**-**
min			**41.58**	**-**	**0.656**	**-**	**-**	**1**	**0.030**	**-**	**0.035**	**-**	**-**	**-**
max			**58.52**	**-**	**1.954**	**-**	**-**	**2**	**0.271**	**-**	**0.129**	**-**	**-**	**-**
mean			**46.70**	**-**	**1.044**	**-**	**-**	**1.087**	**0.106**	**-**	**0.075**	**-**	**-**	**-**
median			**46.37**	**-**	**1.064**	**-**	**-**	**1.000**	**0.097**	**-**	**0.072**	**-**	**-**	**-**
standard deviation			**4.055**	**-**	**0.282**	**-**	**-**	**0.288**	**0.062**	**-**	**0.025**	**-**	**-**	**-**
standard error			**0.846**	**-**	**0.059**	**-**	**-**	**0.060**	**0.013**	**-**	**0.005**	**-**	**-**	**-**

Notes: BSB = Brook Stickleback; F = Female.

Table E.6: Male Brook Stickleback Meristic Data from Sturgeon Creek, RRP Phase 1 EEM, 2017

Processing Date	Species	Fish ID Number	Total Length (mm)	Fork Length (mm)	Body Weight (g)	Age Structure Collected	Sex	Age	Gonad Weight (g)	Liver Weight (g)	Abnormalities / Comments
22-Apr-17	BSB	StuC-BSB-03	51.78	-	1.102	whole body	M	1	0.003	0.035	worms in body cavity
22-Apr-17	BSB	StuC-BSB-04	48.87	-	0.858	whole body	M	1	0.005	0.029	-
22-Apr-17	BSB	StuC-BSB-09	49.04	-	0.902	whole body	M	1	0.003	0.031	-
22-Apr-17	BSB	StuC-BSB-10	46.96	-	0.788	whole body	M	1	0.002	0.019	-
22-Apr-17	BSB	StuC-BSB-11	49.51	-	0.895	whole body	M	1	0.002	0.020	-
22-Apr-17	BSB	StuC-BSB-12	51.16	-	0.996	whole body	M	1	0.004	0.030	-
22-Apr-17	BSB	StuC-BSB-13	47.84	-	0.865	whole body	M	1	0.004	0.031	-
22-Apr-17	BSB	StuC-BSB-14	45.40	-	0.785	whole body	M	1	0.003	0.017	-
22-Apr-17	BSB	StuC-BSB-19	40.67	-	0.530	whole body	M	1	0.001	0.012	-
22-Apr-17	BSB	StuC-BSB-21	41.75	-	0.635	whole body	M	1	0.002	0.015	worm in body cavity
22-Apr-17	BSB	StuC-BSB-26	50.17	-	0.840	whole body	M	1	0.004	0.014	-
22-Apr-17	BSB	StuC-BSB-27	47.05	-	0.808	whole body	M	1	0.003	0.017	worm
22-Apr-17	BSB	StuC-BSB-29	49.43	-	0.977	whole body	M	1	0.003	0.029	-
22-Apr-17	BSB	StuC-BSB-30	51.40	-	1.040	whole body	M	1	0.004	0.014	-
22-Apr-17	BSB	StuC-BSB-33	45.46	-	0.747	whole body	M	1	0.002	0.020	-
22-Apr-17	BSB	StuC-BSB-35	45.71	-	0.914	whole body	M	1	0.002	0.045	large worm
22-Apr-17	BSB	StuC-BSB-36	47.48	-	0.880	whole body	M	1	0.002	0.037	-
22-Apr-17	BSB	StuC-BSB-38	51.85	-	0.972	whole body	M	1	0.006	0.022	-
22-Apr-17	BSB	StuC-BSB-40	47.93	-	0.766	whole body	M	1	0.002	0.018	-
22-Apr-17	BSB	StuC-BSB-42	45.09	-	0.694	whole body	M	1	0.003	0.012	-
22-Apr-17	BSB	StuC-BSB-44	40.94	-	0.578	whole body	M	1	0.002	0.019	-
22-Apr-17	BSB	StuC-BSB-45	50.55	-	1.095	whole body	M	1	0.004	0.033	-
n			**22**	**-**	**22**	**-**	**-**	**22**	**22**	**22**	**-**
min			**40.67**	**-**	**0.530**	**-**	**-**	**1**	**0.001**	**0.012**	**-**
max			**51.85**	**-**	**1.102**	**-**	**-**	**1**	**0.006**	**0.045**	**-**
mean			**47.55**	**-**	**0.849**	**-**	**-**	**1.000**	**0.003**	**0.024**	**-**
median			**47.89**	**-**	**0.862**	**-**	**-**	**1.000**	**0.003**	**0.020**	**-**
standard deviation			**3.348**	**-**	**0.154**	**-**	**-**	**0.000**	**0.001**	**0.009**	**-**
standard error			**0.714**	**-**	**0.033**	**-**	**-**	**0.000**	**0.000**	**0.002**	**-**

Notes: BSB = Brook Stickleback; M = Male.

Table E.7: Male Brook Stickleback Meristic Data from the Pinewood River, RRP Phase 1 EEM, 2017

Processing Date	Species	Fish ID Number	Total Length (mm)	Fork Length (mm)	Body Weight (g)	Age Structure Collected	Sex	Age	Gonad Weight (g)	Liver Weight (g)	Abnormalities / Comments
22-Apr-17	BSB	PinR-BSB-01	52.10	-	1.302	whole body	M	1	0.007	0.064	-
22-Apr-17	BSB	PinR-BSB-08	52.65	-	1.577	whole body	M	1	0.008	0.072	-
22-Apr-17	BSB	PinR-BSB-14	52.49	-	1.625	whole body	M	1	0.004	0.116	-
22-Apr-17	BSB	PinR-BSB-19	49.93	-	1.235	whole body	M	1	0.004	0.047	-
22-Apr-17	BSB	PinR-BSB-20	49.06	-	1.057	whole body	M	1	0.004	0.025	-
22-Apr-17	BSB	PinR-BSB-25	42.64	-	0.858	whole body	M	1	0.001	0.059	scale tared before weight
22-Apr-17	BSB	PinR-BSB-30	50.29	-	1.252	whole body	M	1	0.006	0.062	-
22-Apr-17	BSB	PinR-BSB-31	47.92	-	0.905	whole body	M	1	0.002	0.020	worm in body cavity
22-Apr-17	BSB	PinR-BSB-32	44.49	-	1.006	whole body	M	1	0.004	0.050	-
22-Apr-17	BSB	PinR-BSB-33	42.73	-	0.855	whole body	M	1	0.002	0.024	-
22-Apr-17	BSB	PinR-BSB-34	43.95	-	0.920	whole body	M	1	0.006	0.040	-
22-Apr-17	BSB	PinR-BSB-35	51.80	-	1.210	whole body	M	1	0.002	0.054	-
22-Apr-17	BSB	PinR-BSB-36	47.46	-	1.099	whole body	M	1	0.003	0.058	-
22-Apr-17	BSB	PinR-BSB-37	43.39	-	0.814	whole body	M	1	0.004	0.039	-
22-Apr-17	BSB	PinR-BSB-38	44.64	-	0.942	whole body	M	1	0.004	0.057	-
22-Apr-17	BSB	PinR-BSB-39	45.28	-	0.833	whole body	M	1	0.004	0.030	-
22-Apr-17	BSB	PinR-BSB-40	41.80	-	0.692	whole body	M	1	0.003	0.031	-
22-Apr-17	BSB	PinR-BSB-41	45.51	-	0.889	whole body	M	1	0.001	0.028	-
22-Apr-17	BSB	PinR-BSB-42	42.87	-	0.690	whole body	M	1	0.004	0.030	-
22-Apr-17	BSB	PinR-BSB-43	51.23	-	1.155	whole body	M	1	0.001	0.048	-
22-Apr-17	BSB	PinR-BSB-44	48.21	-	0.968	whole body	M	1	0.003	0.028	-
n			**21**	**-**	**21**	**-**	**-**	**21**	**21**	**21**	**-**
min			**41.80**	**-**	**0.690**	**-**	**-**	**1**	**0.001**	**0.020**	**-**
max			**52.65**	**-**	**1.625**	**-**	**-**	**1**	**0.008**	**0.116**	**-**
mean			**47.16**	**-**	**1.042**	**-**	**-**	**1.000**	**0.004**	**0.047**	**-**
median			**47.46**	**-**	**0.968**	**-**	**-**	**1.000**	**0.004**	**0.047**	**-**
standard deviation			**3.710**	**-**	**0.255**	**-**	**-**	**0.000**	**0.002**	**0.022**	**-**
standard error			**0.810**	**-**	**0.056**	**-**	**-**	**0.000**	**0.000**	**0.005**	**-**

Notes: BSB = Brook Stickleback; M = Male.

Table E.8: Female Central Mudminnow Meristic Data from Sturgeon Creek, RRP Phase 1 EEM, 2017

Processing Date	Species	Fish ID Number	Total Length (mm)	Fork Length (mm)	Body Weight (g)	Age Structure Collected	Sex	Age	Gonad Weight (g)	Gonad Subsample Weight (g)	Liver Weight (g)	Fecundity	Egg Weight (g)	Abnormalities / Comments
22-Apr-17	CMM	StuC-CMM-02	60.10	-	2.064	whole body	F (I)	-	-	-	-	-	-	-
22-Apr-17	CMM	StuC-CMM-04	98.19	-	8.476	whole body	F	2	0.764	-	0.189	699	0.0011	-
22-Apr-17	CMM	StuC-CMM-05	65.75	-	2.564	whole body	F (I)	-	-	-	-	-	-	-
22-Apr-17	CMM	StuC-CMM-13	98.08	-	8.319	whole body	F	2	0.713	-	0.196	775	0.0009	-
22-Apr-17	CMM	StuC-CMM-15	67.95	-	2.750	whole body	F	1	0.162	-	0.063	201	0.0008	-
22-Apr-17	CMM	StuC-CMM-17	98.87	-	8.244	whole body	F	2	0.451	-	0.153	646	0.0007	-
22-Apr-17	CMM	StuC-CMM-19	89.13	-	6.525	whole body	F	2	0.726	-	0.152	552	0.0013	-
22-Apr-17	CMM	StuC-CMM-21	61.51	-	1.914	whole body	F	1	0.105	-	0.042	185	0.0006	-
22-Apr-17	CMM	StuC-CMM-22	61.43	-	1.922	whole body	F	1	0.093	-	0.046	192	0.0005	-
22-Apr-17	CMM	StuC-CMM-23	106.65	-	12.819	whole body	F	2	1.121	-	0.335	1,144	0.0010	-
22-Apr-17	CMM	StuC-CMM-24	112.82	-	13.750	whole body	F	2	1.996	-	0.294	1,027	0.0019	worms
22-Apr-17	CMM	StuC-CMM-27	67.28	-	3.089	whole body	F	1	0.219	-	0.089	190	0.0012	-
22-Apr-17	CMM	StuC-CMM-29	79.89	-	4.206	whole body	F	2	0.328	-	0.108	204	0.0016	-
22-Apr-17	CMM	StuC-CMM-31	98.86	-	8.938	whole body	F	2	0.971	-	0.236	694	0.0014	-
22-Apr-17	CMM	StuC-CMM-34	77.52	-	4.171	whole body	F	1	0.388	-	0.108	452	0.0009	-
22-Apr-17	CMM	StuC-CMM-35	91.11	-	6.441	whole body	F	2	0.306	-	0.173	637	0.0005	-
22-Apr-17	CMM	StuC-CMM-36	64.03	-	2.224	whole body	F (I)	-	-	-	-	-	-	-
22-Apr-17	CMM	StuC-CMM-39	58.17	-	1.826	whole body	F	1	0.075	-	0.034	133	0.0006	-
22-Apr-17	CMM	StuC-CMM-40	86.54	-	6.113	whole body	F	2	0.583	-	0.182	326	0.0018	-
24-Apr-17	CMM	StuC-CMM-42	90.44	-	7.200	whole body	F	3	0.912	-	0.148	517	0.0018	-
24-Apr-17	CMM	StuC-CMM-43	79.06	-	4.689	whole body	F	2	0.595	-	0.118	291	0.0020	-
24-Apr-17	CMM	StuC-CMM-44	101.45	-	10.604	whole body	F	2	1.089	-	0.247	1,086	0.0010	-
24-Apr-17	CMM	StuC-CMM-45	81.34	-	4.764	whole body	F	2	0.470	-	0.129	364	0.0013	-
24-Apr-17	CMM	StuC-CMM-46	74.01	-	3.916	whole body	F	1	0.342	-	0.090	417	0.0008	missing part of caudal fin
24-Apr-17	CMM	StuC-CMM-47	96.53	-	10.462	whole body	F	3	1.377	-	0.239	705	0.0020	-
n			**25**	**-**	**25**	**-**	**-**	**22**	**22**	**-**	**22**	**22**	**22**	**-**
min			**58.17**	**-**	**1.826**	**-**	**-**	**1**	**0.075**	**-**	**0.034**	**133**	**0.000480**	**-**
max			**112.82**	**-**	**13.750**	**-**	**-**	**3**	**1.996**	**-**	**0.335**	**1,144**	**0.002045**	**-**
mean			**82.67**	**-**	**5.920**	**-**	**-**	**1.773**	**0.627**	**-**	**0.153**	**520**	**0.001161**	**-**
median			**81.34**	**-**	**4.764**	**-**	**-**	**2.000**	**0.527**	**-**	**0.150**	**485**	**0.001048**	**-**
standard deviation			**16.381**	**-**	**3.536**	**-**	**-**	**0.612**	**0.476**	**-**	**0.082**	**306**	**0.000506**	**-**
standard error			**3.276**	**-**	**0.707**	**-**	**-**	**0.130**	**0.102**	**-**	**0.017**	**65.26**	**0.000108**	**-**

Notes: CMM = Central Mudminnow; F = Female; I = Immature.

Table E.9: Female Central Mudminnow Meristic Data from the Pinewood River, RRP Phase 1 EEM, 2017

Processing Date	Species	Fish ID Number	Total Length (mm)	Fork Length (mm)	Body Weight (g)	Age Structure Collected	Sex	Age	Gonad Weight (g)	Gonad Subsample Weight (g)	Liver Weight (g)	Fecundity	Egg Weight (g)	Abnormalities / Comments
22-Apr-17	CMM	PinR-CMM-02	95.32	-	10.371	head	F	2	1.123	-	0.408	559	0.0020	-
22-Apr-17	CMM	PinR-CMM-03	81.90	-	5.339	whole body	F	2	0.743	-	0.154	460	0.0016	-
22-Apr-17	CMM	PinR-CMM-05	89.66	-	6.820	whole body	F	2	0.817	-	0.151	502	0.0016	-
22-Apr-17	CMM	PinR-CMM-07	68.37	-	3.626	whole body	F	1	0.497	-	0.080	284	0.0018	-
22-Apr-17	CMM	PinR-CMM-08	86.09	-	7.201	whole body	F	1	1.213	-	0.150	620	0.0020	-
22-Apr-17	CMM	PinR-CMM-10	65.01	-	2.857	whole body	F	1	0.341	-	0.048	157	0.0022	-
23-Apr-17	CMM	PinR-CMM-11	92.24	-	8.989	whole body	F	2	1.429	-	0.253	631	0.0023	-
23-Apr-17	CMM	PinR-CMM-12	68.43	-	3.414	whole body	F	-	-	-	-	-	-	-
24-Apr-17	CMM	PinR-CMM-14	81.92	-	5.985	whole body	F	1	0.574	-	0.201	388	0.0015	-
24-Apr-17	CMM	PinR-CMM-16	95.97	-	9.099	whole body	F	2	0.588	-	0.214	428	0.0014	-
24-Apr-17	CMM	PinR-CMM-17	69.05	-	2.995	whole body	F	1	0.106	-	0.093	206	0.0005	-
24-Apr-17	CMM	PinR-CMM-18	76.31	-	3.306	whole body	F	2	0.103	-	0.062	234	0.0004	-
24-Apr-17	CMM	PinR-CMM-20	95.59	-	9.280	whole body	F	2	1.071	-	0.263	458	0.0023	-
24-Apr-17	CMM	PinR-CMM-21	103.90	-	14.018	whole body	F	4	2.442	-	0.348	1,120	0.0022	worms
25-Apr-17	CMM	PinR-CMM-23	99.59	-	10.939	whole body	F	2	1.893	-	0.268	961	0.0020	-
25-Apr-17	CMM	PinR-CMM-28	80.33	-	5.805	whole body	F	2	1.055	-	0.172	446	0.0024	-
25-Apr-17	CMM	PinR-CMM-31	125.70	-	24.841	whole body	F	3	4.163	-	0.766	1,834	0.0023	-
25-Apr-17	CMM	PinR-CMM-33	69.44	-	2.992	whole body	F	-	-	-	-	-	-	-
25-Apr-17	CMM	PinR-CMM-34	61.63	-	2.531	whole body	F	2	0.278	-	0.057	238	0.0012	-
25-Apr-17	CMM	PinR-CMM-35	73.61	-	4.335	whole body	F	1	0.535	-	0.142	243	0.0022	-
25-Apr-17	CMM	PinR-CMM-43	77.37	-	4.675	whole body	F	1	0.580	-	0.139	341	0.0017	-
25-Apr-17	CMM	PinR-CMM-45	109.49	-	15.336	whole body	F	2	2.595	-	0.353	1,272	0.0020	-
25-Apr-17	CMM	PinR-CMM-46	78.77	-	4.923	whole body	F	2	0.520	-	0.153	394	0.0013	-
n			**23**	**-**	**23**	**-**	**-**	**21**	**21**	**-**	**21**	**21**	**21**	**-**
min			**61.63**	**-**	**2.531**	**-**	**-**	**1**	**0.103**	**-**	**0.048**	**157**	**0.000440**	**-**
max			**125.70**	**-**	**24.841**	**-**	**-**	**4**	**4.163**	**-**	**0.766**	**1,834**	**0.002365**	**-**
mean			**84.60**	**-**	**7.377**	**-**	**-**	**1.810**	**1.079**	**-**	**0.213**	**561**	**0.001750**	**-**
median			**81.90**	**-**	**5.805**	**-**	**-**	**2.000**	**0.743**	**-**	**0.154**	**446**	**0.001956**	**-**
standard deviation			**15.917**	**-**	**5.237**	**-**	**-**	**0.750**	**0.986**	**-**	**0.162**	**415**	**0.000552**	**-**
standard error			**3.319**	**-**	**1.092**	**-**	**-**	**0.164**	**0.215**	**-**	**0.035**	**90.56**	**0.000120**	**-**

Notes: CMM = Central Mudminnow; F = Female.

Table E.10: Male Central Mudminnow Meristic Data from Sturgeon Creek, RRP Phase 1 EEM, 2017

Processing Date	Species	Fish ID Number	Total Length (mm)	Fork Length (mm)	Body Weight (g)	Age Structure Collected	Sex	Age	Gonad Weight (g)	Liver Weight (g)	Abnormalities / Comments
22-Apr-17	CMM	StuC-CMM-01	64.00	-	2.324	whole body	M	1	0.021	0.030	-
22-Apr-17	CMM	StuC-CMM-03	89.85	-	6.958	whole body	M	3	0.098	0.093	-
22-Apr-17	CMM	StuC-CMM-06	98.79	-	9.147	whole body	M	2	0.203	0.133	-
22-Apr-17	CMM	StuC-CMM-07	66.95	-	2.868	whole body	M	1	0.013	0.029	-
22-Apr-17	CMM	StuC-CMM-08	54.18	-	1.335	whole body	M	1	0.008	0.013	-
22-Apr-17	CMM	StuC-CMM-09	69.56	-	3.091	whole body	M	2	0.028	0.049	-
22-Apr-17	CMM	StuC-CMM-10	81.90	-	4.978	whole body	M	2	0.090	0.083	-
22-Apr-17	CMM	StuC-CMM-11	92.15	-	7.791	whole body	M	2	0.165	0.101	-
22-Apr-17	CMM	StuC-CMM-12	69.84	-	3.125	whole body	M	1	0.048	0.044	-
22-Apr-17	CMM	StuC-CMM-14	75.10	-	3.498	whole body	M	3	0.050	0.036	-
22-Apr-17	CMM	StuC-CMM-16	61.61	-	2.154	whole body	M	1	0.026	0.048	-
22-Apr-17	CMM	StuC-CMM-18	91.42	-	6.739	whole body	M	2	0.169	0.091	-
22-Apr-17	CMM	StuC-CMM-20	89.30	-	6.809	whole body	M	2	0.194	0.138	-
22-Apr-17	CMM	StuC-CMM-25	66.07	-	2.514	whole body	M	1	0.053	0.028	-
22-Apr-17	CMM	StuC-CMM-26	63.12	-	2.374	whole body	M	1	0.037	0.039	-
22-Apr-17	CMM	StuC-CMM-28	63.52	-	2.383	whole body	M	1	0.024	0.028	-
22-Apr-17	CMM	StuC-CMM-30	62.73	-	2.030	whole body	M	1	0.031	0.022	-
22-Apr-17	CMM	StuC-CMM-32	76.38	-	3.806	whole body	M	2	0.050	0.069	-
22-Apr-17	CMM	StuC-CMM-33	61.41	-	2.121	whole body	M	1	0.026	0.026	-
22-Apr-17	CMM	StuC-CMM-37	56.56	-	1.675	whole body	M	1	0.021	0.032	-
22-Apr-17	CMM	StuC-CMM-38	55.56	-	1.629	whole body	M	1	0.022	0.024	-
22-Apr-17	CMM	StuC-CMM-41	66.88	-	3.018	whole body	M	2	0.064	0.038	-
n			**22**	**-**	**22**	**-**	**-**	**22**	**22**	**22**	**-**
min			**54.18**	**-**	**1.335**	**-**	**-**	**1**	**0.008**	**0.013**	**-**
max			**98.79**	**-**	**9.147**	**-**	**-**	**3**	**0.203**	**0.138**	**-**
mean			**71.68**	**-**	**3.744**	**-**	**-**	**1.545**	**0.066**	**0.054**	**-**
median			**66.92**	**-**	**2.943**	**-**	**-**	**1.000**	**0.043**	**0.039**	**-**
standard deviation			**13.252**	**-**	**2.266**	**-**	**-**	**0.671**	**0.061**	**0.036**	**-**
standard error			**2.825**	**-**	**0.483**	**-**	**-**	**0.143**	**0.013**	**0.008**	**-**

Notes: CMM = Central Mudminnow; M= Male.

Table E.11: Male Central Mudminnow Meristic Data from the Pinewood River, RRP Phase 1 EEM, 2017

Processing Date	Species	Fish ID Number	Total Length (mm)	Fork Length (mm)	Body Weight (g)	Age Structure Collected	Sex	Age	Gonad Weight (g)	Liver Weight (g)	Abnormalities / Comments
22-Apr-17	CMM	PinR-CMM-01	63.04	-	2.548	whole body	M	1	0.034	0.057	-
22-Apr-17	CMM	PinR-CMM-04	61.35	-	2.319	whole body	M	1	0.032	0.031	-
22-Apr-17	CMM	PinR-CMM-06	64.72	-	2.493	whole body	M	1	0.035	0.038	-
22-Apr-17	CMM	PinR-CMM-09	62.25	-	2.283	whole body	M	1	-	0.059	not developed - immature?
23-Apr-17	CMM	PinR-CMM-13	66.36	-	3.316	whole body	M	1	0.057	0.137	-
24-Apr-17	CMM	PinR-CMM-15	80.16	-	5.053	whole body	M	2	0.085	0.067	-
24-Apr-17	CMM	PinR-CMM-19	86.74	-	6.984	whole body	M	2	0.122	0.209	-
24-Apr-17	CMM	PinR-CMM-22	59.75	-	2.229	whole body	M	1	0.034	0.061	-
25-Apr-17	CMM	PinR-CMM-24	94.76	-	8.918	whole body	M	1	0.206	0.287	-
25-Apr-17	CMM	PinR-CMM-25	70.40	-	3.678	whole body	M	1	0.106	0.049	-
25-Apr-17	CMM	PinR-CMM-26	95.54	-	10.933	whole body	M	3	0.181	0.187	-
25-Apr-17	CMM	PinR-CMM-27	121.02	-	20.732	whole body	M	4	0.544	0.323	-
25-Apr-17	CMM	PinR-CMM-29	77.54	-	4.988	whole body	M	2	0.098	0.103	-
25-Apr-17	CMM	PinR-CMM-30	56.04	-	2.002	whole body	M	1	0.009	0.049	-
25-Apr-17	CMM	PinR-CMM-32	172.48	-	3.649	whole body	M	1	0.061	0.100	-
25-Apr-17	CMM	PinR-CMM-36	68.59	-	3.107	whole body	M	1	0.023	0.089	-
25-Apr-17	CMM	PinR-CMM-37	69.29	-	3.318	whole body	M	1	0.053	0.089	-
25-Apr-17	CMM	PinR-CMM-38	52.12	-	1.381	whole body	M	1	0.006	0.030	-
25-Apr-17	CMM	PinR-CMM-39	55.15	-	1.628	whole body	M	1	0.011	0.038	-
25-Apr-17	CMM	PinR-CMM-40	53.11	-	1.259	whole body	M	1	0.016	0.029	-
25-Apr-17	CMM	PinR-CMM-41	51.85	-	1.191	whole body	M	1	0.013	0.016	-
25-Apr-17	CMM	PinR-CMM-42	45.24	-	0.939	whole body	M	1	0.004	0.030	-
25-Apr-17	CMM	PinR-CMM-44	100.76	-	11.145	whole body	M	3	0.253	0.150	-
n			**25**	**-**	**25**	**-**	**-**	**23**	**22**	**23**	**-**
min			**45.24**	**-**	**0.939**	**-**	**-**	**1**	**0.004**	**0.016**	**-**
max			**172.48**	**-**	**20.732**	**-**	**-**	**4**	**0.544**	**0.323**	**-**
mean			**74.65**	**-**	**4.500**	**-**	**-**	**1.435**	**0.090**	**0.097**	**-**
median			**68.43**	**-**	**3.107**	**-**	**-**	**1.000**	**0.044**	**0.061**	**-**
standard deviation			**27.015**	**-**	**4.406**	**-**	**-**	**0.843**	**0.122**	**0.084**	**-**
standard error			**5.403**	**-**	**0.881**	**-**	**-**	**0.176**	**0.026**	**0.017**	**-**

Notes: CMM = Central Mudminnow; M= Male.

Table E.12: Sample Size Calculations for Endpoints with a Minimum Detectable Difference < 25% (or 10% for Condition) for Brook Stickleback Health Endpoints For Pinewood River (Effluent-exposed) Compared to Sturgeon Creek (Reference) Areas, RRP Phase 1 EEM, 2017

Species	Sex	Indicator	Endpoint	Variables		Sample Size		Test	S[a]	COV (%)[b]	Minimum Sample Size to Detect an Effect Size (% Increase/Decrease Relative to Reference) with α=β=0.1								
				Response	Covariate	Reference	Effluent-exposed				ANCOVA	d=5%	d=10%	d=20%	d=25%	d=30%	d=33%	d=40%	d=50%	d=100%
												d=-5%	d=-9%	d=-17%	d=-20%	d=-23%	d=-25%	d=-29%	d=-33%	d=-50%
											T-test/M-W	d=±5%	d=±10%	d=±20%	d=±25%	d=±30%	d=±33%	d=±40%	d=±50%	d=±100%
Central Mudminnow	Female	Survival	Age	Age	-	22	21	M-W	-	38.50	M-W	1,178	296	76	49	34	29	20	13	5
		Energy Usage	Weight-at-age (Age 1 and 2 fish)	log[Adjusted Body Weight (g)]	Age	20	19	ANCOVA	0.18174	-	ANCOVA	1,261	331	91	61	45	37	28	19	8
			Relative Gonad Weight	log[Gonad Weight (g)]	log[Adjusted Body Weight (g)]	22	21	ANCOVA	0.17503	-	ANCOVA	1,170	307	85	57	42	35	26	18	7
	Male	Survival	Age	Age	-	22	22	M-W	-	30.76	M-W	752	189	49	32	22	19	13	10	4
		Energy Usage	Weight-at-age (Age 1 and 2 fish)	log[Adjusted Body Weight (g)]	Age	20	19	ANCOVA	0.18438	-	ANCOVA	1,298	341	94	63	46	38	28	20	8
			log[Gonad Weight (g)]	log[Adjusted Body Weight (g)]	Age	20	19	ANCOVA	0.16833	-	ANCOVA	1,082	284	79	53	39	32	24	17	7
		Energy Storage	Relative Liver Weight	log[Liver Weight (g)]	log[Adjusted Body Weight (g)]	22	22	ANCOVA	0.131779	-	ANCOVA	664	175	49	33	24	20	15	11	5
Brook Stickleback	Female	Energy Usage	Relative Gonad Weight	log[Gonad Weight (g)]	log[Adjusted Body Weight (g)]	23	22	ANCOVA	0.15985	-	ANCOVA	976	257	71	48	35	29	22	15	6
		Energy Storage	Relative Liver Weight	log[Liver Weight (g)]	log[Adjusted Body Weight (g)]	23	22	ANCOVA	0.09759	-	ANCOVA	364	96	27	19	14	12	9	7	3
	Male	Energy Usage	Relative Gonad Weight	log[Gonad Weight (g)]	log[Adjusted Body Weight (g)]	22	21	ANCOVA	0.20397	-	ANCOVA	1,588	417	115	77	56	47	35	24	9
		Energy Storage	Relative Liver Weight	log[Liver Weight (g)]	log[Adjusted Body Weight (g)]	23	22	ANCOVA	0.14004	-	ANCOVA	749	197	55	37	27	23	17	12	5

Samples size required to detect a 25% increase relative to reference

[a] Pooled standard deviation of the regression residuals

[b] Coefficient of variation (pooled standard deviation/reference mean)×100%

FISH COMMUNITY DATA

Fish Permits

Ontario

Ministry of Natural Resources

Ministère des Richesses naturelles

Licence to Collect Fish for Scientific Purposes

Permis pour faire la collecte de poissons à des fins scientifiques

Licence No. / N° de permis	1086615
Local Reference No. / N° de référence local	2017-2245
Issuer Account No. / N° de compte du délivreur de permis.	10003046

This licence is issued under Part I of the Fish Licensing Regulation made under the Fish and Wildlife Conservation Act, 1997 to:

Ce permis est délivré en vertu de la Partie I du règlement sur la délivrance de permis de pêche formulé conformément à la Loi sur la protection du poisson et de la faune de 1997 à:

	Last Name / Nom de famille	First Name / Prénom	Middle Name / Second Prénom
Name of Licencee / Nom du titulaire du permis	Mrs. Tester	Jess	

Name of Business/Organization/Affiliation (If applicable) / Nom de l'entreprise/de l'organisme/de l'affiliation (le cas échéant)

Minnow Enviromental Inc.

Mailing address of Licencee / ***Adresse postale du titulaire du permis***

Street Name & No./PO Box/RR#/Gen. Del./ N° rue/C.P./R.R./poste restante

2 Lamb Street

City/Town/Municipality / Ville/village/municipalité	Province/State / Province/État	Postal Code/Zip Code / Code Postal/Zip
Georgetown	ON	L7G 3M9

to collect the species, size and quantites of fish from the waters as set out below.
Pour faire la collecte des espèces suivantes (stade et nombre indiqués ci-dessous):

Species / Espèces	Eggs / Oeuf X	Juvenile / Fretin X	Adults / Adulte X	Numbers / Nombre	Name of Waterbody / Nom de l'étendue d'eau
SMALL BODIED SPECIES			X	50	Pineewood River
SMALL BODIED SPECIES			X	50	Sturgeon Creek or Kishkakoesis River

Yes/Oui ☐ Additional species/Waterbody list attached / Liste d'espèces/d'étendue d'eau additionnelles ci-jointe

Purpose of collection / ***But de la collecte***: Fish population survey

Licence Dates / ***Dates du permis***	Effective Date / Date d'entrée en vigueur (YYYY-MM-DD)	Expiry Date / Date d'expiration (YYYY-MM-DD)
	2017-04-18	2017-05-31

Licence conditions This licence is subject to the conditions contained in Schedule A if included. / Ce permis doit respecter les conditions de l'annexe A si celle-ci est jointe.

Conditions du permis

Yes/Oui	No/Non	
☒	☐	Schedule A included. / Annexe A ci-jointe

Issued by (please print) / Délivré par (veuillez écrire en caractères d'imprimerie)	Signature of issuer / Signature du délivreur	Date of Issue/Date de délivrance (YYYY-MM-DD)
Matt Myers	<Original signed by>	2017-05-04

Signature of Licencee / Signature du titulaire du permis	Date (YYYY-MM-DD)
<Original signed by>	2017-05-05

Personal information contained on this form is collected under the authority of the Fish and Wildlife Conservation Act, 1997 and will be used for the purpose of licencing, identification, enforcement, resource management and customer service surveys. Please direct further inquiries to the District Manager of the MNR issuing district.

Les renseignements personnels dans ce formulaire sont recueillis conformément à la Loi sur la protection du poisson de la faune, 1997 , et ils seront utilisés aux fins de délivrance de permis, d'identification, d'application des règlements, de gestion des ressources et de sondage sur les services a la clientèle. Veuillez communiquer avec le chef du district du MRN qui délivré le permis si vous avez des questions.

Ontario

Licence to Collect Fish for Scientific Purposes
Schedule A – Licence Conditions

Licence No. 1086615
Local Reference No. 2017-2245
Issuer Account No. 10003046

This licence is subject to the conditions listed below.

1. Mandatory report forms documenting the sampling conducted under this licence must be submitted to the licence issuer within 30 days of the termination date, but in no case later than January 31 next following the year of issue. The digital Mandatory Report form (Part 1) must be completed for each Sampling Program and the digital Site Collection Reports (Part 2) must be completed for each collection site. A separate map clearly indicating the location of each collection site must be attached to the Site Collection Reports. Submit Mandatory Report forms to the Fort Frances District MNRF office. The submission of a satisfactory report is a prerequisite to any subsequent renewals.

2. Sampling locations must be reported using GPS location data using: Projection: Universal Transverse Mercator (UTM); Datum: North American 1983 (NAD83), Canadian Transformation (CNT); Zone: 15 N; Units: metres.

3. Before carrying out any operation under this licence, any person authorized under this licence is required to consult with the Fort Frances Ministry of Natural Resources District Manager at least one week prior to anticipated start of sampling and obtain approval from the respective Manager for the proposed sampling activity. Also, any person authorized under this licence must advise the respective Manager of the date, time and location of all sampling.

4. A copy of the signed original licence must be carried by the licenced person when working at the designated sites. An assistant of the licenced person who is carrying out activities under this licence during the absence of the licenced person shall carry the licence on his or her person.

5. All collection gear shall be clearly marked with the licenced person's and the organization's name.

6. This licence is not valid in Provincial Parks, park reserves, Conservation Authority property or National Parks without written permission from the authorized person in charge of the area concerned.
http://www.ontarioparks.com/email/research

7. Capture gear shall be inspected regularly and live holding traps must be inspected at least once daily.

8. This licence does not allow access to any property without permission of the landowner.

9. The licensee shall follow the best management practices for the collection, handling, transportation and holding of fish identified in **FPS Technical Bulletin (Dec. 15, 2011)** included with the licence in order to minimize the risk of spreading aquatic invasive species and diseases.

10. All field equipment must be de-contaminated prior to use on each water body in order to prevent the spread of exotic species and disease.

11. This licence does not authorize any activity that is prohibited under the federal ***Species at Risk Act*** or the provincial ***Endangered Species Act.***

12. All SAR fish and mussels must also be reported to the OMNR Natural Heritage Information Centre on the appropriate form at:
http://nhic.mnr.gov.on.ca/MNR/nhic/species/species_report.cfm

13. This licence does not authorize the possession of specially protected fish under the ***Ontario Fishery Regulations.***

14. This licence does not authorize the collection of any species of fish protected under the ***Species at Risk Act, Endangered Species Act, or Ontario Fishery Regulations.*** If these species are accidentally captured they must be returned to the water immediately.

15. **This licence ONLY allows for the following capture gear to be used:**

    Minnow traps, seine nets, mini hoop nets, backpack electrofishing

16. **Persons authorized under this licence include the following:**

    Jess Tester, Kevin Martens, Katharina Batchelar, Tyler Nash, Tyrell Worrall, Mike White

17. ***The following MNRF Class Animal Care Protocols will be adhered to as appropriate for the project activity:***
    - ***Capture Methods- Electrofishing***
    - ***Capture Methods- Seining***
    - ***Capture Methods- Impounding Gear***
    - ***Handling and Marking- Biological Sampling***
    - ***Containment- Short term Containment***

Signature of Licensee

<Original signed by>

X

Date

5 - MAY - 2017

NEW GOLD RAINY RIVER MINE
APPENDIX S
2018 WILDLIFE MONITORING REPORT

New Gold Inc. Rainy River Mine

2018 Wildlife Monitoring Report
Per Provincial Environmental Assessment Notice of Approval
Condition 5
TC111504

Prepared for:

New Gold Inc.

March 2019

New Gold Inc. Rainy River Mine

2018 Wildlife Monitoring Report
Per Provincial Environmental Assessment Notice of Approval
Condition 5
TC111504

Prepared for:

New Gold Inc.
Rainy River Mine

Prepared by:

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March 2019

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Executive Summary

New Gold Inc. (New Gold) has constructed, is now operating, and will eventually reclaim a new open pit and underground gold mine, the Rainy River Mine (RRM), with processing plant and related infrastructure. The RRM site is located in the Township of Chapple, District of Rainy River, in northwestern Ontario, approximately 65 kilometres (km) northwest of Fort Frances, and 420 km west of Thunder Bay. Construction of the RRM began in the winter of 2015, normal operations and production began in 2017.

Regular baseline and monitoring studies have been undertaken since 2009 and have established a comprehensive understanding of the local environment. As part of the Federal environmental assessment process, New Gold committed to follow-up monitoring programs focusing on avian populations to verify the accuracy of the environmental assessment predictions. The current report provides the methods and results from the 2018 wildlife follow-up monitoring program and some initial statistical comparisons to baseline and construction years.

Avian morning point count stations were surveyed in 2014, 2015 (baseline), 2016 (construction) and 2018 (post-construction) to allow for comparisons across years, and the potential to assess any changes in the distribution, abundance, density and richness of species over time within the impact areas as well as areas outside the impact zone(control areas). Impact stations were located around the periphery of the mine site, whereas control stations were located at least 5 km from the mine site.

Data analysis of species distribution, abundance, density and richness were conducted to evaluate temporal and spatial effects of the RRM construction and operation on dominant avian species as well as to identify potential effects on primary avian guilds based on habitat preference.

The comparison of avian populations across survey years suggests that the RRM operations have not significantly adversely affected avian populations in the long term. Half of the most commonly occurring species evaluated experienced no interaction effects on abundance or density, suggesting that the RRM has not had an adverse effect on several of the most commonly occurring species. The other half of the most common species had interaction effects indicating the RRM had some effect on their populations. Some species appear to have been displaced temporarily during construction, either into control stations or further afield. The progression into mine operation activities and the decrease in intensive disturbances appears to have allowed these species to re-disperse evenly and for some, to move into optimal regenerating habitats created by the construction activities. Other species do not appear to have been adversely affected by construction activities but are showing preferential locations in post construction.

Mine related construction activities may provide increased habitat opportunities for some songbirds in the areas surrounding the RRM footprint. Species of Conservation Concern (SCC) Edge / Shrub / Successional birds increased specifically at impact stations. This indicates that construction activities have resulted in the creation of early successional habitat preferred by these species, causing a shift into these optimal habitats. Two species within this guild analysis, Chestnut-sided Warbler and Song Sparrow showed similar significant trends at the species level.

Forest birds (SCC and non-SCC) showed interaction effects whereby abundance and richness decreased at impact stations between 2014/15 and 2016, followed by an increase in these metrics in 2018 (i.e., post-construction). Conversely, these metrics increased at control station between 2014/15 and 2016, followed by a decrease in 2018. This indicates that these species may have been negatively impacted by construction activities being undertaken at the RRM impact stations. Individuals may have avoided impact

stations in 2016 and established breeding territories further away from construction activities. Individuals appear to be dispersing more evenly in 2018 (post-construction) now that habitats around impact stations are no longer undergoing active disturbance. Forest birds are frequently more common at control stations as compared to impact stations suggesting that there is more optimal (forested) habitat for these species further from the RRM. Black-and-white Warbler, Hermit Thrush, Red-eyed Vireo and White-throated Sparrow, species belonging to the Forest bird guild, showed similar results at the species level.

Grassland / Open Country birds are showing broad population increases, which could be attributed, at least in part, to the prevalence of optimal habitat provided by the Bobolink Overall Benefit lands and the work undertaken by New Gold to ensure these lands are maintained as high quality grassland bird habitat. Non-SCC Grassland birds had greater density and richness at impact stations. However, this may be a result of study design bias, since 32 stations were located within the Bobolink Overall Benefit areas (which provide preferred grassland habitat), as opposed to 11 control stations.

Overall, the data suggests that at this time most birds are not avoiding areas associated with mine activities, other than where habitats have been directly displaced by mine infrastructure. Abundance and density values which decreased in 2016 appear to be trending back towards baseline values, suggesting a lack of residual negative interaction effects on species and guilds. Ongoing monitoring studies will continue to identify longer term trends in avoidance and / or acclimatization of bird species to RRM activities.

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1.0 Introduction

1.1 Project Background

New Gold Inc. (New Gold) is constructing, operating and eventually reclaiming a new open pit and underground gold mine, the Rainy River Mine (RRM). The RRM will produce doré bars (gold with silver) for sale. Physical works related to the RRM consists primarily of:

- Open pit and underground mine;
- Overburden, mine rock and low grade ore stockpiles;
- Primary crusher and process plant;
- Tailings management area;
- 230 kilovolt transmission line;
- Relocation of a portion of gravel-surfaced Highway 600; and
- Associated buildings, facilities and infrastructure.

The RRM site is located in the Township of Chapple, District of Rainy River, in northwestern Ontario, approximately 65 kilometres (km) northwest of Fort Frances, and 420 km west of Thunder Bay (Figure 1-1). Lands in the immediate RRM site vicinity are typically gently rolling to flat, forested wetlands in low-lying areas, rounded bedrock outcrops and subcrops in upland areas and areas that have been cleared for agriculture. Local drainage systems are characterized by small creeks that flow to the Pinewood River which drains most of the RRM site area.

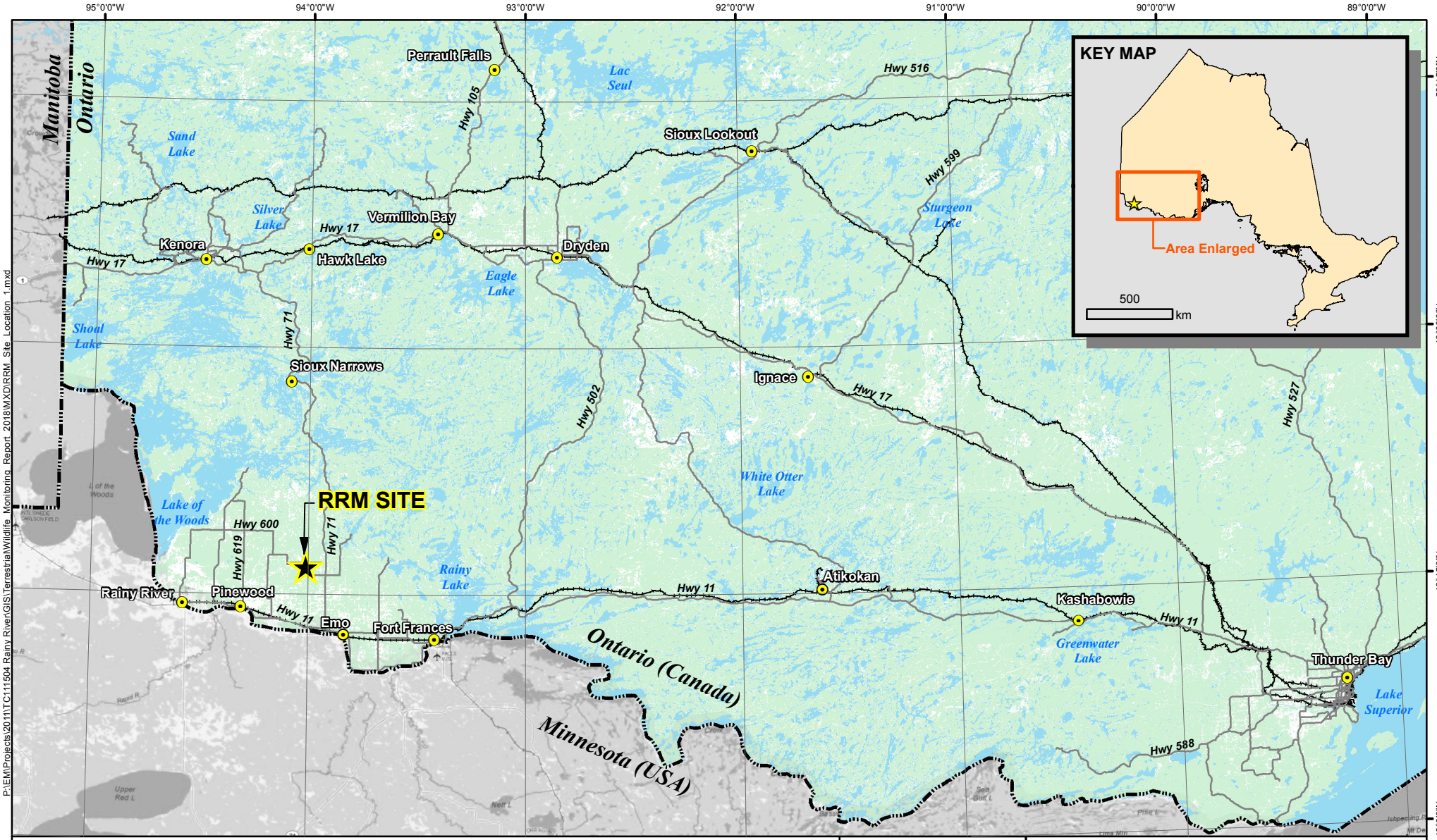
Environmental baseline studies for the RRM, initiated in 2009 and continued through development, established a comprehensive understanding of the composition of local plant and wildlife communities within the RRM footprint as well as surrounding lands. Regular baseline reports and wildlife monitoring reports have been produced in addition to annual Species at Risk (SAR) assessments (KCB 2011; AMEC 2011, 2012, 2014, 2015; Amec Foster Wheeler 2016a). The assessment of potential environmental impacts of the RRM was summarized in the RRP Final Environmental Assessment (EA) Report (Environmental Impact Statement) Version 2 (AMEC 2014), submitted to the Federal and Provincial Governments, including for Aboriginal and public review. A positive Federal EA Decision Statement was issued on January 12, 2015, and a favourable Provincial EA Notice of Approval was released on January 29, 2015. Construction of the RRM began in the winter of 2015, and normal operations and production began in 2017.

As a component of the Federal EA process, Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood; formerly Amec Foster Wheeler Environment & Infrastructure), was retained to create and implement a Follow-up Monitoring Plan (FMP; Amec Foster Wheeler 2016b). In accordance with the *Canadian Environmental Assessment Act, 2012* (CEAA 2012), the purpose of the FMP is to verify the accuracy of the predictions made in the EA about the potential impacts of the RRM on wildlife and wildlife habitat, and to monitor the effectiveness of rehabilitation efforts for wildlife habitat and terrestrial environments.

1.2 Objective and Scope

The RRP Final EA Report (AMEC 2014) estimated that approximately 2,170 hectares (ha) of terrestrial habitat would be directly impacted by the RRM. A total of 1,352 ha of woodland habitat would be cleared, of which 1,090 ha comprised second-growth aspen-birch hardwood forest, the dominant forest community type in the natural environment local study area (NLSA, as defined in AMEC 2014; Figure 1-2). Other affected community types include active agricultural lands (277 ha), open wetland habitat (261 ha), coniferous swamp (16.5 ha), and cultural meadows / fallow fields (10.8 ha). Portions of an additional 27 boreal community types were to be removed, with 11 of these community types expected to experience a loss of less than 10 ha. The NLSA supports a variety of wildlife species, including breeding populations of SAR and provincially rare species (AMEC 2014). The principal mitigation measures designed to limit adverse effects to terrestrial systems for the RRM include the development of a compact project footprint and the avoidance of SAR territories.

This *2018 Wildlife Monitoring Report* has been created to support the objectives of the FMP. The report presents the results of wildlife monitoring surveys undertaken in 2018 by Wood. Detailed monitoring results for SAR, including evening crepuscular bird surveys, are presented under a separate title, *2018 Species at Risk Monitoring Report* (Wood 2018).



P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\Wildlife_Monitoring_Report_2018\MXD\RRM_Site_Location_1.mxd

LEGEND

- RRM Site
- Regional Communities
- Provincial / National Border
- Regional Road / Highway
- Railway

0 25 50 100 150 200 250 Kilometres

NOTES:
- Ontario base data extracted from Land Information Ontario (MNR) data warehouse, Queen's Printer for Ontario, 2011-2012
- Base data outside of Ontario extracted from ESRI DeLorme World Basemap

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Project Location

PROJECT N°: TC111504	**FIGURE: 1-1**
SCALE: 1:1,800,000	DATE: February 2019

397500 405000 412500 420000 427500 435000 442500 450000

5422500 5415000 5407500 5400000

Bergland
Hwy-600
Little Grassy River
Sifton Township Conservation Reserve
Cranberry Lake Provincial Park
Hwy-621
Hwy-619
Marsh Lake
Agassiz Peatlands Provincial Park
Cranberry Lake
Gameland
Kishkakoesis River
North Branch
Hwy-617
Dearlock
Hwy-600
Pinewood River
Spruce Island Provincial Park
Little Pine Lake
Muskrat Lake
Hwy-71
Finland
Hwy-615
Burditt Lake
Off Lake
Burditt Lake
West Jackfish Lake
Rainy Lake I.R. No. 17B
Lake Despair
Pinewood Lake
Abbott Lake
Hwy-613
Sturgeon Creek
La Vallée River
CANADA
U.S.A.
Hwy-11
Pinewood
Rainy River

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\Wildlife_Monitoring_Report 2018\MXD\NLSA_and_NRSA_1.mxd

LEGEND

- RRM Site
- Natural Environment Local Study Area Boundary (NLSA)
- Natural Environment Regional Study Area Boundary (NRSA)
- Transmission Line
- Regional Road / Highway
- Waterbody / Large Watercourse
- Wooded Area
- First Nation Reserve
- Conservation Reserve (Regulated)
- Provincial Park

NOTES:
- All base data on this map was extacted from Land Information Ontario (MNR), Queen's Printer for Ontario, 2011-2012
- USA land extracted from ESRI base map service, USGS Topo maps

0 5 10 20 30 40 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Local and Regional Natural Study Areas

PROJECT N°: TC111504 | **FIGURE: 1-2**

SCALE: 1:150,000 | DATE: February 2019

2.0 Methodology

The following subsections outline the field methodology for completing the wildlife monitoring program, as well as the study design and analytical approach undertaken to evaluate project-related effects on avian communities.

The RRM FMP for breeding migratory birds and their habitats follows the Environment Canada (EC) guidelines for surveys as outlined in *Mining Project Baseline Desktop Assessment and Survey Requirements* (EC 2014a), *Incidental Take of Migratory Birds in Canada* (EC 2014b), and *General Nesting Periods of Migratory Birds in Canada* (EC 2018).

2.1 Avian Community

2.1.1 Morning Point Count Surveys

During the 2018 breeding bird season, morning point count surveys were undertaken at 185 long-term monitoring point count stations (Figure 2-1) distributed across available habitat types. All of these same point count stations were previously surveyed in 2016; however, only 181 of the 185 stations were surveyed in either 2014, 2015, or both. As such, statistical analyses on the temporal and/or spatial changes in the distribution, abundance, density and richness of avian species were only completed on the 181 stations surveyed across all monitoring years. High-level comparisons in avian community data between 2016 and 2018 were, however, evaluated using all 185 stations.

Magnolia Warbler (Photo: Wikimedia Commons)

Point count surveys were undertaken in accordance with standardized protocols (Fuller and Langslow 1994; OBBA 2001; EC 2014a) and were designed to target the majority of bird species that breed in proximity to the RRM site. The 2018 surveys were undertaken twice at each station during the breeding bird season by qualified biologists skilled in the identification of birds by sight and sound. During the second round of sampling, stations were surveyed in the reverse order from the first round (to the greatest extent possible) to reduce temporal sampling bias. Surveys were initiated prior to sunrise and extended to five hours after sunrise, depending on the weather conditions. Point count surveys were aborted or postponed if weather conditions were not optimal (e.g., light rain or high wind above 20 km/hour). Surveys were conducted for ten minutes at each listening station (an increase from the five minute listening period outlined in the OBBA 2001 guidelines) and all birds heard or observed were recorded at intervals of 0 to 50 metres (m), 50 to 100 m, > 100 m, and flyovers. In addition, birds were recorded at intervals of 0 to 3 minutes, 3 to 5 minutes, and 5 to 10 minutes. Each bird was recorded once and mapped on the field data sheets to minimize duplication of individual birds, as best feasible.

The first round of surveys was conducted between May 30 and June 5, 2018 and the second round of surveys was conducted between June 21 and 27, 2018. Incidental sightings were documented, particularly for SAR and species not detected during standardized point count surveys.

2.1.2 Analytical Methods

Morning point count survey stations are separated into impact and control stations. Impact stations were selected from point count stations surveyed at least once during the 2009 to 2014 baseline breeding bird studies and are located around the periphery of the RRM site (Figure 2-1), and in areas where noise from mine operation is expected to be greater than the average ambient noise level (approximately 40 decibels; dBA). Control stations are located at least 5 km from the RRM site (Figure 2-1), chosen to reflect a similar representation of ecosites found at impact stations, and where noise from mine operation is expected to be at or below the average ambient noise level. Additionally, the impact stations were positioned along the transmission line right-of-way (ROW), with control stations located at least 1 km from the ROW (Figure 2-1). Given the extent of previous anthropogenic disturbances and associated road networks throughout the area, it is recognized that birds at these control locations are likely experiencing and / or have experienced minor disturbance. As such these control stations serve as a reference with which to measure the effects of mine-related activities.

The purpose of separating stations into impact and control types was to allow for the application of a Before-After Control-Impact (BACI) study design, used to evaluate potential project-related effects on avian populations. The BACI design is statistically powerful, defensible, and allows for comparisons of the population metrics across years and between station types. The initial surveys were completed at 181 point count stations in 2014 and 2015, prior to the initiation of construction activities in the winter of 2015. These stations were re-surveyed over the years to allow for direct comparisons of the metrics during and after construction with baseline values. The paired nature of the design allows for an assessment of the potential adverse effects by the RRM on the avian population before and after construction activities.

The RRM FMP for breeding migratory birds and their habitats follows the EC guidelines for surveys as outlined in EC 2014a. As per this guideline, several metrics were applied to compare yearly changes in avian populations in an evaluation of potential project-related effects. The data and results are presented separately for impact and control stations. These metrics include:

- *Species Distribution (Percent Occurrence) Among Survey Stations:* a measure of the occurrence of individual species of birds at each point count station expressed as the percent occurrence. Percent occurrence was calculated by dividing the total number of species recorded by the total number of point count stations surveyed. This index of species prevalence does not take into account observation distance.

- *Species Abundance:* a measure of the maximum number of individuals recorded across all visits to a single point count station regardless of distance. The mean species abundance was calculated by dividing the sum of the maximum number of individuals recorded across all visits by the total number of point count stations. Species abundance is expressed as birds per station (birds/station).

- *Species Density*: a measure of the number of individual species present per unit area. Density was calculated at each survey station as the maximum number of birds per species recorded within a 100 m radius of the surveyor divided by the total area of the survey station (3.1416 ha), divided by the total number of count stations. Species density is expressed as birds per hectare (birds/ha).

- *Species Richness:* a measure of the total maximum number of species recorded across all visits to a single point count station regardless of distance. The mean species richness was calculated by

dividing the sum of the maximum number of species recorded across all visits by the total number of count stations. Species richness is expressed as species per station (species/station).

The Ontario Landbird Conservation Plan has been created by Partners in Flight (PIF), through the collaboration of the Ontario Ministry of Natural Resources and Forestry (MNRF), Bird Studies Canada (BSC), and EC. In Ontario, plans have been developed for each of the three Bird Conservation Regions (BCR) occurring within the province. The purpose of these plans is to guide landbird conservation efforts so that the distribution, diversity and abundance of birds across this region are sustained within the estimated range of natural variability for this forest ecosystem. The Ontario Landbird Conservation Plan for the Boreal Hardwood Transition (North American BCR 12) overlaps with the NLSA (PIF 2008; EC 2014c).

For the purposes of this report, Species of Conservation Concern (SCC) include BCR 12 priority species as well as provincially and federally-listed SAR (PIF 2008, EC 2014c, ECCC 2018, MNRF 2018). The population metrics have been evaluated and results presented separately for SCC and non-SCC. This was done to highlight results for those species for which conservation has been prioritized.

For some analyses, bird species recorded were also grouped into one of four guilds based on habitat preferences. These four categories include:

- Edge / shrub / successional (species typical of shrubby and/or young habitats, including shrub swamps, bogs and fens);
- Forest (species typical of treed habitats, including treed swamp);
- Wetland / open water (species typical of large rivers, lakes and marshes); and
- Grassland / open country (species typical of open habitats).

Occasionally, observations were excluded from certain analyses. Observations of large flocks or groups of a single species can result in outliers in the statistical analyses and were consequently removed. Notations are made in each relevant results section when observations were excluded.

2.1.3 Statistical Analysis

Statistical analyses were completed using STATISTICA© software (StatSoft, Inc., 2009). A repeated measure analysis of variance (ANOVA) was applied to evaluate project-related effects on avian population metrics. Statistical analyses were completed on only those point count stations where monitoring was completed pre-construction (2014 or 2015), during construction (2016), and post-construction (2018). For pre-construction data, 2014 data was only included in the analysis when no 2015 data existed for a given point count station. Monitoring years (2014/15, 2016 and 2018) were inputted as the repeated dependent variables and station type (impact versus control station) was inputted as the categorical predictor. Assumptions of normality (normal distribution) were tested using Kolmogorov-Smirnov test and Shapiro-Wilk's test, as well as visually assessing quantile-quantile (Q-Q) plots and histograms. Some minor deviations from normality were detected within the analyses depending on the normality test applied; however, a graphical assessment of histograms and Q-Q plots suggested deviations were minor. Sphericity analysis, a measure of variance between all possible pairs of within-subject conditions, was also completed to verify the assumptions of repeated measures ANOVA; however, the assumption of sphericity was violated for several analyses. Nonetheless, as paired parametric analyses are highly robust to the presence of small deviations from normality and preferred over non-parametric analyses, the small

deviations were considered acceptable to allow for the application of the parametric repeated measures ANOVA. Where sphericity was violated, a discussion on the influence of the violation relative to the analysis is provided in the results section below. Where the analyses revealed a significant interaction (i.e., one of the variables differs depending on the level of the other variable), the Fisher's Least Significant Difference (LSD) post-hoc test was utilized to detect differences between groups.

As the consequences of making Type II errors (false negative) may outweigh those associated with Type I errors (false positive) when evaluating environmental effects, a significance level of 0.10 (alpha = 0.10) was used to detect significant differences rather than 0.05 (Steidl et al. 1997).

