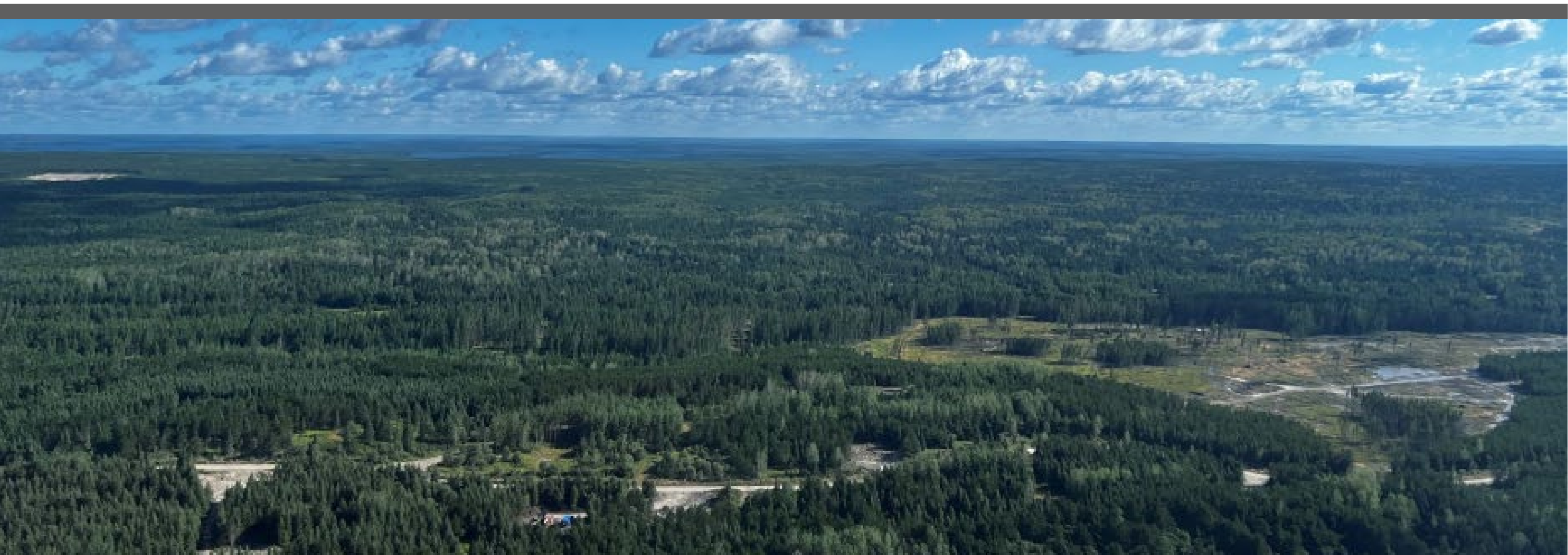
KINROSS Great Bear

Great Bear Gold Project Impact Statement

Appendix D-2:

Air Quality Modelling Report



GREAT BEAR RESOURCES LTD.

GREAT BEAR PROJECT

AIR QUALITY ASSESSMENT

OCTOBER 2025

GREAT BEAR PROJECT

AIR QUALITY ASSESSMENT

GREAT BEAR RESOURCES LTD.

PROJECT NO.: OMEMA2303
OCTOBER 2025

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ABBREVIATIONS

AAQC	Ontario Ambient Air Quality Criteria
AAV	Annual Assessment Value
ACB	Air Contaminants Benchmark
ADMGO	Guideline A-11: Air Dispersion Modelling Guideline for Ontario, v3.0, 2018
AERMOD	US EPA AERMOD version 22112, an MECP approved air quality dispersion model
ANFO	ammonium nitrate fuel oil
As	arsenic
b(a)p	benzo(a)pyrene
BMP	Best Management Practice
CAAQS	Canadian Ambient Air Quality Standards
CAP	Criteria Air Parameter
CaO	calcium oxide
CCME	Canadian Council of Ministers of the Environment
CEPA	*Canadian Environmental Protection Act*
CO	carbon monoxide
Cr	chromium
$CuSO_4$	copper sulphate
DAV	Daily Assessment Value
De	Equivalent Diameter
DPM	diesel particulate matter
E2	Environmental Emergency
ECA	Environmental Compliance Approval
ECCC	Environment and Climate Change Canada
Fe	iron
GHG	greenhouse gas(es)
Great Bear Resources	Great Bear Resources Ltd.
HCN	hydrogen cyanide
Hg	mercury
km	kilometre
km/h	kilometres per hour
L	litres
LGO	low grade ore stockpile
LSA	Local Study Area
m	metre
m^3	cubic metres
m^3/yr	cubic metres per year
m^3/d	cubic metres per day
m^3/s	cubic metres per second
mg/kg	milligrams per kilogram
MECP	Ministry of the Environment, Conservation and Parks
Mg	magnesium
mmHg	millimetres of mercury
Mn	manganese
MRS	mine rock stockpile
Mt	million tonnes (metric)
MTO	Ontario Ministry of Transportation
NAPS	National Air Pollution Surveillance Program
Ni	nickel
NH_3	ammonia
NO	nitric oxide
N_2O	nitrous oxide
NO_2	nitrogen dioxide

NO_X	nitrogen oxides
NPI	Australian National Pollutant Inventory
NPRI	National Pollutant Reporting Inventory
O_3	ozone
OLM	Ozone Limiting Method
O.Reg.	Ontario Regulation
OVB	overburden stockpile
PAH	polycyclic aromatic hydrocarbon
Pb	lead
PA	Project Area
PM	particulate matter
$PM_{2.5}$	particles less than 2.5 micrometers in diameter
PM_{10}	particles less than 10 micrometers in diameter
POI	point of impingement
POR	point of reception
ppb	parts per billion
ppm	parts per million
Project	Great Bear Project
ROM	run of mine stockpile
RSA	Regional Study Area
SiO_2	silicon dioxide (respirable silica)
SO_2	sulphur dioxide
SO_3	sulphur trioxide
SOx	sulphur oxides
SPM	suspended particulate matter (particulate matter less than 44 micrometers in diameter)
Ti	titanium
TMF	tailings management facility
US EPA	United States Environmental Protection Agency
UTM	Universal Transverse Mercator
VMF	Viggo management facility
VOC	volatile organic compound
WSP	WSP Canada Inc.
Zn	zinc
°C	degrees Celsius
µm	micrometre (one millionth of a metre), also micron
µg	micrograms (one millionth of a gram)
µg/g	micrograms per gram, also ppm
$\mu g/m^3$	micrograms (one millionth of a gram) per cubic metre

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1 INTRODUCTION

1.1 OVERVIEW

Great Bear Resources Ltd. (Great Bear Resources) a wholly owned subsidiary of Kinross Gold Corporation, is planning to develop, operate, and reclaim a gold mine (the Great Bear Project or Project) on the Great Bear Property (the Property). The Project will consist of two open pits, underground mining activities, an onsite ore processing facility, and auxiliary operations and administrative activities will also take place on the Property. The Property, shown in Figure 1-1, is located approximately 25 kilometres (km) southeast of the Town of Red Lake in northwestern Ontario.

An Impact Assessment pursuant to the *Impact Assessment Act* is required to be completed for the Project. This Air Quality Assessment is one of a series of documents prepared by WSP Canada Inc. (WSP) on behalf of Great Bear Resources to describe the predicted environmental impact of the Project.

1.2 OBJECTIVE

This Air Quality Assessment has been prepared by WSP to summarize the findings of the air quality modelling assessment. The scope of work is to determine the cumulative air quality concentrations for the construction, operation, and closure and decommissioning phases of the Project. This Air Quality Assessment was prepared in accordance with industry best practices and to address the Tailored Impact Statement Guidelines for the Project dated August 1, 2024.

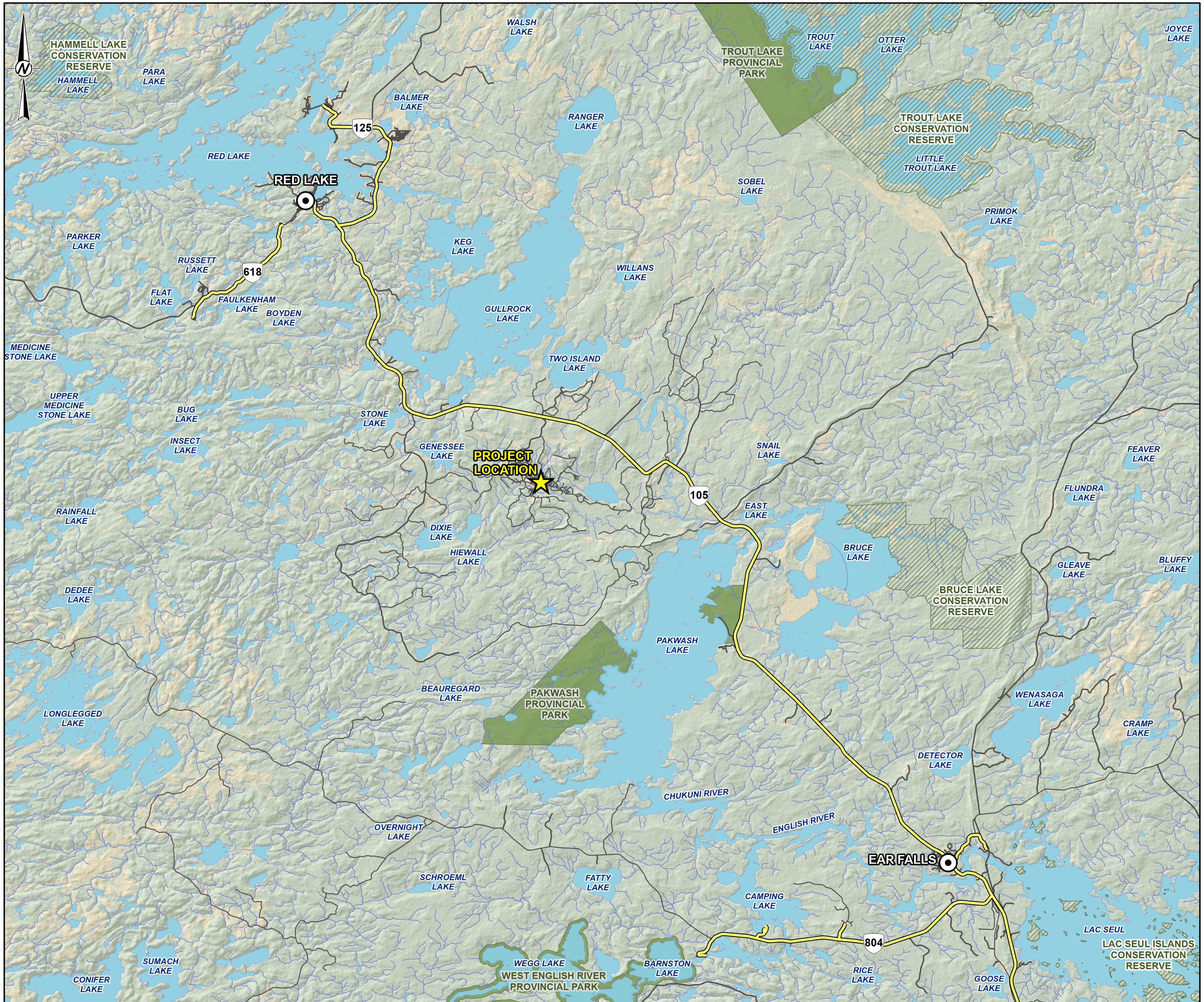
The expected duration of Project phases are provided below for reference:

- Construction phase (Year -3 to Year -1: three years in length)
- Operations phase (Year 1 to Year 26: 26 years in length)
- Closure phase (active closure period; Year 27 to Year 29: 3 years in length. passive closure period; Year 30, approximately one additional year; final close out period (removal of water management infrastructure): less than one year in length).

The main components of the Project (Figure 1-2) include:

- LP Central pit, Viggo pit
- Underground mine, accessed via portals, ramps and shaft
- Flood protection berm
- Tailings management facility (TMF)
- Viggo management facility (VMF)
- Run of mine stockpile (ROM)
- Low grade ore stockpiles (LGO)
- Mine rock stockpile (MRS)
- Overburden stockpiles (OVB)
- Process plant complex
- Assay lab
- Portable crushers
- Buildings and supporting infrastructure
- Water management and treatment facilities

- Construction camp and permanent camp
- Domestic landfill
- Concrete batch plant, cemented rockfill plant and paste plant
- Quarry, and sand and gravel pits
- Explosives storage facility.



KEY MAP

SCALE: 1:30,000,000

LEGEND

- ★ PROJECT LOCATION
- ⊙ TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- RESOURCE / RECREATION ROAD
- WATERCOURSE
- WATERBODY

0 2.5 5 10

1:250,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. WATERCOURSES AND WATERBODY ACQUIRED FROM LAND INFORMATION ONTARIO (MNRF) AND MODIFIED TO MATCH AERIAL IMAGERY AND LIDAR.
3. ROADS INFORMATION PROVIDED BY GREAT BEAR RESOURCES, AUGUST 2022.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

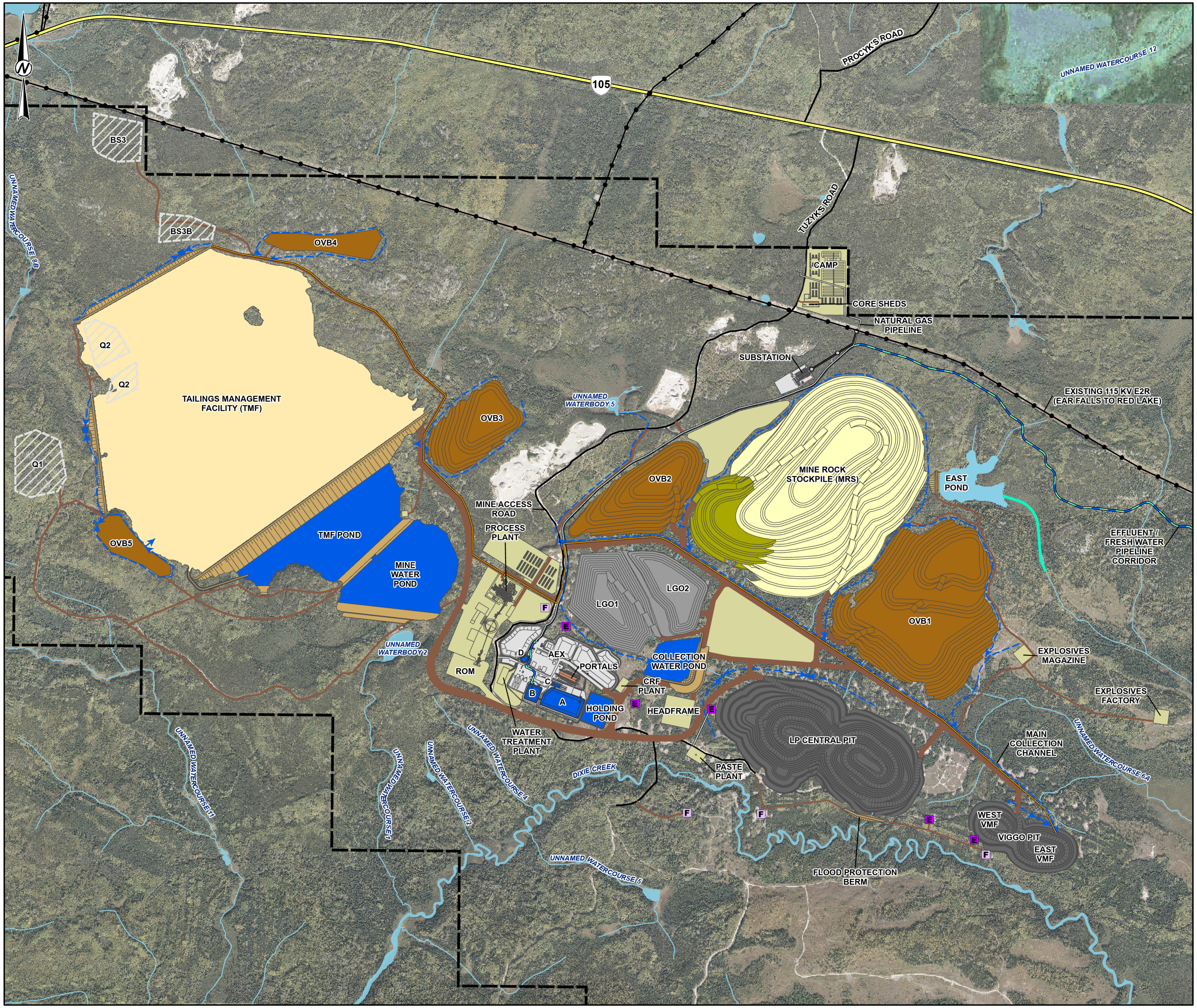
TITLE
PROJECT LOCATION

CONSULTANT
wsp

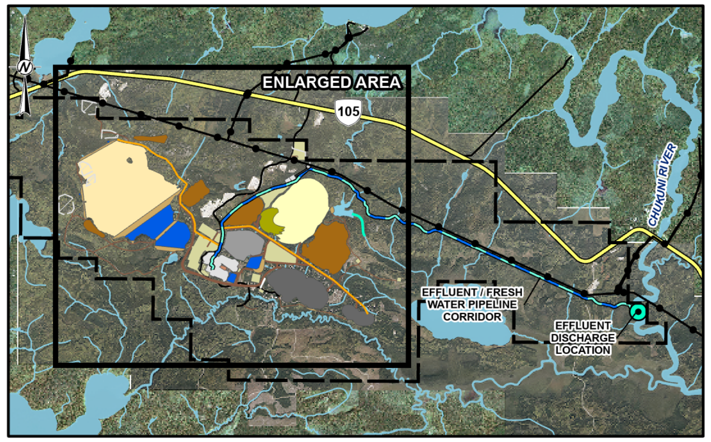
YYYY-MM-DD	2025-09-17
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	1-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25mm



KEY MAP



SCALE: 1:175,000

LEGEND

- LEASED CLAIMS BOUNDARY
- HIGHWAY (INCLUDING ENBRIDGE PIPELINE)
- LOCAL ROAD
- EXISTING TRANSMISSION LINE
- WATERCOURSE
- WATERBODY

PROPOSED MINE FEATURE

- OPEN PIT
- MINE ROCK STOCKPILE (NPAG)
- MINE ROCK STOCKPILE (PAG)
- LOW GRADE ORE STOCKPILE (LGO)
- OVERBURDEN STOCKPILE (OVB)
- TAILINGS MANAGEMENT FACILITY (TMF)
- DAM
- POND
- COLLECTION DITCH
- MINE FACILITIES / INFRASTRUCTURE
- ROAD
- PORTAL
- ADVANCED EXPLORATION SITE (AEX)
- ROCK QUARRY (Q) / SAND AND GRAVEL PIT (B)
- DIVERSION CHANNEL
- F FRESH AIR VENT RAISE
- E EXHAUST VENT RAISE
- TRANSMISSION LINE
- TAILINGS PIPELINE
- PASTE PLANT PIPELINE
- EFFLUENT / FRESH WATER PIPELINE CORRIDOR
- EFFLUENT DISCHARGE LOCATION

0 0.25 0.5 1

1:26,500 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE
2. VMF: VIGGO MANAGEMENT FACILITY
3. ROM: RUN OF MINE ORE
4. AEX PONDS: A-AEX MINE WATER POND, B-AEX TREATED WATER POND, C-AEX SETTLING POND, D-AEX SEDIMENT POND

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. AERIAL IMAGERY PROVIDED BY GREAT BEAR RESOURCES (SCENE DATE: SEPTEMBER 2022).
3. PROPERTY BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, AUGUST 2024.
4. ROADS INFORMATION PROVIDED BY GREAT BEAR RESOURCES, AUGUST 2022.
5. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
6. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
SITE PLAN (SATELLITE)

CONSULTANT

wsp

YYYY-MM-DD	2025-10-15
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	1-2

2 ATMOSPHERIC EMISSIONS AND APPLICABLE AIR QUALITY CRITERIA

2.1 ATMOSPHERIC EMISSIONS AND AIR QUALITY CRITERIA

The Air Quality Assessment requires comparing the cumulative concentrations to applicable air quality criteria. The cumulative concentrations were determined by adding air dispersion modelling concentrations to existing condition concentrations.

Greenhouse gases (GHG), including carbon dioxide, methane, and nitrous oxide, are considered in a separate document.

2.2 AIR PARAMETERS

Key air parameters anticipated from the Project are presented in Table 2-1 with a summary of relevant criteria, benchmarks, and standards provided in Table 2-2.

The release of these key air parameters to the atmosphere from the open pit, stationary and mobile sources (such as tailpipe emissions from haul trucks), and road dust particulate were considered in the assessment; mobile sources and existing condition concentrations were excluded for the O.Reg. 419/05 assessment per O.Reg. 419/05 and the Ministry of the Environment, Conservation and Parks' (MECP) *Guideline A-11: Air Dispersion Modelling Guideline for Ontario* (ADMGO), *Version 3.0*. Trace metals released with the fugitive dust were considered in both assessments.

2.2.1 NITROGEN OXIDES

There are three oxides of nitrogen found in appreciable concentrations in the atmosphere: nitrogen dioxide (NO_2), nitric oxide (NO) and nitrous oxide (N_2O). Collectively they are known as nitrogen oxides (NO_X) and are often expressed as the equivalent mass concentration of NO_2. Sources of NO_X for the Project include blasting and fuel combustion.

Since NO_2 has adverse effects at much lower concentrations than NO, and NO converts to NO_2 in ambient air, the standards and Ontario Ambient Air Quality Criteria (AAQC) for NO_X are based on the health effects of NO_2. In the assessment of ambient air quality where concentrations are compared against the AAQCs, NO_2 is the reference parameter.

The MECP has set standards for NO_2 concentrations, however there are no standards for NO or N_2O. The O. Reg. 419/05 standards are based upon potential health effects of exposure to NO_2 but conservatively set for total NO_X under the regulation. This takes into consideration that the amount of NO_2 formation from NO conversion between the point of release and the receptor is not accurately known.

Currently there are Canadian Ambient Air Quality Standards (CAAQS) for NO_2 which come into effect in 2030. For the purposes of this Air Quality Assessment, 2030 values have been utilized.

2.2.2 CARBON MONOXIDE

Carbon monoxide (CO) is a colourless and odourless gas which is produced primarily through the combustion of fossil fuels as a result of incomplete combustion. Releases associated with explosive detonation are also considered in the assessment. CO is generally not considered to be a key environmental parameter for mining operations with respect to environmental air quality compliance.

The O. Reg. 419/05 CO benchmark is for the one half-hour averaging time. AAQCs exist for the 1-hour and 8-hour averaging times. The O. Reg. 419/05 standards and AAQC for CO are all based upon potential health effects.

2.2.3 SULPHUR OXIDES

Sulphur oxides (SO_X) comprise sulphur dioxide (SO_2), sulphur trioxide (SO_3), and solid sulphate forms. SO_2 is a non-flammable, non-explosive colourless gas. In connection with fuel burning, where the majority is in the form of SO_2, SO_X is normally expressed in terms of the equivalent mass concentration of SO_2.

The combustion of fuels is a source of SO_2 due to the presence of sulphur in the fuel, though in very low concentrations. Explosive detonation is also a source of SO_2, again due to the presence of sulphur in the fuel. SO_2 is used in the cyanide destruction process, however the delivery and process tanks are operated as closed loop with no releases to atmosphere, except for the cyanide mix tank, which is connected to a ventilation filter.

Effective July 1, 2023, new O. Reg. 419/05 air quality standards for SO_2 were introduced for the 1-hour and annual averaging times (there is no longer a 24-hour standard), with equivalent AAQCs. In addition, Ontario has a 10-minute AAQC for SO_2. The standards and AAQC are based upon potential health effects of SO_2, as well as potential effects on vegetation.

Currently there are CAAQS for SO_2 which come into effect in 2030. For the purposes of the Air Quality Assessment, 2030 values have been utilized.

2.2.4 PARTICULATE MATTER

Suspended particulate matter (SPM), which consists primarily of fugitive dusts, is generated from a variety of activities at mine sites, including crushing, screening, and material handling activities. Airborne particles are categorized as primary (being emitted directly from the source into the atmosphere) and secondary (being formed in part by chemical and physical transformations). Particles can be chemically inert or active. Even if inert, they may adsorb chemically active compounds or they may combine to form chemically active species.

Historically, standards were developed based upon visibility effects for all particle sizes that remain airborne for appreciable distances as they are small enough that gravitational settling does not prevent dispersion, referred to as SPM. As the scientific data evolved, it was found that the correlation between health effects and particulate was stronger at smaller particle sizes. Air quality criteria were then developed for particles with diameters of less than 10 µm and, more recently, those criteria have been superseded by standards for particles less than 2.5 µm in diameter.

SPM is defined by the MECP, in O. Reg. 419/05, as having a particle size less than 44 µm in aerodynamic diameter. SPM will be discussed in terms of 44 µm noting that the measured quantities may include a small contribution from larger particle sizes. The AAQC for SPM is based on visibility.

SPM includes the smaller particle size fractions of particles less than 10 micrometres (µm) in diameter (PM_{10})and particles less than 2.5 µm in diameter ($PM_{2.5}$); it is emphasized that these particle size fractions are not separate compounds, nor are they additive. The smaller particle sizes are a subset of the large particulate matter size fractions.

The PM_{10} size fraction is generally associated with dusts generated by mechanical activities and road dust. MECP has not set an AAQC for PM_{10}. In the AAQC listing, the MECP (2023a) suggests a value for PM_{10} of 50 micrograms per cubic metre (µg/m^3) for the 24-hour averaging time and identified it as an interim AAQC.

Respirable particle $PM_{2.5}$, with particles sizes less than 2.5 µm in diameter, are produced during the combustion of fuels for power generation and equipment operation. The CAAQS for $PM_{2.5}$ were updated to become more stringent in 2030 and are set at 23 µg/m^3 for the 24-hour averaging time, and 8.0 µg/m^3 for the annual averaging time.

2.2.4.1 RESPIRABLE SILICA

Respirable Silica (SiO_2) is present as a constituent of PM_{10}. The quartz content of the deposit is similar to that observed for common granitic rocks, which have quartz contents that range from 20% to 60%. These types of granitic rocks are a considerable component of the rock found throughout northern Ontario.

The secondary minerals in granites (feldspar and phyllosilicates) are less resistant to physical abrasion and weathering than quartz and would be preferentially liberated from the rock matrix by physical comminution / abrasion in comparison to quartz. As a result, the fine particulate emitted from handling and processing of the mine rock and ore would be composed of a disproportionately higher content of secondary minerals compared to silica, and the respirable silica would be appreciably less than the bulk material quartz content. A silica concentration of 7.5% of the PM_{10} was determined in an extensive Ministry of Labour study of mines in northern Ontario (Verma et al. 2014).

The MECP has AAQCs for cristobalite, quartz, and tridymite respirable silica. O. Reg. 419/05 air quality standards are identical to the AAQCs.

2.2.4.2 DIESEL PARTICULATE MATTER

Diesel Particulate Matter (DPM) consists of fine and ultrafine particulate matter released directly from fuel combustion in diesel engines or is formed by secondary particulates in the exhaust. $PM_{2.5}$ from combustion processes (including blasting) were considered in the air dispersion modelling as a surrogate for DPM and were compared against chronic and short-term exposure guidance values for diesel exhaust particulate matter published by Health Canada (2016).

2.2.5 METALS

Several metal species are present in the mine rock and processed ore and may be subsequently emitted as trace constituents of the particulate matter (i.e., particle-bound).

The following list of metals were included in the assessment due to their potential presence in appreciable concentrations in the ore and mine rock as determined by the geochemistry of samples collected at the Project, the existence of an AAQC to compare modelled concentrations against, and the general interest of these metals for mining projects:

- Arsenic (As)
- Chromium (Cr)
- Copper (Cu), including the Cu fraction in copper sulphate ($CuSO_4$)
- Iron (Fe)
- Mercury (Hg)
- Magnesium (Mg)
- Manganese (Mn)
- Nickel (Ni)
- Lead (Pb)
- Titanium (Ti)
- Zinc (Zn).

These metals all have O. Reg. 419/05 standards based upon potential health effects. As well, a number of these metals have AAQC values based on different particle size fractions (i.e., the metal content in $PM_{2.5}$ or PM_{10}). The screening of the available geochemistry data to identify the metals and metalloids to include in the air dispersion modelling is detailed in Appendix C.

There are other metals likely to be present in trace quantities on the dust emitted from the Project, including beryllium, bismuth, gallium, gold, lanthanum, scandium, and thorium.

Mercury, including methylmercury, will not be used in the mining or ore processing, and therefore no associated processing releases to the air will occur. Mercury that may be present in the mine rock and ore is considered, and the potential concentrations have been modelled for comparison against the AAQC and O. Reg. 419/05 standard for mercury.

Silica, a metalloid with properties of both metals and non-metals, is naturally occurring in the overburden, mine rock, and ore; the assessment of silica concentrations is described in Section 5 as a constituent of respirable particulate matter.

2.2.6 VOLATILE ORGANIC COMPOUNDS AND POLYCYCLIC AROMATIC HYDROCARBONS

There are a number of volatile organic compound (VOCs) and polycyclic aromatic hydrocarbon (PAHs) that are emitted as a by-product of fuel combustion by generators, onsite equipment and vehicles, and from fuel storage and dispensing activities. VOCs and PAHs are both groups of parameters, and surrogate species were selected to represent each grouping for the assessment.

Benzo(a)pyrene (b(a)p) was used as the surrogate for all PAHs, as recommended by the MECP.

For mobile combustion sources, relevant VOCs include 1,3-butadiene, acetaldehyde, acrolein, benzene, and formaldehyde (MTO, 2020). Additionally, the VOCs toluene, ethylbenzene, and xylene were monitored onsite as common VOCs in petroleum products. Considering those VOCs with the most stringent criteria, and where data were available, benzene and 1,3-butadiene were selected as surrogates for the VOCs.

2.2.7 OTHER PARAMETERS ASSOCIATED WITH ORE MINING AND PROCESSING

A number of other parameters have been considered in this Air Quality Assessment that may be released from the mining and ore processing phase of the Project. These parameters include hydrogen cyanide (HCN), calcium oxide (CaO), and copper sulphate ($CuSO_4$). Assessment of these parameters during the construction phase was required as mining is expected at the Viggo Pit during all construction years and ore processing is expected during the final year of construction.

Ore processing will be carried out using a conventional whole ore cyanidation for gold recovery, which involves the use of sodium cyanide. A cyanide destruction circuit will be established within the process plant to treat residual cyanide concentrations in the tailings and process plant water, prior to pumping to the tailings management facility. Cyanide, in the form of HCN, is emitted from the leach tanks as a process fugitive. The AAQC (and equivalent O. Reg. 419/05 standard) for HCN is based upon the potential for both acute and chronic health effects.

CaO and $CuSO_4$ were also considered for this assessment as there is bulk handling of these reagents at the process plant. Calcium oxide has a corrosion-based AAQC (and equivalent O. Reg. 419/05 standard). $CuSO_4$ has an O. Reg. 419/05 standard but no AAQC. Where the AAQCs are used, the copper fraction of $CuSO_4$ was compared to the copper AAQC.

Ammonia (NH_3) is known to be released during explosive detonation, however the quantities discharged during each blast are not substantial; in the absence of other ammonia sources, the expected concentrations from NH_3 are not appreciable and it was not chosen as an air quality indicator for this assessment.

Ozone (O_3) is monitored and regulated as an indicator of air quality in Canada. This Air Quality Assessment does not include ozone as an indicator. There are no sources of ozone associated with the Project. While the Project emits air parameters that could be considered precursors for ozone (i.e., NO_X and small quantities of VOCs that react in the presence of heat and sunlight to form ozone), there is no expectation that the amounts emitted will cause an increase in ozone on either a local or regional scale. Ozone concentrations measured in northwestern Ontario are also similar across the region, suggesting that ozone is a regional air quality issue rather than a local issue. However, ozone is important in the conversion of NO, the major constituent of NO_X emissions, to NO_2 in the atmosphere; the ozone concentrations measured at the Experimental Lakes Area were used in this Air Quality Assessment to quantify the extent of this atmospheric conversion using the Ozone Limiting Method (OLM), as described in Section 3.

2.3 AIR QUALITY STANDARDS AND CRITERIA

Various regulatory agencies set specific target criteria to be protective of human health and the environment. Criteria and standards can have different averaging times depending on the type of effect the parameter may have. The averaging time is the duration of exposure to the air parameter, and ranges from 10-minute averaging time for odour-based criteria to evaluate acute effects, to annual averaging time for long-term exposure effects (chronic). It is noted that air quality criteria are reported in both units of parts per million (ppm), parts per billion (ppb), and $\mu g/m^3$; in order to present consistent values for comparison, any ppm or ppb values will be converted to $\mu g/m^3$ using a reference temperature and pressure of 25° C and 760 mm Hg respectively (Environment Canada 2004) where not otherwise provided.

The MECP has established AAQC for various parameters, including most of the target parameters identified for this Air Quality Assessment. The AAQCs are set to determine a target concentration for a location, inclusive of all sources and baseline. The AAQC levels are not compliance standards but set to provide guidance for decision-making regarding what is an acceptable ambient air concentration. They are most commonly used in environmental assessments, special studies using ambient air monitoring data, assessment of general air quality in a community and annual reporting on air quality across the province. For this assessment, AAQCs were the appropriate measure against which to compare the modelled concentrations with consideration of baseline air concentrations.

In contrast, the O. Reg. 419/05 standards are used for the assessment of stationary sources for the purposes of permitting or to establish compliance with the regulation. There is no consideration of deposition or plume depletion, an assumption that all NO_X is converted to NO_2 immediately, and generally no consideration of background concentration, as described in Section 2.4.4. This Air Quality Assessment was also conducted in accordance with the specific requirements of O.Reg. 419/05, *Guideline A 10: Procedure for Preparing an Emission Summary and Dispersion Modelling Report* (MECP 2018), and ADMGO (MECP 2017) to demonstrate whether the proposed Project can operate in compliance with provincial air quality regulations. The *Air Contaminants Benchmarks List: standards, guidelines and screening levels for assessing point of impingement concentrations of air contaminants* (ACBs) (MECP 2023b) outlines the standards, as well as other benchmarks used for permitting and compliance purposes. The ACBs include standards, guidelines and jurisdictional screening levels for more than 5,000 parameters. In many cases, the AAQCs and the ACBs are numerically the same.

The ACB list also includes provincial Annual Assessment Values (AAVs) and Daily Assessment Values (DAVs) for parameters that have ACBs based on effects of long-term exposure (i.e., ACBs with annual averaging times); the DAV reflects the short-term risk associated with the parameters. The AAV represents the maximum annual average concentration associated with sustained, peak operations over the entire year.

In addition to the provincial criteria, federal CAAQS for $PM_{2.5}$, NO_2, and SO_2 have been adopted by the Canadian Council of Ministers of the Environment (CCME) and were considered in this assessment. Per the August 9, 2025, Canada Gazette notice, more stringent CAAQS for $PM_{2.5}$ will come into effect for 2030. These CAAQS are intended as targets for air quality to determine appropriate air quality management actions for action within an air zone and not for local assessment or enforcement. The CAAQS are not intended for the assessment of specific emission sources but rather to characterize air quality within a broader air zone. The CAAQS are not directly comparable to individual concentrations but rather to the 3-year average of the 98^{th} percentile of $PM_{2.5}$ and NO_2 data, and the 99^{th} percentile for SO_2. For this assessment, the concentrations predicted by the air dispersion model were compared directly against the CAAQS to allow for discussion of the modelled concentrations of air emissions on the air zone.

There is no AAQC for DPM; in order to assess the modelled concentrations, the Health Canada's chronic and short-term exposure guidance values were used (Health Canada 2016).

A summary of the applicable AAQCs, ACBs, and CAAQS are provided in Table 2 2.

Table 2-1: Key Parameters Considered by Project Phase

Parameter	Project Phase (1)	
	Construction	Operations
Oxides of nitrogen (NO_X), reported as nitrogen dioxide (NO_2)	✓	✓
Carbon monoxide (CO)	✓	✓
Suspended particulates matter (SPM)	✓	✓
Fine particulate matter less than 10 µm in diameter (PM_{10})	✓	✓
Fine particulate matter less than 2.5 µm in diameter ($PM_{2.5}$)	✓	✓
Diesel particulate matter (DPM);	✓	✓
Volatile organic compounds (VOCs) (2)	✓	✓
Polycyclic aromatic hydrocarbons (PAHs) (3)	✓	✓
Hydrogen cyanide (HCN)	✓	✓
Sulphur dioxide (SO_2)	✓	✓
Metals (particle-bound)	✓(4)	✓
Respirable silica (SiO_2);	✓(4)	✓
Calcium oxide (CaO);	✓	✓
Copper sulphate ($CuSO_4$);	✓	✓

Notes:

1 *The closure and decommissioning phase would have parameters in common with the construction phase but at a reduced fleet and activity level.*

2 *Benzene and 1,3-butadiene were used as surrogates for all VOCs.*

3 *Benzo(a)pyrene was used as a surrogate for all PAHs.*

4 *Metals and silica were assessed for construction and operations of the mine site infrastructure.*

Table 2-2: Air Quality Standards and Criteria

Parameter	Averaging Time	Ambient Air Quality Criterion (AAQC)	O. Reg. 419/05 Standards and Air Contaminants Benchmark (ACB) [(5)]	Canadian Ambient Air Quality Standard [(6)] (CAAQS)
		Unit of Measure: µg/m³		
Suspended particulate matter (SPM)	24 hr	120	120	—
	Annual	60	—	—
Inhalable particulate (PM_{10})	24 hr	50 (Interim)	—	—
Respirable particulate ($PM_{2.5}$)	24 hr	27 [(1)]	—	23
	Annual	8.8 [(1)]	—	8.0
Diesel particulate matter (DPM)	24 hr	10 [(2)]	—	—
	Annual	5 [(2)]	—	—
Respirable silica (<10 µm)	24 hr	5	5	—
Nitrogen dioxide (NO_2)	1 hr	400	400 [(4)]	79
	24 hr	200	200 [(4)]	—
	Annual	—	—	23
Carbon monoxide (CO)	0.5 hr	—	6,000	—
	1 hr	36,200	—	—
	8 hr	15,700	—	—
Sulphur dioxide (SO_2)	10-min	175	—	—
	1 hr	105	100	170
	Annual	10	10	10
Hydrogen cyanide (HCN)	24 hr	8	8	—
Calcium oxide (CaO)	24 hr	10	10	—
Copper sulphate ($CuSO_4$)	24 hr	— [(3)]	0.5	—
Arsenic (As)	24 hr	0.3	0.3	—
Chromium (Cr)	24 hr	0.5	0.5	—
Copper (Cu)	24 hr	50 [(3)]	50	—
Iron (Fe)	24 hr	25	25 [(7)]	—
Lead (Pb)	24 hr	0.5	0.5	—
	30-day	0.2	0.2	—
Magnesium (Mg)	24 hr	120 [(8)]	72	—
Manganese (Mn)	24 hr	0.4 in SPM	0.4	—
		0.2 in PM_{10}	—	—
		0.1 in $PM_{2.5}$	—	—
Mercury (Hg)	24 hr	2	2	—
Nickel (Ni)	24 hr	0.2 in SPM	—	—
		0.1 in PM_{10}	—	—
	Annual	0.04 in SPM	0.04	—
		0.02 in PM_{10}	—	—
	AAV	—	0.4	—
	DAV	—	2	—
Zinc (Zn)	24 hr	120	120	—
Benzene	Annual	0.45	0.45	—
	24-hour	2.3	—	—
	AAV	—	4.5	—
	DAV	—	100	—
1,3-Butadiene	24-hour	10	10	—
	Annual	2	2	—
	AAV	—	20	—
	DAV	—	300	—
Benzo(a)pyrene [(9)]	24-hour	0.00005	—	—
	Annual	0.00001	0.00001	—
	AAV	—	0.0001	—
	DAV	—	0.005	—

Notes:

— *indicates that there is no criterion or standard for the respective parameter and/or averaging times.*

1 *MECP references the CAAQS for assessment of $PM_{2.5}$ concentrations.*

2 *Acute and chronic exposure guidance values for diesel particulate matter (Health Canada 2016).*
3 *The copper fraction of copper sulphate was compared to the copper AAQC.*
4 *NO_X expressed as NO_2.*
5 *AAV – Annual Assessment Value, DAV – Daily Assessment Value.*
6 *2030 CAAQS for $PM_{2.5}$. Note that the CAAQS are based on specific statistical forms and not for direct comparison of the maximum modelled concentrations.*
7 *Ferric oxide as surrogate.*
8 *Magnesium oxide as surrogate.*
9 *Benzo(a)pyrene, as a surrogate of total Polycyclic Aromatic Hydrocarbons (PAHs).*

3 METHODOLOGY

3.1 SPATIAL BOUNDARIES

The Project Area (PA) encompasses the anticipated footprint of the Project within the care and control of Great Bear Resources and includes the mine site area. For this assessment, the PA is not used as a spatial boundary. However, the study areas are based on setbacks from the PA, which are represented by the grey project footprint elements shown in Figure 3-1 (excluding the pipeline).

3.1.1 LEASED CLAIMS BOUNDARY

This boundary represents the extent of the mining claims that have been leased or are in the process of being leased.

3.1.2 LOCAL STUDY AREA

The Local Study Area (LSA) for air quality corresponds to the area in the vicinity of the Project where most of the air quality effects of the Project are expected to occur and can be predicted or measured with a reasonable degree of accuracy; this is a buffer that extends 10 km from the PA but does not include a buffer for the Chukuni River pipeline(s) or pump house as these are expected to be materially compete as part of the advanced exploration program, and once complete are not expected to have substantial associated air emissions.

3.1.3 REGIONAL STUDY AREA

The Regional Study Area (RSA) for air quality encompasses the leased claims boundary and LSA and extends 10 km further than the LSA to support a regional context in the assessment of potential Project effects. It is the maximum geographical extent or zone of influence in which potential effects from the Project are assessed. Air quality effects of the Project would not be distinguishable from background concentrations beyond the RSA.

3.2 TEMPORAL BOUNDARIES

The temporal boundaries of the Air Quality Assessment correspond to those of the Impact Statement, and will span all phases of the Project:

- Construction
- Operations
- Closure and decommissioning.

3.3 POINTS OF RECEPTION

For the purposes of the Air Quality Assessment, the term point of reception (POR) is defined as a location with human activity, which may include traditional land and resources uses. It is recognized that the term receptor in air quality commonly refers to all computer-generated points where the modelling software predicts concentrations of parameters, independent of land use; this is distinct from a POR.

The PORs consist of residences, potential recreational use, cabins, lodges, and camp sites identified through field work and a review of the Ministry of Natural Resources Geospatial Ontario (formerly Land

Information Ontario) geospatial datasets. In some cases where a land use covered a large area, representative points were selected.

Locations of selected PORs are provided in Figure 3-1 and represent an assumption of potential PORs. These PORs are subject to change.

3.4 MODELLING SETUP

WSP has completed an assessment of the potential air quality concentrations from the proposed Project in accordance with standard air quality assessment practice.