2.2 Other Taxa

Incidental observations of other taxa, including mammal, reptile and amphibian species were collected opportunistically concurrently with the targeted avian surveys within the NLSA. The incidental observations included, but were not limited to: visual observations, vocalizations, and evidence such as tracks, scat, burrows and nests.

400000 405000 410000 415000 420000 425000 430000 435000 440000 445000 450000

5425000 5420000 5415000 5410000 5405000

P:\EM\Projects\2011\TC111504 Rainy River\GIS\TerrestrialWildlife_Monitoring_Report_2018MXD\2018_BB_Survey_Loc_1.mxd

LEGEND

- Approximate Principal RRM Facilities
- Natural Environment Local Study Area Boundary (NLSA)
- Road
- Watercourse
- Waterbody

Breeding Bird Point Count Survey Stations

- Monitoring Control Stations
- Monitoring Impact Stations

0 1 2 4 6 8 10 Kilometres

NOTES:
- Pleiades imagery Sept. 6, 2018 and July 20, 2014
- Road data extracted from Land Information Ontario, Ontario Road Network, MNRF

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

2018 Breeding Bird Point Count Survey Station Locations

PROJECT N°: TC111504	**FIGURE: 2-1**
SCALE: 1:125,000	DATE: February 2019

3.0 Results

The purpose of the RRM FMP is to evaluate potential project-related impacts on avian species in proximity to the RRM operations. Accordingly, this 2018 Wildlife Monitoring Report presents 2018 field results, high-level comparisons of the current results with those gathered at the same survey stations in 2016 (n=185), and a BACI statistical analysis to compare the current results with those gathered at the same survey stations in 2014/15 and 2016 (n=181).

Results for SAR listed as Threatened or Endangered under the *Endangered Species Act, 2007*, including Evening Crepuscular Bird Survey results are presented in the *2018 RRP Species at Risk Report* (Wood 2018) as required by Provincial and Federal legislation. As such, SAR are included in the following analyses but are not highlighted other than by grouping them with other SCC.

3.1 Avian Community

A total of 164 bird species have been recorded within the RRM monitoring area between 2009 and 2018, however, the number of bird species recorded has varied with each monitoring year. In 2018, 132 bird species and 4,309 individual birds were recorded during the morning point count surveys, which is an increase from the 115 species and 3,890 individual birds recorded in 2016 at the same 185 point count stations. A summary of all species recorded within each survey year (during standardized counts and incidentally) is provided in Appendix A.

3.1.1 Species of Conservation Concern

Morning point count surveys undertaken in 2018 recorded a total of 54 avian SCC, accounting for 40.9% of the total bird species recorded in 2018 (Appendix B). Forty-five (45) SCC were recorded at impact stations and 48 were recorded at control stations. These data indicate that there is currently little to no difference between the number of avian SCC at impact and control stations. The 54 species are all considered BCR 12 priority species with 12 further designated as SAR. Avian SAR are discussed further in the *2018 RRP Species at Risk Report* (Wood 2018).

Two SCC recorded in 2016 were not recorded during morning surveys in 2018 (Red Crossbill and Red-headed Woodpecker; Appendix C), whereas ten SCC recorded in 2018 had not been recorded in 2016 (American Woodcock, Black-throated Blue Warbler, Cliff Swallow, Evening Grosbeak, Herring Gull, Hooded Merganser, Northern Rough-winged Swallow, Purple Finch, Ring-necked Duck and Vesper Sparrow). Two additional SCC, Common Nighthawk and Eastern Whip-poor-will, were both frequently recorded during crepuscular surveys; one Common Nighthawk was recorded during morning surveys in 2016, and one Eastern Whip-poor-will was recorded during 2018 morning surveys but were otherwise not detected during morning point count surveys.

Barn Swallow (Photo: ThinkStock)

3.1.2 Species Distribution among Survey Stations

Of the 132 bird species identified within the monitoring area during the 2018 morning point count surveys, 113 species were recorded at impact stations and 120 species were recorded at control stations. Despite the slightly greater occurrence of species at control stations, the most widely occurring species were largely comparable.

Species of Conservation Concern

The five most widely occurring SCC recorded at impact stations in 2018, including the percentage of stations where presence was observed, were:

- Nashville Warbler (recorded at 73.3% of all impact stations);
- Common Yellowthroat (67.8%);
- Chestnut-sided Warbler (62.2%);
- White-throated Sparrow (54.4); and
- Song Sparrow (53.3).

Nashville Warbler (Photo: Bill Majoros/Wikimedia Commons)

These species were also the five most widely occurring SCC recorded at impact stations in 2016. The summary of dominant SCC occurrence between 2016 and 2018 is provided in Table 3-1 and presented in Illustration 1. Percent occurrence for all species from the 2018 surveys is presented in Appendix B and a multi-year comparison of population metrics is presented in Appendix C.

Four of these five species were also amongst the five most widely occurring species across the control stations. The five most widely occurring SCC recorded at control stations in 2018, including the percentage of stations where presence was observed, were:

- Nashville Warbler (81.1%);
- White-throated Sparrow (63.2%);
- Veery (46.3%);
- Chestnut-sided Warbler (43.2%); and
- Common Yellowthroat (34.7%).

Similar to the impact stations, these species were also the five most widely occurring SCC recorded at control stations in 2016. These results indicate that there is little difference in the dominant SCC species between the impact and control stations, as well as between survey years.

Non-Species of Conservation Concern

The five most widely occurring non-SCC recorded at impact stations in 2018, including the percentage of stations where presence was observed, were:

- Red-eyed Vireo (80.0%);
- Ovenbird (67.8%);
- American Robin (62.2%);
- Black-and-white Warbler (52.2%); and
- Blue Jay (42.2%).

These species were also the five most widely occurring non-SCC recorded at impact stations in 2016.

Four of these five species were also amongst the five most widely occurring species across the control stations. The six most widely occurring non-SCC recorded at control stations in 2018, including the percentage of stations where presence was observed, were:

- Red-eyed Vireo (91.6%);
- Ovenbird (70.5%);
- Black-and-white Warbler (50.5%);
- American Robin (48.4%);
- Hermit Thrush (41.1%); and
- Blue Jay (37.9%).

Red-eyed Vireo (Photo: Wikimedia Commons)

These species were also the six most widely occurring non-SCC recorded at control stations in 2016. These results indicate that there is little difference in the dominant non-SCC species between the impact and control stations, as well as between survey years.

The summary of dominant non-SCC occurrence is provided in Table 3-1 and presented in Illustration 2. Percent occurrence for all species from the 2018 surveys is presented in Appendix B and a multi-year comparison of population metrics is presented in Appendix C.

The slight differences within these species lists between impact and control stations indicate that impact stations may be attracting more species which adapt well to anthropogenic disturbances and prefer shrubby, regenerating and edge habitats (Song Sparrow and higher percent occurrence of Common Yellowthroat, Chestnut-sided Warbler and American Robin) while the control stations are attracting species which prefer forested habitats (Veery, Hermit Thrush and higher percent occurrence of Nashville Warbler, White-throated Sparrow, Red-eyed Vireo and Ovenbird).

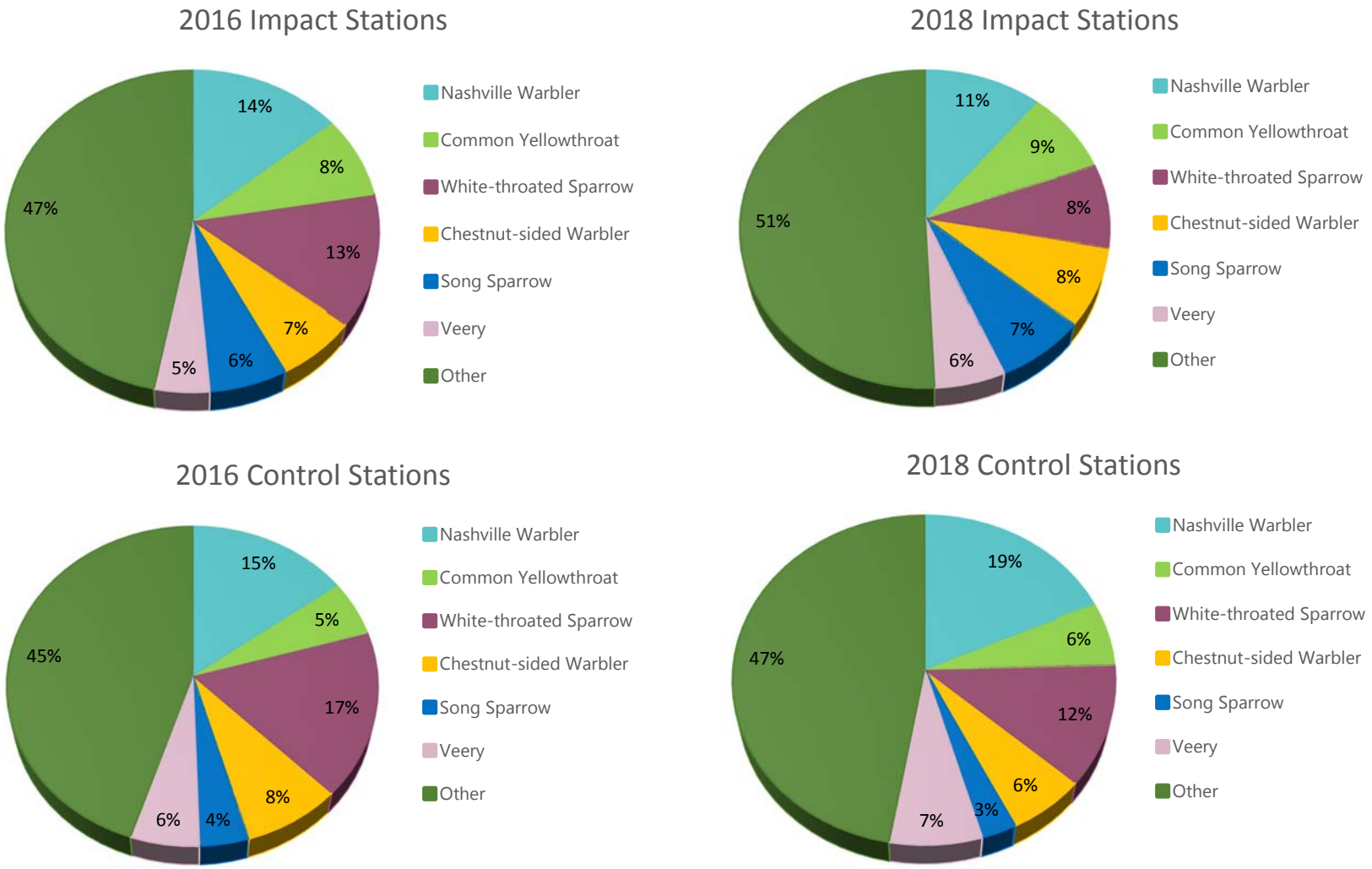


Illustration 1: Abundance of Dominant SCC Birds

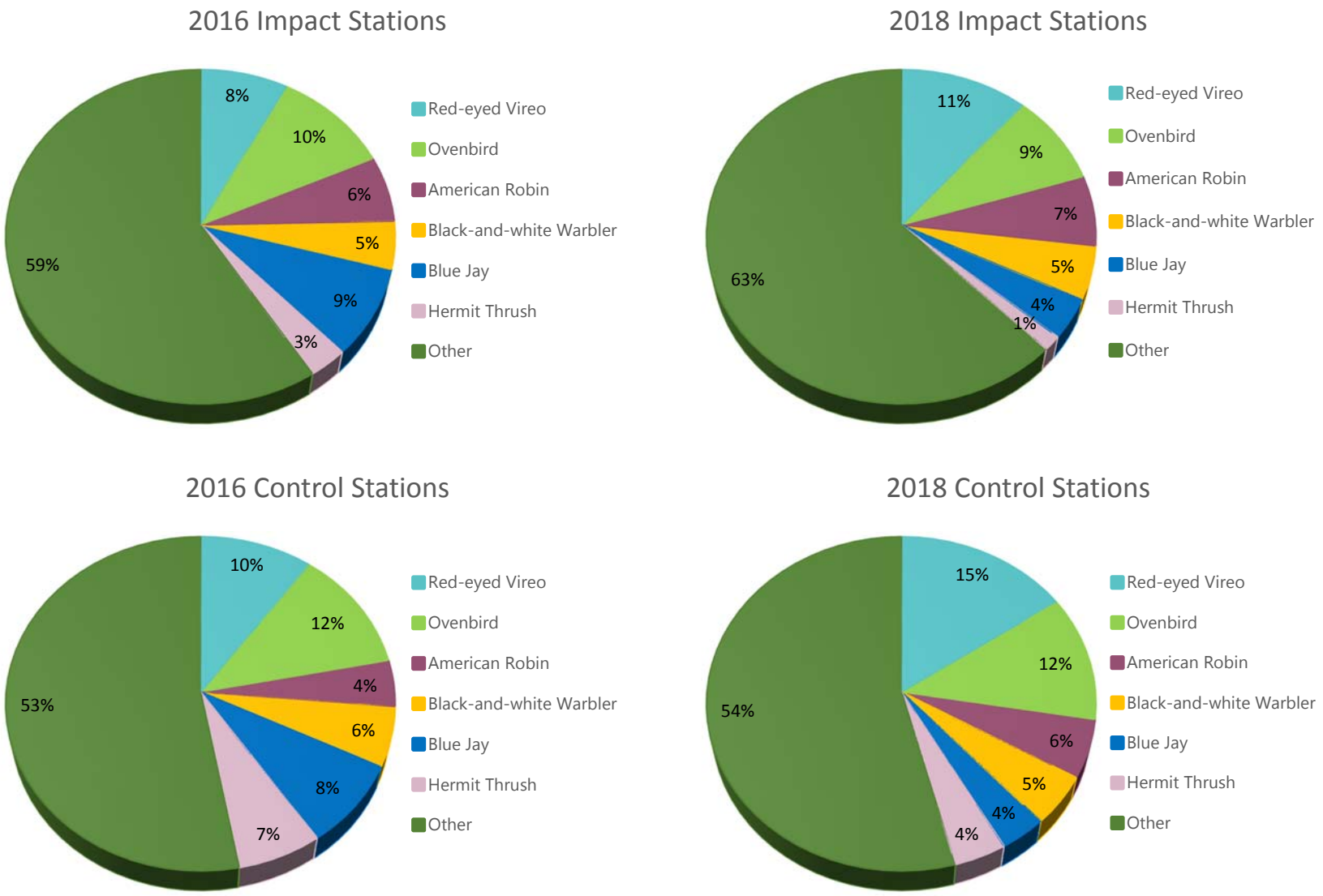


Illustration 2: Abundance of Dominant non-SCC Birds

3.1.3 Species Abundance

3.1.3.1 2018 Results

The most abundant birds were considered to be those with the highest abundance coupled with a relatively high (>25%) percent occurrence. Several species were identified in flocks or large groups and these bulk observations were excluded from the lists of dominant species and analyses as they can represent outliers in the statistical analyses.

During the 2018 morning point count surveys, 2,197 individual birds were recorded at impact stations and 2,112 individual birds were recorded at control stations. Despite the slightly greater abundance of individual birds at impact stations, the lists of most abundant species were largely comparable.

The five most abundant SCC recorded at impact stations in 2018, including their mean abundance, were:

- Nashville Warbler (average 1.28 birds/point count station across all impact stations);
- Common Yellowthroat (1.00 birds/point count station);
- White-throated Sparrow (0.99 birds/point count station);
- Chestnut-sided Warbler (0.94 birds/point count station); and
- Bobolink (0.89 birds/point count station).

These species were also the five most abundant SCC recorded at impact stations in 2016. Abundances for all species from the 2018 surveys are presented in Appendix B and a multi-year comparison of population metrics is presented in Appendix C.

Four of these five species were also amongst the five most abundant SCC across the control stations. Consequently, the five most abundant SCC recorded at control stations in 2018, including their mean abundance, were:

- Nashville Warbler (1.66 birds/point count station);
- White-throated Sparrow (1.07 birds/point count station);
- Veery (0.66 birds/point count station);
- Common Yellowthroat (0.57 birds/point count station); and
- Chestnut-sided Warbler (0.57 birds/point count station).

Common Yellowthroat (Photo: Matt Tillett/Wikimedia Commons)

These species were also the five most abundant SCC recorded at control stations in 2016.

Canada Goose was excluded from this 2018 list of SCC at control stations. While this species had an abundance value of 0.86 birds/point count station, it was observed at only four point count stations. In one instance a flock of 65 individuals was recorded flying over a single survey station.

The five most abundant non-SCC recorded at impact stations in 2018, including their mean abundance, were:

- Red-eyed Vireo (1.41 birds/point count station);
- Ovenbird (1.10 birds/point count station);
- Savannah Sparrow (0.88 birds/point count station);
- American Robin (0.84 birds/point count station); and
- Black-and-white Warbler (0.64 birds/point count station).

Four of these five species were also the most abundant non-SCC recorded at impact stations in 2016. In 2016, Blue Jay was one of the most abundant non-SCC at impact stations in 2016, replacing Black-and-white Warbler in the list above.

Four of these five species were also amongst the five most abundant species across the control stations. The five most abundant non-SCC recorded at control stations in 2018, including their mean abundance, were:

- Red-eyed Vireo (1.84 birds/point count station);
- Ovenbird (1.44 birds/point count station);
- American Robin (0.67 birds/point count station);
- Black-and-white Warbler (0.58 birds/point count station); and
- Hermit Thrush (0.48 birds/point count station).

Four of these five species were also the most abundant non-SCC recorded at control stations in 2016. In 2016, Blue Jay was one of the most abundant non-SCC recorded at control stations, replacing American Robin in the list above.

There is substantial overlap between the most abundant species and the most widely distributed species. Further statistical analyses were conducted on the abundances of the most widely occurring SCC and non-SCC recorded in 2018 (as described in Section 3.1.2). Summaries of these analyses are provided in Table 3-2 and Table 3-3.

3.1.3.2 BACI Analysis Results

The BACI analysis revealed no significant interaction effect between station type (impact or control) and year relative to the abundance of some of the most widely occurring SCC (Nashville Warbler, Common Yellowthroat and Veery), and some of the most widely occurring non-SCC (Red-eyed Vireo, Ovenbird, American Robin and Blue Jay), suggesting that RRM construction

Hermit Thrush (Photo: Matt MacGillivray/Wikimedia Commons)

and operations have not adversely affected the abundance of these species since baseline conditions (2014/15; Table 3-2 and Table 3-3).

However, this trend was not universal among the SCC and non-SCC birds evaluated. Analysis of SCC Chestnut-sided Warbler ($F_{2,266}$ = 10.2023, $p < 0.0001$), Song Sparrow ($F_{2,196}$ = 5.9626, $p = 0.0031$), White-throated Sparrow ($F_{2,340}$ = 2.5024, $p = 0.0834$), and non-SCC Black-and-white Warbler ($F_{2,282}$ = 2.8318, $p = 0.0606$) and Hermit Thrush ($F_{2,232}$ = 2.6775, $p = 0.0709$) showed significant interaction effects indicating that abundance at control and impact stations differs depending on the year.

Further analysis revealed that the abundance of Chestnut-sided Warbler significantly increased at impact stations between 2014/15 and 2016, and again between 2016 and 2018 ($p = 0.0035$ and $p = 0.0154$, respectively). Abundance of this species significantly increased at control stations between 2014/15 and 2016 ($p = 0.0234$), and then significantly decreased between 2016 and 2018 ($p = 0.0051$). Chestnut-sided Warbler abundance was significantly greater at control stations compared to impact stations in 2014/15 and 2016 ($p = 0.0083$ and $p = 0.0279$). However, in 2018 this pattern was reversed with abundance significantly greater at impact stations ($p = 0.0100$). The significant increases in population at both control and impact stations in 2016 may indicate this species is experiencing broad population increases across the overall monitoring area which did not appear to be adversely impacted by the construction activities being undertaken at the RRM impact stations. The continued increase in abundance at impact stations in 2018 and the concurrent drop in abundance at control stations may indicate that the construction activities have resulted in disturbed areas which have begun regenerating into preferred successional habitat for this species causing a shift into these new optimal habitats. The assumption of sphericity was violated for the Chestnut-sided Warbler abundance analysis ($p = 0.0497$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean abundances with non-overlapping standard errors and relatively low p-values (not approaching the limit of 0.10), therefore, it is likely that these assertions are significant despite the violation of sphericity.

Further evaluation of Song Sparrow revealed a decrease in abundance at impact stations between 2014/15 and 2016 (not significant; $p = 0.2057$) before significantly increasing between 2016 and 2018 ($p = 0.0522$). Concurrently, abundance of this species decreased significantly at control stations between 2014/15 and 2016 ($p = 0.0521$), and again between 2016 and 2018 ($p = 0.0888$). This resulted in Song Sparrow abundance being significantly greater at impact stations compared to control stations in 2018 ($p = 0.0017$), a difference that was not significant in the previous monitoring years. The decreases between 2014/15 and 2016 at both the control and impact stations indicate broad population declines across the overall monitoring and did not appear to be further impacted by the construction activities being undertaken at the RRM. The increase in population abundance at impact stations in 2018 and concurrent drop in abundance at control stations may indicate that the construction activities have resulted in the creation of early successional habitat, preferred by Song Sparrow, in the disturbed areas which and that the birds are shifting into these optimal habitats.

Further analysis revealed the abundance of SCC White-throated Sparrow significantly decreased at impact stations between 2014/15 and 2016 ($p = 0.0932$), and again between 2016 and 2018 ($p = 0.0045$). Abundance at control stations showed an increase between 2014/15 and 2016 (not significant; $p = 0.1443$), followed by a significant decrease between 2016 and 2018 ($p < 0.0001$). The overall abundances for this species in 2014/15 and 2016 were similar, suggesting that the significant decrease in abundance at impact stations and the (non-significant) increase at control stations is potentially due to individuals avoiding impact stations in 2016 and breeding further away from construction activities.

White-throated Sparrow abundance in 2018 was similar between impact and control stations, potentially due to individuals dispersing more evenly post-construction once habitats around impact stations were no longer undergoing active disturbance. There also appears to be a broad population decrease in 2018 across the overall monitoring areas, demonstrated by the significant decreases at both impact and control stations.

Further evaluation of Black-and-white Warbler revealed a significant increase in abundance at control stations between 2014/15 and 2016 ($p = 0.0057$) and remained significantly higher in 2018 than it was in 2014/15 ($p = 0.0773$). In 2016, the control stations had significantly higher abundance of this species than impact stations ($p = 0.0253$). A subsequent significant increase in abundance of this species occurred at impact stations between 2016 and 2018 ($p = 0.0836$) and, as such, there was no longer a significant difference in Black-and-white Warbler abundance between impact and control stations in 2018. This could be explained by individuals choosing control stations further away from construction activities in 2016 and dispersing more evenly in post-construction once habitats around impact stations were no longer undergoing active disturbance.

Further analysis revealed the abundance of Hermit Thrush decreased at impact stations between 2014/15 and 2016 (not significant; $p = 0.1244$), followed by a significant decrease between 2016 and 2018 ($p = 0.0961$). Concurrently, the abundance at control stations increased between 2014/15 and 2016 (not significant; $p = 0.1989$), and then decreased significantly between 2016 and 2018 ($p = 0.0302$). This could be explained by population decreases across the overall monitoring area coupled with individuals preferentially using control stations in 2016, either to distance themselves from construction activities or due to preferred habitat loss. This utilization appears to be maintained in 2018 (post-construction) once the optimal forested habitats preferred by this species was removed near the impact stations. The assumption of sphericity was violated for the Hermit Thrush abundance analysis ($p = 0.0002$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is limited overlap of standard errors of the mean abundances and some of the p-values are relatively high, therefore, it is possible some of the significant interactions could be false positives. Regardless of significance, this is still a clear and notable trend despite the violation of sphericity, and the assertions and explanations are still valid.

The analysis of yearly effects (inclusive of impact and control stations) showed a significant increase in abundance of Veery ($F_{2,248} = 3.1774$, $p = 0.0434$), American Robin ($F_{2,298} = 3.0311$, $p = 0.0498$), and Red-eyed Vireo ($F_{2,348} = 30.0890$, $p < 0.0001$) in 2018 compared with the abundance in 2014/15 and 2016, indicating that these species may have experienced broad increases within the overall monitoring area between 2016 and 2018. All three of these species also experienced decreases in abundance between 2014/15 and 2016, although only the decrease in Red-eyed Vireo abundance was found to be significant. This indicates that these species may be experiencing broad population fluctuations between years within the overall monitoring area. Non-SCC Blue Jay ($F_{2,306} = 19.6596$, $p < 0.0001$) showed opposite effects, Blue Jay abundance significantly increased between 2014/15 and 2016 ($p < 0.0001$), followed by a significant decrease in abundance between 2016 and 2018 ($p < 0.0001$). This suggests that this species may be experiencing broad population fluctuations within the overall monitoring area. No yearly changes in abundance were observed for the other species analyzed (Table 3-3). The assumption of sphericity was violated for Blue Jay and Red-eyed Vireo abundance analyses ($p = 0.0057$ and $p = 0.0029$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In the instance of both these species, there are clear trends in the mean abundances with non-overlapping standard errors and most p-values of < 0.0001, therefore, it is likely that these assertions are significant despite the violation of sphericity.

The analysis of location effects (inclusive of 2014/15, 2016 and 2018) showed Common Yellowthroat ($F_{1,125}$ = 2.8626, p = 0.0932) was significantly more abundant at impact stations compared to control stations indicating that habitat for these species was more prevalent within the impact areas. Conversely, Red-eyed Vireo ($F_{1,174}$ = 8.8833, p = 0.0033) and Ovenbird ($F_{1,155}$ = 5.0001, p = 0.0268) were significantly more abundant at control stations compared to impact stations indicating that habitat for these species was more prevalent within the control areas. No changes in abundance between impact and control stations were observed for the other species analyzed (Table 3-3). The assumption of sphericity was violated for the Common Yellowthroat abundance analysis (p = 0.0382) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In the instance of this species, there is no overlap of standard errors of the mean abundances however the p-value is relatively high, therefore, it is possible that this significant interaction could be a false positive. This is still a clear and notable trend despite the violation of sphericity and the explanations are still valid.

3.1.4 Species Density

3.1.4.1 2018 Results

The species with the highest densities were considered to be those with the highest density coupled with a relatively high (>25%) percent occurrence. Several species were identified in flocks or large groups and these bulk observations were excluded from the lists of dominant species and analyses as they represent outliers in the statistical analyses.

The five SCC recorded with the highest densities across all impact stations in 2018 were:

- Nashville Warbler (average 0. 350 birds/ha across all impact stations);
- Chestnut-sided Warbler (0.251 birds/ha);
- Common Yellowthroat (0.237 birds/ha);
- White-throated Sparrow (0.223 birds/ha); and
- Bobolink (0.209 birds/ha).

White-throated Sparrow (Photo: Pixabay)

These species were also the five SCC with the highest densities recorded at impact stations in 2016. Densities for all species from the 2018 surveys are presented in Appendix B and a multi-year comparison of population metrics is presented in Appendix C.

Four of these five species were also amongst the five SCC with the highest densities across the control stations. The five SCC with the highest densities at control stations were:

- Nashville Warbler (average 0.503 birds/ha across all control stations);
- White-throated Sparrow (0.251 birds/ha);
- Chestnut-sided Warbler (0.168 birds/ha);
- Common Yellowthroat (0.168 birds/ha); and

- Veery (0.121 birds/ha).

All five of these species were also the SCC with the highest densities recorded at control stations in 2016.

Barn Swallow was excluded from this 2018 list of SCC at control stations. While this species had a density value of 0.137 birds/ha, it was observed at only four point count stations.

The five non-SCC with the highest densities recorded at impact stations in 2018 were:

- Red-eyed Vireo (0.255 birds/ha);
- Savannah Sparrow (0.248 birds/ha);
- Ovenbird (0.202 birds/ha);
- LeConte's Sparrow (0.191 birds/ha); and
- Black-and-white Warbler (0.159 birds/ha).

Four of these five species also had the highest non-SCC densities recorded at impact stations in 2016. In the 2016 survey year, Blue Jay had the one of the highest densities of the non-SCC recorded at impact stations in 2016, replacing Black-and-white Warbler in the list above.

Three of these five species listed above were also amongst the five non-SCC with the highest densities across the control stations. The five non-SCC with the highest densities recorded at control stations in 2018 were:

- Red-eyed Vireo (0.456 birds/ha);
- Ovenbird (0.328 birds/ha);
- Black-and-white Warbler (0.171 birds/ha);
- American Robin (0.161 birds/ha); and
- Magnolia Warbler (0.134 birds/ha).

Three of these five species also had the highest non-SCC densities recorded at control stations in 2016. In the 2016 survey year, Golden-crowned Kinglet and Blue Jay had some of the highest densities recorded for non-SCC at the control stations, replacing American Robin and Magnolia Warbler in the list above.

Despite some differences, there is substantial overlap between the most abundant species and those with the highest densities. Further statistical analyses were conducted on the densities of the most widely occurring SCC and non-SCC recorded in 2018 (as described in Section 3.1.2). Summaries of these analyses are provided in Table 3-4 and Table 3-5.

3.1.4.2 BACI Analysis Results

The BACI analysis revealed no significant interaction effect between survey station type and year relative to the density of half of the most widely occurring SCC (Nashville Warbler, Common Yellowthroat and Veery), and half of the non-SCC (Ovenbird, American Robin and Blue Jay), suggesting that RRM construction and operations have not affected the densities of these species (Table 3-4 and Table 3-5).

American Robin (Photo: Ken Thomas/Wikimedia Commons)

However, this trend was not universal amongst the SCC and non-SCC birds evaluated. Analysis of SCC Chestnut-sided Warbler ($F_{2,266}$ = 7.9714, p = 0.0004), Song Sparrow ($F_{2,196}$ = 3.6906, p = 0.0267), White-throated Sparrow ($F_{2,340}$ = 3.9998, p = 0.0192), and non-SCC Red-eyed Vireo ($F_{2,348}$ = 3.8922, p = 0.0213), Black-and-white Warbler ($F_{2,282}$ = 2.7627, p = 0.0648) and Hermit Thrush ($F_{2,232}$ = 2.8269, p = 0.0612) showed significant interaction effects indicating that abundance at control and impact stations differs depending on the year.

Further analysis revealed the density of Chestnut-sided Warbler followed the same pattern as was seen for abundance. Density significantly increased at impact stations between 2014/15 and 2016 and again between 2016 and 2018 (p = 0.0176 and p = 0.0400). Density significantly increased at control stations between 2014/15 and 2016 (p = 0.0154) and significantly decreased between 2016 and 2018 (p = 0.0040). Chestnut-sided Warbler density was significantly greater at control stations compared to impact stations in 2014/15 and 2016 (p = 0.0137 and p = 0.0082). However, in 2018 this reversed with density significantly greater at impact stations (p = 0.0936). The significant increases in densities at both control and impact stations in 2016 indicate that this species is experiencing broad population increases across the overall monitoring area and did not appear to be adversely affected by the construction activities undertaken at the RRM impact stations. The continued increase in density at impact stations in 2018 and concurrent drop in density at control stations may indicate that the construction activities have created early successional habitat, preferred by Chestnut-sided Warbler, causing a shift into these optimal habitats. As with abundance, the assumption of sphericity was violated for the Chestnut-sided Warbler (p = 0.0329) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there are non-overlapping standard errors of the mean densities, all but one of the p-values are relatively low and there is a clear trend in the mean densities, therefore, it is likely that these assertions are significant despite the violation of sphericity.

Further evaluation of Song Sparrow revealed a similar pattern as was seen for abundance. Density significantly decreased (p = 0.0373) at impact stations between 2014/15 and 2016 before significantly increasing between 2016 and 2018 (p = 0.0111). Concurrently, density of this species decreased significantly between 2014/15 and 2016 (p = 0.0208) and continued to decrease slightly between 2016 and 2018 (not significant; p = 0.5608). Song Sparrow density was therefore significantly greater at impact stations compared to control stations in 2018 (p = 0.0216), a difference that was not significant in the previous monitoring years. The significant decreases between 2014/15 and 2016 at both control and impact stations could be due to broad population decreases across the overall monitoring area which did not appear to be adversely impacted further by the construction activities being undertaken at the RRM impact stations. The significant increase in density at impact stations in 2018 and concurrent non-significant decrease at control stations may indicate that the construction activities have resulted in the creation of early successional habitat, preferred by Song Sparrow, causing a shift into these optimal

habitats. The assumption of sphericity was violated for the Song Sparrow density analysis ($p = 0.0179$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean densities with non-overlapping standard errors and relatively low p-values, therefore, it is likely that these assertions are significant despite the violation of sphericity.

Further analysis revealed that the density of White-throated Sparrow significantly decreased at impact stations between 2014/15 and 2016 ($p = 0.0035$) and increased at impact stations between 2016 and 2018 (not significant; $p = 0.2559$). The density at control stations showed an increase between 2014/15 and 2016 (not significant; $p = 0.3144$), followed by a decrease between 2016 and 2018 (not significant; $p = 0.2346$). White-throated Sparrow density was significantly greater at control stations than impact stations in 2016. Similar to the patterns observed for the abundance of this species, this is potentially due to individuals avoiding impact stations in 2016 and breeding further away from construction activities. Density in 2018 does not show a significant difference between impact and control stations, potentially due to individuals dispersing more evenly in 2018 post-construction once habitats around impact stations were no longer undergoing active disturbance. The assumption of sphericity was again violated for the White-throated Sparrow density analysis ($p = 0.0530$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. There is again a clear trend in the mean densities with non-overlapping standard errors and all the significant p-values are relatively low, therefore, it is likely that these assertions are significant despite the violation of sphericity.

Further evaluation of Red-eyed Vireo revealed a significant decrease in abundance between 2014/15 and 2016 at both the impact and control stations ($p = 0.0037$ and $p = 0.0954$). Subsequently, density significantly increased between 2016 and 2018 at both the impact and control stations ($p = 0.0026$ and $p < 0.0001$). Density was significantly greater at control stations than at impact stations in all monitoring years with the greatest difference in densities between the two station types in 2018. These results are likely in part due to broad population fluctuations across the overall monitoring area, combined with some avoidance of impact stations in 2016 due to increased construction activities. The increase in density at control stations in 2018 is likely because habitats around impact stations no longer support as much optimal (forested) habitat for this species. The assumption of sphericity was violated for the Red-eyed Vireo density analysis ($p = 0.0382$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In the instance of this species, there is a clear trend in the mean densities with non-overlapping standard errors and most p-values are relatively low, therefore, it is likely that these assertions are significant despite the violation of sphericity and the assertions and explanations are valid regardless due to the clear trend in the data.

Further analysis revealed the density of Black-and-white Warbler once again followed the same pattern as was seen for abundance. Density significantly increased at control stations between 2014/15 and 2016 ($p = 0.0086$) and remained significantly higher in 2018 than it was in 2014/15 ($p = 0.0352$). As such, control stations in 2016 had significantly higher Black-and-white Warbler densities than impact stations ($p = 0.0503$). No significant changes in densities occurred between 2016 and 2018 at either the control or the impact stations. However, there was no significant difference in Black-and-white Warbler density between control and impact stations in 2018 ($p = 0.6040$). These results suggest that individuals may have preferentially used control stations further away from construction activities in 2016 and dispersed more evenly in post-construction once habitats around impact stations were no longer undergoing active disturbance.

Further analysis revealed the density of Hermit Thrush followed a similar pattern as was seen for abundance. Hermit Thrush density decreased significantly at impact stations between 2014/15 and 2016 ($p = 0.0323$), followed by a decrease in density between 2016 and 2018 (not significant; $p = 0.1863$). Concurrently, the density at control stations showed very minimal change across monitoring years. Hermit Thrush density was significantly greater ($p = 0.0556$) at control stations than impact stations in 2018. This suggests that individuals may have preferentially used control stations in 2016, either to distance themselves from construction activities or due to preferred habitat loss. This utilization appears to be maintained in 2018 (post-construction) with significantly greater density at control stations, potentially due the removal of optimal forested habitat, preferred by this species, near the impact stations. The assumption of sphericity was violated for the Hermit Thrush density analysis ($p < 0.0001$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean densities with non-overlapping standard errors and the p-values are relatively low, therefore, it is likely that these assertions are significant despite the violation of sphericity.

The analysis of yearly effects (inclusive of impact and control stations) showed significant decreases in the density of Common Yellowthroat ($F_{2,250} = 5.2972$, $p = 0.0056$) between 2014/15 and 2016 ($p = 0.0041$), followed by a significant increase in the density of this species between 2016 and 2018 ($p = 0.0067$), indicating that this species may be experiencing broad population fluctuations within the overall monitoring area. No significant change in density was observed for Veery ($F_{2,248} = 3.8761$, $p = 0.0220$) and non-SCC Blue Jay ($F_{2,306} = 3.4179$, $p = 0.0340$) between 2014/15 and 2016. However, both species experienced significant changes in density between 2016 and 2018. Veery densities increased significantly ($p = 0.0131$) while Blue Jay densities decreased significantly ($p = 0.0220$). This suggests that these species may be experiencing broad increases and decreases (respectively) within the overall monitoring area. No yearly changes in density were observed for the other species analyzed (Table 3-5). The assumption of sphericity was violated for the Common Yellowthroat ($p = 0.0006$), Veery ($p = 0.0088$) and Blue Jay density analyses ($p = 0.0076$) resulting in increased chances of Type I error, as such results should be interpreted with some caution. In the instance of all three species, there are clear trends in the mean densities with non-overlapping standard errors and relatively low p-values, therefore, it is likely that these assertions are significant despite the violation of sphericity.

The analysis of location effects (inclusive of 2014/15, 2016 and 2018) showed Ovenbird ($F_{1,155} = 8.5917$, $p = 0.0039$) had a significantly greater density at control stations compared to impact stations suggesting that the less disturbed forest habitat preferred by this species, is more prevalent within the control areas. No changes in density between impact and control stations was observed for the other species analyzed (Table 3-5).

3.1.5 Species Abundance by Guild

Statistical comparisons of SCC and non-SCC by guild were conducted to detect significant differences in abundance between monitoring year (2014/15, 2016 and 2018) and survey station type (impact versus control) as summarized in Table 3-6 and Table 3-7. The total abundance of birds between monitoring years and station types was also evaluated, which was inclusive of all four guilds.

Several species were identified in flocks or large groups and these bulk observations were excluded from the guild analyses as they represent outliers in the statistical analyses. Within the abundance data, these species included: American White Pelican, Barn Swallow, Canada Goose, European Starling and Sharp-tailed Grouse.

Species of Conservation Concern

The SCC analysis revealed a significant interaction effect between survey station type and year relative to the abundance of the SCC Edge / Shrub / Successional birds ($F_{2,332}$ = 9.5154, p < 0.0001), Forest birds ($F_{2,358}$ = 4.6350, p = 0.0103), Grassland / Open Country birds ($F_{2,136}$ = 2.5805, p = 0.0794 and Total birds ($F_{2,358}$ = 7.1600, p = 0.0009) indicating that abundance at control and impact stations differs depending on the year.

Further analysis revealed the abundance of the SCC Edge / Shrub / Successional birds was relatively unchanged between 2014/15 and 2016. The abundance of birds in this guild significantly increased at impact stations between 2016 and 2018 (p = 0.0021), while decreasing significantly at control stations (p = 0.0358; Table 3-6 and Table 3-7). The abundance of SCC Edge / Shrub / Successional birds was also significantly greater at impact stations in 2018 (p < 0.0001) as compared to control stations. The lack of notable change in abundance at both impact and control stations between 2014/15 and 2016 indicates this guild of species was not adversely impacted by the construction activities being undertaken at the RRM impact stations. Additionally, the increase in population abundance at impact stations in 2018 and concurrent drop at control stations indicates that the construction activities have resulted in the creation of early successional habitat preferred by SCC Edge / Shrub / Successional birds, causing a shift into these optimal habitats. This result aligns with the similar species-level trends observed for Chestnut-sided Warbler and Song Sparrow, both of which are included in this habitat guild. The assumption of sphericity was violated for the SCC Edge / Shrub / Successional abundance analysis (p = 0.0975) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance, there is a clear trend in the mean abundances with non-overlapping standard errors and relatively low p-values, therefore, it is likely that these assertions are significant despite the violation of sphericity.

Black-and-white Warbler (Photo: National Park Service)

Further analysis revealed the abundance of the SCC Forest birds to be similar at both impact and control stations in 2014/15. The abundance of these birds then significantly increased at control stations (p = 0.0200) between 2014/15 and 2016, while concurrently decreasing significantly at impact stations (p = 0.0610). As such, abundance was significantly greater at control stations than impact stations in 2016 (p < 0.0001). Between 2016 and 2018, the abundance of the SCC Forest birds significantly decreased (p = 0.0579) at control stations while showing increasing abundances at impact stations (not significant; p = 0.3311). Despite this, the significantly greater abundance of SCC Forest birds recorded at control stations as compared to impact was sustained in 2018 (p = 0.0858). These results indicate this guild may have been temporarily adversely affected by increased disturbance and habitat loss from the RRM construction activities. Disturbance typically experienced at impact stations may have included increased noise levels beyond tolerance thresholds and/or habitat degradation due to mine construction activities (e.g., road construction, tree removals) to a point where individuals of these species found alternative nesting territories at control stations in 2016. The subsequent decrease in abundance of SCC Forest birds at control stations, coupled with non-significant increase at impact stations in 2018 may indicate that effects from disturbances at these locations have decreased now that the RRM has entered the operations phase and these species are able to disperse more evenly. However, the continued significantly greater abundance at control stations indicates habitats around impact stations likely no longer support as much optimal (forested) habitat for these species.

Further evaluation of SCC Grassland / Open Country birds revealed a significant increase in abundance at both control and impact stations ($p = 0.0103$ and $p = 0.0571$) between 2016 and 2018. This appears to indicate a broad population increase across the overall monitoring area. This could be attributed to the work undertaken by New Gold to ensure protected Bobolink Overall Benefit lands are maintained as high quality grassland bird habitat or the clearing of previously woody vegetated land into anthropogenically open areas introducing new habitat for certain species. A non-significant decrease in abundance at impact stations between 2014/15 and 2016 may indicate these species were temporarily adversely affected by construction activities to a point where individuals of these species found alternative nesting territories. However, the subsequent increase in abundance at all stations in 2018 may indicate that disturbances at these locations have decreased now that the RRM has entered the operations phase and these species are able to again increase their utilization of habitats at these sites. The assumption of sphericity was violated for the SCC Grassland / Open Country abundance analysis ($p < 0.0001$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean abundances and relatively low p-values, however, there is some overlap of the standard errors. Despite this the trends in the data are clear and notable it is likely that these assertions are significant despite the violation of sphericity.

Further analysis revealed total SCC bird abundance trends are similar to those observed in the two largest guilds showing interaction effects, SCC Edge / Shrub / Successional birds and SCC Forest birds. Total SCC abundance decreased (not significant; $p = 0.2918$) at impact stations between 2014/15 and 2016, followed by a significant increase ($p = 0.0010$) in abundance at impact stations between 2016 and 2018. Concurrently, Total SCC bird abundance significantly increased ($p = 0.0344$) at control stations between 2014/15 and 2016, followed by a significant decrease ($p = 0.0481$) between 2016 and 2018 (Table 3-6 and Table 3-7). These results support the theory that birds may have been temporarily adversely affected by construction activities to a point where individuals found alternative nesting territories (resulting in an increase in abundance at control stations), however, the subsequent increase in abundance at impact stations in 2018 corroborates the theory that disturbances at these locations have decreased now that the RRM has entered the operations phase and that new optimal habitat may have been created through these construction activities to support numerous species across the guilds.

The analysis for SCC revealed no significant interaction effects were observed for SCC Wetland / Open Water birds which would imply that the RRM construction and operations have not adversely affected the abundance of this guild. As well, the analysis of yearly effects (inclusive of impact and control stations) showed no changes in abundance between monitoring years for SCC Wetland / Open Water birds (Table 3-6 and Table 3-7).

The analysis of location effects (using pooled abundances for all years of study) showed that SCC Wetland / Open Water bird abundance was significantly greater at impact stations compared to control stations ($F_{1,134} = 5.2195$, $p = 0.0239$). This suggests that there may be more suitable habitats within the impact areas for these species. The assumption of sphericity was violated for the SCC Wetland / Open Water abundance analysis ($p < 0.0001$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean abundances with non-overlapping standard errors and a low p-value, therefore, it is likely these assertions are significant despite the violation of sphericity.

Non-Species of Conservation Concern

The analysis for non-SCC revealed significant interaction effects between survey station type and year relative to the abundance of non-SCC Forest birds ($F_{2,358}$ = 3.7810, p = 0.0237) and Wetland / Open Water birds ($F_{2,198}$ = 2.7580, p = 0.0659) indicating that abundance at control and impact stations differs depending on the year.

Further evaluation of non-SCC Forest revealed a decrease in abundance at impact stations between 2014/15 and 2016 (not significant; p = 0.2790), followed by a significant increase in abundance between 2016 and 2018 (p = 0.0778). At control stations, non-SCC Forest bird abundance significantly increased between 2014/15 and 2016 (p = 0.0057) and demonstrated no notable change between 2016 and 2018. Abundance at control stations was significantly greater than at impact stations for all monitoring years with the largest differences in mean abundance occurring in 2016 followed by 2018. These results indicate this guild may have been temporarily adversely affected by increased disturbance and habitat loss from the RRM construction activities. Disturbance typically experienced at impact stations may have included increased noise levels beyond tolerance thresholds and/or habitat degradation due to mine construction activities (e.g., road construction, tree removals) to a point where individuals of these species found alternative nesting territories at control stations in 2016. The subsequent non-significant increase at impact stations in 2018 may indicate that disturbances at these locations have decreased now that the RRM has entered the operations phase and that these species are able to disperse more evenly. However, the continued significantly greater abundance at control stations indicates habitats around impact stations likely no longer support as much optimal (forested) habitat for these species.

Further analysis revealed the abundance of the non-SCC Wetland / Open Water birds increased at control stations between 2014/15 and 2016 (not significant; p = 0.2535), followed by a significant increase in the abundance of these birds between 2016 and 2018 (p = 0.0874). Abundance at impact stations showed no significant trend between years. In 2014/15, the abundance of non-SCC Wetland / Open water species was significantly greater at impact stations than at control stations (p = 0.0300). However, this trend was not found in 2016 and 2018. Instead, abundance was slightly greater (although not significantly) at control stations in 2018. These results suggest that these species were not adversely affected by the active construction in 2016. However, the current trends could indicate that habitat for these species was diminished at impact stations resulting in higher abundance of these species at control site post-construction in 2018. Further years of surveys will be needed to determine conclusive trends in abundance for these species.

The analysis of non-SCC guilds revealed no significant interaction effects between survey station type and year relative to the abundance of non-SCC Edge / Shrub / Successional birds, Grassland / Open Country birds or Total non-SCC birds. This would imply that the RRM construction and operations have not adversely affected the abundance of these guilds (Table 3-6 and Table 3-7). As well, the analysis of yearly effects (inclusive of impact and control stations) showed significant effects on the abundance of non-SCC Edge / Shrub / Successional birds ($F_{2,354}$ = 6.2746, p = 0.0021), Grassland / Open Country birds ($F_{2,122}$ = 13.2407, p < 0.0001) and Total non-SCC birds ($F_{2,358}$ = 10.4110, p < 0.0001).

Non-SCC Edge / Shrub / Successional bird abundance significantly decreased between 2014/15 and 2016 (p = 0.0624), followed by a significant increase in abundance between 2016 and 2018 (p = 0.0005), which indicates that these species are experiencing broad population fluctuations within the overall monitoring area. For non-SCC Grassland / Open Country birds, abundance significantly increased between 2014/15 and 2016 (p = 0.0002) and again between 2016 and 2018 (p = 0.0296), indicating that these species are

experiencing broad population increases within the overall monitoring area. The total combined non-SCC bird abundance also increased significantly between 2016 and 2018, which is mainly a result of the increase observed for non-SCC Edge / Shrub / Successional birds. The non-SCC Total birds showed an increase between 2014/15 and 2016 as well, although it was not significant. These results indicate that non-SCC birds overall are experiencing broad populations increases within the overall monitoring area. The assumption of sphericity was violated for the non-SCC Grassland / Open Country abundance analysis ($p = 0.0071$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean abundances with minimal standard error overlap and relatively low p-values, therefore, it is likely that these assertions are significant despite the violation of sphericity.

The analysis of location effects (inclusive of 2014/15, 2016 and 2018) showed that non-SCC Edge / Shrub / Successional bird abundance was significantly greater at impact stations compared to control stations ($F_{1,177} = 5.1531$, $p = 0.0244$). This result is potentially due to a greater prevalence of suitable habitats within impact areas. Similarly, non-SCC Grassland / Open Country bird abundance was significantly greater at the impact stations compared to the control stations ($F_{1,61} = 12.8638$, $p = 0.0007$). This result is potentially due to the greater prevalence of impact stations located within Bobolink Overall Benefit lands (32 stations as opposed to 11 control stations) which provide suitable habitat.

3.1.6 Species Density by Guild

Statistical comparisons of SCC and non-SCC by guild were conducted to detect significant differences in density between monitoring year (2014/15, 2016 and 2018) and survey station type (impact versus control) as summarized in Table 3-8 and Table 3-9. The total density of birds between monitoring years and station types was also evaluated, which is inclusive of all four guilds.

Several species were identified in flocks or large groups and these bulk observations were excluded from the guild analyses as they represent outliers in the statistical analyses. Within the density data, these species included: Barn Swallow and Sharp-tailed Grouse.

Species of Conservation Concern

Similar to the results for abundance, the SCC analysis revealed a significant interaction effect between survey station type and year, relative to the density of the SCC Edge / Shrub / Successional birds ($F_{2,332} = 5.8382$, $p = 0.0032$), Forest birds ($F_{2,358} = 3.9912$, $p = 0.0193$), Grassland / Open Country birds ($F_{2,136} = 2.5455$, $p = 0.0822$) and Total birds ($F_{2,358} = 5.4810$, $p = 0.0045$) indicating that density at control and impact stations differs depending on the year.

Further analysis revealed that the density of the SCC Edge / Shrub / Successional birds followed a similar trend to that seen for abundance. Density was relatively unchanged between 2014/15 and 2016, then significantly increased at impact stations between 2016 and 2018 ($p = 0.0002$), while decreasing slightly at control stations (not significant; $p = 0.4965$; Table 3-8 and Table 3-9). The density of SCC Edge / Shrub / Successional birds was therefore significantly greater at impact stations in 2018 ($p = 0.0005$) as compared to control stations. The lack of notable change in density at both impact and control stations between 2014/15 and 2016 indicates this guild of species was not adversely impacted by the construction activities being undertaken at the RRM impact stations. The increase in density at impact stations in 2018 and concurrent slight decrease at control stations may indicate that the construction activities have resulted in

disturbed areas which have begun regenerating into preferred edge / shrub / successional habitat for these species causing a shift into these optimal habitats.

Further analysis revealed that the density of the SCC Forest birds followed a similar trend to that seen for abundance. Density was similar at both impact and control stations in 2014/15, then increased at control stations (not significant; $p = 0.3882$) between 2014/15 and 2016, while concurrently decreasing significantly at impact stations ($p = 0.0047$). As such, there was a significantly greater density at control stations than impact stations in 2016 ($p = 0.0004$). Between 2016 and 2018, the density of the SCC Forest birds significantly increased ($p = 0.0381$) at both control and impact stations ($p = 0.0085$). A significantly greater density was maintained at control stations as compared to impact stations in 2018 ($p = 0.0017$). These results indicate that SCC Forest birds may have been adversely affected by increased disturbance and habitat loss from the RRM construction activities. Disturbance typically experienced at impact stations may have included increased noise levels beyond tolerance thresholds and/or habitat degradation due to mine construction activities (e.g., road construction, tree removals) to a point where individuals of these species found alternative nesting territories at control stations in 2016. The subsequent increase in density at both control and impact stations in 2018 may indicate that disturbances at impact stations have decreased now that the RRM has entered the operations phase, and that these species are able to disperse more evenly. However, the sustained significantly greater abundance at control stations indicates habitats around impact stations no longer support as much optimal (forested) habitat for these species.

Further analysis revealed that the density of the SCC Grassland / Open Country birds followed a similar trend to that seen for abundance. Density significantly increased at both the control and impact stations ($p = 0.0086$ and $p = 0.0109$) between 2016 and 2018. This appears to indicate a broad population increase across the overall monitoring area. This could be attributed to the work undertaken by New Gold to maintain high quality grassland bird habitat within the protected Bobolink Overall Benefit lands or the clearing of previously woody vegetated land into anthropogenically open areas introducing new habitat for certain species. In 2014/15, density of SCC Grassland / Open Country birds was significantly greater at impact stations than at control stations ($p = 0.0527$), this could have been due to the greater prevalence of impact stations located within Bobolink Overall Benefit lands (32 stations as opposed to 11 control stations), which provide suitable habitat for birds in this guild. The decrease in abundance at impact stations between 2014/15 and 2016, whilst not significant, may indicate that these species were temporarily adversely affected by construction activities to a point where individuals of these species found alternative nesting territories. The subsequent increase in density at all stations in 2018 may indicate that disturbances at these locations have decreased now that the RRM has entered the operations phase and these species are able to again increase their utilization of habitats at these sites. The assumption of sphericity was violated for the SCC Grassland / Open Country density analysis ($p < 0.0001$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean densities with non-overlapping standard errors and most of the p-values are relatively low, therefore, it is likely that these assertions are significant despite the violation of sphericity and regardless of significance there is a clear trend in the data and the explanations are still valid.

Further analysis revealed the density of the Total SCC birds followed a similar trend to those observed in the two largest guilds showing interaction effects, SCC Edge / Shrub / Successional birds and SCC Forest birds. Total SCC bird density significantly decreased ($p = 0.0001$) at impact stations between 2014/15 and 2016, followed by a significant increase ($p < 0.0001$) between 2016 and 2018. Total SCC density also slightly (non-significantly) increased ($p = 0.7093$) at control stations between 2014/15 and 2016, followed by a significant increase ($p = 0.0337$) between 2016 and 2018. (Table 3-8 and Table 3-9). These results

corroborate the theory that birds may have been temporarily adversely affected by construction activities at impact stations to a point where individuals found alternative nesting territories (resulting in an increase in density at control stations), however, the subsequent increase in density at impact stations in 2018 supports the theory that disturbances at these locations have decreased now that the RRM has entered the operations phase and that new optimal habitat may have been created through these construction activities to support numerous species across the guilds. The assumption of sphericity was violated for the Total SCC density analysis ($p = 0.0028$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean densities with non-overlapping standard errors and low p-values, therefore, it is likely that these assertions are significant despite the violation of sphericity.

The analysis for SCC revealed no significant interaction effect between survey station type and year relative to the density of SCC Wetland / Open Water birds. This suggests that the RRM construction and operations have not adversely affected the density of this guild (Table 3-8 and Table 3-9).

The analysis of yearly effects (inclusive of impact and control stations) showed significant fluctuations in the density of SCC Wetland / Open Water birds ($F_{2,268} = 3.445$, $p = 0.0333$) between monitoring years. The density significantly decreased between 2014/15 and 2016 ($p = 0.0276$), followed by a significant increase between 2016 and 2018 ($p = 0.0089$). These results indicate that species within this guild are experiencing broad population fluctuations within the overall monitoring area. The assumption of sphericity was violated for the SCC Wetland / Open Water density analysis ($p < 0.0001$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean densities with non-overlapping standard errors and low p-values, therefore, it is likely that these assertions are significant despite the violation of sphericity.

The analysis of location effects (inclusive of 2014/15, 2016 and 2018) showed no changes in density between impact and control stations was observed for SCC Wetland / Open Water birds.

Non-Species of Conservation Concern

The analysis for non-SCC revealed significant interaction effects between survey station type and year relative to the density of non-SCC Forest birds ($F_{2,358} = 5.0312$, $p = 0.0070$) and Total non-SCC birds ($F_{2,358} = 3.5550$, $p = 0.0296$) indicating that density at control and impact stations differs depending on the year.

Ruby-crowned Kinglet (Photo: Cephas/Wikimedia Commons)

Further analysis revealed that the density of the non-SCC Forest birds followed similar trends to those described for abundance. Density slightly increased at control stations between 2014/15 and 2016 (not significant; $p = 0.4568$), followed by a significant increase in density between 2016 and 2018 ($p = 0.0562$). At impact stations non-SCC Forest bird density significantly decreased between 2014/15 and 2016 ($p = 0.0009$), followed by a significant increase in density between 2016 and 2018 ($p = 0.0174$). Abundance at control stations was significantly greater than at impact stations for all monitoring years with the largest differences occurring in 2016 followed by 2018. These results indicate this guild may have been adversely affected by increased disturbance and habitat loss from the RRM construction activities. Disturbance typically experienced at impact stations may have included increased noise levels beyond tolerance thresholds and/or habitat degradation due to mine construction activities (e.g., road construction, tree removals) to a

point where individuals of these species found alternative nesting territories in 2016. The subsequent significant increase in density at impact stations in 2018 may indicate that disturbances at these locations have decreased now that the RRM has entered the operations phase and these species are able to disperse more evenly. The sustained significantly greater abundance at control stations indicates habitats around impact stations likely no longer support as much optimal (forested) habitat for these species.

Further analysis revealed that the density of the Total non-SCC birds displays trends similar to those observed for the non-SCC Forest birds. Total non-SCC bird density slightly decreased at control stations between 2014/15 and 2016 (not significant; $p = 0.8085$), followed by a significant increase in density between 2016 and 2018 ($p = 0.0001$). At impact stations Total non-SCC bird density significantly decreased between 2014/15 and 2016 ($p = 0.0012$), followed by a significant increase in density between 2016 and 2018 ($p = 0.0005$). Density at control stations increased from (non-significantly) lower in 2014/15, to (non-significantly) greater in 2016, to significantly greater ($p = 0.0493$) than at impact stations in 2018. These results corroborate the theory that birds may have been temporarily adversely affected by construction activities at impact stations to a point where individuals found alternative nesting territories. The subsequent significant increase in density at impact and control stations in 2018 show a broad increase in birds across the overall monitoring area as well as corroborating the theory that species are able to disperse more evenly now that disturbances at impact stations have decreased with the RRM entering the operations phase. The significantly greater density at control stations in 2018 indicates some species may have been displaced permanently from impact stations due to loss of forest habitat. The assumption of sphericity was violated for the Total non-SCC density analysis ($p = 0.0038$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean densities with non-overlapping standard errors and low p-values, therefore, it is likely that these assertions are significant despite the violation of sphericity.

The analysis of non-SCC guilds revealed no significant interaction effects between survey station type and year relative to the density of non-SCC Edge / Shrub / Successional birds, Grassland / Open Country birds or Wetland / Open Water birds. This would imply that the RRM construction and operations have not adversely affected the densities of these guilds (Table 3-8 and Table 3-9).

The analysis of yearly effects (inclusive of impact and control stations) showed significant fluctuations in the density of non-SCC Edge / Shrub / Successional birds ($F_{2,354} = 6.5819$, $p = 0.0016$). The density significantly decreased between 2014/15 and 2016 ($p = 0.0047$), followed by a significant increase between 2016 and 2018 ($p = 0.0008$). These results indicate species within this guild are experiencing broad population fluctuations within the overall monitoring area. Additionally, non-SCC Grassland / Open Country birds ($F_{2,122} = 13.6516$, $p < 0.0001$) showed significant increases in density between 2014/15 and 2016 ($p = 0.0054$) and again between 2016 and 2018 ($p = 0.0015$). These results indicate species within this guild are experiencing broad increases within the overall monitoring area. No changes in density between monitoring years were observed for non-SCC Wetland / Open Water birds. The assumption of sphericity was violated for the non-SCC Grassland / Open Country density analysis ($p = 0.0008$) resulting in an increased chance of Type I error, as such results should be interpreted with some caution. In this instance there is a clear trend in the mean densities with non-overlapping standard errors and low p-values, therefore, it is likely that these assertions are significant despite the violation of sphericity.

The analysis of location effects (inclusive of 2014/15, 2016 and 2018) showed that the density of non-SCC Edge / Shrub / Successional birds ($F_{1,177} = 2.8900$, $p = 0.0909$) and non-SCC Grassland / Open Country birds ($F_{1,61} = 12.0017$, $p = 0.0010$) was significantly greater at impact stations compared to control stations. This result is potentially due to a greater prevalence of suitable habitats within the impact areas.

No significant changes in density between impact and control stations were observed for non-SCC Wetland / Open Water birds.

3.1.7 Species Richness by Guild

Statistical comparisons of SCC and non-SCC by guild were conducted to detect significant differences in species richness between monitoring year (2014/15, 2016 and 2018) and survey station type (impact versus control) as summarized in Table 3-10 and Table 3-11. The total species richness of birds between monitoring years and station types was also evaluated, which is inclusive of all four guilds.

Species of Conservation Concern

The SCC analysis revealed a significant interaction effect between survey station type and year relative to the richness of the SCC Edge / Shrub / Successional birds ($F_{2,332}$ = 8.7981, p = 0.0002), Forest birds ($F_{2,358}$ = 4.2230, p = 0.0154), Grassland / Open Country birds ($F_{2,132}$ = 2.9229, p = 0.0573), and Total birds ($F_{2,358}$ = 7.6580, p = 0.0006; Table 3-10 and Table 3-11) indicating that species richness at control and impact stations differs depending on the year.

Further analysis revealed that the richness of the SCC Edge / Shrub / Successional birds follows similar trends to those described for abundance. Richness increased at impact stations between 2014/15 and 2016 (not significant; p = 0.2286), followed by a significant increase in species richness between 2016 and 2018 (p = 0.0062). Concurrently, richness decreased at control stations between 2014/15 and 2016 (not significant; p = 0.5324) and again between 2016 and 2018 (not significant; p = 0.2122). Despite the decreases being non-significant, the richness at control stations in 2018 was significantly lower (p = 0.0.0617) than in 2014/15. The richness of SCC Edge / Shrub / Successional species in 2014/15 was similar at impact and control stations, however, in both 2016 and 2018 richness was significantly greater at impact stations compared to control stations (p = 0.8987 and p < 0.0001). The increase in richness at impact stations between 2014/15 and 2016 substantiates the theory that this guild of species was not adversely impacted by the construction activities being undertaken at the RRM. The increase in richness at impact stations in 2018 and concurrent decrease at control stations supports the theory that the construction activities have resulted in disturbed areas which have begun regenerating into preferred edge / shrub / successional habitat for these species causing a shift into these optimal habitats.

Further analysis revealed that the richness of the SCC Forest birds follows similar trends to those described for abundance. Richness significantly increased at control stations (p = 0.0244) between 2014/15 and 2016 while concurrently decreasing at impact stations (not significant; p = 0.3044). As such, richness was significantly greater at control stations than at impact stations in 2016 (p < 0.0001). Between 2016 and 2018 the richness of SCC Forest birds significantly decreased (p = 0.0858) at control stations while significantly increasing at impact stations (p = 0.0404). These results corroborate the theory that this guild may have been adversely affected by increased disturbance and habitat loss from the RRM construction activities. The subsequent decrease in richness at control stations, coupled with the increase at impact stations in 2018 supports the theory that disturbances at these locations have decreased now that the RRM has entered the operations phase and these species are able to disperse more evenly.

Further analysis revealed the richness of the SCC Grassland / Open Country birds was significantly greater at impact stations compared to control stations in 2014/15 (p = 0.0740). Between 2014/15 and 2016, richness at control stations significantly increased (p = 0.0764) while decreasing at impact stations (not significant; p = 0.1706). Richness increased slightly at both impact and control stations between 2016 and

2018 (not significant; p = 0.2859 and p= 0.7990, respectively), with species richness being similar between the impact stations and control stations in 2018 (1.32 and 1.33, respectively). These results further corroborate the theory that these species were temporarily adversely affected by construction activities to a point where individuals of these species found alternative nesting territories in 2016.The subsequent slight increase in richness between 2016 and 2018 supports the theory that disturbances at the impact locations have decreased now that the RRM has entered the operations phase and these species are able to again increase their utilization of habitats at these sites.

The richness of Total SCC showed trends similar to those observed in the two largest guilds showing interaction effects; SCC Edge / Shrub / Successional birds and SCC Forest birds. Total SCC bird richness significantly increased at control stations between 2014/15 and 2016 (p = 0.0069), followed by a significant decrease in richness between 2016 and 2018 (p = 0.0021). At impact stations there was no notable change in richness between 2014/15 and 2016, however a significant increase in richness occurred between 2016 and 2018. Richness values were similar at impact and control stations (mean richness 6.58 and 6.60, respectively) in 2016, however, richness was significantly greater at impact stations compared with control stations in both 2014/15 and 2018. This further supports the theory that some species were temporarily adversely affected by construction activities to a point where individuals of these species found or chose alternative nesting territories in 2016. The subsequent increase in richness at impact stations between 2016 and 2018, coupled with the decrease in richness at control stations supports the theory that disturbances at the impact locations have decreased now that the RRM has entered the operations phase and species are able to disperse more evenly and again increase their utilization of habitats at these sites.

No significant interaction effect between survey station type and year was observed relative to the richness of SCC Wetland / Open Water birds (Table 3-10 and Table 3-11); however, the analysis of yearly effects (inclusive of impact and control stations) showed a significant fluctuation in the richness of SCC Wetland / Open Water birds between monitoring years ($F_{2,268}$ = 5.7960, p = 0.0034). Richness significantly increased between 2014/15 and 2016 (p = 0.0095), followed by a significant decrease in richness between 2016 and 2018 (p = 0.0024). This result indicates SCC Wetland / Open Water species are experiencing broad fluctuations of richness within the overall monitoring area.

The analysis of location effects (inclusive of 2014/15, 2016 and 2018) showed no changes in richness between impact and control stations for SCC Wetland / Open Water birds (Table 3-10 and Table 3-11).

Non-Species of Conservation Concern

The analysis for non-SCC revealed significant interaction effects between survey station type and year relative to the richness of non-SCC Forest birds ($F_{2,358}$ = 4.6000, p = 0.0107) and Total non-SCC birds ($F_{2,358}$ = 4.3820, p = 0.0132; Table 3-10 and Table 3-11) indicating that species richness at control and impact stations differs depending on the year.

Further analysis revealed the richness of non-SCC Forest species follows similar trends to those described for abundance. Richness significantly increased at control stations (p = 0.0118) between 2014/15 and 2016 while concurrently decreasing at impact stations (not significant; p = 0.1499). Richness was consistently significantly greater at control stations than impact stations across all monitoring years. This difference was most pronounced in 2016 (p < 0.0001). Between 2016 and 2018, the richness of non-SCC Forest birds decreased (not significant; p = 0.1295) at control stations while significantly increasing at impact stations (p = 0.0627). These results corroborate the theory that this guild may have been adversely

affected by increased disturbance and habitat loss from the RRM construction activities. The subsequent decrease (non-significant) in richness at control stations, coupled with the increase at impact stations in 2018 supports the theory that disturbances at these locations have decreased now that the RRM has entered the operations phase and these species are able to disperse more evenly.

Further analysis revealed Total non-SCC bird richness trends are similar to those observed for non-SCC Forest birds. Total non-SCC bird richness significantly increased at control stations ($p = 0.0716$) between 2014/15 and 2016 while concurrently decreasing at impact stations (not significant; $p = 0.1192$). Richness was therefore significantly greater at control stations than at impact stations in 2016 ($p = 0.0920$). Between 2016 and 2018, richness decreased (not significant; $p = 0.8741$) at control stations while significantly increasing at impact stations ($p < 0.0001$). These results support the theory that some species have been adversely affected by increased disturbance and habitat loss from the RRM construction activities. However, disturbances at these locations have decreased now that the RRM has entered the operations phase and these species are able to disperse more evenly.

No significant interaction effect between survey station type and year was observed relative to the richness of non-SCC Edge / Shrub / Successional, Grassland / Open Country or Wetland / Open Water species (Table 3-10 and Table 3-11).

The analysis of yearly effects (inclusive of impact and control stations) showed a significant fluctuation in the richness of non-SCC Edge / Shrub / Successional birds ($F_{2,354} = 7.4605$, $p = 0.0007$) between monitoring years. Richness decreased significantly between 2014/15 and 2016 ($p = 0.0098$) and increased significantly between 2016 and 2018 ($p = 0.0002$). Similar to the results for abundance and density, these results indicate that species within this guild are experiencing broad fluctuations within the overall monitoring area. The analysis of yearly effects also showed significant increases in the richness of non-SCC Grassland / Open Country birds ($F_{2,122} = 9.5910$, $p = 0.0001$) and non-SCC Wetland / Open Water birds ($F_{2,198} = 6.3257$, $p = 0.0022$). Non-SCC Grassland / Open Country bird richness significantly increased between 2014/15 and 2016 ($p = 0.0090$) and again between 2016 and 2018 ($p = 0.0422$). Similarly, non-SCC Wetland / Open water bird richness significantly increased between 2014/15 and 2016 ($p = 0.0457$) and again between 2016 and 2018 ($p = 0.0004$). Similar to the results for abundance and density, this indicates that these species are experiencing broad population increases within the overall monitoring area.

The analysis of location effects (inclusive of 2014/15, 2016 and 2018) revealed that the richness of non-SCC Edge / Shrub / Successional species ($F_{1,177} = 5.8888$, $p = 0.0162$) and non-SCC Grassland / Open Country species ($F_{1,61} = 16.5067$, $p = 0.0001$) were significantly greater at impact stations compared to control stations. This result suggests that habitat for non-SCC Edge / Shrub / Successional species and non-SCC Grassland / Open Country species may be more prevalent at impact stations. No significant differences between impact and control stations were observed for non-SCC Wetland / Open Water species (Table 3-10 and Table 3-11).

3.2 Other Taxa (Incidental Observations)

White-tailed Deer (*Odocoileus virginianus*) were commonly observed throughout the NLSA as were their tracks and droppings, indicating a high level of local habitat use by this species. Similarly, evidence of Beaver (*Castor canadensis*) activity such as dams, lodges and chewed stumps were widespread throughout the NLSA.

The only avian species documented incidentally which was not also recorded during morning point count surveys was Common Nighthawk (Appendix A).

Table 3-1: Summary of Percent Occurrence of Dominant Species between 2016 and 2018 Monitoring Years

Species	Year	Impact (n = 90)			Control (n = 95)		
		Max. Birds Observed	No. of Stations Observed	Percent of Stations Observed	Max. Birds Observed	No. of Stations Observed	Percent of Stations Observed
SCC Birds							
Nashville Warbler	2016	129	64	71.1	141	79	83.2
	2018	115	66	73.3	158	70	81.1
Common Yellowthroat	2016	76	54	60.0	53	38	40.0
	2018	90	61	67.8	54	27	34.7
Chestnut-sided Warbler	2016	61	43	47.8	76	45	47.4
	2018	85	56	62.2	54	34	43.2
White-throated Sparrow	2016	122	71	78.9	158	76	80.0
	2018	89	49	54.4	102	54	63.2
Song Sparrow	2016	58	37	41.1	38	23	24.2
	2018	78	48	53.3	24	12	21.1
Veery	2016	41	32	35.6	53	41	43.2
	2018	61	40	44.4	63	39	46.3
Non-SCC Birds							
Red-eyed Vireo	2016	74	57	63.3	105	73	76.8
	2018	127	72	80.0	175	77	91.6
Ovenbird	2016	101	65	72.2	125	73	76.8
	2018	99	61	67.8	137	60	70.5
American Robin	2016	61	44	48.9	47	39	41.1
	2018	76	56	62.2	64	37	48.4
Black-and-white Warbler	2016	44	38	42.2	61	52	54.7
	2018	58	47	52.2	55	42	50.5
Blue Jay	2016	83	49	54.4	87	58	61.1
	2018	44	38	42.2	41	30	37.9
Hermit Thrush	2016	29	21	23.3	69	49	51.6
	2018	16	14	15.6	46	37	41.1

Table 3-2: Summary of Abundance of Commonly Occurring Species between Monitoring Years

Species	Station Type	No. of Survey Stations (n)*	2014/15 Mean Abundance ±SE	2016 Mean Abundance ±SE	2018 Mean Abundance ±SE
SCC Birds					
Nashville Warbler	Impact	81	1.43 ± 0.13	1.59 ± 0.12	1.42 ± 0.14
	Control	88	1.52 ± 0.12	1.56 ± 0.12	1.75 ± 0.13
Common Yellowthroat	Impact	71	1.17 ± 0.12	1.07 ± 0.10	1.27 ± 0.12
	Control	56	1.11 ± 0.13	0.89 ± 0.11	0.93 ± 0.13
White-throated Sparrow	Impact	83	1.72 ± 0.14	1.48 ± 0.14	1.07 ± 0.13
	Control	89	1.49 ± 0.13	1.70 ± 0.13	1.10 ± 0.12
Chestnut-sided Warbler	Impact	72	0.44 ± 0.09	0.85 ± 0.12	1.18 ± 0.10
	Control	63	0.86 ± 0.10	1.19 ± 0.13	0.78 ± 0.11
Song Sparrow	Impact	61	1.16 ± 0.13	0.95 ± 0.14	1.28 ± 0.12
	Control	39	1.38 ± 0.16	0.97 ± 0.17	0.62 ± 0.15
Veery	Impact	59	0.81 ± 0.11	0.69 ± 0.11	1.03 ± 0.12
	Control	67	0.73 ± 0.10	0.73 ± 0.10	0.91 ± 0.11
non-SCC Birds					
Red-eyed Vireo	Impact	88	1.19 ± 0.10	0.85 ± 0.08	1.44 ± 0.11
	Control	88	1.28 ± 0.10	1.14 ± 0.08	1.91 ± 0.11
Ovenbird	Impact	80	1.33 ± 0.12	1.26 ± 0.11	1.24 ± 0.12
	Control	77	1.57 ± 0.12	1.47 ± 0.11	1.62 ± 0.12
American Robin	Impact	81	0.75 ± 0.09	0.75 ± 0.08	0.94 ± 0.09
	Control	70	0.73 ± 0.10	0.64 ± 0.09	0.89 ± 0.10
Black-and-white Warbler	Impact	73	0.63 ± 0.07	0.60 ± 0.08	0.79 ± 0.08
	Control	70	0.53 ± 0.07	0.84 ± 0.08	0.73 ± 0.08
Blue Jay	Impact	77	0.71 ± 0.08	1.08 ± 0.11	0.57 ± 0.07
	Control	78	0.55 ± 0.08	1.09 ± 0.11	0.49 ± 0.07
Hermit Thrush	Impact	44	0.93 ± 0.13	0.66 ± 0.13	0.36 ± 0.10
	Control	74	0.72 ± 0.10	0.89 ± 0.10	0.59 ± 0.07

Note:

* Unlike the abundances provided above and in Appendix B and C, those presented in this table are over the total number of point counts where the species was observed (n) across both survey years (rather than the total number of overall point counts).

Table 3-3: Results of Repeated Measures ANOVA on Species Abundance

Species	Effect	DF	F	P*
SCC Birds				
Nashville Warbler	Station Type	1,167	0.9257	0.3374
	Year	2,334	0.6499	0.5228
	Station Type * Year	2,334	1.5953	0.2044
Common Yellowthroat	**Station Type**	**1,125**	**2.8626**	**0.0932**
	Year	2,250	1.2130	0.2990
	Station Type * Year	2,250	0.8897	0.4121
White-throated Sparrow	Station Type	1,170	0.0012	0.9729
	Year	**2,340**	**17.6935**	**<0.0001**
	Station Type * Year	**2,340**	**2.5024**	**0.0834**
Chestnut-sided Warbler	Station Type	1,133	1.2813	0.2597
	Year	**2,266**	**8.1483**	**0.0004**
	Station Type * Year	**2,266**	**10.2023**	**<0.0001**
Song Sparrow	Station Type	1,98	0.9854	0.3233
	Year	**2,196**	**3.7745**	**0.0246**
	Station Type * Year	**2,196**	**5.9626**	**0.0031**
Veery	Station Type	1,124	0.4003	0.5281
	Year	**2,248**	**3.1774**	**0.0434**
	Station Type * Year	2,248	0.2971	0.7432
non-SCC Birds				
Red-eyed Vireo	**Station Type**	**1,174**	**8.8833**	**0.0033**
	Year	**2,348**	**30.0890**	**<0.0001**
	Station Type * Year	2,348	2.2169	0.1105
Ovenbird	**Station Type**	**1,155**	**5.0001**	**0.0268**
	Year	2,310	0.4592	0.6322
	Station Type * Year	2,310	0.5369	0.5851
American Robin	Station Type	1,149	0.7396	0.3912
	Year	**2,298**	**3.0311**	**0.0498**
	Station Type * Year	2,298	0.1129	0.8933
Black-and-white Warbler	Station Type	1,141	0.1867	0.6663
	Year	**2,282**	**2.9574**	**0.0536**
	Station Type * Year	**2,282**	**2.8318**	**0.0606**
Hermit Thrush	Station Type	1,116	1.0382	0.3104
	Year	**2,232**	**5.5932**	**0.0042**
	Station Type * Year	**2,232**	**2.6775**	**0.0709**
Blue Jay	Station Type	1,153	1.4131	0.2364
	Year	**2,306**	**19.6596**	**<0.0001**
	Station Type * Year	2,306	0.4334	0.6487

Note:

* Bolded values represent statistically significant at $p < 0.10$

Table 3-4: Summary of Densities of Commonly Occurring Species between Monitoring Years

Species	Station Type	No. of Survey Stations (n)*	2014/15 Mean Density ±SE (per ha)	2016 Mean Density ±SE (per ha)	2018 Mean Density ±SE (per ha)
SCC Birds					
Nashville Warbler	Impact	81	1.21 ± 0.12	1.30 ± 0.12	1.22 ± 0.14
	Control	88	1.26 ± 0.12	1.39 ± 0.11	1.66 ± 0.13
Common Yellowthroat	Impact	71	0.96 ± 0.11	0.69 ± 0.08	0.94 ± 0.11
	Control	56	0.88 ± 0.12	0.57 ± 0.09	0.86 ± 0.12
White-throated Sparrow	Impact	83	0.99 ± 0.12	0.61 ± 0.11	0.76 ± 0.12
	Control	89	0.84 ± 0.12	0.97 ± 0.11	0.82 ± 0.11
Chestnut-sided Warbler	Impact	72	0.42 ± 0.09	0.72 ± 0.12	0.99 ± 0.10
	Control	63	0.79 ± 0.10	1.13 ± 0.13	0.73 ± 0.11
Song Sparrow	Impact	61	0.90 ± 0.12	0.61 ± 0.09	0.97 ± 0.11
	Control	39	1.08 ± 0.15	0.67 ± 0.12	0.56 ± 0.14
Veery	Impact	59	0.32 ± 0.09	0.27 ± 0.09	0.61 ± 0.10
	Control	67	0.45 ± 0.08	0.43 ± 0.09	0.54 ± 0.10
non-SCC Birds					
Red-eyed Vireo	Impact	88	0.81 ± 0.10	0.49 ± 0.08	0.82 ± 0.10
	Control	88	1.03 ± 0.10	0.85 ± 0.08	1.47 ± 0.10
Ovenbird	Impact	80	0.73 ± 0.11	0.65 ± 0.10	0.71 ± 0.11
	Control	77	1.03 ± 0.10	0.85 ± 0.08	1.47 ± 0.10
American Robin	Impact	81	0.58 ± 0.08	0.57 ± 0.08	0.51 ± 0.08
	Control	70	0.57 ± 0.09	0.43 ± 0.08	0.66 ± 0.09
Black-and-white Warbler	Impact	73	0.59 ± 0.07	0.52 ± 0.07	0.62 ± 0.08
	Control	70	0.44 ± 0.07	0.73 ± 0.08	0.67 ± 0.08
Blue Jay	Impact	77	0.51 ± 0.08	0.36 ± 0.09	0.22 ± 0.06
	Control	78	0.35 ± 0.08	0.50 ± 0.08	0.29 ± 0.06
Hermit Thrush	Impact	44	0.61 ± 0.12	0.32 ± 0.09	0.14 ± 0.08
	Control	74	0.45 ± 0.09	0.39 ± 0.07	0.38 ± 0.06

Note:

* Unlike the densities provided above and in Appendix B and C, those presented in this table are over the total number of point counts where the species was observed (n) across both survey years (rather than the total number of overall point counts).

Table 3-5: Results of Repeated Measure ANOVA on Species Density

Species	Effect	DF	F	P*
SCC Birds				
Nashville Warbler	Station Type	1,167	2.1566	0.1438
	Year	2,334	2.1488	0.1182
	Station Type * Year	2,334	2.3017	0.1017
Common Yellowthroat	Station Type	1,125	0.8990	0.3449
	Year	**2,250**	**5.2972**	**0.0056**
	Station Type * Year	2,250	0.0201	0.9801
White-throated Sparrow	Station Type	1,170	0.5163	0.4734
	Year	2,340	1.3431	0.2624
	Station Type * Year	**2,340**	**3.9998**	**0.0192**
Chestnut-sided Warbler	Station Type	1,133	2.6730	0.1044
	Year	**2,266**	**6.4865**	**0.0018**
	Station Type * Year	**2,266**	**7.9714**	**0.0004**
Song Sparrow	Station Type	1,98	0.2313	0.6316
	Year	**2,196**	**5.0147**	**0.0075**
	Station Type * Year	**2,196**	**3.6906**	**0.0267**
Veery	Station Type	1,124	0.7341	0.3932
	Year	**2,248**	**3.8761**	**0.0220**
	Station Type * Year	2,248	1.0797	0.3413
non-SCC Birds				
Red-eyed Vireo	**Station Type**	**1,174**	**19.0390**	**<0.0001**
	Year	**2,348**	**18.8345**	**<0.0001**
	Station Type * Year	**2,348**	**3.8922**	**0.0213**
Ovenbird	**Station Type**	**1,155**	**8.5917**	**0.0039**
	Year	2,310	1.2446	0.2895
	Station Type * Year	2,310	0.3817	0.6830
American Robin	Station Type	1,149	0.0002	0.9887
	Year	2,298	0.5973	0.5509
	Station Type * Year	2,298	1.4553	0.2350
Black-and-white Warbler	Station Type	1,141	0.4199	0.5181
	Year	2,282	1.6663	0.1908
	Station Type * Year	**2,282**	**2.7627**	**0.0648**
Hermit Thrush	Station Type	1,116	0.4142	0.5211
	Year	**2,232**	**5.0789**	**0.0069**
	Station Type * Year	**2,232**	**2.8269**	**0.0612**
Blue Jay	Station Type	1,153	0.0710	0.7903
	Year	**2,306**	**3.4179**	**0.0340**
	Station Type * Year	2,306	2.1381	0.1196

Note:
Bolded values represent statistically significant at $p < 0.10$

Table 3-6: Bird Species Abundance by Guild between Monitoring Years

Guild	Station Type	No. of Survey Stations (n)*	2014/15 Mean Abundance ±SE	2016 Mean Abundance ±SE	2018 Mean Abundance ±SE
SCC Birds					
Edge / Shrub / Successional Birds	Impact	87	2.49 ± 0.22	2.48 ± 0.18	3.15 ± 0.20
	Control	81	2.32 ± 0.23	2.25 ± 0.19	1.78 ± 0.20
Forest Birds	Impact	90	5.42 ± 0.29	4.80 ± 0.30	5.12 ± 0.31
	Control	91	5.70 ± 0.28	6.47 ± 0.30	5.85 ± 0.31
Grassland / Open Country Birds	Impact	50	2.84 ± 0.37	2.44 ± 0.39	3.14 ± 0.55
	Control	20	1.65 ± 0.58	2.00 ± 0.61	3.50 ± 0.88
Wetland / Open Water Birds	Impact	76	1.38 ± 0.17	1.78 ± 0.20	2.07 ± 0.31
	Control	60	1.10 ± 0.19	1.43 ± 0.22	1.10 ± 0.35
Total Birds	Impact	90	10.58 ± 0.45	10.08 ± 0.43	11.66 ± 0.53
	Control	91	8.86 ± 0.45	9.86 ± 0.43	8.92 ± 0.52
Non-SCC Birds					
Edge / Shrub / Successional Birds	Impact	89	3.79 ± 0.29	3.31 ± 0.28	4.15 ± 0.35
	Control	90	2.94 ± 0.29	2.58 ± 0.28	3.33 ± 0.35
Forest Birds	Impact	90	5.93 ± 0.33	5.51 ± 0.33	6.20 ± 0.33
	Control	91	6.85 ± 0.33	7.92 ± 0.33	7.70 ± 0.32
Grassland / Open Country Birds	Impact	45	1.82 ± 0.20	2.87 ± 0.26	3.42 ± 0.32
	Control	18	0.72 ± 0.31	1.39 ± 0.42	1.89 ± 0.50
Wetland / Open Water Birds	Impact	49	0.92 ± 0.20	1.02 ± 0.16	0.84 ± 0.15
	Control	52	0.40 ± 0.19	0.67 ± 0.15	1.08 ± 0.15
Total Birds	Impact	90	11.09 ± 0.47	10.78 ± 0.36	12.47 ± 0.53
	Control	91	10.13 ± 0.46	11.13 ± 0.36	11.99 ± 0.53

Note:

* Unlike the abundances provided above and in Appendix B and C, those presented in this table are over the total number of point count stations *where the species was observed* (n) across both survey years (rather than the total number of overall point counts stations).

Table 3-7: Repeated Measures ANOVA of Bird Species Abundance by Guild

Guild	Effect	DF	F	P*
SCC Birds				
Edge / Shrub / Successional Birds	**Station Type**	**1,166**	**6.6590**	**0.0107**
	Year	2,332	0.2052	0.8146
	Station Type * Year	**2,332**	**9.5154**	**< 0.0001**
Forest Birds	**Station Type**	**1,179**	**7.6580**	**0.0062**
	Year	2,358	0.2120	0.8089
	Station Type * Year	**2,358**	**4.6350**	**0.0103**
Grassland / Open Country Birds	Station Type	1,68	0.3347	0.5648
	Year	**2,136**	**6.7752**	**0.0016**
	Station Type * Year	**2,136**	**2.5805**	**0.0794**
Wetland / Open Water Birds	**Station Type**	**1,134**	**5.2195**	**0.0239**
	Year	2,268	1.5512	0.2139
	Station Type * Year	2,268	1.3335	0.2653
Total Birds	**Station Type**	**1,179**	**8.2620**	**0.0045**
	Year	2,358	1.4740	0.2304
	Station Type * Year	**2,358**	**7.1600**	**0.0009**
Non-SCC Birds				
Edge / Shrub / Successional Birds	**Station Type**	**1,177**	**5.1531**	**0.0244**
	Year	**2,354**	**6.2746**	**0.0021**
	Station Type * Year	2,354	0.0294	0.9711
Forest Birds	**Station Type**	**1,179**	**22.6020**	**< 0.0001**
	Year	2,358	2.1120	0.1225
	Station Type * Year	**2,358**	**3.7810**	**0.0237**
Grassland / Open Country Birds	**Station Type**	**1,61**	**12.8638**	**0.0007**
	Year	**2,122**	**13.2407**	**<0.0001**
	Station Type * Year	2,122	0.3776	0.6863
Wetland / Open Water Birds	Station Type	1,99	2.4294	0.1223
	Year	2,198	1.5685	0.2109
	Station Type * Year	**2,198**	**2.7580**	**0.0659**
Total Birds	Station Type	1,179	0.5600	0.4551
	Year	**2,358**	**10.4110**	**< 0.0001**
	Station Type * Year	2,358	1.5780	0.2078

Note:
Bolded values represent statistically significant at $p < 0.10$

Table 3-8: Bird Species Density by Guild between Monitoring Years

Guild	Station Type	No. of Survey Stations (n)*	2014/15 Mean Abundance ±SE	2016 Mean Abundance ±SE	2018 Mean Abundance ±SE
SCC Birds					
Edge / Shrub / Successional Birds	Impact	87	1.92 ± 0.19	1.75 ± 0.16	2.47 ± 0.18
	Control	81	1.81 ± 0.19	1.73 ± 0.16	1.59 ± 0.18
Forest Birds	Impact	90	3.63 ± 0.26	2.83 ± 0.25	3.58 ± 0.30
	Control	91	3.95 ± 0.26	4.19 ± 0.24	4.77 ± 0.29
Grassland / Open Country Birds	Impact	50	1.88 ± 0.24	1.36 ± 0.19	2.34 ± 0.47
	Control	20	0.70 ± 0.38	1.15 ± 0.30	2.75 ± 0.74
Wetland / Open Water Birds	Impact	76	0.67 ± 0.12	0.25 ± 0.07	0.83 ± 0.21
	Control	60	0.47 ± 0.14	0.30 ± 0.08	0.40 ± 0.23
Total Birds	Impact	90	7.10 ± 0.34	5.50 ± 0.27	7.97 ± 0.43
	Control	91	6.02 ± 0.34	6.18 ± 0.27	7.05 ± 0.43
Non-SCC Birds					
Edge / Shrub / Successional Birds	Impact	89	3.07 ± 0.24	2.31 ± 0.23	2.76 ± 0.30
	Control	90	2.21 ± 0.24	1.81 ± 0.22	2.72 ± 0.29
Forest Birds	Impact	90	3.92 ± 0.29	2.88 ± 0.30	3.62 ± 0.30
	Control	91	4.98 ± 0.29	5.21 ± 0.29	5.80 ± 0.29
Grassland / Open Country Birds	Impact	45	1.62 ± 0.18	2.33 ± 0.23	3.11 ± 0.30
	Control	18	0.61 ± 0.29	1.11 ± 0.36	1.78 ± 0.47
Wetland / Open Water Birds	Impact	49	0.43 ± 0.12	0.33 ± 0.08	0.35 ± 0.11
	Control	52	0.23 ± 0.12	0.15 ± 0.08	0.42 ± 0.11
Total Birds	Impact	90	8.00 ± 0.34	6.51 ± 0.32	8.10 ± 0.40
	Control	91	7.42 ± 0.34	7.31 ± 0.32	9.09 ± 0.40

Note:

* Unlike the densities provided above and in Appendix B and C, those presented in this table are over the total number of point count stations *where the species was observed* (n) across both survey years (rather than the total number of overall point count stations).

Table 3-9: Repeated Measures ANOVA of Bird Species Density by Guild

Guild	Effect	DF	F	P*
SCC Birds				
Edge / Shrub / Successional Birds	**Station Type**	**1,166**	**3.0143**	**0.0844**
	Year	2,332	2.2631	0.1056
	Station Type * Year	**2,332**	**5.8382**	**0.0032**
Forest Birds	**Station Type**	**1,179**	**10.0757**	**0.0018**
	Year	**2,358**	**5.6371**	**0.0039**
	Station Type * Year	**2,358**	**3.9912**	**0.0193**
Grassland / Open Country Birds	Station Type	1,68	0.5396	0.4651
	Year	**2,136**	**8.5620**	**0.0003**
	Station Type * Year	**2,136**	**2.5455**	**0.0822**
Wetland / Open Water Birds	Station Type	1,134	1.7848	0.1838
	Year	**2,268**	**3.4447**	**0.0333**
	Station Type * Year	2,268	1.4567	0.2348
Total Birds	Station Type	1,179	1.4030	0.2377
	Year	**2,358**	**16.4650**	**< 0.0001**
	Station Type * Year	**2,358**	**5.4810**	**0.0045**
Non-SCC Birds				
Edge / Shrub / Successional Birds	**Station Type**	**1,177**	**2.8900**	**0.0909**
	Year	**2,354**	**6.5819**	**0.0016**
	Station Type * Year	2,354	2.0440	0.1310
Forest Birds	**Station Type**	**1,179**	**31.6478**	**< 0.0001**
	Year	**2,358**	**4.7098**	**0.0096**
	Station Type * Year	**2,358**	**5.0312**	**0.0070**
Grassland / Open Country Birds	**Station Type**	**1,61**	**12.0017**	**0.0010**
	Year	**2,122**	**13.6516**	**< 0.0001**
	Station Type * Year	2,122	0.2069	0.8134
Wetland / Open Water Birds	Station Type	1,99	0.8500	0.3588
	Year	2,198	1.2449	0.2902
	Station Type * Year	2,198	1.3363	0.2652
Total Birds	Station Type	1,179	1.4140	0.2359
	Year	**2,358**	**13.7540**	**< 0.0001**
	Station Type * Year	**2,358**	**3.5550**	**0.0296**

Note:
Bolded values represent statistically significant at $p < 0.10$

Table 3-10: Summary of Bird Species Richness by Guild

Guild	Station Type	No. of Survey Stations (n)*	2014/15 Mean Richness ±SE	2016 Mean Richness ±SE	2018 Mean Richness ±SE
SCC Birds					
Edge / Shrub / Successional Birds	Impact	87	1.60 ± 0.12	1.76 ± 0.11	2.13 ± 0.12
	Control	81	1.56 ± 0.13	1.47 ± 0.11	1.30 ± 0.13
Forest Birds	Impact	90	3.44 ± 0.16	3.23 ± 0.16	3.66 ± 0.19
	Control	91	3.82 ± 0.16	4.29 ± 0.16	3.93 ± 0.19
Grassland / Open Country Birds	Impact	50	1.36 ± 0.14	1.18 ± 0.14	1.32 ± 0.13
	Control	18	0.89 ± 0.23	1.28 ± 0.23	1.33 ± 0.22
Wetland / Open Water Birds	Impact	76	0.95 ± 0.11	1.17 ± 0.11	0.92 ± 0.12
	Control	60	0.77 ± 0.12	1.15 ± 0.13	0.68 ± 0.14
Total Birds	Impact	90	6.54 ± 0.27	6.58 ± 0.24	7.22 ± 0.26
	Control	91	5.89 ± 0.27	6.60 ± 0.24	5.79 ± 0.26
Non-SCC Birds					
Edge / Shrub / Successional Birds	Impact	89	2.63 ± 0.18	2.25 ± 0.17	2.93 ± 0.20
	Control	90	2.20 ± 0.18	1.89 ± 0.16	2.21 ± 0.20
Forest Birds	Impact	90	4.47 ± 0.23	4.09 ± 0.22	4.58 ± 0.22
	Control	91	5.01 ± 0.23	5.67 ± 0.22	5.27 ± 0.22
Grassland / Open Country Birds	Impact	45	1.20 ± 0.12	1.51 ± 0.13	1.80 ± 0.12
	Control	18	0.50 ± 0.19	0.94 ± 0.20	1.17 ± 0.19
Wetland / Open Water Birds	Impact	49	0.51 ± 0.08	0.55 ± 0.08	0.69 ± 0.10
	Control	52	0.29 ± 0.08	0.62 ± 0.08	0.77 ± 0.10
Total Birds	Impact	90	7.91 ± 0.31	7.37 ± 0.25	8.76 ± 0.33
	Control	91	7.45 ± 0.31	8.08 ± 0.25	8.13 ± 0.33

Note:

* Unlike the species richness values provided in Appendix B and C, those presented in this table are over the total number of point count stations *where the species was observed* (n) across both survey years (rather than the total number of overall point count stations).

Table 3-11: Repeated Measures ANOVA of Bird Species Richness by Guild

Guild	Effect	DF	F	P*
SCC Birds				
Edge / Shrub / Successional Birds	**Station Type**	**1,166**	**8.9902**	**0.0031**
	Year	2,332	1.0490	0.3514
	Station Type * Year	**2,332**	**8.7981**	**0.0002**
Forest Birds	**Station Type**	**1,179**	**10.4880**	**0.0014**
	Year	2,358	0.6790	0.5077
	Station Type * Year	**2,358**	**4.2230**	**0.0154**
Grassland / Open Country Birds	Station Type	1,66	0.3072	0.5813
	Year	2,132	1.2688	0.2846
	Station Type * Year	**2,132**	**2.9229**	**0.0573**
Wetland / Open Water Birds	Station Type	1,134	1.7380	0.1896
	Year	**2,268**	**5.7960**	**0.0034**
	Station Type * Year	2,268	0.4906	0.6128
Total Birds	**Station Type**	**1,179**	**5.5590**	**0.0195**
	Year	2,358	2.2130	0.1108
	Station Type * Year	**2,358**	**7.6580**	**0.0006**
Non-SCC Birds				
Edge / Shrub / Successional Birds	**Station Type**	**1,177**	**5.8888**	**0.0162**
	Year	**2,354**	**7.4605**	**0.0007**
	Station Type * Year	2,354	1.0402	0.3545
Forest Birds	**Station Type**	**1,179**	**16.1650**	**< 0.0001**
	Year	2,358	0.5590	0.5724
	Station Type * Year	**2,358**	**4.6000**	**0.0107**
Grassland / Open Country Birds	**Station Type**	**1,61**	**16.5067**	**0.0001**
	Year	**2,122**	**9.5910**	**0.0001**
	Station Type * Year	2,122	0.1050	0.9004
Wetland / Open Water Birds	Station Type	1,99	0.1899	0.6640
	Year	**2,198**	**6.3257**	**0.0022**
	Station Type * Year	2,198	1.6200	0.2005
Total Birds	Station Type	1,179	0.1610	0.6886
	Year	**2,358**	**6.0960**	**0.0025**
	Station Type * Year	**2,358**	**4.3820**	**0.0132**

Note:
Bolded values represent statistically significant at $p < 0.10$

4.0 Conclusions

A total of 132 bird species were recorded during the 2018 morning point count surveys, of which 113 species were recorded at impact stations and 120 species were recorded at control stations. A total of 54 bird SCC were documented, of which 45 species were recorded at impact stations and 48 species were recorded at control stations. These 54 species are all considered BCR 12 priority species with 12 of them further designated as SAR. The SAR are discussed further in the *2018 RRP Species at Risk Report* (Wood 2018).

Based on the percent occurrence, abundance and density there was significant overlap of the overall dominant species between impact and control stations and between monitoring years.

Based on the analyses undertaken for the most commonly occurring species, abundance and density values followed similar trends for each species, especially for those species with significant interaction effects present (i.e., interaction between station type and year indicating the RRM is having some effect).

Based on the analyses of the most widely occurring SCC, Chestnut-sided Warbler, Song Sparrow and White-throated Sparrow all showed significant interaction effects between site type and year, indicating that the RRM has had an effect on these species. Neither Chestnut-sided Warbler nor Song Sparrow showed a negative effect at impact stations in 2016 (construction), indicating that these species did not appear to have been adversely impacted by the construction activities being undertaken at the RRM impact stations. Both species experienced increases in abundance and density at impact stations in 2018 with concurrent decreases at control stations, suggesting that the construction activities may have resulted in the creation of early successional habitat preferred by species belonging to the Edge / Shrub / Successional habitat guild, causing some species to shift into these new optimal habitats. White-throated Sparrow showed a significant decrease in abundance and density at impact stations between 2014/15 and 2016 but not at control stations. This suggests that this species may have been negatively impacted by construction activities being undertaken at the RRM impact stations. Individuals may have avoided impact stations in 2016 and established breeding territories further away from construction activities. Abundance and density of White-throated Sparrow in 2018 appear similar between impact and control stations, potentially due to individuals dispersing more evenly in 2018 (post-construction) once habitats around impact stations were no longer undergoing active disturbance (Table 4-1).

Based on the analyses of the most widely occurring non-SCC, Red-eyed Vireo, Black-and-white Warbler and Hermit Thrush all showed significant interaction effects between location type and year, indicating the RRM has had some effect on these species. Black-and-white Warbler abundance and density were slightly higher at impact stations than control stations in 2014/15. Both metrics were significantly higher at control stations in 2016 and then returned to similar values between station types in 2018. This indicates individuals may have been preferentially choosing control stations in 2016 to be further away from construction activities. Additionally, these species may have been dispersing more evenly in 2018 (post-construction), once habitats around impact stations were no longer undergoing active disturbance. Hermit Thrush showed overall population declines. Density of this species was slightly higher at impact stations in 2014/15, then decreasing at impact stations in 2016 and 2018. In 2018, the density of this species was greater at control stations than at the impact stations. This indicates that, in addition to the overall decreases in density, this species may be preferentially choosing control stations as optimal forested habitat was removed near the impact stations. Red-eyed Vireo density was significantly lower in 2016 at both the impact and control stations when compared with 2014/2015and 2018. Density of this species was significantly greater at control stations than at impact stations in all monitoring years, with the

greatest difference between station types observed in 2018. These results are likely in part due to population fluctuations across the overall monitoring area, combined with some avoidance of impact stations in 2016 due to increased construction activities. The increase in density at control stations in 2018 is likely because habitats around impact stations no longer support as much optimal (forested) habitat for this species (Table 4-1).

Based on the analysis of the most commonly occurring SCC, there was a significant increase in the abundance and density of Veery between 2016 and 2018. This implies that this species may be experiencing a population increase within the overall monitoring area. A significantly greater abundance of Common Yellowthroat was recorded at impact stations than control stations, though this trend was not observed for density. This increased abundance of Common Yellowthroat may be due to a prevalence of suitable habitat for this species at the impact stations.

Based on the analysis of the most commonly occurring non-SCC, abundance fluctuated across years for several species. Red-eyed Vireo abundance initially decreased between 2014/15 and 2016 followed by an increase between 2016 and 2018. Conversely, Blue Jay showed the opposite trend with an increase in abundance between 2014/2015 and 2016 followed by a decrease between 2016 and 2018. The density of Blue Jay also significantly decreased between 2016 and 2018. American Robin abundance increased between 2016 and 2018. This implies that these species may be experiencing population changes within the overall monitoring area. Red-eyed Vireo and Ovenbird showed significantly greater abundance (Ovenbird also showed greater density) at control stations than at impact stations, which may be due to the prevalence of forested habitat at locations further removed from mine activities.

Half of the most widely occurring species experienced no interaction effects between station type and year for either abundance or density, suggesting the RRM has not had an adverse effect on several of the most widely occurring species. Additionally, the recurring trend of these metrics increasing for several species at impact stations post-construction (2018) indicates that any disturbance effects of mine construction were likely temporary and reversible and, in some cases, possibly beneficial in providing optimal habitat for some species (especially those preferring successional habitats).

Based on the analysis of guilds, species abundance, density and richness followed similar trends for both SCC and non-SCC birds, although the level of significance for these trends varied between the guilds. Overall, the RRM operations did appear to have some effect on species abundance or density for several guilds. Decreases in abundance and density were noted for some guilds, particularly in 2016 (construction). However, the abundance and density of several guilds subsequently increased between 2016 and 2018 (Table 4-1). This suggests that some species may be less sensitive to disturbance from the RRM operations and / or habitats for these species are either still available or enhanced at the impact stations post-construction.

SCC Edge / Shrub / Successional bird population metrics remained relatively unchanged between 2014/15 and 2016, indicating that this guild of species was not adversely impacted by the construction activities being undertaken at the RRM impact stations. Between 2016 and 2018, abundance, density and richness increased at impact stations while decreasing at control stations. This may indicate that construction activities resulted in the creation of edge / shrub / successional habitat preferred these species, causing them to shift into these optimal habitats.

No change in abundance was detected between location types over time (interaction effect) for Non-SCC Edge / Shrub / Successional birds, implying that the RRM construction and operations have not affected

the abundance of this guild. Abundance and density of these species was greater at impact stations compared with control stations, potentially due to a greater prevalence of suitable habitats within impact areas. Abundance, density and richness for these species did vary over time, a decrease in these metrics for these species was recorded in 2016 followed by a subsequent increase in 2018. This would suggest that these species are experiencing population fluctuations within the overall monitoring area.

Both SCC and non-SCC Forest birds exhibited similar differences in population metrics between location types and year. Abundance and richness increased at control stations between 2014/15 and 2016, and decreased between 2016 and 2018. Conversely, at impact stations, these metrics decreased between 2014/15 and 2016 and increased between 2016 and 2018. This indicates that these species may have been negatively impacted by construction activities being undertaken at the RRM impact stations. Individuals may have avoided impact stations in 2016 and established breeding territories further away from construction activities (causing increases at control stations). Population metrics were similar at impact and control stations in 2018, potentially due to individuals dispersing more evenly post-construction, once habitats around impact stations were no longer undergoing active disturbance. Forest birds are frequently more common at control stations as compared to impact stations indicating that there is more optimal (forested) habitat for these species further from the RRM.

Birds belonging to the SCC Grassland / Open Country guild showed some non-significant trends in abundance and density between 2014/15 and 2016. These metrics decreased at impact stations while increasing at control stations, indicating that these species may have been temporarily adversely affected by construction activities, thereby temporarily displacing individuals of these species to alternative nesting territories. Between 2016 and 2018 abundance and density significantly increased at both control and impact stations, indicating a population increase across the overall monitoring area. This could be partly attributed to the work undertaken by New Gold to maintain high quality grassland bird habitat within the protected Bobolink Overall Benefit lands. Since disturbances at these locations have decreased and the RRM has entered the operations phase, populations of these species have increased, suggesting that they are once again able to fully utilize these habitats.

No change in abundance was detected between location types and year for Non-SCC Grassland / Open Country birds, implying that the RRM construction and operations have not affected the abundance of this guild. Abundance, density and richness of these species were higher at impact stations than control stations, which is likely a result of the higher number of impact stations located within Bobolink Overall Benefit lands. Thirty-two (32) impact stations are located in the Bobolink Overall Benefit lands, compared with only 11 control stations. An increase in these same population metrics was recorded across monitoring years, indicating that these species are experiencing population increases within the overall monitoring area.

No change in abundance was detected between location types and year for SCC Wetland / Open Water birds, implying that the RRM construction and operations have not affected the abundance of this guild. The abundance of these species was higher at impact stations compared with control stations, potentially due to a prevalence of suitable habitats within impact areas. Density and richness showed an inverse relationship over time, whereby density decreased between 2014/15 and 2016, followed by an increase between 2016 and 2018. Conversely, richness increased between 2014/2015 and 2016, followed by a decrease between 2016 and 2018. This suggests that these species are experiencing population fluctuations within the overall monitoring area. As there is limited wetland habitat within the NLSA, it is possible that these trends have been magnified based on limited sample sizes as no explanation is apparent. Future monitoring could identify potential sources of these changes.

The abundance of Non-SCC Wetland / Open water birds in 2014/15 was significantly greater at impact stations than at control stations. In 2016, abundance increased slightly at both impact and control stations, indicating that these species did not seem to be negatively impacted by construction activities being undertaken at the RRM impact stations. In 2018, abundance decreased slightly at impact stations, while increasing significantly at control stations, potentially indicating that these species are preferentially choosing control stations. Further years of surveys will be needed to confirm and explain this trend.

Total SCC birds showed similar trends to those noted above for the larger guilds contained within it. This group showed clear decreases in abundance at impact stations in 2016, while concurrently showing marked increases at control stations. This may indicate that some species may have been negatively impacted by construction activities undertaken at impact stations. Individual SCC birds may have avoided impact stations in 2016 and established breeding territories further away from construction activities either at control stations or further afield. An opposite trend was observed in 2018 when abundances increased at impact stations and simultaneously decreased at control stations. This may potentially be due to individuals dispersing more evenly in 2018 (post-construction), when habitats around impact stations were no longer undergoing active disturbance.

No significant differences in the abundance of total non-SCC birds were recorded between location types and year, implying that the RRM construction and operations did not affect the majority of non-SCC species. An increase in the abundance of non-SCC birds was recorded across all monitoring years. Decreases in Total non-SCC bird density and richness were recorded at impact stations in 2016, followed by increases in these metrics in 2018. This trend supports the theory that some species may have been temporarily negatively impacted by construction activities undertaken at impact stations in 2016. However, individuals appear to be dispersing more evenly in 2018 (post-construction) now that habitats around impact stations are no longer undergoing active disturbance.

The culmination of results suggests that the RRM activities (i.e., construction activities and operations) have not significantly adversely affected avian populations in the long term. The progression into mine operation activities and the decrease in intensive disturbances appears to have allowed these species to re-disperse evenly and for some, to move into optimal regenerating habitats created by the construction activities (Table 4-1).

Despite the apparent lack of long-term adverse effects on avian populations, it is unclear whether productivity (e.g., clutch size and fledgling rate) or rates of depredation have been affected by the RRM operations. In cases where bird abundance, density and richness increase, yet productivity decreases, and depredation increases, a ‘sink’ population may be produced in which immigration rates are higher that emigration rates (or death rates are greater than birth rates), resulting in a population decline. A ‘sink’ population is in contrast to a ‘source’ population, in which populations grow due to greater emigration than immigration (or birth rates are greater than death rates). Further studies that include productivity measures in addition to the population metrics may provide further insight into the effect of mining operations on bird populations.

Table 4-1: Summary of Significant Yearly, Location and Interaction Effects on Avian Community

Species / Guild	Abundance	Density	Richness
Species Effects – SCC			
Nashville Warbler	Nil	Nil	N/A
Common Yellowthroat	Impact > Control	Nil	N/A
White-throated Sparrow	Impact 2015-2016: Decrease Impact 2016-2018: Decrease Control 2016-2018: Decrease	Impact 2015-2016: Decrease 2016: Control > Impact	N/A
Chestnut-sided Warbler	Impact 2015-2016: Increase Impact 2016-2018: Increase Control 2015-2016: Increase Control 2016-2018: Decrease 2015: Control > Impact 2016: Control > Impact 2018: Impact > Control	Impact 2015-2016: Increase Impact 2016-2018: Increase Control 2015-2016: Increase 2015: Control > Impact 2016: Control > Impact 2018: Impact > Control	N/A
Song Sparrow	Impact 2016-2018: Increase Control 2015-2016: Decrease Control 2016-2018: Decrease 2018: Impact > Control	Impact 2015-2016: Decrease Impact 2016-2018: Increase Control 2015-2016: Decrease 2018: Impact > Control	N/A
Veery	2016-2018: Increase	2016-2018: Increase	N/A
Species Effects – non-SCC			
Red-eyed Vireo	2015-2016: Decrease 2016-2018: Increase Control > Impact	Impact 2015-2016: Decrease Impact 2016-2018: Increase Control 2015-2016: Decrease Control 2016-2018: Increase	N/A
Ovenbird	Control > Impact	Control > Impact	N/A
American Robin	2016-2018: Increase	Nil	N/A
Black-and-white Warbler	Impact 2016-2018: Increase Control 2015-2016: Increase 2016: Control > Impact	Control 2015-2016: Increase 2016: Control > Impact	N/A
Blue Jay	2015-2016: Increase 2016-2018: Decrease	2016-2018: Decrease	N/A
Hermit Thrush	Impact 2016-2018: Decrease Control 2016-2018: Decrease	Impact 2015-2016: Decrease 2018: Control > Impact	N/A
Guild Effects – SCC			
Edge / Shrub / Successional Birds	Impact 2016-2018: Increase Control 2016-2018: Decrease 2018: Impact > Control	Impact 2016-2018: Increase 2018: Impact > Control	Impact 2016-2018: Increase 2016: Impact > Control 2018: Impact > Control
Forest Birds	Impact 2015-2016: Decrease Control 2015-2016: Increase Control 2016-2018: Decrease 2016: Control > Impact 2018: Control > Impact	Impact 2015-2016: Decrease Impact 2016-2018: Increase Control 2016-2018: Increase 2016: Control > Impact 2018: Control > Impact	Impact 2016-2018: Increase Control 2015-2016: Increase Control 2016-2018: Decrease 2016: Control > Impact
Grassland / Open Country Birds	Impact 2016-2018: Increase Control 2016-2018: Increase	Impact 2016-2018: Increase Control 2016-2018: Increase 2015: Impact > Control	Control 2015-2016: Increase 2015: Impact > Control
Wetland / Open Water Birds	Impact > Control	2015-2016: Decrease 2016-2018: Increase	2015-2016: Increase 2016-2018: Decrease
Total Combined Birds	Impact 2016-2018: Increase Control 2015-2016: Increase Control 2016-2018: Decrease	Impact 2015-2016: Decrease Impact 2016-2018: Increase Control 2016-2018: Increase	Impact 2016-2018: Increase Control 2015-2016: Increase Control 2016-2018: Decrease 2015: Impact > Control 2018: Impact > Control

Species / Guild	Abundance	Density	Richness
Guild Effects – Non-SCC			
Edge / Shrub / Successional Birds	2015-2016: Decrease 2016-2018: Increase Impact > Control	2015-2016: Decrease 2016-2018: Increase Impact > Control	2015-2016: Decrease 2016-2018: Increase Impact > Control
Forest Birds	Impact 2016-2018: Increase Control 2015-2016: Increase 2015: Control > Impact 2016: Control > Impact 2018: Control > Impact	Impact 2015-2016: Decrease Impact 2016-2018: Increase Control 2016-2018: Increase 2015: Control > Impact 2016: Control > Impact 2018: Control > Impact	Impact 2016-2018: Increase Control 2015-2016: Increase 2015: Control > Impact 2016: Control > Impact 2018: Control > Impact
Grassland / Open Country Birds	2015-2016: Increase 2016-2018: Increase Impact > Control	2015-2016: Increase 2016-2018: Increase	2015-2016: Increase 2016-2018: Increase Impact > Control
Wetland / Open Water Birds	Control 2016-2018: Increase 2015: Impact > Control	Nil	2015-2016: Increase 2016-2018: Increase
Total Combined Birds	2016-2018: Increase	Impact 2015-2016: Decrease Impact 2016-2018: Increase Control 2016-2018: Increase 2018: Impact > Control	Impact 2016-2018: Increase Control 2015-2016: Increase 2016: Control > Impact

Notes:

Highlighted cells represent interaction effects
Nil denotes no significant trend revealed
Increase/Decrease denotes change between specified years
> denotes location effect showing metric greater at either control or impact stations across all monitoring years
N/A – not applicable
2015 = 2014/15 combined baseline survey years

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6.0 Closing

This report has been developed based on information gathered from field surveys.

We trust that this report is sufficient for your needs. Should additional information be required, please contact the undersigned at (905) 568-2929.