The prediction of concentrations involved the following steps:

- Identify stationary and mobile emissions sources associated with each phase of the Project.
- Identify the key parameters emitted to the atmosphere from the identified sources.
- Summarize the baseline ambient air quality conditions in the absence of the Project for each of the key parameters emitted (see Section 4 - Existing Environmental Conditions).
- Estimate the air emission rates for each of the key parameters using appropriate estimation methods and established data sources.
- Prepare a source summary table that identifies sources at the Project site which may release one or more of the key parameters emitted to the atmosphere in appreciable quantities and the corresponding parameters and emission rates.
- Perform air dispersion modelling using the United States Environmental Protection Agency (US EPA) AERMOD version 22112, the current regulatory air dispersion model used in Ontario.
- Compare the dispersion modelling output to the assessment criteria, comparing predicted offsite concentrations with the corresponding air quality standard or criterion.
- Provide a quantitative or qualitative discussion of concentrations for each Project phase, as applicable.

3.4.1 EMISSION SOURCES AND EMISSION RATE QUANTIFICATION

A list of emission sources identified by phase for the Project and included in the air dispersion modelling is outlined in Table 3-2.

The emission estimates from the different phases of the Project have been presented in the form of Source Summary Tables and Emission Summary Tables (Appendix B), which include data on all emission sources that may discharge one or more of the target parameters, data quality, source of the emission data and percent of total emissions for each source, for each parameter. The locations of the emission sources at for each phase of the Project site are shown in Figure 3-2.

A summary of the emission calculation methodologies, emission factors used, and the associated calculations, are provided in Appendix C. Calculations are shown for all emission source type, including open pit blasting, vent raises, material handling and hauling, crushing, fuel combustion, and ore processing.

3.4.1.1 STATIONARY FUEL COMBUSTION

The US EPA *AP-42: Compilation of Air Emissions Factors from Stationary Sources* (US EPA AP-42) Section 3.3 factors for Gasoline and Diesel Industrial Engines were used to quantify emission rates from the stationary diesel generators, with the exception of SO_2; to quantify SO_2 emissions, the US EPA AP-42 Section 3.4 factors for Large Stationary Diesel and All Stationary Dual-fuel Engines, assumed sulphur content in the fuel and engine horsepower were used.

For natural gas fired combustion sources, the US EPA Emission Standards from *Table 1 to Subpart JJJJ of Part 60 – Standards of Performance for New Stationary Sources* (US EPA, 2011) were used with maximum power output to estimate nitrogen oxide emissions. As the natural gas generators are still in the design stages, the exact make and model of the units is unknown. If natural gas is not available for heating, propane may be used. Emissions from propane are not expected to be materially different from natural gas, as the same emission factors would be utilized.

3.4.1.2 MOBILE FUEL COMBUSTION

For the construction phase scenarios, a construction fleet was developed for each major construction activity with typical engine size and utilization factors (US DOT, 2017) applied. Tier 4 emission standards were applied to estimate emission rates. While not all equipment may meet Tier 4 standard, the Project is expected to employ a modern fleet with a high percentage of Tier 4 engines.

3.4.1.3 DRILLING OPERATIONS

Emission factors for drilling published in US EPA AP-42 Section 11.9 Western Surface Coal Mining were used with an estimate of the number of holes drilled per hour. A control efficiency of 70% was used to account for dust control at the drills, this is consistent with the recommended reduction indicated in the Ontario Mining Association's *Guidelines for Compiling Emission Inventories for the Ontario Mining Association* (Ontario Mining Association's Emission Inventory Guidance Document) (OMA, 2003).

3.4.1.4 BLASTING OPERATIONS

The emissions expected from blasting are particulate matter and by-products of combustion from ammonium nitrate fuel oil (ANFO) emulsion or emulsion blend explosives. Particulate emissions from blasting were calculated using factors published in US EPA AP-42 Section 11.9 Western Surface Coal Mining and the projected emulsion usage. Manufacturer emission information from similar operations was used to calculate SO_2, NO_X and CO emissions.

3.4.1.5 MATERIAL HANDLING

Fugitive emissions during loading and unloading at material transfer points were estimated using emission factors published in US EPA AP-42 Section 11.24 Factors for Metallic Mineral Processing for high moisture ore (>4%). The material loaded onto haul trucks within the pit is very coarse (minimal fines) as it is transported uncrushed from the pit to the primary crusher; particulate emissions associated with this very coarse ore would be notably lower than emissions associated with fine aggregate which has been crushed and screened, or sand and gravel operations where the raw material already contains fines. A control efficiency of 80% was used to account for naturally wet material and the reduced particulate emissions that would be associated with the handling of very coarse material. This is supported by the US EPA AP-42 Table 11.24-1 emission factors where a 90% control efficiency is assumed for wet material handling and transfers.

3.4.1.6 BAGHOUSE DUST COLLECTORS AND WET SCRUBBERS

Several baghouse dust collection systems are located on site to control emissions from various processes. Per Table C-2 of the MECP (2018) Guideline A-10, an outlet concentration of 20 mg/m^3 for the most significant dust collector, and 10 mg/m^3 for other units is acceptable. As a conservative measure, particulate emissions for all dust collectors were estimated assuming an outlet concentration of 20 mg/m^3.

Particulate emissions from wet scrubbers were estimated assuming an outlet concentration of 20 mg/m^3.

3.4.1.7 CYANIDE PROCESS TANKS

Hydrogen cyanide (HCN) emissions from process leach tanks and process were calculated using the equation published in the *Australian NPI Emission Estimation Technique Manual for Gold Ore Processing*, Version 2.0, Section 6.2.1. The process design criteria specifies that solution in tanks is kept alkaline at a minimum pH of 10.5 to minimize HCN volatilization and emissions.

3.4.1.8 CYANIDE DESTRUCTION

Excess SO_2 is used in the cyanide destruction process to support a complete stoichiometric reaction, however there are no emissions to the air as the process is operated as a closed-circuit with excess SO_2 returned to the cyanide destruction tanks.

3.4.1.9 STOCKPILES

Emissions from bulldozing at stockpiles were estimated using the published US EPA AP-42 Section 11.9 Western Surface Coal Mining equations for this activity. The calculated emission factor is dependent on the aggregate silt content, which was assumed to be similar to taconite mining; a 5.8% silt content value was assessed. A control efficiency of 75% was applied to account for regular watering to control fugitive emissions.

3.4.1.10 ROAD DUST

Fugitive road dust emissions for SPM, PM10, and PM2.5, were estimated using the method detailed in US EPA AP-42 Chapter 13.2.2 Unpaved Roads. A 5.8% silt content was assessed and a dust control efficiency of 90% was assessed to account for watering, vehicle speed, low silt content, and dust suppressant use as applicable for operations; for the construction phase assessments a dust control of 90% was also applied. The US EPA AP-42 chapter provides a silt content range of 3.9% to 9.7% with a mean of 5.8% for Taconite (lean iron ore) mining and processing haul roads to/from the pit based on studies in the 1970s. Keeping an unpaved road surface's silt level on the lower end of what was typical in the 1970s was considered feasible using modern practices. Considering the proximity of the planned haul road to the property line, it was assumed that highly effective road surface design and maintenance (including a robust fugitive dust management plan and monitoring program) would be required. Section 6 presents a sensitivity assessment including a dust control of 0%, 50%, and 70% to demonstrate how differing dust control affect the predicted concentrations.

3.4.1.11 WIND EROSION

An average value for wind erosion from open areas and stockpiles is recommended by Environment Australia in their *Emission Estimation Technique Manual for Mining* (Version 3.1). This approach was used to avoid overestimating the disturbed areas that would be susceptible to wind erosion.

This estimated average value is more conservative in nature than the estimated wind erosion of overburden or graded areas at surface coal mine (US EPA, 2023c, AP-42 Section 11.9), which estimates that the annual losses from wind erosion are 0.85 tonne/ha/year (or 0.097 kg/ha/h).

Per unit area emission rates for the different particulate size fractions were multiplied by the respective footprint of the TMF beach and lift area of stockpiles to obtain emission rates. A dust control of 80% was applied to account for watering in the stockpiles and TMF beach area.

3.4.1.12 VENT RAISES

To maintain a safe underground respiratory environment, ventilation systems including fresh air raises and return air raises will be installed. The fresh air raises include natural gas heating units for winter months; however, these were assumed to be operating at all times of the year for conservatism. US EPA AP-42 Section 1.4: Natural Gas Combustion emission factors were used along with the guidance from Section 7.1.1 of the ESDM Procedure Document, which states that air parameters other than nitrogen oxides are generally emitted in negligible amounts.

3.4.1.13 METALS IN FUGITIVE DUST

Metals will be present in the particulate matter that is generated as fugitive dust on the site and dispersed offsite. The dust is assumed to have the same metals composition as the mine rock used in road construction and the unprocessed ore. Trace metals are also likely to be released from various ore processing activities such as crushing, conveying, and ore handling. The measures that are designed to control fugitive dust releases will also serve to control the emission and deposition of metals that are a component of the dust.

The predicted air concentrations for each of the speciated metals was determined by assuming a conservative particulate matter composition that considers each metal present in the particulate matter at a concentration equal to the 90th percentile concentration measured in the mine rock. Project concentrations for metals are expected to be conservative as the worst-case operating scenarios were paired with 90th percentile metals' concentrations from the geochemistry.

Maintenance welding operations are expected to be undertaken predominantly at the service area which is centrally located approximately 2 km from the leased claims boundary. Welding emissions would be treated via best practices and industry standard controls and given the setback distance are not expected to be a significant contributor to POI concentrations.

3.4.1.14 RESPIRABLE SILICA IN FUGITIVE DUST

Silica is present in fugitive dusts generated by the disturbance of both ore and mine rock. The predicted air concentrations of respirable silica as a constituent of respirable dust (PM_{10}) were quantified assuming the modelled PM_{10} concentrations are comprised of 7.5% silica (Verma et al. 2014); this has been accepted by the MECP for a number of Environmental Compliance Approvals for other mining projects in northern Ontario and has therefore been used as a default value in the absence of site-specific data.

3.4.1.15 CONCRETE BATCH PLANT, CEMENTED ROCKFILL PLANT, AND PASTE PLANT

Particulate matter emissions from the onsite concrete batch plant, cemented rockfill plant, and paste plant were estimated using the emission factors published in US EPA (2023c) AP-42 Section 11.12 Concrete Batching. The controlled emission factors were used to account for dust management practices that will be employed.

3.4.1.16 ASSAY LAB

Emissions from an assay lab were also included in the assessment. Since details on the planned assay lab are not currently available, the assay lab was assumed to emit particulate matter and metals from a single dust collector and nitrogen oxides from the exhaust of a furnace and oven related to the fire assay process. It is assumed that reagent usage will be in small quantities and VOCs would be filtered through a fume hood and scrubbing system, rendering them negligible.

3.4.1.17 PORTABLE CRUSHER

Portable crushing will occur at the quarry areas and the cemented rockfill plant through a single portable crusher. Emissions were estimated using US EPA AP-42 Section 11.19.2 Crushed Stone Processing and Pulverized Mineral Processing. Emissions were estimated with emission factors for the drop to the portable crusher, a jaw crusher, a cone crusher, screening, three transfer points, and a load out from the portable crusher.

3.4.1.18 FUEL STORAGE

During fuel storage filling, VOC-saturated headspace can be displaced as an emission to atmosphere proportional to the tank filling rate, however relative to VOC emissions from onsite tailpipe exhausts, these emissions were not considered to be material.

3.4.2 AIR DISPERSION MODEL SELECTION

AERMOD, an industry-standard Gaussian air dispersion model, was determined to be the most appropriate model for this assessment as it is capable of handling multiple sources of varying types such as point, area, and line sources. The dispersion model was used to predict the offsite concentrations (in $\mu g/m^3$) of the air parameters identified in Section 2 at each receptor beyond the Project lease area (i.e., leased claims boundary in the model). The model also predicts particle deposition (in g/m^2). The location of the maximum modelled offsite concentration for a given parameter is termed the maximum Point of Impingement (POI).

The input data required for AERMOD includes five years of local, hourly meteorological data and the characteristics of the buildings, structures, open pit, roads and emission sources at the Project.

Although the immediate area surrounding the Project does not have major topographical features such as mountains, valleys, or canyons, local topography was considered in the AERMOD modelling. Canadian Digital Elevation Data were publicly available as GeoTIFF files for the modelling domain.

3.4.2.1 PLUME DEPLETION

Where particulate matter was modelled, the plume depletion option was used to account for particle mass being removed from the plume via gravitational settling and precipitation scavenging, with the particles deposited on the ground.

The particle size distribution and characterization used in this assessment were derived from the US EPA Air AP-42 Emission Factors and Quantification guidance documents, such as those for mining and ore processing (US EPA 2023c). As an example for the wind erosion sources, the deposition parameters, including the particle size distribution, the equivalent diameter (De), and the particle density, are summarized in Table 3-1.

3.4.2.2 ATMOSPHERIC CONVERSION OF NITROGEN OXIDE TO NITROGEN DIOXIDE

Where air dispersion modelling was used to predict air concentrations for comparison against the AAQCs and CAAQS, the OLM method NO_X conversion was used to account for atmospheric reactions that convert NO emissions to NO_2. This method is widely accepted as being a reasonable approach that recognizes the most important mechanism for NO_X conversion, namely reactions with ozone, and is a preferred method in other Canadian provinces (such as Alberta, British Columbia and Newfoundland) when chemical transformation is required (Alberta 2021; Saskatchewan 2012). Other conversion options are either typically less accurate or recommended only for isolated sources.

Baseline ozone concentrations measured at the ECCC Experimental Lakes Area station (64001) from 2022 were used as representative ozone concentrations at the Project, specifically the monthly 90^{th} percentile ozone values were used (Section 4.1); the 90^{th} percentile is a conservative statistical measure where 90% of values (i.e., measured ozone concentrations) are less than, and 10% of values are greater than the value.

An in-stack value ratio 0.1 NO_2 / NO_X was used in the model. This value was obtained from the US EPA (2023a) In-Stack-Ratio (ISR) database and used for all NO_X conversion in this assessment. For blasting, full NO_X conversation was assumed.

3.4.3 METEOROLOGICAL DATA FOR AIR DISPERSION

Meteorological data has been collected on site since mid-2022. Air dispersion modelling requires a robust, long-term dataset with particular parameters relevant to modelling. For this reason, an MECP approved dataset was used, which consists of five years of surface meteorological data and upper air data pre-processed by the MECP.

Wind is a critical parameter in the dispersion of parameters. The wind direction determines the primary direction of dispersion. At low wind speeds (or calm conditions), concentrations tend to be higher due to poor mixing and dispersion. Increasing wind speed has the effect of decreasing air concentrations of parameters through enhanced dispersion and mixing. For particulates, this enhanced dispersion can be offset by increased emissions of particulates due to wind erosion and reduced settling.

The wind data from the MECP prescribed dataset (International Falls) is presented for the period of 1996 to 2000 as a wind rose in Figure 3-3. A wind rose is a useful frequency distribution plot that shows the wind speed and direction data in one plot. Each colour in the plot represents a wind speed range, and each segment extending out from the centre represents the frequency that wind is blowing from that direction. This is the wind speed and direction data used for the air dispersion modelling. It is noted that MECP modifies the wind speed data in the data set to replace all calm conditions with low wind speeds. As such, the wind rose does not show any calm conditions.

The wind rose indicates that winds are generally from the west and most predominant from the northwest and south. This was validated by comparison against the onsite wind data. The average wind speed for the data set was 3.4 m/s.

Precipitation data are used in the air dispersion model to incorporate plume depletion; the average, minimum, and maximum monthly rainfall data are presented in Figure 3-4. Precipitation is also a natural dust suppressant, and on days where there is appreciable rainfall or snowfall, the emission rate estimates used in the air dispersion model that assume dry conditions will be even more conservative.

The method outlined in the ADMGO was used to address the potential for meteorological anomalies to overly influence the results of air dispersion modelling (MECP 2017).

3.4.4 AIR DISPERSION MODELLING FOR PERMITTING IN ONTARIO

Air dispersion modelling was completed in accordance with the ADMGO to allow for the Project, which is eligible for an Environmental Compliance Approval (ECA; Air and Noise) to demonstrate compliance with the air standards of O. Reg. 419/05 (Section 5). The modelling following the ADMGO does not incorporate plume depletion or NO_X conversion, and only operations phase stationary sources of air emission were modelled (mobile sources are excluded from assessment per O. Reg. 419/05) and fugitive dusts were modelled only to assess the POI concentrations for the metals with standards based upon health effects.

Table 3-1: Particular Size Distribution and Density used for Wind Erosion Plume Depletion and Deposition

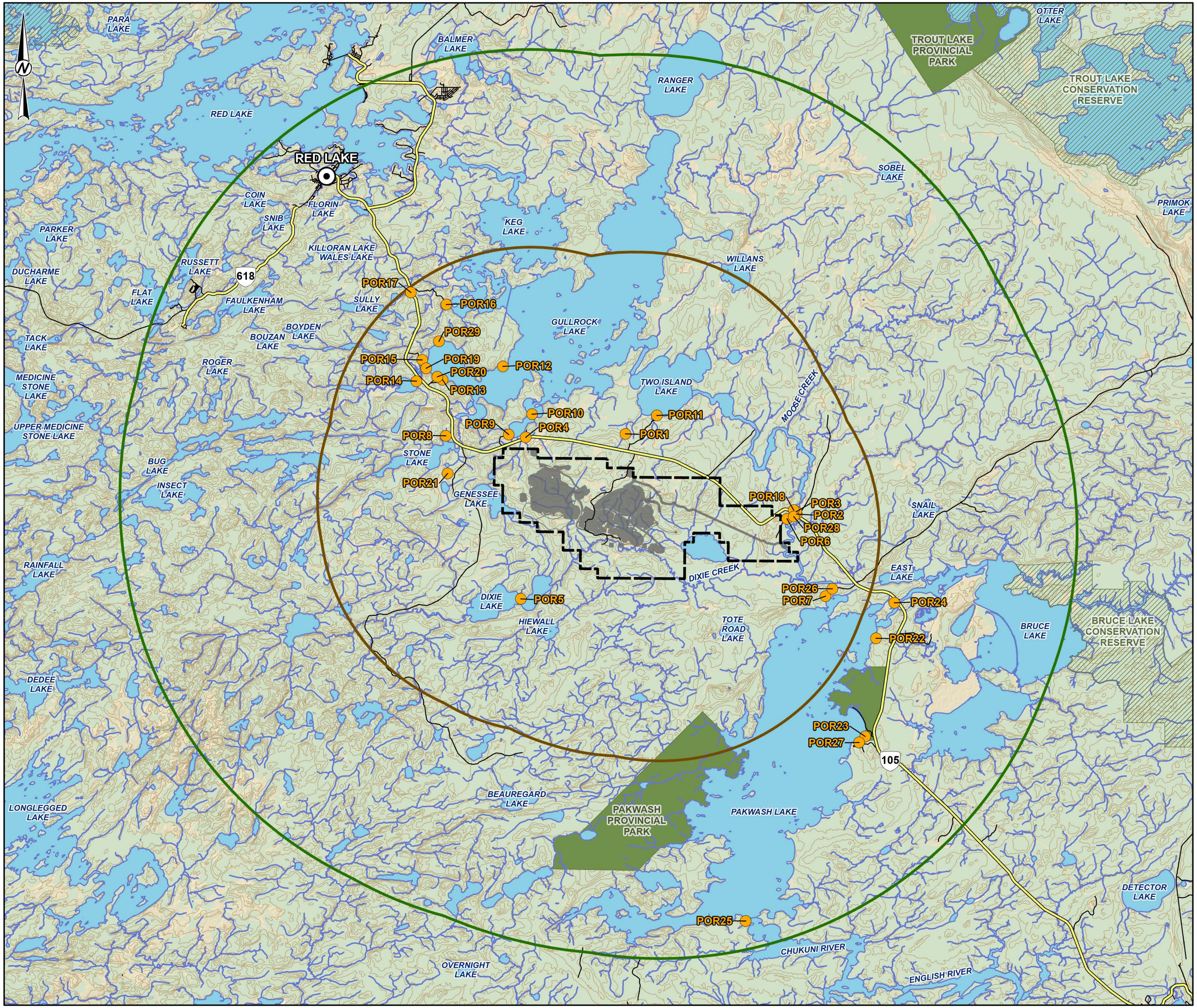
Model	Equivalent Particulate Diameter (microns)	Mass Fraction (0 to 1)	Particulate Density (g/cm^3)
SPM	1.6	0.375	2.6
	6.9	0.125	2.6
	30.2	0.50	2.6
PM_{10}	1.6	0.75	2.6
	6.9	0.25	2.6
$PM_{2.5}$	1.6	1.00	2.6

Table 3-2: Sources Considered by Project Phase

Source	Phase [(1)]	
	Construction	Operations
Open pit emissions from drilling, blasting, material handling, in-pit road dust, and mobile equipment	✓	✓
Material handling at the plant	✓	✓
Material handling and crushing of ore and mine rock	✓	✓
Material handling at ore stockpiles and the TMF	✓	✓
Material handling at quarries and aggregate sources	✓	✓
Dust from dozers at stockpiles	✓	✓
Equipment tailpipe exhaust from stockpiles, the TMF, quarries, aggregate sources, dams, and other various areas of the Project	✓	✓
Concrete batch plant	✓	✓
Cemented rockfill plant	✓	✓
Paste plant	✓	✓
Ore processing at the process plant	✓	✓
Exhaust from natural gas substation		✓
Exhaust from natural gas heating for underground ventilation	✓	✓
Exhaust from diesel generators	✓	✓
Dust and tailpipe exhaust from haul trucks along haul roads	✓	✓
Wind erosion at ore stockpiles and the TMF	✓	✓
Fuel combustion for heating	✓	✓
Portable crushers	✓	✓

Notes:

1 *The closure and decommissioning phase would have parameters in common with the construction phase but at a reduced fleet and activity level.*



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- LOCAL STUDY AREA FOR AIR QUALITY
- REGIONAL STUDY AREA FOR AIR QUALITY
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY
- CONTOURS (10 M INTERVAL)

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

0 2.5 5 10

1:195,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
SPATIAL BOUNDARIES AND POINTS OF RECEPTION

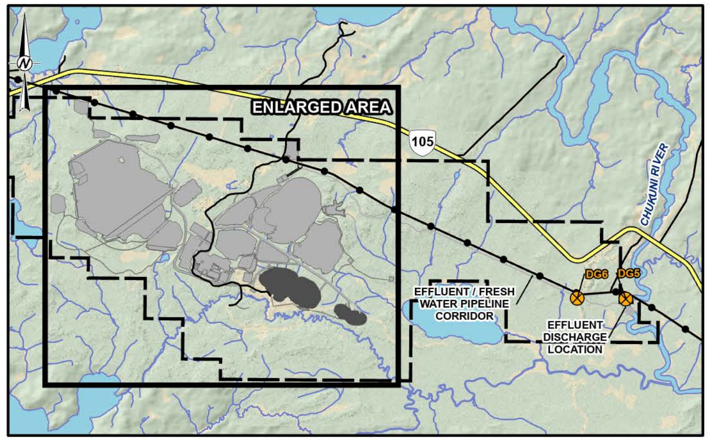
CONSULTANT

wsp

YYYY-MM-DD	2025-07-30
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	3-1

KEY MAP



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LEGEND

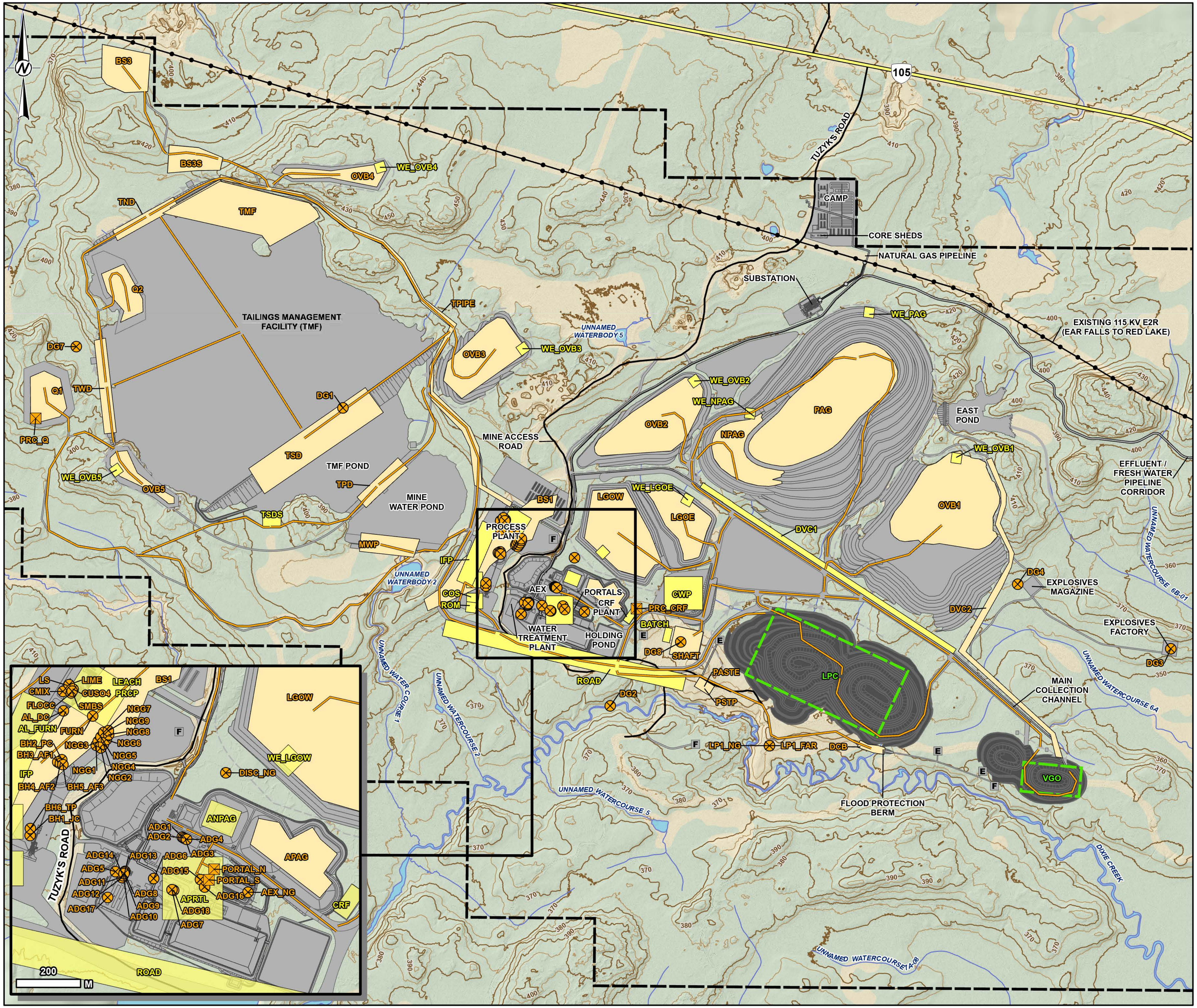
- LEASED CLAIMS BOUNDARY
- HIGHWAY
- LOCAL ROAD
- EXISTING TRANSMISSION LINE
- WATERCOURSE
- WATERBODY
- MAJOR CONTOURS (10 M INTERVAL)
- MINOR CONTOURS (5 M INTERVAL)

MODELLED AIR EMISSION SOURCES

- POINT SOURCE
- VOLUME SOURCE
- LINE VOLUME SOURCE
- OPEN PIT SOURCE
- AREA SOURCE
- POLYGON AREA SOURCE

PROPOSED MINE FEATURE

- OPEN PIT
- OTHER MINE FEATURES
- COLLECTION DITCH
- EXHAUST VENT RAISE
- FRESH AIR VENT RAISE
- TRANSMISSION LINE



NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. CONTOURS ACQUIRED FROM 2022 LIDAR SURVEY.
3. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
4. ROADS INFORMATION PROVIDED BY GREAT BEAR RESOURCES, AUGUST 2022.
5. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
6. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
DISPERSION MODELLING AIR EMISSION SOURCES

CONSULTANT

wsp

YYYY-MM-DD	2025-08-05
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	3-2

25mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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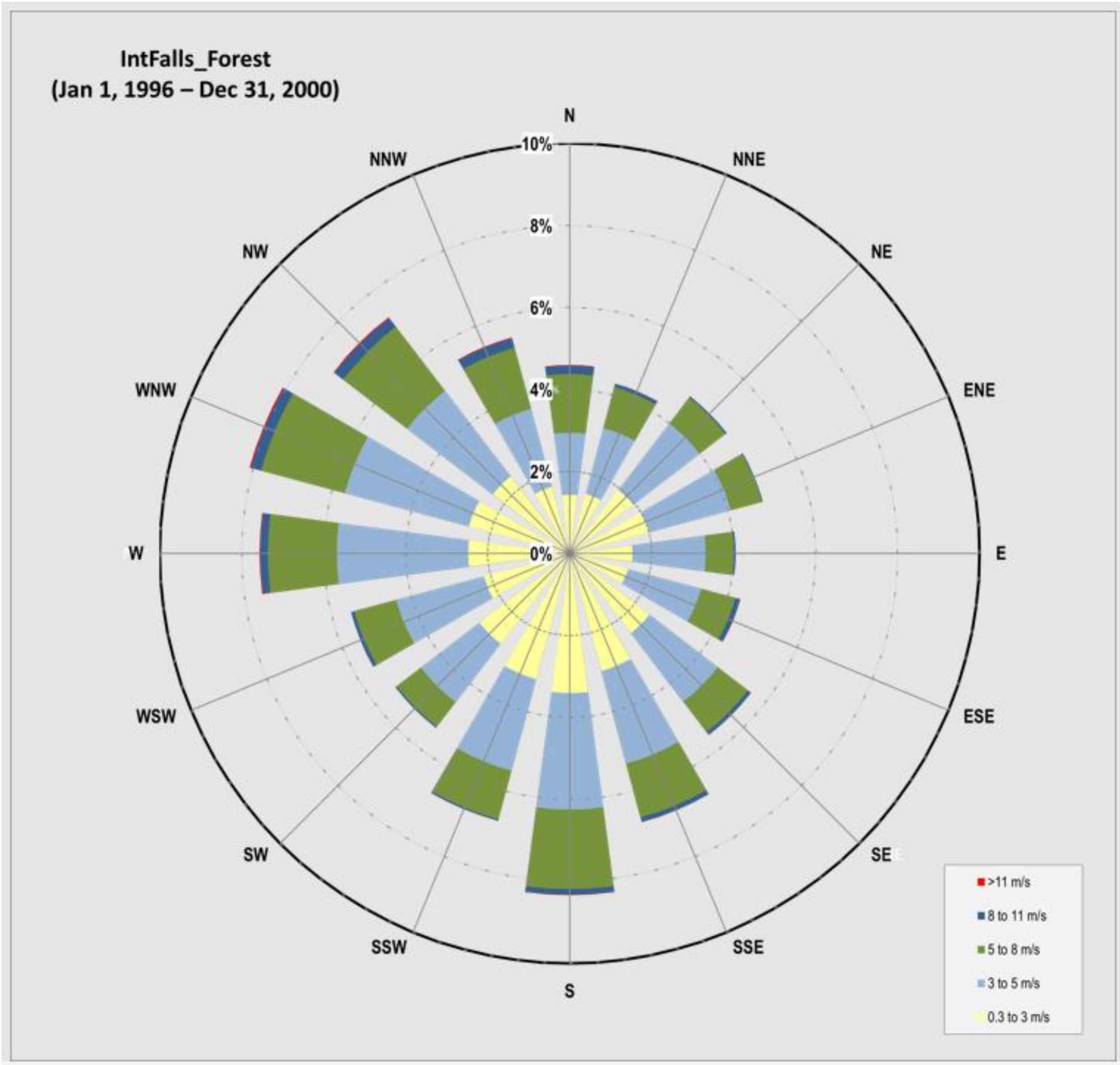


Figure 3-3: Wind Rose (1996 to 2000) (MECP Pre-Processed Dataset, International Falls)

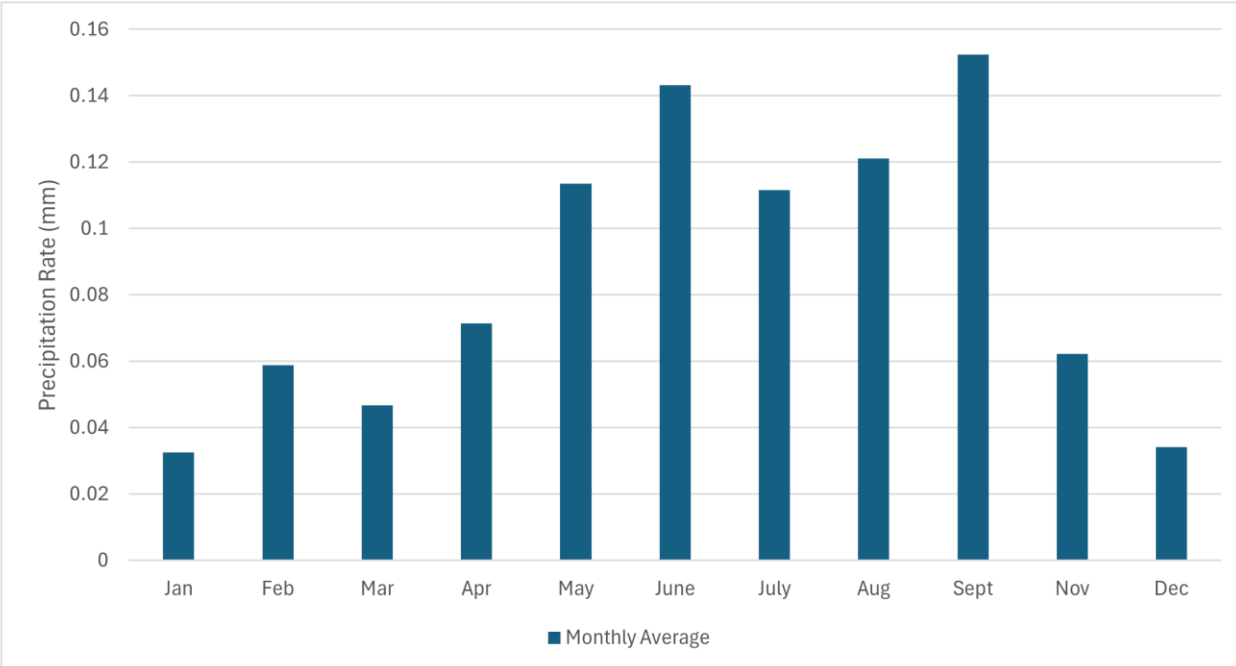


Figure 3-4: Monthly Precipitation (Red Lake, 1996 to 2000)

4 EXISTING ENVIRONMENTAL CONDITIONS

4.1 BASELINE AIR QUALITY

The Project is located in the Red Lake mining district in a relatively undeveloped area approximately 25 km southeast of Red Lake. Local sources of emissions may include road dust, exploration and forestry activities, comfort heating, operation of small gensets, recreational vehicles. While there are mining activities in the area, the associated emissions are not expected to be measurable at the Project.

Baseline air quality at the Project is also influenced by long-range transport of air parameters as well as by natural sources, such as wildfires and VOC emissions from forest vegetation.

An onsite baseline air monitoring program was undertaken from July 2022 to August 2024 to characterize existing condition in the LSA (measuring SPM, PM_{10}, $PM_{2.5}$, metals, NO_2, SO_2, VOCs, PAHs, DPM, and dustfall). Results of the program are included herein. The baseline field program confirmed that baseline air concentrations are well below respective AAQCs as expected. As an example, the 24-hour 90th percentile SPM concentration for the program was 18% of its AAQC and the highest metal of interest was cadmium at 4% of its 24-hour AAQC.

Where data could be collected onsite in a robust and representative manner, these data were preferentially used to establish baseline concentrations; other data collected onsite were used to qualify the use of regional data. Side-by-side comparisons of the onsite methods and ECCC National Air Pollution Surveillance (NAPS) data for each parameter are provided in the *Ambient Air Quality Baseline Monitoring Report* (WSP 2024).

Regional data summarized in the baseline report were collected by regulatory agencies at Thunder Bay, Winnipeg (Ellen Station), and at the Experimental Lakes Area stations which are regional stations in the NAPS network. The location of each regional station in UTM coordinates is provided in Table 4-1 and shown in Figure 4-1. Although Thunder Bay is located approximately 420 km from the Project and Winnipeg approximately 270 km, these stations are still representative of the regional air quality experienced in northwestern Ontario. These urban stations will overestimate air concentrations at the Project as they are influenced by urban sources (e.g., traffic, industry and residential heating) and are considered to be a conservative baseline; this is particularly true where the 90th percentile of a measured dataset are used.

The data collected for the determination of existing concentrations in the Project area are provided in the Ambient Air Quality Baseline Monitoring Report (WSP 2024) and the baseline concentration used in the assessment of air quality concentrations for each parameter is provided in Table 4 2.

4.1.1 PARTICULATES AND METALS ON PARTICULATE

For SPM and metals on SPM, high volume air sampling using a Tisch TE-5170 high volume sampler was completed. The SPM measured by high-volume sampling was used to establish baseline concentrations. For the baseline program 115 SPM and metals samples were analyzed, across two years and all four seasons. High volume air sampling is the MECP's approved reference method for SPM.

For PM_{10}, two methods were used for onsite sampling: PQ200 low volume sampling, and continuous monitoring using Aeroqual Dust Sentry Pro instruments. PQ200 results were used to establish baseline concentrations as a robust dataset (134 samples) was collected with seasonal variability and this is an MECP reference method.

For $PM_{2.5}$, two methods were used for onsite sampling: PQ200 low volume sampling, and continuous monitoring using Aeroqual Dust Sentry Pro instruments. PQ200 results were used to establish baseline concentrations as a robust dataset (107 samples) was collected with seasonal variability and this is an MECP reference method.

A total of 34 DPM samples were collected on site. These samples were analysed for elemental carbon which was used to establish the baseline DPM value. The 90th percentile value was used for the 24-hour averaging time concentration, while the mean value was used for the annual averaging time baseline value.

4.1.2 CRITERIA AIR PARAMETERS (NO_2, SO_2, CO, AND OZONE)

The baseline concentrations for CO and ozone were determined using regional data measured at the Thunder Bay, Winnipeg, and Experimental Lakes Area NAPS stations. The baseline concentrations determined at these sites are comparable or conservative, particularly at the 90th percentile, as both are from stations located in a more urban environment in comparison to the remote location of the Project.

The baseline concentrations for NO_2 and SO_2 were determined using onsite data.

For NO_2, baseline concentrations were established using the onsite data. For the 1-hour and 24-hour averaging periods, the 90th percentiles of the 1-hour and 24-hour averaged continuous data were used, respectively (24,865 hours of continuous data was collected). The annual baseline value was established using the mean of the onsite passive monitoring data (63 passive samples were collected).

For SO_2, baseline concentrations were established using the onsite data. For the 10-minute, 1-hour, and 24-hour averaging periods, the 90th percentiles of the 10-minute, 1-hour, and 24-hour averaged continuous data were used, respectively (13,923 hours of continuous data was collected). The annual baseline value was established using the mean of the onsite passive monitoring data (63 passive samples were collected).

For CO, baseline concentrations were established using Winnipeg data for the relevant averaging times.

For ozone, baseline concentrations were established using NAPS data for Experimental Lakes Area; ozone was not quantitatively assessed for resultant concentrations but was an input in the air dispersion models for NO_X as part of the OLM method.

4.1.3 VOLATILE ORGANIC COMPOUNDS

Volatile Organic Compounds were measured on site using both US EPA Method TO-15 (25 samples collected) and Method 325 (22 samples collected). For determination of baseline concentrations, data from the Method TO-15 samples were used since these are 24-hour averaged samples. The 90th percentile of measured concentrations were used for averaging times of less than one year, and the average of measured values was used as baseline for the annual averaging time.

Of the VOCs commonly associated with diesel fuel combustion (i.e., vehicle and equipment tailpipe emissions), only benzene and 1,3-butadiene were measured at concentrations greater than 5% of their respective AAQCs onsite. For both benzene and 1,3-butadiene the onsite 90th percentile concentration values were greater than the 90th percentile ambient concentration values recorded at the NAPS stations. Accordingly, use of these values were utilized as surrogates for VOCs.

Onsite measurements of most VOCs were below the detection limit with the notable exceptions of benzene, carbon tetrachloride, toluene, and some others.

4.1.4 POLYCYCLIC AROMATIC HYDROCARBONS

PAHs were measured on site using a Tisch TE-1000 poly-urethane foam (PUF) high volume sampler. A total of 47 samples were analyzed across all seasons over nearly two years. The 90th percentile and mean concentrations of b(a)p were taken to be used a surrogate for total PAH.

4.1.5 OTHER PARAMETERS (HCN, CAO AND $CUSO_4$)

Existing concentrations for HCN, CaO, and CuSO4 were assumed to be negligible and not present in the baseline conditions in an appreciable concentration.