Regards,
Wood Environment & Infrastructure Solutions
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Appendix A

Compiled Bird Species List by Survey Year

Appendix A: Compiled Bird Species List by Survey Year

Common Name	Latin Name	2018	2016	2015	2014	2012	2011	2010	2009	Guild	S-Rank	ESA / SARA Status	BCR 12 Priority Species
Alder Flycatcher	*Empidonax alnorum*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
American Bittern	*Botaurus lentiginosus*	✓	✓	✓	✓	✓	✓	✓	✓	Wetland/Open Water	S4B	--	--
American Crow	*Corvus brachyrhynchos*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5B	--	--
American Golden Plover	*Pluvialis dominica*	--	--	--	--	--	✓	--	--	Wetland/Open Water	S2B, S4N	--	--
American Goldfinch	*Carduelis tristis*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
American Kestrel	*Falco sparverius*	✓	✓	✓	--	✓	✓	✓	✓	Grassland/Open Country	S4	--	✓
American Pipit	*Anthus rubescens*	✓	--	--	--	--	--	--	--	Grassland/Open Country	S4	--	--
American Redstart	*Setophaga ruticilla*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
American Robin	*Turdus migratorius*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
American Three-toed Woodpecker	*Picoides dorsalis*	--	--	--	--	✓	--	--	--	Forest	S4	--	--
American Tree Sparrow	*Spizella arborea*	--	--	--	✓	--	--	--	--	Edge/Shrub/Successional	S4B	--	--
American White Pelican	*Pelecanus erythrorhynchos*	✓	✓	✓	✓	✓	✓	--	✓	Wetland/Open Water	S2B	THR/--	✓
American Woodcock	*Scolopax minor*	✓	--	✓	--	✓	✓	--	✓	Edge/Shrub/Successional	S4B	--	✓
Bald Eagle	*Haliaeetus leucocephalus*	✓	✓	✓	--	✓	✓	--	--	Wetland/Open Water	S2N, S4B	SC/--	✓
Baltimore Oriole	*Icterus galbula*	✓	--	✓	--	✓	✓	✓	--	Edge/Shrub/Successional	S4B	--	--
Bank Swallow	*Riparia riparia*	--	✓	--	--	--	--	✓	✓	Wetland/Open Water	S4B	THR/THR	✓
Barn Swallow	*Hirundo rustica*	✓	✓	✓	✓	✓	✓	✓	✓	Grassland/Open Country	S4B	THR/THR	✓
Barred Owl	*Strix varia*	--	✓	✓	--	✓	✓	--	--	Forest	S5	--	--
Bay-breasted Warbler	*Setophaga castanea*	✓	✓	--	--	--	--	--	--	Forest	S5B	--	✓
Belted Kingfisher	*Ceryle alcyon*	✓	✓	✓	✓	✓	✓	✓	--	Wetland/Open Water	S4B	--	✓
Black-and-white Warbler	*Mniotilta varia*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5B	--	--
Black-backed Woodpecker	*Picoides arcticus*	✓	--	✓	--	✓	--	--	--	Forest	S4B	--	--
Black-billed Cuckoo	*Coccyzus erythropthalmus*	✓	✓	✓	✓	✓	--	--	--	Edge/Shrub/Successional	S5B	--	✓
Black-billed Magpie	*Pica pica*	✓	✓	✓	✓	✓	✓	✓	--	Edge/Shrub/Successional	S3?	--	--
Blackburnian Warbler	*Setophaga fusca*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S5B	--	✓
Black-capped Chickadee	*Poecile atricapillus*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S5	--	--
Blackpoll Warbler[e]	*Setophaga striata*	✓	--	✓	--	--	--	--	--	Forest	S4B	--	--
Black-throated Blue Warbler	*Setophaga caerulescens*	✓	--	--	✓	✓	✓	--	--	Forest	S5B	--	✓
Black-throated Green Warbler	*Setophaga virens*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S5B	--	✓
Blue Jay	*Cyanocitta cristata*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5	--	--
Blue-headed Vireo	*Vireo solitarius*	✓	✓	✓	✓	✓	✓	--	--	Forest	S5B	--	--
Blue-winged Teal	*Anas discors*	--	--	--	--	--	--	✓	✓	Wetland/Open Water	S4	--	--
Bobolink	*Dolichonyx oryzivorus*	✓	✓	✓	✓	✓	✓	✓	✓	Grassland/Open Country	S4B	THR/THR	✓

Common Name	Latin Name	2018	2016	2015	2014	2012	2011	2010	2009	Guild	S-Rank	ESA / SARA Status	BCR 12 Priority Species
Boreal Chickadee	*Poecile hudsonica*	--	--	--	✓	✓	--	--	--	Forest	S5	--	--
Brewer's Blackbird	*Euphagus cyanocephalus*	✓	✓	--	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S4B	--	--
Broad-winged Hawk	*Buteo platypterus*	✓	✓	✓	--	✓	--	✓	--	Forest	S5B	--	✓
Brown Creeper	*Certhia americana*	✓	✓	--	✓	✓	--	--	--	Forest	S5B	--	--
Brown Thrasher	*Toxostoma rufum*	✓	✓	--	--	✓	✓	✓	✓	Edge/Shrub/Successional	S4B	--	✓
Brown-headed Cowbird	*Molothrus ater*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S4B	--	--
Canada Goose	*Branta canadensis*	✓	✓	✓	✓	✓	✓	✓	✓	Wetland/Open Water	S5	--	✓
Canada Warbler	*Cardellina canadensis*	✓	✓	✓	✓	✓	--	--	✓	Forest	S4B	SC/THR	✓
Cape May Warbler	*Setophaga tigrina*	✓	✓	✓	--	✓	--	--	--	Forest	S5B	--	--
Cedar Waxwing	*Bombycilla cedrorum*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
Chestnut-sided Warbler	*Setophaga pensylvanica*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	✓
Chipping Sparrow	*Spizella passerina*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
Clay-coloured Sparrow	*Spizella pallida*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S4B	--	--
Cliff Swallow	*Petrochelidon pyrrhonota*	✓	--	✓	--	--	✓	✓	--	Wetland/Open Water	S4B	--	✓
Common Goldeneye	*Bucephala clangula*	--	--	--	--	✓	--	✓	✓	Wetland/Open Water	S5	--	✓
Common Grackle	*Quiscalus quiscula*	✓	✓	✓	--	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
Common Loon	*Gavia immer*	✓	✓	✓	✓	✓	✓	✓	✓	Wetland/Open Water	S5B, S5N	--	--
Common Merganser	*Mergus merganser*	--	--	--	--	✓	--	--	--	Wetland/Open Water	S5B, S5N	--	✓
Common Nighthawk	*Chordeiles minor*	✓	✓	✓	--	✓	✓	--	✓	Grassland/Open Country	S4B	SC/THR	✓
Common Raven	*Corvus corax*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5	--	--
Common Yellowthroat	*Geothlypis trichas*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	✓
Connecticut Warbler	*Oporornis agilis*	✓	✓	✓	✓	✓	✓	--	--	Forest	S4B	--	✓
Dark-eyed Junco	*Junco hyemalis*	✓	✓	✓	✓	✓	--	--	--	Forest	S5B	--	--
Double-crested Cormorant	*Phalacrocorax auritus*	--	--	--	--	--	✓	--	--	Wetland/Open Water	S5B	--	--
Downy Woodpecker	*Picoides pubescens*	✓	✓	✓	✓	✓	--	✓	--	Forest	S5	--	--
Eastern Bluebird	*Sialia sialis*	✓	--	--	--	--	✓	✓	--	Grassland/Open Country	S5B	--	--
Eastern Kingbird	*Tyrannus tyrannus*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S4B	--	--
Eastern Phoebe	*Sayornis phoebe*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
Eastern Towhee	*Pilo erythrophthalmus*	--	--	✓	--	--	--	--	--	Edge/Shrub/Successional	S4B	--	✓
Eastern Whip-poor-will	*Antrostomus vociferous*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S4B	THR/THR	✓
Eastern Wood-Pewee	*Contopus virens*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S4B	SC/SC	✓
European Starling	*Sturnus vulgaris*	✓	✓	✓	--	✓	✓	✓	✓	Edge/Shrub/Successional	SNA	--	--
Evening Grosbeak	*Coccothraustes vespertinus*	✓	--	--	--	✓	--	--	--	Forest	S4B	SC/--	✓
Forster's Tern	*Sterna forsteri*	--	--	--	--	--	--	--	✓	Wetland/Open Water	S2B	--	--
Golden-crowned Kinglet	*Regulus satrapa*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S5B	--	--

Common Name	Latin Name	2018	2016	2015	2014	2012	2011	2010	2009	Guild	S-Rank	ESA / SARA Status	BCR 12 Priority Species
Golden-winged Warbler	*Vermivora chrysoptera*	✓	✓	✓	✓	✓	✓	--	--	Edge/Shrub/Successional	S4B	SC/THR	✓
Gray Catbird	*Dumetella carolinensis*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S4B	--	✓
Gray Jay	*Perisoreus canadensis*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S5	--	--
Great Blue Heron	*Ardea herodias*	✓	✓	--	✓	✓	✓	--	✓	Wetland/Open Water	S4	--	--
Great Crested Flycatcher	*Myiarchus crinitus*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S4B	--	--
Great Gray Owl	*Strix nebulosa*	--	--	--	--	✓	✓	✓	--	Forest	S4	--	✓
Great Horned Owl	*Bubo virginianus*	--	--	--	--	--	--	✓	--	Forest	S4	--	--
Greater Yellowlegs	*Tringa melanoleuca*	--	--	--	--	--	--	--	✓	Wetland/Open Water	S4B, S4N	--	--
Green Heron	*Butorides virescens*	--	--	✓	--	--	✓	--	--	Wetland/Open Water	S4B	--	✓
Green-winged Teal	*Anas crecca*	--	--	--	--	--	--	✓	--	Wetland/Open Water	S4	--	✓
Hairy Woodpecker	*Picoides villosus*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5	--	--
Hermit Thrush	*Catharus guttatus*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S5B	--	--
Herring Gull	*Larus argentatus*	✓	--	--	--	--	--	--	✓	Wetland/Open Water	S5B, S5N	--	✓
Hooded Merganser	*Lophodytes cucullatus*	✓	--	--	--	--	✓	--	--	Wetland/Open Water	S5B, S5N	--	✓
House Sparrow	*Passer domesticus*	--	--	--	--	✓	✓	✓	--	Edge/Shrub/Successional	SNA	--	--
House Wren	*Troglodytes aedon*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
Indigo Bunting	*Passerina cyanea*	✓	✓	✓	✓	✓	--	✓	--	Edge/Shrub/Successional	S4B	--	--
Killdeer	*Charadrius vociferus*	✓	✓	✓	--	✓	✓	✓	✓	Grassland/Open Country	S5B, S5N	--	✓
Least Flycatcher	*Empidonax minimus*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S4B	--	✓
Le Conte's Sparrow	*Ammodramus leconteii*	✓	✓	✓	✓	✓	✓	✓	✓	Grassland/Open Country	S4B	--	--
Lincoln's Sparrow	*Melospiza lincolnii*	✓	✓	✓	✓	--	--	✓	✓	Edge/Shrub/Successional	S5B	--	--
Long-eared Owl	*Asio otus*	--	✓	✓	--	✓	✓	--	--	Forest	S4	--	--
Magnolia Warbler	*Setophaga magnolia*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S5B	--	--
Mallard	*Anas platyrhynchos*	✓	✓	--	--	✓	✓	✓	✓	Wetland/Open Water	S5	--	✓
Marbled Godwit	*Limosa fedoa*	✓	--	--	--	--	--	--	--	Wetland/Open Water	S3B	--	--
Marsh Wren	*Cistothorus palustris*	✓	--	✓	--	--	--	✓	--	Wetland/Open Water	S4B	--	--
Merlin	*Falco columbarius*	--	✓	--	--	✓	--	--	--	Forest	S5B	--	--
Mourning Dove	*Zenaida macroura*	✓	✓	✓	--	--	✓	--	--	Edge/Shrub/Successional	S5	--	--
Mourning Warbler	*Geothlypis philadelphia*	✓	✓	✓	✓	✓	--	✓	✓	Forest	S4B	--	✓
Nashville Warbler	*Oreothlypis ruficapilla*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5B	--	✓
Northern Flicker	*Colaptes auratus*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S4B	--	✓
Northern Harrier	*Circus cyaneus*	✓	✓	✓	--	--	✓	✓	✓	Grassland/Open Country	S4B	--	--
Northern Parula	*Setophaga americana*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S4B	--	--
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	✓	--	--	--	--	✓	✓	✓	Wetland/Open Water	S4B	--	✓
Northern Saw-whet Owl	*Aegolius acadicus*	--	--	--	--	--	✓	✓	--	Forest	S4	--	--

Common Name	Latin Name	2018	2016	2015	2014	2012	2011	2010	2009	Guild	S-Rank	ESA / SARA Status	BCR 12 Priority Species
Northern Waterthrush	*Parkesia noveboracensis*	✓	✓	✓	✓	✓	--	✓	✓	Forest	S5B	--	--
Olive-sided Flycatcher	*Contopus cooperi*	✓	✓	✓	--	✓	✓	✓	--	Forest	S4B	SC/THR	✓
Orange-crowned Warbler	*Setophaga celata*	✓	--	✓	✓	--	--	--	--	Forest	S4B	--	--
Ovenbird	*Seiurus aurocapilla*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S4B	--	--
Palm Warbler	*Setophaga palmarum*	✓	✓	✓	✓	✓	✓	--	--	Edge/Shrub/Successional	S5B	--	--
Philadelphia Vireo	*Vireo philadelphicus*	✓	--	✓	✓	✓	✓	--	✓	Forest	S5B	--	--
Pied-billed Grebe	*Podilymbus podiceps*	✓	--	--	--	--	--	✓	--	Wetland/Open Water	S4B, S4N	--	--
Pileated Woodpecker	*Dryocopus pileatus*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S5	--	--
Pine Siskin	*Spinus pinus*	✓	✓	--	--	✓	✓	✓	--	Forest	S4B	--	--
Pine Warbler	*Setophaga pinus*	✓	--	✓	--	✓	--	--	--	Forest	S5B	--	--
Purple Finch	*Haemorhous purpureus*	✓	--	✓	✓	✓	--	✓	✓	Forest	S4B	--	✓
Red-breasted Nuthatch	*Sitta canadensis*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5	--	--
Red Crossbill	*Loxia curvirostra*	--	✓	--	--	✓	--	--	--	Forest	S4B	--	✓
Red-eyed Vireo	*Vireo olivaceus*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5B	--	--
Redhead	*Aythya americana*	--	--	--	--	--	--	--	✓	Wetland/Open Water	S2B, S4N	--	--
Red-headed Woodpecker	*Melanerpes erythrocephalus*	--	✓	--	--	--	✓	--	--	Edge/Shrub/Successional	S4B	SC/THR	✓
Red-shouldered Hawk	*Buteo lineatus*	--	--	✓	--	--	✓	--	--	Forest	S4B	--	✓
Red-tailed Hawk	*Buteo jamaicensis*	✓	✓	✓	✓	--	✓	--	--	Forest	S5	--	--
Red-winged Blackbird	*Agelaius phoeniceus*	✓	✓	✓	✓	✓	✓	✓	✓	Wetland/Open Water	S4	--	--
Ring-billed Gull	*Larus delawarensis*	--	✓	✓	--	--	✓	--	--	Wetland/Open Water	S5B, S4N	--	--
Ring-necked Duck	*Aythya collaris*	✓	--	--	--	--	--	✓	✓	Wetland/Open Water	S5	--	✓
Rock Pigeon	*Columba livia*	✓	--	--	--	--	✓	✓	--	Grassland/Open Country	SNA	--	--
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S4B	--	✓
Ruby-crowned Kinglet	*Regulus calendula*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S4B	--	✓
Ruby-throated Hummingbird	*Archilochus colubris*	✓	✓	✓	✓	✓	✓	✓	--	Edge/Shrub/Successional	S5B	--	--
Ruffed Grouse	*Bonasa umbellus*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S4	--	✓
Rusty Blackbird	*Euphagus carolinus*	--	--	✓	--	--	--	--	--	Forest	S4B	SC/SC	✓
Sandhill Crane	*Grus canadensis*	✓	✓	✓	✓	✓	✓	✓	✓	Wetland/Open Water	S5B	--	✓
Savannah Sparrow	*Passerculus sandwichensis*	✓	✓	✓	✓	✓	✓	✓	✓	Grassland/Open Country	S4B	--	--
Scarlet Tanager	*Piranga olivacea*	✓	✓	✓	✓	✓	--	--	--	Forest	S4B	--	--
Sedge Wren	*Cistothorus platensis*	✓	✓	✓	✓	✓	✓	✓	✓	Grassland/Open Country	S4B	--	✓
Sharp-shinned Hawk	*Accipiter striatus*	✓	--	--	--	✓	--	--	--	Forest	S5	--	--
Sharp-tailed Grouse	*Tympanuchus phasianellus*	✓	✓	✓	--	✓	✓	✓	--	Grassland/Open Country	S4	--	--
Short-eared Owl	*Asio flammeus*	--	--	--	--	--	--	--	✓	Grassland/Open Country	S2N, S4B	SC/SC	✓
Song Sparrow	*Melospiza melodia*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	✓

Common Name	Latin Name	2018	2016	2015	2014	2012	2011	2010	2009	Guild	S-Rank	ESA / SARA Status	BCR 12 Priority Species
Sora	*Porzana carolina*	✓	✓	✓	✓		✓	✓	✓	Wetland/Open Water	S4B	--	--
Spotted Sandpiper	*Actitis macularia*	✓	✓	--	--	--	--	--	✓	Wetland/Open Water	S5	--	✓
Spruce Grouse	*Falcipennis canadensis*	--	--	--	--	✓	--	--	--	Forest	S5	--	--
Swainson's Thrush	*Catharus ustulatus*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S4B	--	--
Swamp Sparrow	*Melospiza georgiana*	✓	✓	✓	✓	✓	✓	✓	✓	Wetland/Open Water	S5B	--	✓
Tennessee Warbler	*Oreothlypis peregrina*	✓	✓	✓	✓	✓	✓	--	--	Forest	S5B	--	✓
Tree Swallow	*Tachycineta bicolor*	✓	✓	--	✓	✓	✓	✓	✓	Wetland/Open Water	S4B	--	✓
Trumpeter Swan	*Cygnus buccinator*	✓	✓	✓	--	✓	✓	--	--	Wetland/Open Water	S4	--	--
Turkey Vulture	*Cathartes aura*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
Veery	*Catharus fuscescens*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S4B	--	✓
Vesper Sparrow	*Pooecetes* gramineus	✓	--	--	--	--	--	--	--	Grassland/Open Country	S4B	--	✓
Virginia Rail	*Rallus limicola*	✓	--	✓	--	--	--	✓	✓	Wetland/Open Water	S5B	--	--
Warbling Vireo	*Vireo gilvus*	✓	✓	✓	✓	✓	--	✓	✓	Edge/Shrub/Successional	S5B	--	--
Western Meadowlark	*Sturnella neglecta*	✓	--	✓	--	--	--	--	--	Grassland/Open Country	S3B	--	--
White-breasted Nuthatch	*Sitta carolinensis*	--	✓	✓	--	--	--	--	--	Forest	S5	--	--
White-throated Sparrow	*Zonotrichia albicollis*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5B	--	✓
White-winged Crossbill	*Loxia leucoptera*	--	✓	--	✓	✓	--	--	--	Forest	S5B	--	--
Wilson's Snipe	*Gallinago delicata*	✓	✓	✓	✓	✓	✓	✓	✓	Wetland/Open Water	S5B	--	✓
Wilson's Warbler	*Cardellina pusilla*	✓	--	✓	--	✓	✓	✓	✓	Edge/Shrub/Successional	S4B	--	--
Winter Wren	*Troglodytes troglodytes*	✓	✓	✓	✓	✓	✓	✓	✓	Forest	S5B	--	--
Wood Duck	*Aix sponsa*	✓	✓	--	--	✓	✓	✓	✓	Wetland/Open Water	S5	--	✓
Wood Thrush	*Hylocichla mustelina*	✓	✓	✓	✓	✓	--	✓	--	Forest	S4B	SC/THR	✓
Yellow Warbler	*Setophaga petechia*	✓	✓	✓	✓	✓	✓	✓	✓	Edge/Shrub/Successional	S5B	--	--
Yellow-bellied Flycatcher	*Empidonax flaviventris*	✓	✓	✓	✓	✓	✓	✓	--	Forest	S5B	--	--
Yellow-bellied Sapsucker	*Sphyrapicus varius*	✓	✓	✓	✓	✓	--	✓	✓	Forest	S5B	--	✓
Yellow-rumped Warbler	*Setophaga coronata*	✓	✓	✓	✓	✓	✓	--	--	Forest	S5B	--	--

Appendix B

2018 Bird Population Metrics

Appendix B: 2018 Morning Bird Populations Metrics

Common Name	Distribution (Percent Occurrence) α		Abundance (birds/point count) α		Density (birds/ha) α	
	Impact	Control	Impact	Control	Impact	Control
Alder Flycatcher	36.7	21.1	0.56	0.36	0.120	0.101
American Bittern	2.2	5.3	0.02	0.05	0.000	0.000
American Crow	15.6	18.9	0.19	0.25	0.007	0.023
American Goldfinch	25.6	14.7	0.40	0.22	0.106	0.054
*American Kestrel	2.2	3.2	0.02	0.03	0.007	0.007
American Pipit	0.0	1.1	0.0	0.01	0.000	0.003
American Redstart	16.7	26.3	0.17	0.32	0.050	0.094
American Robin	62.2	48.4	0.84	0.67	0.145	0.161
*γAmerican White Pelican	3.3	2.1	0.08	0.16	0.007	0.003
*American Woodcock	1.1	1.1	0.01	0.01	0.000	0.003
*βBald Eagle	3.3	1.1	0.04	0.01	0.011	0.003
Baltimore Oriole	4.4	2.1	0.06	0.02	0.014	0.007
*γBarn Swallow	8.9	4.2	0.28	0.51	0.064	0.137
*Bay-breasted Warbler	1.1	5.3	0.01	0.06	0.004	0.017
*Belted Kingfisher	2.2	0.0	0.02	0.00	0.007	0.000
Black-and-white Warbler	52.2	50.5	0.64	0.58	0.159	0.171
Black-backed Woodpecker	3.3	4.2	0.03	0.05	0.007	0.013
*Black-billed Cuckoo	4.4	4.2	0.04	0.04	0.011	0.007
Black-billed Magpie	13.3	2.1	0.20	0.02	0.028	0.000
*Blackburnian Warbler	4.4	16.8	0.04	0.21	0.014	0.060
Black-capped Chickadee	26.7	21.1	0.30	0.28	0.071	0.087
Blackpoll Warbler	1.1	0.0	0.01	0.00	0.004	0.000
*Black-throated Blue Warbler	0.0	1.1	0.0	0.01	0.000	0.003
*Black-throated Green Warbler	12.2	26.3	0.14	0.33	0.028	0.094
Blue Jay	42.2	37.9	0.49	0.43	0.060	0.087
Blue-headed Vireo	0.0	1.1	0.00	0.01	0.000	0.003
*γBobolink	28.9	8.4	0.89	0.27	0.209	0.077
Brewer's Blackbird	3.3	2.1	0.07	0.06	0.007	0.010
*Broad-winged Hawk	0.0	1.1	0.00	0.01	0.000	0.003
Brown Creeper	3.3	3.2	0.03	0.03	0.011	0.010
*Brown Thrasher	1.1	0.0	0.01	0.00	0.000	0.000
Brown-headed Cowbird	6.7	4.2	0.13	0.04	0.039	0.013
*Canada Goose	15.6	4.2	0.77	0.86	0.099	0.000
*βCanada Warbler	6.7	6.3	0.08	0.06	0.025	0.020
Cape May Warbler	1.1	2.1	0.01	0.03	0.004	0.010
Cedar Waxwing	17.8	20.0	0.33	0.47	0.106	0.131
*Chestnut-sided Warbler	62.2	43.2	0.94	0.57	0.251	0.168
Chipping Sparrow	16.7	10.5	0.17	0.11	0.046	0.030

Common Name	Distribution (Percent Occurrence) α		Abundance (birds/point count) α		Density (birds/ha) α	
	Impact	Control	Impact	Control	Impact	Control
Clay-colored Sparrow	37.8	8.4	0.54	0.11	0.124	0.020
*Cliff Swallow	1.1	0.0	0.02	0.00	0.007	0.000
Common Grackle	4.4	4.2	0.04	0.06	0.007	0.010
Common Loon	3.3	7.4	0.03	0.07	0.000	0.003
Common Raven	15.6	8.4	0.27	0.15	0.025	0.000
*Common Yellowthroat	67.8	34.7	1.00	0.57	0.237	0.168
*Connecticut Warbler	2.2	1.1	0.03	0.01	0.007	0.003
Dark-eyed Junco	1.1	7.4	0.01	0.11	0.004	0.030
Downy Woodpecker	2.2	4.2	0.02	0.04	0.000	0.010
Eastern Bluebird	3.3	0.0	0.03	0.00	0.011	0.000
Eastern Kingbird	7.8	3.2	0.08	0.06	0.018	0.020
Eastern Phoebe	3.3	4.2	0.03	0.04	0.004	0.010
*$^{\gamma}$Eastern Whip-poor-will	0.0	1.1	0.0	0.01	0.000	0.003
*$^{\beta}$Eastern Wood-Pewee	5.6	7.4	0.06	0.08	0.007	0.020
European Starling	6.7	4.2	0.28	0.09	0.011	0.023
*$^{\beta}$Evening Grosbeak	0.0	1.1	0.00	0.03	0.000	0.010
Golden-crowned Kinglet	3.3	5.3	0.04	0.05	0.014	0.017
*$^{\beta}$Golden-winged Warbler	13.3	10.5	0.14	0.14	0.046	0.030
*Gray Catbird	2.2	1.1	0.02	0.01	0.007	0.003
Gray Jay	3.3	9.5	0.06	0.18	0.011	0.054
Great Blue Heron	3.3	2.1	0.03	0.03	0.004	0.000
Great Crested Flycatcher	4.4	1.1	0.04	0.01	0.011	0.000
Hairy Woodpecker	3.3	0.0	0.03	0.00	0.011	0.000
Hermit Thrush	15.6	41.1	0.18	0.48	0.021	0.094
*Herring Gull	0.0	1.1	0.00	0.01	0.000	0.003
*Hooded Merganser	0.0	1.1	0.00	0.01	0.000	0.003
House Wren	3.3	1.1	0.04	0.02	0.004	0.003
Indigo Bunting	1.1	0.0	0.01	0.00	0.004	0.000
*Killdeer	5.6	4.2	0.08	0.06	0.011	0.013
*Least Flycatcher	13.3	14.7	0.19	0.20	0.039	0.057
LeConte's Sparrow	35.6	8.4	0.62	0.14	0.191	0.044
Lincoln's Sparrow	0.0	6.3	0.00	0.08	0.000	0.027
Magnolia Warbler	10.0	31.6	0.10	0.44	0.028	0.134
*Mallard	3.3	0.0	0.07	0.00	0.004	0.000
Marbled Godwit	1.1	1.1	0.01	0.01	0.000	0.000
Marsh Wren	1.1	0.0	0.01	0.00	0.000	0.000
Mourning Dove	1.1	1.1	0.01	0.02	0.000	0.003
*Mourning Warbler	37.8	22.1	0.42	0.27	0.085	0.070
*Nashville Warbler	73.3	81.1	1.28	1.66	0.350	0.503
*Northern Flicker	11.1	11.6	0.11	0.14	0.021	0.034

Common Name	Distribution (Percent Occurrence) α		Abundance (birds/point count) α		Density (birds/ha) α	
	Impact	Control	Impact	Control	Impact	Control
Northern Harrier	0.0	1.1	0.00	0.01	0.000	0.003
Northern Parula	2.2	15.8	0.02	0.17	0.000	0.044
*Northern Rough-winged Swallow	1.1	0.0	0.02	0.00	0.007	0.000
Northern Waterthrush	10.0	8.4	0.10	0.09	0.014	0.023
*[β]Olive-sided Flycatcher	3.3	1.1	0.03	0.01	0.004	0.003
Orange-crowned Warbler	0.0	1.1	0.00	0.01	0.000	0.003
Ovenbird	67.8	70.5	1.10	1.44	0.202	0.328
Palm Warbler	2.2	7.4	0.02	0.13	0.004	0.040
Philadelphia Vireo	4.4	3.2	0.04	0.03	0.014	0.010
Pied-billed Grebe	0.0	1.1	0.00	0.01	0.000	0.000
Pileated Woodpecker	12.2	6.3	0.12	0.06	0.000	0.013
Pine Siskin	5.6	2.1	0.12	0.03	0.039	0.010
Pine Warbler	0.0	1.1	0.00	0.01	0.000	0.003
*Purple Finch	4.4	0.0	0.04	0.00	0.011	0.000
Red-breasted Nuthatch	23.3	23.2	0.24	0.25	0.060	0.064
Red-eyed Vireo	80.0	91.6	1.41	1.84	0.255	0.456
Red-tailed Hawk	7.8	2.1	0.09	0.02	0.004	0.003
Red-winged Blackbird	23.3	16.8	0.30	0.28	0.057	0.074
*Ring-necked Duck	0.0	1.1	0.00	0.01	0.000	0.003
Rock Pigeon	1.1	0.0	0.07	0.00	0.021	0.000
*Rose-breasted Grosbeak	26.7	15.8	0.32	0.18	0.064	0.050
*Ruby-crowned Kinglet	10.0	17.9	0.11	0.20	0.018	0.050
Ruby-throated Hummingbird	0.0	3.2	0.00	0.03	0.000	0.010
*Ruffed Grouse	20.0	23.2	0.20	0.24	0.032	0.047
*Sandhill Crane	18.9	10.5	0.34	0.14	0.039	0.003
Savannah Sparrow	42.2	10.5	0.88	0.19	0.248	0.054
Scarlet Tanager	0.0	1.1	0.00	0.01	0.000	0.003
*Sedge Wren	27.8	9.5	0.48	0.24	0.124	0.067
Sharp-shinned Hawk	1.1	3.2	0.01	0.04	0.000	0.013
Sharp-tailed Grouse	3.3	1.1	0.23	0.01	0.074	0.003
*Song Sparrow	53.3	21.1	0.87	0.25	0.209	0.074
Sora	0.0	1.1	0.00	0.01	0.000	0.000
*Spotted Sandpiper	2.2	1.1	0.02	0.01	0.004	0.000
Swainson's Thrush	2.2	8.4	0.02	0.11	0.004	0.010
*Swamp Sparrow	12.2	8.4	0.18	0.15	0.032	0.037
*Tennessee Warbler	11.1	16.8	0.12	0.21	0.035	0.060
*Tree Swallow	6.7	3.2	0.08	0.03	0.004	0.007
Trumpeter Swan	2.2	10.5	0.03	0.15	0.000	0.003
Turkey Vulture	1.1	1.1	0.01	0.01	0.000	0.003
*Veery	44.4	46.3	0.68	0.66	0.127	0.121

Common Name	Distribution (Percent Occurrence) α		Abundance (birds/point count) α		Density (birds/ha) α	
	Impact	Control	Impact	Control	Impact	Control
*Vesper Sparrow	0.0	1.1	0.00	0.01	0.000	0.003
Virginia Rail	1.1	1.1	0.01	0.01	0.000	0.000
Warbling Vireo	3.3	0.0	0.03	0.00	0.004	0.000
Western Meadowlark	4.4	1.1	0.04	0.01	0.004	0.003
*White-throated Sparrow	54.4	63.2	0.99	1.07	0.223	0.251
*Wilson's Snipe	7.8	13.7	0.10	0.22	0.004	0.030
Wilson's Warbler	1.1	3.2	0.01	0.03	0.004	0.010
Winter Wren	7.8	7.4	0.08	0.08	0.011	0.023
*Wood Duck	0.0	2.1	0.00	0.02	0.000	0.000
*$^{\beta}$Wood Thrush	14.4	13.7	0.17	0.15	0.028	0.030
Yellow Warbler	13.3	16.8	0.18	0.22	0.032	0.060
Yellow-bellied Flycatcher	14.4	24.2	0.19	0.28	0.050	0.077
*Yellow-bellied Sapsucker	8.9	2.1	0.09	0.02	0.018	0.007
Yellow-rumped Warbler	17.8	17.9	0.18	0.20	0.057	0.057

Notes:

α Distribution (Percent Occurrence) = number of point count stations at which a species was recorded divided by the total number of point counts surveyed
Abundance = maximum number of individuals per species divided by the total number of point count stations
Density = maximum number of individuals per species recorded within 100m radius of the surveyor divided by the area of the survey station (=3.1416 ha)

* BCR 12 Priority Species

β Species provincially-listed as Special Concern under the Endangered Species Act

γ Species provincially-listed as Threatened or Endangered under the Endangered Species Act

Appendix C

2014 – 2018 Bird Population Metrics

Appendix C1: Species Richness and Survey Stations by Year

	Species Richness for All Species			Species Richness for Species of Conservation Concern			Number of Survey Stations		
Year	Impact	Control	Total	Impact	Control	Total	Impact	Control	Total
2018	113	120	132	46	49	54	90	95	185
2016	99	101	115	43	38	47	90	95	185
2015	94	102	117	40	38	47	63	85	148
2014	74	85	95	27	33	36	32	75	107

Appendix C2: Distribution of All Species by Survey Year

Species	Distribution (Percent Occurrence)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Alder Flycatcher	36.7	21.1	16.9	29.5	44.4	22.4	34.4	16.7
American Bittern	2.2	5.3	0.0	3.2	1.6	2.4	3.1	1.4
American Crow	15.6	18.9	28.1	21.1	33.3	15.3	18.8	6.9
American Goldfinch	25.6	14.7	14.6	12.6	22.2	23.5	31.3	18.1
*American Kestrel	2.2	3.2	2.2	3.2	3.2	0.0	0.0	0.0
American Pipit	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
American Redstart	16.7	26.3	4.5	10.5	9.5	9.4	25.0	6.9
American Robin	62.2	48.4	49.4	41.1	55.6	41.2	37.5	34.7
American Tree Sparrow	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
*γAmerican White Pelican	3.3	2.1	3.4	0.0	4.8	0.0	0.0	1.4
*American Woodcock	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0
*βBald Eagle	3.3	1.1	0.0	1.1	3.2	1.2	0.0	0.0
Baltimore Oriole	4.4	2.1	0.0	0.0	3.2	2.4	0.0	0.0
*γBarn Swallow	8.9	4.2	7.9	2.1	12.7	1.2	0.0	1.4
Barred Owl	0.0	0.0	0.0	2.1	0.0	0.0	0.0	0.0
*Bay-breasted Warbler	1.1	5.3	1.1	0.0	0.0	0.0	0.0	0.0
*Belted Kingfisher	2.2	0.0	0.0	1.1	0.0	3.5	3.1	0.0
Black-and-white Warbler	52.2	50.5	41.6	54.7	38.1	29.4	31.3	34.7
Black-backed Woodpecker	3.3	4.2	0.0	0.0	0.0	1.2	0.0	0.0
*Black-billed Cuckoo	4.4	4.2	4.5	8.4	19.0	7.1	53.1	9.7
Black-billed Magpie	13.3	2.1	14.6	0.0	22.2	2.4	6.3	1.4
*Blackburnian Warbler	4.4	16.8	4.5	18.9	3.2	11.8	0.0	6.9
Black-capped Chickadee	26.7	21.1	7.9	17.9	4.8	12.9	3.1	12.5
Blackpoll Warbler	1.1	0.0	0.0	0.0	0.0	4.7	0.0	0.0
*Black-throated Blue Warbler	0.0	1.1	0.0	0.0	0.0	0.0	0.0	1.4
*Black-throated Green Warbler	12.2	26.3	13.5	26.3	3.2	21.2	12.5	15.3
Blue Jay	42.2	37.9	53.9	61.1	50.8	44.7	37.5	31.9
Blue-headed Vireo	0.0	1.1	0.0	2.1	14.3	9.4	3.1	5.6
*γBobolink	28.9	8.4	32.6	10.5	49.2	10.6	21.9	5.6
Boreal Chickadee	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4
Brewer's Blackbird	3.3	2.1	2.2	2.1	0.0	0.0	6.3	1.4
*Broad-winged Hawk	0.0	1.1	3.4	0.0	3.2	4.7	0.0	0.0
Brown Creeper	3.3	3.2	3.4	4.2	0.0	0.0	6.3	2.8
*Brown Thrasher	1.1	0.0	4.5	0.0	0.0	0.0	0.0	0.0
Brown-headed Cowbird	6.7	4.2	2.2	3.2	9.5	1.2	25.0	6.9
*Canada Goose	15.6	4.2	11.2	11.6	12.7	5.9	0.0	1.4
*βCanada Warbler	6.7	6.3	5.6	5.3	0.0	3.5	3.1	0.0
Cape May Warbler	1.1	2.1	0.0	2.1	0.0	1.2	0.0	0.0
Cedar Waxwing	17.8	20.0	15.7	15.8	14.3	22.4	25.0	22.2
*Chestnut-sided Warbler	62.2	43.2	48.3	47.4	11.1	30.6	50.0	37.5
Chipping Sparrow	16.7	10.5	10.1	8.4	6.3	3.5	15.6	12.5
Clay-colored Sparrow	37.8	8.4	30.3	7.4	47.6	10.6	25.0	8.3
*Cliff Swallow	1.1	0.0	0.0	0.0	1.6	0.0	0.0	0.0
Common Grackle	4.4	4.2	2.2	3.2	3.2	3.5	0.0	0.0

Species	Distribution (Percent Occurrence)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Common Loon	3.3	7.4	2.2	8.4	0.0	4.7	0.0	2.8
*[β]Common Nighthawk	0.0	0.0	1.1	0.0	1.6	0.0	0.0	0.0
Common Raven	15.6	8.4	24.7	27.4	12.7	23.5	21.9	12.5
*Common Yellowthroat	67.8	34.7	60.7	40.0	55.6	43.5	62.5	43.1
*Connecticut Warbler	2.2	1.1	4.5	0.0	0.0	5.9	3.1	11.1
Dark-eyed Junco	1.1	7.4	2.2	1.1	4.8	8.2	0.0	8.3
Downy Woodpecker	2.2	4.2	1.1	9.5	1.6	3.5	6.3	2.8
Eastern Bluebird	3.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Eastern Kingbird	7.8	3.2	2.2	3.2	14.3	7.1	3.1	2.8
Eastern Phoebe	3.3	4.2	7.9	11.6	6.3	10.6	3.1	4.2
Eastern Towhee	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0
*[γ]Eastern Whip-poor-will	0.0	1.1	0.0	0.0	1.6	1.2	0.0	2.8
*[β]Eastern Wood-Pewee	5.6	7.4	1.1	1.1	4.8	14.1	9.4	2.8
European Starling	6.7	4.2	2.2	2.1	1.6	5.9	0.0	0.0
*[β]Evening Grosbeak	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Golden-crowned Kinglet	3.3	5.3	0.0	11.6	0.0	8.2	0.0	9.7
*[β]Golden-winged Warbler	13.3	10.5	9.0	8.4	9.5	10.6	9.4	2.8
*Gray Catbird	2.2	1.1	1.1	2.1	3.2	0.0	6.3	1.4
Gray Jay	3.3	9.5	5.6	8.4	0.0	8.2	3.1	11.1
Great Blue Heron	3.3	2.1	0.0	1.1	0.0	0.0	3.1	0.0
Great Crested Flycatcher	4.4	1.1	5.6	1.1	1.6	2.4	9.4	2.8
Green Heron	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0
Hairy Woodpecker	3.3	0.0	4.5	4.2	7.9	1.2	6.3	1.4
Hermit Thrush	15.6	41.1	22.5	51.6	23.8	43.5	37.5	47.2
*Herring Gull	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
*Hooded Merganser	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
House Wren	3.3	1.1	1.1	2.1	6.3	2.4	3.1	0.0
Indigo Bunting	1.1	0.0	2.2	1.1	1.6	0.0	9.4	0.0
*Killdeer	5.6	4.2	4.5	1.1	7.9	1.2	0.0	0.0
*Least Flycatcher	13.3	14.7	24.7	22.1	28.6	25.9	28.1	16.7
LeConte's Sparrow	35.6	8.4	30.3	8.4	34.9	3.5	9.4	0.0
Lincoln's Sparrow	0.0	6.3	1.1	7.4	3.2	10.6	0.0	5.6
Long-eared Owl	0.0	0.0	2.2	0.0	0.0	1.2	0.0	0.0
Magnolia Warbler	10.0	31.6	12.4	23.2	20.6	23.5	6.3	13.9
*Mallard	3.3	0.0	3.4	1.1	0.0	0.0	0.0	0.0
Marbled Godwit	1.1	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Marsh Wren	1.1	0.0	0.0	0.0	1.6	1.2	0.0	0.0
Merlin	0.0	0.0	1.1	1.1	0.0	0.0	0.0	0.0
Mourning Dove	1.1	1.1	0.0	2.1	3.2	0.0	0.0	0.0
*Mourning Warbler	37.8	22.1	12.4	11.6	3.2	12.9	25.0	15.3
*Nashville Warbler	73.3	81.1	70.8	83.2	69.8	75.3	68.8	90.3
*Northern Flicker	11.1	11.6	23.6	20.0	22.2	24.7	12.5	18.1
Northern Harrier	0.0	1.1	4.5	1.1	0.0	1.2	0.0	0.0
Northern Parula	2.2	15.8	2.2	15.8	1.6	15.3	6.3	9.7
*Northern Rough-winged Swallow	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Species	Distribution (Percent Occurrence)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Northern Waterthrush	10.0	8.4	5.6	4.2	3.2	2.4	0.0	2.8
*[β]Olive-sided Flycatcher	3.3	1.1	0.0	2.1	1.6	0.0	0.0	0.0
Orange-crowned Warbler	0.0	1.1	0.0	0.0	0.0	1.2	0.0	1.4
Ovenbird	67.8	70.5	73.0	76.8	74.6	72.9	68.8	66.7
Palm Warbler	2.2	7.4	1.1	6.3	0.0	17.6	0.0	8.3
Philadelphia Vireo	4.4	3.2	0.0	0.0	0.0	2.4	6.3	0.0
Pied-billed Grebe	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Pileated Woodpecker	12.2	6.3	2.2	5.3	9.5	8.2	3.1	2.8
Pine Siskin	5.6	2.1	1.1	3.2	0.0	0.0	0.0	0.0
Pine Warbler	0.0	1.1	0.0	0.0	0.0	2.4	0.0	0.0
*Purple Finch	4.4	0.0	0.0	0.0	1.6	2.4	0.0	2.8
Red-breasted Nuthatch	0.0	0.0	1.1	0.0	0.0	0.0	0.0	0.0
*Red Crossbill	23.3	23.2	15.7	25.3	12.7	23.5	3.1	12.5
Red-eyed Vireo	80.0	91.6	62.9	76.8	77.8	76.5	71.9	75.0
*[β]Red-headed Woodpecker	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0
*Red-shouldered Hawk	0.0	0.0	0.0	0.0	0.0	2.4	0.0	0.0
Red-tailed Hawk	7.8	2.1	2.2	2.1	3.2	3.5	0.0	1.4
Red-winged Blackbird	23.3	16.8	22.5	15.8	23.8	10.6	15.6	5.6
Ring-billed Gull	0.0	0.0	2.2	0.0	0.0	0.0	0.0	0.0
*Ring-necked Duck	0.0	1.1	0.0	0.0	0.0	1.2	0.0	0.0
Rock Pigeon	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
*Rose-breasted Grosbeak	26.7	15.8	27.0	32.6	14.3	25.9	25.0	20.8
*Ruby-crowned Kinglet	10.0	17.9	5.6	12.6	15.9	9.4	0.0	2.8
Ruby-throated Hummingbird	0.0	3.2	2.2	2.1	4.8	1.2	3.1	1.4
*Ruffed Grouse	20.0	23.2	5.6	32.6	6.3	14.1	18.8	4.2
*[β]Rusty Blackbird	0.0	0.0	0.0	0.0	1.6	0.0	0.0	0.0
*Sandhill Crane	18.9	10.5	19.1	20.0	23.8	11.8	18.8	2.8
Savannah Sparrow	42.2	10.5	38.2	8.4	38.1	5.9	21.9	8.3
Scarlet Tanager	0.0	1.1	3.4	3.2	0.0	2.4	6.3	2.8
*Sedge Wren	27.8	9.5	16.9	7.4	31.7	7.1	18.8	1.4
Sharp-shinned Hawk	1.1	3.2	0.0	0.0	0.0	0.0	0.0	0.0
Sharp-tailed Grouse	3.3	1.1	2.2	0.0	11.1	0.0	0.0	0.0
*Song Sparrow	53.3	21.1	40.4	24.2	66.7	34.1	56.3	27.8
Sora	0.0	1.1	0.0	2.1	1.6	1.2	3.1	1.4
*Spotted Sandpiper	2.2	1.1	3.4	0.0	0.0	0.0	0.0	0.0
Swainson's Thrush	2.2	8.4	0.0	1.1	0.0	7.1	3.1	1.4
*Swamp Sparrow	12.2	8.4	15.7	13.7	14.3	20.0	15.6	9.7
*Tennessee Warbler	11.1	16.8	2.2	6.3	11.1	7.1	6.3	0.0
*Tree Swallow	6.7	3.2	3.4	4.2	0.0	0.0	0.0	1.4
Trumpeter Swan	2.2	10.5	3.4	4.2	1.6	0.0	0.0	0.0
Turkey Vulture	1.1	1.1	4.5	2.1	1.6	3.5	3.1	0.0
*Veery	44.4	46.3	36.0	43.2	47.6	37.6	56.3	40.3
*Vesper Sparrow	0.0	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Virginia Rail	1.1	1.1	0.0	0.0	1.6	0.0	0.0	0.0
Warbling Vireo	3.3	0.0	6.7	0.0	0.0	1.2	6.3	0.0
Western Meadowlark	4.4	1.1	0.0	0.0	1.6	0.0	0.0	0.0

Species	Distribution (Percent Occurrence)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
White-breasted Nuthatch	0.0	0.0	0.0	1.1	0.0	1.2	0.0	0.0
*White-throated Sparrow	54.4	63.2	78.7	80.0	74.6	71.8	59.4	72.2
White-winged Crossbill	0.0	0.0	0.0	1.1	0.0	0.0	0.0	1.4
*Wilson's Snipe	7.8	13.7	38.2	24.2	47.6	17.6	31.3	11.1
Wilson's Warbler	1.1	3.2	0.0	0.0	1.6	0.0	0.0	0.0
Winter Wren	7.8	7.4	10.1	16.8	1.6	16.5	9.4	16.7
*Wood Duck	0.0	2.1	0.0	1.1	0.0	0.0	0.0	0.0
*[β]Wood Thrush	14.4	13.7	1.1	21.1	0.0	7.1	6.3	2.8
Yellow Warbler	13.3	16.8	30.3	9.5	23.8	21.2	18.8	6.9
Yellow-bellied Flycatcher	14.4	24.2	4.5	6.3	6.3	16.5	0.0	8.3
*Yellow-bellied Sapsucker	8.9	2.1	1.1	11.6	11.1	20.0	9.4	8.3
Yellow-rumped Warbler	17.8	17.9	6.7	21.1	20.6	24.7	9.4	11.1

Notes:

[α] Distribution (Percent Occurrence) = number of point count stations at which a species was recorded divided by the total number of point counts surveyed;
Abundance = maximum number of individuals per species divided by the total number of point count stations;
Density = maximum number of individuals per species recorded within a 50 m radius of the surveyor divided by the area of the survey station (= 0.79 ha).

* BCR 12 Priority Species

[β] Species provincially-listed as *Special Concern* under the *Endangered Species Act*

[γ] Species provincially-listed as Threatened or Endangered under the *Endangered Species Act*

Appendix C3: Abundance of All Species by Survey Year

Species	Abundance (Birds / Point Count)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Alder Flycatcher	0.56	0.36	0.17	0.39	0.65	0.38	0.41	0.27
American Bittern	0.02	0.05	0.00	0.04	0.02	0.02	0.03	0.01
American Crow	0.19	0.25	0.33	0.25	0.43	0.26	0.19	0.08
American Goldfinch	0.40	0.22	0.19	0.16	0.35	0.36	0.47	0.19
*American Kestrel	0.02	0.03	0.02	0.03	0.03	0.00	0.00	0.00
American Pipit	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
American Redstart	0.17	0.32	0.04	0.15	0.13	0.09	0.34	0.07
American Robin	0.84	0.67	0.69	0.49	0.78	0.53	0.50	0.51
American Tree Sparrow	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
*$^{\gamma}$American White Pelican	0.08	0.16	0.09	0.00	0.06	0.00	0.00	0.03
*American Woodcock	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
*$^{\beta}$Bald Eagle	0.04	0.01	0.00	0.01	0.03	0.01	0.00	0.00
Baltimore Oriole	0.06	0.02	0.00	0.00	0.03	0.02	0.00	0.00
*$^{\gamma}$Barn Swallow	0.28	0.51	0.33	0.06	0.40	0.05	0.00	0.01
Barred Owl	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00
*Bay-breasted Warbler	0.01	0.06	0.01	0.00	0.00	0.00	0.00	0.00
*Belted Kingfisher	0.02	0.00	0.00	0.01	0.00	0.04	0.03	0.00
Black-and-white Warbler	0.64	0.58	0.48	0.64	0.38	0.36	0.41	0.39
Black-backed Woodpecker	0.03	0.05	0.00	0.00	0.00	0.01	0.00	0.00
*Black-billed Cuckoo	0.04	0.04	0.04	0.09	0.21	0.12	0.69	0.11
Black-billed Magpie	0.20	0.02	0.25	0.00	0.40	0.02	0.06	0.01
*Blackburnian Warbler	0.04	0.21	0.06	0.23	0.03	0.12	0.00	0.09
Black-capped Chickadee	0.30	0.28	0.11	0.26	0.06	0.16	0.03	0.15
Blackpoll Warbler	0.01	0.00	0.00	0.00	0.00	0.05	0.00	0.00
*Black-throated Blue Warbler	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.03
*Black-throated Green Warbler	0.14	0.33	0.13	0.35	0.03	0.22	0.13	0.20
Blue Jay	0.49	0.43	0.91	0.92	0.70	0.52	0.50	0.35
Blue-headed Vireo	0.00	0.01	0.00	0.03	0.14	0.09	0.03	0.05
*$^{\gamma}$Bobolink	0.89	0.27	0.73	0.21	1.05	0.26	0.53	0.08
Boreal Chickadee	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Brewer's Blackbird	0.07	0.06	0.03	0.04	0.00	0.00	0.19	0.01
*Broad-winged Hawk	0.00	0.01	0.03	0.00	0.03	0.06	0.00	0.00
Brown Creeper	0.03	0.03	0.03	0.04	0.00	0.00	0.06	0.03
*Brown Thrasher	0.01	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Brown-headed Cowbird	0.13	0.04	0.02	0.03	0.14	0.01	0.38	0.07
*Canada Goose	0.77	0.86	0.30	0.14	3.44	0.16	0.00	0.34
*$^{\beta}$Canada Warbler	0.08	0.06	0.06	0.06	0.00	0.05	0.03	0.00
Cape May Warbler	0.01	0.03	0.00	0.02	0.00	0.01	0.00	0.00
Cedar Waxwing	0.33	0.47	0.43	0.31	0.27	0.27	0.41	0.31
*Chestnut-sided Warbler	0.94	0.57	0.69	0.80	0.14	0.42	0.78	0.57
Chipping Sparrow	0.17	0.11	0.10	0.11	0.06	0.04	0.16	0.14
Clay-colored Sparrow	0.54	0.11	0.51	0.16	0.76	0.15	0.50	0.15
*Cliff Swallow	0.02	0.00	0.00	0.00	0.05	0.00	0.00	0.00
Common Grackle	0.04	0.06	0.02	0.04	0.03	0.08	0.00	0.00

Species	Abundance (Birds / Point Count)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Common Loon	0.03	0.07	0.02	0.09	0.00	0.07	0.00	0.03
*[β]Common Nighthawk	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00
Common Raven	0.27	0.15	0.29	0.34	0.13	0.31	0.28	0.15
*Common Yellowthroat	1.00	0.57	0.85	0.56	1.10	0.61	1.06	0.73
*Connecticut Warbler	0.03	0.01	0.06	0.00	0.00	0.09	0.06	0.20
Dark-eyed Junco	0.01	0.11	0.02	0.01	0.05	0.09	0.00	0.14
Downy Woodpecker	0.02	0.04	0.01	0.11	0.02	0.04	0.06	0.03
Eastern Bluebird	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Eastern Kingbird	0.08	0.06	0.02	0.03	0.17	0.08	0.06	0.05
Eastern Phoebe	0.03	0.04	0.09	0.12	0.06	0.11	0.03	0.04
Eastern Towhee	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
*[γ]Eastern Whip-poor-will	0.00	0.01	0.00	0.00	0.02	0.01	0.00	0.03
*[β]Eastern Wood-Pewee	0.06	0.08	0.01	0.01	0.05	0.16	0.09	0.03
European Starling	0.28	0.09	0.29	0.07	0.24	0.44	0.00	0.00
*[β]Evening Grosbeak	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
Golden-crowned Kinglet	0.04	0.05	0.00	0.24	0.00	0.12	0.00	0.14
*[β]Golden-winged Warbler	0.14	0.14	0.11	0.12	0.16	0.12	0.09	0.03
*Gray Catbird	0.02	0.01	0.01	0.02	0.03	0.00	0.06	0.01
Gray Jay	0.06	0.18	0.08	0.14	0.00	0.09	0.03	0.12
Great Blue Heron	0.03	0.03	0.00	0.01	0.00	0.00	0.03	0.00
Great Crested Flycatcher	0.04	0.01	0.06	0.02	0.03	0.02	0.09	0.03
Green Heron	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Hairy Woodpecker	0.03	0.00	0.04	0.04	0.10	0.02	0.06	0.03
Hermit Thrush	0.18	0.48	0.31	0.73	0.25	0.60	0.50	0.86
*Herring Gull	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
*Hooded Merganser	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
House Wren	0.04	0.02	0.01	0.02	0.08	0.02	0.03	0.00
Indigo Bunting	0.01	0.00	0.02	0.01	0.03	0.00	0.09	0.00
*Killdeer	0.08	0.06	0.06	0.01	0.08	0.01	0.00	0.00
*Least Flycatcher	0.19	0.20	0.33	0.28	0.51	0.32	0.34	0.19
LeConte's Sparrow	0.62	0.14	0.60	0.13	0.46	0.04	0.13	0.00
Lincoln's Sparrow	0.00	0.08	0.01	0.12	0.03	0.13		0.09
Long-eared Owl	0.00	0.00	0.02	0.00	0.00	0.01	0.00	0.00
Magnolia Warbler	0.10	0.44	0.12	0.32	0.21	0.27	0.06	0.15
*Mallard	0.07	0.00	0.04	0.01	0.00	0.00	0.00	0.00
Marbled Godwit	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Marsh Wren	0.01	0.00	0.00	0.00	0.02	0.04	0.00	0.00
Merlin	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
Mourning Dove	0.01	0.02	0.00	0.02	0.03	0.00	0.00	0.00
*Mourning Warbler	0.42	0.27	0.15	0.17	0.03	0.13	0.31	0.23
*Nashville Warbler	1.28	1.66	1.42	1.48	1.00	1.32	1.31	2.19
*Northern Flicker	0.11	0.14	0.27	0.23	0.29	0.29	0.22	0.26
Northern Harrier	0.00	0.01	0.04	0.02	0.00	0.01	0.00	0.00
Northern Parula	0.02	0.17	0.02	0.23	0.02	0.20	0.09	0.12
*Northern Rough-winged Swallow	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Species	Abundance (Birds / Point Count)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Northern Waterthrush	0.10	0.09	0.07	0.05	0.03	0.02	0.00	0.04
*[β]Olive-sided Flycatcher	0.03	0.01	0.00	0.02	0.02	0.00	0.00	0.00
Orange-crowned Warbler	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01
Ovenbird	1.10	1.44	1.13	1.32	1.29	1.38	1.31	1.28
Palm Warbler	0.02	0.13	0.01	0.08	0.00	0.27	0.00	0.22
Philadelphia Vireo	0.04	0.03	0.00	0.00	0.00	0.04	0.06	0.00
Pied-billed Grebe	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Pileated Woodpecker	0.12	0.06	0.02	0.05	0.10	0.08	0.06	0.03
Pine Siskin	0.12	0.03	0.02	0.08	0.00	0.00	0.00	0.00
Pine Warbler	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00
*Purple Finch	0.04	0.00	0.00	0.00	0.02	0.02	0.00	0.03
Red-breasted Nuthatch	0.24	0.25	0.16	0.29	0.13	0.27	0.03	0.14
*Red Crossbill	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00
Red-eyed Vireo	1.41	1.84	0.82	1.11	1.27	1.28	1.38	1.41
*[β]Red-headed Woodpecker	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
*Red-shouldered Hawk	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00
Red-tailed Hawk	0.09	0.02	0.02	0.02	0.03	0.06	0.00	0.01
Red-winged Blackbird	0.30	0.28	0.38	0.18	0.54	0.20	0.22	0.05
Ring-billed Gull	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00
*Ring-necked Duck	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.00
Rock Pigeon	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00
*Rose-breasted Grosbeak	0.32	0.18	0.27	0.40	0.19	0.31	0.31	0.23
*Ruby-crowned Kinglet	0.11	0.20	0.06	0.14	0.19	0.11	0.00	0.03
Ruby-throated Hummingbird	0.00	0.03	0.02	0.02	0.05	0.01	0.03	0.01
*Ruffed Grouse	0.20	0.24	0.07	0.36	0.08	0.19	0.19	0.04
*[β]Rusty Blackbird	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00
*Sandhill Crane	0.34	0.14	0.26	0.31	0.41	0.15	0.38	0.03
Savannah Sparrow	0.88	0.19	0.73	0.12	0.68	0.11	0.69	0.18
Scarlet Tanager	0.00	0.01	0.06	0.04	0.00	0.02	0.09	0.03
*Sedge Wren	0.48	0.24	0.21	0.11	0.67	0.09	0.38	0.01
Sharp-shinned Hawk	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00
Sharp-tailed Grouse	0.23	0.01	0.07	0.00	0.14	0.00	0.00	0.00
*Song Sparrow	0.87	0.25	0.63	0.40	1.05	0.64	1.03	0.51
Sora	0.00	0.01	0.00	0.02	0.02	0.01	0.03	0.01
*Spotted Sandpiper	0.02	0.01	0.08	0.00	0.00	0.00	0.00	0.00
Swainson's Thrush	0.02	0.11	0.00	0.01	0.00	0.07	0.03	0.03
*Swamp Sparrow	0.18	0.15	0.21	0.19	0.22	0.26	0.31	0.20
*Tennessee Warbler	0.12	0.21	0.03	0.14	0.11	0.09	0.06	0.00
*Tree Swallow	0.08	0.03	0.03	0.04	0.00	0.00	0.00	0.03
Trumpeter Swan	0.03	0.15	0.13	0.05	0.02	0.00	0.00	0.00
Turkey Vulture	0.01	0.01	0.08	0.02	0.02	0.04	0.03	0.00
*Veery	0.68	0.66	0.46	0.56	0.70	0.54	1.06	0.61
*Vesper Sparrow	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
Virginia Rail	0.01	0.01	0.00	0.00	0.02	0.00	0.00	0.00
Warbling Vireo	0.03	0.00	0.08	0.00	0.00	0.01	0.06	0.00
Western Meadowlark	0.04	0.01	0.00	0.00	0.02	0.00	0.00	0.00

Species	Abundance (Birds / Point Count)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
White-breasted Nuthatch	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00
*White-throated Sparrow	0.99	1.07	1.36	1.66	1.27	1.24	1.69	1.70
White-winged Crossbill	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.01
*Wilson's Snipe	0.10	0.22	0.46	0.27	0.65	0.21	0.31	0.12
Wilson's Warbler	0.01	0.03	0.00	0.00	0.03	0.00	0.00	0.00
Winter Wren	0.08	0.08	0.11	0.17	0.02	0.16	0.13	0.23
*Wood Duck	0.00	0.02	0.00	0.01	0.00	0.00	0.00	0.00
*$^{\beta}$Wood Thrush	0.17	0.15	0.01	0.24	0.00	0.08	0.06	0.03
Yellow Warbler	0.18	0.22	0.47	0.13	0.30	0.28	0.19	0.08
Yellow-bellied Flycatcher	0.19	0.28	0.07	0.12	0.06	0.20	0.00	0.08
*Yellow-bellied Sapsucker	0.09	0.02	0.01	0.13	0.13	0.22	0.09	0.12
Yellow-rumped Warbler	0.18	0.20	0.15	0.27	0.24	0.27	0.13	0.11

Notes:

- α Distribution (Percent Occurrence) = number of point count stations at which a species was recorded divided by the total number of point counts surveyed;
  Abundance = maximum number of individuals per species divided by the total number of point count stations;
  Density = maximum number of individuals per species recorded within a 50 m radius of the surveyor divided by the area of the survey station (= 0.79 ha).
- * BCR 12 Priority Species
- β Species provincially-listed as Special Concern under the Endangered Species Act
- γ Species provincially-listed as Threatened or Endangered under the Endangered Species Act

Appendix C4: Densities of All Species by Survey Year

Species	Density (birds/ha)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Alder Flycatcher	0.120	0.101	0.039	0.104	0.172	0.090	0.053	0.042
American Bittern	0.000	0.000	0.000	0.007	0.000	0.000	0.000	0.003
American Crow	0.007	0.023	0.011	0.007	0.040	0.037	0.003	0.008
American Goldfinch	0.106	0.054	0.050	0.017	0.101	0.101	0.030	0.033
*American Kestrel	0.007	0.007	0.004	0.007	0.010	0.000	0.000	0.000
American Pipit	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
American Redstart	0.050	0.094	0.011	0.040	0.040	0.030	0.042	0.011
American Robin	0.145	0.161	0.163	0.104	0.192	0.120	0.058	0.055
American Tree Sparrow	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
*γAmerican White Pelican	0.007	0.003	0.000	0.000	0.000	0.000	0.019	0.006
*American Woodcock	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
*βBald Eagle	0.011	0.003	0.000	0.000	0.005	0.004	0.000	0.000
Baltimore Oriole	0.014	0.007	0.000	0.000	0.005	0.004	0.000	0.000
*γBarn Swallow	0.064	0.137	0.000	0.000	0.025	0.000	0.000	0.003
Barred Owl	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
*Bay-breasted Warbler	0.004	0.017	0.004	0.000	0.000	0.000	0.000	0.000
*Belted Kingfisher	0.007	0.000	0.000	0.003	0.000	0.004	0.003	0.000
Black-and-white Warbler	0.159	0.171	0.134	0.178	0.106	0.101	0.080	0.055
Black-backed Woodpecker	0.007	0.013	0.000	0.000	0.000	0.004	0.000	0.000
*Black-billed Cuckoo	0.011	0.007	0.000	0.010	0.020	0.004	0.022	0.000
Black-billed Magpie	0.028	0.000	0.018	0.000	0.081	0.007	0.003	0.003
*Blackburnian Warbler	0.014	0.060	0.014	0.074	0.005	0.037	0.006	0.019
Black-capped Chickadee	0.071	0.087	0.032	0.077	0.020	0.045	0.008	0.028
Blackpoll Warbler	0.004	0.000	0.000	0.000	0.000	0.015	0.000	0.000
*Black-throated Blue Warbler	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
*Black-throated Green Warbler	0.028	0.094	0.039	0.077	0.010	0.060	0.028	0.025
Blue Jay	0.060	0.087	0.099	0.137	0.141	0.094	0.061	0.053
Blue-headed Vireo	0.000	0.003	0.000	0.010	0.040	0.026	0.008	0.011
*γBobolink	0.209	0.077	0.191	0.044	0.217	0.034	0.028	0.011
Boreal Chickadee	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.003
Brewer's Blackbird	0.007	0.010	0.011	0.010	0.000	0.000	0.014	0.003
*Broad-winged Hawk	0.000	0.003	0.004	0.000	0.010	0.007	0.011	0.000
Brown Creeper	0.011	0.010	0.011	0.013	0.000	0.000	0.006	0.006
*Brown Thrasher	0.000	0.000	0.004	0.000	0.000	0.000	0.000	0.000
Brown-headed Cowbird	0.039	0.013	0.007	0.007	0.025	0.004	0.022	0.011
*Canada Goose	0.099	0.000	0.000	0.000	0.000	0.015	0.003	0.000
*βCanada Warbler	0.025	0.020	0.011	0.017	0.000	0.015	0.014	0.000
Cape May Warbler	0.004	0.010	0.000	0.007	0.000	0.004	0.000	0.000
Cedar Waxwing	0.106	0.131	0.103	0.070	0.051	0.056	0.042	0.039
*Chestnut-sided Warbler	0.251	0.168	0.184	0.241	0.035	0.120	0.116	0.089
Chipping Sparrow	0.046	0.030	0.021	0.017	0.010	0.004	0.019	0.022
Clay-colored Sparrow	0.124	0.020	0.117	0.047	0.222	0.030	0.025	0.011
*Cliff Swallow	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Common Grackle	0.007	0.010	0.007	0.007	0.010	0.022	0.000	0.000

Species	Density (birds/ha)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Common Loon	0.000	0.003	0.000	0.000	0.000	0.011	0.000	0.000
*[β]Common Nighthawk	0.00	0.00	0.000	0.000	0.005	0.000	0.000	0.000
Common Raven	0.025	0.000	0.018	0.013	0.010	0.049	0.000	0.003
*Common Yellowthroat	0.237	0.168	0.173	0.117	0.278	0.146	0.089	0.108
*Connecticut Warbler	0.007	0.003	0.011	0.000	0.000	0.026	0.011	0.033
Dark-eyed Junco	0.004	0.030	0.004	0.003	0.005	0.022	0.008	0.022
Downy Woodpecker	0.000	0.010	0.004	0.034	0.005	0.011	0.006	0.006
Eastern Bluebird	0.011	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Eastern Kingbird	0.018	0.020	0.007	0.003	0.045	0.015	0.008	0.011
Eastern Phoebe	0.004	0.010	0.018	0.027	0.010	0.019	0.000	0.008
Eastern Towhee	0.00	0.00	0.000	0.000	0.000	0.004	0.000	0.000
*[γ]Eastern Whip-poor-will	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.003
*[β]Eastern Wood-Pewee	0.007	0.020	0.004	0.000	0.005	0.037	0.006	0.006
European Starling	0.011	0.023	0.000	0.003	0.000	0.026	0.000	0.000
*[β]Evening Grosbeak	0.000	0.010	0.000	0.000	0.000	0.000	0.000	0.000
Golden-crowned Kinglet	0.014	0.017	0.000	0.077	0.000	0.037	0.008	0.025
*[β]Golden-winged Warbler	0.046	0.030	0.032	0.030	0.040	0.037	0.006	0.003
*Gray Catbird	0.007	0.003	0.004	0.007	0.010	0.000	0.006	0.003
Gray Jay	0.011	0.054	0.025	0.034	0.000	0.030	0.011	0.022
Great Blue Heron	0.004	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Great Crested Flycatcher	0.011	0.000	0.011	0.003	0.000	0.007	0.008	0.006
Green Heron	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hairy Woodpecker	0.011	0.000	0.007	0.007	0.015	0.007	0.011	0.000
Hermit Thrush	0.021	0.094	0.050	0.101	0.020	0.097	0.080	0.113
*Herring Gull	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
*Hooded Merganser	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
House Wren	0.004	0.003	0.000	0.003	0.015	0.004	0.003	0.000
Indigo Bunting	0.004	0.000	0.007	0.003	0.010	0.000	0.006	0.000
*Killdeer	0.011	0.013	0.007	0.000	0.010	0.000	0.000	0.000
*Least Flycatcher	0.039	0.057	0.064	0.067	0.116	0.097	0.039	0.036
LeConte's Sparrow	0.191	0.044	0.170	0.040	0.147	0.011	0.006	0.000
Lincoln's Sparrow	0.000	0.027	0.004	0.037	0.005	0.030	0.000	0.017
Long-eared Owl	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Magnolia Warbler	0.028	0.134	0.035	0.094	0.045	0.071	0.017	0.022
*Mallard	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000
Marbled Godwit	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Marsh Wren	0.000	0.000	0.000	0.000	0.005	0.011	0.000	0.000
Merlin	0.00	0.00	0.004	0.000	0.000	0.000	0.000	0.000
Mourning Dove	0.000	0.003	0.000	0.000	0.010	0.000	0.000	0.000
*Mourning Warbler	0.085	0.070	0.039	0.030	0.010	0.022	0.072	0.033
*Nashville Warbler	0.350	0.503	0.371	0.422	0.243	0.352	0.208	0.318
*Northern Flicker	0.021	0.034	0.032	0.027	0.045	0.034	0.033	0.028
Northern Harrier	0.000	0.003	0.004	0.000	0.000	0.000	0.000	0.000
Northern Parula	0.000	0.044	0.004	0.064	0.005	0.041	0.008	0.019
*Northern Rough-winged Swallow	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Species	Density (birds/ha)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
Northern Waterthrush	0.014	0.023	0.007	0.010	0.010	0.004	0.000	0.003
*[β]Olive-sided Flycatcher	0.004	0.003	0.000	0.003	0.000	0.000	0.000	0.000
Orange-crowned Warbler	0.000	0.003	0.000	0.000	0.000	0.004	0.000	0.003
Ovenbird	0.202	0.328	0.184	0.278	0.177	0.292	0.138	0.158
Palm Warbler	0.004	0.040	0.004	0.027	0.000	0.071	0.008	0.036
Philadelphia Vireo	0.014	0.010	0.000	0.000	0.000	0.011	0.008	0.000
Pied-billed Grebe	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Pileated Woodpecker	0.000	0.013	0.004	0.007	0.005	0.015	0.000	0.006
Pine Siskin	0.039	0.010	0.000	0.017	0.000	0.000	0.003	0.000
Pine Warbler	0.000	0.003	0.000	0.000	0.000	0.004	0.000	0.000
*Purple Finch	0.011	0.000	0.000	0.000	0.005	0.007	0.000	0.006
Red-breasted Nuthatch	0.060	0.064	0.035	0.070	0.015	0.071	0.019	0.025
*Red Crossbill	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
Red-eyed Vireo	0.255	0.456	0.152	0.261	0.263	0.333	0.113	0.147
*[β]Red-headed Woodpecker	0.00	0.00	0.007	0.000	0.000	0.000	0.000	0.000
*Red-shouldered Hawk	0.00	0.00	0.000	0.000	0.000	0.007	0.000	0.000
Red-tailed Hawk	0.004	0.003	0.004	0.003	0.005	0.000	0.000	0.000
Red-winged Blackbird	0.057	0.074	0.057	0.020	0.086	0.034	0.025	0.003
Ring-billed Gull	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
*Ring-necked Duck	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Rock Pigeon	0.021	0.000	0.000	0.000	0.000	0.000	0.000	0.000
*Rose-breasted Grosbeak	0.064	0.050	0.032	0.084	0.051	0.060	0.036	0.042
*Ruby-crowned Kinglet	0.018	0.050	0.014	0.027	0.015	0.030	0.000	0.006
Ruby-throated Hummingbird	0.000	0.010	0.007	0.007	0.010	0.004	0.003	0.003
*Ruffed Grouse	0.032	0.047	0.011	0.044	0.005	0.034	0.019	0.008
*[β]Rusty Blackbird	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.000
*Sandhill Crane	0.039	0.003	0.007	0.000	0.061	0.000	0.000	0.000
Savannah Sparrow	0.248	0.054	0.177	0.027	0.192	0.030	0.044	0.030
Scarlet Tanager	0.000	0.003	0.007	0.013	0.000	0.004	0.003	0.003
*Sedge Wren	0.124	0.067	0.039	0.027	0.202	0.026	0.033	0.003
Sharp-shinned Hawk	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000
Sharp-tailed Grouse	0.074	0.003	0.021	0.000	0.030	0.000	0.000	0.000
*Song Sparrow	0.209	0.074	0.131	0.087	0.253	0.161	0.061	0.069
Sora	0.000	0.000	0.000	0.000	0.000	0.004	0.003	0.003
*Spotted Sandpiper	0.004	0.000	0.011	0.000	0.000	0.000	0.000	0.000
Swainson's Thrush	0.004	0.010	0.000	0.000	0.000	0.015	0.006	0.006
*Swamp Sparrow	0.032	0.037	0.035	0.037	0.061	0.064	0.028	0.036
*Tennessee Warbler	0.035	0.060	0.011	0.023	0.030	0.026	0.003	0.000
*Tree Swallow	0.004	0.007	0.000	0.000	0.000	0.000	0.000	0.000
Trumpeter Swan	0.000	0.003	0.000	0.007	0.000	0.000	0.000	0.000
Turkey Vulture	0.000	0.003	0.007	0.000	0.000	0.004	0.000	0.000
*Veery	0.127	0.121	0.057	0.107	0.086	0.097	0.058	0.075
*Vesper Sparrow	0.000	0.003	0.000	0.000	0.000	0.000	0.000	0.000
Virginia Rail	0.000	0.000	0.000	0.000	0.005	0.000	0.000	0.000
Warbling Vireo	0.004	0.000	0.021	0.000	0.000	0.000	0.006	0.000
Western Meadowlark	0.004	0.003	0.000	0.000	0.000	0.000	0.000	0.000

Species	Density (birds/ha)							
	2018		2016		2015		2014	
	Impact	Control	Impact	Control	Impact	Control	Impact	Control
White-breasted Nuthatch	0.00	0.00	0.000	0.003	0.000	0.004	0.000	0.000
*White-throated Sparrow	0.223	0.251	0.180	0.308	0.136	0.172	0.227	0.197
White-winged Crossbill	0.00	0.00	0.000	0.000	0.000	0.000	0.000	0.003
*Wilson's Snipe	0.004	0.030	0.000	0.030	0.096	0.026	0.025	0.017
Wilson's Warbler	0.004	0.010	0.011	0.000	0.000	0.000	0.000	0.000
Winter Wren	0.011	0.023	0.014	0.034	0.005	0.022	0.030	0.028
*Wood Duck	0.000	0.000	0.000	0.003	0.000	0.000	0.000	0.000
*$^{\beta}$Wood Thrush	0.028	0.030	0.004	0.020	0.000	0.019	0.006	0.006
Yellow Warbler	0.032	0.060	0.127	0.027	0.076	0.079	0.028	0.017
Yellow-bellied Flycatcher	0.050	0.077	0.018	0.034	0.015	0.064	0.006	0.017
*Yellow-bellied Sapsucker	0.018	0.007	0.004	0.017	0.020	0.041	0.019	0.014
Yellow-rumped Warbler	0.057	0.057	0.046	0.080	0.045	0.079	0.033	0.022

Notes:

- α Distribution (Percent Occurrence) = number of point count stations at which a species was recorded divided by the total number of point counts surveyed;
  Abundance = maximum number of individuals per species divided by the total number of point count stations;
  Density = maximum number of individuals per species recorded within a 100 m radius of the surveyor divided by the area of the survey station (= 3.1416 ha).
- * BCR 12 Priority Species
- β Species provincially-listed as Special Concern under the Endangered Species Act
- γ Species provincially-listed as Threatened or Endangered under the Endangered Species Act

New Gold Inc. Rainy River Mine

2015 - 2018 Bat Acoustic Monitoring Report
Per Provincial Environmental Assessment Notice of Approval Condition 6
TC111504

Prepared for:

New Gold Inc.

March 2019

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Yours truly,

Wood Environment & Infrastructure
a Division of Wood Canada Limited

'Wood' is a trading name for John Wood Group PLC and its subsidiaries

New Gold Inc. Rainy River Mine

2015 - 2018 Bat Acoustic Monitoring Report
TC111504

Prepared for:

New Gold Inc.
Rainy River Project

Prepared by:

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March 2019

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Executive Summary

Environmental baseline studies and wildlife monitoring for the RRM have been undertaken annually since 2009. These studies have established a comprehensive understanding of the composition of local plant and wildlife communities within the Project footprint as well as on surrounding lands. Environmental baseline studies for bats were undertaken at the RRM by Wood (formerly AMEC) in 2012 and 2013. As part of the federal environmental assessment process, New Gold committed to follow-up wildlife monitoring programs to verify the accuracy of the environmental assessment predictions. This current report provides the methods and results from the 2015 to 2018 bat acoustic monitoring program.

Annual bat acoustic monitoring was conducted at five monitoring stations between 2015 and 2018 during the maternal brood rearing period in June and early July. Bat acoustic surveys were designed to target two bat SAR whose ranges overlap with the study area and have previously been identified within the Project footprint: Little Brown Myotis and Northern Myotis. Recordings were identified to species using SonoBat™ software and were verified manually using parameters such as frequency of maximum energy, minimum and maximum frequency, call duration, slope of the call, and other qualitative parameters.

Acoustic monitoring has consistently recorded all six species of bat anticipated to be present, based on current known ranges: Little Brown Myotis, Northern Myotis, Eastern Red Bat, Silver-Haired Bat, Hoary Bat and Big Brown Bat. Little Brown Myotis and Northern Myotis are both designated as Endangered Species under Ontario's ESA, which prohibits harming, destroying or disturbing habitat for this species under Sections 9 and 10 of the Act.

Little Brown Myotis and Silver-haired Bats have been consistently detected at the highest frequencies and widest distributions followed by Hoary Bat. Eastern Red Bat and Big Brown Bat are both widespread and have been consistently detected at relatively low frequencies while Northern Myotis has the lowest level of detection and the smallest consistent distribution.

During the spring maternal brood rearing period surveys, Northern Myotis made up 0.16% and 0.06% (2 passes) of all recorded passes in 2015 and 2016 respectively. Despite this low sample size, it appears Detector 23 may have slightly higher activity levels for this species than the other detector locations. This is consistent with the wooded habitat present at this location.

Little Brown Myotis was recorded at all five survey locations within the RRM study area at relatively high levels, particularly in 2015 and 2017. In 2015, 52% of all passes were by Little Brown Myotis or Myotis species and in 2017 these species represented 34% of all passes. Little Brown Myotis and Myotis species passes appear to have their highest detection rate consistently at Detector 21. Between 2015 and 2017 detections of these species at Detector 21 made up between 68% to 93% of their overall detections. The same pattern was present for Silver-haired Bat with the highest number of passes per night for this species recorded at this detector during each maternal brood rearing survey period.

Due to issues with the acoustic surveys during the maternal brood rearing period in 2018 a survey was undertaken in early fall. During this survey period several activity levels for non-SAR bat species survey were the highest of the entire study. Silver-haired Bat numbers (passes per night) were relatively high at every detector location during this survey period and Detector 25 had the highest number of nightly passes over the entire study for Eastern Red Bat, Hoary Bat, Big Brown Bat and the second highest number of nightly passes for Silver-haired Bat.

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1.0 Introduction

1.1 Project Background

New Gold Inc. (New Gold) is constructing, operating and eventually reclaiming a new open pit and underground gold mine, the Rainy River Mine (RRM; the Project). The RRM will produce doré bars (gold with silver) for sale. Physical works related to the RRM will consist primarily of:

- Open pit and underground mine;
- Overburden, mine rock and low grade ore stockpiles;
- Primary crusher and process plant;
- Tailings management area;
- 230 kilovolt transmission line;
- Relocation of a portion of gravel-surfaced Highway 600; and
- Associated buildings, facilities and infrastructure.

The RRM site is located in the Township of Chapple, District of Rainy River, in northwestern Ontario, approximately 65 kilometres (km) northwest of Fort Frances, and 420 km west of Thunder Bay (Figure 1-1). Lands immediately adjacent to the RRM are typically gently rolling to flat, forested wetlands in low-lying areas, rounded bedrock outcrops and subcrops in upland areas and areas that have been cleared for agriculture. Local drainage systems are characterized by small creeks that flow to the Pinewood River which drains most of the RRM site area.

Environmental baseline studies and wildlife monitoring for the RRM have been undertaken annually since 2009 within the Natural Environment Local Study Area (NLSA) and the wider Regional Study Area (as defined in AMEC 2014; Figure 1-2). These studies have established a comprehensive understanding of the composition of local plant and wildlife communities within the Project footprint as well as on surrounding lands (i.e., the Study Area). Environmental baseline studies for bats were undertaken at the RRM by Wood Environment & Infrastructure Solutions, a Division of Wood Canada Limited (Wood; formerly AMEC) in 2012 and 2013. Initial acoustic surveys during these baseline studies revealed the presence of six bat species within the proposed RRM footprint, including two species designated as Endangered: Little Brown Myotis (*Myotis lucifugus*) and Northern Myotis (*Myotis septentrionalis*).

The assessment of potential environmental impacts for the RRM was summarized in the RRM Final Environmental Assessment Report (Environmental Impact Statement) Version 2 (AMEC 2014) submitted to the Federal and Provincial Governments, including for Aboriginal and public review. A positive federal Environmental Assessment (EA) Decision Statement was issued on January 12, 2015 and a favourable provincial EA Notice of Approval was released on January 29, 2015.

As a component of the federal EA process, Amec Foster Wheeler Environment & Infrastructure (currently Wood Environment & Infrastructure), was retained to create and implement a Follow-up Monitoring Plan (FMP). In accordance with the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) the purpose of the FMP is to verify the accuracy of the predictions made in the EA about the potential impacts of the

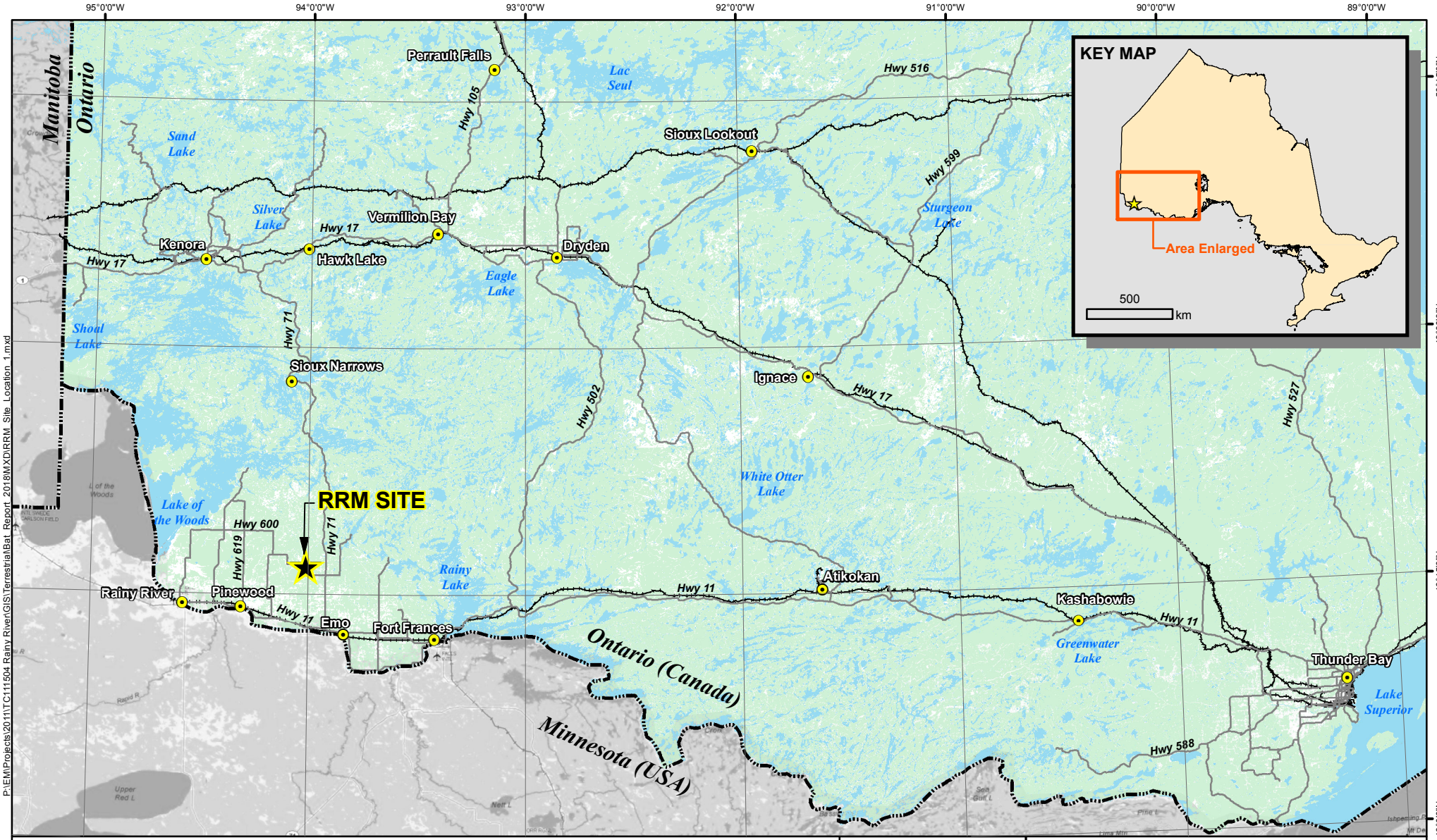
Project on wildlife and wildlife habitat, and to monitor the effectiveness of rehabilitation efforts for wildlife habitat and terrestrial environments. This bat acoustic monitoring report has been created to support the objectives of the FMP and presents the results of bat acoustic monitoring surveys undertaken between 2015 and 2018.

1.2 Objective and Scope

Noise disturbance can cause adverse effects on wildlife, particularly bats, in a variety of ways, most notably interference with acoustic signals. Bats rely heavily on vocal and auditory feedback for foraging and navigation. Anthropogenic noise can interfere with these signals and deter bats (Schaub et al. 2008, Arnett et al. 2013, Bunkley et al. 2015). Additionally, bats rely on, and are relatively faithful to specific habitat features with particular conditions for roosting, mating and hibernation, the latter two being relatively uncommon in the landscape, and anthropogenic disturbance may drive bats to abandon these areas. Chronic noise disturbance can decrease breeding success, increase mortality rates and lead to an overall decrease in population density and/or species diversity (USFWS 2012).

Bat acoustic studies were undertaken annually between 2015 and 2018 to fulfill the following objectives:

- Provide an annual reassessment of bat acoustic survey results;
- Monitor current bat populations as compared to baseline bat acoustic surveys at the RRM;
- Confirm the continued presence or absence of Endangered Little Brown Myotis and Northern Myotis within the RRM Natural Environment Local Study Area (NLSA; as shown in Figure 1-2);
- Begin to identify any long-term population changes and implications of any such changes.



P:\EM\Projects\2011\TC111504 Rainy River\GIS\TerrestrialBat_Report_2018\MXD\RRM_Site_Location_1.mxd

LEGEND

- RRM Site
- Regional Communities
- Provincial / National Border
- Regional Road / Highway
- Railway

0 25 50 100 150 200 250 Kilometres

NOTES:
- Ontario base data extracted from Land Information Ontario (MNR) data warehouse, Queen's Printer for Ontario, 2011-2012
- Base data outside of Ontario extracted from ESRI DeLorme World Basemap

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Project Location

PROJECT N°: TC111504	**FIGURE: 1-1**
SCALE: 1:1,800,000	DATE: February 2019

397500 405000 412500 420000 427500 435000 442500 450000

5422500 5415000 5407500 5400000

Bergland
Hwy-600
Little Grassy River
Sifton Township Conservation Reserve
Cranberry Lake Provincial Park
Hwy-621
Marsh Lake
Agassiz Peatlands Provincial Park
Cranberry Lake
Gameland
Hwy-619
Kishkakoesis River
North Branch
Hwy-617
Dearlock
Hwy-600
Pinewood River
Spruce Island Provincial Park
Little Pine Lake
Muskrat Lake
Finland
Hwy-71
Hwy-615
Burditt Lake
Off Lake
Burditt Lake
West Jackfish Lake
Rainy Lake I.R. No. 17B
Lake Despair
Pinewood Lake
Abbott Lake
Hwy-613
Sturgeon Creek
La Vallée River
CANADA
U.S.A.
Hwy-11
Pinewood
Rainy River

P:\EM\Projects\2011\TC111504 Rainy River\GIS\TerrestrialBat_Report_2018\MXD\NLSA_and_NRSA_1.mxd

LEGEND

- RRM Site
- Natural Environment Local Study Area Boundary (NLSA)
- Natural Environment Regional Study Area Boundary (NRSA)
- Transmission Line
- Regional Road / Highway
- Waterbody / Large Watercourse
- Wooded Area
- First Nation Reserve
- Conservation Reserve (Regulated)
- Provincial Park

NOTES:
- All base data on this map was extacted from Land Information Ontario (MNR), Queen's Printer for Ontario, 2011-2012
- USA land extracted from ESRI base map service, USGS Topo maps

0 5 10 20 30 40 Kilometres

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Local and Regional Natural Study Areas

PROJECT N°: TC111504 | **FIGURE: 1-2**

SCALE: 1:150,000 | DATE: February 2019

2.0 Methodology

2.1 Existing Information Review

A list of bat species likely to occur within the RRM Study Area was generated from inventory maps in the Atlas of the Mammals of Ontario (Dobbyn 1994) and up-to-date range maps provided by Bat Conservation International (BCI 2018). Six bat species, including two SAR, were found to potentially occur in the vicinity of the RRM: Little Brown Myotis, Northern Myotis, Big Brown Bat (*Eptesicus fuscus*), Silver-Haired Bat (*Lasionycteris noctivagans*), Hoary Bat (*Lasiurus cinereus*) and Eastern Red Bat (*Lasiurus borealis*). All six species were confirmed to occur within the RRM footprint during the baseline studies in 2012 and 2013.

2.2 Bat Acoustic Surveys

To support the objectives of the FMP and to monitor RRM-induced effects on bats, Wood conducted annual bat acoustic monitoring at five monitoring stations between 2015 and 2018. Bat acoustic surveys were designed to target two bat SAR whose ranges overlap with the study area and have previously been identified within the Project footprint: Little Brown Myotis and Northern Myotis. Both species are designated provincially and federally as Endangered. The program focused on confirming the continued presence of these SAR and other bat species and to monitor the level of activity and relative abundance of all bat species at representative locations around the periphery of the mine site and in nearby compensatory property (Figure 2-1).

Bat acoustic surveys were conducted annually between 2015 and 2018 to detect nocturnal bat activity, generally during the maternal brood rearing period in June and early July. All nocturnal bat activity was recorded from 30 minutes before sunset to 30 minutes after sunrise. During each annual recording period, five ultrasonic recording detectors were deployed throughout the study area (Figure 2-1). From 2015-2017, Songmeter SM2Bat+ (Wildlife Acoustics Inc.) recorders paired with SMX-US and SMX-UT microphones were used, while in 2018, a combination of SM2Bat+ recorders with SMX-UT microphones and SM4BAT recorders with SMM-U1 microphones were used. Details of the yearly bat detector deployment dates are provided in Table 2-1. Whenever possible, based on other RRM field program schedules, two rounds of acoustic monitoring were conducted.

Prior to deployment, an ultrasonic calibrator (Wildlife Acoustics Inc.) that emitted a 40 kilohertz (kHz) pure tone was used to verify the sensitivity and proper functioning of the bat detector microphones. Detectors were positioned 2 to 4 metres (m) above ground at representative locations with characteristics likely to result in higher levels of bat activity, such as the edges of wetlands and woodlands and / or near natural corridors to potential feeding areas (Furlonger et al. 1987). Bat detectors were configured to begin recording when ultrasonic signals greater than 18 decibels (dB) above the noise floor rolling average were detected. Upon trigger, a 2 to 5 second recording was saved. A signal process then filtered recorded signals and retained those files resembling bat echolocation. All recordings were made in .wav format with a 384 kHz sampling frequency and 16 bit resolution, producing real time, full spectrum data that afford greater accuracy and confidence when identifying recordings of bat calls to species.

Recordings were identified to species using SonoBat 3.2.0 NE.vi (Sonobat^{TM}) automated processing software (for Ontario and United States, north and northeast). Recordings were also classified manually because, while automated classification can provide accurate classifications for clear recordings that have a high signal to noise ratio, most field recordings contain some level of noise which can limit the accuracy of automated software and its ability to detect echolocation calls within recordings. Recordings were first

examined for saturated calls (calls with a noise level that surpassed the limits of the recording equipment). Saturated calls were removed from recordings with Audacity software to ensure better identification of calls by the species identification software. If all calls within a recording were saturated, the volume of the recording was reduced, and the clipped sections of the calls were digitally corrected with Audacity software. For these calls, amplitude information was not used to identify the calls to species. While automated classification provides efficient classification of large numbers of echolocation recordings, studies on the accuracy of automated classification caution on relying solely on this method (Menon et al. 2018, Rydell et al. 2017, Lemen et al. 2015). Therefore, a subset of the recordings for each year was also classified manually. While poor recording quality or call feature overlap can lead to inaccurate classifications by the software, the software is able to accurately distinguish between High-frequency bats and Low-frequency bats. The former group emits calls with a minimum frequency above 35 kHz and includes all SAR species as well as the Eastern Red Bat, while the latter, emits calls with a minimum frequency below 35 kHz. Since we were confident that all classifications by the software to a low-frequency species were unlikely to be an inaccurately classified SAR species, recordings selected for manual vetting included only those classified to SAR species. Due to the volume of recordings, we also limited the manual vetting to 200 passes for a given species at a given detector.

Automated classification used the mean classification decision method in Sonobat. Individual calls within a recording were classified based on over 30 acoustic parameters. The software used a discriminant analysis to provide an accuracy probability for each classification and only calls with a probability greater than 90% were accepted. The calls within a sequence are sorted hierarchically and processed to generate a mean classification decision. Manual classification was accomplished by comparing qualitative and quantitative parameters of recorded bat calls to a library of known species parameters. Parameters used for species identification included: frequency of maximum energy, minimum frequency, maximum frequency, call duration, slope of the call, and other more qualitative parameters such as the time-frequency shape of the call, the position of the knee, presence of inflections and terminal curvatures (see diagram in Appendix A). Less importance was placed on maximum frequency due to its susceptibility to atmospheric attenuation. Calls that could not be classified to a single species were placed in a group named after the two or more species most likely to have produced the call.

2.2.1 Exceptions to Standard Methodology

In 2016 microphone sensitivity was found to be extremely variable during routine calibration testing, likely due to the age of the microphones and different weathering conditions attained through use in previous seasons. In an attempt to determine qualitative differences in detectability, bat detectors were 'paired' at the RRM in 2016 to allow a comparison of recorded data. This involved deploying two bat detectors at each location, one with a known 'good condition' microphone with high sensitivity (>17 dB) paired with a known 'poor condition' microphone with lower sensitivity (<30 dB). The results of this comparison are provided in Appendix B. The data used in this report was that obtained from the detector with higher sensitivity to ensure the most accurate results are presented.

In 2018 two bat detectors failed to collect data for unknown reasons and the other three detectors had suspicious gaps in the recorded data. Factors could have included inclement weather, natural bat population fluctuations, microphone sensitivity, detector faults, human error or a combination of these factors. As only three of the five detectors collected data during the maternal brood rearing period, a second round of monitoring was undertaken in early fall to supplement the study program.

Table 2-1: Details of Bat Acoustic Surveys Completed

Year	Detector	Round [1]		Round [2]		Combined
		Recording Dates	Recording Period (nights)	Recording Dates	Recording Period (nights)	Recording Period (nights)
2015	Detector 20	June 7 – June 20	14	June 26 – July 10	15	29
	Detector 21	June 7 – June 18	12	June 26 – July 9	14	26
	Detector 23	June 7 – June 17	11	June 26 – July 9	14	25
	Detector 24	June 7 – June 22	16	June 27 – July 11	15	31
	Detector 25	June 7 – June 21	15	June 26 – July 10	15	30
2016[1]	Detector 20	June 25 – July 9	15	--	--	15
	Detector 21	June 19 – June 30	12	--	--	12
	Detector 23	June 20 – July 4	15	--	--	15
	Detector 24	June 19 – July 1	13	--	--	13
	Detector 25	June 20 – July 3	14	--	--	14
2017	Detector 20	June 3 – June 16	14	July 1 – July 17	17	31
	Detector 21	June 1 – June 6	6	July 2 – July 15	14	20
	Detector 23	June 2 – June 16	15	July 1 – July 15	15	30
	Detector 24	June 1 – June 15	15	July 2 – July 15	14	29
	Detector 25	June 2 – June 16	15	July 1 – July 16	16	31
2018[2]	Detector 20	--	--	Aug 12 – Sept 6	26	N/A
	Detector 21	June 21 – June 27	7	Aug 12 – Sept 7	27	N/A
	Detector 23	June 2 – July 2	31	Aug 12 – Sept 7	27	N/A
	Detector 24	June 1 – June 27	27	Aug 12 – Sept 6	26	N/A
	Detector 25	--	--	Aug 12 – Sept 6	26	N/A

Notes:

Detectors were only deployed for one round in 2016.

Detector failures in 2018 led to minimal data collected during maternal brood rearing period and a later round 2 of collection in early fall, as such a total recording period was used for each round rather than the entire season.

408000 411000 414000 417000 420000 423000 426000 429000 432000 435000 438000 441000 444000

5424000 5421000 5418000 5415000 5412000 5409000 5406000

Detector 24
Detector 23
Detector 20
Detector 25
Detector 21

Strachan Rd
Lange Rd
Fisher Rd
Richardson Rd
Hwy 71
Manomin Rd
Fleming Rd
Hwy 615
Caul Rd

P:\EM\Projects\2011\TC111504 Rainy River\GIS\Terrestrial\Bat_Report_2018\MXD\Locations_of_Bat_Detectors_1.mxd

LEGEND

- Bat Detector Locations (labelled with ID)
- Approximate Principal RRM Facilities
- Watercourse
- Waterbody
- Road

0 2 4 8 12 16 20 Kilometres

NOTES:
- Pleiades imagery Sept. 6, 2018 and July 20, 2014
- Road data extracted from Land Information Ontario, Ontario Road Network, MNRF

Datum: NAD83
Projection: UTM Zone 15N

N W E S

newgold™ Rainy River Project wood.

RAINY RIVER MINE

Bat Detector Locations

PROJECT N°: TC111504 | **FIGURE: 2-1**

SCALE: 1:100,000 | DATE: February 2019

3.0 Results

Subsequent to the baseline surveys undertaken in 2012 and 2013, acoustic bat monitoring was conducted annually between 2015 and 2018. A compiled species list with respective provincial rank, SAR status, relevant protective acts and details on the years species have been detected is provided in Table 3-1.

Calls that could not be classified to a single species were placed into separate paired classes (e.g., Myotis species, LANO/EPFU) if possible and where this level of classification was not possible, calls were placed into high-frequency, low-frequency or unknown groupings.

3.1 Bat Acoustic Surveys

2015 Bat Acoustic Surveys

Acoustic bat monitoring during 2015 produced records of all six bat species anticipated to be present in the RRM area based on existing data sources: Little Brown Myotis, Northern Myotis, Big Brown Bat, Silver-Haired Bat, Hoary Bat and Eastern Red Bat. A total of 13,958 passes were recorded during the maternal brood rearing period (June to early July) over a total of 141 recording nights. Little Brown Myotis were recorded at all five survey locations and had the highest frequency of occurrence (35.3%; 4,921 passes). Another 17.3% of the total recorded passes were classified as Myotis species (either Little Brown Myotis or Northern Myotis) (Table 3-2). Silver-haired Bats, Hoary Bats and Eastern Red Bats were recorded at all five survey locations, with the next highest frequencies of occurrence (18.4%, 5.5% and 2.8% of the total recorded passes, respectively). Big Brown Bat and Northern Myotis had low frequencies of occurrence (0.3%; 37 passes and 0.2%; 22 passes, respectively) with Big Brown Bat recorded at all five survey stations and Northern Myotis at four of the five survey locations. The combination of Silver-haired Bat or Big Brown Bat had an occurrence frequency of 0.3% of the total recorded passes while the combination of Little Brown Bat or Eastern Red Bat had a very low frequency of occurrence with less than 0.01% of total recorded passes.

A total of 2,801 passes could not be classified to species or species pair; 2,450 of these were from high-frequency species, 350 were from low-frequency species, and one could not be classified, likely as a result of poor recording quality.

The acoustic activity of bats during the first recording period (early June to late June) averaged 125.29 passes per night (passes/night) at Detector 20 (D20), 529.25 passes/night at D21, 43.09 passes/night at D23, 45.31 passes/night at D24 and 14.53 passes/night at D25. The acoustic monitoring of bats during the second recording period (late June to mid-July) recorded less passes than the first round and averaged 26.33 passes/night at D20, 203.79 passes/night at D21, 14.86 passes/night at D23, 44.40 passes/night at D24 and 20.93 passes/night at D25 (Table 3-2). Several species, particularly Little Brown Myotis, showed a substantial decrease in activity during the later survey period.

2016 Bat Acoustic Surveys

Acoustic bat monitoring during 2016 produced records of all six bat species anticipated to be present in the RRM area based on existing data sources: Little Brown Myotis, Northern Myotis, Big Brown Bat, Silver-Haired Bat, Hoary Bat and Eastern Red Bat. A total of 3,591 passes were recorded during the maternal brood rearing period (June to early July) over a total of 69 recording nights. Silver-haired Bats and Hoary Bats were recorded at all five surveys stations with the two highest frequencies of occurrence (32.4% and

25.3% of the total passes recorded, respectively). Little Brown Myotis were also recorded at all five survey locations and with a relatively high frequency of occurrence (10.6%; 330 passes). Another 12.8% of the total passes were classified as Myotis species (either Little Brown Myotis or Northern Myotis) (Table 3-3). Eastern Red Bats and Big Brown Bats were both recorded at low frequencies of occurrence (1.3%; 46 passes and 0.4%; 22 passes respectively) with Eastern Red Bat recorded at all five survey stations and Big Brown Bat at four of the five survey locations. Northern Myotis were recorded twice at a single survey station, representing 0.06% of the total passes recorded. The combination of Silver-haired Bat or Big Brown Bat had a frequency of occurrence of 0.6% of the total passes recorded while the combination of Little Brown Bat or Eastern Red Bat had an even lower frequency of occurrence making up 0.2% of the total passes recorded.

A total of 591 passes could not be classified to species or species pair; 370 of these were from high-frequency species and 221 were from low-frequency species.

The acoustic activity of bats during the recording period (mid-late June to early June) averaged 49.73 passes/night at D20, 116.17 passes/night at D21, 7.20 passes/night at D23, 79.92 passes/night at D24 and 21.71 passes/night at D25. This level of activity is lower than that of 2015 and corroborates the idea noted in 2015 that activity may be lower in this area by late June.

2017 Bat Acoustic Surveys

Acoustic bat monitoring during 2017 produced records of five of the six bat species anticipated to be present in the RRM area based on existing data sources: Little Brown Myotis, Big Brown Bat, Silver-Haired Bat, Hoary Bat and Eastern Red Bat. Although no Northern Myotis were identified during this survey year, ambiguous recordings classified as Myotis species may include passes by Northern Myotis as this species is known to occur in the RRM area as it has been recorded in previous survey years (Table 3-4). A total of 9,004 passes were recorded during the maternal brood rearing period (June to early July) over a total of 141 recording nights. Silver-haired Bats were recorded at all five surveys stations with the highest frequency of occurrence (30.4% of the total passes recorded). Little Brown Myotis were also recorded at all five survey locations with a high frequency of occurrence (30.1%; 2,709 passes), with another 3.2% of the total recorded passes being classified as Myotis species (Table 3-4). Hoary Bats and Eastern Red Bats were both recorded at all five survey stations with relatively low frequencies of occurrence of 12.8% and 1.8% of the total recorded passes respectively, while Big Brown Bats were recorded at two survey stations with a low frequency of occurrence (0.06%; 5 passes). Four pairs of species occurred in low frequencies; the combination of Little Brown Bat or Eastern Red Bat had a frequency of 6.4% of the total recorded passes, Silver-haired Bat or Hoary Bat had a frequency of 0.87% of the total recorded passes, Silver-haired Bat or Big Brown Bat had a frequency of 0.14% of the total recorded passes and the combination of Eastern Red Bat or Big Brown Bat had a frequency of 0.01% of the total recorded passes.

A total of 1,061 passes could not be classified to species or species pair; 222 of these were from high-frequency species, 647 were from low-frequency species and 414 could not be classified, likely as a result of poor recording quality.

The acoustic activity of bats during the first recording period (early June to late June) averaged 45.43 passes/night at D20, 634.67 passes/night at D21, 10.07 passes/night at D23, 19.67 passes/night at D24 and 5.53 passes/night at D25. The acoustic activity of bats during the second recording period (late June to mid-July) was higher than the first round and averaged 58.18 passes/night at D20, 95.71 passes/night at D21, 31.20 passes/night at D23, 66.00 passes/night at D24 and 19.38 passes/night at D25 (Table 3-4). Most species occurrences increased in this second survey period, which may indicate a late arrival from

wintering areas. Once again, Little Brown Myotis showed a substantial decrease in activity during the later survey period which corroborates the idea noted in 2015 and 2016 that activity of this species may decrease in this area by late June.

2018 Bat Acoustic Surveys

Acoustic bat monitoring during 2018 was not undertaken with the same methodology as the previous survey years (further details in Section 2.2.1). As such the results cannot be directly compared and should be interpreted with caution. Minimal data of unknown quality was collected during the maternal brood rearing period and an additional full survey program was undertaken in the early fall.

Despite the anomalies in data collection, five of the six bat species anticipated to be present in the RRM area based on existing data sources were detected: Little Brown Myotis, Big Brown Bat, Silver-Haired Bat, Hoary Bat and Eastern Red Bat. Although no Northern Myotis were identified during this survey year, ambiguous recordings classified as Myotis species may include passes by Northern Myotis as this species is known to occur in the RRM area as it has been recorded in previous survey years (Table 3-5).

During the spring survey period a total of 1,825 passes were recorded during the maternal brood rearing period (June to early July) over a total of 65 recording nights. Only three detectors collected data for various recording periods (Table 2-1). No Little Brown Myotis were detected during this survey period. Silver-haired Bats and Hoary Bats were recorded at all three surveys stations with the two highest frequencies of occurrence (57.4% and 15.5% of the total recorded passes). Big Brown Bats and Eastern Red Bats were both recorded at two of the three survey stations with low frequencies of occurrence (0.8% and 0.2% of the total recorded passes, respectively). Five passes (0.3% of the total recorded passes) classified as Myotis species (either Little Brown Myotis or Northern Myotis) were recorded at a single station (Table 3-5).

A total of 472 (25.8%) passes could not be classified to species or species pair; 63 of these were from high-frequency species and 409 were from low-frequency species.

The acoustic activity of bats during the spring recording period (June to July) averaged 14.48 passes/night at D21, 10.11 passes/night at D23 and 157.57 passes/night at D24. Due to the various issues with bat detectors it is unclear whether the low numbers of Myotis species recorded is due to an actual paucity of individuals or due to faults with the recording equipment. Results from the next monitoring year will be key to determining current trends for these species.

During the fall survey period (late August to early September) a total of 12,975 passes were recorded over a total of 132 recording nights. Silver-haired Bats and Hoary Bats were recorded at all five surveys stations with the two highest frequencies of occurrence (60.3% and 20.6% of the total recorded passes, respectively). Eastern Red Bat and Big Brown Bat were also both recorded at all five survey stations with lower frequencies of occurrence (4.1% and 1.8% of the total recorded passes, respectively). Little Brown Myotis were recorded at three of the five survey locations while Myotis species were recorded at four of the five locations and each had a low frequency of occurrence (0.1% of the total recorded passes each; 17 and 13 passes, respectively) (Table 3-5).

A total of 1,690 passes could not be classified to species or species pair; 636 of these were from high-frequency species and 1,054 were from low-frequency species.

The acoustic activity of bats during the fall recording period (late August to early September) averaged 217.15 passes/night at D20, 83.26 passes/night at D21, 97.15 passes/night at D23, 44.73 passes/night at D24 and 139.81 passes/night at D25. Little Brown Myotis and unknown Myotis species were identified among the recorded passes, indicating they were present within the RRM study area during 2018. However, these values do not give an indication of their level of activity during the maternal brood rearing period. This fall survey has recorded the highest number of passes from both Silver-haired and Hoary Bats across all survey years. Silver-haired, Hoary and Eastern Red Bats are migratory species. Migration occurs in the spring and late summer/fall, with this latter period also coinciding with the mating period. Except for the mating period, at all other times of the year, these species are generally solitary so it is therefore not uncommon to see increases in acoustic activity of these species during late summer and fall (Jameson and Willis 2014).

3.2 Bat Species at Risk

In January 2013, the Little Brown Myotis and the Northern Myotis were afforded Endangered Species Status in Ontario and are now protected under the ESA and the federal *Fish and Wildlife Conservation Act, 1997* (FWCA). Since it first appeared in upstate New York in 2006, the fungal disease known as White Nose Syndrome has decimated millions of bats throughout eastern North America and is rapidly spreading westward (Frick et al. 2010). Little Brown Myotis and Northern Myotis are the two species most impacted by White Nose Syndrome (White-Nose Syndrome Response Team 2018). The natural histories of these two species are very similar in that both rely on old growth forest stands where they form maternity colonies in tree cavities. Both also rely on caves and abandoned mines as hibernacula and staging points for reproductive activities (Norquay et al. 2013). This section presents acoustic survey results specific to the two SAR known to occur within the RRM study area.

3.2.1 Little Brown Myotis

Since the Northern Myotis is generally less abundant than the Little Brown Myotis (Caceres and Barclay 2000), the majority of calls classified as Myotis species were likely produced by the Little Brown Myotis.

During spring maternal brood rearing period surveys in 2015 Little Brown Myotis and the Myotis species group made up 52% (7,334 out of 13,958) of all recorded passes, of which 70% of these (5,152 out of 7,334) were at D21 (Table 3-6). In 2016, these species made up less of the overall passes, with 23% (839 out of 3591) of all recorded passes, however, 68% of these (573 out of 839) were again at D21. Similarly, in 2017 these species made up 33% (2,999 out of 9,004) of all recorded passes, and again, 93% of these (2,778 out of 2,999) were at D21. While there appears to be variation in the activity levels of this species between years, the majority of the activity is consistently at Detector D21.

The average activity of the Little Brown Myotis and Myotis group throughout the study area was 52.01 passes/night in 2015, 12.16 passes/night in 2016, 21.27 passes/night in 2017, dropping to 0.08 passes/night in 2018. There appears to be high variability in average number of passes/night between survey years. While this decrease does seem to correspond with the approximate arrival of White Nose Syndrome in the area (White-Nose Syndrome Response Team 2018), the data from 2018 is of relatively questionable quality, so the next round of survey data will be key to predicting ongoing population dynamics for this species.

3.2.2 Northern Myotis

Northern Myotis was recorded in the RRM study area in 2015 and 2016 with a low detection rate. This species was not confidently identifiable to species in 2017 or 2018. This species may have been recorded more often but could not be distinguished from the Little Brown Myotis. Both species commonly produce echolocation calls that are difficult to distinguish from each other and so the Northern Myotis may have been recorded more often and at more locations than could be determined.

During spring maternal brood rearing period surveys in 2015, Northern Myotis made up 0.16% of all recorded passes (22 out of 13958) of which 18% were recorded at D20, 50% at D23, 23% at D24 and 9% at D25 (Table 3-6). In 2016, only two passes were detected, and both were at D23. It is not possible to make broad conclusions with the paucity of data currently available for this species, however, it appears D23 may have slightly higher activity levels of this species in comparison with the other detectors.

Average activity of Northern Myotis throughout the study area was 0.16 passes/night in 2015 and 0.03 passes/night in 2016.

Table 3-1: Bat Species Confirmed Present by Survey Year

Common Name	Scientific Name	Observed in 2012	Observed in 2013	Observed in 2015	Observed in 2016	Observed in 2017	Observed in 2018	Provincial S-Rank 1	ESA / SARA Status 2	Other Protective Acts 3
Big Brown Bat	*Eptesicus fuscus*	--	✓	✓	✓	✓	✓	S4	--	FWCA
Silver-haired Bat	*Lasionycteris noctivagans*	✓	✓	✓	✓	✓	✓	S4	--	FWCA
Eastern Red Bat	*Lasiurus borealis*	✓	--	✓	✓	✓	✓	S4	--	FWCA
Hoary Bat	*Lasiurus cinereus*	✓	✓	✓	✓	✓	✓	S4	--	FWCA
Little Brown Myotis	*Myotis lucifugus*	✓	✓	✓	✓	✓	✓	S3	END/END	FWCA
Northern Myotis	*Myotis septentrionalis*	✓	✓	✓	✓	--	--	S3	END/END	FWCA

Notes:

S-Rank: S3 Uncommon or vulnerable species; S4 Apparently Secure Species; S5 Secure Species
ESA: Endangered Species Act; SARA: Species at Risk Act – Schedule 1: Full protection under SARA. END: Endangered
FWCA: Fish and Wildlife Conservation Act

Table 3-2: Bat Passes Recorded at Acoustic Detectors during the 2015 Maternal Brood Rearing Period

Detector ID	Round	MYLU	MYSE	Myotis	MYLU / LABO	LABO	LABO / EPFU	HiF Species	LACI	LANO	EPFU	LANO / EPFU	LANO / LACI	LoF Species	Unknown	Total Passes	Passes/Night
D20	1	348	4	482	5	32	--	330	133	387	8	2	--	23	--	**1754**	**125.29**
D20	2	70	--	147	--	2	--	71	19	81	1	--	--	4	--	**395**	**26.33**
D21	1	2988	--	779	--	330	--	1354	25	788	10	9	--	67	1	**6,351**	**529.25**
D21	2	892	--	493	--	4	--	505	48	699	8	25	--	179	--	**2853**	**203.79**
D23	1	72	8	171	--	2	--	43	40	122	2	--	--	14	--	**474**	**43.09**
D23	2	18	3	53	--	1	--	24	37	57	--	2	--	13	--	**208**	**14.86**
D24	1	307	3	121	--	2	--	42	153	87	--	--	--	10	--	**725**	**45.31**
D24	2	203	2	128	--	13	--	50	176	79	1	2	--	12	--	**666**	**44.40**
D25	1	11	0	20	--	0	--	11	84	74	6	--	--	12	--	**218**	**14.53**
D25	2	12	2	19	--	0	--	20	49	195	1	--	--	16	--	**314**	**20.93**
TOTAL		**4921**	**22**	**2413**	**5**	**386**	**--**	**2450**	**764**	**2569**	**37**	**40**	**--**	**350**	**1**	**13,958**	**98.99**
Total Passes / Night		**34.90**	**0.16**	**17.11**	**0.04**	**2.74**	**--**	**17.38**	**5.42**	**18.22**	**0.26**	**0.28**	**--**	**2.48**	**0.01**	**--**	**--**

Notes:

Four letter codes are derived from scientific names; combinations refer to passes with characteristics from both species

HiF = high-frequency bat species
LoF = low-frequency bat species
MYLU = Little Brown Myotis
MYSE = Northern Myotis
LABO = Eastern Red Bat
LACI = Hoary Bat
LANO = Silver-haired Bat
EPFU = Big Brown Bat
MYLU/LABO = Little Brown Myotis or Eastern Red Bat
LABO / EPFU = Eastern Red Bat or Big Brown Bat
LANO/EPFU = Silver-haired Bat or Big Brown Bat
LANO/LACI = Silver-haired Bat or Hoary Bat

Table 3-3: Bat Passes Recorded at Acoustic Detectors during the 2016 Maternal Brood Rearing Period

Detector ID	Round	MYLU	MYSE	Myotis	MYLU / LABO	LABO	LABO / EPFU	HiF Species	LACI	LANO	EPFU	LANO / EPFU	LANO / LACI	LoF Species	Unknown	Total Passes	Passes/Night
D20	1	7	--	111	1	2	--	109	263	241	1	1	--	10	--	**746**	**49.73**
D21	1	330	--	243	4	6	--	210	27	425	7	10	--	132	--	**1,394**	**116.17**
D23	1	10	2	19	--	4	--	6	11	49	--	3	--	4	--	**108**	**7.20**
D24	1	23	--	69	--	29	--	40	703	97	4	5	--	69	--	**1,039**	**79.92**
D25	1	10	--	17	3	5	--	5	160	96	1	1	--	6	--	**304**	**21.71**
TOTAL		**380**	**2**	**459**	**8**	**46**	**--**	**370**	**1164**	**908**	**13**	**20**	**--**	**221**	**--**	**3591**	**52.04**
Total Passes / Night		**5.51**	**0.03**	**6.65**	**0.12**	**0.67**	**--**	**5.36**	**16.87**	**13.16**	**0.19**	**0.29**	**--**	**3.20**	**--**	**--**	**--**

Notes:

Four letter codes are derived from scientific names; combinations refer to passes with characteristics from both species

HiF = high-frequency bat species
LoF = low-frequency bat species
MYLU = Little Brown Myotis
MYSE = Northern Myotis
LABO = Eastern Red Bat
LACI = Hoary Bat
LANO = Silver-haired Bat
EPFU = Big Brown Bat
MYLU/LABO = Little Brown Myotis or Eastern Red Bat
LABO / EPFU = Eastern Red Bat or Big Brown Bat
LANO/EPFU = Silver-haired Bat or Big Brown Bat
LANO/LACI = Silver-haired Bat or Hoary Bat

Table 3-4: Bat Passes Recorded at Acoustic Detectors during the 2017 Maternal Brood Rearing Period

Detector ID	Round	MYLU	MYSE	Myotis	MYLU / LABO	LABO	LABO / EPFU	HiF Species	LACI	LANO	EPFU	LANO / EPFU	LANO / LACI	LoF Species	Unknown	Total Passes	Passes/Night
D20	1	6	--	1	--	--	--	3	152	374	--	--	2	44	54	**636**	**45.43**
D20	2	5	--	5	2	8	--	1	361	427	--	--	15	96	69	**989**	**58.18**
D21	1	2669	--	109	562	127	--	168	28	114	--	--	6	17	8	**3,808**	**634.67**
D21	2	23	--	137	1	9	--	34	172	644	3	9	20	159	129	**1,340**	**95.71**
D23	1	1	--	--	--	1	--	--	30	94	--	--	--	12	13	**151**	**10.07**
D23	2	3	--	1	--	14	--	5	123	269	2	3	7	15	26	**468**	**31.20**
D24	1	--	--	4	--	--	--	--	107	71	--	--	2	70	41	**295**	**19.67**
D24	2	--	--	30	--	2	1	9	90	514	--	1	21	202	54	**924**	**66.00**
D25	1	1	--	--	--	--	--	--	29	47	--	--	--	2	4	**83**	**5.53**
D25	2	1	--	3	--	2	--	2	65	186	--	--	5	30	16	**310**	**19.38**
TOTAL		**2709**	**--**	**290**	**565**	**163**	**1**	**222**	**1157**	**2740**	**5**	**13**	**78**	**647**	**414**	**9,004**	**63.86**
Total Passes / Night		**19.21**	**--**	**2.06**	**4.01**	**1.16**	**0.01**	**1.57**	**8.21**	**19.43**	**0.04**	**0.09**	**0.55**	**4.59**	**2.94**	**--**	**--**

Notes:

Four letter codes are derived from scientific names; combinations refer to passes with characteristics from both species

HiF = high-frequency bat species
LoF = low-frequency bat species
MYLU = Little Brown Myotis
MYSE = Northern Myotis
LABO = Eastern Red Bat
LACI = Hoary Bat
LANO = Silver-haired Bat
EPFU = Big Brown Bat
MYLU/LABO = Little Brown Myotis or Eastern Red Bat
LABO / EPFU = Eastern Red Bat or Big Brown Bat
LANO/EPFU = Silver-haired Bat or Big Brown Bat
LANO/LACI = Silver-haired Bat or Hoary Bat

Table 3-5: Bat Passes Recorded at Acoustic Detectors during the 2018 Survey Period

Detector ID[2]	Round	MYLU	MYSE	Myotis	MYLU / LABO	LABO	LABO / EPFU	HiF Species	LACI	LANO	EPFU	LANO / EPFU	LANO / LACI	LoF Species	Unknown	Total Passes	Passes/Night[1]
Maternal Roosting Period Surveys																	
D21	1	--	--	5	--	1	--	50	151	589	7	--	--	300	--	**449**	**14.48**
D23	1	--	--	--	--	2	--	7	59	301	7	--	--	73	--	**273**	**10.11**
D24	1	--	--	--	--	--	--	6	73	158	--	--	--	36	--	**1103**	**157.57**
TOTAL		**--**	**--**	**5**	**--**	**3**	**--**	**63**	**283**	**1048**	**14**	**--**	**--**	**409**	**--**	**1,825**	**28.08**
Total Passes / Night[1]		--	--	0.08	--	0.05	--	0.97	4.35	16.12	0.22	--	--	6.29	--	--	--
Early Fall Surveys																	
D20	2	3	--	1	--	115	--	58	516	2352	16	--	--	245	--	**3,306**	**127.15**
D21	2	--	--	4	--	105	--	244	458	1257	4	--	--	176	--	**2,248**	**83.26**
D23	2	--	--	--	--	60	--	196	537	1550	8	--	--	272	--	**2,623**	**97.15**
D24	2	5	--	2	--	15	--	32	198	806	13	--	--	92	--	**1,163**	**44.73**
D25	2	9	--	6	--	235	--	106	963	1855	192	--	--	269	--	**3,635**	**139.81**
TOTAL		**17**	**--**	**13**	**--**	**530**	**--**	**636**	**2672**	**7820**	**233**	**--**	**--**	**1054**	**--**	**12,975**	**98.30**
Total Passes / Night[1]		**0.13**	**--**	**0.10**	**--**	**4.02**	**--**	**4.82**	**20.24**	**59.24**	**1.77**	**--**	**--**	**7.98**	**--**	**--**	**--**

Notes:

Detector failures in 2018 led to minimal data collected during maternal brood rearing period and a later round 2 of collection in early fall, as such passes/night were calculated for each round rather than the entire season.

Four letter codes are derived from scientific names; combinations refer to passes with characteristics from both species

HiF = high-frequency bat species
LoF = low-frequency bat species
MYLU = Little Brown Myotis
MYSE = Northern Myotis
LABO = Eastern Red Bat
LACI = Hoary Bat
LANO = Silver-haired Bat
EPFU = Big Brown Bat
MYLU/LABO = Little Brown Myotis or Eastern Red Bat
LABO / EPFU = Eastern Red Bat or Big Brown Bat
LANO/EPFU = Silver-haired Bat or Big Brown Bat
LANO/LACI = Silver-haired Bat or Hoary Bat.