Table 4-1: Regional Air Monitoring Station Locations

Station	Station ID	UTM Coordinates (NAD83)			Distance from Site (km)	Relevant Parameters Measured
		Northing (m)	Easting (m)	Zone		
Experimental Lakes Area	064001	5 501 512	447 959	15U	135	O_3
Thunder Bay	060809	5 360 993	330 430	16U	420	O_3
Winnipeg Ellen Station	070119	5 528 926	663 112	14U	270	CO

Table 4-2: Baseline Concentrations

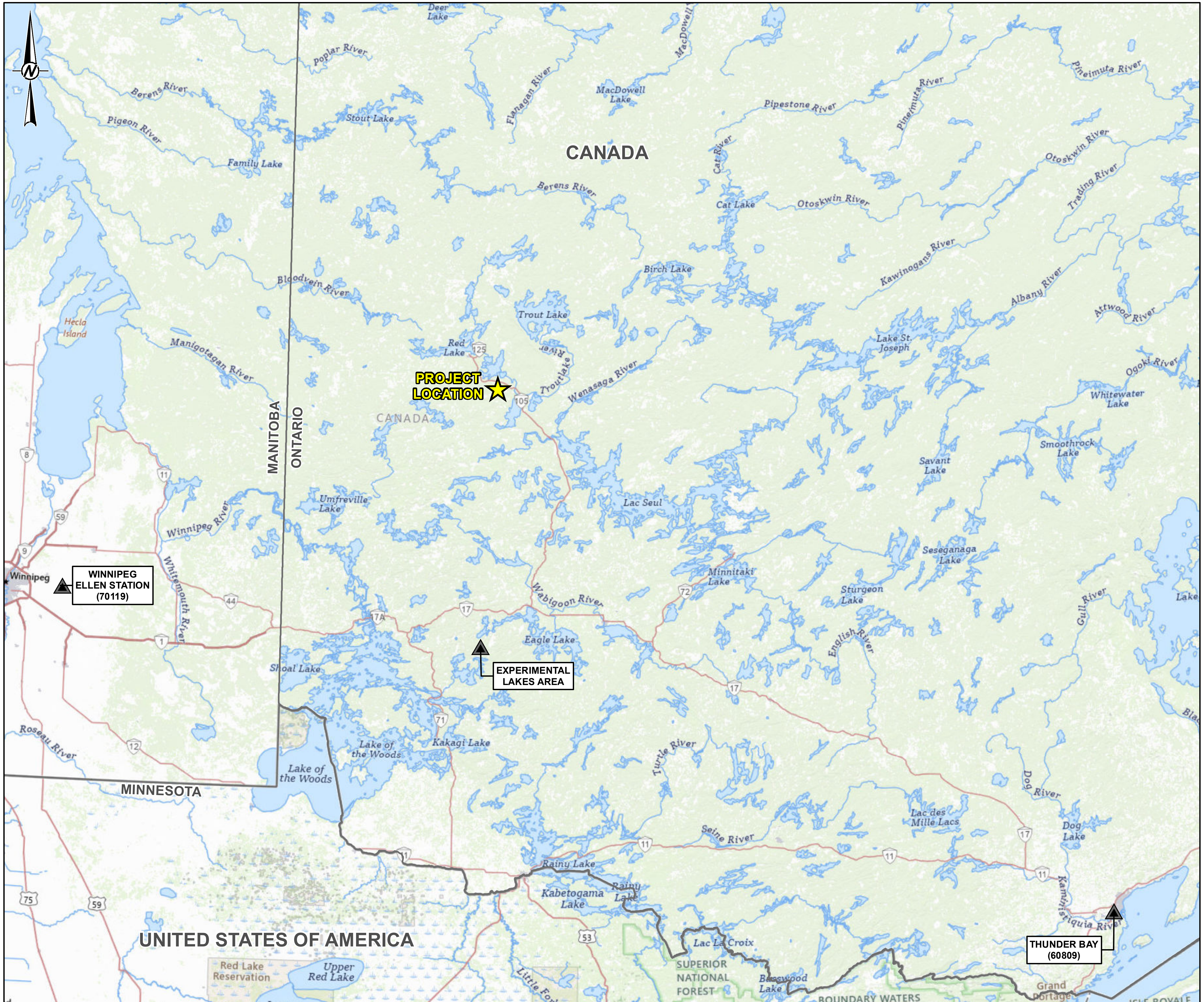
Air Parameter	CAS Number	Averaging Time	Baseline Concentration (µg/m^3) (1)	Reference for Baseline Concentration
Suspended Particulate Matter (SPM)	n/a	24-hour	21.4	90th percentile of 24-hr concentrations
		Annual (2)	5.8	Geometric mean of 24-hr concentrations was 4.5 µg/m^3, the annual arithmetic mean of $PM_{2.5}$ was conservatively used.
Inhalable Particulate (PM_{10})	n/a	24-hour	18.3	90th percentile of onsite PQ200 24-hr concentrations
Respirable Particulate ($PM_{2.5}$)	n/a	24-hour	10.0	90th percentile of PQ200 24-hr concentrations
		Annual (2)	5.8	Arithmetic mean of PQ200 24-hr concentrations
Diesel Particulate Matter (DPM)	n/a	24-hour	0.19	90th percentile elemental carbon concentration
		Annual	0.089	Average elemental carbon concentration
Respirable Silica (SiO_2, <10µm) Cristobalite	14464-46-1	24-hour	0.10	90th percentile of 24-hr concentrations
Respirable Silica (SiO_2, <10µm) Quartz	14808-60-7	24-hour	0.92	90th percentile of 24-hr concentrations
Respirable Silica (SiO_2, <10µm) Tridymite	15469-32-3	24-hour	0.21	90th percentile of 24-hr concentrations
Nitrogen Dioxide (NO_2)	10102-44-0	1 hour	4.8	90th percentile of the onsite monitoring data, 1-hr averages
		24-hour	3.9	90th percentile of the onsite monitoring data, 24-hr averages
		Annual	0.3	Mean of onsite passive monitoring.
Carbon Monoxide (CO)	630-08-0	1 hour	114	90th percentile of the regional monitoring data (Winnipeg)
		8-hour	114	90th percentile of regional monitoring data (Winnipeg)
Sulphur Dioxide (SO_2)	7446-09-5	10-minute	5.2	90th percentile of the onsite monitoring data, 10-minute averages
		1-hour	3.9	90th percentile of the onsite monitoring data, 1-hr averages
		24-hour	3.2	90th percentile of the onsite monitoring data, 24-hr averages
		Annual	0.3	Mean of onsite passive monitoring.
Hydrogen Cyanide (HCN)	74-90-8	24-hour	—	No appreciable baseline concentration.
Calcium Oxide (CaO)	1305-78-8	24-hour	1.7 (as Ca)	The baseline concentrations of CaO were estimated assuming the particulate is of the same composition of ore and mine rock.
Copper Sulphate ($CuSO_4$)	7758-99-8	24-hour	—	Conservatively assumes all copper is copper sulphate
Arsenic (As)	7440-38-2	24-hour	0.0028	90th percentile and mean, respectively, of onsite SPM high-volume sampling.
Chromium (Cr)	7440-47-3	24-hour	0.0023	
Copper (Cu)	7440-50-8	24-hour	0.095	
Iron (Fe)	7439-89-6	24-hour	0.13	
Lead (Pb)	10099-74-8	24-hour	0.0014	
		30-day	0.0014	
Manganese (Mn) in SPM	7439-96-5	24-hour	0.0071	
Manganese (Mn) in PM_{10}		24-hour	0.0071	
Manganese (Mn) in $PM_{2.5}$		24-hour	0.0071	
Mercury (Hg)	7439-97-6	24-hour	9.3E-06	
Nickel (Ni) in SPM	7440-02-0	24-hour	0.0014	

Air Parameter	CAS Number	Averaging Time	Baseline Concentration (µg/m³) (1)	Reference for Baseline Concentration
		Annual	0.0010	
Nickel (Ni) in PM_{10}		24-hour	0.0014	
		Annual	0.0010	
Zinc (Zn)	7440-66-6	24-hour	0.013	
Benzene	71-43-2	24-hour	0.55	90th percentile and mean, respectively, of the onsite 24-hr data
		Annual	0.34	
1,3-Butadiene	106-99-0	24-hour	0.56	90th percentile and mean, respectively, of the onsite 24-hr data
		Annual	0.56	
Benzo(a)pyrene	50-32-8	24-hour	1.3E-05	90th percentile and mean of the onsite monitoring data.
		Annual	5.0E-06	

Notes:

1 *NAPS and onsite data are reported and measured in ppb and were converted to µg/m³ using a reference temperature and pressure of 25° C and 760 mmHg respectively (Environment Canada, 2004) where a conversion was not otherwise provided.*

2 *AAQC for SPM annual values states that the geometric mean of 24-hr concentrations be utilized, whereas the AAQC for $PM_{2.5}$ annual values states that the mean of 24-hr concentrations be used. Accordingly, the baseline concentration for annual SPM values is lower than that of $PM_{2.5}$.*



LEGEND

- ☆ PROJECT LOCATION
- ▲ REGIONAL AMBIENT AIR MONITORING STATION

0 25 50 100
1:2,000,000 KILOMETRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. TOPOGRAPHIC BASEMAP: USGS THE NATIONAL MAP: NATIONAL BOUNDARIES
2. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
REGIONAL AMBIENT AIR MONITORING STATIONS

CONSULTANT
wsp

YYYY-MM-DD	2024-08-23
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
OMEMA2303	0001	A	4-1

5 PREDICTIVE AIR QUALITY ASSESSMENT

5.1 SCENARIOS AND EMISSION RATE ESTIMATES

An assessment of predicted concentrations was undertaken for each Project phase to understand the cumulative concentrations predicted from the Project emissions and the existing air concentrations for the key parameters.

5.1.1 CONSTRUCTION PHASE – MINE INFRASTRUCTURE AND VIGGO PIT

The construction phase is expected to take place over a three-year period.

Construction activities are expected to include:

- Early works such as clearing and grubbing for road building and infrastructure pad preparations
- Development and use of onsite quarry areas
- Open pit preparation, development, and mining (Viggo pit)
- Haul road construction and operation
- Use of non-acid generating mine rock from the open pit as a construction material
- Process plant and site infrastructure construction and initial operation
- Preparation and use of stockpile pads
- TMF clearing, grubbing, and overburden removal
- TMF preparation, dam construction, and operation.

The prediction of concentrations encompasses the sources of air emissions that are associated with the construction phase of the Project. The concentrations assessed evolve upon completion of this construction phase as the activities transition into the operations phase. Equipment, activity levels, emissions sources, and key parameters associated with the construction phase are similar to those of the operations phase, but at a generally smaller scale and of shorter duration.

A maximum emission scenario was developed for the construction phase which considered variability in the construction schedule and in the location of construction phase activities. The scenario combined the most intensive period of earthworks construction with other activities which, while not necessarily concurrent, were spatially offset. In some cases, modelling non concurrent tasks together meant that emissions associated with certain construction equipment or activities were double-counted leading to conservatism in the predicted concentrations.

Predicted concentrations were compared to the AAQCs and CAAQS with consideration of baseline air quality concentrations.

5.1.2 OPERATIONS PHASE

The operations phase of the Project is expected to take place over a 25-year period. For the operations phase, it was conservatively assumed that the Project will be operating under the maximum emission scenario, which included all operations occurring concurrently at maximum activity rates.

A conservative approach was also taken to capture potential variation in material movement. The emissions scenario for material movement considered the maximum movements for each activity (e.g., ore from pit, mine rock from pit, stockpile management) over the life of the Project. The scenario modelled was a maximum hybrid of all operational years (the peak material movement for all routes assumed to happen concurrently), with material movement scaled to 120,000 tonnes per day to account for the maximum ore, mine rock, and overburden extracted / moved. The full breakdown of the material movement rates and origins/destinations can be found in Appendix C, Table C-3.

The modelled results are expected to over-predict the emissions and air quality concentrations for material handling operations and haul truck movements.

All sources were considered in the air dispersion modelling to assess air quality concentrations for comparison against AAQCs and CAAQS; certain sources were intentionally excluded from the modelling where O. Reg. 419/05 requirements were followed to allow for appropriate comparisons against the standards set out in O. Reg. 419/05 and the ACBs applicable to facility operations as described in Section 2.2.

5.1.3 CLOSURE AND DECOMMISSIONING PHASE, AND POST-CLOSURE

The active closure and decommissioning period is expected to be three years in length, with passive closure following. Activities in the closure and decommissioning phase are similar to those that occur during the operations and construction phases, and use similar mining and construction equipment, but on a generally smaller scale and timeframe. The fugitive dust management plan will include practices to minimize dust emissions during the closure phase (e.g., watering, travel area surface management). Accordingly, no quantitative closure and decommissioning phase assessment of air quality was completed.

Notable sources of air parameter emissions that would warrant the assessment of concentrations are not expected to be occur post-closure.

5.2 AIR QUALITY ASSESSMENT RESULTS

Air dispersion modelling was used to predict the offsite air concentrations of the key parameters identified in Section 2 beyond the extent of the mine leases. The modelled air quality offsite concentrations were compared against the criteria and standards (with, and without, inclusion of baseline concentrations as applicable) as presented in:

- Table 5-1: Construction Phase – Maximum POI compared to AAQC
- Table 5-2: Construction Phase – Maximum POR compared to AAQC
- Table 5-3: Construction Phase – Maximum POR compared to CAAQS
- Table 5-4: Operations Phase – Maximum POI compared to AAQC
- Table 5-5: Operations Phase – Maximum POR compared to AAQC
- Table 5-6: Operations Phase – O.Reg. 419/05 (excludes baseline)
- Table 5-7: Operations Phase – Maximum POR compared to CAAQS.

Note, the maximum POI modelled concentration for each key parameter and relevant averaging time, takes into account the removal of meteorological anomalies using the method described in the ADMGO (MECP 2017). The maximum predicted air concentrations at the PORs did not have meteorological anomalies removed.

The figures in Section 5 depict the predicted, worst-case, extent of each phase's air quality concentrations as predicted by the air dispersion model. The figures show contour lines that represent the annotated percent of the relevant AAQC for the relevant averaging time.

The shapes of the contours indicate the location of predicted concentrations, which vary with direction and distance, as a result of source locations, meteorological conditions, and topography. These contours are a composite of the maximum predicted concentrations over the five-year dataset and not a snapshot in time. The contours show how ground-level concentrations decrease with distance from the Project, due to the generally ground-level and open pit release height of the emissions for all phases.

The concentrations in the tables, not the concentration plots, should be taken as the final value of each maximum predicted concentration as meteorological anomalies have not been removed from the plots.

5.2.1 CONSTRUCTION PHASE

5.2.1.1 MINE INFRASTRUCTURE AND VIGGO PIT OPERATIONS

For the construction of the mine infrastructure, the maximum predicted cumulative concentrations for all parameters were below their respective AAQC, and there were no predicted concentrations above the guidelines at PORs.

As previously noted, the CAAQS were not developed as project-level regulatory standards. Rather they are used by provinces and territories to guide air zone management actions and represent an indicator of good air quality (CCME 2019). For NO_2, the Ontario AAQC over the same averaging time is over four times greater than the CAAQS and is also not a regulatory value but is protective against effects on health and the environment (MECP 2020). The CAAQS consist of a numerical standard and the statistical form, intended to minimize the influence of variable meteorological conditions on compliance with the CAAQS.

When a direct comparison to maximum modelled POI concentrations at PORs is compared to the CAAQs, only NO_2 concentrations for the 1-hour averaging time are predicted to be above the guidelines. When the appropriate statistical form is considered, all of the air parameters were predicted to be below the respective CAAQS.

The construction phase predicted concentrations are presented in Tables 5-1 to 5-3.

5.2.2 OPERATIONS PHASE

5.2.2.1 PARTICULATE MATTER

The modelling identified fugitive dusts, primarily from haul road fugitive emissions, as having the highest potential for contributing to offsite concentrations, and effective dust mitigation is necessary to prevent, or minimize, these contributions.

These predicted concentrations for particulate matter should be considered in the context of the conservative nature of the emission rate estimates (all sources active at maximum all the time, activity levels for all years at the maximum year of operations) and the conservative modelling (worst-case meteorological conditions over five years of meteorological data). The modelled concentrations for particulate are at a level that is also typical of many mining projects in Ontario.

As summarized in Table 5-4, the modelling predicts concentrations for all particulate fractions are below their respective AAQCs.

The modelled concentrations were compared against the AAQC for each of the three particulate size fractions.

Respirable silica and DPM are other particulates identified as key air parameters associated with mining activities with air emissions quantified and the air quality concentrations predicted using air dispersion modelling. For both respirable silica and DPM, the predicted concentrations were below the respective criteria.

5.2.2.2 NITROGEN DIOXIDE AND SULPHUR DIOXIDE

These CAPs are by-products of fuel combustion, and the air quality concentrations for the 1-hour averaging time are overwhelmingly influenced by fuel combustion emissions when compared with the in-pit blasting and quarry blasting.

The predicted maximum concentrations for NO_2 and SO_2 at the extent of the mine leased area were below their respective AAQC. Blasting was modelled during unfavourable meteorological conditions for additional conservatism.

5.2.2.3 VOLATILE ORGANIC COMPOUNDS

As noted previously, the combustion of fuels results in the emission of VOCs to the air, for which benzene and 1,3-butadiene were used as a surrogate for this Air Quality Assessment. The predicted benzene and 1,3-butadiene concentrations resulting from these Project emissions are below the AAQCs for both the 24-hour and annual averaging times.

5.2.2.4 POLYCYCLIC AROMATIC HYDROCARBONS

The combustion of fuels results in trace emissions of PAHs to the air, for which b(a)p is used as a surrogate in air quality assessments. The predicted b(a)p concentrations resulting from these Project emissions are below the AAQC for both the 24-hour and the annual averaging times.

5.2.2.5 OTHER PARAMETERS

The predicted maximum concentrations of all other air parameters at the leased claims boundary, and beyond, were below their respective AAQC even when baseline concentrations were added to the modelled concentrations as a cumulative air quality effect. The results at the PORs, with baseline levels included, were also less than the AAQCs.

For the metals identified in Section 2.1.5, namely As, Cr, Cu, Fe, Hg, Mn, Ni, Pb, and Zn, the maximum offsite concentrations were estimated through speciation of the modelled particulate matter concentrations, assuming that the dust is of the same composition as that of the samples of ore and mine rock at the Project. There were no concentrations above the AAQCs for the metals.

5.2.2.6 OZONE FORMATION

There are no sources of ozone associated with the Project. NO_X and VOCs will however be released, are known ozone precursors, and react in the presence of heat and sunlight to form ozone.

Given these requirements, ozone formation is most likely from May to September, between noon and the early evening (MECP n.d.).

In 2021, Ontario measured ozone at 47 stations where the 90th percentile of 1-hour values ranged from 36 to 47 ppb. The health-based AAQC for ozone is 80 ppb and given the range of ozone concentrations from remote to urban locations only varied by 11 ppb, ozone is a regional air quality issue rather than a local issue with no appreciable concentrations from the Project on the ozone concentrations in the LSA or RSA.

5.2.2.7 ONTARIO REGULATION 419/05 COMPLIANCE

O. Reg. 419/05 air quality standards are used to assess emissions from all stationary sources associated with the Project; by regulatory requirement and guidance, baseline concentrations, non-Project emissions sources, construction activities, and mobile sources are excluded, and the total NOx is compared against the ACB. The modelled Project concentrations were assessed against the O. Reg. 419/05 standards and other applicable ACBs.

The emissions summary table (Table 5-6) summarizes the site-wide emission rates for all stationary sources and the modelled predictions for all air parameters compared to the respective standards or ACBs.

The emissions summary table demonstrates that the modelled concentrations for all air parameters are predicted to below the respective O. Reg. 419/05 standards or ACB, including at the receptors and, as such, the Project is predicted to be permittable in Ontario.

A complete Emission Summary and Dispersion Modelling Report will be prepared as part of an application for an ECA (Air and Noise) for the Project.

5.2.2.8 CANADIAN AIR QUALITY STANDARDS

As noted, the CAAQS were not developed as project-level regulatory standards. Rather, they are used by provinces and territories to guide air zone management actions and represent an indicator of good air quality (CCME 2019). For NO_2, the Ontario AAQC over the same averaging time is over four times greater than the CAAQS and is also not a regulatory value but is protective against effects on health and the environment (MECP 2020).

The CAAQS consist of a numerical standard and the statistical form, intended to minimize the influence of variable meteorological conditions on compliance with the CAAQS. When the direct comparison is considered, all but one of the air parameters were predicted to be below their respective CAAQS. The NO_2 concentrations in the operations scenario that were predicted to be above the CAAQS with a direct comparison for the 1-hour averaging time are below the CAAQS when the matching statistical form is considered.

These predicted concentrations should be considered in the context of the conservative nature of the emission rate estimates (all sources active at maximum all the time, activity levels for all years at the maximum year of operations) and the conservative modelling (worst-case meteorological conditions over five years of meteorological data).

Table 5-1: Construction Phase - Emissions Summary Table with Comparison of Maximum Modelled Concentrations to the Ambient Air Quality Criteria

Air Parameter	CAS Number	Averaging Time	Project Emission Rate (g/s)	Project Concentration (µg/m^3)	Baseline Concentration (µg/m^3)	Project + Baseline Concentration (µg/m^3)	AAQC (µg/m^3)	% of AAQC
Suspended particulate matter (SPM)	NA	24-hour	76.9	17.4	21.4	38.8	120	32%
		annual		2.3	5.8	8.1	60	14%
Inhalable particulate (PM_{10})	NA	24-hour	30.2	12.5	18.3	30.8	50	62%
Respirable particulate ($PM_{2.5}$)	NA	24-hour	7.5	4.9	10.0	14.9	27	55%
		annual		0.66	5.8	6.5	8.8	73%
Diesel particulate matter (DPM)	NA	24-hour	3.0	4.2	0.19	4.5	10	45%
		annual		0.65	0.089	0.74	5	15%
Respirable silica (SiO_2 <10 µm)	various	24-hour	2.3	0.9	1.2	2.2	5	43%
Nitrogen dioxide (NO_2)	10102-44-0	1-hour	115	94.6	4.8	99.4	400	25%
		24-hour	72.7	51.1	3.9	55.0	200	27%
Carbon monoxide (CO)	630-08-0	1-hour	281	2805	114	2919	36200	8%
		8-hour	48.3	577	114	691	15700	4%
Sulphur dioxide (SO_2)	7446-09-5	10-minute	3.2	56.8	4.8	61.6	178	35%
		1-hour	3.2	34.4	3.9	38.3	100	38%
		annual	0.19	0.38	3.2	3.6	10	36%
Hydrogen cyanide (HCN)	74-90-8	24-hour	0.56	0.89	—	0.89	8	11%
Calcium oxide (CaO)	1305-78-8	24-hour	0.13	0.18	1.7	1.8	10	18%
Arsenic (As)	7440-38-2	24-hour	0.057	0.013	0.0028	0.016	0.3	5%
Chromium (Cr)	7440-47-3	24-hour	0.0098	0.0022	0.0023	0.0045	0.5	1%
Copper sulphate ($CuSO_4$)	7758-99-8	24-hour	0.040	0.12	—	0.12	50	0.2%
Copper (Cu)	7440-50-8	24-hour	0.022	0.0050	0.10	0.10	50	0.2%
Iron (Fe)	7439-89-6	24-hour	9.6	2.2	0.13	2.3	25	9%
Lead (Pb)	7439-92-1	30-day	0.032	0.0073	0.0014	0.0087	0.5	2%
		24-hour	0.032	0.0073	0.0014	0.0087	0.2	4%
Manganese (Mn) in $PM_{2.5}$	7439-96-5	24-hour	0.019	0.013	0.0071	0.020	0.1	20%
Manganese (Mn) in PM_{10}		24-hour	0.079	0.032	0.0071	0.040	0.2	20%
Manganese (Mn) in SPM		24-hour	0.20	0.045	0.0071	0.052	0.4	13%
Mercury (Hg)	7439-97-6	24-hour	0.000019	0.0000042	0.0000093	0.000014	2	0.001%
Nickel (Ni) in SPM	7440-02-0	24-hour	0.0070	0.0016	0.0014	0.0030	0.2	1%
		annual		0.00021	0.0010	0.0012	0.04	3%
Nickel (Ni) in PM_{10}		24-hour	0.0070	0.0016	0.0014	0.0030	0.1	3%
		annual		0.00021	0.0010	0.0012	0.02	6%
Zinc (Zn)	7440-66-6	24-hour	0.16	0.036	0.013	0.049	120	0.04%
Benzene	71-43-2	24-hour	1.2	1.0	0.55	1.6	2.3	68%
		annual		0.10	0.34	0.44	0.45	98%
1,3-Butadiene	106-99-0	24-hour	0.051	0.080	0.56	0.64	10	6%
		annual		0.0081	0.56	0.57	2	28%
Benzo(a)pyrene	50-32-8	24-hour	0.0000068	0.0000057	0.000013	0.000019	0.00005	37%
		annual		0.0000010	0.0000050	0.0000060	0.00001	60%

Notes:

"—" *indicates that there is no value for the respective parameter and/or averaging time.*

Table 5-2: Construction Phase - Emission Summary Table with Maximum Concentration at a Point of Reception (POR)

Air Parameter	CAS Number	Averaging Time	Receptor ID	Project Emission Rate (g/s)	Project Concentration (µg/m³)	Baseline Concentration (µg/m³)	Project + Baseline Concentration (µg/m³)	AAQC (µg/m³)	% of AAQC
Suspended particulate matter (SPM)	NA	24-hour	POR1	76.9	4.3	21.4	25.7	120	21%
		annual	POR1		0.50	5.8	6.3	60	11%
Inhalable particulate (PM_{10})	NA	24-hour	POR1	30.2	3.6	18.3	21.9	50	44%
Respirable particulate ($PM_{2.5}$)	NA	24-hour	POR4	7.5	1.2	10.0	11.2	27	42%
		annual	POR1		0.14	5.8	5.9	8.8	68%
Diesel particulate matter (DPM)	NA	24-hour	POR1	3.0	0.66	0.19	0.85	10	8%
		annual	POR1		0.084	0.089	0.17	5	3%
Respirable silica (SiO_2 <10 µm)	various	24-hour	POR1	2.3	0.27	1.2	1.5	5	30%
Nitrogen dioxide (NO_2)	10102-44-0	1-hour	POR1	115	82.0	4.8	86.8	400	22%
		24-hour	POR1	72.7	10.6	3.9	14.5	200	7%
Carbon monoxide (CO)	630-08-0	1-hour	POR7	281	958	114	1072	36200	3%
		8-hour	POR7	48.3	158	114	272	15700	2%
Sulphur dioxide (SO_2)	7446-09-5	10-minute	POR1	3.2	11.2	4.8	16	178	9%
		1-hour	POR1	3.2	6.8	3.9	11	100	11%
		annual	POR1	0.19	0.046	3.2	3.2	10	32%
Hydrogen cyanide (HCN)	74-90-8	24-hour	POR1	0.56	0.18	—	0.18	8	2%
Calcium oxide (CaO)	1305-78-8	24-hour	POR1	0.13	0.038	1.7	1.7	10	17%
Arsenic (As)	7440-38-2	24-hour	POR1	0.057	0.0010	0.0028	0.0038	0.3	1%
Chromium (Cr)	7440-47-3	24-hour	POR1	0.010	0.00017	0.0023	0.0025	0.5	0.5%
Copper sulphate ($CuSO_4$)	7758-99-8	24-hour	POR1	0.040	0.010	—	0.010	50	0.02%
Copper (Cu)	7440-50-8	24-hour	POR1	0.022	0.00037	0.10	0.10	50	0.2%
Iron (Fe)	7439-89-6	24-hour	POR1	9.6	0.16	0.13	0.29	25	1%
Lead (Pb)	7439-92-1	24-hour	POR1	0.032	0.063	0.0014	0.064	0.5	13%
		30-day	POR1	0.032	0.00018	0.0014	0.0016	0.2	1%
Manganese - in $PM_{2.5}$	7439-96-5	24-hour	POR1	0.019	0.00087	0.0071	0.0080	0.1	8%
Manganese - in PM_{10}		24-hour	POR1	0.079	0.0023	0.0071	0.0094	0.2	5%
Manganese - in SPM		24-hour	POR1	0.20	0.0033	0.0071	0.010	0.4	3%
Mercury	7439-97-6	24-hour	POR1	0.000019	0.00000031	0.0000093	0.0000096	2	<0.01%
Nickel - in SPM	7440-02-0	24-hour	POR1	0.0070	0.00012	0.0014	0.0015	0.2	1%
		annual	POR1		0.000046	0.0010	0.0010	0.04	3%
Nickel - in PM_{10}		24-hour	POR1	0.0070	0.00021	0.0014	0.0016	0.1	2%
		annual	POR1		0.000073	0.0010	0.0011	0.02	5%
Zinc (Zn)	7440-66-6	24-hour	POR1	0.16	0.0087	0.013	0.022	120	0.02%
Benzene	71-43-2	24-hour	POR1	1.2	0.22	0.55	0.77	2.3	34%
		annual	POR1		0.025	0.34	0.36	0.45	81%
1,3-Butadiene	106-99-0	24-hour	POR1	0.051	0.018	0.56	0.58	10	6%
		annual	POR1		0.0020	0.56	0.56	2	28%
Benzo(a)pyrene	50-32-8	24-hour	POR4	0.0000068	0.0000025	0.000013	0.000016	0.00005	31%
		annual	POR4		0.00000022	0.0000050	0.0000052	0.00001	52%

Notes:

"—" *indicates that there is no value for the respective parameter and/or averaging time*

Table 5-3: Construction Phase - Emission Summary Table with Comparison to Canadian Ambient Air Quality Standards (CAAQS)

Air Parameter	CAS Number	Averaging Time (hr - unless noted otherwise)	Project Concentration (µg/m^3)	Baseline Concentration (µg/m^3)	Project + Baseline Concentration (µg/m^3)	Canadian Ambient Air Quality Standard - 2030 (µg/m^3)	% of CAAQS
Fine particulate matter ($PM_{2.5}$)	NA	24	1.2	10.0	11.2	23	49%
		Annual	0.14	5.8	5.9	8	74%
Nitrogen dioxide (NO_2)	10102-44-0	1(1)	44.0	4.8	48.8	79	62%
		Annual	10.6	0.3	10.9	23	47%
Sulfur dioxide (SO_2)	7446-09-5	1	6.8	3.9	10.7	170	6%
		Annual	0.046	3.2	3.2	10	32%

Notes:

(1) Matching statistical form per Guidance Document on Achievement Determination For Canadian Ambient Air Quality Standards For Nitrogen Dioxide (CCME 2020), all other comparisons are Direct Comparison.

Table 5-4: Operations Phase - Emissions Summary Table with Comparison of Maximum Modelled Concentrations to the Ambient Air Quality Criteria

Air Parameter	CAS Number	Averaging Time	Project Emission Rate (g/s)	Project Concentration (μg/m³)	Baseline Concentration (μg/m³)	Project + Baseline Concentration (μg/m³)	AAQC (μg/m³)	% of AAQC
Suspended particulate matter (SPM)	NA	24-hour	63.6	16.9	21.4	38.3	120	32%
		annual		1.8	5.8	7.6	60	13%
Inhalable particulate (PM_{10})	NA	24-hour	24.2	12.1	18.3	30.4	50	61%
Respirable particulate ($PM_{2.5}$)	NA	24-hour	6.2	4.7	10.0	14.7	27	55%
		annual		1.5	5.8	7.3	8.8	83%
Diesel particulate matter (DPM)	NA	24-hour	2.4	4.1	0.2	4.3	10	43%
		annual		1.5	0.1	1.5	5	31%
Respirable silica (SiO_2 <10 μm)	various	24-hour	1.8	0.91	1.2	2.1	5	43%
Nitrogen dioxide (NO_2)	10102-44-0	1-hour	114	94.6	4.8	99.4	400	25%
		24-hour	76.5	51.1	3.9	55.0	200	27%
Carbon monoxide (CO)	630-08-0	1-hour	257	768	114	882	36200	2%
		8-hour	53.1	106	114	220	15700	1%
Sulphur dioxide (SO_2)	7446-09-5	10-minute	2.8	14.8	4.8	19.6	178	11%
		1-hour	2.8	9.0	3.9	12.9	100	13%
		annual	0.16	0.013	3.2	3.2	10	32%
Hydrogen cyanide (HCN)	74-90-8	24-hour	0.56	0.89	—	0.89	8	11%
Calcium oxide (CaO)	1305-78-8	24-hour	0.13	0.18	1.7	1.8	10	18%
Arsenic (As)	7440-38-2	24-hour	0.047	0.012	0.0028	0.015	0.3	5%
Chromium (Cr)	7440-47-3	24-hour	0.0081	0.0021	0.0023	0.0044	0.5	1%
Copper Sulphate ($CuSO_4$)	7758-99-8	24-hour	0.040	0.12	—	0.12	50	0.2%
Copper (Cu)	7440-50-8	24-hour	0.018	0.0048	0.10	0.10	50	0.2%
Iron (Fe)	7439-89-6	24-hour	7.9	2.1	0.13	2.2	25	9%
Lead (Pb)	7439-92-1	30-day	0.032	0.0084	0.0014	0.010	0.5	2%
		24-hour	0.032	0.0084	0.0014	0.010	0.2	5%
Manganese (Mn) in $PM_{2.5}$	7439-96-5	24-hour	0.016	0.012	0.0071	0.019	0.1	19%
Manganese (Mn) in PM_{10}		24-hour	0.063	0.032	0.0071	0.039	0.2	19%
Manganese (Mn) in SPM		24-hour	0.17	0.044	0.0071	0.051	0.4	13%
Mercury (Hg)	7439-97-6	24-hour	0.000015	0.0000041	0.0000093	0.000013	2	0.001%
Nickel (Ni) in SPM	7440-02-0	24-hour	0.0058	0.0015	0.0014	0.0029	0.2	1%
		annual		0.00017	0.0010	0.0012	0.04	3%
Nickel (Ni) in PM_{10}		24-hour	0.0058	0.0015	0.0014	0.0029	0.1	3%
		annual		0.00017	0.0010	0.0012	0.02	6%
Zinc (Zn)	7440-66-6	24-hour	0.13	0.13	0.013	0.1	120	0.1%
Benzene	71-43-2	24-hour	0.99	1.0	0.55	1.5	2.3	67%
		annual		0.10	0.34	0.44	0.45	98%
1,3-Butadiene	106-99-0	24-hour	0.042	0.079	0.56	0.64	10	6%
		annual		0.0081	0.56	0.57	2	28%
Benzo(a)pyrene	50-32-8	24-hour	0.0000078	0.0000053	0.000013	0.000018	0.00005	37%
		annual		0.0000011	0.0000050	0.0000061	0.00001	61%

Notes:

"—" *indicates that there is no value for the respective parameter and/or averaging time*

Bolded *values indicate a concentration that is above the guidelines.*

Table 5-5: Operations Phase - Emission Summary Table with Maximum Concentration at a Point of Reception (POR)

Air Parameter	CAS Number	Averaging Time	Receptor ID	Project Emission Rate (g/s)	Project Concentration (µg/m^3)	Baseline Concentration (µg/m^3)	Project + Baseline Concentration (µg/m^3)	Ontario AAQC (µg/m^3)	% of AAQC
Suspended particulate matter (SPM)	NA	24-hour	POR1	63.6	4.1	21.4	25.5	120	21%
		annual	POR1		0.45	5.8	6.3	60	10%
Inhalable particulate (PM_{10})	NA	24-hour	POR4	24.2	3.3	18.3	21.6	50	43%
Respirable particulate ($PM_{2.5}$)	NA	24-hour	POR4	6.2	1.1	10	11.1	27	41%
		annual	POR1		0.11	5.8	5.9	8.8	67%
Diesel particulate matter (DPM)	NA	24-hour	POR1	2.4	0.52	0.19	0.71	10	7%
		annual	POR1		0.065	0.089	0.15	5	3%
Respirable silica (SiO_2 <10 µm)	various	24-hour	POR4	1.8	0.25	1.2	1.48	5	30%
Nitrogen dioxide (NO_2)	10102-44-0	1-hour	POR1	114	85.6	4.8	90.4	400	23%
		24-hour	POR1	76.5	10.7	3.9	14.6	200	7%
Carbon monoxide (CO)	630-08-0	1-hour	POR1	257	729	114	843	36200	2%
		8-hour	POR1	53.1	94.9	114	209	15700	1%
Sulphur dioxide (SO_2)	7446-09-5	10-minute	POR1	2.8	14.3	4.8	19.1	178	11%
		1-hour	POR1	2.8	8.6	3.9	12.5	100	13%
		annual	POR1	0.16	0.0044	3.2	3.2	10	32%
Hydrogen cyanide (HCN)	74-90-8	24-hour	POR1	0.56	0.18	0	0.18	8	2%
Calcium oxide (CaO)	1305-78-8	24-hour	POR1	0.13	0.038	1.66	1.7	10	17%
Arsenic (As)	7440-38-2	24-hour	POR1	0.047	0.0030	0.0028	0.0058	0.3	2%
Chromium (Cr)	7440-47-3	24-hour	POR1	0.0081	0.00052	0.0023	0.0028	0.5	1%
Copper sulphate ($CuSO_4$)	7758-99-8	24-hour	POR1	0.040	0.010	0	0.010	50	0.02%
Copper (Cu)	7440-50-8	24-hour	POR1	0.018	0.0012	0.10	0.10	50	0.2%
Iron (Fe)	7439-89-6	24-hour	POR1	7.9	0.51	0.13	0.64	25	3%
Lead (Pb)	7439-92-1	24-hour	POR1	0.032	0.0020	0.0014	0.0034	0.5	1%
		30-day	POR1	0.032	0.0020	0.0014	0.0034	0.2	2%
Manganese - in $PM_{2.5}$	7439-96-5	24-hour	POR4	0.016	0.0028	0.0071	0.010	0.1	10%
Manganese - in PM_{10}		24-hour	POR4	0.063	0.0086	0.0071	0.016	0.2	8%
Manganese - in SPM		24-hour	POR1	0.17	0.011	0.0071	0.018	0.4	3%
Mercury	7439-97-6	24-hour	POR1	0.000015	0.0000010	0.0000093	0.000010	2	0.001%
Nickel - in SPM	7440-02-0	24-hour	POR1	0.0058	0.00037	0.0014	0.0018	0.2	1%
		annual	POR1		0.000042	0.0010	0.0010	0.04	3%
Nickel - in PM_{10}		24-hour	POR4	0.0058	0.00080	0.0014	0.0022	0.1	2%
		annual	POR1		0.000062	0.0010	0.0011	0.02	5%
Zinc (Zn)	7440-66-6	24-hour	POR1	0.13	0.0084	0.013	0.021	120	0.02%
Benzene	71-43-2	24-hour	POR1	0.99	0.18	0.55	0.73	2.3	32%
		annual	POR1		0.017	0.34	0.36	0.45	79%
1,3-Butadiene	106-99-0	24-hour	POR1	0.042	0.014	0.56	0.57	10	6%
		annual	POR1		0.0013	0.56	0.56	2	28%
Benzo (a)pyrene	50-32-8	24-hour	POR4	0.0000078	0.0000027	0.000013	0.000016	0.00005	31%
		annual	POR4		0.00000025	0.0000050	0.0000053	0.00001	52%

Notes:

"—" *indicates that there is no value for the respective parameter and/or averaging time*

Table 5-6: Operations Phase - Emission Summary Table with Comparison to Ontario Regulation 419/05 Standards and Guidelines

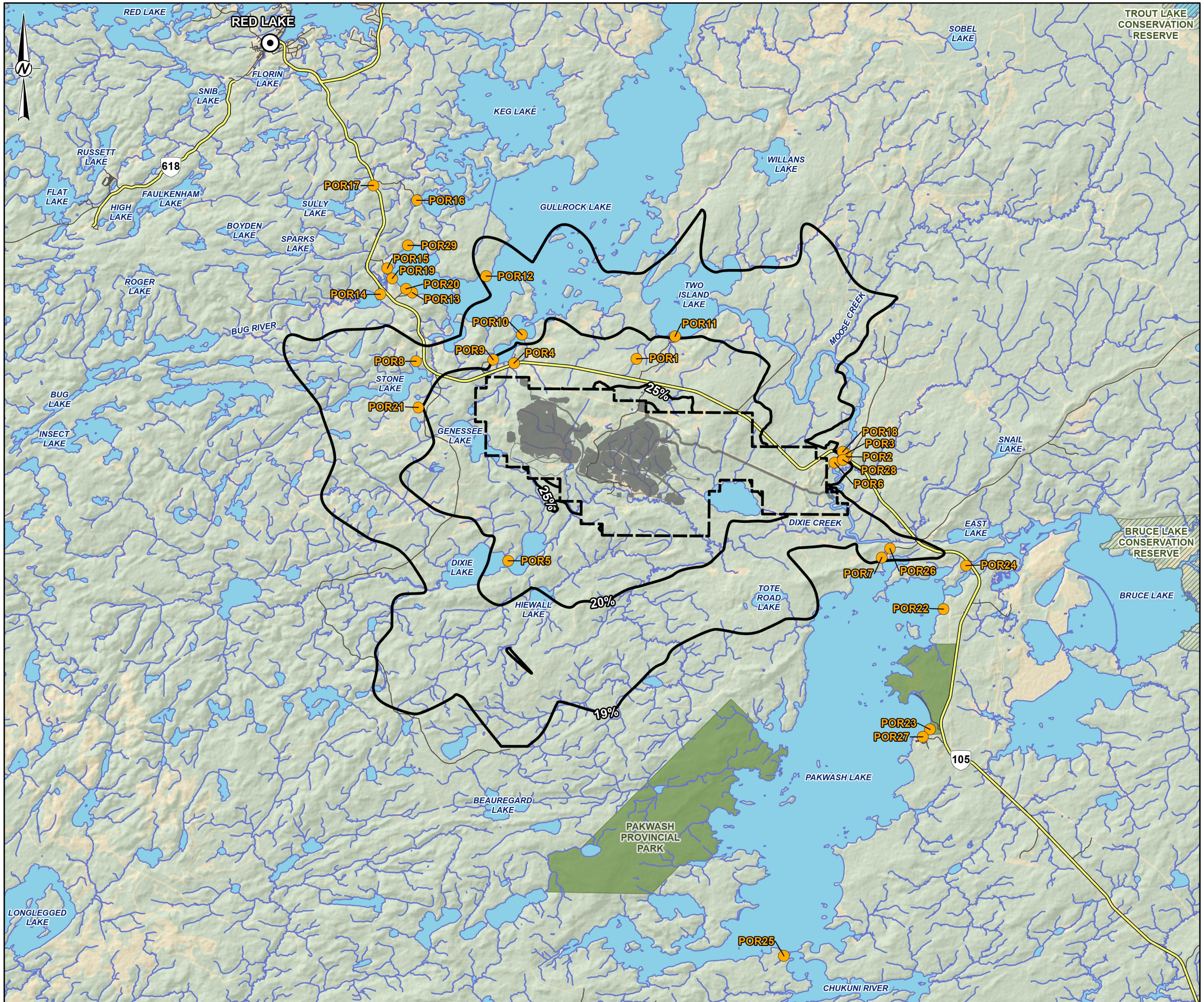
Air Parameter	CAS Number	Averaging Time	Project Emission Rate (g/s)	Modelled POI Concentration (µg/m³)	Ontario Regulation 419/05 Standard or ACB (µg/m³)	ACB B1/B2	% of Criterion
Suspended particulate matter (SPM)	NA	24-hour	17.9	10.8	120	B1	9%
Respirable silica (<10µm)	various	24-hour	11.9	0.58	5	B1	12%
Nitrogen oxides (NO_x, reported as NO_2)	10102-44-0	1-hour	99.7	281	400	B1	70%
		24-hour	63.0	59.7	200	B1	30%
Carbon monoxide (CO)	630-08-0	0.5-hour	243	919	6000	B1	15%
Sulphur dioxide (SO_2)	7446-09-5	1-hour	2.8	9.0	100	B1	9%
		annual	0.16	0.013	10	B1	0.1%
Hydrogen cyanide (HCN)	74-90-8	24-hour	0.56	0.89	8	B1	11%
Calcium oxide (CaO)	1305-78-8	24-hour	0.13	0.18	10	B1	2%
Copper sulphate ($CuSO_4$)	7758-99-8	24-hour	0.040	0.12	0.5	B2	25%
Ammonia (NH3)	7664-41-7	24-hour	0.59	2.6	100	B1	3%
Arsenic (As)	7440-38-2	24-hour	0.013	0.008	0.3	B1	3%
Chromium (Cr)	7440-47-3	24-hour	0.0022	0.001	0.5	B1	0.3%
Copper (Cu)	7440-50-8	24-hour	0.0050	0.003	50	B1	0.01%
Iron (Fe)	7439-89-6	24-hour	2.1	1.276	25	B2	5%
Lead (Pb)	7439-92-1	24-hour	0.029	0.018	0.5	B1	4%
		30-day	0.029	0.018	0.2	B2	9%
Magnesium (Mg)	1309-48-4	24-hour	0.40	0.24	72	B1	0.3%
Manganese (Mn)	7439-96-5	24-hour	0.044	0.027	0.4	B1	7%
Mercury (Hg)	7439-97-6	24-hour	0.0000042	0.0000025	2	B1	0.0001%
Nickel (Ni)	7440-02-0	24-hour	0.0017	0.001	2	DAV	0.1%
		Annual		0.00017	0.4	AAV	0.04%
		Annual		0.00017	0.04	B1	0.4%
Zinc (Zn)	7440-66-6	24-hour	0.036	0.022	120	B1	0.02%

Table 5-7: Operations Phase - Emission Summary Table with Comparison to Canadian Ambient Air Quality Standards (CAAQS)

Air Parameter	CAS Number	Averaging Time (hr - unless noted otherwise)	Modelled POR Concentration (µg/m³)	Baseline Concentration (µg/m³)	Modelled + Baseline Concentration (µg/m³)	Canadian Ambient Air Quality Standard - 2030 (µg/m³)	% of CAAQS
Fine particulate matter ($PM_{2.5}$)	NA	24	1.1	10.0	11.1	23	48%
		Annual	0.11	5.8	5.9	8	74%
Nitrogen oxides (as NO_2)	10102-44-0	1[(1)]	39.2	4.8	44.0	79	56%
		Annual	10.7	0.3	11.0	23	48%
Sulfur dioxide (SO_2)	7446-09-5	1	8.6	3.9	12.5	170	7%
		Annual	0.004	3.2	3.2	10	32%

Notes:

(1) Matching statistical form per Guidance Document on Achievement Determination for Canadian Ambient Air Quality Standards For Nitrogen Dioxide (CCME 2020), all other comparisons are Direct Comparison.



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  CUMULATIVE = EXISTING CONDITIONS + PROJECT
  BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 17.8%
  ONTARIO AAQC: 120 ug/m³
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

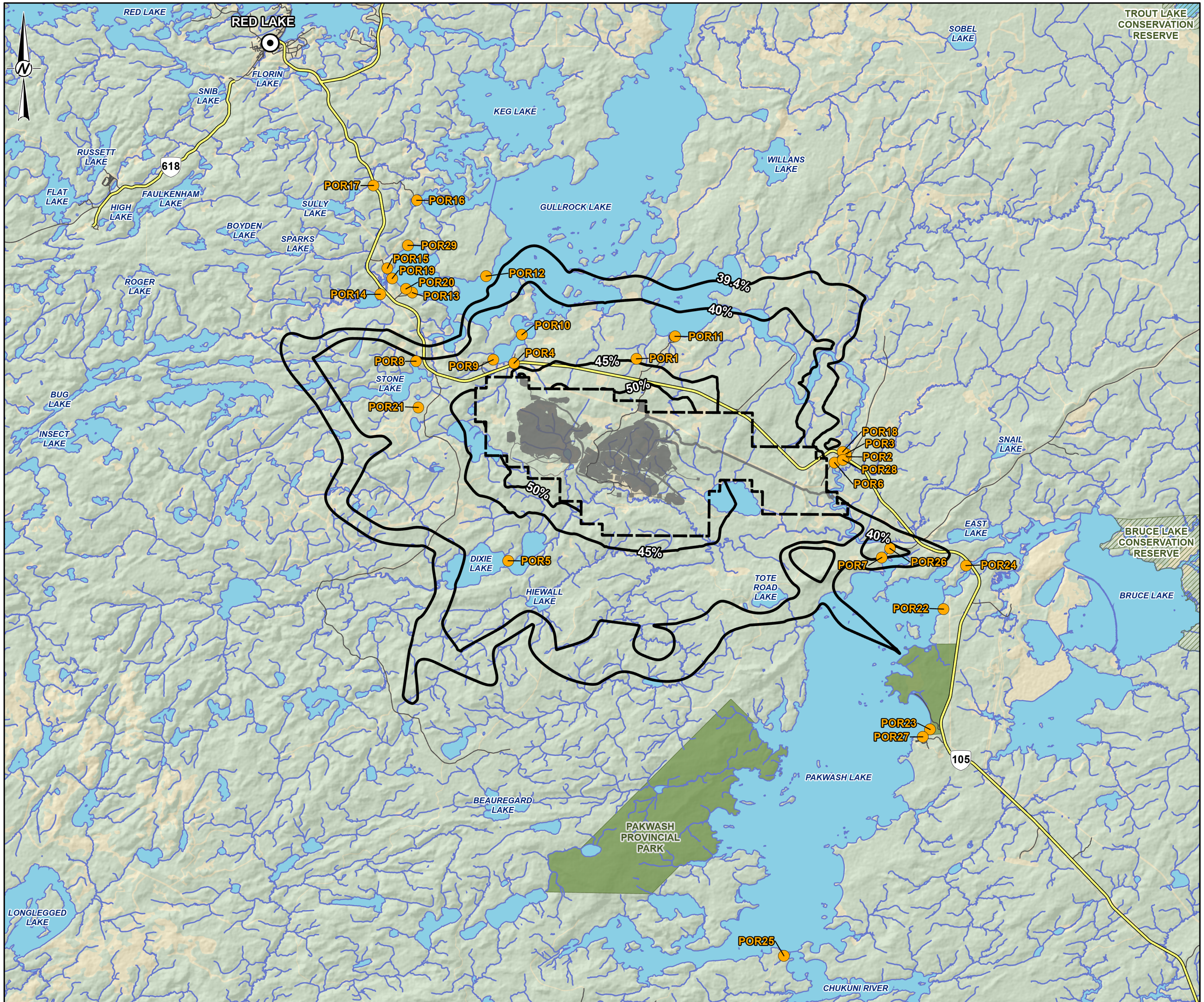
TITLE
OPERATIONS - SPM CONCENTRATION CONTOURS (24-HOUR, 90% DUST CONTROL)

CONSULTANT

wsp

YYYY-MM-DD	2025-09-26
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	5-1



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  CUMULATIVE = EXISTING CONDITIONS + PROJECT
  BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 36.6%
  ONTARIO AAQC: 50 ug/m^3
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

0 2.5 5 10

1:160,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
CONSTRUCTION - PM_{10} CONCENTRATION CONTOURS (24-HOUR, 90% DUST CONTROL)

CONSULTANT

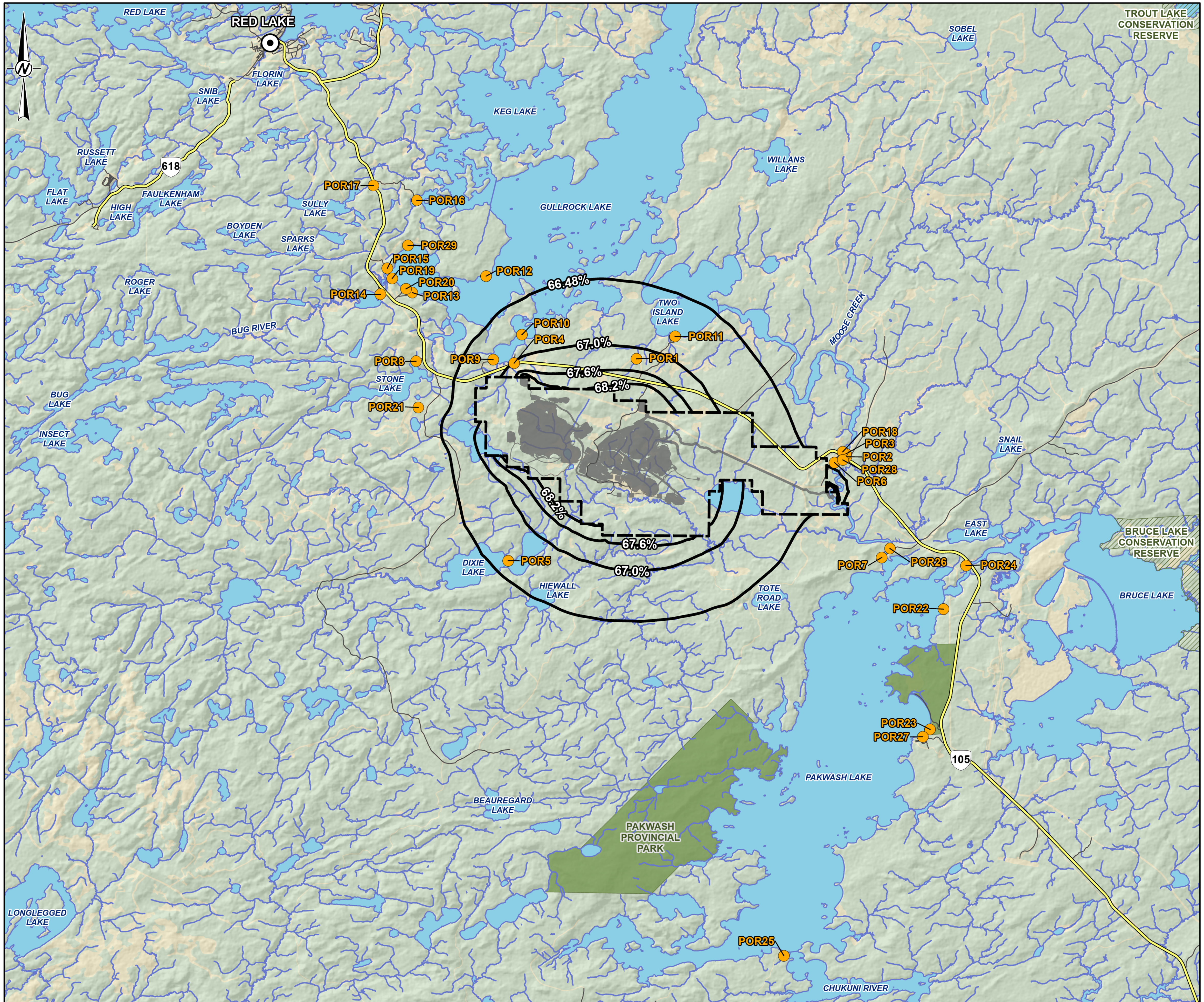
wsp

YYYY-MM-DD	2025-09-26
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	5-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25mm



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  CUMULATIVE = EXISTING CONDITIONS + PROJECT
  BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 65.9%
  ONTARIO AAQC: 8.8 ug/m^3
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
CONSTRUCTION - $PM_{2.5}$ CONCENTRATION CONTOURS (24-HOUR, 90% DUST CONTROL)

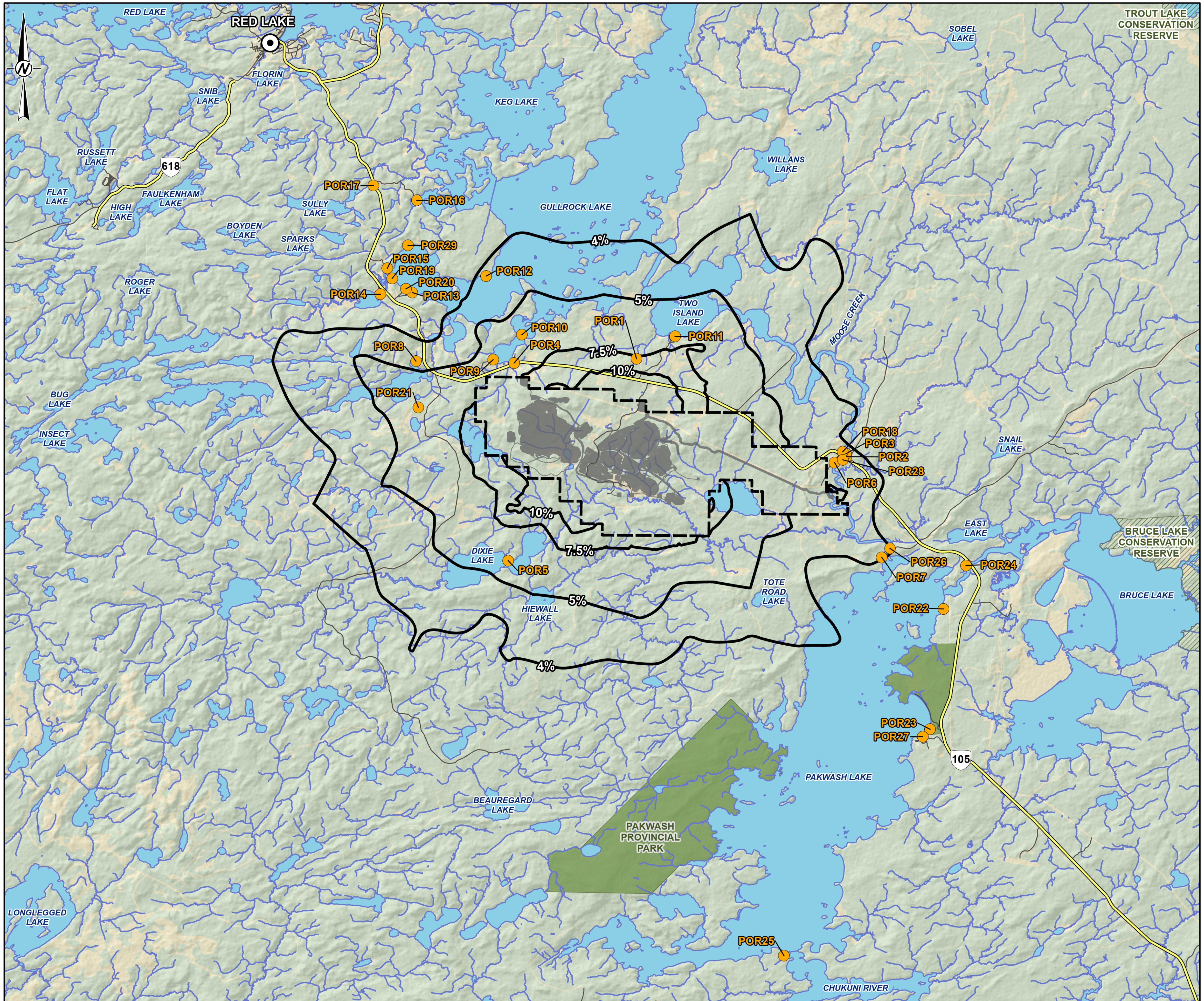
CONSULTANT

wsp

YYYY-MM-DD	2025-09-30
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	5-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
25mm



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  CUMULATIVE = EXISTING CONDITIONS + PROJECT
  BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 2.0%
  ONTARIO AAQC: 200 ug/m^3
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

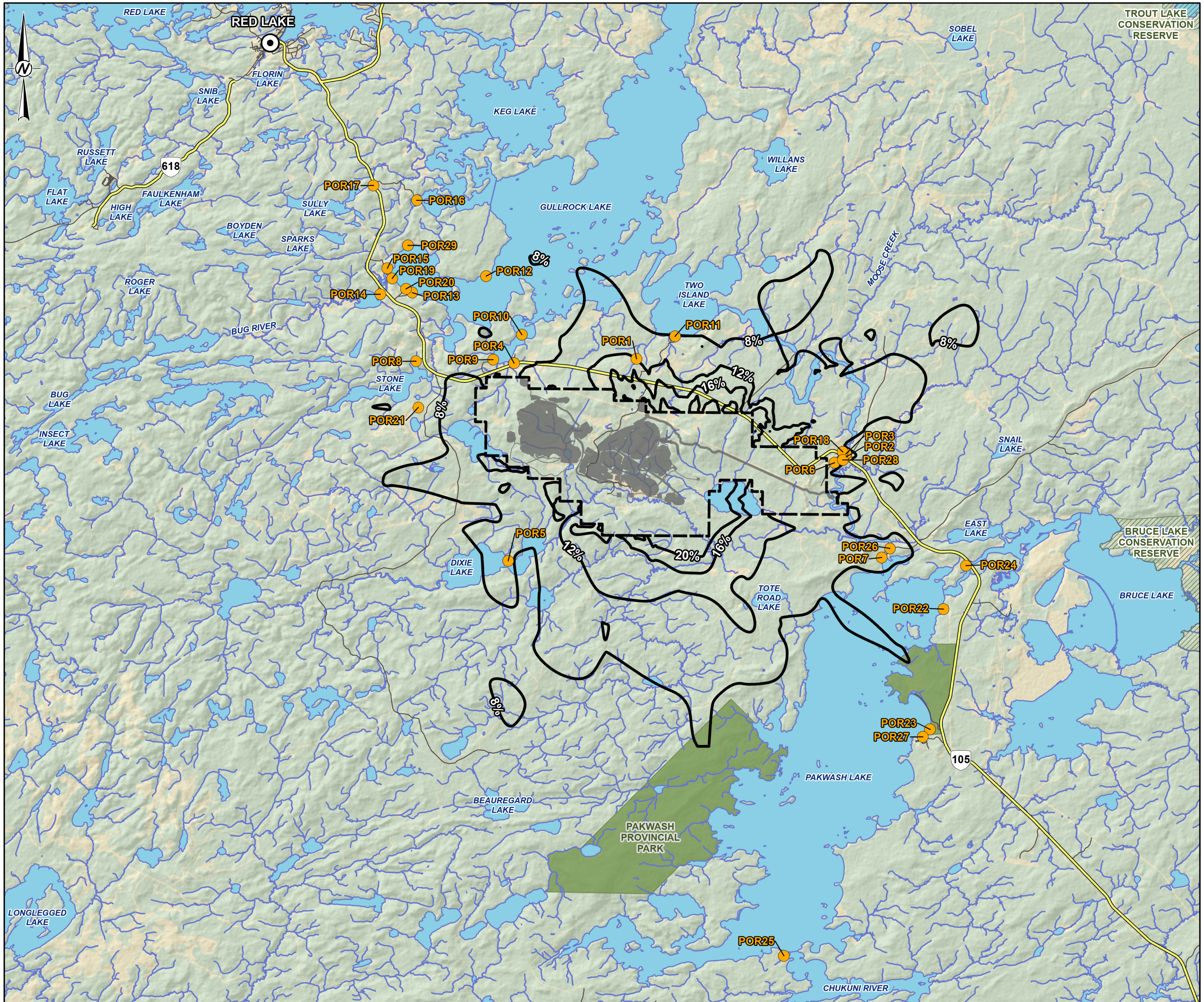
TITLE
CONSTRUCTION - NO_2 CONCENTRATION CONTOURS (24-HOUR)

CONSULTANT

YYYY-MM-DD	2025-09-29
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	5-4

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  CUMULATIVE = EXISTING CONDITIONS + PROJECT
  BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 3.9%
  ONTARIO AAQC: 100 ug/m^3
- TOWN
- HIGHWAY
- LOCAL ROAD
- CONSERVATION RESERVE
- PROVINCIAL PARK
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

0 2.5 5 10

1:160,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIM BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
CONSTRUCTION - SO_2 CONCENTRATION CONTOURS (1-HOUR)

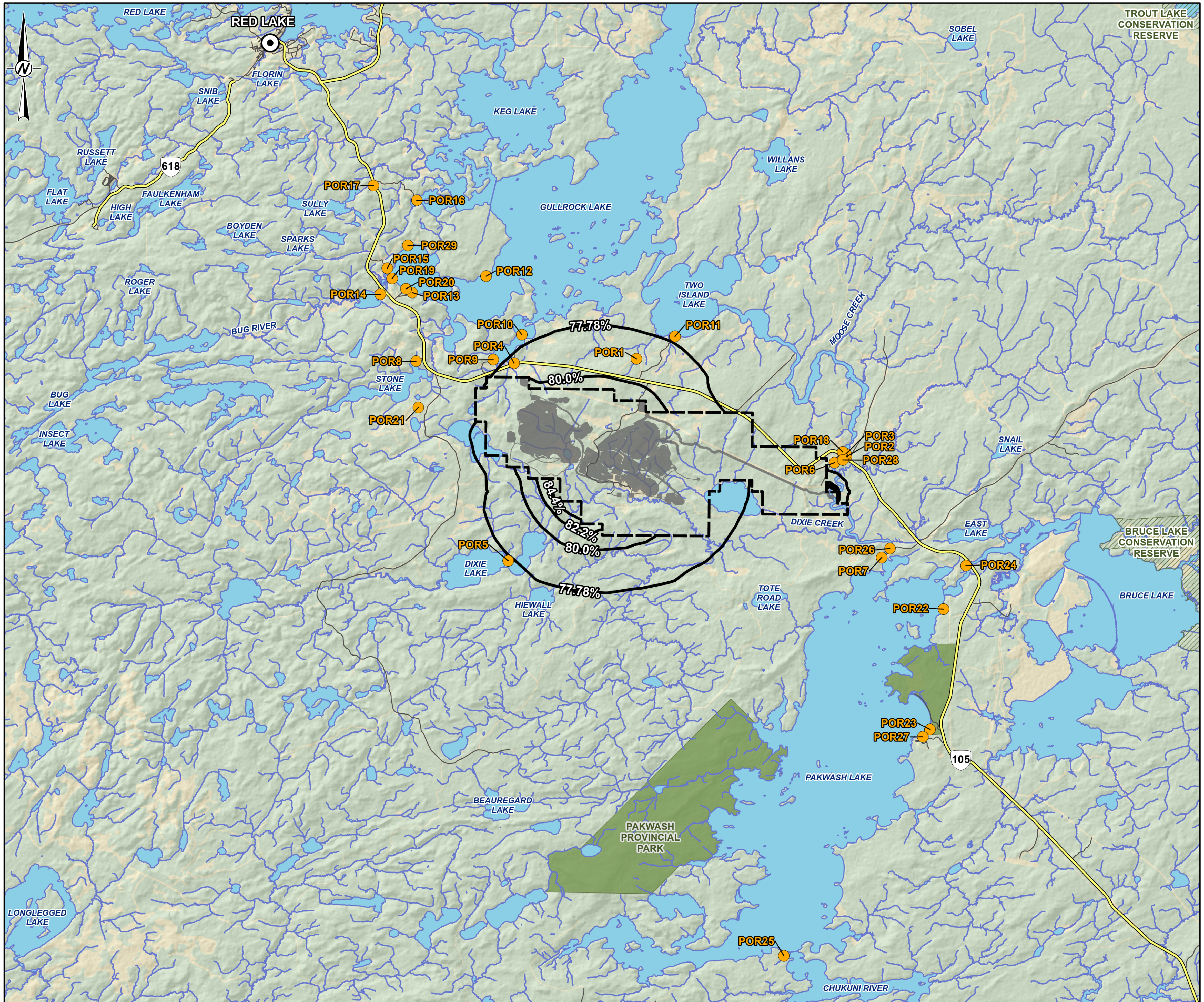
CONSULTANT

wsp

YYYY-MM-DD	2025-09-30
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	5-5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  - CUMULATIVE = EXISTING CONDITIONS + PROJECT
  - BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 75.6%
  - ONTARIO AAQC: 0.45 ug/m^3
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

0 2.5 5 10

1:160,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIM BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

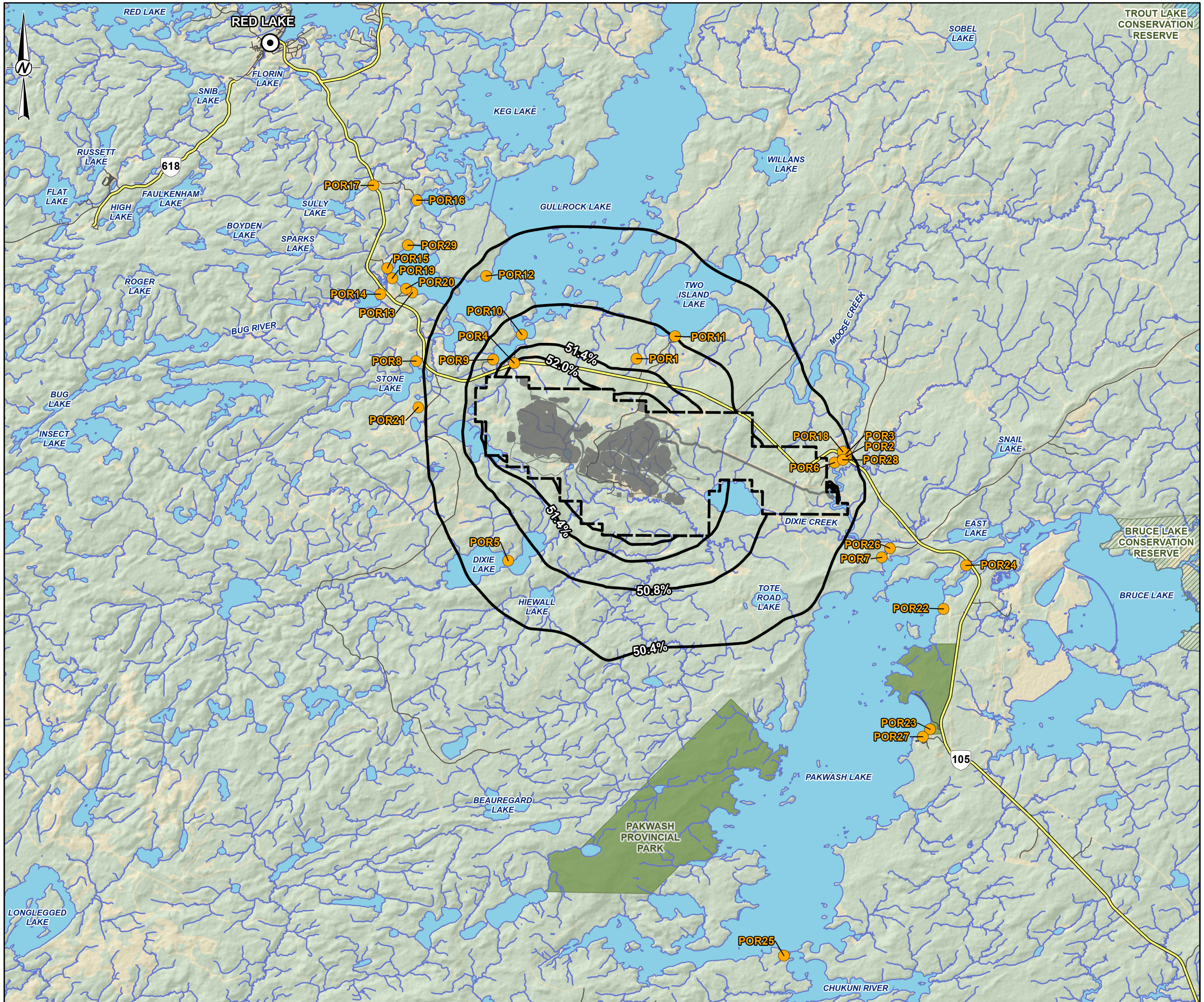
PROJECT
GREAT BEAR PROJECT

TITLE
OPERATIONS - BENZENE CONCENTRATION CONTOURS (ANNUAL)

CONSULTANT

YYYY-MM-DD	2025-09-26
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	5-6



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  CUMULATIVE = EXISTING CONDITIONS + PROJECT
  BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 50.0%
  ONTARIO AAQC: 0.00001 ug/m³
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

0 2.5 5 10
1:160,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

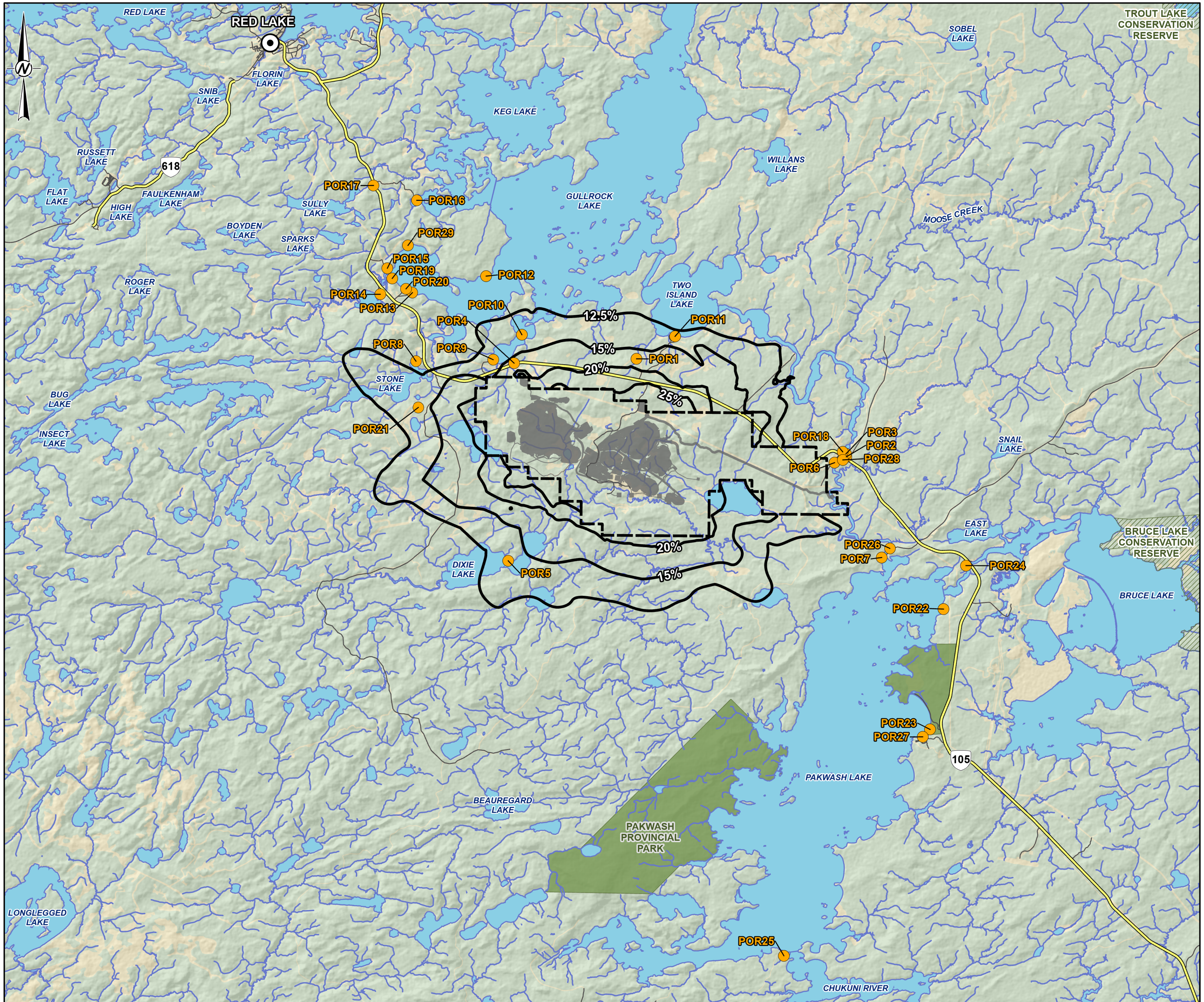
PROJECT
GREAT BEAR PROJECT

TITLE
OPERATIONS - B(a)P CONCENTRATION CONTOURS (ANNUAL)

CONSULTANT

YYYY-MM-DD	2025-09-29
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	5-7



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  CUMULATIVE = EXISTING CONDITIONS + PROJECT
  BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 7.1%
  ONTARIO AAQC: 0.1 ug/m³
- TOWN
- HIGHWAY
- LOCAL ROAD
- CONSERVATION RESERVE
- PROVINCIAL PARK
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)
1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
CONSTRUCTION - Mn IN PM_{10} CONCENTRATION CONTOURS (24-HOUR, 90% DUST CONTROL)

CONSULTANT
wsp

YYYY-MM-DD	2025-09-29
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	5-8

6 PARAMETER SENSITIVITY

6.1 MODEL

AERMOD is Ontario's approved air dispersion model for evaluating air quality concentrations within 50 km of a project, and where there are no notable terrain features or major waterbodies.

The model uses source input parameters (e.g., location, flows, emissions rates), terrain inputs, and a 5-year meteorological dataset to predict the maximum air parameter concentrations for the given inputs. An assumption of the methodology is that all sources are operating at maximum activity levels concurrently to create a maximum emissions scenario for modelling. This assumption results in conservatism build into the modelled results (i.e., predicted concentrations). In addition to considering the magnitude of the maximum predicted air quality concentration, a frequency assessment allows for the determination of the likelihood of such an event taking place.

6.2 USE OF REGIONAL MONITORING DATA TO ESTABLISH BASELINE CONCENTRATIONS

Where data could be collected onsite in a robust and representative manner, these data were preferentially used to establish the baseline concentrations used and otherwise were used to qualify the use of regional data.

In some cases, the assessment used 3 to 5 years of data from the referenced NAPS monitoring stations, to develop a robust, long-term monitoring dataset, which was used to establish baseline concentrations.

Although the selected NAPS locations are influenced by local urban sources, they are broadly reflective of regional air quality, and from an IS perspective they are expected to overestimate parameters relative to the Project site. This lends itself to a conservative approach when assessing air quality concentrations from the Project.

The sensitivity of the assessment to baseline concentration accuracy depends on the parameter concentration relative to its criteria. As onsite baseline data is collected, CO baseline concentrations remain the sole CAP based on further afield NAPS locations (Winnipeg). The CO 90^{th} percentile baseline concentration is 0.3% and 0.7% of the 1-hour and 8-hour AAQC respectively. Accordingly, the sensitivity of the CO baseline condition is considered to be low.

6.3 DUST CONTROL EFFICIENCY FOR UNPAVED ROADS

Empirical calculations to estimate emission factors according to the method outlined in the US EPA AP-42 emission factor compilation Section 13.2.2 Unpaved Roads.

Dust control efficacy on unpaved haul road is an important consideration for most operations with haul roads that is difficult to accurately quantify. Control efficiencies of 85% to 95% reflect well-managed sites with effective dust management programs.

Control efficiencies are multiplicative, meaning that an overall control efficiency may be estimated considering the expected efficiency of individual control measures as follows:

Where CE = Control Efficiency,

$CE_{Total} = 1 – (1-CE_1)*(1-CE_2)*…(1-CE_N)$

Considering the following individual CEs, an overall CE of 90% is justified where an effective dust management and monitoring plan is implemented:

- Watering: 70 to 75%
- Chemical dust suppression: 80 to 84%
- Limit vehicle speeds: 44%.

To provide additional insight into the conservatism around dust control, modelling of the roads considering no dust control, 50%, 70%, and 90% dust control efficiency was done to demonstrate the variability of results and the importance of the Project having highly effective dust control measures.

Practically, dust controls efficacy can be difficult to measure. A robust fugitive dust management plan and monitoring program with continuous particulate monitoring to allow a feedback loop will be key tools in helping the Project minimize offsite concentrations.

A comparison of the different dust control efficiencies are presented in Table 6-1 and Table 6-2. These table demonstrates the importance for the Project to have a robust fugitive dust management program.

Note the isopleths (Figures 6-1 to 6-3) have had meteorological anomalies removed and tabular values and modelling was completed exclusively for the leased claims boundary and PORs. The predicted concentrations at any PORs would be lower than the maximum predicted concentrations presented in Table 6-1 and 6-2.

6.3.1 FREQUENCY ASSESSMENT FOR MEASUREMENTS ABOVE THE ONTARIO AAQC VALUES

The Tailored Impact Statement Guidelines for the Impact Statement for the Project require modelling of particulate matter emission from unpaved road dust both with and without implementation of mitigation measures during the construction and operations phases. Mitigation measures of varying control efficiencies for 90%, 70%, 50%, and 0% were modelled for both phases; however, it is important to note that the reduced control efficiencies would represent scenarios in which the site is implementing few or no best management practices for fugitive dust.

The reduced dust control efficiency (50%, 0%) scenarios for unpaved roads noted in section 6.3 predict concentrations above the Ontario AAQCs for some particulate fractions; however, there are no predicted measurements above the guidelines for any air parameters at the PORs. The frequency of measurements above the guidelines for air parameters predicted to be above their relevant Ontario AAQC are presented in Table 6-3.

If the site were to not implement any fugitive dust best management practices during the construction or operations phase, PM_{10} is predicted to be above the 24-hour AAQC 2.7% and 2.4% of the time and SPM is predicted to be above the 24-hour AAQC 0.3% and 2.2% of the time during the construction and operations phases respectively at the leased claims boundary.

Table 6-1: Comparison of Construction Phase Particulate Maximum Point of Impingement Results with Varying Road Dust Control

Air Parameter	CAS Number	Averaging Time (hr - unless noted otherwise)	Modelled POI Concentration (µg/m^3)	Baseline Concentration (µg/m^3)	Modelled + Baseline Concentration (µg/m^3)	Ontario Ambient Air Quality Standard (µg/m^3)	% of Criteria
90% Control Efficiency							
Suspended Particulate Matter (SPM)	NA	24	17.4	21.4	38.8	120	32%
		Annual	2.3	4.5	6.8	60	11%
Inhalable Particulate (PM_{10})	NA	24	12.5	18.3	30.8	50	62%
Respirable Particulate ($PM_{2.5}$)	NA	24	4.9	10.0	14.9	27	55%
		Annual	0.7	5.8	6.5	8.8	73%
70% Control Efficiency							
Suspended Particulate Matter (SPM)	NA	24	39.1	21.4	60.5	120	50%
		Annual	6.6	4.5	11.1	60	19%
Inhalable Particulate (PM_{10})	NA	24	25.4	18.3	43.7	50	87%
Respirable Particulate ($PM_{2.5}$)	NA	24	5.9	10.0	15.9	27	59%
		Annual	0.8	5.8	6.64	8.8	75%
50% Control Efficiency							
Suspended Particulate Matter (SPM)	NA	24	64.6	21.4	86.0	120	72%
		Annual	9.5	4.5	14.0	60	23%
Inhalable Particulate (PM_{10})	NA	24	40.9	18.3	59.2	50	**118%**
Respirable Particulate ($PM_{2.5}$)	NA	24	7.2	10.0	17.2	27	64%
		Annual	1.02	5.8	6.82	8.8	78%
0% Control Efficiency							
Suspended Particulate Matter (SPM)	NA	24	123.8	21.4	145	120	**121%**
		Annual	18.4	4.5	22.9	60	38%
Inhalable Particulate (PM_{10})	NA	24	76.5	18.3	94.8	50	**190%**
Respirable Particulate ($PM_{2.5}$)	NA	24	11.6	10.0	21.6	27	80%
		Annual	1.51	5.8	7.31	8.8	83%

Notes:
There are no predicted concentrations above guidelines at PORs for any road dust control level.
***Bolded** values are predicted concentrations above guidelines.*

Table 6-2: Comparison of Operations Phase Particulate Maximum Point of Impingement Results with Varying Road Dust Control

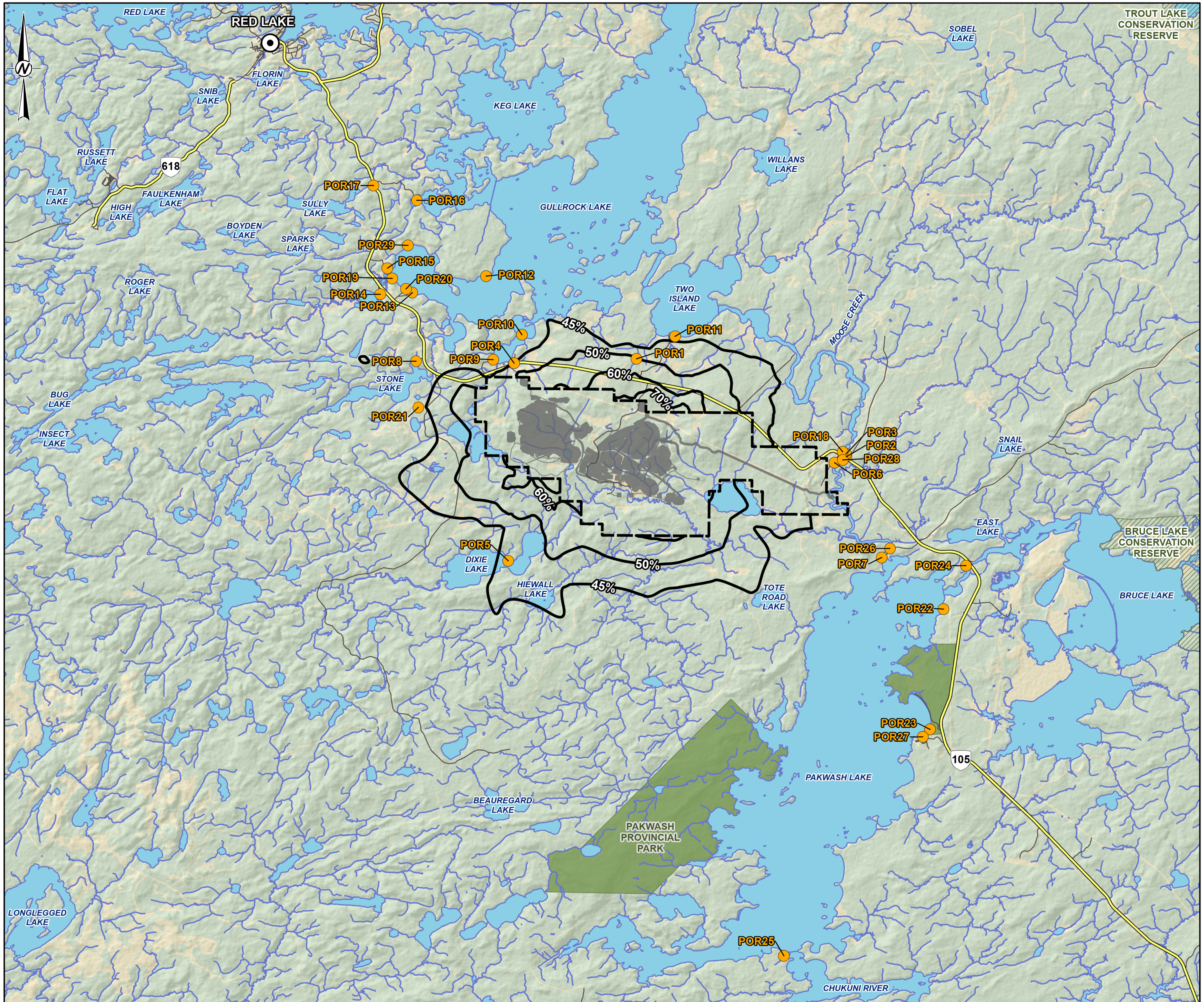
Air Parameter	CAS Number	Averaging Time (hr - unless noted otherwise)	Modelled POI Concentration (µg/m^3)	Baseline Concentration (µg/m^3)	Modelled + Baseline Concentration (µg/m^3)	Ontario Ambient Air Quality Standard (µg/m^3)	% of Criteria
90% Control Efficiency							
Suspended Particulate Matter (SPM)	NA	24	16.9	21.4	38.3	120	32%
		Annual	1.8	5.8	7.6	60	13%
Inhalable Particulate (PM_{10})	NA	24	12.1	18.3	30.4	50	61%
Respirable Particulate ($PM_{2.5}$)	NA	24	4.7	10.0	14.7	27	55%
		Annual	1.5	5.8	7.3	8.8	83%
70% Control Efficiency							
Suspended Particulate Matter (SPM)	NA	24	42.9	21.4	64	120	54%
		Annual	4.7	5.8	10.5	60	18%
Inhalable Particulate (PM_{10})	NA	24	23.6	18.3	41.9	50	84%
Respirable Particulate ($PM_{2.5}$)	NA	24	6.0	10.0	16.0	27	59%
		Annual	1.5	5.8	7.28	8.8	83%
50% Control Efficiency							
Suspended Particulate Matter (SPM)	NA	24	69.4	21.4	91	120	76%
		Annual	7.6	5.8	13.4	60	22%
Inhalable Particulate (PM_{10})	NA	24	37.3	18.3	55.6	50	**111%**
Respirable Particulate ($PM_{2.5}$)	NA	1	7.5	10.0	17.5	27	65%
		Annual	1.5	5.8	7.30	8.8	83%
0% Control Efficiency							
Suspended Particulate Matter (SPM)	NA	24	136	21.4	157	120	**131%**
		Annual	14.8	5.8	20.6	60	34%
Inhalable Particulate (PM_{10})	NA	24	71.5	18.3	89.8	50	**180%**
Respirable Particulate ($PM_{2.5}$)	NA	24	11.2	10.0	21.2	27	79%
		Annual	1.5	5.8	7.33	8.8	83%

Notes:
There are no predicted concentrations above guidelines at PORs for any road dust control level.
***Bolded** values are predicted concentrations above guidelines.*

Table 6-3: Frequency of Concentrations above Ontario AAQC at Leased Claims Boundary and PORs

Air Parameter	CAS Number	Averaging Time (hr – unless otherwise noted)	Dust Control Efficiency for Unpaved Roads	Number of Concentrations above Guidelines (Leased Claims Boundary)	Percent of Concentrations above Guidelines (Leased Claims Boundary)	Number of Concentrations above Guidelines (PORs)
Construction Phase						
Suspended Particulate Matter (SPM)	NA	24	0%	5 days	0.3%	0 days
Inhalable Particulate (PM_{10})	NA	24	50%	2 days	0.1%	0 days
Inhalable Particulate (PM_{10})	NA	24	0%	48 days	2.7%	0 days
Operations Phase						
Suspended Particulate Matter (SPM)	NA	24	0%	40 days	2.2%	0 days
Inhalable Particulate (PM_{10})	NA	24	50%	6 days	0.3%	0 days
Inhalable Particulate (PM_{10})	NA	24	0%	43 days	2.4%	0 days

Notes:
There are no predicted concentrations above guidelines at PORs for any road dust control level.