Table 3-6: SAR Bat Passes by Year

Year	Detector ID	MYLU		MYSE		Myotis	
		Total Passes	Passes/Night	Total Passes	Passes/Night	Total Passes	Passes/Night
2015	D20	418	14.41	4	0.14	629	21.69
	D21	3880	149.23	0	0.00	1272	48.92
	D23	90	3.60	11	0.44	224	8.96
	D24	510	16.45	5	0.16	249	8.03
	D25	23	0.77	2	0.07	39	1.30
	Total	4921	34.90	22	0.16	2413	17.11
2016	D20	7	0.47	0	0	111	7.40
	D21	330	27.5	0	0	243	20.25
	D23	10	0.67	2	0.136	19	1.27
	D24	23	1.77	0	0	69	5.31
	D25	10	0.71	0	0	17	1.21
	Total	380	5.51	2	0.03	459	6.65
2017	D20	11	0.35	0	0	6	0.19
	D21	2692	134.6	0	0	246	12.3
	D23	4	0.13	0	0	1	0.03
	D24	0	0	0	0	34	1.17
	D25	2	0.06	0	0	3	0.1
	Total	2709	19.21	0	0	290	2.06
2018 S	D21	0	0	0	0	5	0.08
	D23	0	0	0	0	0	0
	D24	0	0	0	0	0	0
	Total	0	0	0	0	5	0.08
2018 F	D20	3	0.12	0	0	1	0.04
	D21	0	0	0	0	4	0.15
	D23	0	0	0	0	0	0
	D24	5	0.19	0	0	2	0.08
	D25	9	0.35	0	0	6	0.23
	Total	17	0.13	0	0	13	0.1

Notes:

Yellow highlighted squares are those with relatively high values worthy of note. This was considered to be > 8 passes/night
Four letter codes are derived from scientific names; MYLU = Little Brown Myotis, MYSE = Northern Myotis

Table 3-7: SAR Bat Passes by Detector

Detector ID	Year	MYLU		MYSE		Myotis	
		Total Passes	Passes/Night	Total Passes	Passes/Night	Total Passes	Passes/Night
D20	2015	418	14.41	4	0.14	629	21.69
	2016	7	0.47	0	0	111	7.40
	2017	11	0.35	0	0	6	0.19
	2018 F	3	0.12	0	0	1	0.04
D21	2015	3880	149.23	0	0	1272	48.92
	2016	330	27.50	0	0	243	20.25
	2017	2692	134.60	0	0	246	12.3
	2018 S	0	0	0	0	5	0.08
	2018 F	0	0	0	0	4	0.15
D23	2015	90	3.60	11	0.44	224	8.96
	2016	10	0.67	2	0.13	19	1.27
	2017	4	0.13	0	0	1	0.03
	2018 S	0	0	0	0	0	0
	2018 F	0	0	0	0	0	0
D24	2015	510	16.45	5	0.16	249	8.03
	2016	23	1.77	0	0	69	5.31
	2017	0	0	0	0	34	1.17
	2018 S	0	0	0	0	0	0
	2018 F	17	0.13	0	0	13	0.10
D25	2015	23	0.77	2	0.07	39	1.3
	2016	10	0.71	0	0	17	1.21
	2017	2	0.06	0	0	3	0.10
	2018 F	9	0.35	0	0	6	0.23

Notes:

Yellow highlighted squares are those with relatively high values worthy of note. This was considered to be > 8 passes/night
Four letter codes are derived from scientific names; MYLU = Little Brown Myotis, MYSE = Northern Myotis

Table 3-8: Non-SAR Bat Passes by Year

Year	Detector ID	LABO		LACI		LANO		EPFU	
		Total Passes	Passes/Night	Total Passes	Passes/Night	Total Passes	Passes/Night	Total Passes	Passes/Night
2015	D20	34	1.17	152	5.24	468	16.14	9	0.31
	D21	334	12.85	73	2.81	1487	57.19	18	0.69
	D23	3	0.12	77	3.08	179	7.16	2	0.08
	D24	15	0.48	329	10.61	166	5.35	1	0.03
	D25	0	0.00	133	4.43	269	8.97	7	0.23
	Total	386	2.74	764	5.42	2569	18.22	37	0.26
2016	D20	2	0.13	263	17.53	241	16.07	1	0.07
	D21	6	0.50	27	2.25	425	35.42	7	0.58
	D23	4	0.27	11	0.73	49	3.27	0	0.00
	D24	29	2.23	703	54.08	97	7.46	4	0.31
	D25	5	0.36	160	11.43	96	6.86	1	0.07
	Total	46	0.67	1164	16.87	908	13.16	13	0.19
2017	D20	8	0.26	513	16.55	801	25.84	0	0.00
	D21	136	6.80	200	10.00	758	37.90	3	0.15
	D23	15	0.50	153	5.10	363	12.10	2	0.07
	D24	2	0.07	197	6.79	585	20.17	0	0.00
	D25	2	0.06	94	3.03	233	7.52	0	0.00
	Total	163	1.16	1157	8.21	2740	19.43	5	0.04
2018 S	D21	1	0.14	151	21.57	589	84.14	7	1.00
	D23	2	0.06	59	1.90	301	9.71	7	0.23
	D24	0	0.00	73	2.70	158	5.85	0	0.00
	Total	3	0.05	283	4.35	1048	16.12	14	0.22
2018 F	D20	115	4.42	516	19.85	2352	90.46	16	0.62
	D21	105	3.89	458	16.96	1257	46.56	4	0.15
	D23	60	2.22	537	19.89	1550	57.41	8	0.30
	D24	15	0.58	198	7.62	806	31.00	13	0.50
	D25	235	9.04	963	37.04	1855	71.35	192	7.38
	Total	530	4.02	2672	20.24	7820	59.24	233	1.77

Notes:

Yellow highlighted squares are those with relatively high values worthy of note. For species with lower frequency of detection (LABO and EPFU) this was considered to be 9 passes/night and for species with high frequency of detection (LACI and LANO) this was considered to be > 30 passes/night.

Four letter codes are derived from scientific names; LABO = Eastern Red Bat, LACI = Hoary Bat, LANO = Silver-haired Bat, EPFU = Big Brown Bat.

Table 3-9: Non-SAR Bat Passes by Detector

Detector ID	Year	LABO		LACI		LANO		EPFU	
		Total Passes	Passes/Night	Total Passes	Passes/Night	Total Passes	Passes/Night	Total Passes	Passes/Night
D20	2015	34	1.17	152	5.24	468	16.14	9	0.31
	2016	2	0.13	263	17.53	241	16.07	1	0.07
	2017	8	0.26	513	16.55	801	25.84	0	0.00
	2018 F	115	4.42	516	19.85	2352	90.46	16	0.62
D21	2015	334	12.85	73	2.81	1487	57.19	18	0.69
	2016	6	0.50	27	2.25	425	35.42	7	0.58
	2017	136	6.80	200	10.00	758	37.90	3	0.15
	2018 S	1	0.14	151	21.57	589	84.14	7	1.00
	2018 F	105	3.89	458	16.96	1257	46.56	4	0.15
D23	2015	3	0.12	77	3.08	179	7.16	2	0.08
	2016	4	0.27	11	0.73	49	3.27	0	0.00
	2017	15	0.50	153	5.10	363	12.10	2	0.07
	2018 S	2	0.06	59	1.90	301	9.71	7	0.23
	2018 F	60	2.22	537	19.89	1550	57.41	8	0.30
D24	2015	15	0.48	329	10.61	166	5.35	1	0.03
	2016	29	2.23	703	54.08	97	7.46	4	0.31
	2017	2	0.07	197	6.79	585	20.17	0	0.00
	2018 S	0	0.00	73	2.70	158	5.85	0	0.00
	2018 F	15	0.58	198	7.62	806	31.00	13	0.50
D25	2015	0	0.00	133	4.43	269	8.97	7	0.23
	2016	5	0.36	160	11.43	96	6.86	1	0.07
	2017	2	0.06	94	3.03	233	7.52	0	0.00
	2018 F	235	9.04	963	37.04	1855	71.35	192	7.38

Notes:

Yellow highlighted squares are those with relatively high values worthy of note. For species with lower frequency of detection (LABO and EPFU) this was considered to be 9 passes/night and for species with high frequency of detection (LACI and LANO) this was considered to be > 30 passes/night.

Four letter codes are derived from scientific names; LABO = Eastern Red Bat, LACI = Hoary Bat, LANO = Silver-haired Bat, EPFU = Big Brown Bat.

4.0 Discussion

4.1 Species at Risk

Little Brown Myotis

The Little Brown Myotis is designated as Endangered under both the ESA and SARA. Ontario's ESA prohibits harming, destroying or disturbing habitat for this species under Sections 9 and 10 of the Act. The Little Brown Myotis is at risk of population decline due to their low reproduction rates, communal hibernating behaviour and recent declines due to White Nose Syndrome, a fungal infection that has been devastating bat populations across eastern North America. More information about White Nose Syndrome is provided in Section 4.5.

Little Brown Myotis roost in small spaces or crevices found in loose bark, hollow trees, rock faces and human structures such as walls and bat boxes. Colony numbers may range from a few to a few hundred individuals (Ministry of Natural Resources [MNR] 2011, Environment and Climate Change Canada [ECCC] 2018). This species forages over open areas such as water, forest trails and meadows. During the winter months the Little Brown Myotis will hibernate in caves and abandoned mines shafts, underground foundations and karst (MNR 2011, ECCC 2018). Hibernacula sites are characterized by remote and restricted openings with sufficient space for entry and with interior air temperatures slightly above freezing, relative humidity levels above 90% and sufficient space for roosting (Raesly and Gates 1987, MNR 2000, ECCC 2018).

Little Brown Myotis was recorded at all five survey locations within the RRM study area at high levels, particularly in 2015 and 2017 (Table 3-6). In 2015 35% of all passes were by Little Brown Myotis with an additional 17% by Myotis species (4,921 and 2,413 passes, respectively). In 2017, 30% of all passes were by Little Brown Myotis with an additional 4% by Myotis species (2,709 and 290 passes, respectively).

Little Brown Myotis and Myotis species passes appear to have a consistently high detection rate at Detector 21 (Table 3-7). In 2015, detections of these species at D21 made up 70% of their overall detections and in 2017 this value increased to 93%. Despite the 2016 survey period having a smaller sample size for these species, 68% of their overall detections were at D21.

Detector 21 is situated beside the Pinewood River with agriculture to the north and forest to the south of the river. During 2013 vegetation and habitat assessments for bat critical habitat no maternity roost sites were identified and no habitat meeting the Ministry of Natural Resources and Forestry (MNRF) criteria for significant bat habitat was detected around the RRM site (AMEC 2013). However, with the high levels of activity and detection rates at Detector 21 it is possible a maternity roost is located in the adjacent forest habitat and further bat habitat surveys should be considered.

There is not enough repetition in survey periods yet to indicate clear trends. However, it appears that Little Brown Myotis and Myotis species show higher activity levels in earlier sampling periods (beginning in early June). In 2015 and 2017 when two rounds of surveys were undertaken, the second round in both years had lower numbers of Little Brown Myotis and Myotis detections. While only one survey was undertaken in 2016, it was completed later in June than surveys completed in 2015 and 2017 (Table 2-1). While it could be at least partly a yearly effect, the levels of Little Brown Myotis and Myotis activity were lower in this survey than they had been for those performed earlier in 2015 and 2017.

Northern Myotis

The Northern Myotis is designated as Endangered under both the ESA and SARA. Ontario's ESA prohibits harming, destroying or disturbing habitat for this species under Sections 9 and 10 of the Act. The Northern Myotis is at risk of population decline due to their low reproduction rates, communal hibernating behaviour and recent declines due to White Nose Syndrome, discussed below in Section 4.5.

The habitat requirements of the Northern Myotis are similar to those of the Little Brown Myotis. The Northern Myotis is also a cavity roosting bat species that resides year-round in Ontario. Roost sites include small spaces or crevices found in loose bark, hollow trees, rock faces and human structures such as walls and bat boxes. Northern Myotis roost singly or in small groups (ECCC 2018). This species forages along and within forests including forested stream corridors. During the winter months the Northern Myotis will hibernate in caves and abandoned mines shafts, underground foundations and karst (MNR 2011, ECCC 2018). Hibernacula sites are characterized by remote and restricted openings with sufficient space for entry and with interior air temperatures slightly above freezing, relative humidity levels above 90% and sufficient space for roosting (Raesly and Gates 1987, MNR 2000, ECCC 2018).

Northern Myotis was recorded in 2015 and 2016 with a low detection rate and no Northern Myotis were specifically identified in 2017 or 2018 (Table 3-6). Since the recordings of Northern Myotis are difficult to distinguish from Little Brown Myotis, identification of this species may have been underrepresented. The presence of calls classified to genus (Myotis species) suggests it is possible that Northern Myotis may be present at higher levels than currently reported within the study area.

Northern Myotis have been detected at four of the five survey stations, indicating the population may be widespread though at very low numbers. During spring maternal brood rearing period surveys Northern Myotis made up 0.16% and 0.06% of all recorded passes in 2015 and 2016 respectively. Within the passes recorded for this species, 50% of the detections were at Detector 23 in 2015 and 100% (2 passes) were at D23 in 2016. It appears D23 may have slightly higher activity levels of this species than the other detector locations (Table 3-7). However, further data are required to confirm this apparent trend.

Detector 23 is situated in a wooded area with rock barren habitat, forest clearings, trails, and roads present in close proximity. These habitats provide ample preferred foraging habitat for this species. During the 2013 vegetation and habitat assessments for bat critical habitat, no maternity roost sites or hibernacula were identified and no habitat meeting the MNRF criteria for significant bat habitat was detected around the RRM site and nearby compensatory habitats (AMEC 2013). The low levels of activity and detection rates of this species indicate that while it may be using some of these nearby habitats to carry out its life processes, it is unlikely that critical habitat is present within the RRM site.

4.2 Non-Species at Risk

Some interesting patterns were observed in the data across the survey years. As stated in Section 4.1, Detector 21 appeared to have consistently high activity levels of Little Brown Myotis. The same pattern was present for Silver-haired Bat with the highest passes/night for this species, in each maternal brood rearing survey period, recorded at this detector (Table 3-8). The highest passes/night for Eastern Red Bat across the study, recorded in 2015, were recorded at this survey location. As suggested for Little Brown Myotis, further bat habitat surveys should be considered in the forest habitat adjacent to this survey location.

Due to the issues with the acoustic surveys during the maternal brood rearing period in 2018, a unique survey was undertaken in early fall (late August to early September). The activity levels for several non-SAR bat species were detected at the highest levels for the entire study during this survey period. Silver-haired Bat detections were high at every detector location (Table 3-9) during this survey period and Detector 25 had the highest passes/night of the entire study for Eastern Red Bat, Hoary Bat, Big Brown Bat and the second highest passes/night for Silver-haired Bat. Silver-haired, Hoary and Eastern Red Bats are migratory species. Migration occurs in the spring and late summer and fall, with this latter period also coinciding with the mating period. Except for the mating period, at all other times of the year, these species are generally solitary, therefore it is not uncommon to see increases in acoustic activity of these species during late summer and fall (Jameson and Willis 2014). Detector 25 is on the edge of a large wetland complex and may represent an ideal foraging site for migrating bats. Migratory species rely on large trees for roosting and potentially as landmarks for mating (Jameson and Willis 2014). However, the 2013 vegetation and habitat assessments for bat critical habitat found no habitat meeting the MNRF criteria for significant bat habitat around the RRM site and nearby compensatory habitats (AME 2013) which supports the hypothesis that the area at D25 may serve more as a foraging stop-over site.

4.3 Results Relative to 2012 and 2013 Data

The 2012 and 2013 detectors were deployed in different locations to the detectors in 2015 through 2018. Additionally, survey periods were much shorter (5 nights) which can cause species with low detection levels to be missed or misrepresented. As such, direct comparisons are not recommended with the current analysis. These early acoustic surveys coupled with habitat assessments are considered a pilot run to determine the best locations for long term bat acoustic monitoring.

Species presence/absence, as well as relative detection levels from the current analysis are consistent with the results obtained from the 2012 and 2013 surveys periods. The 2012 survey period recorded five of the six species, with Big Brown Bat not confirmed to the species level. The 2013 survey period likewise recorded five of the six species, with Eastern Red Bat not confirmed to the species level.

Little Brown Myotis and Silver-haired Bat have been consistently detected at the highest frequencies of occurrence and widest distributions followed by Hoary Bat. Eastern Red Bat and Big Brown Bat are widespread and have been consistently detected at relatively low frequencies of occurrence while Northern Myotis has the lowest level of detection and the smallest consistent distribution.

Average activity of the Little Brown Myotis and Myotis group can be compared across the study area; in 2012 these species averaged 11.9 passes/night, in 2013 10.4 passes/night, in 2015 this value escalated to 52.0 passes/night, in 2016 5.5 passes/night, in 2017 19.21 passes/night and only 0.08 passes/night in 2018. The high degree of variability in species occurrences may be explained by multiple factors and/or combinations thereof, such as: actual population fluctuations, the arrival of White Nose Syndrome in the area in 2017/2018, weather during survey periods, various errors during detector deployment, equipment sensitivity, and/or the timing of surveys.

4.4 Critical Habitat

The RRM Final EA Report (AMEC 2014) estimated that approximately 2,170 hectares (ha) of terrestrial habitat would be directly impacted by RRM. A total of 1,352 ha of woodland habitat will be cleared, of which 1,090 ha comprise second-growth aspen-birch hardwood forest, the dominant forest community type in the NLSA. This older deciduous or mixed wood habitat type can also potentially support bat maternal roost colonies and foraging habitat for local bat species including two SAR. In addition,

approximately 261 ha of open wetland habitat and other habitats potentially used as foraging habitat will be directly impacted.

During the spring and early summer, most Ontario bat species rely on forest habitat, typically mature (dominant trees over 80 years old) deciduous or mixed stands, that support a healthy density of large-diameter cavity trees. Little Brown Myotis, Northern Myotis, Silver-haired Bat and Big Brown Bat utilize maternity roosts consisting of cavities or crevices provided by loose bark, hollow trees, woodpecker holes and rock faces, whereas Eastern Red Bat and Hoary Bat are foliage-roosting species (Fenton 1970, MNR 2011). Preferred roost trees of forest-dwelling bats are generally in early stages of decay, but may be alive, are relatively tall with large trunks, are situated in areas of low density canopy and are in proximity to other suitable roost trees (Kunz and Lumsden 2003). Females form maternity colonies of single individuals to hundreds of individuals in cavities that provide a warm, humid microclimate that optimizes gestation and growth of offspring (Kunz and Anthony, 1982).

In August and September, bats congregate at the entrance of caves or mine shafts which are used as hibernacula during the winter (Norquay et al. 2013). Hibernacula sites are characterized by remote and restricted openings with sufficient space for entry and with interior air temperatures slightly above freezing, consistent air flow, relative humidity levels above 90% and sufficient space for roosting (Raesly and Gates 1987, MNR 2000, ECCC 2018).

Thorough vegetation and habitat surveys undertaken in 2013 did not identify any maternity roost or hibernacula sites within the NLSA and nearby compensatory properties.

The density of potential maternity roosting trees in forest stands impacted by the RRM footprint ranged from 0 to 6.67 trees per ha (trees/ha) with an average of 3.6 trees/ha. The density of candidate roost trees in forest stands within prospective compensatory properties near the RRM ranged from 0 trees/ha to 8.9 trees/ha with an average of 5.2 trees/ha. Both values are below the 10 trees/ha minimum threshold specified by the MNR (MNR 2011) for identifying candidate significant bat maternity roosting habitat. Therefore, areas impacted by project activities and those in nearby compensatory properties do not contain significant maternity roosting habitat for bats, particularly of the genus Myotis.

Six areas of exposed bedrock were thoroughly examined, and none contained features such as cracks, crevices or other openings that might provide suitable habitat for hibernation. Rock piles at these sites were also unsuitable. No abandoned mines occurred near or within the RRM.

While no areas met the criteria of candidate bat maternity roost habitat or hibernacula, the detection of bats within the study area indicates several species are utilizing the habitats within the study area to carry out their life processes. The relatively high levels of activity observed in certain locations and at certain times of year as described in Sections 4.1 and 4.2 above may indicate these critical habitats are present and undetected. Future acoustic programs and bat habitat assessment could be considered as described above.

4.5 White Nose Syndrome

Little Brown Myotis and Northern Myotis species have recently experienced dramatic population declines in Ontario and across northeastern North America due to White Nose Syndrome. White Nose Syndrome is a fungus which grows optimally in the same conditions under which bats hibernate and has killed up to 99% of bats in infected hibernacula (Frick et al. 2010). White Nose Syndrome grows on the muzzle, ears and wings of hibernating bats and spreads quickly between hibernating bats which huddle together to

thermoregulate during the winter. In doing so, infected individuals may pass the fungus to neighbouring bats. White Nose Syndrome causes bats to prematurely arouse from torpor (hibernation) in the winter and subsequently, leads to death from starvation due to excessive activity without a readily available food source (MNR 2011).

5.0 Conclusion

Acoustic monitoring has consistently recorded all six species of bat anticipated to be present, based on current known ranges. These species are: Little Brown Myotis, Northern Myotis, Eastern Red Bat, Silver-Haired Bat, Hoary Bat and Big Brown Bat. The Little Brown Myotis and Northern Myotis are both designated as Endangered Species protected under Ontario's ESA, which prohibits harming, destroying or disturbing habitat for these species under Sections 9 and 10 of the Act.

Detection levels for all species are variable though some patterns are apparent. Little Brown Myotis and Silver-haired Bats have been consistently detected at the highest frequencies of occurrence and widest distributions, followed by Hoary Bat. Eastern Red Bat and Big Brown Bat are widespread and have been consistently detected at relatively low frequencies of occurrence, while Northern Myotis has the lowest level of detection and the smallest consistent distribution.

Northern Myotis was recorded in 2015 and 2016, although with a low detection rate, and this species was not confidently identifiable to species in 2017 or 2018. Since the recordings of Northern Myotis are difficult to distinguish from Little Brown Myotis, identification of this species may have been underrepresented. The presence of calls classified to genus (Myotis species) suggests it is possible that Northern Myotis may be present at higher levels than currently reported within the study area. During spring maternal brood rearing period surveys Northern Myotis made up 0.16% and 0.06% of all recorded passes in 2015 and 2016, respectively. Within the passes recorded for this species, 50% of the detections were at D23 in 2015 and 100% (2 passes) were at D23 in 2016. While it is not possible to confirm apparent trends with the level of data currently collected, it appears D23 may have slightly higher activity levels of this species than the other detector locations.

Little Brown Myotis was frequently recorded at all five survey locations within the RRM study area at relatively high levels, particularly in 2015 and 2017. In 2015, 52% of the total passes recorded were by Little Brown Myotis or Myotis species and in 2017 these species represented 34% of all passes.

Little Brown Myotis and Myotis species passes appear to have a consistently high detection rate at Detector D21. Between 2015 and 2017 detections of these species at D21 made up 68% to 93% of their overall detections. The same pattern was present for Silver-haired Bat, where D21 consistently recorded the highest passes/night for this species throughout all of the survey periods.

Due to the issues with the acoustic surveys during the maternal brood rearing period in 2018, a unique survey was undertaken in early fall (late August to early September). Interestingly, activity levels for several non-SAR bat species were recorded at their highest levels for the entire study area during this survey period. Silver-haired Bat detections were relatively high at every detector location during this survey period and Detector 25 had the highest passes/night of the entire study for Eastern Red Bat, Hoary Bat, Big Brown Bat. Detector 25 is on the edge of a large wetland complex and may represent an ideal foraging stop-over site for migrating bats.

Most of Ontario's bats, including the two SAR, Little Brown Myotis and Northern Myotis, use mature forests with a high density of large diameter cavity trees as maternity colonies (MNR 2011). Use of maternity colony stands generally occurs between June and July, thus tree clearing of potential bat habitat should be undertaken outside of this period to avoid harming or disrupting roosting bats. If tree clearing must be undertaken between the months of May and August, consultation with the MNRF should be undertaken prior to clearing activities to confirm other seasonal restrictions (such as the breeding bird season) and surveys should be undertaken to confirm the presence of significant roosting habitat. Should

roosting colonies be located within these areas, consultation with the MNRF and ECCC will be required to establish whether clearing activities may continue, whether SAR permitting is required and whether habitat compensation will be required.

During thorough vegetation surveys and bat habitat assessments in 2013 no candidate maternity roosting habitat or hibernacula were identified. However, acoustic surveys demonstrate that these species are consistently active, with some species having relatively high activity levels within the RRM study area. This suggests that at least some roosts or other critical habitat may be present nearby.

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7.0 Closing

This report has been developed based on information gathered from field and acoustic surveys.

We trust that this report is sufficient for your needs. Should additional information be required, please contact the undersigned at (905) 568-2929.

Regards,
Wood Environment & Infrastructure
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Appendix A
Bat Acoustic Analysis Sample

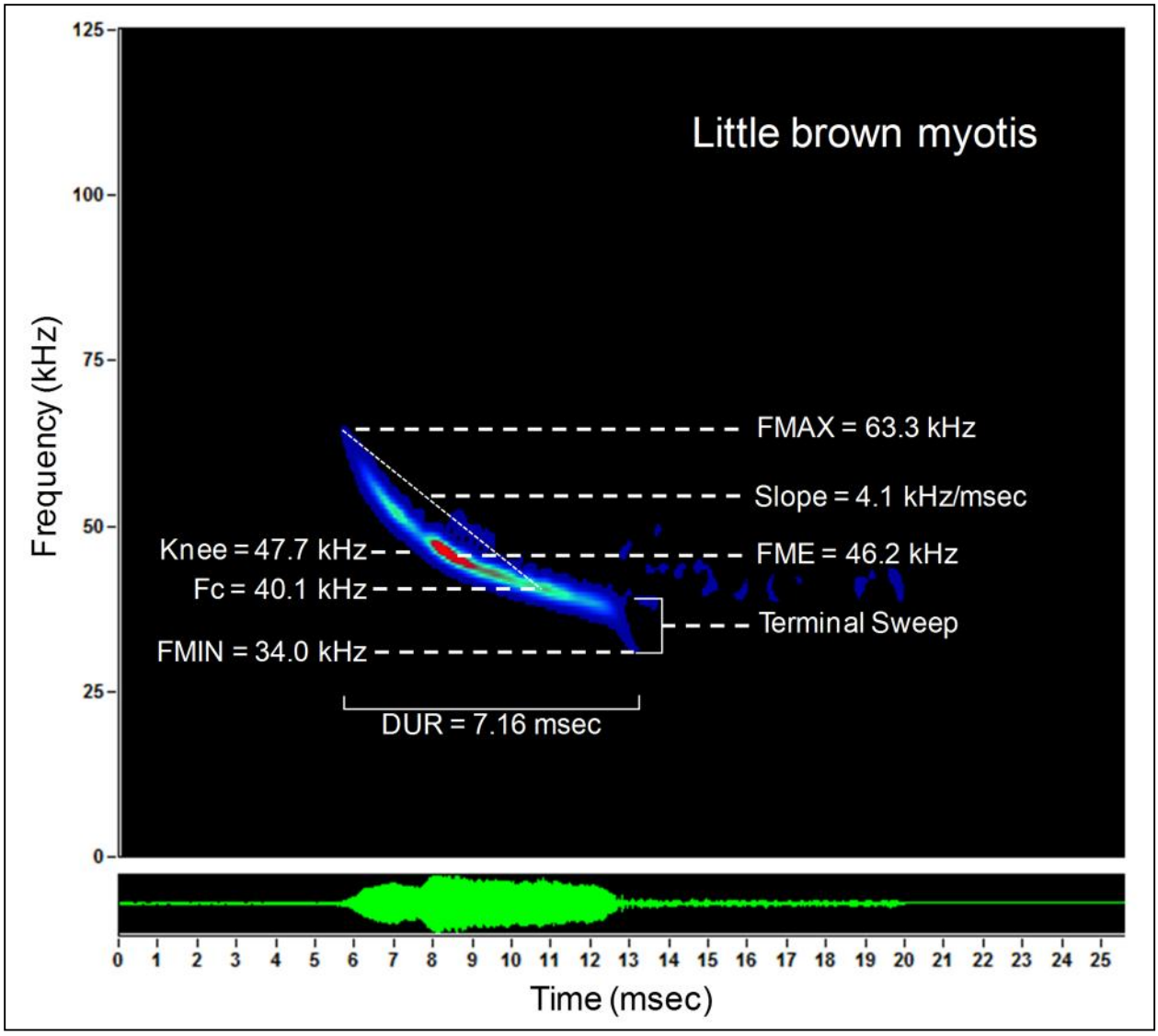

Figure 1: Spectrogram (above) and oscillogram (below) of a search-phase echolocation pulse from a Little Brown Myotis (Myotis lucifugus). Parameters displayed are those used to identify which species emitted the call: FMAX = Maximum frequency, FMIN = Minimum frequency, FME = Frequency with maximum energy, Knee = Frequency of most abrupt change in slope, Fc = Main frequency at the end of the call, DUR = Duration.

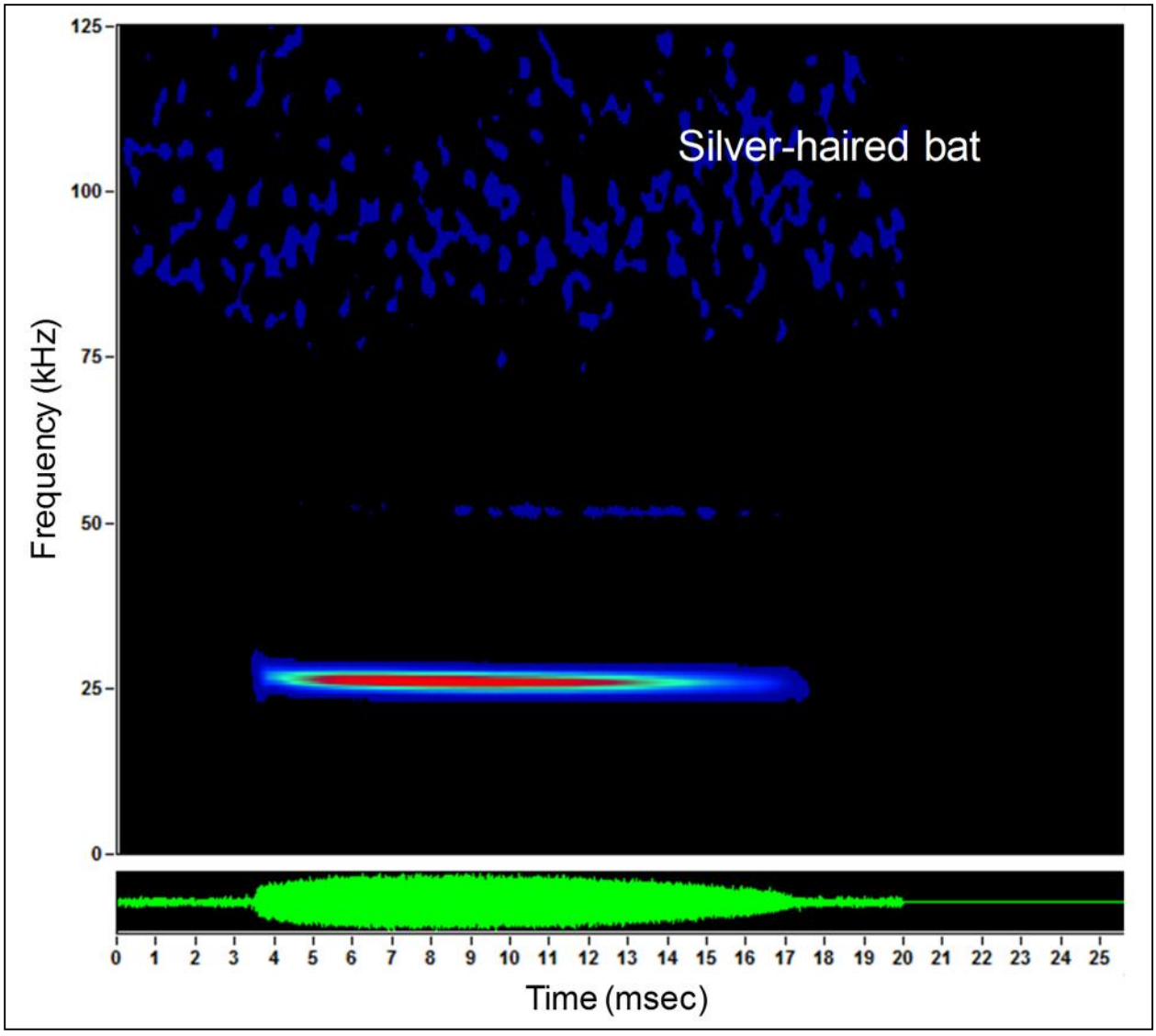

Figure 2: Spectrogram (above) and oscillogram (below) of a search-phase (constant frequency variant) echolocation pulse from a Silver-haired Bat (Lasionycteris noctivagans).

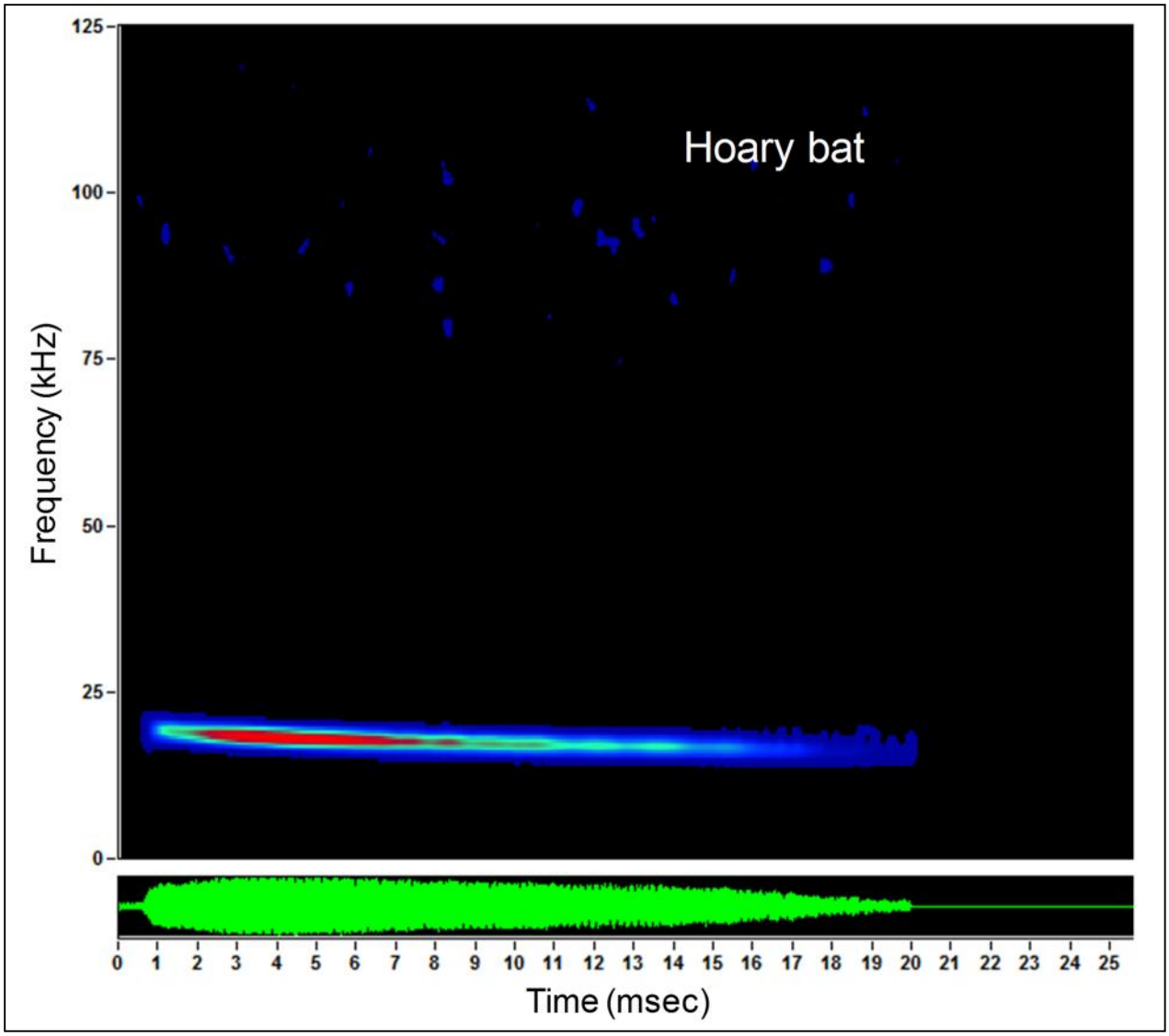

Figure 3: Spectrogram (above) and oscillogram (below) of a search-phase echolocation pulse from a Hoary Bat (Lasiurus cinereus).

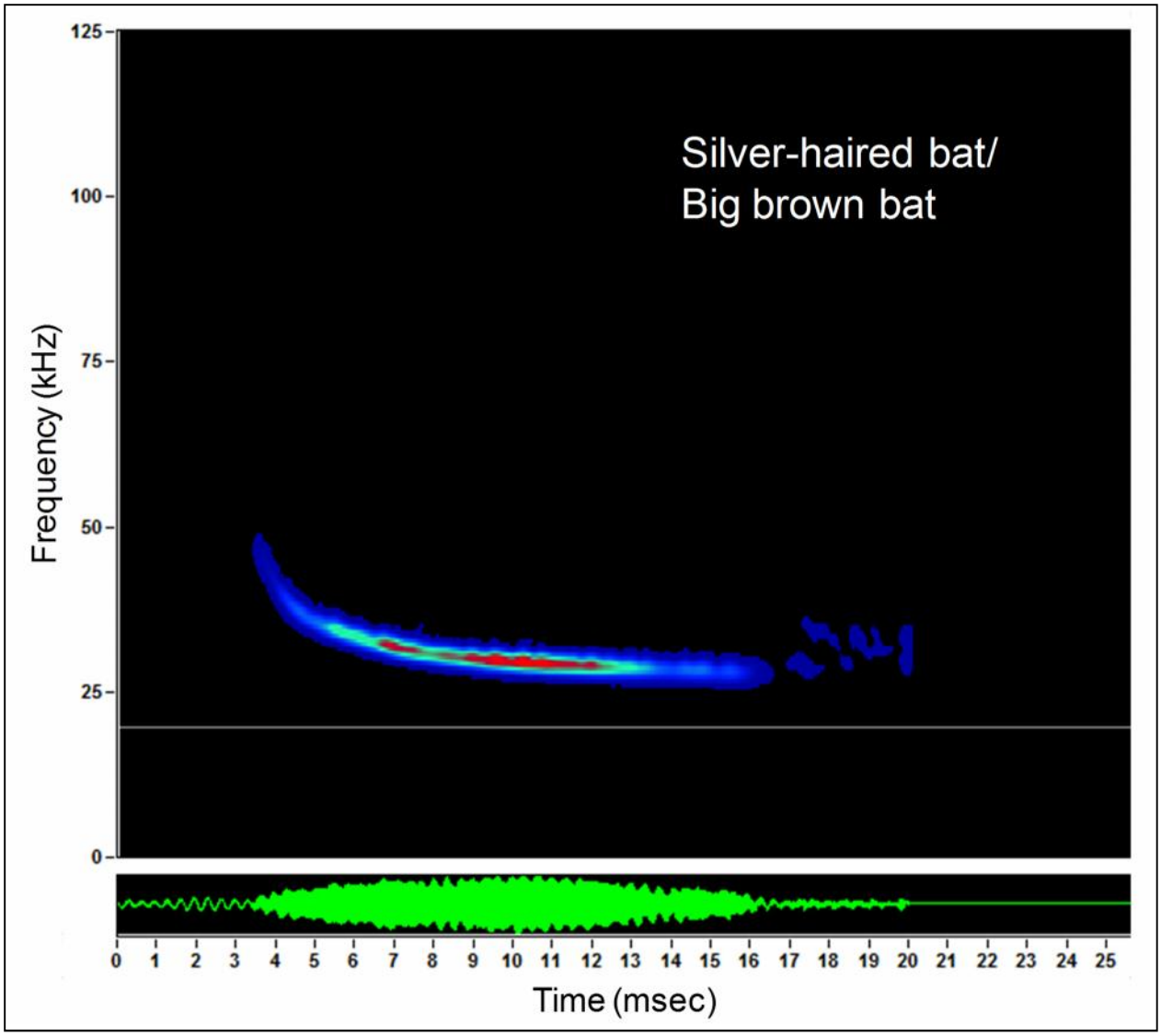

Figure 4: Spectrogram (above) and oscillogram (below) of a search-phase echolocation pulse from either a Silver-haired Bat (Lasionycteris noctivagans) or a Big Brown Bat (Eptesicus fuscus). These two species produce certain variants of echolocation that are similar to each other. This often makes it nearly impossible to accurately distinguish between these species using echolocation.

Appendix B

Microphone Sensitivity Report

Bat Detector Pair Testing in 2016

In 2016 microphone sensitivity was found to be extremely variable during routine calibration testing; likely due to the age of the microphones and different weathering conditions attained through use in previous seasons. In an attempt to determine qualitative differences in detectability bat detectors were 'paired' at the RRM in 2016 to allow a comparison of recorded data. This involved deploying two bat detectors at each location, one with a known 'good condition' microphone with a high sensitivity (< -17 dB) with a known 'poor condition' microphone with lower sensitivity (>19 dB).

As shown in the table below the qualitative differences in detectability are quite variable. A microphone pairing that had a 50.30% decrease in sensitivity resulted in an increase of 10.19% passes recorded while another pairing with a 38.78% decrease in sensitivity resulted in a 62.46% reduction in passes recorded.

There are other factors which could be influencing this variability such as recording environment, background noise, microphone positioning, the quality and distance from the source sound and whether there is a clear path between the source and the microphone.

High microphone sensitivity is clearly integral to the quality of data produced however there appears to be high variability in this relationship. This variability makes setting an acceptable sensitivity threshold difficult and implications may need to be addressed on a case by case basis.

Table 1: Appendix Microphone Sensitivity Data

Detector ID	Microphone Condition1	Microphone Sensitivity (dB)	MYLU	MYSE	Myotis	MYLU / LABO	LABO	HiF Species	LACI	LANO	EPFU	LANO / EPFU	LoF Species	UNKN	Total Passes	Passes / Night
D21	Good	-15.9	330	--	243	4	6	210	27	425	7	10	132	--	**1394**	**116.17**
D21	Poor	-23.5	--	--	200	--	1	182	15	182	1	12	108	1	**702**	**58.50**
Difference		***-47.80%***	*(-330)*	--	*(-43)*	*(-4)*	*(-5)*	*(-28)*	*(-12)*	*(-243)*	*(-6)*	*(-2)*	*(-24)*	*+1*	***(-692)***	***-49.64%***
D23	Good	-16.9	10	2	19	--	4	6	11	49	--	3	4	--	**108**	**7.20**
D23	Poor	-25.4	15	4	13	--	4	13	13	52	--	--	5	--	**119**	**7.93**
Difference		***-50.30%***	*+5*	*+4*	*(-6)*	--	*0*	*+7*	*+2*	*+3*	--	*(-3)*	*+1*	--	***+11***	***+10.19%***
D24	Good	-14.7	23	--	69	--	29	40	703	97	4	5	69	--	**1039**	**79.92**
D24	Poor	-20.4	63	--	75	2	23	34	124	53	--	1	15	--	**390**	**30.00**
Difference		***-38.78%***	*+40*	--	*+6*	*+2*	*(-6)*	*(-6)*	*(-579)*	*(-44)*	*(-4)*	*(-4)*	*(-54)*	--	***(-649)***	***-62.46%***
D25	Good	-17.0	10	--	17	3	5	5	160	96	1	1	6	--	**304**	**21.71**
D25	Poor	-19.9	5	--	4	--	1	6	25	22	--	--	4	--	**67**	**4.79**
Difference		***-17.06%***	*(-5)*	--	*(-13)*	*(-3)*	*(-4)*	*+1*	*(-135)*	*(-74)*	*(-1)*	*(-1)*	*(-2)*	--	***(-237)***	***-22.04%***

Notes:

Positive differences for unidentified species (HiF, LoF, Unknown or combinations e.g., MYLU / LABO) for microphone with poor sensitivity could indicate these calls were able to be identified to the species level with good quality microphone.

Four letter codes are derived from scientific names; combinations refer to passes with characteristics from both species.

HiF = high-frequency bat species
LoF = low-frequency bat species
MYLU = Little Brown Myotis
LABO = Eastern Red Bat
LACI = Hoary Bat
LANO = Silver-haired Bat
EPFU = Big Brown Bat
MYLU/LABO = Little Brown Myotis or Eastern Red Bat
LANO/EPFU = Silver-haired Bat or Big Brown Bat.

NEW GOLD RAINY RIVER MINE
APPENDIX T
PAG COVER TRAIL FACTUAL REPORT
2019

O'Kane Consultants
Integrated Mine Waste Management and Closure Services
Specialists in Geochemistry and Unsaturated Zone Hydrology

O'Kane Consultants Inc.
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Calgary, AB T2E 7W6
Canada
T: (403) 215 3873 F: (403) 250 5330
www.okc-sk.com

Memorandum

To:	Sylvie St. Jean – Environmental Manager, New Gold Inc.
From:	Graham Hay, Jr. Engineer
Cc:	Garnet Cornell – New Gold Denise Chapman – O'Kane Consultants Inc.
Our ref:	1003-08-005
Date:	March 12, 2019
Re:	**Rainy River Cover System Field Trial – 2017 – 2019 Factual Data Report**

New Gold Inc. (New Gold) retained the services of O'Kane Consultants Inc. (OKC) to provide engineering and field support for development, instrumentation and performance monitoring of the potentially acid generating (PAG) mine rock cover system field trial at New Golds' Rainy River Mine. This memorandum provides a summary of field data collected from the cover system field trial between October 2017 and February 2019.

PAG Cover System Trials Background:

The PAG cover system field trial consists of two instrumented cover systems which were constructed in October 2017. Trial #1 consists of 0.5 m compacted Brenna clay (CBC), 0.75 m non-compacted clay overburden, and 0.25 m topsoil. Trial #2 consists of 0.5 m CBC and 1 m non-compacted clay overburden. The constructed field trial has an approximate area of 65 m x 100 m with a 1 to 2% sloping plateau of ~3,000 m^2. The main objectives of the cover systems are to:

- Evaluate overburden clay as cover material for mitigation of oxygen ingress during stockpile construction (operations);
- Evaluate overburden clay as a compacted layer within the closure cover system for mitigation of oxygen ingress and net percolation (closure); and
- Develop conceptual models of performance for the cover system field trial area through examining changes in *in situ* gas concentrations after cover system placement and water balances (e.g., precipitation, runoff, evaporation, water storage, etc.).

Each field trial configuration was outfitted with two instrumentation nests (primary and secondary). A meteorological station was installed on Trial #2 to collect local precipitation and net radiation data on the plateau of the trial. *In situ* monitoring instrumentation installed at each field trial includes:

- Eleven (11) matrix suction sensors (CSI 229) to measure suction and *in situ* soil temperature;
- Fourteen (14) water content sensors (CS 616) to measure *in situ* volumetric water content; and
- Six (6) oxygen sensors (SO 110) to measure differential oxygen concentrations above and below the CBC.

Automated data collection has been on-going since commissioning of the data acquisition system (DAS) in June 2018.

***In Situ* Instrumentation Data:**

Instrumentation data obtained from each cover system includes *in situ* volumetric water content and soil temperature throughout the cover system profile, and oxygen concentrations above and below the CBC. This data can be further analysed to investigate the performance of each cover system. This section presents the results of the data analysis, while data measurements obtained directly from *in situ* instrumentation are presented in Attachment A. The top of each cover system was selected as origin datum for all instrumentation depths.

Volumetric Water Content:

Volumetric water content was measured throughout the profile of each cover system to observe changes in the degree of saturation of the CBC. In order to successfully mitigate the ingress of oxygen into the underlying waste rock, the CBC must remain at / near saturated levels. As the degree of saturation exceeds 80%, the diffusion coefficient decreases by several orders of magnitude. A general rule of thumb indicates that maintaining a consistent degree of saturation of 85% or greater within a compacted clay layer will effectively limit the amount of oxygen movement by diffusion[1]. Figures 1 through 4 present the observed change in the degree of saturation with time through the cover system profiles. Table 1 highlights the key findings of saturation levels of the CBC

Table 1: Degree of saturation of the CBC.

	Degree of Saturation		
	Maximum	**Minimum**	**Average**
Trial #1 Primary Nest	100%	92%	96%
Trial #1 Secondary Nest	99%	93%	96%
Trial #2 Primary Nest	100%	83%	96%
Trial #2 Secondary Nest	99%	79%	92%

[1] Aachib, M., Mbonimpa, M., and M. Aubertin. 2004. Measurement and Prediction of the Oxygen Diffusion Coefficient in Unsaturated Media, with Applications to Soil Covers. Water, Air, and Soil Pollution 156: 163–193, 2004.

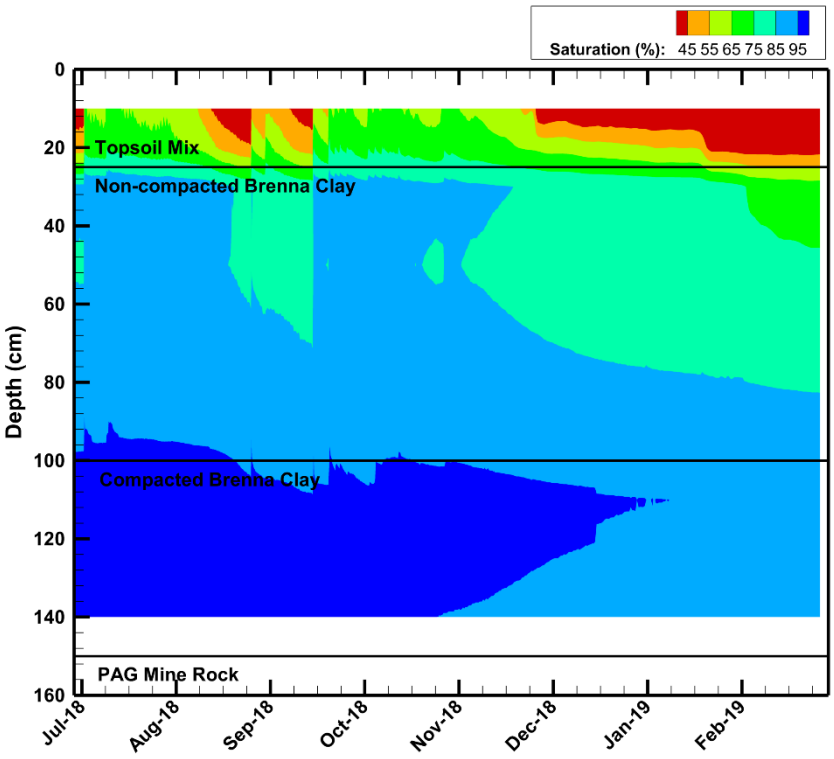

Figure 1: Change in degree of saturation at Trial #1 Primary Nest.

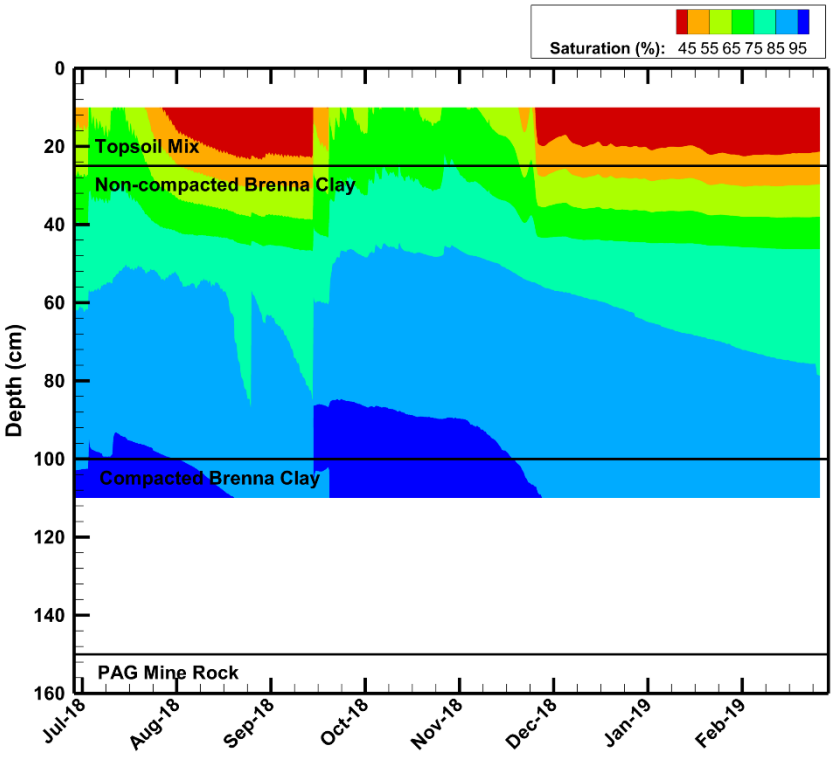

Figure 2: Change in degree of saturation at Trial #1 Secondary Nest.

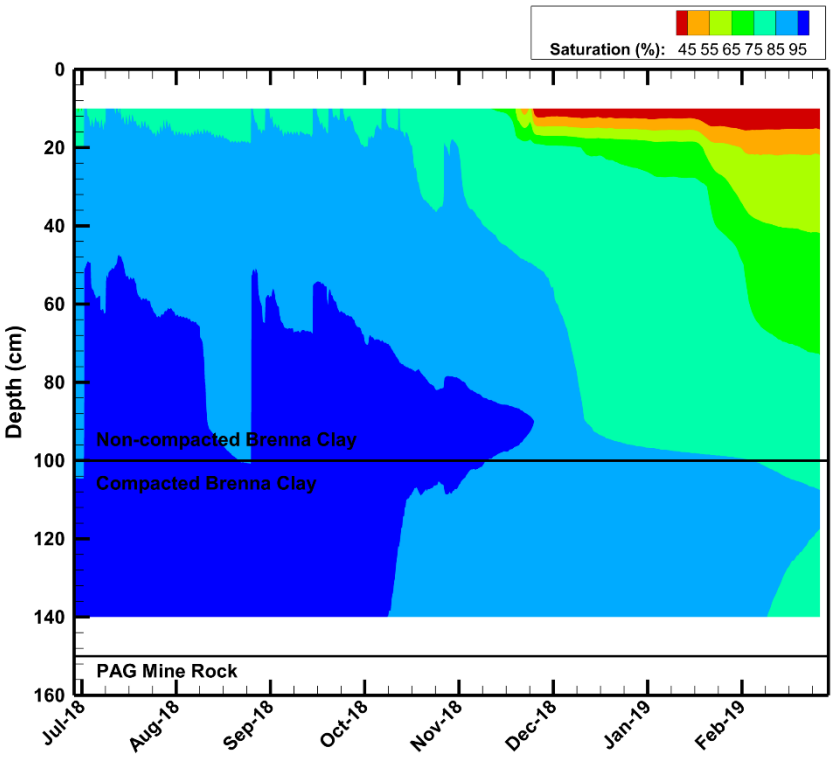

Figure 3: Change in degree of saturation at Trial #2 Primary Nest.

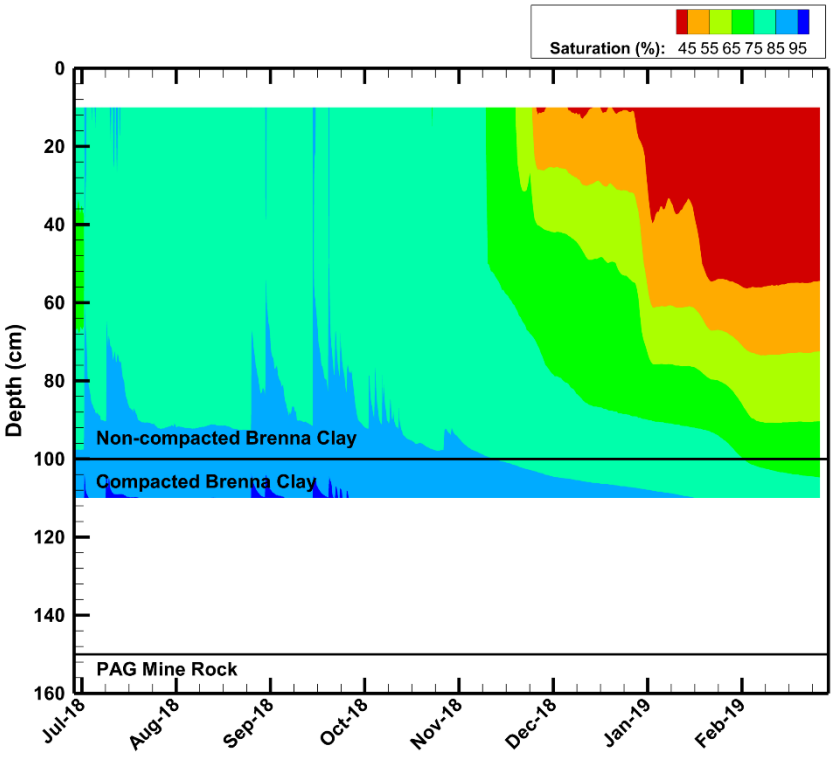

Figure 4: Change in degree of saturation at Trial #2 Secondary Nest.

In Situ Soil Temperature:

In situ soil temperature was monitored over the entire cover system of Trial #1 and Trail #2. *In situ* soil temperature is monitored to determine if the CBC undergoes freeze-thaw cycling. The biggest implication of a freeze-thaw cycle on the CBC is potential changes to physical characteristics (e.g., altering the hydraulic conductivity or moisture retention causing how the degree of saturation is managed. Freezing temperatures were observed in both cover systems starting November 25, 2018. Currently, based on *in situ* temperature measurements presented in Attachment A, the maximum freezing depth is 30 cm and 110 cm for Trial #1 and Trial #2, respectively. The large difference between the observed freezing regime is attributed to the deeper snow pack on Trial #1 (see snow survey for details). The deep snow pack provided an insulating layer between the cover system and ambient air temperature which limits the depth of freezing in the cover system. While Trial #2 had little snow pack (i.e., less insulation) this resulted in the CBC freezing to a greater depth. Figures 5 through 8 illustrate the change in *in situ* soil temperature with time through the trial profiles.

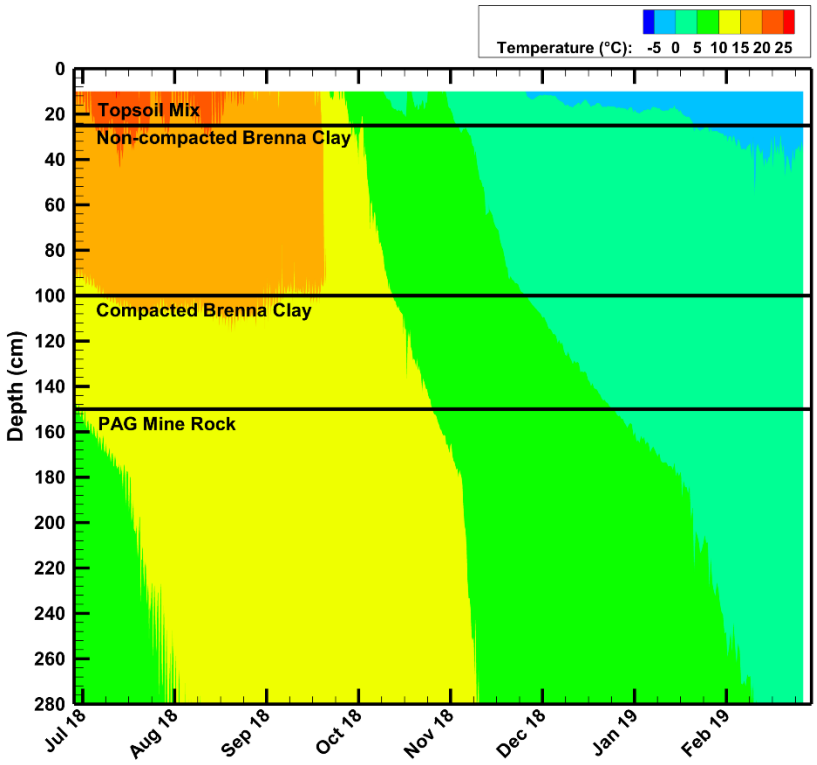

Figure 5: *In situ* soil temperature profile measured at Trial #1 Primary Nest.