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  CUMULATIVE = EXISTING CONDITIONS + PROJECT
  BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 36.6%
  ONTARIO AAQC: 50 ug/m^3
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

0 2.5 5 10

1:160,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
CONSTRUCTION - PM_{10} CONCENTRATION CONTOURS (24-HOUR, 70% DUST CONTROL)

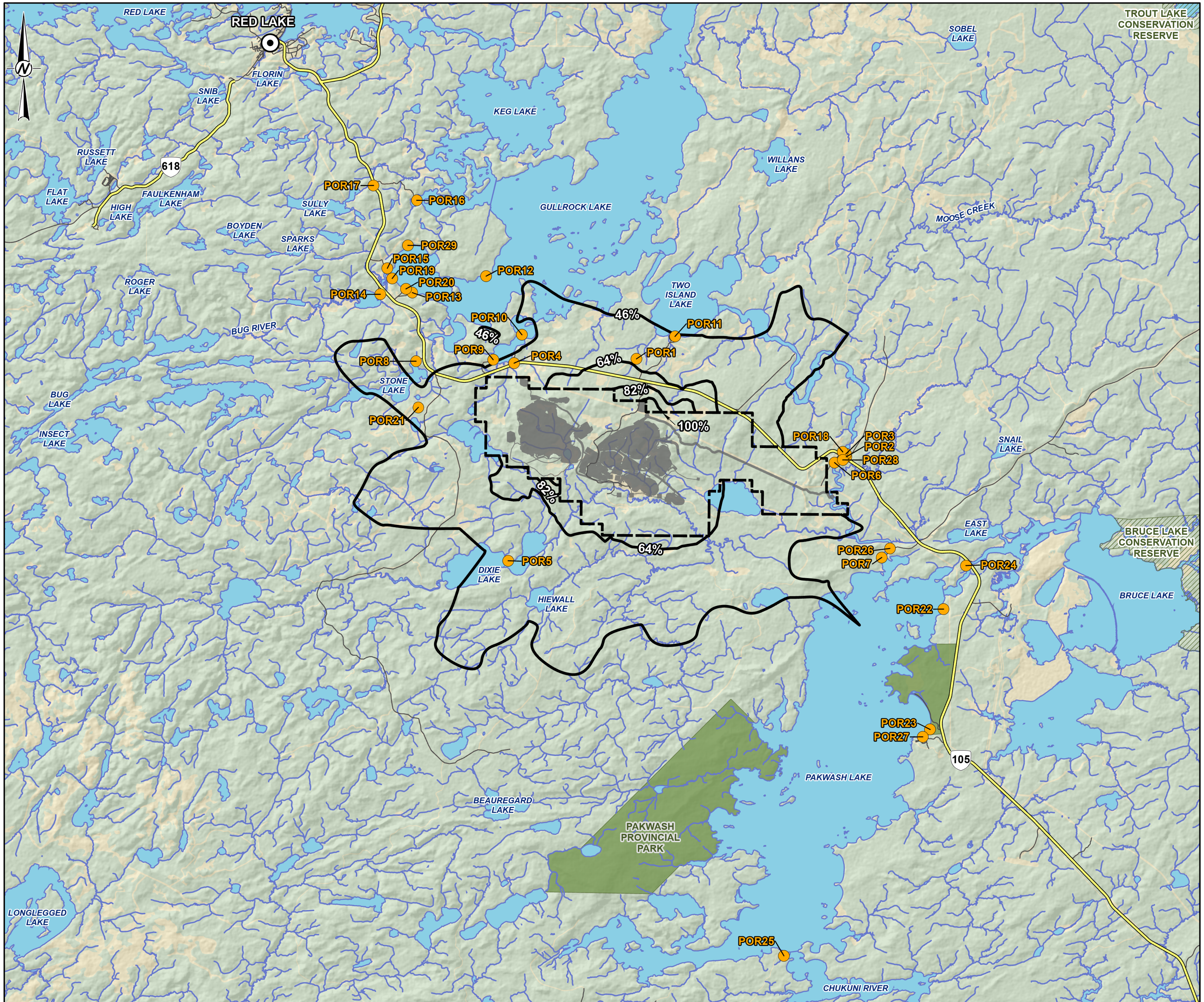
CONSULTANT

YYYY-MM-DD	2025-09-29
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	6-1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25mm



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  - **CUMULATIVE = EXISTING CONDITIONS + PROJECT**
  - **BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 36.6%**
  - **ONTARIO AAQC: 50 ug/m^3**
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

0 2.5 5 10

1:160,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

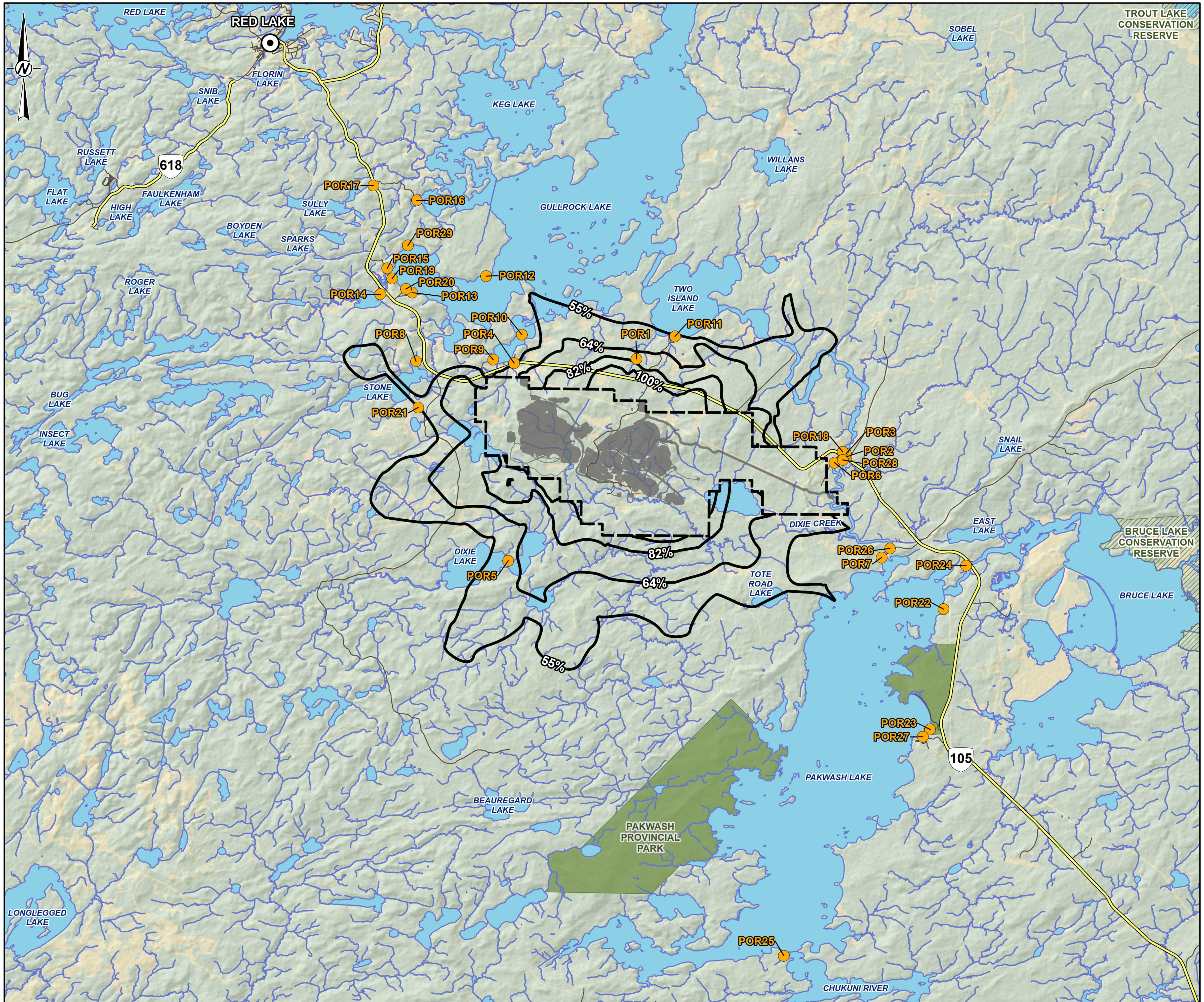
TITLE
CONSTRUCTION - PM_{10} CONCENTRATION CONTOURS (24-HOUR, 50% DUST CONTROL)

CONSULTANT

YYYY-MM-DD	2025-09-30
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	6-2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B



LEGEND

- LEASED CLAIMS BOUNDARY
- GREAT BEAR PROJECT FOOTPRINT
- CONTOUR REPRESENT % OF ONTARIO AAQC
  CUMULATIVE = EXISTING CONDITIONS + PROJECT
  BACKGROUND LEVEL (AS % OF ONTARIO AAQC): 36.6%
  ONTARIO AAQC: 50 ug/m^3
- TOWN
- CONSERVATION RESERVE
- PROVINCIAL PARK
- HIGHWAY
- LOCAL ROAD
- WATERCOURSE
- WATERBODY

POTENTIAL POINTS OF RECEPTION

- RESIDENCE / CABIN / LODGE / CAMP

0 2.5 5 10

1:160,000 KILOMETRES

NOTE(S)

1. ALL LOCATIONS ARE APPROXIMATE

REFERENCE(S)

1. CONTAINS INFORMATION LICENSED UNDER THE OPEN GOVERNMENT LICENCE - ONTARIO
2. LEASED CLAIMS BOUNDARY PROVIDED BY GREAT BEAR RESOURCES, APRIL 2025.
3. SITE PLAN BASED ON INFORMATION PROVIDED BY GREAT BEAR RESOURCES, DECEMBER 2024 / JUNE 2025.
4. COORDINATE SYSTEM: NAD 1983 UTM ZONE 15N

CLIENT
GREAT BEAR RESOURCES

PROJECT
GREAT BEAR PROJECT

TITLE
CONSTRUCTION - PM_{10} CONCENTRATION CONTOURS (24-HOUR, 0% DUST CONTROL)

CONSULTANT

YYYY-MM-DD	2025-09-29
DESIGNED	----
PREPARED	MD
REVIEWED	----
APPROVED	----

PROJECT NO.	CONTROL	REV.	FIGURE
CA0031272	0001	A	6-3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

7 MITIGATION MEASURES

The key air parameters emitted from the Project are particulate matter (fugitive dust), criteria air parameters and other by-products of fuel combustion parameters, and metals present on the fugitive dust (i.e., particle-bound). The emissions are mainly attributed to the following sources:

- Construction equipment tailpipe emissions
- Road dust associated with haul trucks transporting mine rock, ore, and overburden
- Dust from mining activities within the open pit (drilling, blasting, and loading of haul trucks)
- Dust from material handling at the overburden, ore, and TMF areas
- Dust from ore crushing
- Dust from the exposed area of the TMF.

A dust management plan will be prepared prior to the construction and operations phase to identify all potential sources of fugitive dusts, outline mitigation measures that will be employed to control dust generation, and detail the inspection and record keeping required to demonstrate that fugitive dusts are being effectively managed. The proposed dust control measures will be based on current international best management practices (BMPs), are predictably effective and are not prone to failure. The dust management plan will include opportunities for adaptive management, in which the intensity of the control measures would be increased if site inspections and monitoring indicate that current measures are insufficient to prevent offsite dust concentrations from being above AAQCs.

Dust emissions from roads and mineral stockpiles will be controlled through the application of water spray. If required, chemical suppressants will also be used to control dust, particularly on roads, provided that such applications are acceptable to the MECP; magnesium chloride and calcium chloride are common suppressants utilized at mining projects. All site roadways will be constructed using coarse aggregate and will be maintained in good condition with regular inspections and timely maintenance completed to minimize the silt loading on the roads.

The process plant emission sources will be designed to allow for good atmospheric dispersion, and dust control equipment such as dust collectors and water sprays will be utilized together with BMPs, where necessary, to reduce emissions.

Blasting also results in emissions for particulate and NO_X. NO_X generated from the blast can be minimized by reducing the water penetration of the set charges, and the blasting plan will include a procedure to minimize the length of time the blasting material is allowed to sit in a drill hole before blasting.

Air emissions from diesel consumption associated with mobile heavy equipment operations will be controlled through strategic mine scheduling to minimize the total distance travelled by haul trucks. Other measures to reduce tailpipe air parameter emissions will include:

- Use of low sulphur diesel fuel
- Implementation of an anti-idling policy and speed limits
- Equipment meeting ECCC’s vehicle emission requirements
- Effective preventive and responsive equipment maintenance.

A preventive maintenance program will be employed that encompasses all pollution control equipment, diesel-fired engines (vehicle, equipment, and standby power generating), and all processes with the potential for meaningful influence on air quality concentrations.

At closure, exposed dust sources will be vegetated, and progressive reclamation will be used wherever practicable to better control dust emissions from the TMF. A summary of mitigation measures for each of the construction, operations, and closure phases is provided as Table 7-1.

7.1 AIR EMISSION TRACKING AND REPORTING PROGRAMS

7.1.1 NATIONAL POLLUTANT RELEASE INVENTORY

The National Pollutant Release Inventory (NPRI) is Canada's public inventory of releases, disposals and transfers. Under the authority of the *Canadian Environmental Protection Act* (CEPA), owners or operators of facilities that meet published reporting requirements must report to the NPRI program. The Project is expected to meet reporting requirements for the NPRI program.

7.1.2 ENVIRONMENTAL EMERGENCY PLAN

Under the Environmental Emergency (E2) Regulations in the CEPA registry, an E2 plan is required of any person who owns or has the charge, management or control of any of the regulated substances, listed in Schedule 1, at or above specified threshold quantities and stored in a container that has a maximum capacity equalling or being greater than the specified quantities for that substance. The Project is expected to meet or be above the specified threshold quantities for substances listed in Schedule 1 and therefore may require an E2 plan.

Table 7-1: Summary of Mitigation Measures

Project Phase	Potential Interaction	Mitigation Measure	Description / Commitment	Standard
Construction	Fugitive Dust Emissions	Dust Management Plan	The dust management plan will outline effective fugitive dust management to mitigate potential offsite effects of the particulate matter and trace metals present on the particulate. The dust management plan will detail the following measures: watering frequency, visual monitoring, inspection, record keeping, responsibility, training, complaint response, and corrective actions. The site will have water trucks; if required, other acceptable suppressants (such as magnesium chloride or calcium chloride) will be used following MECP notification and authorization. Travel surfaces will be maintained to minimize silt (fine material). Onsite speed limits will be enforced.	Maintain air quality below AAQCs for SPM and metals at offsite receptors
Construction	Blasting emissions Poor dispersion during specific hours Increased emissions due to specific operational conditions	Manufacturer's recommended guidelines regarding water infiltration and time of explosives usage	NO_X emissions may increase if emulsion is left in boreholes for extended period of time due to infiltration of water.	Maintain air quality below AAQCs for SPM and metals at offsite receptors
Construction	Exhaust from generators, trucks, and mobile equipment	Engine Maintenance Program	A preventive maintenance program will be employed that encompasses all pollution control equipment and diesel-fired engines.	Maintain air quality below Ontario's AAQC for NO_2, SO_2, CO, and SPM at offsite receptors.
Construction	Exhaust from trucks and off-road mobile equipment	Equipment compliant with ECCC vehicle emission requirements	Emission reductions achieved through the use of equipment that complies with ECCC's off-road engine emission criteria.	Off-road Compression-Ignition and Large Spark-Ignition Engine Emission Regulations (SOR/2020-258)
Construction	Sulphur dioxide (SO_2) emissions from diesel fuel use	Use of low sulphur fuel (15 ppm sulphur)	Low sulphur fuels will be used in off-road diesel engines; this will reduce the sulphur dioxide emissions from all sources and the resultant offsite air concentrations.	ECCC sulphur in diesel fuel regulation limiting fuel sulphur content to less than 15 ppm for off-road engines (SOR/2004-254).
Operations	Fugitive Dust Emissions	Dust Management Plan	The dust management plan will outline effective fugitive dust management to mitigate potential offsite effects of the particulate matter and trace metals present on the particulate and will incorporate adaptive management. The dust management plan will detail the following measures: watering frequency, visual monitoring, inspection, record keeping, responsibility, training, complaint response, and corrective actions.	Maintain air quality below O. Reg. 419/05 standards for SPM and metals at offsite receptors. Dust management plan will be part of MECP

Project Phase	Potential Interaction	Mitigation Measure	Description / Commitment	Standard
			The site will have water trucks; if required, other acceptable suppressants (such as magnesium chloride or calcium chloride) will be used following MECP notification and authorization. Travel surfaces will be maintained to minimize silt (fine material). Onsite speed limits will be enforced.	Environmental Compliance Approval.
Operations	Exhaust from generators, trucks, and mobile equipment	Engine Maintenance Program	A preventive maintenance program will be employed that encompasses all pollution control equipment and diesel-fired engines.	Maintain air quality below the Ontario AAQC for NO_2, SO_2, CO, and particulate matter at offsite receptors.
Operations	Exhaust from trucks and off-road mobile equipment	Equipment compliant with ECCC vehicle emission requirements	Emission reductions achieved through the use of equipment that complies with ECCC off-road engine emission criteria.	Off-road Compression-Ignition and Large Spark-Ignition Engine Emission Regulations (SOR/2020-258)
Operations	SO_2 emissions from diesel fuel use	Use of low sulphur fuel (15 ppm sulphur)	Low sulphur fuels will be used in off-road diesel engines; this will reduce the sulphur dioxide emissions from all sources and the resultant offsite air concentrations.	ECCC Sulphur in Diesel Fuel Regulation limiting fuel sulphur content to less than 15 ppm for off-road engines (SOR/2002-254)
Operations	Particulate emissions from drilling	Control measures provided by equipment supplier plus water suppression	Mitigation measures are required to prevent offsite effects of SPM and metals through the use of equipment with dust control and water application.	Compliance with O. Reg. 419/05 standards for SPM and metals at offsite receptors.
Operations	Blasting emissions Poor dispersion during specific hours Increased emissions due to specific operational conditions	Manufacturer's recommended guidelines regarding water infiltration and time of explosives usage.	Nitrogen oxides (NO_X) emissions may increase if emulsion is left in boreholes for extended period of time due to infiltration of water.	Compliance with Ontario Regulation 419/05 air quality standards for NO_X, SPM, and metals at offsite receptors.
Operations	Hydrogen cyanide (HCN) emissions	HCN destruction at the processing facility	HCN emissions eliminated, as sulphur dioxide will be used to destroy HCN at the process facility before tailings are placed in the TMF	Compliance with O. Reg. 419/05 air quality standard for HCN at offsite receptors.
Operations	Material handling at the process plant	Mechanical dust collector or equivalent technology	Mitigation measures to control dust emissions from crushing (primary and secondary) and reclaim from feed stockpiles are required to prevent offsite effects of SPM and metals. All crushing and reclaim from stockpiles for crushed materials are to be controlled by baghouses. A maintenance plan will support baghouses functioning properly.	Compliance with O. Reg. 419/05 air quality standards for SPM at offsite receptors.

Project Phase	Potential Interaction	Mitigation Measure	Description / Commitment	Standard
Operations	Particulate emissions from lime silo	Dust collector	Mitigation measures are required to control dust during lime delivery to the silos to prevent offsite effects of SPM. Lime silo vents are to be controlled by a dust collector. A maintenance plan will support dust collectors functioning properly.	Compliance with O. Reg. 419/05 air quality standards for SPM at offsite receptors.
Operations	Emissions from lime slaker	Dust control equipment	Mitigation measures are required to control emissions from the lime slaker to prevent offsite effects of SPM. A maintenance plan will support dust control equipment functioning properly.	Compliance with O. Reg. 419/05 air quality standard for SPM at offsite receptors.
Operations	Particulate from dry material handling at the process plant (flocculants, copper sulphate)	Dust collectors	Mitigation measures are required to control emissions from handling and mixing of dry chemicals. Mixing and handling areas are to be controlled by dust collectors. A maintenance plan will support dust collectors functioning properly.	Compliance with O. Reg. 419/05 air quality standard for SPM at offsite receptors.
Operations	Emissions from induction furnace	Dust control equipment	Emissions from the furnace are to be controlled. A maintenance plan will support dust control equipment functioning properly.	Compliance with O. Reg. 419/05 air quality standard for SPM at offsite receptors.
Operations	SO_2 emissions from HCN destruction	Closed loop delivery and cyanide destruction process	To control emissions during delivery, SO_2 is to be delivered to the site as a pressurized liquid with a return line from the tank to the truck used to prevent filling losses; SO_2 gases displaced from the tank will be captured in the truck. The process tanks for cyanide destruction also operate as closed loop to prevent SO_2 releases to the air.	Compliance with O. Reg. 419/05 air quality standard for SO_2 at offsite receptors.
Operations	Emissions from onsite emergency generators	Testing of units one at a time during daytime hours.	Mitigation measures are required to control NO_X and SPM emissions from the generators. Testing one unit at a time will reduce short-term emissions, and testing will be conducted during the day when meteorological conditions promote better air dispersion.	Maintain air quality below O. Reg. 419/05 air quality standards for SPM and NO_X at offsite receptors.
Closure	Fugitive Dust Emissions	Dust Management Plan	The dust management plan will outline effective fugitive dust management to mitigate potential offsite effects of the particulate matter and trace metals present on the particulate. The dust management plan will detail the following measures: watering frequency, visual monitoring, inspection, record keeping, responsibility, training, complaint response, and corrective actions. The site will have water trucks; if required, other acceptable suppressants (such as magnesium chloride or calcium chloride) will be used following MECP notification and authorization. Travel surfaces will be maintained to minimize silt (fine material). Onsite speed limits will be enforced.	Maintain air quality at property line below O. Reg. 419/05 standards for SPM and metals at offsite receptors.
Closure	Exhaust from generators, trucks,	Engine Maintenance Program	A preventive maintenance program will be employed that encompasses all pollution control equipment and diesel-fired engines.	Maintain air quality below Ontario's AAQC

Project Phase	Potential Interaction	Mitigation Measure	Description / Commitment	Standard
	and mobile equipment			for NO_2, SO_2, CO, and particulate matter at offsite receptors.
Closure	Exhaust from trucks and off-road mobile equipment.	Equipment compliant with ECCC vehicle emission requirements	Emission reductions achieved through the use of equipment that complies with ECCC's off-road engine emission criteria.	Off-road Compression-Ignition and Large Spark-Ignition Engine Emission Regulations (SOR/2020-258)

8 CONCLUSIONS

8.1 CONCLUSIONS

This Air Quality Assessment has been prepared to assess air quality concentrations from the construction, operation, and closure phases of the Project on ambient air quality. The assessment considers the modelled concentrations of the Project on ambient air concentrations for each parameter, as well as the cumulative concentrations resulting from the combined Project emissions and the existing baseline air concentrations established for the Project.

The notable findings of this Air Quality Assessment were as follows:

- The Project is subject to the *EPA* Section 9 requirement and will require approval from the MECP to construct and operate. It was determined that the Project met the requirements of O. Reg. 419/05 and there were no modelled concentrations above the Air Quality Standards or other ACBs, which demonstrates that the Project meets the air quality requirements for obtaining the required provincial ECA (Air).
- For both the construction and operations phases, predicted concentrations of air parameters were below the respective AAQC for all averaging times, including both Project emissions and the existing baseline concentrations. There were no concentrations predicted to be above these AAQCs at PORs for any air parameter.
- The CAAQS were included as air quality standards for the assessment; these CAAQS were not developed as facility level regulatory standards. Rather, they are intended for use by the provinces and territories to guide air zone management actions as an indicator of good air quality (CCME 2019). For NO_2, the Ontario AAQC over the same averaging time is over four times greater than the CAAQS and is protective against effects on health and the environment (MECP 2020). Project concentrations were compared to the CAAQS for discussion purposes, which indicated that that when the appropriate statistical form is considered, all predicted air parameters are below their respective CAAQS for all relevant averaging times.

In order to minimize air quality concentrations, the Project includes the following mitigation and operational controls:

- A dust management plan will be prepared prior to the construction and operations phases that will be subject to MECP review and approval as part of the provincial ECA application process. The plan will identify potential sources of fugitive dusts, outline mitigation measures that will be employed to control dust generation and detail the inspection and record keeping required to demonstrate that fugitive dusts are being effectively managed. The proposed dust control measures will be based on current international best management practices that are predictably effective and are not prone to failure. The dust management plan will utilize adaptive management, in which the intensity of the control measures may need to be adjusted based on site inspections and monitoring.
- A preventive maintenance program will be employed that encompasses all pollution control equipment, diesel-fired engines (vehicle, equipment, and standby power generating), natural gas fired power generation units, and all processes with the potential for meaningful environmental effects.
- An ambient air quality monitoring program will be established in consultation with the MECP as part of the ECA approvals process.
- Vehicle speed limiting.
- Revegetation and progressive reclamation of exposed dust sources will be conducted wherever appropriate.

- A Net-Zero Plan to reduce the net GHG emissions to zero over the life of the Project. The Net-Zero Plan (Appendix W-1) developed for the Project and issued under separate cover, aims to achieve this target includes the use of technologies and practices to reduce fossil fuel use and carbon offsets to balance GHG emissions that cannot be eliminated. Benefits of this plan are expected to also be reductions in non-GHG air parameter emissions.

9 REFERENCES

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Appendix A
Emission Summary Tables

Table A-1: Construction Phase - Point of Impingement Emission Summary Table with Comparison to the Ambient Air Quality Criteria (AAQCs)

Compound	CAS Number	Averaging Period	Project Emission Rate (g/s)	Project Concentration (µg/m^3)	Background Concentration (µg/m^3)	Project + Background	Ontario AAQC (µg/m^3)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	76.9	17.4	21.4	38.8	120	32%
		annual		2.3	5.8	8.1	60	14%
Inhalable Particulate (PM10)	NA	24-hour	30.2	12.5	18.3	30.8	50	62%
Respirable Particulate (PM2.5)	NA	24-hour	7.5	4.9	10.0	14.9	27	55%
		annual		0.66	5.8	6.5	8.8	73%
Diesel Particulate Matter (DPM)	NA	24-hour	3.0	4.3	0.19	4.5	10	45%
		annual		0.66	0.089	0.75	5	15%
Respirable Silica (<10µm)	various	24-hour	2.3	0.9	1.2	2.2	5	43%
Nitrogen Dioxide	10102-44-0	1-hour	115	94.6	4.8	99.4	400	25%
		24-hour	72.7	51.1	3.9	55.0	200	27%
Carbon Monoxide	630-08-0	1-hour	281	2805	114	2919	36200	8%
		8-hour	48.3	577	114	691	15700	4%
Sulphur Dioxide	7446-09-5	10-minute	3.2	56.8	4.8	61.6	178	35%
		1-hour	3.2	34.4	3.9	38.3	100	38%
		annual	0.19	0.38	3.2	3.6	10	36%
Hydrogen Cyanide	74-90-8	24-hour	0.56	0.89	0.0	0.89	8	11%
Calcium Oxide (CaO)	1305-78-8	24-hour	0.13	0.18	1.7	1.8	10	18%
Arsenic	7440-38-2	24-hour	0.057	0.013	0.0028	0.016	0.3	5%
Chromium	7440-47-3	24-hour	0.0098	0.0022	0.0023	0.0045	0.5	1%
Copper Sulphate ($CuSO_4$)	7758-99-8	24-hour	0.040	0.12	0.00	0.12	50	0.2%
Copper (Cu)	7440-50-8	24-hour	0.022	0.0050	0.10	0.10	50	0.2%
Iron (Fe)	7439-89-6	24-hour	9.6	2.2	0.13	2.3	25	9%
Lead	7439-92-1	24-hour	0.032	0.0073	0.0014	0.0087	0.5	2%
		30-day	0.032	0.0073	0.0014	0.0087	0.2	4%
Manganese - in $PM_{2.5}$	7439-96-5	24-hour	0.019	0.013	0.0071	0.020	0.1	20%
- in PM_{10}		24-hour	0.079	0.032	0.0071	0.040	0.2	20%
- in SPM		24-hour	0.20	0.045	0.0071	0.052	0.4	13%
Mercury	7439-97-6	24-hour	0.000019	0.0000042	0.0000093	0.000014	2	0.001%
Nickel - in SPM	7440-02-0	24-hour	0.0070	0.0016	0.0014	0.0030	0.2	1%
		annual		0.00021	0.0010	0.0012	0.04	3%
Nickel - in PM_{10}		24-hour	0.0070	0.0016	0.0014	0.0030	0.1	3%
		annual		0.00021	0.0010	0.0012	0.02	6%
Zinc	7440-66-6	24-hour	0.16	0.036	0.013	0.049	120	0.04%
Benzene	71-43-2	24-hour	1.20	1.0	0.55	1.6	2.3	68%
		annual		0.10	0.34	0.44	0.45	98%
1,3-Butadiene	106-99-0	24-hour	0.051	0.080	0.56	0.64	10	6%
		annual		0.0081	0.56	0.57	2	28%
Benzo(a)pyrene	50-32-8	24-hour	0.0000068	0.0000057	0.000013	0.000019	0.00005	37%
		annual		0.0000010	0.0000050	0.0000060	0.00001	60%

Table A-2: Construction Phase - Point of Reception Emission Summary Table with Comparison to the Ambient Air Quality Criteria (AAQCs)

Compound	CAS Number	Averaging Period	Receptor ID	Project Emission Rate (g/s)	Project Concentration (µg/m^3)	Background Concentration (µg/m^3)	Project + Background	Ontario AAQC (µg/m^3)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	POR1	76.9	4.3	21.4	25.7	120	21%
		annual	POR1		0.50	5.8	6.3	60	11%
Inhalable Particulate (PM10)	NA	24-hour	POR1	30.2	3.6	18.3	21.9	50	44%
Respirable Particulate (PM2.5)	NA	24-hour	POR4	7.5	1.2	10.0	11.2	27	42%
		annual	POR1		0.14	5.8	5.9	8.8	68%
Diesel Particulate Matter (DPM)	NA	24-hour	POR1	3.0	0.66	0.19	0.85	10	8%
		annual	POR1		0.084	0.089	0.17	5	3%
Respirable Silica (<10µm)	various	24-hour	POR1	2.3	0.27	1.2	1.5	5	30%
Nitrogen Dioxide	10102-44-0	1-hour	POR1	115	82.0	4.8	86.8	400	22%
		24-hour	POR1	72.7	10.6	3.9	14.5	200	7%
Carbon Monoxide	630-08-0	1-hour	POR7	281	958	114	1072	36200	3%
		8-hour	POR7	48.3	158	114	272	15700	2%
Sulphur Dioxide	7446-09-5	10-minute	POR1	3.2	11.2	4.8	16	178	9%
		1-hour	POR1	3.2	6.8	3.9	11	100	11%
		annual	POR1	0.19	0.046	3.2	3.2	10	32%
Hydrogen Cyanide	74-90-8	24-hour	POR2	0.56	0.18	0	0.18	8	2%
Calcium Oxide (CaO)	1305-78-8	24-hour	POR2	0.13	0.038	1.7	1.7	10	17%
Arsenic	7440-38-2	24-hour	POR1	0.057	0.0009	0.0028	0.0037	0.3	1%
Chromium	7440-47-3	24-hour	POR1	0.010	0.00016	0.0023	0.0025	0.5	0.5%
Copper Sulphate ($CuSO_4$)	7758-99-8	24-hour	POR2	0.040	0.010	0.00	0.010	50	0.02%
Copper (Cu)	7440-50-8	24-hour	POR1	0.022	0.00037	0.10	0.10	50	0.2%
Iron (Fe)	7439-89-6	24-hour	POR1	9.6	0.16	0.13	0.29	25	1%
Lead	7439-92-1	24-hour	POR1	0.032	0.063	0.0014	0.064	0.5	13%
		30-day	POR1	0.032	0.00018	0.0014	0.0016	0.2	1%
Manganese - in $PM_{2.5}$	7439-96-5	24-hour	POR1	0.019	0.00087	0.0071	0.0080	0.1	8%
- in PM_{10}		24-hour	POR1	0.079	0.0023	0.0071	0.0094	0.2	5%
- in SPM		24-hour	POR1	0.20	0.0033	0.0071	0.010	0.4	3%
Mercury	7439-97-6	24-hour	POR1	0.000019	0.00000031	0.0000093	0.0000096	2	0.0005%
Nickel - in SPM	7440-02-0	24-hour	POR1	0.0070	0.00012	0.0014	0.0015	0.2	1%
		annual	POR1		0.000046	0.0010	0.0010	0.04	3%
Nickel - in PM_{10}		24-hour	POR1	0.0070	0.00021	0.0014	0.0016	0.1	2%
		annual	POR1		0.000073	0.0010	0.0011	0.02	5%
Zinc	7440-66-6	24-hour	POR1	0.16	0.0087	0.013	0.022	120	0.02%
Benzene	71-43-2	24-hour	POR1	1.2	0.22	0.55	0.77	2.3	34%
		annual	POR1		0.025	0.34	0.36	0.45	81%
1,3-Butadiene	106-99-0	24-hour	POR1	0.051	0.018	0.56	0.58	10	6%
		annual	POR1		0.0020	0.56	0.56	2	28%
Benzo(a)pyrene	50-32-8	24-hour	POR4	0.0000068	0.0000025	0.000013	0.000016	0.00005	31%
		annual	POR4		0.00000022	0.0000050	0.0000052	0.00001	52%

Table A-3: Construction Emissions 90% Road Dust Control

Compound	CAS Number	Averaging Period	Project Concentration (µg/m³)	Background Concentration (µg/m³)	Project + Background	Ontario AAQC (µg/m³)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	17.4	21.4	38.8	120	32%
		annual	2.3	5.8	8.1	60	14%
Inhalable Particulate (PM10)	NA	24-hour	12.5	18.3	30.8	50	62%
Respirable Particulate (PM2.5)	NA	24-hour	4.9	10.0	14.9	27	55%
		annual	0.7	5.8	6.5	8.8	73%

Table A-4: Construction Emissions 70% Road Dust Control

Compound	CAS Number	Averaging Period	Project Concentration (µg/m³)	Background Concentration (µg/m³)	Project + Background	Ontario AAQC (µg/m³)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	39.1	21.4	60.5	120	50%
		annual	6.6	5.8	12.4	60	21%
Inhalable Particulate (PM10)	NA	24-hour	25.4	18.3	43.7	50	87%
Respirable Particulate (PM2.5)	NA	24-hour	5.9	10.0	15.9	27	59%
		annual	0.8	5.8	6.64	8.8	75%

Table A-5: Construction Emissions 50% Road Dust Control

Compound	CAS Number	Averaging Period	Project Concentration (µg/m³)	Background Concentration (µg/m³)	Project + Background	Ontario AAQC (µg/m³)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	64.6	21.4	86.0	120	72%
		annual	9.5	5.8	15.3	60	25%
Inhalable Particulate (PM10)	NA	24-hour	40.9	18.3	59.2	50	**118%**
Respirable Particulate (PM2.5)	NA	24-hour	7.2	10.0	17.2	27	64%
		annual	1.02	5.8	6.82	8.8	78%

Table A-6: Construction Emissions 0% Road Dust Control

Compound	CAS Number	Averaging Period	Project Concentration (µg/m³)	Background Concentration (µg/m³)	Project + Background	Ontario AAQC (µg/m³)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	123.8	21.4	145	120	**121%**
		annual	18.4	5.8	24.2	60	40%
Inhalable Particulate (PM10)	NA	24-hour	76.5	18.3	94.8	50	**190%**
Respirable Particulate (PM2.5)	NA	24-hour	11.6	10.0	21.6	27	80%
		annual	1.51	5.8	7.31	8.8	83%

Table A-7: Emission Summary Table with Comparison to Canadian Ambient Air Quality Standards (CAAQS)

Compound	CAS Number	Matching Statistical Form or Direct Comparison	Project Concentration ($\mu g/m^3$)	Background Concentration ($\mu g/m^3$)	Project + Background (µg/m3)	Averaging Period (hr - unless noted otherwise)	Year(s)	CAAQS 2025 ($\mu g/m^3$)	% of Criteria
Nitrogen Oxides (as NO_2)	10102-44-0	Matching Statistical Form	44.0	4.8	48.8	1	1996 to 1998	79	62%

*Matching statistical form follows the procedure outlined in the "Guidance Document on Achievement Determination For Canadian Ambient Air Quality Standards For Nitrogen Dioxide". The maximum average of predicted 98th percentile results from three consecutive years is presented.

Table A-8: Construction Phase - Emission Summary Table with Comparison to Canadian Ambient Air Quality Standards (CAAQS) (DIRECT COMPARISON)

Fine Particulate Matter (PM2.5)	NA	Direct Comparison	1.2	10.0	11.2	24	N/A	23	49%
		Direct Comparison	0.14	5.8	5.9	Annual		8	74%
Nitrogen Oxides (as NO_2)	10102-44-0	Direct Comparison	82	4.8	86.8	1	N/A	79	**110%**
		Direct Comparison	10.6	0.3	10.9	Annual	N/A	23	47%
Sulfur Dioxide (SO_2)	7446-09-5	Direct Comparison	6.8	3.9	10.7	1	N/A	170	6%
		Direct Comparison	0.046	3.2	3.2	Annual	N/A	10	32%

Bolded values indicate a predicted value above the CAAQS

Table A-9: Operations Phase - Point of Impingement Emission Summary Table with Comparison to the Ambient Air Quality Criteria (AAQCs)

Compound	CAS Number	Averaging Period	Project Emission Rate (g/s)	Project Concentration (µg/m^3)	Background Concentration (µg/m^3)	Project + Background	Ontario AAQC (µg/m^3)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	63.6	16.9	21.4	38.3	120	32%
		annual		1.8	5.8	7.6	60	13%
Inhalable Particulate (PM10)	NA	24-hour	24.2	12.1	18.3	30.4	50	61%
Respirable Particulate (PM2.5)	NA	24-hour	6.2	4.7	10.0	14.7	27	55%
		annual		1.5	5.8	7.3	8.8	83%
Diesel Particulate Matter (DPM)	NA	24-hour	2.4	4.1	0.2	4.3	10	43%
		annual		1.5	0.1	1.5	5	31%
Respirable Silica (<10µm)	various	24-hour	1.8	0.91	1.2	2.1	5	43%
Nitrogen Dioxide	10102-44-0	1-hour	114	94.6	4.8	99.4	400	25%
		24-hour	76.5	51.1	3.9	55.0	200	27%
Carbon Monoxide	630-08-0	1-hour	257	768	114	882	36200	2%
		8-hour	53.1	106	114	220	15700	1%
Sulphur Dioxide	7446-09-5	10-minute	2.8	14.8	4.8	19.6	178	11%
		1-hour	2.8	9.0	3.9	12.9	100	13%
		annual	0.16	0.013	3.2	3.2	10	32%
Hydrogen Cyanide	74-90-8	24-hour	0.56	0.89	0	0.89	8	11%
Calcium Oxide (CaO)	1305-78-8	24-hour	0.13	0.18	1.7	1.8	10	18%
Arsenic	7440-38-2	24-hour	0.047	0.012	0.0028	0.015	0.3	5%
Chromium	7440-47-3	24-hour	0.0081	0.0021	0.0023	0.0044	0.5	1%
Copper Sulphate ($CuSO_4$)	7758-99-8	24-hour	0.040	0.12	0	0.12	50	0.2%
Copper (Cu)	7440-50-8	24-hour	0.018	0.0048	0.10	0.10	50	0.2%
Iron (Fe)	7439-89-6	24-hour	7.9	2.1	0.13	2.2	25	9%
Lead	7439-92-1	24-hour	0.032	0.0084	0.0014	0.010	0.5	2%
		30-day	0.032	0.0084	0.0014	0.010	0.2	5%
Manganese - in $PM_{2.5}$	7439-96-5	24-hour	0.016	0.012	0.0071	0.019	0.1	19%
- in PM_{10}		24-hour	0.063	0.032	0.0071	0.039	0.2	19%
- in SPM		24-hour	0.17	0.044	0.0071	0.051	0.4	13%
Mercury	7439-97-6	24-hour	0.000015	0.0000041	0.0000093	0.000013	2	0.001%
Nickel - in SPM	7440-02-0	24-hour	0.0058	0.0015	0.0014	0.0029	0.2	1%
		annual		0.00017	0.0010	0.0012	0.04	3%
Nickel - in PM_{10}		24-hour	0.0058	0.0015	0.0014	0.0029	0.1	3%
		annual		0.00017	0.0010	0.0012	0.02	6%
Zinc	7440-66-6	24-hour	0.13	0.13	0.013	0.14	120	0.1%
Benzene	71-43-2	24-hour	0.99	1.0	0.55	1.5	2.3	67%
		annual		0.10	0.34	0.44	0.45	98%
1,3-Butadiene	106-99-0	24-hour	0.042	0.079	0.56	0.64	10	6%
		annual		0.0081	0.56	0.57	2	28%
Benzo(a)pyrene	50-32-8	24-hour	0.0000078	0.0000053	0.000013	0.000018	0.00005	37%
		annual		0.0000011	0.0000050	0.0000061	0.00001	61%

Table A-10: Operations Phase - Point of Reception Emission Summary Table with Comparison to the Ambient Air Quality Criteria (AAQCs)

Compound	CAS Number	Averaging Period	Receptor ID	Project Emission Rate (g/s)	Project Concentration (µg/m³)	Background Concentration (µg/m³)	Project + Background	Ontario AAQC (µg/m³)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	POR1	63.6	4.1	21.4	25.5	120	21%
		annual	POR1		0.45	5.8	6.3	60	10%
Inhalable Particulate (PM10)	NA	24-hour	POR4	24.2	3.3	18.3	21.6	50	43%
Respirable Particulate (PM2.5)	NA	24-hour	POR4	6.2	1.1	10	11.1	27	41%
		annual	POR1		0.11	5.8	5.9	8.8	67%
Diesel Particulate Matter (DPM)	NA	24-hour	POR1	2.4	0.52	0.19	0.71	10	7%
		annual	POR1		0.065	0.089	0.15	5	3%
Respirable Silica (<10µm)	various	24-hour	POR4	1.8	0.25	1.2	1.48	5	30%
Nitrogen Dioxide	10102-44-0	1-hour	POR1	114	85.6	4.8	90.4	400	23%
		24-hour	POR1	76.5	10.7	3.9	14.6	200	7%
Carbon Monoxide	630-08-0	1-hour	POR1	257	729	114	843	36200	2%
		8-hour	POR1	53.1	94.9	114	209	15700	1%
Sulphur Dioxide	7446-09-5	10-minute	POR1	2.8	14.3	4.8	19.1	178	11%
		1-hour	POR1	2.8	8.6	3.9	12.5	100	13%
		annual	POR1	0.16	0.0044	3.2	3.20	10	32%
Hydrogen Cyanide	74-90-8	24-hour	POR1	0.56	0.18	0	0.18	8	2%
Calcium Oxide (CaO)	1305-78-8	24-hour	POR1	0.13	0.038	1.66	1.7	10	17%
Arsenic	7440-38-2	24-hour	POR1	0.047	0.0030	0.0028	0.0058	0.3	2%
Chromium	7440-47-3	24-hour	POR1	0.0081	0.00052	0.0023	0.0028	0.5	1%
Copper Sulphate ($CuSO_4$)	7758-99-8	24-hour	POR1	0.040	0.010	0	0.010	50	0.02%
Copper (Cu)	7440-50-8	24-hour	POR1	0.018	0.0012	0.10	0.10	50	0.2%
Iron (Fe)	7439-89-6	24-hour	POR1	7.9	0.51	0.13	0.64	25	3%
Lead	7439-92-1	24-hour	POR1	0.032	0.0020	0.0014	0.0034	0.5	1%
		30-day	POR1	0.032	0.0020	0.0014	0.0034	0.2	2%
Manganese - in $PM_{2.5}$	7439-96-5	24-hour	POR4	0.016	0.0028	0.0071	0.010	0.1	10%
- in PM_{10}		24-hour	POR4	0.063	0.0086	0.0071	0.016	0.2	8%
- in SPM		24-hour	POR1	0.17	0.011	0.0071	0.018	0.4	4%
Mercury	7439-97-6	24-hour	POR1	0.000015	0.0000010	0.0000093	0.000010	2	0.001%
Nickel - in SPM	7440-02-0	24-hour	POR1	0.0058	0.00037	0.0014	0.0018	0.2	1%
		annual	POR1		0.000042	0.0010	0.0010	0.04	3%
Nickel - in PM_{10}		24-hour	POR4	0.0058	0.00080	0.0014	0.0022	0.1	2%
		annual	POR1		0.000062	0.0010	0.0011	0.02	5%
Zinc	7440-66-6	24-hour	POR1	0.13	0.0084	0.013	0.021	120	0.02%
Benzene	71-43-2	24-hour	POR1	0.99	0.18	0.55	0.73	2.3	32%
		annual	POR1		0.017	0.34	0.36	0.45	79%
1,3-Butadiene	106-99-0	24-hour	POR1	0.042	0.014	0.56	0.57	10	6%
		annual	POR1		0.0013	0.56	0.56	2	28%
Benzo(a)pyrene	50-32-8	24-hour	POR4	0.0000078	0.0000027	0.000013	0.000016	0.00005	31%
		annual	POR4		0.00000023	0.0000050	0.0000052	0.00001	52%

Table A-11: Operations Emissions 90% Road Dust Control

Compound	CAS Number	Averaging Period	Project Concentration (µg/m³)	Background Concentration (µg/m³)	Project + Background	Ontario AAQC (µg/m³)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	16.9	21.4	38.3	120	32%
		annual	1.8	5.8	7.6	60	13%
Inhalable Particulate (PM10)	NA	24-hour	12.1	18.3	30.4	50	61%
Respirable Particulate (PM2.5)	NA	24-hour	4.7	10.0	14.7	27	55%
		annual	1.5	5.8	7.3	8.8	83%

Table A-12: Operations Emissions 70% Road Dust Control

Compound	CAS Number	Averaging Period	Project Concentration (µg/m³)	Background Concentration (µg/m³)	Project + Background	Ontario AAQC (µg/m³)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	42.9	21.4	64.3	120	54%
		annual	4.7	5.8	10.5	60	18%
Inhalable Particulate (PM10)	NA	24-hour	23.6	18.3000	41.9	50	84%
Respirable Particulate (PM2.5)	NA	24-hour	6.0	10.0	16.0	27	59%
		annual	1.5	5.8	7.3	8.8	83%

Table A-13: Operations Emissions 50% Road Dust Control

Compound	CAS Number	Averaging Period	Project Concentration (µg/m³)	Background Concentration (µg/m³)	Project + Background	Ontario AAQC (µg/m³)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	69.4	21.4	90.8	120	76%
		annual	7.6	5.8	13.4	60	22%
Inhalable Particulate (PM10)	NA	24-hour	37.3	18.3	55.6	50	**111%**
Respirable Particulate (PM2.5)	NA	24-hour	7.5	10.0	17.5	27	65%
		annual	1.5	5.8	7.3	8.8	83%

Table A-14: Operations Emissions 0% Road Dust Control

Compound	CAS Number	Averaging Period	Project Concentration (µg/m³)	Background Concentration (µg/m³)	Project + Background	Ontario AAQC (µg/m³)	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	135.6	21.4	157.0	120	**131%**
		annual	14.8	5.8	20.6	60	34%
Inhalable Particulate (PM10)	NA	24-hour	71.5	18.3	89.8	50	**180%**
Respirable Particulate (PM2.5)	NA	24-hour	11.2	10.0	21.2	27	79%
		annual	1.5	5.8	7.3	8.8	83%

There are no predicted concentrations above guidelines at PORs for any road dust control level.

Bolded Values are predicted concentrations above guidelines.

Table A-15: Operations Phase - Emission Summary Table with Comparison to Ontario Regulation 419/05 Standards and Guidelines

Compound	CAS Number	Averaging Period (hr - unless noted otherwise)	Facility Emission Rate (g/s)	Modelled POI Concentration (µg/m^3)	Ontario Regulation 419/05 POI Limit (µg/m^3)	Ontario Regulation 419/05 Schedule	% of Criteria
Suspended Particulate Matter (SPM)	NA	24-hour	17.9	10.8	120	B1	9%
Respirable Silica (<10µm)	various	24-hour	11.9	0.58	5	B1	12%
Nitrogen Oxides (as NO_2)	10102-44-0	1-hour	99.7	281	400	B1	70%
		24-hour	63.0	59.7	200	B1	30%
Carbon Monoxide (CO)	630-08-0	0.5-hour	243	919	6000	B1	15%
Sulfur Dioxide (SO2)	7446-09-5	1-hour	2.8	9.0	100	B1	9%
		annual	0.16	0.013	10	B1	0.1%
Hydrogen Cyanide (HCN)	74-90-8	24-hour	0.56	0.89	8	B1	11%
Calcium Oxide (CaO)	1305-78-8	24-hour	0.13	0.18	10	B1	2%
Copper Sulphate ($CuSO_4$)	7758-99-8	24-hour	0.040	0.12	0.5	B2	25%
Ammonia (NH_3)	7664-41-7	24-hour	0.59	2.6	100	B1	3%
Arsenic (As)	7440-38-2	24-hour	0.013	0.008	0.3	B1	3%
Chromium (Cr)	7440-47-3	24-hour	0.0022	0.001	0.5	B1	0.3%
Copper (Cu)	7440-50-8	24-hour	0.0050	0.003	50	B1	0.01%
Iron (Fe)	7439-89-6	24-hour	2.1	1.276	25	B2	5%
Lead (Pb)	7439-92-1	24-hour	0.029	0.018	0.5	B1	4%
		30-day	0.029	0.018	0.2	B2	9%
Magnesium (Mg)	1309-48-4	24-hour	0.40	0.24	72	B1	0.3%
Manganese (Mn)	7439-96-5	24-hour	0.044	0.027	0.4	B1	7%
Mercury (Hg)	7439-97-6	24-hour	0.0000042	0.0000025	2	B1	0.0001%
Nickel (Ni)	7440-02-0	24-hour	0.0017	0.001	2	DAV	0.1%
		Annual		0.00017	0.4	AAV	0.04%
		Annual		0.00017	0.04	B1	0.4%
Zinc (Zn)	7440-66-6	24-hour	0.036	0.022	120	B1	0.02%

The modelled concentrations account for meteorological anomalies, as per MECP Guidance

* the POI limit for copper sulphate cited was developed by certified toxicologist.

Table A-16: Emission Summary Table with Comparison to Canadian Ambient Air Quality Standards (CAAQS)

Compound	CAS Number	Matching Statistical Form or Direct Comparison	Project Concentration (µg/m^3)	Background Concentration (µg/m^3)	Project + Background (µg/m3)	Averaging Period (hr - unless noted otherwise)	Year(s)	CAAQS 2030 (µg/m^3)	% of Criteria
Nitrogen Oxides (as NO_2)	10102-44-0	Matching Statistical Form*	39.2	4.8	44.0	1	1996 to 1998	79	56%

*Matching statistical form follows the procedure outlined in the "Guidance Document on Achievement Determination For Canadian Ambient Air Quality Standards For Nitrogen Dioxide". The maximum average of predicted 98th percentile results from three consecutive years is presented.

Table A-17: Operations Phase - Emission Summary Table with Comparison to Canadian Ambient Air Quality Standards (CAAQS) (DIRECT COMPARISON)

Fine Particulate Matter (PM2.5)	NA	Direct Comparison	1.1	10.0	11.1	24	N/A	23	48%
		Direct Comparison	0.11	5.8	5.9	Annual		8.0	74%
Nitrogen Oxides (as NO_2)	10102-44-0	Direct Comparison	86	4.8	90	1	N/A	79	**114%**
		Direct Comparison	10.7	0.3	11.0	Annual	N/A	23	48%
Sulfur Dioxide (SO_2)	7446-09-5	Direct Comparison	8.6	3.9	12.5	1	N/A	170	7%
		Direct Comparison	0.004	3.2	3.20	Annual	N/A	10	32%

Bolded values indicate a predicted value above the CAAQS

Appendix B
Source and Emission Rate Tables

Table B-1: Source and Contaminant Identification Table

Source Information				Expected Contaminants	Included in Model?
Source	Source ID	Source Description	General Location		Significant (Yes or No?)
Drill	Q1_D	Quarry #1 - Drilling	Quarry Source 1+2	PM, Silica, metals	Yes
Drill	Q2_D	Quarry #2 - Drilling	Quarry Source 1+2	PM, Silica, metals	Yes
Drill	PP_D	Process Plant Infrastructure - Drilling	Process Plant	PM, Silica, metals	Yes
Drill	VP_D	Open Pit Mining - Drilling	Viggo Pit	PM, Silica, metals	Yes
Blast	Q1_B	Quarry #1 - Blasting	Quarry Source 1+2	PM, Silica, Metals, NOx, SO2, CO, NH3	Yes
Blast	Q2_B	Quarry #2 - Blasting	Quarry Source 1+2	PM, Silica, Metals, NOx, SO2, CO, NH3	Yes
Blast	PP_B	Process Plant Infrastructure - Blasting	Process Plant	PM, Silica, Metals, NOx, SO2, CO, NH3	Yes
Blast	VP_B	Open Pit Mining - Blasting	Viggo Pit	PM, Silica, Metals, NOx, SO2, CO, NH3	Yes
Material Handling	MH_ANPAG	Material Handling at AEX NPAG	AEX NPAG	PM, Silica, metals	Yes
Material Handling	MH_APAG	Material Handling at AEX PAG	AEX PAG	PM, Silica, metals	Yes
Material Handling	MH_APRTL	Material Handling at AEX Portal	AEX Portal	PM, Silica, metals	Yes
Material Handling	MH_BS1	Material Handling at Borrow Source #1	Borrow Source #1	PM, Silica, metals	Yes
Material Handling	MH_BS3	Material Handling at Borrow Source #3	Borrow Source #3	PM, Silica, metals	Yes
Material Handling	MH_BS3B	Material Handling at Borrow Source #3BS3B	Borrow Source #3BS3B	PM, Silica, metals	Yes
Material Handling	MH_COS	Material Handling at Coarse Ore Storage	Coarse Ore Storage	PM, Silica, metals	Yes
Material Handling	MH_CRUSH	Material Handling at Crusher	Crusher	PM, Silica, metals	Yes
Material Handling	MH_CWP1	Material Handling at CWP #1 Dam	CWP #1	PM, Silica, metals	Yes
Material Handling	MH_CWP2	Material Handling at CWP #2 (Sump #1)	CWP #2	PM, Silica, metals	Yes
Material Handling	MH_CWP3	Material Handling at CWP #3 (Sump #2)	CWP#3	PM, Silica, metals	Yes
Material Handling	MH_DVC1	Material Handling at Diversion Channel #1	Diversion Channel #1	PM, Silica, metals	Yes
Material Handling	MH_DVC2	Material Handling at Diversion Channel #2	Diversion Channel #2	PM, Silica, metals	Yes
Material Handling	MH_DCB	Material Handling at Dixie Creek Berm	Dixie Creek Berm	PM, Silica, metals	Yes
Material Handling	MH_ROAD	Material Handling at Haul Roads	Haul Roads	PM, Silica, metals	Yes
Material Handling	MH_IFP	Material Handling at Infrastructure Pad	Infrastructure Pad	PM, Silica, metals	Yes
Material Handling	MH_LGOE	Material Handling at LGO Stockpile - East (#2)	LGO Stockpile East #2	PM, Silica, metals	Yes
Material Handling	MH_LGOW	Material Handling at LGO Stockpile - West (#1)	LGO Stockpile West #1	PM, Silica, metals	Yes
Material Handling	MH_LPC	Material Handling at LP Central	LP Central Pit	PM, Silica, metals	Yes
Material Handling	MH_MWP	Material Handling at MWP Pond Dam	MWP Pond Dam	PM, Silica, metals	Yes
Material Handling	MH_TND	Material Handling at North Dam	North Dam	PM, Silica, metals	Yes
Material Handling	MH_NPAG	Material Handling at NPAG Stockpile	NPAG Stockpile	PM, Silica, metals	Yes
Material Handling	MH_OVB1	Material Handling at Overburden #1	Overburden #1	PM, Silica, metals	Yes
Material Handling	MH_OVB2	Material Handling at Overburden #2	Overburden #2	PM, Silica, metals	Yes
Material Handling	MH_OVB3	Material Handling at Overburden #3	Overburden #3	PM, Silica, metals	Yes
Material Handling	MH_OVB5	Material Handling at Overburden #5	Overburden #5	PM, Silica, metals	Yes
Material Handling	MH_OVB6	Material Handling at Overburden #6	Overburden #6	PM, Silica, metals	Yes
Material Handling	MH_PAG	Material Handling at PAG Stockpile	PAG Stockpile	PM, Silica, metals	Yes
Material Handling	MH_PSTP	Material Handling at Paste Plant	Paste Plant	PM, Silica, metals	Yes
Material Handling	MH_PRCP	Material Handling at Process Plant	Process Plant	PM, Silica, metals	
Material Handling	MH_Q1	Material Handling at Quarry #1	Quarry #1	PM, Silica, metals	Yes
Material Handling	MH_Q2	Material Handling at Quarry #2	Quarry #2	PM, Silica, metals	Yes
Material Handling	MH_ROM	Material Handling at ROM Stockpile	ROM Stockpile	PM, Silica, metals	Yes
Material Handling	MH_SHAFT	Material Handling at Shaft	Shaft	PM, Silica, metals	Yes
Material Handling	MH_TSD	Material Handling at South Dam	South Dam	PM, Silica, metals	Yes
Material Handling	MH_TSDS	Material Handling at South Dam - spillway	South Dam Spillway	PM, Silica, metals	Yes
Material Handling	MH_TPIPE	Material Handling at Tailings Pipeline	Tailings Pipeline	PM, Silica, metals	Yes
Material Handling	MH_TMF	Material Handling at TMF Facility	TMF Facility	PM, Silica, metals	Yes
Material Handling	MH_TPD	Material Handling at TMF Pond Dam	TMF Pond Dam	PM, Silica, metals	Yes
Material Handling	MH_VP	Material Handling at Viggo Pit	Viggo Pit	PM, Silica, metals	Yes
Material Handling	MH_TWD	Material Handling at West Dam	West Dam	PM, Silica, metals	Yes
Dozer	DZ_ANPAG	Dozer at AEX NPAG	AEX NPAG	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_APAG	Dozer at AEX PAG	AEX PAG	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_APRTL	Dozer at AEX Portal	AEX Portal	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_BS1	Dozer at Borrow Source #1	Borrow Source #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_BS3	Dozer at Borrow Source #3	Borrow Source #3	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_BS3B	Dozer at Borrow Source #3BS3B	Borrow Source #3BS3B	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_COS	Dozer at Coarse Ore Storage	Coarse Ore Storage	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_CRUSH	Dozer at Crusher	Crusher	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_CWP1	Dozer at CWP #1 Dam	CWP #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_CWP2	Dozer at CWP #2 (Sump #1)	CWP #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_CWP3	Dozer at CWP #3 (Sump #2)	CWP#3	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_DVC1	Dozer at Diversion Channel #1	Diversion Channel #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_DVC2	Dozer at Diversion Channel #2	Diversion Channel #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_DCB	Dozer at Dixie Creek Berm	Dixie Creek Berm	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_ROAD	Dozer at Haul Roads	Haul Roads	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_IFP	Dozer at Infrastructure Pad	Infrastructure Pad	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_LGOE	Dozer at LGO Stockpile - East (#2)	LGO Stockpile East #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_LGOW	Dozer at LGO Stockpile - West (#1)	LGO Stockpile West #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_LPC	Dozer at LP Central	LP Central Pit	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_MWP	Dozer at MWP Pond Dam	MWP Pond Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TND	Dozer at North Dam	North Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_NPAG	Dozer at NPAG Stockpile	NPAG Stockpile	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB1	Dozer at Overburden #1	Overburden #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB2	Dozer at Overburden #2	Overburden #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB3	Dozer at Overburden #3	Overburden #3	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB5	Dozer at Overburden #5	Overburden #5	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB6	Dozer at Overburden #6	Overburden #6	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_PAG	Dozer at PAG Stockpile	PAG Stockpile	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_PSTP	Dozer at Paste Plant	Paste Plant	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_PRCP	Dozer at Process Plant	Process Plant	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_Q1	Dozer at Quarry #1	Quarry #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_Q2	Dozer at Quarry #2	Quarry #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_ROM	Dozer at ROM Stockpile	ROM Stockpile	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_SHAFT	Dozer at Shaft	Shaft	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TSD	Dozer at South Dam	South Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TSDS	Dozer at South Dam - spillway	South Dam Spillway	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TPIPE	Dozer at Tailings Pipeline	Tailings Pipeline	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TMF	Dozer at TMF Facility	TMF Facility	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TPD	Dozer at TMF Pond Dam	TMF Pond Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_VP	Dozer at Viggo Pit	Viggo Pit	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TWD	Dozer at West Dam	West Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_Q1	Quarry 1 Tailpipe Emissions	Quarry 1	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_Q2	Quarry 2 Tailpipe Emissions	Quarry 2	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_LPC	LP Central Pit Tailpipe Emissions	LP Central Pit	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_VP	Viggo Pit Tailpipe Emissions	Viggo Pit	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_BS1	Borrow Source 1 Tailpipe Emissions	Borrow Source 1	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_BS3	Borrow Source 3 Tailpipe Emissions	Borrow Source 3B	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_BS3B	Borrow Source 3B Tailpipe Emissions	Borrow Source 3B	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_TMF	TMF Tailpipe Emissions	TMF	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Concrete	BATCH	Batch Plant	Concrete Batch Plant	PM, Silica, Metals	Yes
Concrete	CRF	CRF Plant	CRF Plant	PM, Silica, Metals	Yes
Concrete	PASTE	Paste Plant	Paste Plant	PM, Silica, Metals	Yes
Major Baghouses	BH1_JC	Baghouse for jaw crusher	Primary Crusher	PM, Silica, Metals	Yes
Major Baghouses	BH2_PC	Baghouse for pebble crusher	Mill Crushing	PM, Silica, Metals	Yes
Major Baghouses	BH3_AF1	Baghouse for apron feeder	Apron Feeder	PM, Silica, Metals	Yes
Major Baghouses	BH4_AF2	Baghouse for apron feeder	Apron Feeder	PM, Silica, Metals	Yes
Major Baghouses	BH5_AF3	Baghouse for apron feeder	Apron Feeder	PM, Silica, Metals	Yes
Major Baghouses	BH6_TP	Baghouse for transfer point (sacrificial to stockpile feed conveyor)	Transfer Point	PM, Silica, Metals	Yes
Process Plant - Leach	LEACH	Leach Tanks 1-6	Process Plant	HCN	Yes
Process Plant - Lime	LIME	exhaust for lime bin dust collector	Process Plant	PM, CaO, Metals	Yes
Process Plant - Lime	LS	scrubber for lime slaker	Process Plant	PM, CaO, Metals	Yes
Process Plant - Gold Recovery Area	FLOCC	flocculant handling cartridge filter	Process Plant	PM, Silica, Metals	Yes
Process Plant - Gold Recovery Area	CUSO4	CuSO4 dust filter	Process Plant	CuSO4, PM, Silica, Metals	Yes
Process Plant - Gold Recovery Area	SMBS	SMBS dust collector	Process Plant	PM, Silica, Metals	Yes
Process Plant - Gold Recovery Area	CMIX	Cyanide Mix Ventilation	Process Plant	HCN	Yes
Process Plant - Gold Recovery Area	FURN	Baghouse for Induction Furnace	Process Plant	PM	Yes
CN-Dest	HCND1	CN Destruction Tank	Process Plant	SO2	No: closed process
Natural Gas Generator 1 (Mill)	NGG1	Natural Gas Generator Emissions	Mill	NOx	Yes
Natural Gas Generator 2 (Warm Storage Structure)	NGG2	Natural Gas Generator Emissions	Warm Storage Structure	NOx	Yes
Natural Gas Generator 3 (Truck Shop)	NGG3	Natural Gas Generator Emissions	Truck Shop	NOx	Yes
Natural Gas Generator 4 (Admin Building)	NGG4	Natural Gas Generator Emissions	Admin Building	NOx	Yes
Natural Gas Generator 5 (Truck Wash Bay)	NGG5	Natural Gas Generator Emissions	Truck Wash Bay	NOx	Yes
Natural Gas Generator 6 (Water Treatment Plant)	NGG6	Natural Gas Generator Emissions	Water Treatment Plant	NOx	Yes
Natural Gas Generator 7 (Security Gatehouse)	NGG7	Natural Gas Generator Emissions	Security Gatehouse	NOx	Yes
Natural Gas Generator 8 (Security Gatehouse 2)	NGG8	Natural Gas Generator Emissions	Security Gatehouse 2	NOx	Yes
Natural Gas Generator 9 (Operations Camp)	NGG9	Natural Gas Generator Emissions	Operations Camp	NOx	Yes
Natural Gas Generator 10 (Paste Backfill Plant)	NGG10	Natural Gas Generator Emissions	Paste Backfill Plant	NOx	Yes
Natural Gas Generator 11 (AEX Main Power - 6 Units)	NGG11	Natural Gas Generator Emissions	AEX	NOx	Yes
Ventilation	AEX_NG	Natural Gas Heating Emissions	AEX	NOx	Yes
Ventilation	DISC_NG	Natural Gas Heating Emissions	Discovery Portal	NOx	Yes
Ventilation	LP1_NG	Natural Gas Heating Emissions	LP Central Pit	NOx	Yes
General Generators	DG1	TMF Dam Raises Generator	TMF Dam	NOx, SO2, CO, PM	Yes
General Generators	DG2	Water Intake Dixie Creek Generator	Dixie Creek	NOx, SO2, CO, PM	Yes
General Generators	DG3	Explosives Storage Generator	Explosives Storage Area	NOx, SO2, CO, PM	Yes
General Generators	DG4	Explosives Magazine Generator	Explosives Magazine Area	NOx, SO2, CO, PM	Yes
General Generators	DG5	Water Effluent - Booster Pump Generator	Effluent Corridor	NOx, SO2, CO, PM	Yes
General Generators	DG6	Water Booster Pump PSV Generator	Effluent Corridor	NOx, SO2, CO, PM	Yes
General Generators	DG7	Quarry Power & Dewatering Generator	Quarry Source 1+2	NOx, SO2, CO, PM	Yes
General Generators	DG8	Construction Dewatering - Viggo	Shaft	NOx, SO2, CO, PM	Yes
General Generators	DG9	Operations Camp - construction power	Operations Camp	NOx, SO2, CO, PM	Yes
General Generators	DG10	Mill -Misc Power	Mill	NOx, SO2, CO, PM	Yes
General Generators	DG11	Water Treatment - Misc Power	Water Treatment Plant	NOx, SO2, CO, PM	Yes
General Generators	DG12	Admin - Misc Power	Admin Building	NOx, SO2, CO, PM	Yes
General Generators	DG13	Security Shack - Misc Power	Security Shack	NOx, SO2, CO, PM	Yes
General Generators	ADG1	AEX DG1	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG2	AEX DG2	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG3	AEX DG3	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG4	AEX DG4	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG5	AEX DG5	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG6	AEX DG6	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG7	AEX DG7	AEX	NOx, SO2, CO, PM	Yes

Table B-1: Source and Contaminant Identification Table

General Generators	ADG8	AEX DG8	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG9	AEX DG9	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG10	AEX DG10	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG11	AEX DG11	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG12	AEX DG12	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG13	AEX DG13	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG14	AEX DG14	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG15	AEX DG15	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG16	AEX DG16	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG17	AEX DG17	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG18	AEX DG18	AEX	NOx, SO2, CO, PM	Yes
Haul Roads (Dust)	RD1	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD2	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD3	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD4	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD5	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD6	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD7	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD8	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD9	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD10	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD11	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD12	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD13	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD14	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD15	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD16	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD17	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD18	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD19	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD20	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD21	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD22	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD23	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD24	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD25	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD26	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD27	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD28	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD29	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD30	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD31	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD32	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD33	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD34	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD35	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD36	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD37	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD38	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD39	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD40	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD41	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD42	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD43	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD44	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD45	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD46	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD47	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD48	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD49	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD50	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD51	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD52	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD53	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD54	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD55	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD56	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD57	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD58	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD59	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD60	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD61	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD62	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD63	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD64	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD65	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Tailpipe)	RD1	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD2	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD3	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD4	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD5	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD6	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD7	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD8	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD9	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD10	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD11	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD12	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD13	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD14	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD15	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD16	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD17	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD18	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD19	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD20	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD21	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD22	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD23	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD24	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD25	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD26	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD27	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD28	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD29	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD30	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD31	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD32	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD33	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD34	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD35	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD36	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD37	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD38	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD39	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD40	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD41	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD42	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD43	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD44	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD45	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD46	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD47	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD48	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD49	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD50	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD51	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD52	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD53	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD54	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD55	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD56	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD57	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD58	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD59	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD60	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD61	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD62	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD63	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD64	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD65	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Wind Erosion	WE_NPAG	Wind Erosion NPAG Stockpile	NPAG Stockpile	PM, Silica, Metals	Yes
Wind Erosion	WE_PAG	Wind Erosion PAG Stockpile	PAG Stockpile	PM, Silica, Metals	Yes
Wind Erosion	WE_LGOW	Wind Erosion LGO Stockpile West	LGO Stockpile - Small	PM, Silica, Metals	Yes
Wind Erosion	WE_LGOE	Wind Erosion LGO Stockpile East	LGO Stockpile - Big	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB1	Wind Erosion Overburden #1	Overburden #1	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB2	Wind Erosion Overburden #2	Overburden #2	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB3	Wind Erosion Overburden #3	Overburden #3	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB5	Wind Erosion Overburden #5	Overburden #5	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB6	Wind Erosion Overburden #6	Overburden #6	PM, Silica, Metals	Yes
Wind Erosion	WE_TMF	Wind Erosion TMF Facility	TMF Facility	PM, Silica, Metals	Yes
Wind Erosion	WE_ROM	Wind Erosion ROM Stockpile	ROM Stockpile	PM, Silica, Metals	Yes
Assay Lab	AL_DC	Assay Lab Dust Collector	Assay Lab	PM, Silica, Metals	Yes
Assay Lab	AL_FURN	Assay Lab Fire Assay Propane Furnace and Drying Oven	Assay Lab	NOx	Yes
Portable Crusher	PRC_Q	Quarry Portable Crusher	Quarry	PM, Silica, Metals	Yes
Portable Crusher	PRC_CRF	CRF Portable Crusher	CRF Plant	PM, Silica, Metals	Yes

Table B-2: Construction Phase - Source Summary

Emissions (g/s)

Source Type	Source ID	Description	Model ID	TPM	PM10	PM2.5	NOx		CO		SO_2		NH3		HCN	$CuSO_4$	CaO	Si	BaP	Benzene	1,3-Butadiene
				24-hr	24-hr	24-hr	1-hr	24-hr	1-hr	8-hr	1-hr	24-hr	1-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr
TOTAL				76.89	30.23	7.45	114.98	72.73	280.52	48.27	3.17	0.19	16.14	0.67	0.56	0.04	0.13	2.26	0.00	1.20	0.05
Drill	Q1 D	Quarry #1 - Drilling	Q1 D	2.85E-01	1.48E-01	1.48E-01												1.11E-02			
Drill	Q2 D	Quarry #2 - Drilling	Q2 D	2.85E-01	1.48E-01	1.48E-01												1.11E-02			
Drill	PP D	Process Plant Infrastructure - Drilling	PP D	1.90E-01	9.87E-02	9.87E-02												7.40E-03			
Drill	VP D	Open Pit Mining - Drilling	VP D	1.27E-01	6.62E-02	6.62E-02												4.96E-03			
Blast	Q1 B	Quarry #1 - Blasting	Q1 B	1.81E-02	9.42E-03	5.43E-04	2.27E+00	9.46E-02	1.26E+01	5.25E-01	1.62E-01	6.75E-03	8.40E-01	3.50E-02				7.06E-04			
Blast	Q2 B	Quarry #2 - Blasting	Q2 B	1.81E-02	9.42E-03	5.43E-04	2.27E+00	9.46E-02	1.26E+01	5.25E-01	1.62E-01	6.75E-03	8.40E-01	3.50E-02				7.06E-04			
Blast	PP B	Process Plant Infrastructure - Blasting	PP B	1.83E-02	9.50E-03	5.48E-04	3.03E+00	1.26E-01	1.68E+01	7.01E-01	2.16E-01	9.01E-03	1.12E+00	4.67E-02				7.12E-04			
Blast	VP B	Open Pit Mining - Blasting	VP B	7.50E-01	3.90E-01	2.25E-02	3.60E+01	1.50E+00	2.00E+02	8.35E+00	2.57E+00	1.07E-01	1.33E+01	5.56E-01				2.93E-02			
Material Handling	MH ANPAG	Material Handling at AEX NPAG	MH ANPAG	1.34E-02	5.36E-03	1.51E-03												4.02E-04			
Material Handling	MH APAG	Material Handling at AEX PAG	MH APAG	1.42E-02	5.69E-03	1.61E-03												4.26E-04			
Material Handling	MH APRTL	Material Handling at AEX Portal	MH APRTL	3.01E-02	1.20E-02	3.40E-03												9.04E-04			
Material Handling	MH BS1	Material Handling at Borrow Source #1	MH BS1	1.79E-02	7.17E-03	2.03E-03												5.38E-04			
Material Handling	MH BS3	Material Handling at Borrow Source #3	MH BS3	5.17E-03	2.07E-03	5.84E-04												1.55E-04			
Material Handling	MH BS3B	Material Handling at Borrow Source #3BS3B	MH BS3B	2.43E-04	9.73E-05	2.75E-05												7.30E-06			
Material Handling	MH COS	Material Handling at Coarse Ore Storage	MH COS	2.91E-03	1.16E-03	3.29E-04												8.74E-05			
Material Handling	MH CRUSH	Material Handling at Crusher	MH CRUSH	3.87E-02	1.55E-02	4.38E-03												1.16E-03			
Material Handling	MH CWP1	Material Handling at CWP #1 Dam	MH CWP1	5.40E-03	2.16E-03	6.11E-04												1.62E-04			
Material Handling	MH CWP2	Material Handling at CWP #2 (Sump #1)	MH CWP2	3.10E-04	1.24E-04	3.51E-05												9.30E-06			
Material Handling	MH CWP3	Material Handling at CWP #3 (Sump #2)	MH CWP3	1.95E-03	7.81E-04	2.21E-04												5.85E-05			
Material Handling	MH DVC1	Material Handling at Diversion Channel #1	MH DVC1	2.81E-02	1.12E-02	3.18E-03												8.43E-04			
Material Handling	MH DVC2	Material Handling at Diversion Channel #2	MH DVC2	4.76E-03	1.91E-03	5.39E-04												1.43E-04			
Material Handling	MH DCB	Material Handling at Dixie Creek Berm	MH DCB	1.62E-03	6.50E-04	1.84E-04												4.87E-05			
Material Handling	MH ROAD	Material Handling at Haul Roads	MH ROAD	1.05E-01	4.19E-02	1.18E-02												3.14E-03			
Material Handling	MH IFP	Material Handling at Infrastructure Pad	MH IFP	3.04E-03	1.22E-03	3.44E-04												9.12E-05			
Material Handling	MH LGOE	Material Handling at LGO Stockpile - East (#2)	MH LGOE	1.11E-02	4.42E-03	1.25E-03												3.32E-04			
Material Handling	MH LGOW	Material Handling at LGO Stockpile - West (#1)	MH LGOW	1.59E-02	6.37E-03	1.80E-03												4.77E-04			
Material Handling	MH LPC	Material Handling at LP Central	MH LPC	4.95E-01	1.98E-01	5.60E-02												1.49E-02			
Material Handling	MH MWP	Material Handling at MWP Pond Dam	MH MWP	0.00E+00	0.00E+00	0.00E+00												0.00E+00			
Material Handling	MH TND	Material Handling at North Dam	MH TND	4.42E-03	1.77E-03	4.99E-04												1.32E-04			
Material Handling	MH NPAG	Material Handling at NPAG Stockpile	MH NPAG	3.22E-01	1.29E-01	3.64E-02												9.67E-03			
Material Handling	MH OVB1	Material Handling at Overburden #1	MH OVB1	4.51E-01	1.80E-01	5.09E-02												1.35E-02			
Material Handling	MH OVB2	Material Handling at Overburden #2	MH OVB2	2.04E-02	8.18E-03	2.31E-03												6.13E-04			
Material Handling	MH OVB3	Material Handling at Overburden #3	MH OVB3	2.08E-02	8.33E-03	2.35E-03												6.24E-04			
Material Handling	MH OVB5	Material Handling at Overburden #5	MH OVB5	1.03E-03	4.11E-04	1.16E-04												3.08E-05			
Material Handling	MH OVB6	Material Handling at Overburden #6	MH OVB6	1.06E-03	4.26E-04	1.20E-04												3.19E-05			
Material Handling	MH PAG	Material Handling at PAG Stockpile	MH PAG	4.57E-01	1.83E-01	5.17E-02												1.37E-02			
Material Handling	MH PSTP	Material Handling at Paste Plant	MH PSTP	2.20E-03	8.79E-04	2.49E-04												6.60E-05			
Material Handling	MH PRCP	Material Handling at Process Plant	MH PRCP	1.41E-03	5.62E-04	1.59E-04												4.22E-05			
Material Handling	MH Q1	Material Handling at Quarry #1	MH Q1	3.55E-02	1.42E-02	4.02E-03												1.07E-03			
Material Handling	MH Q2	Material Handling at Quarry #2	MH Q2	3.46E-03	1.39E-03	3.92E-04												1.04E-04			
Material Handling	MH ROM	Material Handling at ROM Stockpile	MH ROM	2.01E-02	8.02E-03	2.27E-03												6.02E-04			
Material Handling	MH SHAFT	Material Handling at Shaft	MH SHAFT	0.00E+00	0.00E+00	0.00E+00												0.00E+00			
Material Handling	MH TSD	Material Handling at South Dam	MH TSD	6.46E-02	2.58E-02	7.30E-03												1.94E-03			
Material Handling	MH TSDS	Material Handling at South Dam - spillway	MH TSDS	7.01E-04	2.81E-04	7.93E-05												2.10E-05			
Material Handling	MH TPIPE	Material Handling at Tailings Pipeline	MH TPIPE	9.07E-03	3.63E-03	1.03E-03												2.72E-04			
Material Handling	MH TMF	Material Handling at TMF Facility	MH TMF	0.00E+00	0.00E+00	0.00E+00												0.00E+00			
Material Handling	MH TPD	Material Handling at TMF Pond Dam	MH TPD	1.37E-02	5.47E-03	1.55E-03												4.10E-04			
Material Handling	MH VP	Material Handling at Viggo Pit	MH VP	5.54E-01	2.22E-01	6.27E-02												1.66E-02			
Material Handling	MH TWD	Material Handling at West Dam	MH TWD	0.00E+00	0.00E+00	0.00E+00												0.00E+00			
Dozer	DZ ANPAG	Dozer at AEX NPAG	DZ ANPAG	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ APAG	Dozer at AEX PAG	DZ APAG	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ APRTL	Dozer at AEX Portal	DZ APRTL	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ BS1	Dozer at Borrow Source #1	DZ BS1	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ BS3	Dozer at Borrow Source #3	DZ BS3	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ BS3B	Dozer at Borrow Source #3BS3B	DZ BS3B	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ COS	Dozer at Coarse Ore Storage	DZ COS	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ CRUSH	Dozer at Crusher	DZ CRUSH	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ CWP1	Dozer at CWP #1 Dam	DZ CWP1	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ CWP2	Dozer at CWP #2 (Sump #1)	DZ CWP2	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ CWP3	Dozer at CWP #3 (Sump #2)	DZ CWP3	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ DVC1	Dozer at Diversion Channel #1	DZ DVC1	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ DVC2	Dozer at Diversion Channel #2	DZ DVC2	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ DCB	Dozer at Dixie Creek Berm	DZ DCB	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ ROAD	Dozer at Haul Roads	DZ ROAD	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ IFP	Dozer at Infrastructure Pad	DZ IFP	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ LGOE	Dozer at LGO Stockpile - East (#2)	DZ LGOE	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ LGOW	Dozer at LGO Stockpile - West (#1)	DZ LGOW	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ LPC	Dozer at LP Central	DZ LPC	1.72E+00	1.29E+00	1.80E-01												9.67E-02			
Dozer	DZ MWP	Dozer at MWP Pond Dam	DZ MWP	0.00E+00	0.00E+00	0.00E+00												0.00E+00			
Dozer	DZ TND	Dozer at North Dam	DZ TND	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ NPAG	Dozer at NPAG Stockpile	DZ NPAG	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ OVB1	Dozer at Overburden #1	DZ OVB1	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ OVB2	Dozer at Overburden #2	DZ OVB2	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ OVB3	Dozer at Overburden #3	DZ OVB3	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ OVB5	Dozer at Overburden #5	DZ OVB5	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ OVB6	Dozer at Overburden #6	DZ OVB6	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ PAG	Dozer at PAG Stockpile	DZ PAG	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ PSTP	Dozer at Paste Plant	DZ PSTP	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ PRCP	Dozer at Process Plant	DZ PRCP	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ Q1	Dozer at Quarry #1	DZ Q1	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ Q2	Dozer at Quarry #2	DZ Q2	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ ROM	Dozer at ROM Stockpile	DZ ROM	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ SHAFT	Dozer at Shaft	DZ SHAFT	0.00E+00	0.00E+00	0.00E+00												0.00E+00			
Dozer	DZ TSD	Dozer at South Dam	DZ TSD	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ TSDS	Dozer at South Dam - spillway	DZ TSDS	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ TPIPE	Dozer at Tailings Pipeline	DZ TPIPE	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ TMF	Dozer at TMF Facility	DZ TMF	0.00E+00	0.00E+00	0.00E+00												0.00E+00			
Dozer	DZ TPD	Dozer at TMF Pond Dam	DZ TPD	2.47E-01	1.86E-01	2.77E-02												1.40E-02			
Dozer	DZ VP	Dozer at Viggo Pit	DZ VP	1.72E+00	1.29E+00	1.80E-01												9.67E-02			
Dozer	DZ TWD	Dozer at West Dam	DZ TWD	0.00E+00	0.00E+00	0.00E+00												0.00E+00			
Equipment (Tailpipe)	TP Q1	Quarry 1 Tailpipe Emissions	TP Q1	1.25E-02	1.25E-02	1.25E-02	6.23E-01	6.23E-01	1.78E+00	1.78E+00	3.05E-03	2.93E-03						9.34E-04	4.59E-07	4.89E-03	2.87E-04
Equipment (Tailpipe)	TP Q2	Quarry 2 Tailpipe Emissions	TP Q2	1.25E-02	1.25E-02	1.25E-02	6.23E-01	6.23E-01	1.78E+00	1.78E+00	3.05E-03	2.93E-03						9.34E-04	4.59E-07	4.89E-03	2.87E-04
Equipment (Tailpipe)	TP LPC	LP Central Pit Tailpipe Emissions	TP LPC	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00
Equipment (Tailpipe)	TP VP	Viggo Pit Tailpipe Emissions	TP VP	8.53E-02	8.53E-02	8.53E-02	4.27E+00	4.27E+00	1.08E+01	1.08E+01	1.84E-02	1.76E-02						6.40E-03	2.63E-06	2.54E-02	1.42E-03
Equipment (Tailpipe)	TP BS1	Borrow Source 1 Tailpipe Emissions	TP BS1	2.43E-03	2.43E-03	2.43E-03	4.86E-02	4.86E-02	5.25E-01	5.25E-01	8.57E-04	8.21E-04						1.82E-04	1.72E-07	1.52E-03	6.89E-05
Equipment (Tailpipe)	TP BS3	Borrow Source 3 Tailpipe Emissions	TP BS3	2.43E-03	2.43E-03	2.43E-03	4.86E-02	4.86E-02	5.25E-01	5.25E-01	8.57E-04	8.21E-04						1.82E-04	1.72E-07	1.52E-03	6.89E-05
Equipment (Tailpipe)	TP BS3B	Borrow Source 3B Tailpipe Emissions	TP BS3B	2.43E-03	2.43E-03	2.43E-03	4.86E-02	4.86E-02	5.25E-01	5.25E-01	8.57E-04	8.21E-04						1.82E-04	1.72E-07	1.52E-03	6.89E-05
Equipment (Tailpipe)	TP TMF	TMF Tailpipe Emissions	TP TMF	1.64E-02	1.64E-02	1.64E-02	3.27E-01	3.27E-01	3.11E+00	3.11E+00	4.87E-03	4.67E-03						1.23E-03	6.31E-07	4.64E-03	1.93E-04
Concrete	BATCH	Batch Plant	BATCH	7.92E-01	3.51E-01	5.66E-02												2.63E-02			
Concrete	CRF	CRF Plant	CRF	7.92E-01	3.51E-01	5.66E-02												2.63E-02			
Concrete	PASTE	Paste Plant	PASTE	7.92E-01	3.51E-01	5.66E-02												2.63E-02			
Major Baghouses	BH1 JC	Baghouse for jaw crusher	BH1 JC	5.66E-02	5.66E-02	5.66E-02												4.25E-03			
Major Baghouses	BH2 PC	Baghouse for pebble crusher	BH2 PC	1.89E-02	1.89E-02	1.89E-02												1.42E-03			
Major Baghouses	BH3 AF1	Baghouse for apron feeder	BH3 AF1	1.18E-02	1.18E-02	1.18E-02												8.85E-04			
Major Baghouses	BH4 AF2	Baghouse for apron feeder	BH4 AF2	1.18E-02	1.18E-02	1.18E-02												8.85E-04			
Major Baghouses	BH5 AF3	Baghouse for apron feeder	BH5 AF3	1.18E-02	1.18E-02	1.18E-02												8.85E-04			
Major Baghouses	BH6 TP	Baghouse for transfer point (sacrificial to stockpile feed conveyor)	BH6 TP	8.50E-02	8.50E-02	8.50E-02												6.37E-03			
Process Plant - Leach	LEACH	Leach Tanks 1-6	LEACH												0.4781						
Process Plant - Lime	LIME	exhaust for lime bin dust collector	LIME	4.72E-02	4.72E-02	4.72E-02											0.0472	3.54E-03			
Process Plant - Lime	LS	scrubber for lime slaker	LS	8.00E-02	8.00E-02	8.00E-02											0.0800	6.00E-03			
Process Plant - Gold Recovery Area	FLOCC	flocculant handling cartridge filter	FLOCC	4.72E-02	4.72E-02	4.72E-02												3.54E-03			
Process Plant - Gold Recovery Area	CUSO4	CuSO4 dust filter	CUSO4	4.00E-02	4.00E-02	4.00E-02										0.0400		3.00E-03			
Process Plant - Gold Recovery Area	SMBS	SMBS dust collector	SMBS	4.72E-02	4.72E-02	4.72E-02												3.54E-03			
Process Plant - Gold Recovery Area	CMIX	Cyanide Mix Ventilation	CMIX												0.0797						
Process Plant - Gold Recovery Area	FURN	Baghouse for Induction Furnace	FURN	9.40E-02	9.40E-02	9.40E-02															
Natural Gas Generator 1 (Mill)	NGG1	Natural Gas Generator Emissions	NGG1				6.55E-01	6.55E-01													
atural Gas Generator 2 (Warm Storage Structu	NGG2	Natural Gas Generator Emissions	NGG2				5.46E-01	5.46E-01													
Natural Gas Generator 3 (Truck Shop)	NGG3	Natural Gas Generator Emissions	NGG3				1.53E+00	1.53E+00													
Natural Gas Generator 4 (Admin Building)	NGG4	Natural Gas Generator Emissions	NGG4				7.64E-01	7.64E-01													
Natural Gas Generator 5 (Truck Wash Bay)	NGG5	Natural Gas Generator Emissions	NGG5				8.73E-01	8.73E-01													
latural Gas Generator 6 (Water Treatment Plar	NGG6	Natural Gas Generator Emissions	NGG6				5.46E-01	5.46E-01													
Natural Gas Generator 7 (Security Gatehouse)	NGG7	Natural Gas Generator Emissions	NGG7				5.46E-03	5.46E-03													
latural Gas Generator 8 (Security Gatehouse 2	NGG8	Natural Gas Generator Emissions	NGG8				5.46E-03	5.46E-03													
Natural Gas Generator 9 (Operations Camp)	NGG9	Natural Gas Generator Emissions	NGG9				1.96E+00	1.96E+00													
Natural Gas Generator 10 (Paste Backfill Plant	NGG10	Natural Gas Generator Emissions	NGG10				5.46E-01	5.46E-01													
ural Gas Generator 11 (AEX Main Power - 6 U	NGG11	Natural Gas Generator Emissions	NGG11				2.90E+00	2.90E+00													
Ventilation	AEX NG	Natural Gas Heating Emissions	AEX NG				1.06E+00	1.06E+00													
Ventilation	DISC NG	Natural Gas Heating Emissions	DISC NG				2.11E+00	2.11E+00													
Ventilation	LP1 NG	Natural Gas Heating Emissions	LP1 NG				2.51E+00	2.51E+00													
General Generators	DG1	TMF Dam Raises Generator	DG1	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	DG2	Water Intake Dixie Creek Generator	DG2	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	DG3	Explosives Storage Generator	DG3	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	DG4	Explosives Magazine Generator	DG4	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	DG5	Water Effluent - Booster Pump Generator	DG5	5.58E-02	5.58E-02	5.58E-02	7.86E-01	7.86E-01	1.69E-01	1.69E-01	3.08E-04	3.08E-04						4.18E-03	3.34E-08	1.52E-02	9.91E-04
General Generators	DG6	Water Booster Pump PSV Generator	DG6	1.86E-02	1.86E-02	1.86E-02	2.62E-01	2.62E-01	5.64E-02	5.64E-02	1.03E-04	1.03E-04						1.39E-03	1.11E-08	7.88E-03	3.30E-04
General Generators	DG7	Quarry Power & Dewatering Generator	DG7	1.86E-01	1.86E-01	1.86E-01	2.62E+00	2.62E+00	5.64E-01	5.64E-01	1.03E-03	1.03E-03						1.39E-02	1.11E-07	7.88E-02	3.30E-03
General Generators	DG8	Construction Dewatering - Viggo	DG8	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	DG9	Operations Camp - construction power	DG9	1.12E-01	1.12E-01	1.12E-01	1.57E+00	1.57E+00	3.39E-01	3.39E-01	6.15E-04	6.15E-04						8.36E-03	6.67E-08	4.73E-02	1.98E-03
General Generators	DG10	Mill -Misc Power	DG10	1.86E-01	1.86E-01	1.86E-01	2.62E+00	2.62E+00	5.64E-01	5.64E-01	1.03E-03	1.03E-03						1.39E-02	1.11E-07	7.88E-02	3.30E-03
General Generators	DG11	Water Treatment - Misc Power	DG11	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	DG12	Admin - Misc Power	DG12	7.43E-02	7.43E-02	7.43E-02	1.05E+00	1.05E+00	2.26E-01	2.26E-01	4.10E-04	4.10E-04						5.58E-03	4.45E-08	3.15E-02	1.32E-03
General Generators	DG13	Security Shack - Misc Power	DG13	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	ADG1	AEX DG1	ADG1	3.72E-01	3.72E-01	3.72E-01	5.24E+00	5.24E+00	1.13E+00	1.13E+00	2.05E-03	2.05E-03						2.79E-02	2.22E-07	1.58E-01	6.61E-03
General Generators	ADG2	AEX DG2	ADG2	3.72E-01	3.72E-01	3.72E-01	5.24E+00	5.24E+00	1.13E+00	1.13E+00	2.05E-03	2.05E-03						2.79E-02	2.22E-07	1.58E-01	6.61E-03
General Generators	ADG3	AEX DG3	ADG3	3.72E-01	3.72E-01	3.72E-01	5.24E+00	5.24E+00	1.13E+00	1.13E+00	2.05E-03	2.05E-03						2.79E-02	2.22E-07	1.58E-01	6.61E-03
General Generators	ADG4	AEX DG4	ADG4	1.86E-01	1.86E-01	1.86E-01	2.62E+00	2.62E+00	5.64E-01	5.64E-01	1.03E-03	1.03E-03						1.39E-02	1.11E-07	7.88E-02	3.30E-03
General Generators	ADG5	AEX DG5	ADG5	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	ADG6	AEX DG6	ADG6	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	ADG7	AEX DG7	ADG7	7.43E-02	7.43E-02	7.43E-02	1.05E+00	1.05E+00	2.26E-01	2.26E-01	4.10E-04	4.10E-04						5.58E-03	4.45E-08	3.15E-02	1.32E-03
General Generators	ADG8	AEX DG8	ADG8	1.86E-02	1.86E-02	1.86E-02	2.62E-01	2.62E-01	5.64E-02	5.64E-02	1.03E-04	1.03E-04						1.39E-03	1.11E-08	7.88E-03	3.30E-04
General Generators	ADG9	AEX DG9	ADG9	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04
General Generators	ADG10	AEX DG10	ADG10	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04