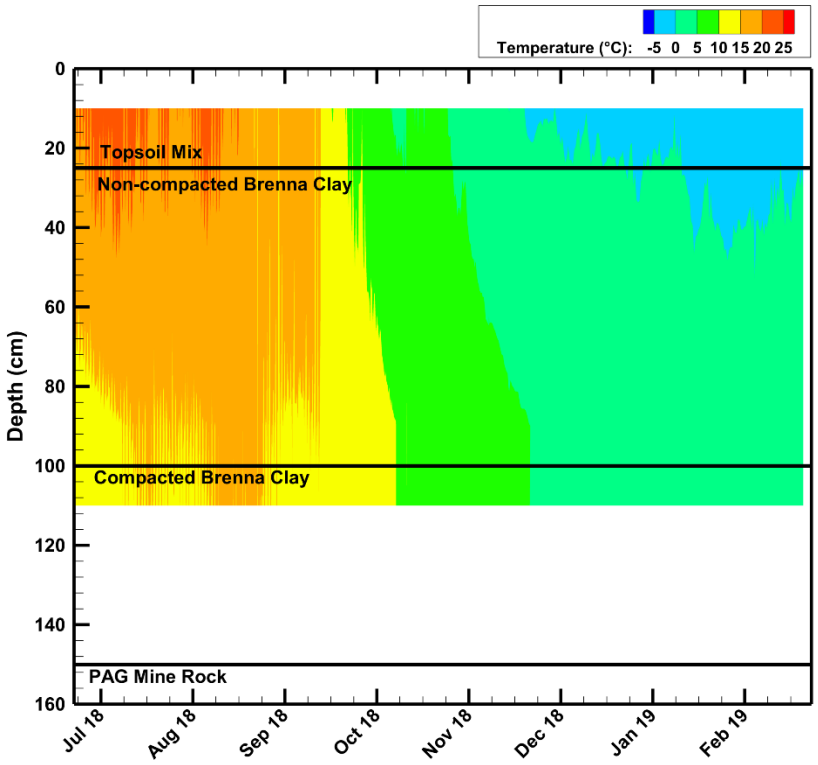

Figure 6: *In situ* soil temperature profile measured at Trial #1 Secondary Nest.

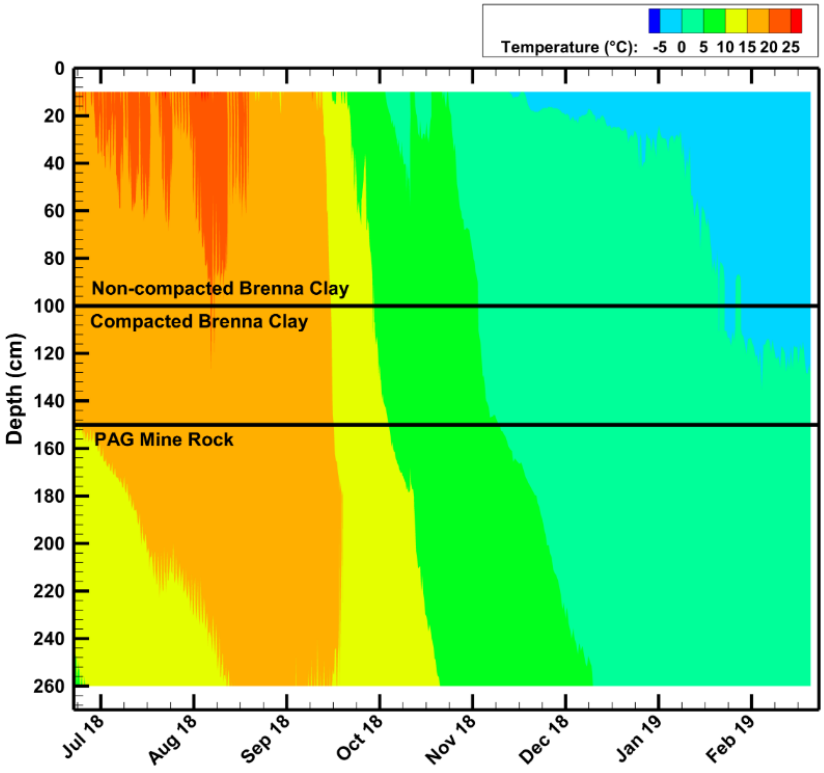

Figure 7: *In situ* soil temperature profile measured at Trial #2 Primary Nest.

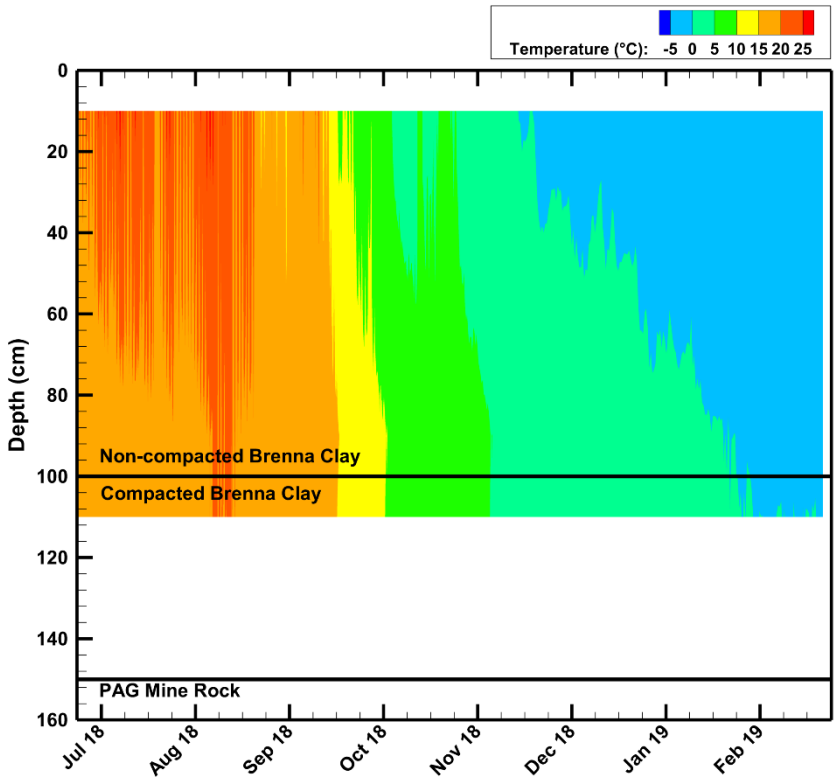

Figure 8: *In situ* soil temperature profile measured at Trial #2 Secondary Nest.

Oxygen Concentration:

Oxygen sensors were placed in the underlying waste rock and directly above the CBC layer to observe the consumption and ingress of oxygen. Prior to installation of the automated DAS, manual voltage measurements were taken periodically by New Gold personnel. Figure 9 shows observed oxygen concentrations below the CBC layer at Trial #1 Primary Nest. Oxygen concentrations in the other instrumented nests showed similar trends as shown in Figure 9. Oxygen concentrations are presented in Attachment A.

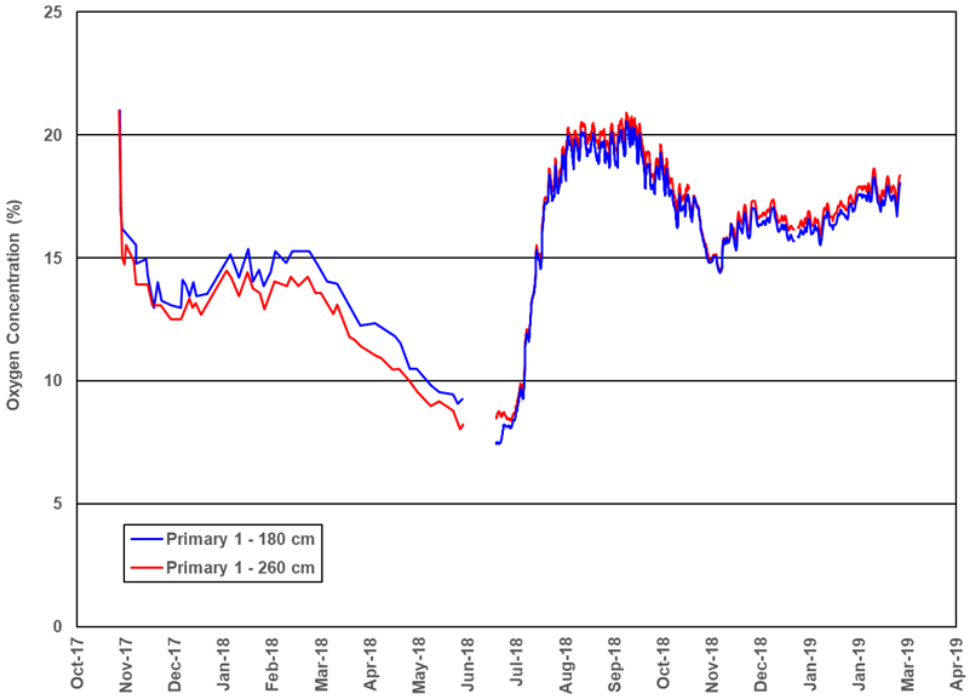

Figure 9: Oxygen concentration in waste rock below CBC layer at Trial #1 Primary Nest.

Manual Oxygen Sampling:

On November 12, 2018, OKC personnel installed ten manual gas sampling stations into the waste rock to verify measurements of the *in situ* oxygen sensors. Table 2 presents the results of oxygen concentrations collected from gas sampling. Some stations measured atmospheric oxygen concentrations immediately after installation due to the bentonite chip not yet moisturizing and sealing the hole. The oxygen concentration at Station TP1-8 measured atmospheric on March 4, 2019 and is thought not to be fully sealed. Additional benitoite will be added during spring in attempts to seal the station.

Table 2: Oxygen concentrations from manual sampling.

Station ID	O_2 (Nov. 13, 2018) (%)	O_2 (Nov. 14, 2018) (%)	O_2 (March 4, 2019) (%)
TP1-1	15.3	15.0	17.6
TP2-2	20.5	20.9	17.8
TP1-3	20.5	20.9	17.2
TP2-4	20.5	20.8	19.4
TP2-5	16.4	16.0	17.9
TP1-6	20.0	20.9	17.2
TP2-7	20.9	20.9	19.1
TP1-8	16.5	19.3	20.9
TP1-9	15.6	15.1	17.3
TP2-10	15.6	15.4	17.8

Snow Survey:

On March 4, 2019, a snow survey was conducted by OKC personnel to measure the depth of the snow pack on each cover system field trial. The trial was split into three transects (one running north to south on each trial and one running east to west across the entire trial). Survey locations and corresponding snow pack depths are illustrated in Figure 10.

Overall, Trial #1 observed a much greater snow pack on the plateau. This is mainly due to the tall vegetation acting as a snow catch on Trial #1 as compared to the bare surface of Trial #2. The large snow packs found on the east and southeast slopes can be attributed to snow blowing off the bare plateau and accumulating on the side slopes.

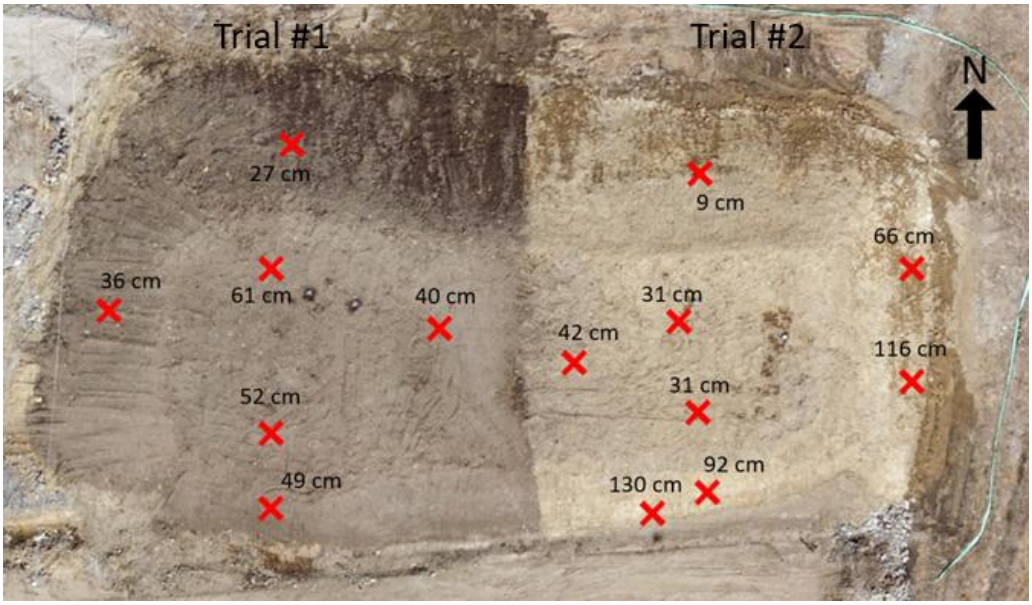

Figure 10: Snow survey locations and snow pack depths.

Summary:

The on-going monitoring of the cover system field trial will provide opportunities to understand the behavior and performance of each cover system and to evaluate the cover systems ability to mitigate the ingress of oxygen. Based on the above data analysis, the following points can be summarized:

- On average, the degree of saturation of the CBC layer is 96%.
- The freezing regime reached a depth of 30 cm and 110 cm on Trial #1 and Trial #2, respectively. This difference is due to the deeper snow pack on Trial #1 providing insulation from the ambient temperatures.
- The snow pack on Trial #1 was regularly consistent having an average depth of approximately 44 cm on the plateau and slopes. Trial #2 experienced limited snow on the plateau and a large snow pack on the south and southeast slopes. Vegetation on the Trial #1 provided a snow catchment, while snow on Trial #2 was exposed to wind gusts which allowed for snow to drift from the plateau to the side slopes.
- It is recommended that instrumentation monitoring, and manual gas sampling continue through 2019, including submission of quarterly factual data reports to New Gold in the form of PowerPoint presentations.

Closure:

We trust information provided in this memorandum is satisfactory for your requirements. Please do not hesitate to contact me at (403) 862-7711 or ghay@okc-sk.com should you have any questions or comments.

Attachment A: Instrumentation Data

Attachment A:

Instrumentation Data

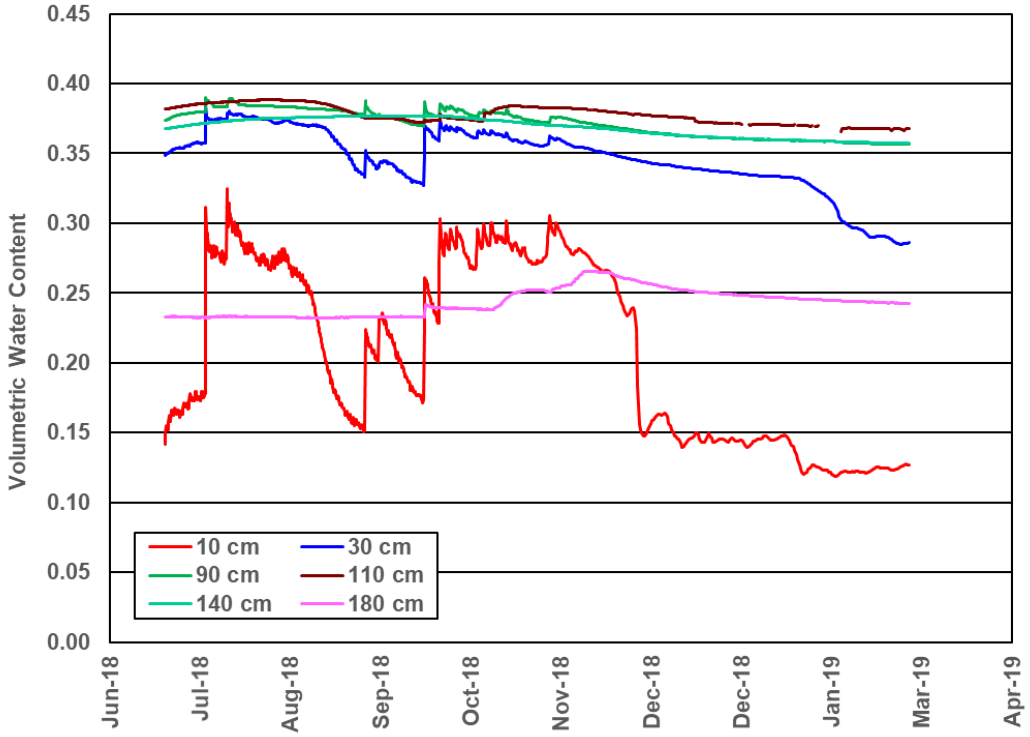

Figure A1: Volumetric water content at Trial #1 Primary Nest.

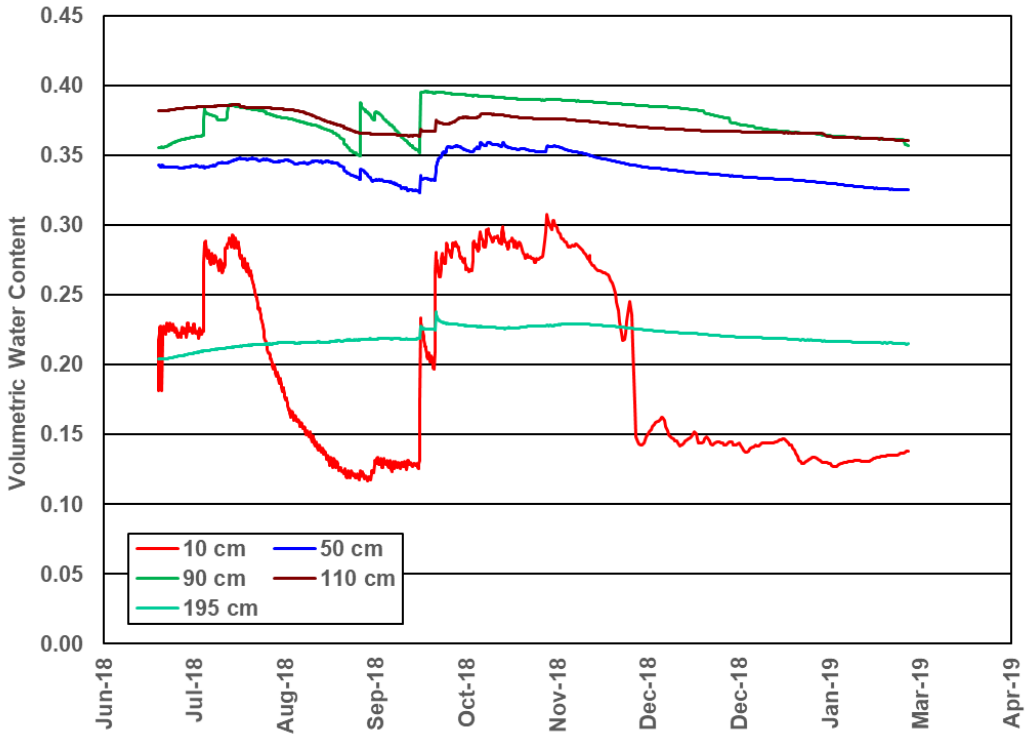

Figure A2: Volumetric water content at Trial #1 Secondary Nest.

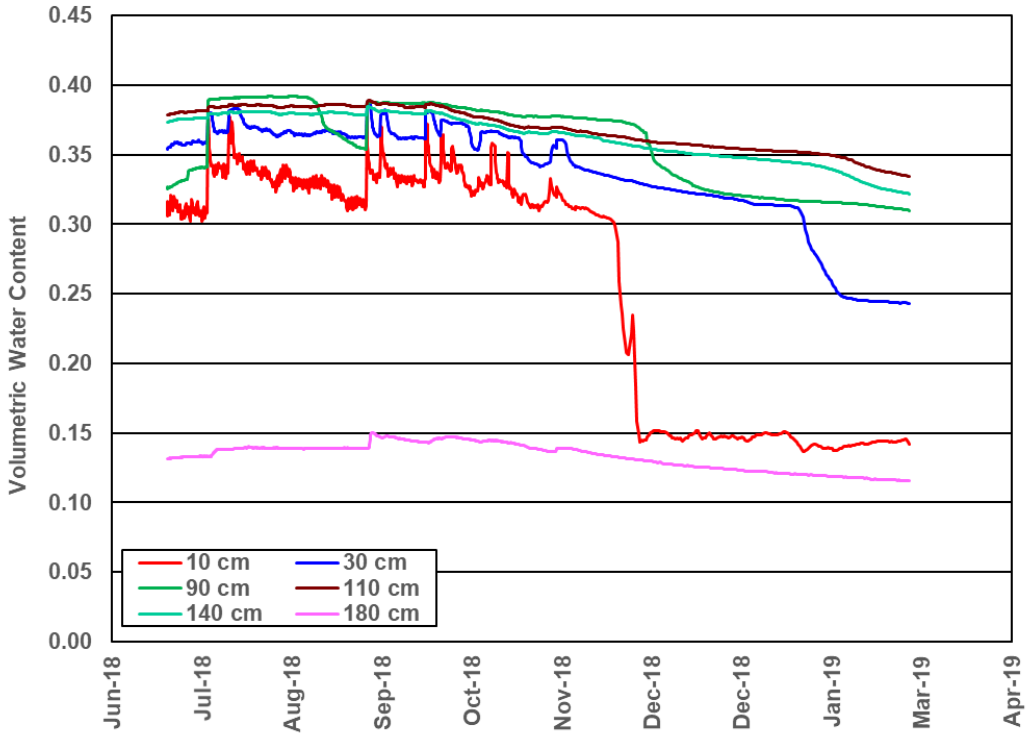

Figure A3: Volumetric water content at Trial #2 Primary Nest.

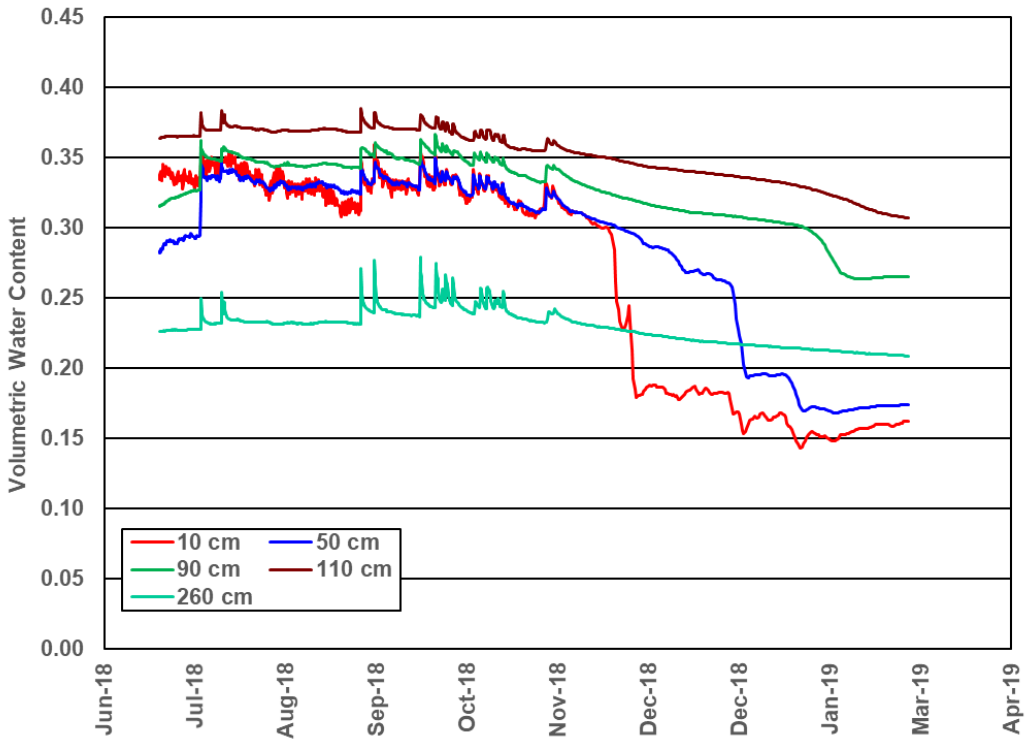

Figure A4: Volumetric water content at Trial #2 Secondary Nest.

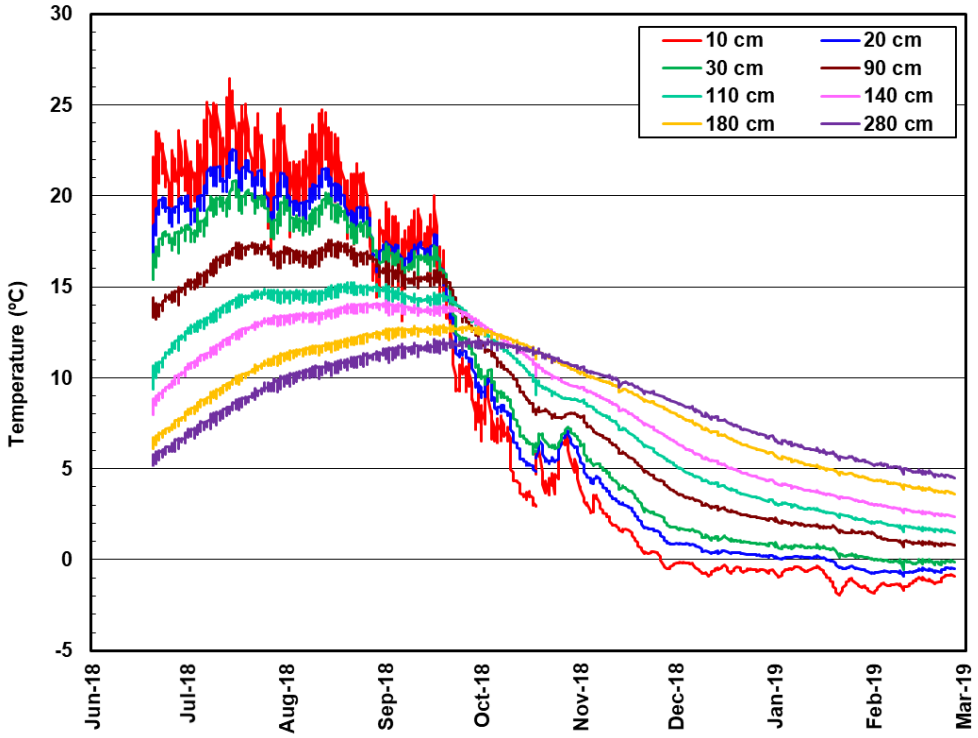

Figure A5: *In situ* soil temperature at Trial #1 Primary Nest.

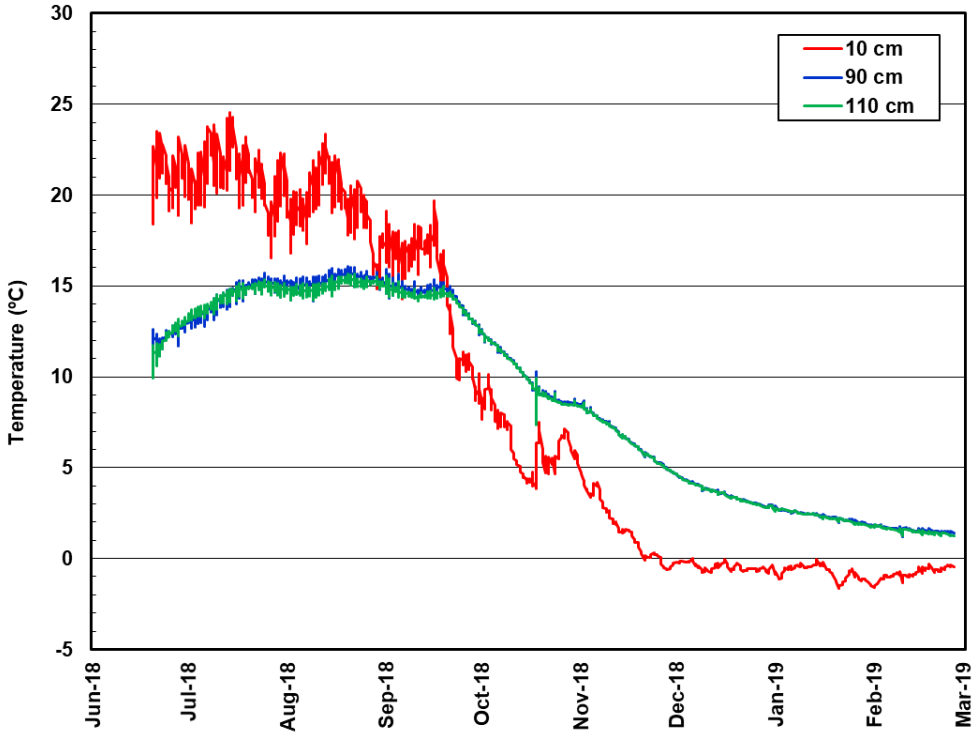

Figure A6: *In situ* soil temperature at Trial #1 Secondary Nest.

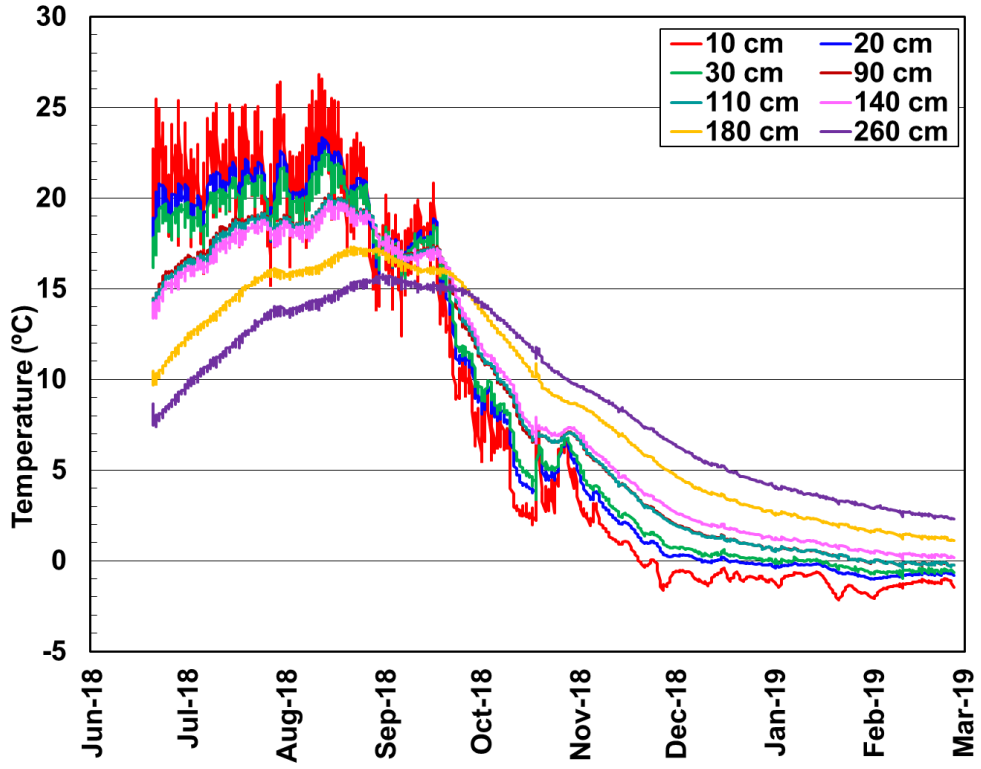

Figure A7: *In situ* soil temperature at Trial #2 Primary Nest.

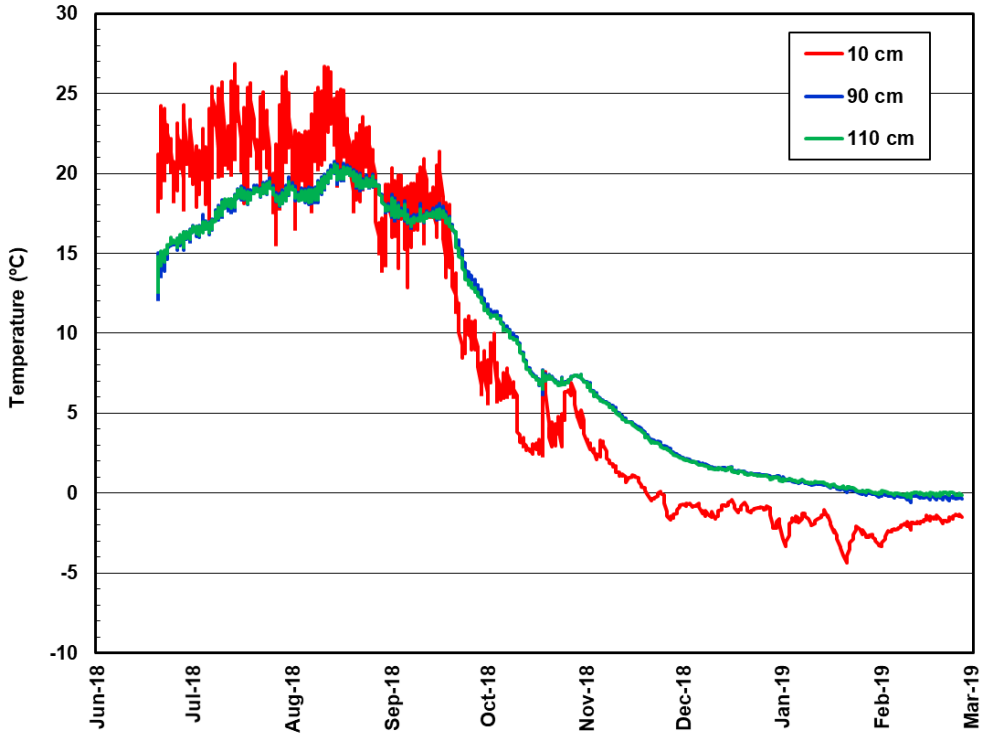

Figure A8: *In situ* soil temperature at Trial #2 Secondary Nest.

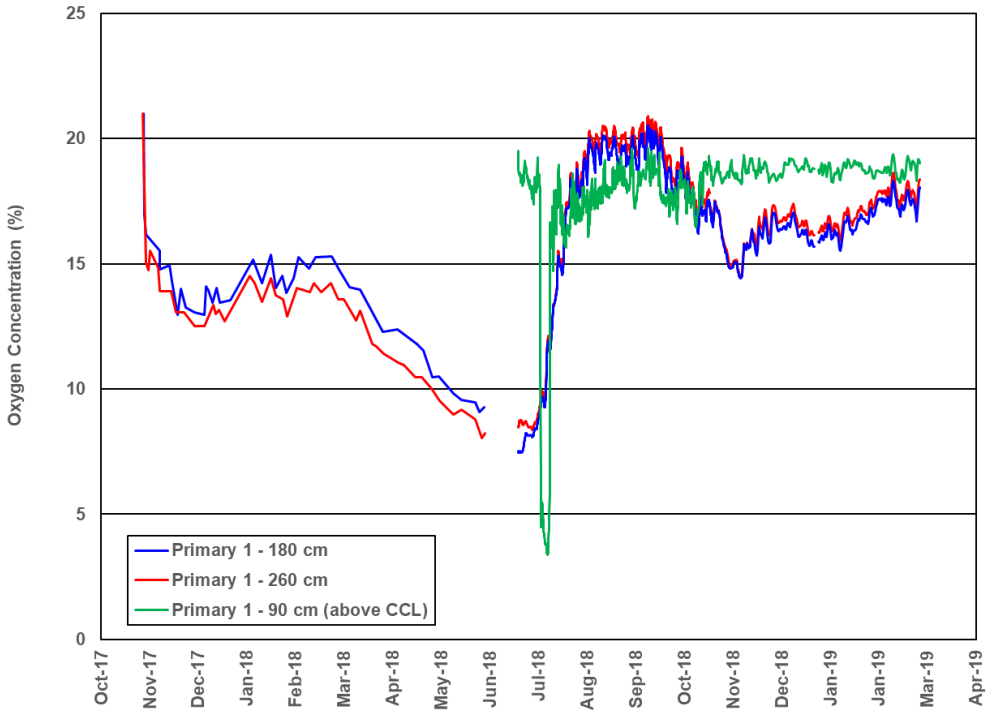

Figure A9: Oxygen concentration at Trial #1 Primary Nest.

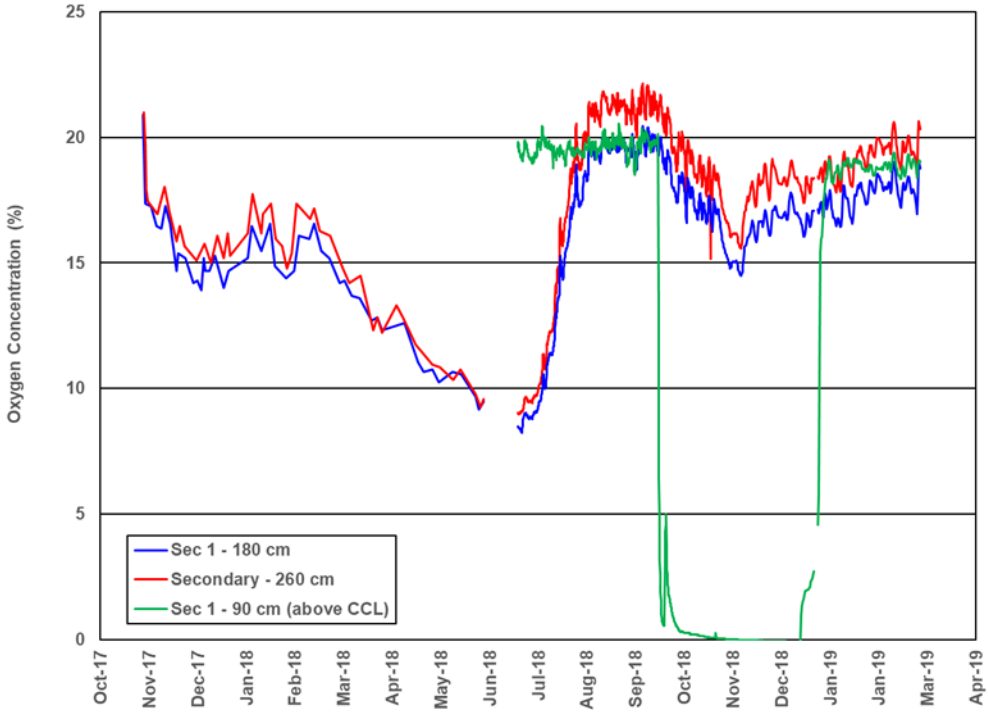

Figure A10: Oxygen concentration at Trial #1 Secondary Nest.

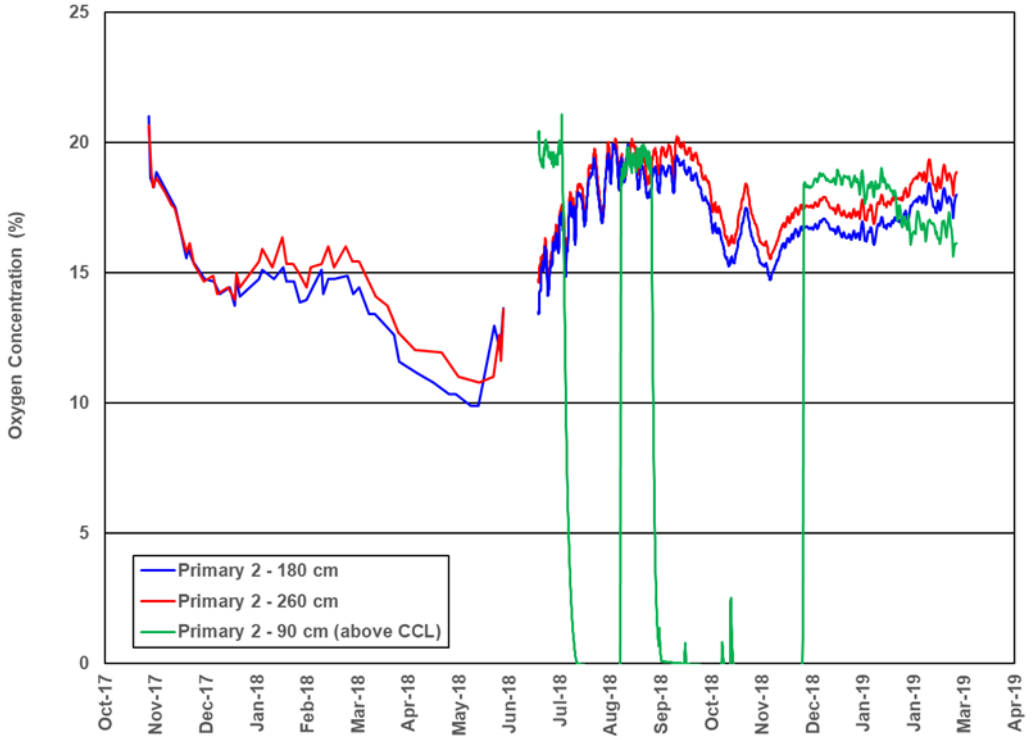

Figure A11: Oxygen concentration at Trial #2 Primary Nest.

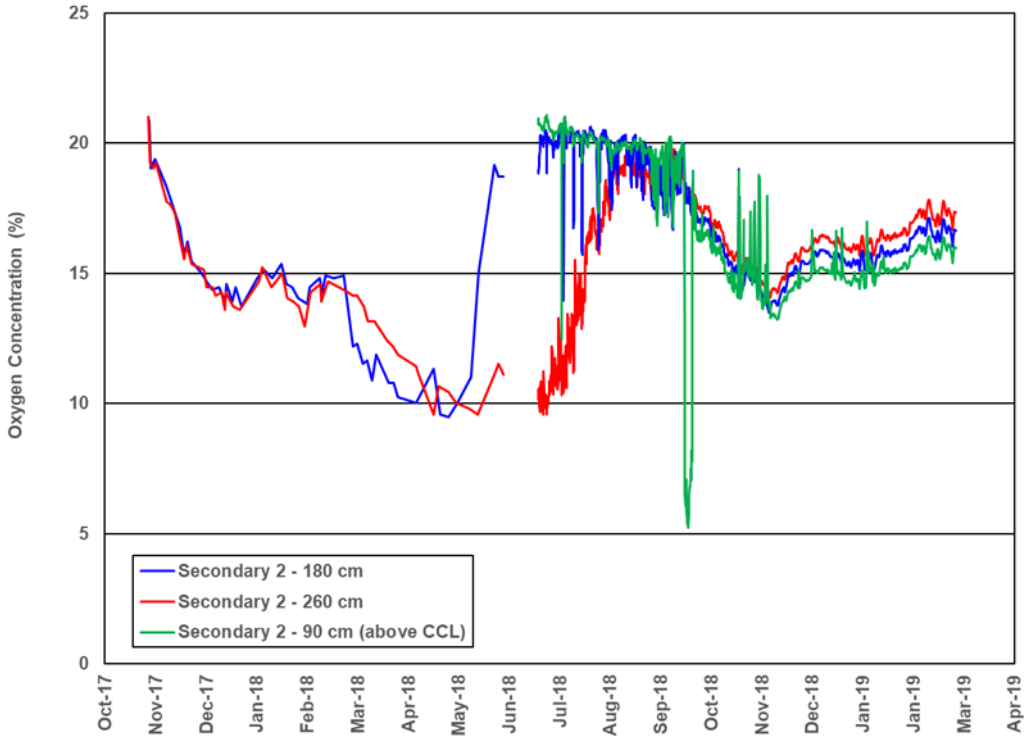

Figure A12: Oxygen concentration at Trial #2 Secondary Nest.

NEW GOLD RAINY RIVER MINE
APPENDIX U
ZONE OF INFLUENCE WATER RESULTS

2018 Offsite Groundwater Monitoring Report

Prepared By:

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December 2018

Introduction

New Gold Inc. (New Gold) is currently operating and will eventually reclaim an open pit and underground gold mine, the Rainy River Mine (RRM). Through the Environmental Assessment process for construction and operation of the RRM, New Gold committed to an offsite well water quality program. The condition states:

> *A groundwater level (flow) and quality monitoring program of regular sampling and dipping of dedicated monitoring wells will be implemented to confirm that no area wells are affected by the mine. Furthermore, local well owners will be asked to participate in a well water quality program to monitor water quality in their wells.*

Water Chemistry Summary

One offsite groundwater sampling program was completed in September-October 2018 with nine local wells participating. The 2018 sample results will be compared against 2017 sample results and the same groundwater quality standards that the wells on the mine site are compared against.

All groundwater results were within the Provincial Water Quality Guidelines of Ontario (PWQO) standards except for phosphorus, copper, iron, uranium, and zinc. Results highlighted in red exceeded the PWQO. Please note, all samples were collected at a location representative of the water quality directly in the well. No samples were collected from a location that could be affected by a water treatment system in the residence.

In Summary;

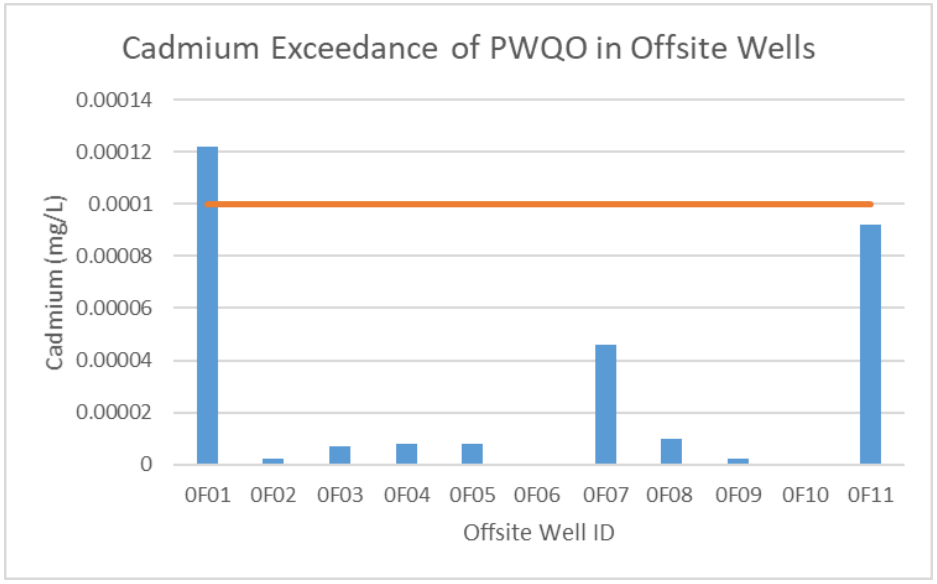
- OF01 had elevated levels of cadmium, copper, lead and zinc.
- OF02 had elevated levels of iron.
- OF03 had elevated levels of copper, iron and zinc.
- OF04 had elevated levels of copper, lead and zinc.
- OF05 had elevated levels of copper, iron, lead and zinc.
- OF06 was not sampled as owner was not available.
- OF07 had elevated levels of cobalt, iron and zinc.
- OF08 had elevated levels of cobalt, iron and zinc.
- OF09 had elevated levels of iron.
- OF10 was not sampled at instruction of owner.
- OF11 had elevated levels of copper and zinc.

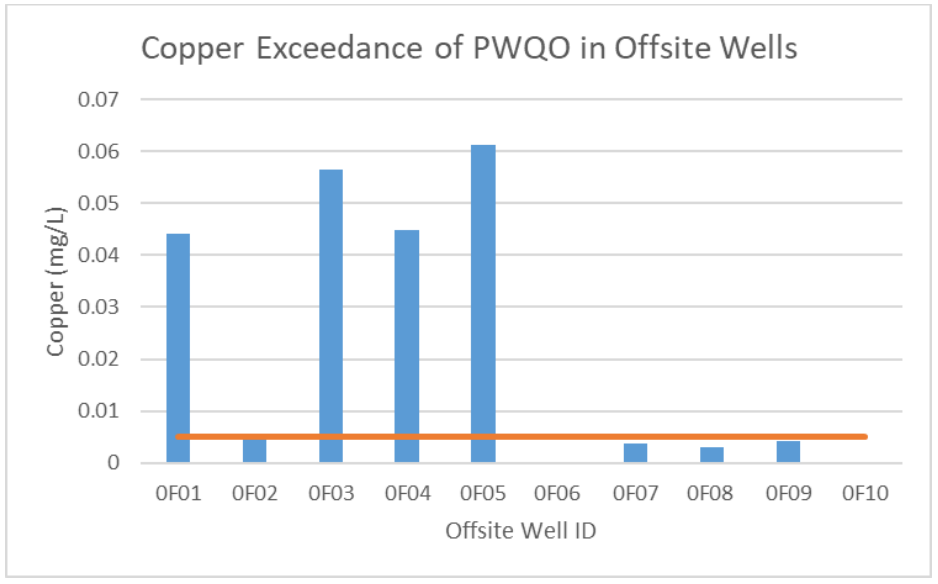
Table 1 displays all water chemistry results for 2018. Figures 1 through 6 show each parameter that measured higher than the Provincial Water Quality Guidelines of Ontario. Individual well result summaries are available in Table 2. Results highlighted in red exceeded the PWQO.

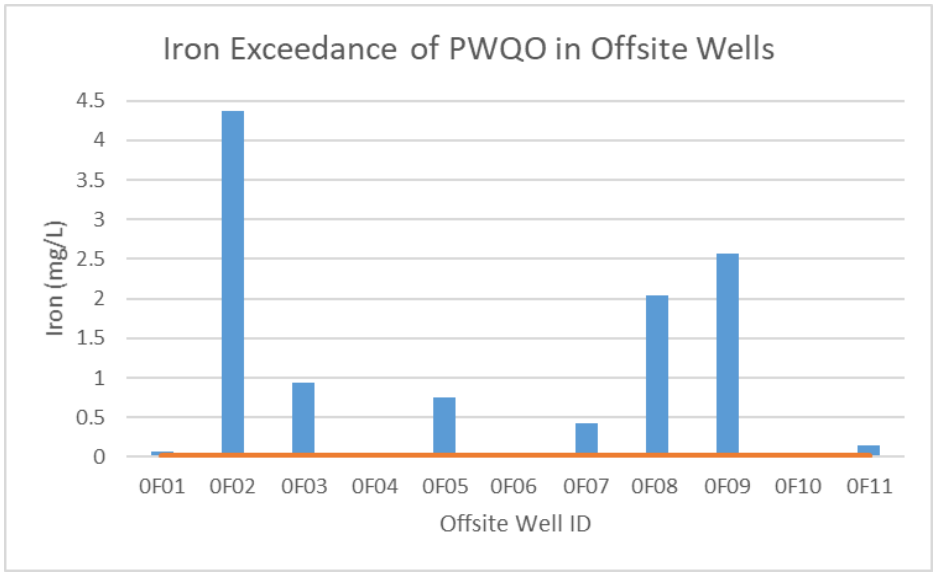
Table 1: Off Site Groundwater 2018 Water Chemistry Sample Results

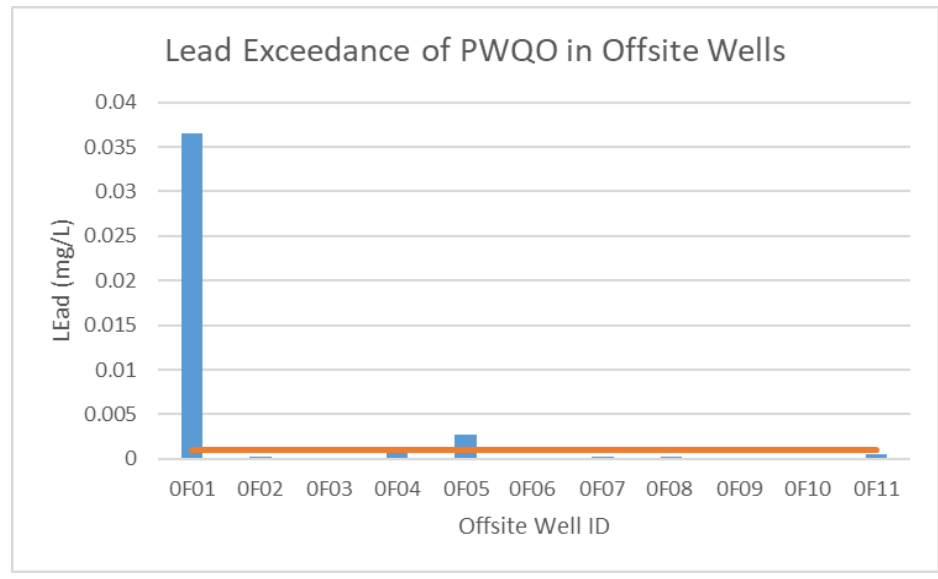
Client Sample ID				0F01	OF02	OF03	OF04	OF05	0F06	OF07	OF08	OF09	0F10	OF11
Date Sampled				26-Sep-2018	25-Sep-2018	27-Sep-2018	26-Sep-2018	27-Sep-2018	No Sample	19-Oct-2018	19-Oct-2018	26-Sep-2018	No Sample	4-Oct-2018
Parameter	Low est Detection Limit	Units	**PWQO**	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Alkalinity, Total (as CaCO3)	2	mg/L		476	481	318	521	466		523	425	524		470
Ammonia, Total (as N)	0.02	mg/L		0.022	0.762	0.086	0.234	0.098		0.282	0.12	0.356		0.118
Chloride (Cl)	0.1	mg/L		9.43	4.27	18.9	107	3.62		8.36	25.5	1.08		6.21
Conductivity (EC)	3	uS/cm		1060	909	615	1310	883		1060	836	997		837
Cyanide, Free	0.002	mg/L		0.0002	0.0002	0.0003	0.0001	0.0003		<0.0001	<0.0001	0.0005		0.0004
Cyanide, Total	0.002	mg/L	**0.005**	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002		<0.0002	<0.0002	<0.0002		<0.0002
Cyanide, Weak Acid Diss	0.002	mg/L		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		0.0002	0.0003	<0.0001		<0.0001
Hardness (as CaCO3)	0.51	mg/L		11.6	450	320	617	479		594	445	536		459
Nitrate (as N)	0.02	mg/L		0.015	0.02	0.045	0.65	0.015		0.01	0.015	0.015		0.05
Nitrite (as N)	0.01	mg/L		0.002	0.004	0.003	0.004	0.003		0.008	0.004	0.003		0.001
pH	0.1	pH	**6.5-8.5**	7.94	7.62	7.78	7.8	7.7		7.36	7.29	7.8		7.69
Phosphorus (P)-Total	0.003	mg/L		0.139	0.0645	0.009	0.003	0.0035		<0.0005	<0.0005	0.014		0.0065
Physical Tests (Effluent)														
Sulfate (SO4)	0.3	mg/L		72.1	39.3	6.12	37.7	22.9		76.7	9.68	36.7		6.26
Total Dissolved Solids	10	mg/L		666	524	346	754	492		600	440	554		458
Aluminum (Al)-Dissolved	0.005	mg/L		0.0018	0.0006	0.0014	0.0014	0.0008		0.0006	0.0024	0.0006		0.0026
Aluminum (Al)-Total	0.005	mg/L	**0.075**	0.0012	0.0008	0.0362	<0.0002	0.0012		0.0016	<0.0002	0.0028		0.0072
Antimony (Sb)-Dissolved	0.0006	mg/L		0.00064	<0.000005	0.0002	0.00038	0.00002		<0.000005	<0.000005	<0.000005		0.00036
Antimony (Sb)-Total	0.0006	mg/L	**0.02**	0.00078	0.00006	0.00026	0.00042	0.00006		<0.00002	0.00002	0.00002		0.0004
Arsenic (As)-Dissolved	0.001	mg/L		0.0107	0.0076	0.0007	0.0007	0.0027		0.0005	0.0004	0.0069		0.0006
Arsenic (As)-Total	0.001	mg/L	**0.1**	0.0099	0.0072	0.0014	0.0007	0.0023		0.0005	0.0005	0.0071		0.0006
Barium (Ba)-Dissolved	0.01	mg/L		0.004	0.067	0.054	0.12	0.092		0.024	0.092	0.114		0.068
Barium (Ba)-Total	0.01	mg/L		0.004	0.068	0.053	0.118	0.095		0.023	0.089	0.114		0.06
Beryllium (Be)-Dissolved	0.001	mg/L		<0.000002	<0.000002	<0.000002	<0.000002	<0.000002		<0.000002	<0.000002	<0.000002		<0.000002
Beryllium (Be)-Total	0.001	mg/L	**0.0011**	<0.000001	0.000002	<0.000001	<0.000001	<0.000001		<0.000001	<0.000001	<0.000001		0.000002
Bismuth (Bi)-Dissolved	0.001	mg/L		<0.000002	<0.000002	<0.000002	0.000006	<0.000002		<0.000002	<0.000002	<0.000002		0.000008
Bismuth (Bi)-Total	0.001	mg/L		0.000004	0.00003	<0.000002	<0.000002	0.00002		<0.000002	<0.000002	<0.000002		0.000014
Boron (B)-Dissolved	0.05	mg/L		0.213	0.174	0.033	0.162	0.049		0.085	0.034	0.07		0.08
Boron (B)-Total	0.05	mg/L	**0.2**	0.187	0.159	0.03	0.151	0.043		0.079	0.031	0.063		0.099
Cadmium (Cd)-Dissolved	0.000017	mg/L		0.000103	<0.0000005	0.000002	0.000006	0.000005		0.000045	0.000004	0.000001		0.00011
Cadmium (Cd)-Total	0.000017	mg/L	**0.0001**	0.000122	0.000002	0.000007	0.000008	0.000008		0.000046	0.00001	0.000002		0.000092
Calcium (Ca)-Dissolved	0.2	mg/L		3.88	101	75.2	129	107		131	118	102		99
Calcium (Ca)-Total	0.2	mg/L		3.92	101	74.7	133	109		133	122	103		101
Cesium (Cs)-Dissolved	0.00001	mg/L		0.000002	0.000004	0.000002	0.000156	0.000019		0.000056	0.000046	0.0000095		0.000002
Cesium (Cs)-Total	0.00001	mg/L		0.000002	0.000007	0.000005	0.000166	0.00002		0.000057	0.000047	0.0000095		0.000002
Chromium (Cr)-Dissolved	0.001	mg/L		0.0001	0.00002	0.0001	0.0001	0.0001		<0.00002	0.00006	0.0001		0.0001
Chromium (Cr)-Total	0.001	mg/L	**0.001**	0.00008	0.00006	0.0002	0.0002	0.0003		0.0001	0.00006	0.00004		0.0001
Cobalt (Co)-Dissolved	0.0005	mg/L		0.00002	0.00003	0.00009	0.00033	0.00049		0.00219	0.00281	0.00005		0.00086
Cobalt (Co)-Total	0.0005	mg/L	**0.0009**	0.00002	0.00003	0.00014	0.00037	0.00052		0.00232	0.003	0.00006		0.00062
Copper (Cu)-Dissolved	0.001	mg/L		0.0289	<0.00002	0.0191	0.0446	0.0117		0.0035	0.0008	0.0022		0.0554
Copper (Cu)-Total	0.001	mg/L	**0.005**	0.0441	0.0047	0.0565	0.0448	0.0613		0.0037	0.0029	0.0042		0.0588
Iron (Fe)-Dissolved	0.02	mg/L		0.047	4.27	0.363	0.024	0.785		0.393	1.82	2.4		0.157
Iron (Fe)-Total	0.02	mg/L	**0.3**	0.065	4.37	0.93	0.037	0.743		0.43	2.04	2.57		0.152
Lead (Pb)-Dissolved	0.001	mg/L		0.0314	<0.000005	0.00001	0.00096	0.0002		0.0002	0.0001	0.00002		0.0008
Lead (Pb)-Total	0.001	mg/L	**0.001**	0.0365	0.0002	0.0001	0.0011	0.0027		0.0002	0.0003	0.00001		0.0006
Lithium (Li)-Dissolved	0.05	mg/L		0.015	0.036	0.017	0.013	0.029		0.06	0.01	0.047		0.016
Lithium (Li)-Total	0.05	mg/L		0.015	0.041	0.016	0.015	0.031		0.059	0.009	0.053		0.014
Magnesium (Mg)-Dissolved	0.02	mg/L		0.45	48.2	32	71.7	51.3		64.9	36.3	68.4		51.3
Magnesium (Mg)-Total	0.02	mg/L		0.434	47.2	31.4	71.1	48.7		70.1	38.3	68.9		49.9
Manganese (Mn)-Dissolved	0.001	mg/L		0.0116	0.231	0.0583	0.046	0.22		1	0.501	0.449		0.054
Manganese (Mn)-Total	0.001	mg/L		0.0115	0.224	0.0639	0.0477	0.217		1.02	0.519	0.417		0.0374
Mercury (Hg)-Dissolved	0.00001	mg/L		<0.000001	<0.000001	0.000001	<0.000001	<0.000001		<0.000001	<0.000001	<0.000001		0.000005
Mercury (Hg)-Total	0.00001	mg/L	**0.0002**	<0.000001	<0.000001	0.000002	<0.000001	<0.000001		<0.000001	<0.000001	<0.000001		<0.000001
Molybdenum (Mo)-Dissolved	0.001	mg/L		0.0031	0.0018	0.0038	0.0035	0.0034		0.0012	0.001	0.0055		0.0031
Molybdenum (Mo)-Total	0.001	mg/L	**0.04**	0.0028	0.0017	0.0035	0.0035	0.0032		0.0014	0.0011	0.0052		0.003
Nickel (Ni)-Dissolved	0.002	mg/L		0.0005	0.0002	0.0016	0.0055	0.0012		0.0004	0.0022	0.0002		0.0061
Nickel (Ni)-Total	0.002	mg/L	**0.025**	0.0005	0.0002	0.0019	0.0059	0.0015		0.0004	0.0022	0.0003		0.0057
Potassium (K)-Dissolved	0.5	mg/L		1.73	6.05	1.57	3.53	4.48		4.38	2.81	5.49		0.79
Potassium (K)-Total	0.5	mg/L		1.67	5.7	1.54	3.44	4.28		4.53	2.89	5.63		0.67
Rubidium (Rb)-Dissolved	0.0002	mg/L		0.00051	0.00113	0.00057	0.00121	0.00631		0.00154	0.00295	0.00135		0.0008
Rubidium (Rb)-Total	0.0002	mg/L		0.00048	0.00111	0.0006	0.00115	0.00612		0.00156	0.00323	0.00153		0.00066
Selenium (Se)-Dissolved	0.001	mg/L		0.000025	0.00003	0.0003	0.0018	0.00005		0.00003	0.000035	0.000025		0.0004
Selenium (Se)-Total	0.001	mg/L	**0.1**	0.00004	0.00006	0.0003	0.0017	0.000045		0.000035	0.00007	0.000035		0.0005
Silicon (Si)-Dissolved	0.05	mg/L		10.3	10.7	8.92	8.45	9.71		10.4	9.98	12.3		9.01
Silicon (Si)-Total	0.1	mg/L		10.3	10.6	8.85	8.81	9.82		10.5	10	12.8		8.98
Silver (Ag)-Dissolved	0.0001	mg/L		<0.0000005	<0.0000005	<0.0000005	0.0000015	<0.0000005		<0.0000005	<0.0000005	<0.0000005		<0.0000005
Silver (Ag)-Total	0.0001	mg/L	**0.0001**	0.000007	0.000003	0.000001	0.000003	0.00002		<0.000001	<0.000001	<0.000001		0.000002
Sodium (Na)-Dissolved	0.1	mg/L		252	30.5	7.74	46.6	11.4		17.5	11	15.1		4.85
Sodium (Na)-Total	0.1	mg/L		260	31.9	8.25	48.3	11.5		18.4	11.8	16.2		4.5
Strontium (Sr)-Dissolved	0.001	mg/L		0.0162	0.821	0.233	0.983	0.364		0.667	0.213	0.558		0.178
Strontium (Sr)-Total	0.001	mg/L		0.0144	0.752	0.22	0.959	0.341		0.705	0.223	0.529		0.173
Sulfur (S)-Dissolved	0.5	mg/L		23.3	12.4	2.1	12.3	7.5		28.6	3.5	11.6		2.2
Sulfur (S)-Total	0.5	mg/L		25.3	13.7	2.1	13.7	8.5		29.7	3.8	13		2.1
Tellurium (Te)-Dissolved	0.001	mg/L		<0.000005	0.00004	<0.000005	0.00003	0.000025		0.00003	0.000015	0.000025		0.000005
Tellurium (Te)-Total	0.001	mg/L		0.00002	0.00008	0.00006	0.0001	0.00004		0.00007	0.00004	0.00008		<0.00001
Thallium (Tl)-Dissolved	0.0003	mg/L		<0.0000001	<0.0000001	0.0000002	0.0000013	0.0000043		0.0000002	<0.0000001	<0.0000001		0.000005
Thallium (Tl)-Total	0.0003	mg/L	**0.0003**	<0.0000002	0.00003	0.0000014	0.0000016	0.0000036		0.000001	<0.0000002	0.0000012		0.0000038
Thorium (Th)-Dissolved	0.0001	mg/L		<0.000002	<0.000002	<0.000002	<0.000002	<0.000002		<0.000002	<0.000002	<0.000002		<0.000002
Thorium (Th)-Total	0.0001	mg/L		0.000002	0.00002	0.00001	<0.000001	<0.000001		<0.000001	<0.000001	0.000004		0.000005
Tin (Sn)-Dissolved	0.001	mg/L		0.0054	<0.000005	0.00002	0.00008	0.000015		<0.000005	<0.000005	<0.000005		0.00001
Tin (Sn)-Total	0.001	mg/L		0.0038	0.00009	0.0002	0.00004	0.00099		<0.00001	<0.00001	<0.00001		0.00002
Titanium (Ti)-Dissolved	0.002	mg/L		<0.00002	0.00002	0.0003	0.00002	<0.00002		0.00002	<0.00002	<0.00002		0.00006
Titanium (Ti)-Total	0.002	mg/L		0.00006	0.00008	0.0015	0.0001	0.00004		0.0001	0.00006	0.0002		0.0003
Tungsten (W)-Dissolved	0.01	mg/L		0.000022	0.00007	0.000012	0.00009	0.000016		0.00001	0.000026	0.000076		<0.000002
Tungsten (W)-Total	0.01	mg/L		0.000032	0.000072	0.000014	0.000088	0.000012		0.000012	0.000034	0.00007		<0.000002
Uranium (U)-Dissolved	0.005	mg/L		0.0021	0.0012	0.0034	0.0024	0.0043		0.0047	0.001	0.0015		0.0025
Uranium (U)-Total	0.005	mg/L	**0.005**	0.002	0.0011	0.0036	0.0023	0.004		0.005	0.001	0.0014		0.0025
Vanadium (V)-Dissolved	0.001	mg/L		0.0001	0.0001	0.0003	0.0003	0.0001		0.0001	0.0002	0.00008		0.0004
Vanadium (V)-Total	0.001	mg/L	**0.006**	0.0001	0.0002	0.0005	0.0005	0.0003		0.0003	0.0002	0.0003		0.0005
Zinc (Zn)-Dissolved	0.003	mg/L		0.134	0.0024	0.0364	0.0314	0.0138		0.0206	0.06	0.0076		0.414
Zinc (Zn)-Total	0.003	mg/L	**0.02**	0.13	0.0044	0.143	0.03	0.0198		0.0224	0.0386	0.0074		0.22
Zirconium (Zr)-Dissolved	0.001	mg/L		0.00009	0.00006	0.0002	0.0004	0.0002		0.00003	0.000014	0.0002		0.0002
Zirconium (Zr)-Total	0.001	mg/L		0.00006	0.00008	0.0002	0.0004	0.0002		0.000038	0.000016	0.0002		0.0002

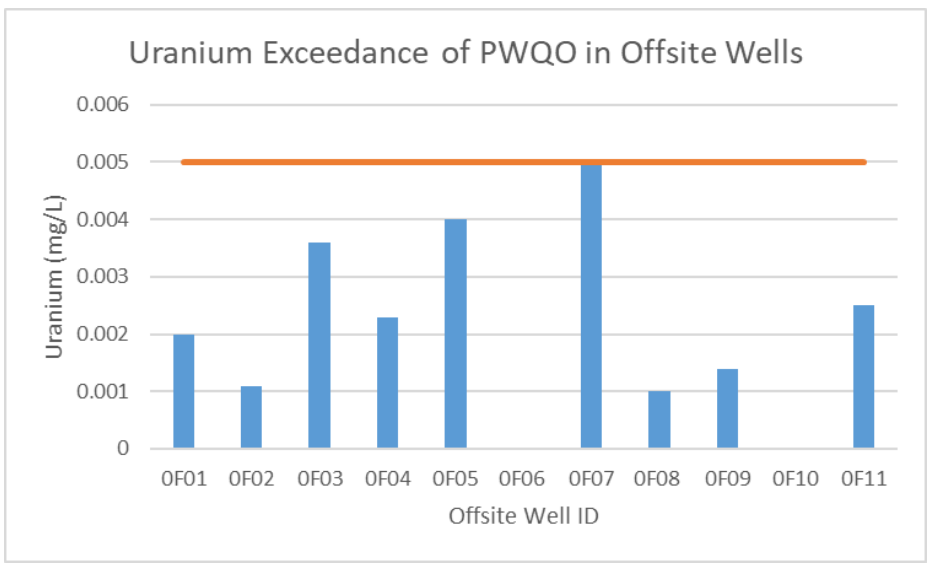
Figures 1-6: Provincial Water Quality Objectives Exceeded in 2018 Offsite Well Samples











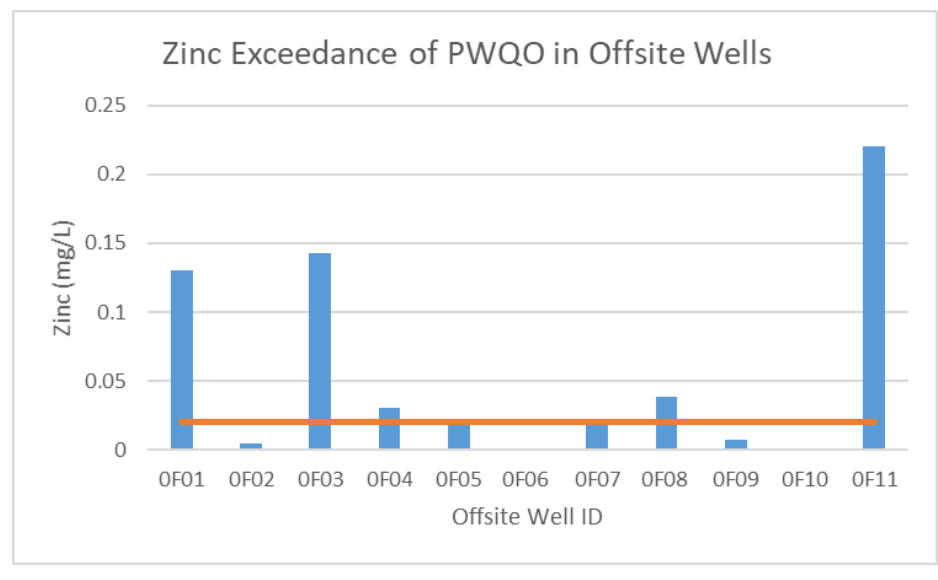


Table 2: Off Site Groundwater Water Chemistry Sample Results Summary by Well

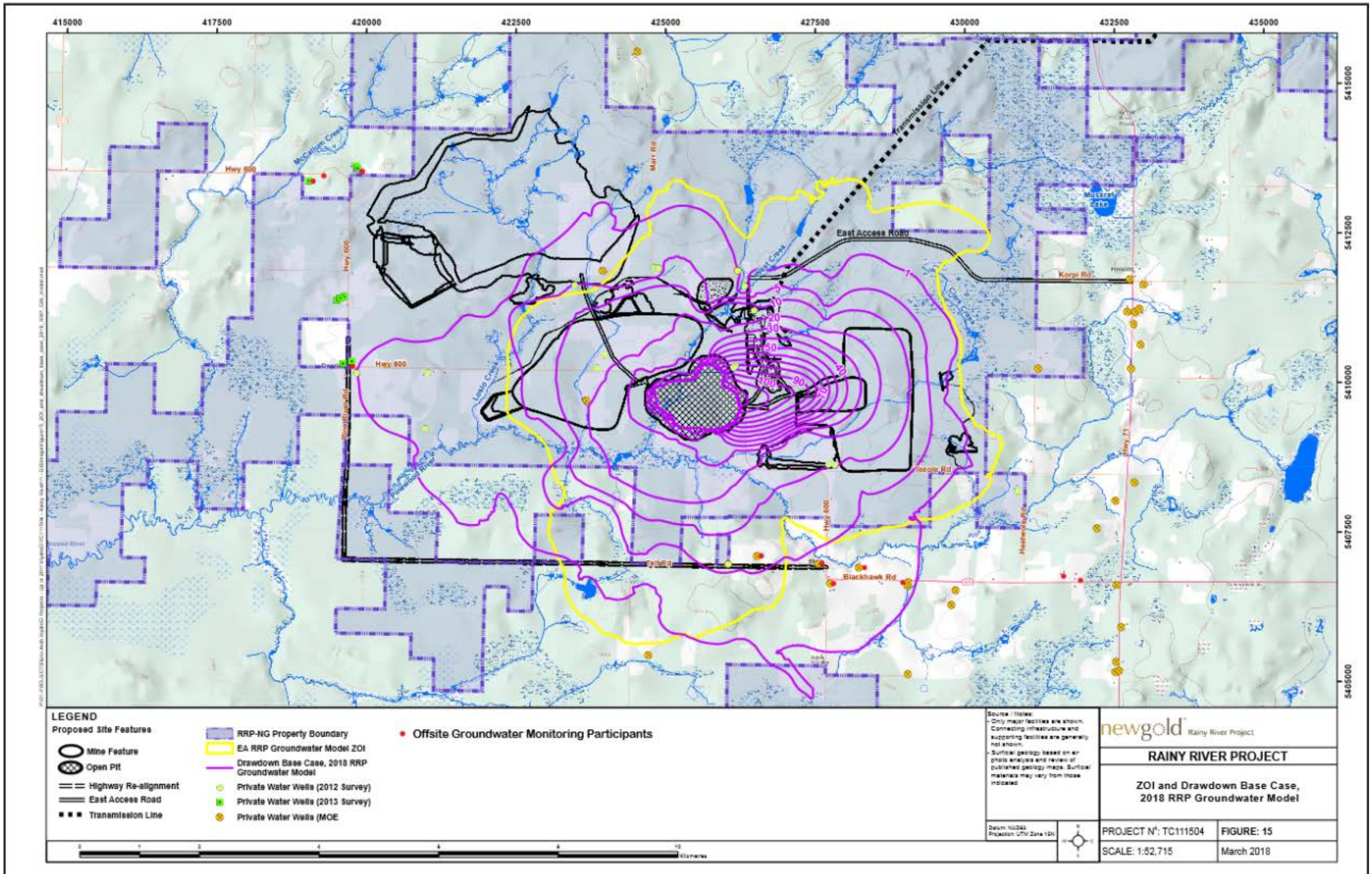
Client Sample ID	Date Sampled	Alkalinity, Total (as CaCO3)	Ammonia, Total (as N)	Chloride (Cl)	Conductivity (EC)	Cyanide, Free	Cyanide, Total	Cyanide, Weak Acid Dissolved	Hardness (as CaCO3)	Nitrate (as N)	Nitrite (as N)	pH	Phosphorus (P)-Total	Sulfate (SO4)	Total Dissolved Solids	Aluminum (Al)-Dissolved	Aluminum (Al)-Total	Antimony (Sb)-Dissolved	Antimony (Sb)-Total
Unit		mg/L	mg/L	mg/L	uS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	pH	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	PWQO						**0.0050**					**6.5-8.5**					**0.0750**		**0.020**
OF01	11-Oct-2017	506	0.658	9.37	958	0.0001	0.0002	0.0001	476	0.005		7.87	0.0083	70.4	555	0.001	0.0010	0.00001	0.00001
OF01	26-Sep-2018	476	0.022	9.43	1060	0.0002	0.0002	0.0001	11.6	0.015	0.002	7.94	0.139	72.1	666	0.0018	0.0012	0.00064	0.00078
OF01	**Average**	**491**	**0.340**	**9.40**	**1009**	**0.0002**	**0.0002**	**0.0001**	**243.8**	**0.010**	**0.002**	**7.91**	**0.0737**	**71.3**	**610.5**	**0.0014**	**0.0011**	**0.00033**	**0.00040**
OF02	11-Oct-2017	526	0.674	3.77	905	0.0001	0.0002	0.0001	474	0.005		8.10	0.0300	35.7	525	0.001	0.0015	0.00001	0.00002
OF02	25-Sep-2018	481	0.762	4.27	909	0.0002	0.0002	0.0001	450	0.020	0.004	7.62	0.0645	39.3	524	0.0006	0.0008	0.000005	0.00006
OF02	**Average**	**504**	**0.718**	**4.02**	**907**	**0.0002**	**0.0002**	**0.0001**	**462.0**	**0.013**	**0.004**	**7.86**	**0.0473**	**37.5**	**524.5**	**0.0008**	**0.0012**	**0.00001**	**0.00004**
OF03	11-Oct-2017	460	0.256	7.67	796	0.0002	0.0002	0.0001	424	0.005		7.85	0.0081	17.3	455	0.001	0.0020	0.00005	0.00006
OF03	27-Sep-2018	318	0.086	18.9	615	0.0003	0.0002	0.0001	320	0.045	0.003	7.78	0.009	6.12	346	0.0014	0.0362	0.0002	0.00026
OF03	**Average**	**389**	**0.171**	**13.29**	**706**	**0.0003**	**0.0002**	**0.0001**	**372.0**	**0.025**	**0.003**	**7.82**	**0.0086**	**11.7**	**400.5**	**0.0012**	**0.0191**	**0.00013**	**0.00016**
OF04	11-Oct-2017	541	0.054	103	1270	0.0001	0.0002	0.0001	612	0.760		7.42	0.0018	36.6	825	0.001	0.0015	0.00043	0.00049
OF04	26-Sep-2018	521	0.234	107	1310	0.0001	0.0002	0.0001	617	0.65	0.004	7.80	0.0030	37.7	754	0.0014	0.0002	0.00038	0.00042
OF04	**Average**	**531**	**0.144**	**105.00**	**1290**	**0.0001**	**0.0002**	**0.0001**	**614.5**	**0.705**	**0.004**	**7.61**	**0.0024**	**37.2**	**789.5**	**0.0012**	**0.0009**	**0.00041**	**0.00046**
OF05	12-Oct-2017	498	0.086	5.74	865	0.0002	0.0002	0.0001	484	0.005		7.65	0.0085	23.4	490	0.0030	0.0010	0.00001	0.00003
OF05	27-Sep-2018	466	0.098	3.62	883	0.0003	0.0002	0.0001	479	0.015	0.003	7.70	0.0035	22.9	492	0.0008	0.0012	0.00002	0.00006
OF05	**Average**	**482**	**0.092**	**4.68**	**874**	**0.0003**	**0.0002**	**0.0001**	**481.5**	**0.010**	**0.003**	**7.68**	**0.0060**	**23.2**	**491.0**	**0.0019**	**0.0011**	**0.00002**	**0.00005**
OF06	12-Oct-2017	598	0.116	3.47	977	0.0001	0.0002	0.0001	549	0.155		7.33	0.0458	19.0	565	0.0020	0.0020	0.00007	0.00010
OF06	2018	No sample																	
OF06	**Average**	**598**	**0.116**	**3.47**	**977**	**0.0001**	**0.0002**	**0.0001**	**549.0**	**0.155**		**7.33**	**0.0458**	**19.0**	**565.0**	**0.0020**	**0.0020**	**0.00007**	**0.00010**
OF07	12-Oct-2017	552	0.332	8.74	1040	0.0001	0.0002	0.0001	549	0.005		7.32	0.0001	77.0	630	0.001	0.0010	0.00001	0.00002
OF07	19-Oct-2018	523	0.282	8.36	1060	0.0001	0.0002	0.0002	594	0.01	0.008	7.36	0.0005	76.7	600	0.0006	0.0016	0.000005	0.00002
OF07	**Average**	**538**	**0.307**	**8.55**	**1050**	**0.0001**	**0.0002**	**0.0002**	**571.5**	**0.008**	**0.008**	**7.34**	**0.0003**	**76.9**	**615.0**	**0.0008**	**0.0013**	**0.00001**	**0.00002**
OF08	13-Oct-2017	429	0.076	19.9	790	0.0001	0.0002	0.0001	405	0.005		7.28	0.0029	9.44	475	0.0020	0.0035	0.00004	0.00001
OF08	19-Oct-2018	425	0.12	25.5	836	0.0001	0.0002	0.0003	445	0.015	0.004	7.29	0.0005	9.68	440	0.0024	0.0002	0.000005	0.00002
OF08	**Average**	**427**	**0.098**	**22.70**	**813**	**0.0001**	**0.0002**	**0.0002**	**425.0**	**0.010**	**0.004**	**7.29**	**0.0017**	**9.6**	**457.5**	**0.0022**	**0.0019**	**0.00002**	**0.00002**
OF09	13-Oct-2017	546	0.256	1.02	948	0.0001	0.0002	0.0001	508	0.005		7.42	0.0168	33.7	555	0.0010	0.0100	0.00003	0.00003
OF09	26-Sep-2018	524	0.356	1.08	997	0.0005	0.0002	0.0001	536	0.015	0.003	7.80	0.014	36.7	554	0.0006	0.0028	0.000005	0.00002
OF09	**Average**	**535**	**0.306**	**1.05**	**973**	**0.0003**	**0.0002**	**0.0001**	**522.0**	**0.010**	**0.003**	**7.61**	**0.0154**	**35.2**	**554.5**	**0.0008**	**0.0064**	**0.00002**	**0.00003**
OF10	14-Oct-2017	489	0.118	38.5	947	0.0001	0.0002	0.0001	406	0.790		7.11	0.0076	18.0	545	0.0010	0.0090	0.00015	0.00015
OF10	2018	No sample																	
OF10	**Average**	**489**	**0.118**	**38.50**	**947**	**0.0001**	**0.0002**	**0.0001**	**406.0**	**0.790**		**7.11**	**0.0076**	**18.0**	**545.0**	**0.0010**	**0.0090**	**0.00015**	**0.00015**
OF11	2017	No sample																	
OF11	4-Oct-2018	470	0.118	6.21	837	0.0004	0.0002	0.0001	459	0.050	0.001	7.69	0.0065	6.3	458	0.0026	0.0072	0.00036	0.0004
OF11	**Average**	**470**	**0.118**	**6.21**	**837**	**0.0004**	**0.0002**	**0.0001**	**459.0**	**0.050**	**0.001**	**7.69**	**0.0065**	**6.3**	**458.0**	**0.0026**	**0.0072**	**0.00036**	**0.00040**
Overall Average		**496**	**0.230**	**19.72**	**944**	**0.0002**	**0.0002**	**0.0001**	**464.2**	**0.162**	**0.004**	**7.57**	**0.0196**	**31.4**	**546.5**	**0.0026**	**0.0046**	**0.00014**	**0.00016**

Client Sample ID	Date Sampled	Arsenic (As)-Dissolved	Arsenic (As)-Total	Barium (Ba)-Dissolved	Barium (Ba)-Total	Beryllium (Be)-Dissolved	Beryllium (Be)-Total	Bismuth (Bi)-Dissolved	Bismuth (Bi)-Total	Boron (B)-Dissolved	Boron (B)-Total	Cadmium (Cd)-Dissolved	Cadmium (Cd)-Total	Calcium (Ca)-Dissolved	Calcium (Ca)-Total	Cesium (Cs)-Dissolved	Cesium (Cs)-Total	Chromium (Cr)-Dissolved	Chromium (Cr)-Total
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	PWQO		**0.10**				**0.0011**				**0.20**		**0.0001**						**0.0010**
OF01	11-Oct-2017	0.0188	0.0192	0.050	0.052	0.00001	0.00001	0.00002	0.00002	0.171	0.202	0.000005	0.000005	113	111			0.0001	0.0001
OF01	26-Sep-2018	0.0107	0.0099	0.004	0.004	0.000002	0.000001	0.000002	0.000004	0.213	0.187	0.000103	0.000122	3.88	3.92	0.000002	0.000002	0.0001	0.00008
OF01	**Average**	**0.01475**	**0.0146**	**0.027**	**0.028**	**0.000006**	**0.000006**	**0.000011**	**0.000012**	**0.192**	**0.195**	**0.000054**	**0.000064**	**58.4**	**57.46**	**0.000002**	**0.000002**	**0.00010**	**0.00009**
OF02	11-Oct-2017	0.00490	0.0052	0.071	0.070	0.00001	0.00001	0.00002	0.00002	0.192	0.21	0.000005	0.000005	98.9	97.3			0.0003	0.0006
OF02	25-Sep-2018	0.0076	0.0072	0.067	0.068	0.000002	0.000002	0.000002	0.00003	0.174	0.159	0.0000005	0.000002	101	101	0.000004	0.000007	0.00002	0.00006
OF02	**Average**	**0.00625**	**0.0062**	**0.069**	**0.069**	**0.000006**	**0.000006**	**0.000011**	**0.000025**	**0.183**	**0.185**	**0.000003**	**0.000004**	**100.0**	**99.15**	**0.000004**	**0.000007**	**0.00016**	**0.00033**
OF03	11-Oct-2017	0.00190	0.0024	0.077	0.081	0.00001	0.00001	0.00002	0.00002	0.049	0.047	0.000005	0.000005	102	102			0.0001	0.0001
OF03	27-Sep-2018	0.0007	0.0014	0.054	0.053	0.000002	0.000001	0.000002	0.000002	0.033	0.030	0.000002	0.000007	75.2	74.7	0.000002	0.000005	0.0001	0.0002
OF03	**Average**	**0.00130**	**0.0019**	**0.066**	**0.067**	**0.000006**	**0.000006**	**0.000011**	**0.000011**	**0.041**	**0.039**	**0.000004**	**0.000006**	**88.6**	**88.35**	**0.000002**	**0.000005**	**0.00010**	**0.00015**
OF04	11-Oct-2017	0.00070	0.0009	0.116	0.120	0.00001	0.00001	0.00002	0.00002	0.167	0.197	0.000005	0.000010	131	136			0.0001	0.0002
OF04	26-Sep-2018	0.0007	0.0007	0.12	0.118	0.000002	0.000001	0.000006	0.000002	0.162	0.151	0.000006	0.000008	129	133	0.000156	0.000166	0.0001	0.0002
OF04	**Average**	**0.00070**	**0.0008**	**0.118**	**0.119**	**0.000006**	**0.000006**	**0.000013**	**0.000011**	**0.165**	**0.174**	**0.000006**	**0.000009**	**130.0**	**134.50**	**0.000156**	**0.000166**	**0.00010**	**0.00020**
OF05	12-Oct-2017	0.00190	0.0019	0.096	0.098	0.00001	0.00001	0.00002	0.00002	0.046	0.056	0.000005	0.000005	111	108			0.0001	0.0002
OF05	27-Sep-2018	0.0027	0.0023	0.092	0.095	0.000002	0.000001	0.000002	0.00002	0.049	0.043	0.000005	0.000008	107	109	0.000019	0.00002	0.0001	0.0003
OF05	**Average**	**0.00230**	**0.0021**	**0.094**	**0.097**	**0.000006**	**0.000006**	**0.000011**	**0.000020**	**0.048**	**0.050**	**0.000005**	**0.000007**	**109.0**	**108.50**	**0.000019**	**0.000020**	**0.00010**	**0.00025**
OF06	12-Oct-2017	0.00098	0.0009	0.085	0.087	0.00001	0.00001	0.00002	0.00002	0.055	0.069	0.000010	0.000010	114	117			0.0001	0.0001
OF06	2018																		
OF06	**Average**	**0.00098**	**0.0009**	**0.085**	**0.087**	**0.000010**	**0.000010**	**0.000020**	**0.000020**	**0.055**	**0.069**	**0.000010**	**0.000010**	**114.0**	**117.00**			**0.00010**	**0.00010**
OF07	12-Oct-2017	0.00060	0.0005	0.022	0.022	0.00001	0.00001	0.00002	0.00002	0.072	0.080	0.000035	0.000035	124	128			0.0001	0.0001
OF07	19-Oct-2018	0.0005	0.0005	0.024	0.023	0.000002	0.000001	0.000002	0.000002	0.085	0.079	0.000045	0.000046	131	133	0.000056	0.000057	0.00002	0.0001
OF07	**Average**	**0.00055**	**0.0005**	**0.023**	**0.023**	**0.000006**	**0.000006**	**0.000011**	**0.000011**	**0.079**	**0.080**	**0.000040**	**0.000041**	**127.5**	**130.50**	**0.000056**	**0.000057**	**0.00006**	**0.00010**
OF08	13-Oct-2017	0.00040	0.0005	0.092	0.091	0.00001	0.00001	0.00002	0.00002	0.027	0.026	0.000005	0.000005	108	110			0.0001	0.0001
OF08	19-Oct-2018	0.0004	0.0005	0.092	0.089	0.000002	0.000001	0.000002	0.000002	0.034	0.031	0.000004	0.00001	118	122	0.000046	0.000047	0.00006	0.00006
OF08	**Average**	**0.00040**	**0.0005**	**0.092**	**0.090**	**0.000006**	**0.000006**	**0.000011**	**0.000011**	**0.031**	**0.029**	**0.000005**	**0.000008**	**113.0**	**116.00**	**0.000046**	**0.000047**	**0.00008**	**0.00008**
OF09	13-Oct-2017	0.00620	0.0087	0.106	0.108	0.00001	0.00001	0.00002	0.00002	0.059	0.070	0.000005	0.000005	99.4	108.0			0.0001	0.0001
OF09	26-Sep-2018	0.0069	0.0071	0.114	0.114	0.000002	0.000001	0.000002	0.000002	0.07	0.063	0.000001	0.000002	102	103	0.0000095	0.0000095	0.0001	0.00004
OF09	**Average**	**0.00655**	**0.0079**	**0.110**	**0.111**	**0.000006**	**0.000006**	**0.000011**	**0.000011**	**0.065**	**0.067**	**0.000003**	**0.000004**	**100.7**	**105.50**	**0.000010**	**0.000010**	**0.00010**	**0.00007**
OF10	14-Oct-2017	0.00050	0.0005	0.097	0.098	0.00001	0.00001	0.00002	0.00002	0.059	0.066	0.000030	0.000030	91.7	95.5			0.0003	0.0004
OF10	2018																		
OF10	**Average**	**0.00050**	**0.0005**	**0.097**	**0.098**	**0.000010**	**0.00001**	**0.000020**	**0.000020**	**0.059**	**0.066**	**0.000030**	**0.000030**	**91.7**	**95.50**			**0.00030**	**0.00040**
OF11	2017																		
OF11	4-Oct-2018	0.0006	0.0006	0.068	0.060	0.000002	0.000002	0.000008	0.000014	0.08	0.099	0.00011	0.000092	99	101	0.000002	0.000002	0.0001	0.0001
OF11	**Average**	**0.00060**	**0.0006**	**0.068**	**0.060**	**0.000002**	**0.000002**	**0.000008**	**0.000014**	**0.080**	**0.099**	**0.000110**	**0.000092**	**99.0**	**101.00**	**0.000002**	**0.000002**	**0.00010**	**0.00010**
Overall Average		**0.00317**	**0.0033**	**0.077**	**0.077**	**0.000006**	**0.000006**	**0.000013**	**0.000015**	**0.091**	**0.095**	**0.000024**	**0.000025**	**102.90**	**104.86**	**0.000033**	**0.000035**	**0.00012**	**0.00017**

Client Sample ID	Date Sampled	Cobalt (Co)-Dissolved	Cobalt (Co)-Total	Copper (Cu) Dissolved	Copper (Cu)-Total	Iron (Fe)-Dissolved	Iron (Fe)-Total	Lead (Pb)-Dissolved	Lead (Pb)-Total	Lithium (Li)-Dissolved	Lithium (Li)-Total	Magnesium (Mg)-Dissolved	Magnesium (Mg)-Total	Manganese (Mn)-Dissolved	Manganese (Mn)-Total	Mercury (Hg)-Dissolved	Mercury (Hg)-Total	Molybdenum (Mo)-Dissolved	Molybdenum (Mo)-Total
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	PWQO		**0.0009**		**0.0050**		**0.30**		**0.0010**								**0.00020**		**0.040**
OF01	11-Oct-2017	0.00007	0.00007	0.0001	0.0001	1.54	1.79	0.00001	0.00001	0.051	0.059	47.2	46.9	0.337	0.357	0.000002	0.000002	0.0029	0.0032
OF01	26-Sep-2018	0.00002	0.00002	0.0289	0.0441	0.047	0.065	0.0314	0.0365	0.015	0.015	0.45	0.434	0.0116	0.0115	0.000001	0.000001	0.0031	0.0028
OF01	**Average**	**0.00005**	**0.00005**	**0.0145**	**0.0221**	**0.794**	**0.928**	**0.01571**	**0.01826**	**0.033**	**0.037**	**23.83**	**23.67**	**0.174**	**0.184**	**0.000002**	**0.000002**	**0.0030**	**0.0030**
OF02	11-Oct-2017	0.00004	0.00004	0.0001	0.0035	2.81	3.35	0.00001	0.00001	0.051	0.053	55.1	51.4	0.193	0.192	0.000002	0.000002	0.0023	0.0023
OF02	25-Sep-2018	0.00003	0.00003	0.00002	0.0047	4.27	4.37	0.000005	0.00020	0.036	0.041	48.2	47.2	0.231	0.224	0.000001	0.000001	0.0018	0.0017
OF02	**Average**	**0.00004**	**0.00004**	**0.0001**	**0.0041**	**3.540**	**3.860**	**0.00001**	**0.00011**	**0.044**	**0.047**	**51.65**	**49.30**	**0.212**	**0.208**	**0.000002**	**0.000002**	**0.0021**	**0.0020**
OF03	11-Oct-2017	0.00024	0.00024	0.0063	0.0212	2.04	2.72	0.00001	0.00006	0.025	0.024	40.9	39.2	0.349	0.350	0.000002	0.000002	0.0022	0.0024
OF03	27-Sep-2018	0.00009	0.00014	0.0191	0.0565	0.363	0.93	0.00001	0.00010	0.017	0.016	32	31.4	0.0583	0.0639	0.000001	0.000002	0.0038	0.0035
OF03	**Average**	**0.00017**	**0.00019**	**0.0127**	**0.03885**	**1.202**	**1.825**	**0.00001**	**0.00008**	**0.021**	**0.020**	**36.45**	**35.30**	**0.204**	**0.207**	**0.000002**	**0.000002**	**0.0030**	**0.0030**
OF04	11-Oct-2017	0.00036	0.00044	0.0257	0.0297	0.020	0.080	0.0002	0.0004	0.013	0.016	69.3	69.4	0.0451	0.0619	0.000002	0.000002	0.0034	0.0039
OF04	26-Sep-2018	0.00033	0.00037	0.0446	0.0448	0.024	0.037	0.00096	0.0011	0.013	0.015	71.7	71.1	0.046	0.0477	0.000001	0.000001	0.0035	0.0035
OF04	**Average**	**0.00035**	**0.00041**	**0.0352**	**0.03725**	**0.022**	**0.059**	**0.00058**	**0.00075**	**0.013**	**0.016**	**70.50**	**70.25**	**0.046**	**0.055**	**0.000002**	**0.000002**	**0.0035**	**0.0037**
OF05	12-Oct-2017	0.00047	0.00049	0.0003	0.0024	0.680	0.72	0.00001	0.00003	0.030	0.032	50.0	49.3	0.226	0.235	0.000002	0.000002	0.0029	0.0033
OF05	27-Sep-2018	0.00049	0.00052	0.0117	0.0613	0.785	0.743	0.0002	0.0027	0.029	0.031	51.3	48.7	0.22	0.217	0.000001	0.000001	0.0034	0.0032
OF05	**Average**	**0.00048**	**0.00051**	**0.0060**	**0.03185**	**0.733**	**0.732**	**0.00011**	**0.00137**	**0.030**	**0.032**	**50.65**	**49.00**	**0.223**	**0.226**	**0.000002**	**0.000002**	**0.0032**	**0.0033**
OF06	12-Oct-2017	0.00003	0.00003	0.350	0.364	0.010	0.010	0.0017	0.00180	0.043	0.045	64.6	64.7	0.0084	0.0087	0.000004	0.000006	0.0047	0.0052
OF06	2018																		
OF06	**Average**	**0.00003**	**0.00003**	**0.3500**	**0.364**	**0.010**	**0.010**	**0.00170**	**0.00180**	**0.043**	**0.045**	**64.60**	**64.70**	**0.008**	**0.009**	**0.000004**	**0.000006**	**0.0047**	**0.0052**
OF07	12-Oct-2017	0.00199	0.00206	0.0010	0.0039	0.350	0.41	0.00001	0.00004	0.057	0.058	58.4	59.0	0.898	0.914	0.000002	0.000002	0.0011	0.0013
OF07	19-Oct-2018	0.00219	0.00232	0.0035	0.0037	0.393	0.43	0.0002	0.0002	0.06	0.059	64.9	70.1	1	1.02	0.000001	0.000001	0.0012	0.0014
OF07	**Average**	**0.00209**	**0.00219**	**0.0023**	**0.0038**	**0.372**	**0.420**	**0.00011**	**0.00012**	**0.059**	**0.059**	**61.65**	**64.55**	**0.949**	**0.967**	**0.000002**	**0.000002**	**0.001150**	**0.0014**
OF08	13-Oct-2017	0.00285	0.00289	0.0001	0.0005	2.03	2.09	0.00009	0.0002	0.009	0.009	32.9	32.2	0.465	0.454	0.000002	0.000002	0.0009	0.00098000
OF08	19-Oct-2018	0.00281	0.003	0.0008	0.0029	1.82	2.04	0.0001	0.0003	0.01	0.009	36.3	38.3	0.501	0.519	0.000001	0.000001	0.001	0.0011
OF08	**Average**	**0.00283**	**0.00295**	**0.0005**	**0.0017**	**1.925**	**2.065**	**0.00010**	**0.00025**	**0.010**	**0.009**	**34.60**	**35.25**	**0.483**	**0.487**	**0.000002**	**0.000002**	**0.0010**	**0.0010**
OF09	13-Oct-2017	0.00006	0.00007	0.0002	0.0013	2.09	2.75	0.00001	0.00003	0.053	0.052	63.0	66.0	0.381	0.393	0.000002	0.000002	0.0050	0.0057
OF09	26-Sep-2018	0.00005	0.00006	0.0022	0.0042	2.4	2.57	0.00002	0.00001	0.047	0.053	68.4	68.9	0.449	0.417	0.000001	0.000001	0.0055	0.0052
OF09	**Average**	**0.00006**	**0.00007**	**0.0012**	**0.0028**	**2.245**	**2.660**	**0.00002**	**0.00002**	**0.050**	**0.053**	**65.70**	**67.45**	**0.415**	**0.405**	**0.000002**	**0.000002**	**0.0053**	**0.0055**
OF10	14-Oct-2017	0.00037	0.00042	0.0755	0.0805	0.01	0.070	0.0004	0.0008	0.018	0.018	42.9	44.7	0.0027	0.0051	0.000006	0.000008	0.0027	0.0030
OF10	2018																		
OF10	**Average**	**0.00037**	**0.00042**	**0.0755**	**0.0805**	**0.010**	**0.070**	**0.00040**	**0.00080**	**0.018**	**0.018**	**42.90**	**44.70**	**0.003**	**0.005**	**0.000006**	**0.000008**	**0.0027**	**0.0030**
OF11	2017																		
OF11	4-Oct-2018	0.00086	0.00062	0.0554	0.0588	0.157	0.152	0.0008	0.0006	0.016	0.014	51.3	49.9	0.054	0.0374	0.000005	0.000001	0.0031	0.003
OF11	**Average**	**0.00086**	**0.00062**	**0.0554**	**0.0588**	**0.157**	**0.152**	**0.00080**	**0.00060**	**0.016**	**0.014**	**51.30**	**49.90**	**0.054**	**0.037**	**0.000005**	**0.000001**	**0.0031**	**0.0030**
Overall Average		**0.00066**	**0.00068**	**0.0503**	**0.0587**	**1.001**	**1.1618**	**0.00177**	**0.0022**	**0.030**	**0.032**	**51.30**	**50.37**	**0.252**	**0.254**	**0.000002**	**0.000003**	**0.0030**	**0.0031**

Client Sample ID	Date Sampled	Nickel (Ni)-Dissolved	Nickel (Ni)-Total	Potassium (K)-Dissolved	Potassium (K)-Total	Rubidium (Rb)-Dissolved	Rubidium (Rb)-Total	Selenium (Se)-Dissolved	Selenium (Se)-Total	Silicon (Si)-Dissolved	Silicon (Si)-Total	Silver (Ag)-Dissolved	Silver (Ag)-Total	Sodium (Na)-Dissolved	Sodium (Na)-Total	Strontium (Sr)-Dissolved	Strontium (Sr)-Total	Sulfur (S)-Dissolved	Sulfur (S)-Total
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	PWQO		**0.025**						**0.100**				**0.00010**						
OF01	11-Oct-2017	0.0002	0.0003	5.26	5.25			0.0002	0.0002			0.00001	0.00001	29.5	28.6	0.972	1.05		
OF01	26-Sep-2018	0.0005	0.0005	1.73	1.67	0.00051	0.00048	0.000025	0.00004	10.3	10.3	0.0000005	0.000007	252	260	0.0162	0.0144	23.3	25.3
OF01	**Average**	**0.0004**	**0.0004**	**3.50**	**3.46**	**0.00051**	**0.00048**	**0.00011**	**0.00012**	**10.30**	**10.30**	**0.000005**	**0.000009**	**140.8**	**144.3**	**0.494**	**0.532**	**23.3**	**25.3**
OF02	11-Oct-2017	0.0004	0.0004	5.52	5.28			0.0002	0.0002			0.00001	0.00001	30.9	26.6	0.713	0.701		
OF02	25-Sep-2018	0.0002	0.0002	6.05	5.7	0.00113	0.00111	0.00003	0.00006	10.7	10.6	0.0000005	0.000003	30.5	31.9	0.821	0.752	12.4	13.7
OF02	**Average**	**0.0003**	**0.0003**	**5.79**	**5.49**	**0.00113**	**0.00111**	**0.00012**	**0.00013**	**10.70**	**10.60**	**0.000005**	**0.000007**	**30.7**	**29.3**	**0.767**	**0.727**	**12.4**	**13.7**
OF03	11-Oct-2017	0.0008	0.0008	3.15	3.18			0.0002	0.0002			0.00001	0.00001	13.7	12.3	0.276	0.306		
OF03	27-Sep-2018	0.0016	0.0019	1.57	1.54	0.00057	0.0006	0.0003	0.0003	8.92	8.85	0.0000005	0.000001	7.74	8.25	0.233	0.22	2.1	2.1
OF03	**Average**	**0.0012**	**0.0014**	**2.36**	**2.36**	**0.00057**	**0.00060**	**0.00025**	**0.00025**	**8.92**	**8.85**	**0.000005**	**0.000006**	**10.7**	**10.3**	**0.255**	**0.263**	**2.1**	**2.1**
OF04	11-Oct-2017	0.0052	0.0058	3.33	3.40			0.0018	0.0016			0.00001	0.00001	48.3	45.9	0.934	1.05		
OF04	26-Sep-2018	0.0055	0.0059	3.53	3.44	0.00121	0.00115	0.0018	0.0017	8.45	8.81	0.0000015	0.000003	46.6	48.3	0.983	0.959	12.3	13.7
OF04	**Average**	**0.0054**	**0.0059**	**3.43**	**3.42**	**0.00121**	**0.00115**	**0.00180**	**0.00165**	**8.45**	**8.81**	**0.000006**	**0.000007**	**47.5**	**47.1**	**0.959**	**1.005**	**12.3**	**13.7**
OF05	12-Oct-2017	0.0010	0.0011	4.52	4.66			0.0002	0.0002			0.00001	0.00001	13.6	12.7	0.345	0.368		
OF05	27-Sep-2018	0.0012	0.0015	4.48	4.28	0.00631	0.00612	0.00005	0.000045	9.71	9.82	0.0000005	0.00002	11.4	11.5	0.364	0.341	7.5	8.5
OF05	**Average**	**0.0011**	**0.0013**	**4.50**	**4.47**	**0.00631**	**0.00612**	**0.00013**	**0.00012**	**9.71**	**9.82**	**0.000005**	**0.000015**	**12.5**	**12.1**	**0.355**	**0.355**	**7.5**	**8.5**
OF06	12-Oct-2017	0.0032	0.0033	4.70	4.88			0.0002	0.0002			0.00008	0.00027	12.0	12.1	0.384	0.393		
OF06	2018																		
OF06	**Average**	**0.0032**	**0.0033**	**4.70**	**4.88**			**0.00020**	**0.00020**			**0.000080**	**0.000270**	**12.0**	**12.1**	**0.384**	**0.393**		
OF07	12-Oct-2017	0.0004	0.0004	4.33	4.34			0.0002	0.0002			0.00001	0.00001	16.5	16.7	0.687	0.719		
OF07	19-Oct-2018	0.0004	0.0004	4.38	4.53	0.00154	0.00156	0.00003	0.000035	10.4	10.5	0.0000005	0.000001	17.5	18.4	0.667	0.705	28.6	29.7
OF07	**Average**	**0.0004**	**0.0004**	**4.36**	**4.44**	**0.00154**	**0.00156**	**0.00012**	**0.00012**	**10.40**	**10.50**	**0.000005**	**0.000006**	**17.0**	**17.6**	**0.677**	**0.712**	**28.6**	**29.7**
OF08	13-Oct-2017	0.0022	0.0022	2.74	2.74			0.0002	0.0002			0.00001	0.00001	10.7	10.4	0.207	0.219		
OF08	19-Oct-2018	0.0022	0.0022	2.81	2.89	0.00295	0.00323	0.000035	0.00007	9.98	10	0.0000005	0.000001	11	11.8	0.213	0.223	3.5	3.8
OF08	**Average**	**0.0022**	**0.0022**	**2.78**	**2.82**	**0.00295**	**0.00323**	**0.00012**	**0.00014**	**9.98**	**10.00**	**0.000005**	**0.000006**	**10.9**	**11.1**	**0.210**	**0.221**	**3.5**	**3.8**
OF09	13-Oct-2017	0.0003	0.0004	5.39	5.50			0.0002	0.0002			0.00001	0.00001	15.1	15.6	0.512	0.574		
OF09	26-Sep-2018	0.0002	0.0003	5.49	5.63	0.00135	0.00153	0.000025	0.000035	12.3	12.8	0.0000005	0.000001	15.1	16.2	0.558	0.529	11.6	13
OF09	**Average**	**0.0003**	**0.0004**	**5.44**	**5.57**	**0.00135**	**0.00153**	**0.00011**	**0.00012**	**12.30**	**12.80**	**0.000005**	**0.000006**	**15.1**	**15.9**	**0.535**	**0.552**	**11.6**	**13.0**
OF10	14-Oct-2017	0.0067	0.0070	3.39	3.49			0.0016	0.0016			0.00001	0.00001	49.1	50.6	0.145	0.162		
OF10	2018																		
OF10	**Average**	**0.0067**	**0.0070**	**3.39**	**3.49**			**0.00160**	**0.00160**			**0.000010**	**0.000010**	**49.1**	**50.6**	**0.145**	**0.162**		
OF11	2017																		
OF11	4-Oct-2018	0.0061	0.0057	0.79	0.67	0.0008	0.00066	0.0004	0.0005	9.01	8.98	0.0000005	0.000002	4.85	4.5	0.178	0.173	2.2	2.1
OF11	**Average**	**0.0061**	**0.0057**	**0.79**	**0.67**	**0.00080**	**0.00066**	**0.00040**	**0.00050**	**9.01**	**8.98**	**0.000001**	**0.000002**	**4.9**	**4.5**	**0.178**	**0.173**	**2.2**	**2.1**
Overall Average		**0.0025**	**0.0026**	**3.73**	**3.73**	**0.00182**	**0.00183**	**0.00045**	**0.00045**	**9.97**	**10.07**	**0.000012**	**0.000031**	**31.9**	**32.3**	**0.451**	**0.463**	**11.5**	**12.4**

Client Sample ID	Date Sampled	Tellurium (Te)-Dissolved	Tellurium (Te)-Total	Thallium (Tl)-Dissolved	Thallium (Tl)-Total	Thorium (Th)-Dissolved	Thorium (Th)-Total	Tin (Sn)-Dissolved	Tin (Sn)-Total	Titanium (Ti)-Dissolved	Titanium (Ti)-Total	Tungsten (W)-Dissolved	Tungsten (W)-Total	Uranium (U)-Dissolved	Uranium (U)-Total	Vanadium (V)-Dissolved	Vanadium (V)-Total	Zinc (Zn)-Dissolved	Zinc (Zn)-Total	Zirconium (Zr)-Dissolved	Zirconium (Zr)-Total
Unit		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
	PWQO				**0.00030**										**0.0050**		**0.0060**		**0.020**		
OF01	11-Oct-2017	0.00003	0.0001	0.000002	0.000002			0.00002	0.00002	0.00005	0.0001	0.00006000	0.00007	0.0019	0.0021	0.00005	0.00005	0.0005	0.0005	0.0002	0.0002
OF01	26-Sep-2018	0.000005	0.00002	0.0000001	0.0000002	0.000002	0.000002	0.0054	0.0038	0.00002	0.00006	0.000022	0.000032	0.0021	0.002	0.0001	0.0001	0.134	0.130	0.00009	0.00006
OF01	**Average**	**0.00002**	**0.00006**	**0.0000011**	**0.0000011**	**0.000002**	**0.000002**	**0.00271**	**0.00191**	**0.00004**	**0.00008**	**0.00004**	**0.00005**	**0.0020**	**0.0021**	**0.00008**	**0.00008**	**0.0673**	**0.0653**	**0.00015**	**0.00013**
OF02	11-Oct-2017	0.00002	0.00007	0.000002	0.000002			0.00002	0.00002	0.00005	0.0001	0.00006000	0.000060	0.0024	0.0023	0.00005	0.0002	0.0035	0.0055	0.00006	0.00006
OF02	25-Sep-2018	0.00004	0.00008	0.0000001	0.00003	0.000002	0.00002	0.000005	0.00009	0.00002	0.00008	0.00007	0.000072	0.0012	0.0011	0.0001	0.0002	0.0024	0.0044	0.00006	0.00008
OF02	**Average**	**0.00003**	**0.00008**	**0.0000011**	**0.0000160**	**0.000002**	**0.000020**	**0.00001**	**0.00006**	**0.00004**	**0.00009**	**0.00007**	**0.00007**	**0.0018**	**0.0017**	**0.00008**	**0.00020**	**0.0030**	**0.0050**	**0.00006**	**0.00007**
OF03	11-Oct-2017	0.00001	0.00003	0.000002	0.000002			0.00002	0.00002	0.00005	0.0002	0.00002000	0.00003	0.0025	0.0027	0.0001	0.0002	0.0220	0.020	0.00008	0.0001
OF03	27-Sep-2018	0.000005	0.00006	0.0000002	0.0000014	0.000002	0.00001	0.00002	0.0002	0.0003	0.0015	0.000012	0.000014	0.0034	0.0036	0.0003	0.0005	0.0364	0.143	0.0002	0.0002
OF03	**Average**	**0.00001**	**0.00005**	**0.0000011**	**0.0000017**	**0.000002**	**0.000010**	**0.00002**	**0.00011**	**0.00018**	**0.00085**	**0.00002**	**0.00002**	**0.0030**	**0.0032**	**0.00020**	**0.00035**	**0.0292**	**0.0815**	**0.00014**	**0.00015**
OF04	11-Oct-2017	0.00002	0.0001	0.000002	0.000002			0.00002	0.00004	0.00005	0.0001	0.00009000	0.0001200	0.0026	0.0028	0.0003	0.0004	0.0200	0.0190	0.0003	0.0005
OF04	26-Sep-2018	0.00003	0.0001	0.0000013	0.0000016	0.000002	0.000001	0.00008	0.00004	0.00002	0.0001	0.00009	0.000088	0.0024	0.0023	0.0003	0.0005	0.0314	0.030	0.0004	0.0004
OF04	**Average**	**0.00003**	**0.00010**	**0.0000017**	**0.0000018**	**0.000002**	**0.000001**	**0.00005**	**0.00004**	**0.00004**	**0.00010**	**0.00009**	**0.00010**	**0.0025**	**0.0026**	**0.00030**	**0.00045**	**0.0257**	**0.0245**	**0.00035**	**0.00045**
OF05	12-Oct-2017	0.00001	0.00004	0.000002	0.000008			0.00002	0.00002	0.00005	0.0001	0.00001000	0.00002	0.0041	0.0044	0.00005	0.00005	0.0030	0.0025	0.0002	0.0002
OF05	27-Sep-2018	0.000025	0.00004	0.0000043	0.0000036	0.000002	0.000001	0.000015	0.00099	0.00002	0.00004	0.000016	0.000012	0.0043	0.004	0.0001	0.0003	0.0138	0.0198	0.0002	0.0002
OF05	**Average**	**0.00002**	**0.00004**	**0.0000032**	**0.0000058**	**0.000002**	**0.000001**	**0.00002**	**0.00002**	**0.00004**	**0.00007**	**0.00001**	**0.00002**	**0.0042**	**0.0042**	**0.00008**	**0.00018**	**0.0084**	**0.0112**	**0.00020**	**0.00020**
OF06	12-Oct-2017	0.00002	0.00004	0.000006	0.000008			0.00002	0.00002	0.0001	0.0002	0.00001	0.00001	0.0058	0.0060	0.0005	0.0005	0.0790	0.08	0.0002	0.0002
OF06	2018																				
OF06	**Average**	**0.00002**	**0.00004**	**0.0000060**	**0.0000080**			**0.00002**	**0.00002**	**0.00010**	**0.00020**	**0.00001**	**0.00001**	**0.0058**	**0.0060**	**0.00050**	**0.00050**	**0.0790**	**0.0800**	**0.00020**	**0.00020**
OF07	12-Oct-2017	0.00003	0.0001	0.000002	0.000002			0.00002	0.00002	0.0001	0.00005	0.00001	0.00001	0.0047	0.0049	0.0001	0.0001	0.0040	0.0050	0.00004	0.00004
OF07	19-Oct-2018	0.00003	0.00007	0.0000002	0.000001	0.000002	0.000001	0.000005	0.00001	0.00002	0.0001	0.00001	0.000012	0.0047	0.005	0.0001	0.0003	0.0206	0.0224	0.00003	0.000038
OF07	**Average**	**0.00003**	**0.00009**	**0.0000011**	**0.0000015**	**0.000002**	**0.000001**	**0.00001**	**0.00002**	**0.00006**	**0.00008**	**0.00001**	**0.00001**	**0.0047**	**0.0050**	**0.00010**	**0.00020**	**0.0123**	**0.0137**	**0.00004**	**0.00004**
OF08	13-Oct-2017	0.00003	0.00003	0.000002	0.000002			0.00002	0.00002	0.00005	0.00005	0.00002000	0.00003	0.0009	0.00099	0.0001	0.00005	0.0350	0.0355	0.00002	0.00002
OF08	19-Oct-2018	0.000015	0.00004	0.0000001	0.0000002	0.000002	0.000001	0.000005	0.00001	0.00002	0.00006	0.000026	0.000034	0.001	0.001	0.0002	0.0002	0.06	0.0386	0.000014	0.000016
OF08	**Average**	**0.00002**	**0.00004**	**0.0000011**	**0.0000011**	**0.000002**	**0.000001**	**0.00001**	**0.00002**	**0.00004**	**0.00006**	**0.00002**	**0.00003**	**0.0010**	**0.0010**	**0.00015**	**0.00013**	**0.035**	**0.0371**	**0.00002**	**0.00002**
OF09	13-Oct-2017	0.00002	0.0001	0.000002	0.000002			0.00002	0.00002	0.00005	0.0009	0.00006000	0.00009	0.0021	0.0023	0.00005	0.00005	0.0055	0.0060	0.0002	0.0002
OF09	26-Sep-2018	0.000025	0.00008	0.0000001	0.0000012	0.000002	0.000004	0.000005	0.00001	0.00002	0.0002	0.000076	0.00007	0.0015	0.0014	0.00008	0.0003	0.0076	0.0074	0.0002	0.0002
OF09	**Average**	**0.00002**	**0.00009**	**0.0000011**	**0.0000016**	**0.000002**	**0.000004**	**0.00001**	**0.00002**	**0.00004**	**0.00055**	**0.00007**	**0.00008**	**0.0018**	**0.0019**	**0.00007**	**0.00018**	**0.006**	**0.0067**	**0.00020**	**0.00020**
OF10	14-Oct-2017	0.00001	0.00003	0.000002	0.000004			0.00002	0.00004	0.00005	0.0005	0.00001	0.00001	0.0019	0.0021	0.0007	0.0008	0.0335	0.0335	0.0001	0.0001
OF10	2018																				
OF10	**Average**	**0.00001**	**0.00003**	**0.000002**	**0.0000040**			**0.00002**	**0.00004**	**0.00005**	**0.00050**	**0.00001**	**0.00001**	**0.0019**	**0.0021**	**0.00070**	**0.00080**	**0.0335**	**0.0335**	**0.00010**	**0.00010**
OF11	2017																				
OF11	4-Oct-2018	0.000005	0.00001	0.000005	0.0000038	0.000002	0.000005	0.00001	0.00002	0.00006	0.0003	0.000002	0.000002	0.0025	0.0025	0.0004	0.0005	0.414	0.22	0.0002	0.0002
OF11	**Average**	**0.00001**	**0.00001**	**0.0000050**	**0.0000038**	**0.000002**	**0.000005**	**0.00001**	**0.00002**	**0.00006**	**0.00030**	**0.000002**	**0.000002**	**0.0025**	**0.0025**	**0.00040**	**0.00050**	**0.414**	**0.2200**	**0.00020**	**0.00020**
Overall Average		**0.00002**	**0.00006**	**0.0000022**	**0.0000042**	**0.000002**	**0.000005**	**0.00026**	**0.00021**	**0.00006**	**0.00026**	**0.00003**	**0.00004**	**0.0028**	**0.0029**	**0.00024**	**0.00032**	**0.065**	**0.0526**	**0.00015**	**0.00016**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Hwy 600
Marr Rd
Transmission Line
East Access Road
Mudcat Lake
Korpi Rd
Hwy 600
Loslo Creek
Rowell Rapids Rd
Rowell River
Teeple Rd
Hwy 600
Hwy 71
Blackhawk Rd
1
5
10
20
30
50
90
40
LEGEND
Proposed Site Features
Mine Feature
Open Pit
Highway Re-alignment
East Access Road
Transmission Line
RRP-NG Property Boundary
EA RRP Groundwater Model ZOI
Drawdown Base Case, 2018 RRP Groundwater Model
Private Water Wells (2012 Survey)
Private Water Wells (2013 Survey)
Private Water Wells (MOE
Offsite Groundwater Monitoring Participants
Source / Notes:
- Only major facilities are shown. Connecting infrastructure and supporting facilities are generally not shown.
- Surficial geology based on air photo analysis and review of published geology maps. Surficial materials may vary from those indicated
Datum: NAD83
Projection: UTM Zone 15N
newgold Rainy River Project
RAINY RIVER PROJECT
ZOI and Drawdown Base Case, 2018 RRP Groundwater Model
PROJECT N°: TC111504
FIGURE: 15
SCALE: 1:52,715
March 2018