Source ID	Arsenic	Chromium	Copper	Iron	Mercury	Magnesium	Manganese	Nickel	Lead	Titanium	Zinc
	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr
TOTAL	0.057	0.0098	0.022	9.58	0.00002	1.80	0.20	0.0070	0.032	0.48	0.16
Q1 D	2.14E-04	3.70E-05	8.31E-05	3.64E-02	7.06E-08	6.83E-03	7.63E-04	2.55E-05	1.61E-05	1.82E-03	5.92E-04
Q2 D	2.14E-04	3.70E-05	8.31E-05	3.64E-02	7.06E-08	6.83E-03	7.63E-04	2.55E-05	1.61E-05	1.82E-03	5.92E-04
PP D	1.42E-04	2.47E-05	5.54E-05	2.43E-02	4.71E-08	4.56E-03	5.09E-04	1.70E-05	1.07E-05	1.21E-03	3.95E-04
VP D	9.54E-05	1.65E-05	3.72E-05	1.63E-02	3.16E-08	3.05E-03	3.41E-04	1.14E-05	7.18E-06	8.12E-04	2.65E-04
Q1 B	1.36E-05	2.35E-06	5.29E-06	2.32E-03	4.49E-09	4.35E-04	4.85E-05	1.62E-06	1.02E-06	1.16E-04	3.77E-05
Q2 B	1.36E-05	2.35E-06	5.29E-06	2.32E-03	4.49E-09	4.35E-04	4.85E-05	1.62E-06	1.02E-06	1.16E-04	3.77E-05
PP B	1.37E-05	2.37E-06	5.33E-06	2.34E-03	4.53E-09	4.38E-04	4.90E-05	1.64E-06	1.03E-06	1.17E-04	3.80E-05
VP B	5.63E-04	9.75E-05	2.19E-04	9.60E-02	1.86E-07	1.80E-02	2.01E-03	6.72E-05	4.23E-05	4.79E-03	1.56E-03
MH ANPAG	1.00E-05	1.74E-06	3.91E-06	1.71E-03	3.32E-09	3.21E-04	3.59E-05	1.20E-06	7.55E-07	8.54E-05	2.79E-05
MH APAG	1.07E-05	1.85E-06	4.15E-06	1.82E-03	3.53E-09	3.41E-04	3.81E-05	1.27E-06	8.02E-07	9.07E-05	2.96E-05
MH APRTL	2.26E-05	3.92E-06	8.79E-06	3.86E-03	7.47E-09	7.23E-04	8.07E-05	2.70E-06	1.70E-06	1.92E-04	6.26E-05
MH BS1	1.35E-05	2.33E-06	5.24E-06	2.30E-03	4.45E-09	4.30E-04	4.81E-05	1.61E-06	1.01E-06	1.14E-04	3.73E-05
MH BS3	3.88E-06	6.72E-07	1.51E-06	6.62E-04	1.28E-09	1.24E-04	1.39E-05	4.63E-07	2.92E-07	3.30E-05	1.08E-05
MH BS3B	1.82E-07	3.16E-08	7.10E-08	3.11E-05	6.03E-11	5.84E-06	6.52E-07	2.18E-08	1.37E-08	1.55E-06	5.06E-07
MH COS	2.18E-06	3.79E-07	8.50E-07	3.73E-04	7.22E-10	6.99E-05	7.80E-06	2.61E-07	1.64E-07	1.86E-05	6.06E-06
MH CRUSH	2.90E-05	5.03E-06	1.13E-05	4.96E-03	9.60E-09	9.29E-04	1.04E-04	3.47E-06	2.18E-06	2.47E-04	8.06E-05
MH CWP1	4.05E-06	7.03E-07	1.58E-06	6.92E-04	1.34E-09	1.30E-04	1.45E-05	4.84E-07	3.05E-07	3.45E-05	1.12E-05
MH CWP2	2.33E-07	4.03E-08	9.05E-08	3.97E-05	7.69E-11	7.44E-06	8.31E-07	2.78E-08	1.75E-08	1.98E-06	6.45E-07
MH CWP3	1.46E-06	2.54E-07	5.70E-07	2.50E-04	4.84E-10	4.68E-05	5.23E-06	1.75E-07	1.10E-07	1.25E-05	4.06E-06
MH DVC1	2.11E-05	3.65E-06	8.21E-06	3.60E-03	6.97E-09	6.74E-04	7.53E-05	2.52E-06	1.58E-06	1.79E-04	5.85E-05
MH DVC2	3.57E-06	6.19E-07	1.39E-06	6.10E-04	1.18E-09	1.14E-04	1.28E-05	4.27E-07	2.69E-07	3.04E-05	9.91E-06
MH DCB	1.22E-06	2.11E-07	4.74E-07	2.08E-04	4.03E-10	3.90E-05	4.35E-06	1.45E-07	9.16E-08	1.04E-05	3.38E-06
MH ROAD	7.85E-05	1.36E-05	3.06E-05	1.34E-02	2.59E-08	2.51E-03	2.80E-04	9.38E-06	5.90E-06	6.68E-04	2.18E-04
MH IFP	2.28E-06	3.95E-07	8.88E-07	3.89E-04	7.54E-10	7.30E-05	8.15E-06	2.72E-07	1.71E-07	1.94E-05	6.32E-06
MH LGOE	8.30E-06	1.44E-06	3.23E-06	1.42E-03	2.74E-09	2.65E-04	2.96E-05	9.91E-07	6.24E-07	7.06E-05	2.30E-05
MH LGOW	1.19E-05	2.07E-06	4.65E-06	2.04E-03	3.95E-09	3.82E-04	4.26E-05	1.43E-06	8.98E-07	1.02E-04	3.31E-05
MH LPC	3.72E-04	6.44E-05	1.45E-04	6.34E-02	1.23E-07	1.19E-02	1.33E-03	4.44E-05	2.79E-05	3.16E-03	1.03E-03
MH MWP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MH TND	3.31E-06	5.74E-07	1.29E-06	5.65E-04	1.10E-09	1.06E-04	1.18E-05	3.96E-07	2.49E-07	2.82E-05	9.18E-06
MH NPAG	2.42E-04	4.19E-05	9.41E-05	4.12E-02	7.99E-08	7.73E-03	8.64E-04	2.89E-05	1.82E-05	2.06E-03	6.70E-04
MH OVB1	3.38E-04	5.86E-05	1.32E-04	5.77E-02	1.12E-07	1.08E-02	1.21E-03	4.04E-05	2.54E-05	2.87E-03	9.37E-04
MH OVB2	1.53E-05	2.66E-06	5.97E-06	2.62E-03	5.07E-09	4.91E-04	5.48E-05	1.83E-06	1.15E-06	1.30E-04	4.25E-05
MH OVB3	1.56E-05	2.71E-06	6.08E-06	2.66E-03	5.16E-09	5.00E-04	5.58E-05	1.86E-06	1.17E-06	1.33E-04	4.33E-05
MH OVB5	7.71E-07	1.34E-07	3.00E-07	1.32E-04	2.55E-10	2.47E-05	2.75E-06	9.21E-08	5.79E-08	6.56E-06	2.14E-06
MH OVB6	7.98E-07	1.38E-07	3.11E-07	1.36E-04	2.64E-10	2.55E-05	2.85E-06	9.53E-08	6.00E-08	6.79E-06	2.21E-06
MH PAG	3.43E-04	5.95E-05	1.34E-04	5.85E-02	1.13E-07	1.10E-02	1.23E-03	4.10E-05	2.58E-05	2.92E-03	9.51E-04
MH PSTP	1.65E-06	2.86E-07	6.42E-07	2.81E-04	5.45E-10	5.28E-05	5.89E-06	1.97E-07	1.24E-07	1.40E-05	4.57E-06
MH PRCP	1.05E-06	1.83E-07	4.11E-07	1.80E-04	3.49E-10	3.37E-05	3.77E-06	1.26E-07	7.93E-08	8.97E-06	2.92E-06
MH Q1	2.67E-05	4.62E-06	1.04E-05	4.55E-03	8.82E-09	8.53E-04	9.53E-05	3.19E-06	2.00E-06	2.27E-04	7.39E-05
MH Q2	2.60E-06	4.50E-07	1.01E-06	4.43E-04	8.59E-10	8.32E-05	9.29E-06	3.10E-07	1.95E-07	2.21E-05	7.21E-06
MH ROM	1.50E-05	2.61E-06	5.86E-06	2.57E-03	4.97E-09	4.81E-04	5.38E-05	1.80E-06	1.13E-06	1.28E-04	4.17E-05
MH SHAFT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MH TSD	4.84E-05	8.40E-06	1.89E-05	8.27E-03	1.60E-08	1.55E-03	1.73E-04	5.79E-06	3.64E-06	4.12E-04	1.34E-04
MH TSDS	5.26E-07	9.12E-08	2.05E-07	8.98E-05	1.74E-10	1.68E-05	1.88E-06	6.28E-08	3.96E-08	4.47E-06	1.46E-06
MH TPIPE	6.80E-06	1.18E-06	2.65E-06	1.16E-03	2.25E-09	2.18E-04	2.43E-05	8.13E-07	5.12E-07	5.79E-05	1.89E-05
MH TMF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
MH TPD	1.03E-05	1.78E-06	3.99E-06	1.75E-03	3.39E-09	3.28E-04	3.66E-05	1.22E-06	7.71E-07	8.72E-05	2.84E-05
MH VP	4.16E-04	7.21E-05	1.62E-04	7.10E-02	1.37E-07	1.33E-02	1.49E-03	4.97E-05	3.13E-05	3.54E-03	1.15E-03
MH TWD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DZ ANPAG	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ APAG	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ APRTL	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ BS1	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ BS3	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ BS3B	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ COS	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ CRUSH	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ CWP1	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ CWP2	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ CWP3	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ DVC1	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ DVC2	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ DCB	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ ROAD	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ IFP	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ LGOE	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ LGOW	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ LPC	1.29E-03	2.23E-04	5.02E-04	2.20E-01	4.26E-07	4.12E-02	4.61E-03	1.54E-04	9.69E-05	1.10E-02	3.57E-03
DZ MWP	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DZ TND	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ NPAG	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ OVB1	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ OVB2	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ OVB3	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ OVB5	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ OVB6	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ PAG	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ PSTP	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ PRCP	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ Q1	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ Q2	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ ROM	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ SHAFT	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DZ TSD	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ TSDS	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ TPIPE	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ TMF	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
DZ TPD	1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
DZ VP	1.29E-03	2.23E-04	5.02E-04	2.20E-01	4.26E-07	4.12E-02	4.61E-03	1.54E-04	9.69E-05	1.10E-02	3.57E-03
DZ TWD	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TP Q1											
TP Q2											
TP LPC											
TP VP											
TP BS1											
TP BS3											
TP BS3B											
TP TMF											
BATCH	5.94E-04	1.03E-04	2.31E-04	1.01E-01	1.96E-07	1.90E-02	2.12E-03	7.10E-05	4.47E-05	5.05E-03	1.65E-03
CRF	5.94E-04	1.03E-04	2.31E-04	1.01E-01	1.96E-07	1.90E-02	2.12E-03	7.10E-05	4.47E-05	5.05E-03	1.65E-03
PASTE	5.94E-04	1.03E-04	2.31E-04	1.01E-01	1.96E-07	1.90E-02	2.12E-03	7.10E-05	4.47E-05	5.05E-03	1.65E-03
BH1 JC	4.25E-05	7.36E-06	1.65E-05	7.25E-03	1.40E-08	1.36E-03	1.52E-04	5.07E-06	3.19E-06	3.61E-04	1.18E-04
BH2 PC	1.42E-05	2.45E-06	5.51E-06	2.42E-03	4.68E-09	4.53E-04	5.06E-05	1.69E-06	1.06E-06	1.20E-04	3.93E-05
BH3 AF1	8.85E-06	1.53E-06	3.45E-06	1.51E-03	2.93E-09	2.83E-04	3.16E-05	1.06E-06	6.65E-07	7.53E-05	2.45E-05
BH4 AF2	8.85E-06	1.53E-06	3.45E-06	1.51E-03	2.93E-09	2.83E-04	3.16E-05	1.06E-06	6.65E-07	7.53E-05	2.45E-05
BH5 AF3	8.85E-06	1.53E-06	3.45E-06	1.51E-03	2.93E-09	2.83E-04	3.16E-05	1.06E-06	6.65E-07	7.53E-05	2.45E-05
BH6 TP	6.37E-05	1.10E-05	2.48E-05	1.09E-02	2.11E-08	2.04E-03	2.28E-04	7.61E-06	4.79E-06	5.42E-04	1.77E-04
LEACH											
LIME	3.54E-05	6.14E-06	1.38E-05	6.04E-03	1.17E-08	1.13E-03	1.26E-04	4.23E-06	2.66E-06	3.01E-04	9.82E-05
LS	6.00E-05	1.04E-05	2.34E-05	1.02E-02	1.98E-08	1.92E-03	2.14E-04	7.17E-06	4.51E-06	5.10E-04	1.66E-04
FLOCC	3.54E-05	6.14E-06	1.38E-05	6.04E-03	1.17E-08	1.13E-03	1.26E-04	4.23E-06	2.66E-06	3.01E-04	9.82E-05
CUSO4	3.00E-05	5.20E-06	1.17E-05	5.12E-03	9.92E-09	9.60E-04	1.07E-04	3.58E-06	2.26E-06	2.55E-04	8.32E-05
SMBS	3.54E-05	6.14E-06	1.38E-05	6.04E-03	1.17E-08	1.13E-03	1.26E-04	4.23E-06	2.66E-06	3.01E-04	9.82E-05
CMIX											
FURN											

Table B-2: Construction Phase - Source Summary

Source Type	Source ID	Description	Model ID	Emissions (g/s)																												
				TPM	PM10	PM2.5	NOx		CO		SO_2		NH3		HCN	$CuSO_4$	CaO	Si	BaP	Benzene	1,3-Butadiene	Arsenic	Chromium	Copper	Iron	Mercury	Magnesium	Manganese	Nickel	Lead	Titanium	Zinc
				24-hr	24-hr	24-hr	1-hr	24-hr	1-hr	8-hr	1-hr	24-hr	1-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr
General Generators	ADG11	AEX DG11	ADG11	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG12	AEX DG12	ADG12	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG13	AEX DG13	ADG13	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG14	AEX DG14	ADG14	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG15	AEX DG15	ADG15	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG16	AEX DG16	ADG16	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG17	AEX DG17	ADG17	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG18	AEX DG18	ADG18	3.72E-02	3.72E-02	3.72E-02	5.24E-01	5.24E-01	1.13E-01	1.13E-01	2.05E-04	2.05E-04						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
Haul Roads (Dust)	RD1	Node Section Haul Road Dust Emissions	RD1	4.59E+00	1.21E+00	1.21E-01												9.11E-02				3.44E-03	5.96E-04	1.34E-03	5.87E-01	1.14E-06	1.10E-01	1.23E-02	4.11E-04	2.59E-04	2.93E-02	9.54E-03
Haul Roads (Dust)	RD2	Node Section Haul Road Dust Emissions	RD2	6.42E+00	1.70E+00	1.70E-01												1.27E-01				4.81E-03	8.34E-04	1.87E-03	8.22E-01	1.59E-06	1.54E-01	1.72E-02	5.75E-04	3.62E-04	4.09E-02	1.34E-02
Haul Roads (Dust)	RD3	Node Section Haul Road Dust Emissions	RD3	0.00E+00	0.00E+00	0.00E+00												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD4	Node Section Haul Road Dust Emissions	RD4	5.32E+00	1.41E+00	1.41E-01												1.06E-01				3.99E-03	6.92E-04	1.55E-03	6.81E-01	1.32E-06	1.28E-01	1.43E-02	4.77E-04	3.00E-04	3.40E-02	1.11E-02
Haul Roads (Dust)	RD5	Node Section Haul Road Dust Emissions	RD5	3.84E+00	1.02E+00	1.02E-01												7.63E-02				2.88E-03	5.00E-04	1.12E-03	4.92E-01	9.53E-07	9.22E-02	1.03E-02	3.44E-04	2.17E-04	2.45E-02	7.99E-03
Haul Roads (Dust)	RD6	Node Section Haul Road Dust Emissions	RD6	2.52E-02	6.68E-03	6.68E-04												5.01E-04				1.89E-05	3.28E-06	7.37E-06	3.23E-03	6.26E-09	6.06E-04	6.77E-05	2.26E-06	1.42E-06	1.61E-04	5.25E-05
Haul Roads (Dust)	RD7	Node Section Haul Road Dust Emissions	RD7	1.75E+00	4.63E-01	4.63E-02												3.47E-02				1.31E-03	2.27E-04	5.11E-04	2.24E-01	4.34E-07	4.20E-02	4.69E-03	1.57E-04	9.86E-05	1.12E-02	3.64E-03
Haul Roads (Dust)	RD8	Node Section Haul Road Dust Emissions	RD8	8.99E-01	2.38E-01	2.38E-02												1.79E-02				6.74E-04	1.17E-04	2.63E-04	1.15E-01	2.23E-07	2.16E-02	2.41E-03	8.06E-05	5.07E-05	5.74E-03	1.87E-03
Haul Roads (Dust)	RD9	Node Section Haul Road Dust Emissions	RD9	2.74E+00	7.26E-01	7.26E-02												5.45E-02				2.06E-03	3.57E-04	8.01E-04	3.51E-01	6.80E-07	6.58E-02	7.35E-03	2.46E-04	1.55E-04	1.75E-02	5.71E-03
Haul Roads (Dust)	RD10	Node Section Haul Road Dust Emissions	RD10	3.73E+00	9.87E-01	9.87E-02												7.40E-02				2.80E-03	4.85E-04	1.09E-03	4.77E-01	9.25E-07	8.95E-02	9.99E-03	3.34E-04	2.10E-04	2.38E-02	7.76E-03
Haul Roads (Dust)	RD11	Node Section Haul Road Dust Emissions	RD11	8.32E+00	2.20E+00	2.20E-01												1.65E-01				6.24E-03	1.08E-03	2.43E-03	1.06E+00	2.06E-06	2.00E-01	2.23E-02	7.45E-04	4.69E-04	5.31E-02	1.73E-02
Haul Roads (Dust)	RD12	Node Section Haul Road Dust Emissions	RD12	1.36E+00	3.60E-01	3.60E-02												2.70E-02				1.02E-03	1.77E-04	3.97E-04	1.74E-01	3.37E-07	3.26E-02	3.65E-03	1.22E-04	7.67E-05	8.68E-03	2.83E-03
Haul Roads (Dust)	RD13	Node Section Haul Road Dust Emissions	RD13	9.17E-01	2.43E-01	2.43E-02												1.82E-02				6.88E-04	1.19E-04	2.68E-04	1.17E-01	2.27E-07	2.20E-02	2.46E-03	8.22E-05	5.17E-05	5.85E-03	1.91E-03
Haul Roads (Dust)	RD14	Node Section Haul Road Dust Emissions	RD14	1.86E-01	4.93E-02	4.93E-03												3.69E-03				1.40E-04	2.42E-05	5.43E-05	2.38E-02	4.62E-08	4.47E-03	4.99E-04	1.67E-05	1.05E-05	1.19E-03	3.87E-04
Haul Roads (Dust)	RD15	Node Section Haul Road Dust Emissions	RD15	1.27E+00	3.37E-01	3.37E-02												2.53E-02				9.55E-04	1.65E-04	3.72E-04	1.63E-01	3.16E-07	3.06E-02	3.41E-03	1.14E-04	7.18E-05	8.12E-03	2.65E-03
Haul Roads (Dust)	RD16	Node Section Haul Road Dust Emissions	RD16	0.00E+00	0.00E+00	0.00E+00												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD17	Node Section Haul Road Dust Emissions	RD17	4.42E-01	1.17E-01	1.17E-02												8.78E-03				3.32E-04	5.75E-05	1.29E-04	5.66E-02	1.10E-07	1.06E-02	1.19E-03	3.96E-05	2.49E-05	2.82E-03	9.20E-04
Haul Roads (Dust)	RD18	Node Section Haul Road Dust Emissions	RD18	6.86E-01	1.82E-01	1.82E-02												1.36E-02				5.14E-04	8.92E-05	2.00E-04	8.78E-02	1.70E-07	1.65E-02	1.84E-03	6.15E-05	3.87E-05	4.38E-03	1.43E-03
Haul Roads (Dust)	RD19	Node Section Haul Road Dust Emissions	RD19	2.57E-02	6.80E-03	6.80E-04												5.10E-04				1.93E-05	3.34E-06	7.51E-06	3.29E-03	6.37E-09	6.17E-04	6.89E-05	2.30E-06	1.45E-06	1.64E-04	5.35E-05
Haul Roads (Dust)	RD20	Node Section Haul Road Dust Emissions	RD20	2.35E-02	6.22E-03	6.22E-04												4.67E-04				1.76E-05	3.06E-06	6.87E-06	3.01E-03	5.83E-09	5.64E-04	6.30E-05	2.11E-06	1.33E-06	1.50E-04	4.89E-05
Haul Roads (Dust)	RD21	Node Section Haul Road Dust Emissions	RD21	1.07E+00	2.82E-01	2.82E-02												2.12E-02				7.99E-04	1.39E-04	3.11E-04	1.36E-01	2.64E-07	2.56E-02	2.86E-03	9.55E-05	6.01E-05	6.80E-03	2.22E-03
Haul Roads (Dust)	RD22	Node Section Haul Road Dust Emissions	RD22	3.58E-01	9.48E-02	9.48E-03												7.11E-03				2.69E-04	4.66E-05	1.05E-04	4.59E-02	8.89E-08	8.60E-03	9.60E-04	3.21E-05	2.02E-05	2.29E-03	7.45E-04
Haul Roads (Dust)	RD23	Node Section Haul Road Dust Emissions	RD23	0.00E+00	0.00E+00	0.00E+00												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD24	Node Section Haul Road Dust Emissions	RD24	4.98E-01	1.32E-01	1.32E-02												9.89E-03				3.74E-04	6.48E-05	1.46E-04	6.38E-02	1.24E-07	1.20E-02	1.34E-03	4.46E-05	2.81E-05	3.18E-03	1.04E-03
Haul Roads (Dust)	RD25	Node Section Haul Road Dust Emissions	RD25	5.03E-01	1.33E-01	1.33E-02												9.98E-03				3.77E-04	6.53E-05	1.47E-04	6.43E-02	1.25E-07	1.21E-02	1.35E-03	4.50E-05	2.83E-05	3.21E-03	1.05E-03
Haul Roads (Dust)	RD26	Node Section Haul Road Dust Emissions	RD26	1.23E-01	3.27E-02	3.27E-03												2.45E-03				9.26E-05	1.61E-05	3.61E-05	1.58E-02	3.06E-08	2.96E-03	3.31E-04	1.11E-05	6.96E-06	7.88E-04	2.57E-04
Haul Roads (Dust)	RD27	Node Section Haul Road Dust Emissions	RD27	4.00E-02	1.06E-02	1.06E-03												7.95E-04				3.00E-05	5.21E-06	1.17E-05	5.13E-03	9.93E-09	9.61E-04	1.07E-04	3.59E-06	2.26E-06	2.55E-04	8.33E-05
Haul Roads (Dust)	RD28	Node Section Haul Road Dust Emissions	RD28	6.27E-01	1.66E-01	1.66E-02												1.25E-02				4.71E-04	8.16E-05	1.83E-04	8.03E-02	1.56E-07	1.51E-02	1.68E-03	5.62E-05	3.54E-05	4.00E-03	1.30E-03
Haul Roads (Dust)	RD29	Node Section Haul Road Dust Emissions	RD29	1.24E+00	3.28E-01	3.28E-02												2.46E-02				9.31E-04	1.61E-04	3.62E-04	1.59E-01	3.08E-07	2.98E-02	3.33E-03	1.11E-04	7.00E-05	7.92E-03	2.58E-03
Haul Roads (Dust)	RD30	Node Section Haul Road Dust Emissions	RD30	3.54E-01	9.38E-02	9.38E-03												7.04E-03				2.66E-04	4.61E-05	1.04E-04	4.54E-02	8.79E-08	8.51E-03	9.50E-04	3.18E-05	2.00E-05	2.26E-03	7.37E-04
Haul Roads (Dust)	RD31	Node Section Haul Road Dust Emissions	RD31	8.46E-02	2.24E-02	2.24E-03												1.68E-03				6.35E-05	1.10E-05	2.47E-05	1.08E-02	2.10E-08	2.03E-03	2.27E-04	7.58E-06	4.77E-06	5.40E-04	1.76E-04
Haul Roads (Dust)	RD32	Node Section Haul Road Dust Emissions	RD32	2.50E+00	6.62E-01	6.62E-02												4.96E-02				1.88E-03	3.25E-04	7.30E-04	3.20E-01	6.20E-07	6.00E-02	6.70E-03	2.24E-04	1.41E-04	1.60E-02	5.20E-03
Haul Roads (Dust)	RD33	Node Section Haul Road Dust Emissions	RD33	1.52E-01	4.02E-02	4.02E-03												3.02E-03				1.14E-04	1.98E-05	4.44E-05	1.94E-02	3.77E-08	3.65E-03	4.07E-04	1.36E-05	8.57E-06	9.69E-04	3.16E-04
Haul Roads (Dust)	RD34	Node Section Haul Road Dust Emissions	RD34	4.49E-01	1.19E-01	1.19E-02												8.91E-03				3.36E-04	5.83E-05	1.31E-04	5.74E-02	1.11E-07	1.08E-02	1.20E-03	4.02E-05	2.53E-05	2.86E-03	9.33E-04
Haul Roads (Dust)	RD35	Node Section Haul Road Dust Emissions	RD35	1.17E-03	3.10E-04	3.10E-05												2.32E-05				8.78E-07	1.52E-07	3.42E-07	1.50E-04	2.90E-10	2.81E-05	3.14E-06	1.05E-07	6.60E-08	7.47E-06	2.43E-06
Haul Roads (Dust)	RD36	Node Section Haul Road Dust Emissions	RD36	0.00E+00	0.00E+00	0.00E+00												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD37	Node Section Haul Road Dust Emissions	RD37	2.91E-01	7.71E-02	7.71E-03												5.78E-03				2.19E-04	3.79E-05	8.51E-05	3.73E-02	7.23E-08	6.99E-03	7.81E-04	2.61E-05	1.64E-05	1.86E-03	6.06E-04
Haul Roads (Dust)	RD38	Node Section Haul Road Dust Emissions	RD38	0.00E+00	0.00E+00	0.00E+00												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD39	Node Section Haul Road Dust Emissions	RD39	0.00E+00	0.00E+00	0.00E+00												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD40	Node Section Haul Road Dust Emissions	RD40	4.88E-01	1.29E-01	1.29E-02												9.69E-03				3.66E-04	6.34E-05	1.42E-04	6.25E-02	1.21E-07	1.17E-02	1.31E-03	4.37E-05	2.75E-05	3.11E-03	1.01E-03
Haul Roads (Dust)	RD41	Node Section Haul Road Dust Emissions	RD41	1.81E-01	4.78E-02	4.78E-03												3.59E-03				1.36E-04	2.35E-05	5.28E-05	2.31E-02	4.48E-08	4.34E-03	4.84E-04	1.62E-05	1.02E-05	1.15E-03	3.76E-04
Haul Roads (Dust)	RD42	Node Section Haul Road Dust Emissions	RD42	1.29E-01	3.41E-02	3.41E-03												2.56E-03				9.65E-05	1.67E-05	3.76E-05	1.65E-02	3.19E-08	3.09E-03	3.45E-04	1.15E-05	7.26E-06	8.21E-04	2.68E-04
Haul Roads (Dust)	RD43	Node Section Haul Road Dust Emissions	RD43	2.20E-03	5.83E-04	5.83E-05												4.37E-05				1.65E-06	2.86E-07	6.43E-07	2.82E-04	5.46E-10	5.28E-05	5.90E-06	1.97E-07	1.24E-07	1.40E-05	4.58E-06
Haul Roads (Dust)	RD44	Node Section Haul Road Dust Emissions	RD44	3.30E-03	8.74E-04	8.74E-05												6.56E-05				2.48E-06	4.29E-07	9.64E-07	4.23E-04	8.19E-10	7.92E-05	8.85E-06	2.96E-07	1.86E-07	2.11E-05	6.87E-06
Haul Roads (Dust)	RD45	Node Section Haul Road Dust Emissions	RD45	2.12E-03	5.62E-04	5.62E-05												4.21E-05				1.59E-06	2.76E-07	6.20E-07	2.72E-04	5.26E-10	5.09E-05	5.69E-06	1.90E-07	1.20E-07	1.35E-05	4.42E-06
Haul Roads (Dust)	RD46	Node Section Haul Road Dust Emissions	RD46	2.59E-03	6.87E-04	6.87E-05												5.15E-05				1.95E-06	3.37E-07	7.58E-07	3.32E-04	6.43E-10	6.23E-05	6.95E-06	2.32E-07	1.46E-07	1.66E-05	5.40E-06
Haul Roads (Dust)	RD47	Node Section Haul Road Dust Emissions	RD47	8.96E-03	2.37E-03	2.37E-04												1.78E-04				6.72E-06	1.16E-06	2.62E-06	1.15E-03	2.22E-09	2.15E-04	2.40E-05	8.03E-07	5.05E-07	5.72E-05	1.86E-05
Haul Roads (Dust)	RD48	Node Section Haul Road Dust Emissions	RD48	2.65E-02	7.00E-03	7.00E-04												5.25E-04				1.98E-05	3.44E-06	7.73E-06	3.39E-03	6.56E-09	6.35E-04	7.09E-05	2.37E-06	1.49E-06	1.69E-04	5.50E-05
Haul Roads (Dust)	RD49	Node Section Haul Road Dust Emissions	RD49	1.38E-02	3.66E-03	3.66E-04												2.74E-04				1.04E-05	1.80E-06	4.04E-06	1.77E-03	3.43E-09	3.32E-04	3.71E-05	1.24E-06	7.80E-07	8.82E-05	2.88E-05
Haul Roads (Dust)	RD50	Node Section Haul Road Dust Emissions	RD50	2.52E-02	6.67E-03	6.67E-04												5.00E-04				1.89E-05	3.28E-06	7.36E-06	3.23E-03	6.25E-09	6.05E-04	6.75E-05	2.26E-06	1.42E-06	1.61E-04	5.24E-05
Haul Roads (Dust)	RD51	Node Section Haul Road Dust Emissions	RD51	4.25E-03	1.13E-03	1.13E-04												8.44E-05				3.19E-06	5.53E-07	1.24E-06	5.44E-04	1.05E-09	1.02E-04	1.14E-05	3.81E-07	2.40E-07	2.71E-05	8.84E-06
Haul Roads (Dust)	RD52	Node Section Haul Road Dust Emissions	RD52	2.45E-01	6.47E-02	6.47E-03												4.85E-03				1.83E-04	3.18E-05	7.14E-05	3.13E-02	6.06E-08	5.87E-03	6.55E-04	2.19E-05	1.38E-05	1.56E-03	5.09E-04
Haul Roads (Dust)	RD53	Node Section Haul Road Dust Emissions	RD53	1.12E-02	2.96E-03	2.96E-04												2.22E-04				8.40E-06	1.46E-06	3.27E-06	1.43E-03	2.78E-09	2.69E-04	3.00E-05	1.00E-06	6.32E-07	7.14E-05	2.33E-05
Haul Roads (Dust)	RD54	Node Section Haul Road Dust Emissions	RD54	1.07E-02	2.83E-03	2.83E-04												2.12E-04				8.02E-06	1.39E-06	3.12E-06	1.37E-03	2.65E-09	2.57E-04	2.87E-05	9.58E-07	6.03E-07	6.82E-05	2.22E-05
Haul Roads (Dust)	RD55	Node Section Haul Road Dust Emissions	RD55	2.41E-02	6.37E-03	6.37E-04												4.78E-04				1.80E-05	3.13E-06	7.03E-06	3.08E-03	5.97E-09	5.78E-04	6.45E-05	2.16E-06	1.36E-06	1.54E-04	5.01E-05
Haul Roads (Dust)	RD56	Node Section Haul Road Dust Emissions	RD56	1.07E-02	2.83E-03	2.83E-04												2.12E-04				8.02E-06	1.39E-06	3.12E-06	1.37E-03	2.65E-09	2.57E-04	2.87E-05	9.58E-07	6.03E-07	6.82E-05	2.22E-05
Haul Roads (Dust)	RD57	Node Section Haul Road Dust Emissions	RD57	6.68E-01	1.77E-01	1.77E-02												1.33E-02				5.01E-04	8.69E-05	1.95E-04	8.55E-02	1.66E-07	1.60E-02	1.79E-03	5.99E-05	3.77E-05	4.26E-03	1.39E-03
Haul Roads (Dust)	RD58	Node Section Haul Road Dust Emissions	RD58	8.61E-02	2.28E-02	2.28E-03												1.71E-03				6.46E-05	1.12E-05	2.51E-05	1.10E-02	2.14E-08	2.07E-03	2.31E-04	7.72E-06	4.86E-06	5.49E-04	1.79E-04
Haul Roads (Dust)	RD59	Node Section Haul Road Dust Emissions	RD59	1.75E-01	4.62E-02	4.62E-03												3.47E-03				1.31E-04	2.27E-05	5.10E-05	2.23E-02	4.33E-08	4.19E-03	4.68E-04	1.56E-05	9.85E-06	1.11E-03	3.63E-04
Haul Roads (Dust)	RD60	Node Section Haul Road Dust Emissions	RD60	2.44E-01	6.45E-02	6.45E-03												4.84E-03				1.83E-04	3.17E-05	7.11E-05	3.12E-02	6.04E-08	5.85E-03	6.53E-04	2.18E-05	1.37E-05	1.55E-03	5.07E-04
Haul Roads (Dust)	RD61	Node Section Haul Road Dust Emissions	RD61	3.50E-01	9.27E-02	9.27E-03												6.95E-03				2.63E-04	4.55E-05	1.02E-04	4.48E-02	8.69E-08	8.41E-03	9.39E-04	3.14E-05	1.98E-05	2.23E-03	7.29E-04
Haul Roads (Dust)	RD62	Node Section Haul Road Dust Emissions	RD62	1.81E-01	4.78E-02	4.78E-03												3.59E-03				1.36E-04	2.35E-05	5.28E-05	2.31E-02	4.48E-08	4.34E-03	4.84E-04	1.62E-05	1.02E-05	1.15E-03	3.76E-04
Haul Roads (Dust)	RD63	Node Section Haul Road Dust Emissions	RD63	0.00E+00	0.00E+00	0.00E+00												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD64	Node Section Haul Road Dust Emissions	RD64	0.00E+00	0.00E+00	0.00E+00												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD65	Node Section Haul Road Dust Emissions	RD65	0.00E+00	0.00E+00	0.00E+00												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Tailpipe)	RD1	Node Section Haul Road Tailpipe Emissions	RD1	1.06E-02	1.06E-02	1.06E-02	9.26E-01	8.88E-01	9.26E-01	9.26E-01	1.11E-03	1.11E-03						7.94E-04	4.02E-08	4.60E-04	1.68E-05											
Haul Roads (Tailpipe)	RD2	Node Section Haul Road Tailpipe Emissions	RD2	1.48E-02	1.48E-02	1.48E-02	1.30E+00	1.24E+00	1.30E+00	1.30E+00	1.56E-03	1.56E-03						1.11E-03	5.63E-08	6.44E-04	2.34E-05											
Haul Roads (Tailpipe)	RD3	Node Section Haul Road Tailpipe Emissions	RD3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD4	Node Section Haul Road Tailpipe Emissions	RD4	1.23E-02	1.23E-02	1.23E-02	1.07E+00	1.03E+00	1.07E+00	1.07E+00	1.29E-03	1.29E-03						9.21E-04	4.67E-08	5.34E-04	1.94E-05											
Haul Roads (Tailpipe)	RD5	Node Section Haul Road Tailpipe Emissions	RD5	8.87E-03	8.87E-03	8.87E-03	7.76E-01	7.44E-01	7.76E-01	7.76E-01	9.32E-04	9.32E-04						6.65E-04	3.37E-08	3.86E-04	1.40E-05											
Haul Roads (Tailpipe)	RD6	Node Section Haul Road Tailpipe Emissions	RD6	5.83E-05	5.83E-05	5.83E-05	5.10E-03	4.89E-03	5.10E-03	5.10E-03	6.13E-06	6.13E-06						4.37E-06	2.22E-10	2.53E-06	9.22E-08											
Haul Roads (Tailpipe)	RD7	Node Section Haul Road Tailpipe Emissions	RD7	4.04E-03	4.04E-03	4.04E-03	3.53E-01	3.38E-01	3.53E-01	3.53E-01	4.24E-04	4.24E-04						3.03E-04	1.53E-08	1.75E-04	6.39E-06											
Haul Roads (Tailpipe)	RD8	Node Section Haul Road Tailpipe Emissions	RD8	2.08E-03	2.08E-03	2.08E-03	1.82E-01	1.74E-01	1.82E-01	1.82E-01	2.18E-04	2.18E-04						1.56E-04	7.89E-09	9.02E-05	3.29E-06											
Haul Roads (Tailpipe)	RD9	Node Section Haul Road Tailpipe Emissions	RD9	6.33E-03	6.33E-03	6.33E-03	5.54E-01	5.31E-01	5.54E-01	5.54E-01	6.65E-04	6.65E-04						4.75E-04	2.41E-08	2.75E-04	1.00E-05											
Haul Roads (Tailpipe)	RD10	Node Section Haul Road Tailpipe Emissions	RD10	8.61E-03	8.61E-03	8.61E-03	7.53E-01	7.22E-01	7.53E-01	7.53E-01	9.04E-04	9.04E-04						6.45E-04	3.27E-08	3.74E-04	1.36E-05											
Haul Roads (Tailpipe)	RD11	Node Section Haul Road Tailpipe Emissions	RD11	1.92E-02	1.92E-02	1.92E-02	1.68E+00	1.61E+00	1.68E+00	1.68E+00	2.02E-03	2.02E-03						1.44E-03	7.30E-08	8.35E-04	3.04E-05											
Haul Roads (Tailpipe)	RD12	Node Section Haul Road Tailpipe Emissions	RD12	3.14E-03	3.14E-03	3.14E-03	2.75E-01	2.63E-01	2.75E-01	2.75E-01	3.30E-04	3.30E-04						2.35E-04	1.19E-08	1.36E-04	4.97E-06											
Haul Roads (Tailpipe)	RD13	Node Section Haul Road Tailpipe Emissions	RD13	2.12E-03	2.12E-03	2.12E-03	1.85E-01	1.77E-01	1.85E-01	1.85E-01	2.22E-04	2.22E-04						1.59E-04	8.04E-09	9.20E-05	3.35E-06											
Haul Roads (Tailpipe)	RD14	Node Section Haul Road Tailpipe Emissions	RD14	4.29E-04	4.29E-04	4.29E-04	3.76E-02	3.60E-02	3.76E-02	3.76E-02	4.51E-05	4.51E-05						3.22E-05	1.63E-09	1.87E-05	6.80E-07											
Haul Roads (Tailpipe)	RD15	Node Section Haul Road Tailpipe Emissions	RD15	2.94E-03	2.94E-03	2.94E-03	2.57E-01	2.46E-01	2.57E-01	2.57E-01	3.09E-04	3.09E-04						2.20E-04	1.12E-08	1.28E-04	4.65E-06											
Haul Roads (Tailpipe)	RD16	Node Section Haul Road Tailpipe Emissions	RD16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD17	Node Section Haul Road Tailpipe Emissions	RD17	1.02E-03	1.02E-03	1.02E-03	8.93E-02	8.56E-02	8.93E-02	8.93E-02	1.07E-04	1.07E-04						7.66E-05	3.88E-09	4.44E-05	1.62E-06											
Haul Roads (Tailpipe)	RD18	Node Section Haul Road Tailpipe Emissions	RD18	1.58E-03	1.58E-03	1.58E-03	1.39E-01	1.33E-01	1.39E-01	1.39E-01	1.66E-04	1.66E-04						1.19E-04	6.02E-09	6.88E-05	2.51E-06											
Haul Roads (Tailpipe)	RD19	Node Section Haul Road Tailpipe Emissions	RD19	5.93E-05	5.93E-05	5.93E-05	5.19E-03	4.97E-03	5.19E-03	5.19E-03	6.24E-06	6.24E-06						4.45E-06	2.26E-10	2.58E-06	9.39E-08											
Haul Roads (Tailpipe)	RD20	Node Section Haul Road Tailpipe Emissions	RD20	5.43E-05	5.43E-05	5.43E-05	4.75E-03	4.55E-03	4.75E-03	4.75E-03	5.71E-06	5.71E-06						4.07E-06	2.06E-10	2.36E-06	8.59E-08											
Haul Roads (Tailpipe)	RD21	Node Section Haul Road Tailpipe Emissions	RD21	2.46E-03	2.46E-03	2.46E-03	2.15E-01	2.06E-01	2.15E-01	2.15E-01	2.58E-04	2.58E-04						1.84E-04	9.35E-09	1.07E-04	3.89E-06											
Haul Roads (Tailpipe)	RD22	Node Section Haul Road Tailpipe Emissions	RD22	8.27E-04	8.27E-04	8.27E-04	7.24E-02	6.93E-02	7.24E-02	7.24E-02	8.69E-05	8.69E-05						6.20E-05	3.14E-09	3.60E-05	1.31E-06											
Haul Roads (Tailpipe)	RD23	Node Section Haul Road Tailpipe Emissions	RD23	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD24	Node Section Haul Road Tailpipe Emissions	RD24	1.15E-03	1.15E-03	1.15E-03	1.01E-01	9.64E-02	1.01E-01	1.01E-01	1.21E-04	1.21E-04						8.63E-05	4.37E-09	5.00E-05	1.82E-06											
Haul Roads (Tailpipe)	RD25	Node Section Haul Road Tailpipe Emissions	RD25	1.16E-03	1.16E-03	1.16E-03	1.01E-01	9.73E-02	1.01E-01	1.01E-01	1.22E-04	1.22E-04						8.70E-05	4.41E-09	5.04E-05	1.84E-06											
Haul Roads (Tailpipe)	RD26	Node Section Haul Road Tailpipe Emissions	RD26	2.85E-04	2.85E-04	2.85E-04	2.49E-02	2.39E-02	2.49E-02	2.49E-02	3.00E-05	3.00E-05						2.14E-05	1.08E-09	1.24E-05	4.51E-07											
Haul Roads (Tailpipe)	RD27	Node Section Haul Road Tailpipe Emissions	RD27	9.24E-05	9.24E-05	9.24E-05	8.09E-03	7.75E-03	8.09E-03	8.09E-03	9.71E-06	9.71E-06						6.93E-06	3.51E-10	4.02E-06	1.46E-07											
Haul Roads (Tailpipe)	RD28	Node Section Haul Road Tailpipe Emissions	RD28	1.45E-03	1.45E-03	1.45E-03	1.27E-01	1.21E-01	1.27E-01	1.27E-01	1.52E-04	1.52E-04						1.09E-04	5.50E-09	6.29E-05	2.29E-06											
Haul Roads (Tailpipe)	RD29	Node Section Haul Road Tailpipe Emissions	RD29	2.86E-03	2.86E-03	2.86E-03	2.51E-01	2.40E-01	2.51E-01	2.51E-01	3.01E-04	3.01E-04						2.15E-04	1.09E-08	1.24E-04	4.53E-06											
Haul Roads (Tailpipe)	RD30	Node Section Haul Road Tailpipe Emissions	RD30	8.18E-04	8.18E-04	8.18E-04	7.16E-02	6.86E-02	7.16E-02	7.16E-02	8.60E-05	8.60E-05						6.14E-05	3.11E-09	3.56E-05	1.30E-06											
Haul Roads (Tailpipe)	RD31	Node Section Haul Road Tailpipe Emissions	RD31	1.95E-04	1.95E-04	1.95E-04	1.71E-02	1.64E-02	1.71E-02	1.71E-02	2.05E-05	2.05E-05						1.46E-05	7.42E-10	8.49E-06	3.09E-07											
Haul Roads (Tailpipe)	RD32	Node Section Haul Road Tailpipe Emissions	RD32	5.77E-03	5.77E-03	5.77E-03	5.05E-01	4.84E-01	5.05E-01	5.05E-01	6.06E-04	6.06E-04						4.33E-04	2.19E-08	2.51E-04	9.13E-06											
Haul Roads (Tailpipe)	RD33	Node Section Haul Road Tailpipe Emissions	RD33	3.51E-04	3.51E-04	3.51E-04	3.07E-02	2.94E-02	3.07E-02	3.07E-02	3.69E-05	3.69E-05						2.63E-05	1.33E-09	1.52E-05	5.55E-07											
Haul Roads (Tailpipe)	RD34	Node Section Haul Road Tailpipe Emissions	RD34	1.04E-03	1.04E-03	1.04E-03	9.06E-02	8.68E-02	9.06E-02	9.06E-02	1.09E-04	1.09E-04						7.77E-05	3.94E-09	4.50E-05	1.64E-06											
Haul Roads (Tailpipe)	RD35	Node Section Haul Road Tailpipe Emissions	RD35	2.70E-06	2.70E-06	2.70E-06	2.36E-04	2.27E-04	2.36E-04	2.36E-04	2.84E-07	2.84E-07						2.03E-07	1.03E-11	1.17E-07	4.28E-09											
Haul Roads (Tailpipe)	RD36	Node Section Haul Road Tailpipe Emissions	RD36	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD37	Node Section Haul Road Tailpipe Emissions	RD37	6.72E-04	6.72E-04	6.72E-04	5.88E-02	5.64E-02	5.88E-02	5.88E-02	7.07E-05	7.07E-05						5.04E-05	2.56E-09	2.92E-05	1.06E-06											
Haul Roads (Tailpipe)	RD38	Node Section Haul Road Tailpipe Emissions	RD38	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD39	Node Section Haul Road Tailpipe Emissions	RD39	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD40	Node Section Haul Road Tailpipe Emissions	RD40	1.13E-03	1.13E-03	1.13E-03	9.85E-02	9.44E-02	9.85E-02	9.85E-02	1.18E-04	1.18E-04						8.45E-05	4.28E-09	4.90E-05	1.78E-06											
Haul Roads (Tailpipe)	RD41	Node Section Haul Road Tailpipe Emissions	RD41	4.17E-04	4.17E-04	4.17E-04	3.65E-02	3.50E-02	3.65E-02	3.65E-02	4.38E-05	4.38E-05						3.13E-05	1.59E-09	1.81E-05	6.60E-07											
Haul Roads (Tailpipe)	RD42	Node Section Haul Road Tailpipe Emissions	RD42	2.97E-04	2.97E-04	2.97E-04	2.60E-02	2.49E-02	2.60E-02	2.60E-02	3.12E-05	3.12E-05						2.23E-05	1.13E-09	1.29E-05	4.70E-07											
Haul Roads (Tailpipe)	RD43	Node Section Haul Road Tailpipe Emissions	RD43	5.08E-06	5.08E-06	5.08E-06	4.45E-04	4.26E-04	4.45E-04	4.45E-04	5.34E-07	5.34E-07						3.81E-07	1.93E-11	2.21E-07	8.04E-09											
Haul Roads (Tailpipe)	RD44	Node Section Haul Road Tailpipe Emissions	RD44	7.62E-06	7.62E-06	7.62E-06	6.67E-04	6.39E-04	6.67E-04	6.67E-04	8.01E-07	8.01E-07						5.72E-07	2.90E-11	3.31E-07	1.21E-08											
Haul Roads (Tailpipe)	RD45	Node Section Haul Road Tailpipe Emissions	RD45	4.90E-06	4.90E-06	4.90E-06	4.29E-04	4.11E-04	4.29E-04	4.29E-04	5.15E-07	5.15E-07						3.67E-07	1.86E-11	2.13E-07	7.75E-09											
Haul Roads (Tailpipe)	RD46	Node Section Haul Road Tailpipe Emissions	RD46	5.99E-06	5.99E-06	5.99E-06	5.24E-04	5.02E-04	5.24E-04	5.24E-04	6.29E-07	6.29E-07						4.49E-07	2.28E-11	2.60E-07	9.48E-09											
Haul Roads (Tailpipe)	RD47	Node Section Haul Road Tailpipe Emissions	RD47	2.07E-05	2.07E-05	2.07E-05	1.81E-03	1.73E-03	1.81E-03	1.81E-03	2.17E-06	2.17E-06						1.55E-06	7.86E-11	8.99E-07	3.27E-08											
Haul Roads (Tailpipe)	RD48	Node Section Haul Road Tailpipe Emissions	RD48	6.11E-05	6.11E-05	6.11E-05	5.34E-03	5.12E-03	5.34E-03	5.34E-03	6.42E-06	6.42E-06						4.58E-06	2.32E-10	2.65E-06	9.67E-08											
Haul Roads (Tailpipe)	RD49	Node Section Haul Road Tailpipe Emissions	RD49	3.19E-05	3.19E-05	3.19E-05	2.79E-03	2.68E-03	2.79E-03	2.79E-03	3.35E-06	3.35E-06						2.39E-06	1.21E-10	1.39E-06	5.05E-08											
Haul Roads (Tailpipe)	RD50	Node Section Haul Road Tailpipe Emissions	RD50	5.82E-05	5.82E-05	5.82E-05	5.09E-03	4.88E-03	5.09E-03	5.09E-03	6.11E-06	6.11E-06						4.36E-06	2.21E-10	2.53E-06	9.21E-08											
Haul Roads (Tailpipe)	RD51	Node Section Haul Road Tailpipe Emissions	RD51	9.81E-06	9.81E-06	9.81E-06	8.59E-04	8.23E-04	8.59E-04	8.59E-04	1.03E-06	1.03E-06						7.36E-07	3.73E-11	4.27E-07	1.55E-08											
Haul Roads (Tailpipe)	RD52	Node Section Haul Road Tailpipe Emissions	RD52	5.64E-04	5.64E-04	5.64E-04	4.94E-02	4.73E-02	4.94E-02	4.94E-02	5.93E-05	5.93E-05						4.23E-05	2.15E-09	2.45E-05	8.93E-07											
Haul Roads (Tailpipe)	RD53	Node Section Haul Road Tailpipe Emissions	RD53	2.58E-05	2.58E-05	2.58E-05	2.26E-03	2.17E-03	2.26E-03	2.26E-03	2.72E-06	2.72E-06						1.94E-06	9.83E-11	1.12E-06	4.09E-08											
Haul Roads (Tailpipe)	RD54	Node Section Haul Road Tailpipe Emissions	RD54	2.47E-05	2.47E-05	2.47E-05	2.16E-03	2.07E-03	2.16E-03	2.16E-03	2.59E-06	2.59E-06						1.85E-06	9.38E-11	1.07E-06	3.91E-08											
Haul Roads (Tailpipe)	RD55	Node Section Haul Road Tailpipe Emissions	RD55	5.55E-05	5.55E-05	5.55E-05	4.86E-03	4.66E-03	4.86E-03	4.86E-03	5.84E-06	5.84E-06						4.17E-06	2.11E-10	2.41E-06	8.79E-08											
Haul Roads (Tailpipe)	RD56	Node Section Haul Road Tailpipe Emissions	RD56	2.47E-05	2.47E-05	2.47E-05	2.16E-03	2.07E-03	2.16E-03	2.16E-03	2.59E-06	2.59E-06						1.85E-06	9.38E-11	1.07E-06	3.91E-08											
Haul Roads (Tailpipe)	RD57	Node Section Haul Road Tailpipe Emissions	RD57	1.54E-03	1.54E-03	1.54E-03	1.35E-01	1.29E-01	1.35E-01	1.35E-01	1.62E-04	1.62E-04						1.16E-04	5.86E-09	6.71E-05	2.44E-06											
Haul Roads (Tailpipe)	RD58	Node Section Haul Road Tailpipe Emissions	RD58	1.99E-04	1.99E-04	1.99E-04	1.74E-02	1.67E-02	1.74E-02	1.74E-02	2.09E-05	2.09E-05						1.49E-05	7.56E-10	8.64E-06	3.15E-07											
Haul Roads (Tailpipe)	RD59	Node Section Haul Road Tailpipe Emissions	RD59	4.03E-04	4.03E-04	4.03E-04	3.53E-02	3.38E-02	3.53E-02	3.53E-02	4.24E-05	4.24E-05						3.02E-05	1.53E-09	1.75E-05	6.38E-07											
Haul Roads (Tailpipe)	RD60	Node Section Haul Road Tailpipe Emissions	RD60	5.62E-04	5.62E-04	5.62E-04	4.92E-02	4.71E-02	4.92E-02	4.92E-02	5.91E-05	5.91E-05						4.22E-05	2.14E-09	2.44E-05	8.90E-07											
Haul Roads (Tailpipe)	RD61	Node Section Haul Road Tailpipe Emissions	RD61	8.08E-04	8.08E-04	8.08E-04	7.07E-02	6.78E-02	7.07E-02	7.07E-02	8.50E-05	8.50E-05						6.06E-05	3.07E-09	3.51E-05	1.28E-06											
Haul Roads (Tailpipe)	RD62	Node Section Haul Road Tailpipe Emissions	RD62	4.17E-04	4.17E-04	4.17E-04	3.65E-02	3.50E-02	3.65E-02	3.65E-02	4.38E-05	4.38E-05						3.13E-05	1.59E-09	1.81E-05	6.60E-07											
Haul Roads (Tailpipe)	RD63	Node Section Haul Road Tailpipe Emissions	RD63	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD64	Node Section Haul Road Tailpipe Emissions	RD64	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD65	Node Section Haul Road Tailpipe Emissions	RD65	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Wind Erosion	WE NPAG	Wind Erosion NPAG Stockpile	WE NPAG	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE PAG	Wind Erosion PAG Stockpile	WE PAG	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE LGOW	Wind Erosion LGO Stockpile West	WE LGOW	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE LGOE	Wind Erosion LGO Stockpile East	WE LGOE	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE OVB1	Wind Erosion Overburden #1	WE OVB1	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE OVB2	Wind Erosion Overburden #2	WE OVB2	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE OVB3	Wind Erosion Overburden #3	WE OVB3	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE OVB5	Wind Erosion Overburden #5	WE OVB5	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE OVB6	Wind Erosion Overburden #6	WE OVB6	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE TMF	Wind Erosion TMF Facility	WE TMF	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE ROM	Wind Erosion ROM Stockpile	WE ROM	1.11E-02	5.56E-03	4.17E-03												4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Assay Lab	AL_DC	Assay Lab Dust Collector	AL_DC	8.50E-02	4.42E-02	2.61E-02												3.31E-03				1.46E-03	1.96E-04	5.03E-04	1.39E-01	3.69E-07	2.73E-02	2.86E-03	3.75E-04	2.83E-02	7.54E-03	4.22E-03
Assay Lab	AL_FURN	Assay Lab Fire Assay Propane Furnace and Drying Oven	AL_FURN				5.50E-03	5.50E-03																								
Portable Crusher	PRC_Q	Quarry Portable Crusher	PRC_Q	3.52E-01	1.76E-01	8.80E-02												1.32E-02				2.64E-04	4.57E-05	1.03E-04	4.50E-02	8.72E-08	8.44E-03	9.43E-04	3.15E-05	1.98E-05	2.24E-03	7.32E-04
Portable Crusher	PRC_CRF	CRF Portable Crusher	PRC_CRF	1.17E-01	5.86E-02	2.93E-02												4.40E-03				8.80E-05	1.52E-05	3.42E-05	1.50E-02	2.91E-08	2.81E-03	3.14E-04	1.05E-05	6.61E-06	7.48E-04	2.44E-04

Table B-3: Construction Phase - List of Primary Emissions Control Equipment

Source ID	Source Description	Make & Model	Flowrate (acfm)	Flowrate (m3/s)
Emissions Controls				
BH1_JC	Baghouse for jaw crusher	Not yet identified. Will be consistent with specifications	6000	2.8
BH2_PC	Baghouse for pebble crusher	Not yet identified. Will be consistent with specifications	2000	0.9
BH3_AF1	Baghouse for apron feeder	Not yet identified. Will be consistent with specifications	1250	0.6
BH4_AF2	Baghouse for apron feeder	Not yet identified. Will be consistent with specifications	1250	0.6
BH5_AF3	Baghouse for apron feeder	Not yet identified. Will be consistent with specifications	1250	0.6
BH6_TP	Baghouse for transfer point (sacrificial to stockpile feed conveyor)	Not yet identified. Will be consistent with specifications	9000	4.2
LIME	Baghouse for lime silo	Not yet identified. Will be consistent with specifications	5000	2.4
LS	Copper sulphate filter	Not yet identified. Will be consistent with specifications	5000	2.4
FLOCC	Flocculant dust collector	Not yet identified. Will be consistent with specifications	5000	2.4
FURN	Furnace dust collector	Not yet identified. Will be consistent with specifications	10000	4.7
EWIN	Electrowinning Area Exhaust Fan	Not yet identified. Will be consistent with specifications	5000	2.4
LS	Lime Slaking Scrubber	Not yet identified. Will be consistent with specifications	5000	2.4

Table B-4: Operations Phase Source and Contaminant Identification Table

Source Information				Expected Contaminants	Included in Model?
Source	Source ID	Source Description	General Location		Significant (Yes or No?)
Drill	Q1_D	Quarry #1 - Drilling	Quarry Source 1+2	PM, Silica, metals	Yes
Drill	Q2_D	Quarry #2 - Drilling	Quarry Source 1+2	PM, Silica, metals	Yes
Drill	LPC_D	Open Pit Mining - Drilling	LP Central Pit	PM, Silica, metals	Yes
Drill	VP_D	Open Pit Mining - Drilling	Viggo Pit	PM, Silica, metals	Yes
Blast	Q1_B	Quarry #1 - Blasting	Quarry Source 1+2	PM, Silica, Metals, NOx, SO2, CO, NH3	Yes
Blast	Q2_B	Quarry #2 - Blasting	Quarry Source 1+2	PM, Silica, Metals, NOx, SO2, CO, NH3	Yes
Blast	LPC_B	Open Pit Mining - Blasting	LP Central Pit	PM, Silica, Metals, NOx, SO2, CO, NH3	Yes
Blast	VP_B	Open Pit Mining - Blasting	Viggo Pit	PM, Silica, Metals, NOx, SO2, CO, NH3	Yes
Material Handling	MH_ANPAG	Material Handling at AEX NPAG	AEX NPAG	PM, Silica, Metals	Yes
Material Handling	MH_APAG	Material Handling at AEX PAG	AEX PAG	PM, Silica, Metals	Yes
Material Handling	MH_APRTL	Material Handling at AEX Portal	AEX Portal	PM, Silica, Metals	Yes
Material Handling	MH_BS1	Material Handling at Borrow Source #1	Borrow Source #1	PM, Silica, Metals	Yes
Material Handling	MH_BS3	Material Handling at Borrow Source #3	Borrow Source #3	PM, Silica, Metals	Yes
Material Handling	MH_BS3B	Material Handling at Borrow Source #3BS3B	Borrow Source #3BS3B	PM, Silica, Metals	Yes
Material Handling	MH_COS	Material Handling at Coarse Ore Storage	Coarse Ore Storage	PM, Silica, Metals	Yes
Material Handling	MH_CRUSH	Material Handling at Crusher	Crusher	PM, Silica, Metals	Yes
Material Handling	MH_CWP1	Material Handling at CWP #1 Dam	CWP #1	PM, Silica, Metals	Yes
Material Handling	MH_CWP2	Material Handling at CWP #2 (Sump #1)	CWP #2	PM, Silica, Metals	Yes
Material Handling	MH_CWP3	Material Handling at CWP #3 (Sump #2)	CWP#3	PM, Silica, Metals	Yes
Material Handling	MH_DVC1	Material Handling at Diversion Channel #1	Diversion Channel #1	PM, Silica, Metals	Yes
Material Handling	MH_DVC2	Material Handling at Diversion Channel #2	Diversion Channel #2	PM, Silica, Metals	Yes
Material Handling	MH_DCB	Material Handling at Dixie Creek Berm	Dixie Creek Berm	PM, Silica, Metals	Yes
Material Handling	MH_ROAD	Material Handling at Haul Roads	Haul Roads	PM, Silica, Metals	Yes
Material Handling	MH_IFP	Material Handling at Infrastructure Pad	Infrastructure Pad	PM, Silica, Metals	Yes
Material Handling	MH_LGOE	Material Handling at LGO Stockpile - East (#2)	LGO Stockpile East #2	PM, Silica, Metals	Yes
Material Handling	MH_LGOW	Material Handling at LGO Stockpile - West (#1)	LGO Stockpile West #1	PM, Silica, Metals	Yes
Material Handling	MH_LPC	Material Handling at LP Central	LP Central Pit	PM, Silica, Metals	Yes
Material Handling	MH_MWP	Material Handling at MWP Pond Dam	MWP Pond Dam	PM, Silica, Metals	Yes
Material Handling	MH_TND	Material Handling at North Dam	North Dam	PM, Silica, Metals	Yes
Material Handling	MH_NPAG	Material Handling at NPAG Stockpile	NPAG Stockpile	PM, Silica, Metals	Yes
Material Handling	MH_OVB1	Material Handling at Overburden #1	Overburden #1	PM, Silica, Metals	Yes
Material Handling	MH_OVB2	Material Handling at Overburden #2	Overburden #2	PM, Silica, Metals	Yes
Material Handling	MH_OVB3	Material Handling at Overburden #3	Overburden #3	PM, Silica, Metals	Yes
Material Handling	MH_OVB5	Material Handling at Overburden #5	Overburden #5	PM, Silica, Metals	Yes
Material Handling	MH_OVB6	Material Handling at Overburden #6	Overburden #6	PM, Silica, Metals	Yes
Material Handling	MH_PAG	Material Handling at PAG Stockpile	PAG Stockpile	PM, Silica, Metals	Yes
Material Handling	MH_PSTP	Material Handling at Paste Plant	Paste Plant	PM, Silica, Metals	Yes
Material Handling	MH_PRCP	Material Handling at Process Plant	Process Plant	PM, Silica, Metals	
Material Handling	MH_Q1	Material Handling at Quarry #1	Quarry #1	PM, Silica, Metals	Yes
Material Handling	MH_Q2	Material Handling at Quarry #2	Quarry #2	PM, Silica, Metals	Yes
Material Handling	MH_ROM	Material Handling at ROM Stockpile	ROM Stockpile	PM, Silica, Metals	Yes
Material Handling	MH_SHAFT	Material Handling at Shaft	Shaft	PM, Silica, Metals	Yes
Material Handling	MH_TSD	Material Handling at South Dam	South Dam	PM, Silica, Metals	Yes
Material Handling	MH_TSDS	Material Handling at South Dam - spillway	South Dam Spillway	PM, Silica, Metals	Yes
Material Handling	MH_TPIPE	Material Handling at Tailings Pipeline	Tailings Pipeline	PM, Silica, Metals	Yes
Material Handling	MH_TMF	Material Handling at TMF Facility	TMF Facility	PM, Silica, Metals	Yes
Material Handling	MH_TPD	Material Handling at TMF Pond Dam	TMF Pond Dam	PM, Silica, Metals	Yes
Material Handling	MH_VP	Material Handling at Viggo Pit	Viggo Pit	PM, Silica, Metals	Yes
Material Handling	MH_TWD	Material Handling at West Dam	West Dam	PM, Silica, Metals	Yes
Dozer	DZ_ANPAG	Dozer at AEX NPAG	AEX NPAG	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_APAG	Dozer at AEX PAG	AEX PAG	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_APRTL	Dozer at AEX Portal	AEX Portal	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_BS1	Dozer at Borrow Source #1	Borrow Source #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_BS3	Dozer at Borrow Source #3	Borrow Source #3	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_BS3B	Dozer at Borrow Source #3BS3B	Borrow Source #3BS3B	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_COS	Dozer at Coarse Ore Storage	Coarse Ore Storage	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_CRUSH	Dozer at Crusher	Crusher	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_CWP1	Dozer at CWP #1 Dam	CWP #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_CWP2	Dozer at CWP #2 (Sump #1)	CWP #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_CWP3	Dozer at CWP #3 (Sump #2)	CWP#3	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_DVC1	Dozer at Diversion Channel #1	Diversion Channel #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_DVC2	Dozer at Diversion Channel #2	Diversion Channel #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_DCB	Dozer at Dixie Creek Berm	Dixie Creek Berm	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_ROAD	Dozer at Haul Roads	Haul Roads	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_IFP	Dozer at Infrastructure Pad	Infrastructure Pad	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_LGOE	Dozer at LGO Stockpile - East (#2)	LGO Stockpile East #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_LGOW	Dozer at LGO Stockpile - West (#1)	LGO Stockpile West #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_LPC	Dozer at LP Central	LP Central Pit	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_MWP	Dozer at MWP Pond Dam	MWP Pond Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TND	Dozer at North Dam	North Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_NPAG	Dozer at NPAG Stockpile	NPAG Stockpile	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB1	Dozer at Overburden #1	Overburden #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB2	Dozer at Overburden #2	Overburden #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB3	Dozer at Overburden #3	Overburden #3	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB5	Dozer at Overburden #5	Overburden #5	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_OVB6	Dozer at Overburden #6	Overburden #6	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_PAG	Dozer at PAG Stockpile	PAG Stockpile	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_PSTP	Dozer at Paste Plant	Paste Plant	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_PRCP	Dozer at Process Plant	Process Plant	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_Q1	Dozer at Quarry #1	Quarry #1	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_Q2	Dozer at Quarry #2	Quarry #2	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_ROM	Dozer at ROM Stockpile	ROM Stockpile	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_SHAFT	Dozer at Shaft	Shaft	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TSD	Dozer at South Dam	South Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TSDS	Dozer at South Dam - spillway	South Dam Spillway	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TPIPE	Dozer at Tailings Pipeline	Tailings Pipeline	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TMF	Dozer at TMF Facility	TMF Facility	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TPD	Dozer at TMF Pond Dam	TMF Pond Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_VP	Dozer at Viggo Pit	Viggo Pit	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Dozer	DZ_TWD	Dozer at West Dam	West Dam	PM, Silica, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_Q1	Quarry 1 Tailpipe Emissions	Quarry 1	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_Q2	Quarry 2 Tailpipe Emissions	Quarry 2	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_LPC	LP Central Pit Tailpipe Emissions	LP Central Pit	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_VP	Viggo Pit Tailpipe Emissions	Viggo Pit	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_BS1	Borrow Source 1 Tailpipe Emissions	Borrow Source 1	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_BS3	Borrow Source 3 Tailpipe Emissions	Borrow Source 3B	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_BS3B	Borrow Source 3B Tailpipe Emissions	Borrow Source 3B	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Equipment (Tailpipe)	TP_TMF	TMF Tailpipe Emissions	TMF	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Concrete	BATCH	Batch Plant	Concrete Batch Plant	PM, Silica, Metals	Yes
Concrete	CRF	CRF Plant	CRF Plant	PM, Silica, Metals	Yes
Concrete	PASTE	Paste Plant	Paste Plant	PM, Silica, Metals	Yes
Major Baghouses	BH1_JC	Baghouse for jaw crusher	Primary Crusher	PM, Silica, Metals	Yes
Major Baghouses	BH2_PC	Baghouse for pebble crusher	Mill Crushing	PM, Silica, Metals	Yes
Major Baghouses	BH3_AF1	Baghouse for apron feeder	Apron Feeder	PM, Silica, Metals	Yes
Major Baghouses	BH4_AF2	Baghouse for apron feeder	Apron Feeder	PM, Silica, Metals	Yes
Major Baghouses	BH5_AF3	Baghouse for apron feeder	Apron Feeder	PM, Silica, Metals	Yes
Major Baghouses	BH6_TP	Baghouse for transfer point (sacrificial to stockpile feed conveyor)	Transfer Point	PM, Silica, Metals	Yes
Process Plant - Leach	LEACH	Leach Tanks 1-6	Process Plant	HCN	Yes
Process Plant - Lime	LIME	exhaust for lime bin dust collector	Process Plant	PM, CaO, Metals	Yes
Process Plant - Lime	LS	scrubber for lime slaker	Process Plant	PM, CaO, Metals	Yes
Process Plant - Gold Recovery Area	FLOCC	flocculant handling cartridge filter	Process Plant	PM, Silica, Metals	Yes
Process Plant - Gold Recovery Area	CUSO4	CuSO4 dust filter	Process Plant	CuSO4, PM, Silica, Metals	Yes
Process Plant - Gold Recovery Area	SMBS	SMBS dust collector	Process Plant	PM, Silica, Metals	Yes
Process Plant - Gold Recovery Area	CMIX	Cyanide Mix Ventilation	Process Plant	HCN	Yes
Process Plant - Gold Recovery Area	FURN	Baghouse for Induction Furnace	Process Plant	PM	Yes
CN-Dest	HCND1	CN Destruction Tank	Process Plant	SO2	No: closed process
Natural Gas Substation	NGG1	Natural Gas Generator Emissions	Substation	NOx	Yes
Natural Gas Substation	NGG2	Natural Gas Generator Emissions	Substation	NOx	Yes
Natural Gas Substation	NGG3	Natural Gas Generator Emissions	Substation	NOx	Yes
Natural Gas Substation	NGG4	Natural Gas Generator Emissions	Substation	NOx	Yes
Natural Gas Substation	NGG5	Natural Gas Generator Emissions	Substation	NOx	Yes
Natural Gas Substation	NGG6	Natural Gas Generator Emissions	Substation	NOx	Yes
Natural Gas Substation	NGG7	Natural Gas Generator Emissions	Substation	NOx	Yes
Natural Gas Substation	NGG8	Natural Gas Generator Emissions	Substation	NOx	Yes
Natural Gas Substation	NGG9	Natural Gas Generator Emissions	Substation	NOx	Yes
Ventilation	AEX_NG	Natural Gas Heating Emissions	AEX	NOx	Yes
Ventilation	DISC_NG	Natural Gas Heating Emissions	Discovery Portal	NOx	Yes
Ventilation	LP1_NG	Natural Gas Heating Emissions	LP Central Pit	NOx	Yes
General Generators	DG1	TMF Dam Raises Generator	TMF Dam	NOx, SO2, CO, PM	Yes
General Generators	DG2	Water Intake Dixie Creek Generator	Dixie Creek	NOx, SO2, CO, PM	Yes
General Generators	DG3	Explosives Storage Generator	Explosives Storage Area	NOx, SO2, CO, PM	Yes
General Generators	DG4	Explosives Magazine Generator	Explosives Magazine Area	NOx, SO2, CO, PM	Yes
General Generators	DG5	Water Effluent - Booster Pump Generator	Effluent Corridor	NOx, SO2, CO, PM	Yes
General Generators	DG6	Water Booster Pump PSV Generator	Effluent Corridor	NOx, SO2, CO, PM	Yes
General Generators	DG7	Quarry Power & Dewatering Generator	Quarry Source 1+2	NOx, SO2, CO, PM	Yes
General Generators	DG8	Shaft Construction Generator	Shaft	NOx, SO2, CO, PM	Yes
General Generators	ADG1	AEX DG1	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG2	AEX DG2	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG3	AEX DG3	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG4	AEX DG4	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG5	AEX DG5	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG6	AEX DG6	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG7	AEX DG7	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG8	AEX DG8	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG9	AEX DG9	AEX	NOx, SO2, CO, PM	Yes

Table B-4: Operations Phase Source and Contaminant Identification Table

General Generators	ADG10	AEX DG10	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG11	AEX DG11	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG12	AEX DG12	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG13	AEX DG13	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG14	AEX DG14	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG15	AEX DG15	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG16	AEX DG16	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG17	AEX DG17	AEX	NOx, SO2, CO, PM	Yes
General Generators	ADG18	AEX DG18	AEX	NOx, SO2, CO, PM	Yes
Haul Roads (Dust)	RD1	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD2	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD3	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD4	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD5	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD6	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD7	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD8	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD9	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD10	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD11	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD12	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD13	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD14	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD15	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD16	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD17	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD18	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD19	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD20	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD21	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD22	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD23	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD24	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD25	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD26	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD27	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD28	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD29	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD30	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD31	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD32	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD33	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD34	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD35	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD36	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD37	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD38	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD39	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD40	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD41	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD42	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD43	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD44	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD45	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD46	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD47	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD48	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD49	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD50	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD51	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD52	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD53	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD54	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD55	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD56	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD57	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD58	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD59	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD60	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD61	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD62	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD63	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD64	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Dust)	RD65	Node Section Haul Road Dust Emissions	Haul Roads	PM, Silica, Metals	Yes
Haul Roads (Tailpipe)	RD1	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD2	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD3	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD4	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD5	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD6	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD7	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD8	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD9	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD10	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD11	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD12	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD13	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD14	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD15	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD16	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD17	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD18	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD19	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD20	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD21	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD22	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD23	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD24	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD25	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD26	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD27	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD28	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD29	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD30	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD31	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD32	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD33	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD34	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD35	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD36	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD37	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD38	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD39	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD40	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD41	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD42	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD43	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD44	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD45	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD46	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD47	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD48	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD49	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD50	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD51	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD52	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD53	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD54	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD55	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD56	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD57	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD58	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD59	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD60	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD61	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD62	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD63	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD64	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Haul Roads (Tailpipe)	RD65	Node Section Haul Road Tailpipe Emissions	Haul Roads	PM, NOx, SO2, CO, VOCs, PAHs	Yes
Wind Erosion	WE_NPAG	Wind Erosion NPAG Stockpile	NPAG Stockpile	PM, Silica, Metals	Yes
Wind Erosion	WE_PAG	Wind Erosion PAG Stockpile	PAG Stockpile	PM, Silica, Metals	Yes
Wind Erosion	WE_LGOW	Wind Erosion LGO Stockpile West	LGO Stockpile - Small	PM, Silica, Metals	Yes
Wind Erosion	WE_LGOE	Wind Erosion LGO Stockpile East	LGO Stockpile - Big	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB1	Wind Erosion Overburden #1	Overburden #1	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB2	Wind Erosion Overburden #2	Overburden #2	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB3	Wind Erosion Overburden #3	Overburden #3	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB5	Wind Erosion Overburden #5	Overburden #5	PM, Silica, Metals	Yes
Wind Erosion	WE_OVB6	Wind Erosion Overburden #6	Overburden #6	PM, Silica, Metals	Yes
Wind Erosion	WE_TMF	Wind Erosion TMF Facility	TMF Facility	PM, Silica, Metals	Yes
Wind Erosion	WE_ROM	Wind Erosion ROM Stockpile	ROM Stockpile	PM, Silica, Metals	Yes
Assay Lab	AL_DC	Assay Lab Dust Collector	Assay Lab	PM, Silica, Metals	Yes
Assay Lab	AL_FURN	Assay Lab Fire Assay Propane Furnace and Drying Oven	Assay Lab	NOx	Yes
Portable Crusher	PRC_Q	Quarry Portable Crusher	Quarry	PM, Silica, Metals	Yes
Portable Crusher	PRC_CRF	CRF Portable Crusher	CRF Plant	PM, Silica, Metals	Yes

Table B-5: Operations Phase - Source Summary

Source Type	Source ID	Description	Model ID	TPM	PM10	PM2.5	NOx		CO		SO_2		NH3		HCN	$CuSO_4$	CaO	Si	BaP	Benzene	1,3-Butadiene	Arsenic	Chromium	Copper	Iron	Mercury	Magnesium	Manganese	Nickel	Lead	Titanium	Zinc
				Emissions (g/s)																												
				24-hr	24-hr	24-hr	1-hr	24-hr	1-hr	8-hr	1-hr	24-hr	1-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr	24-hr
TOTAL				**63.59**	**24.16**	**6.19**	**113.81**	**76.50**	**257.13**	**53.08**	**2.79**	**0.16**	**14.18**	**0.59**	**0.56**	**0.04**	**0.13**	**1.80**	**0.00**	**0.99**	**0.04**	**0.047**	**0.0081**	**0.018**	**7.93**	**0.00002**	**1.49**	**0.17**	**0.0058**	**0.032**	**0.40**	**0.13**
Drill	Q1_D	Quarry #1 - Drilling	Q1_D	0.1414	0.0735	0.0735												5.51E-03				1.06E-04	1.84E-05	4.13E-05	1.81E-02	3.51E-08	3.39E-03	3.79E-04	1.27E-05	7.97E-06	9.02E-04	2.94E-04
Drill	Q2_D	Quarry #2 - Drilling	Q2_D	0.1414	0.0735	0.0735												5.51E-03				1.06E-04	1.84E-05	4.13E-05	1.81E-02	3.51E-08	3.39E-03	3.79E-04	1.27E-05	7.97E-06	9.02E-04	2.94E-04
Drill	LPC_D	Open Pit Mining - Drilling	LPC_D	0.4025	0.2093	0.2093												1.57E-02				3.02E-04	5.23E-05	1.18E-04	5.15E-02	9.98E-08	9.66E-03	1.08E-03	3.61E-05	2.27E-05	2.57E-03	8.37E-04
Drill	VP_D	Open Pit Mining - Drilling	VP_D	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Blast	Q1_B	Quarry #1 - Blasting	Q1_B	0.0064	0.0033	0.0002	1.1348	0.0473	6.3059	0.2627	0.0810	0.0034	0.4199	0.0175				2.50E-04				4.80E-06	8.32E-07	1.87E-06	8.19E-04	1.59E-09	1.54E-04	1.72E-05	5.74E-07	3.61E-07	4.08E-05	1.33E-05
Blast	Q2_B	Quarry #2 - Blasting	Q2_B	0.0064	0.0033	0.0002	1.1348	0.0473	6.3059	0.2627	0.0810	0.0034	0.4199	0.0175				2.50E-04				4.80E-06	8.32E-07	1.87E-06	8.19E-04	1.59E-09	1.54E-04	1.72E-05	5.74E-07	3.61E-07	4.08E-05	1.33E-05
Blast	LPC_B	Open Pit Mining - Blasting	LPC_B	0.7503	0.3901	0.0225	36.0480	1.5020	200.3040	8.3460	2.5740	0.1073	13.3380	0.5558				2.93E-02				5.63E-04	9.75E-05	2.19E-04	9.60E-02	1.86E-07	1.80E-02	2.01E-03	6.72E-05	4.23E-05	4.79E-03	1.56E-03
Blast	VP_B	Open Pit Mining - Blasting	VP_B	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000				0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_ANPAG	Material Handling at AEX NPAG	MH_ANPAG	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_APAG	Material Handling at AEX PAG	MH_APAG	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_APRTL	Material Handling at AEX Portal	MH_APRTL	0.1519	0.0607	0.0172												4.56E-03				1.14E-04	1.97E-05	4.43E-05	1.94E-02	3.77E-08	3.64E-03	4.07E-04	1.36E-05	8.56E-06	9.69E-04	3.16E-04
Material Handling	MH_BS1	Material Handling at Borrow Source #1	MH_BS1	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_BS3	Material Handling at Borrow Source #3	MH_BS3	0.0054	0.0022	0.0006												1.63E-04				4.07E-06	7.05E-07	1.58E-06	6.94E-04	1.35E-09	1.30E-04	1.45E-05	4.86E-07	3.06E-07	3.46E-05	1.13E-05
Material Handling	MH_BS3B	Material Handling at Borrow Source #3BS3B	MH_BS3B	0.0002	0.0001	0.0000												7.15E-06				1.79E-07	3.10E-08	6.96E-08	3.05E-05	5.91E-11	5.72E-06	6.39E-07	2.13E-08	1.34E-08	1.52E-06	4.96E-07
Material Handling	MH_COS	Material Handling at Coarse Ore Storage	MH_COS	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_CRUSH	Material Handling at Crusher	MH_CRUSH	0.2622	0.1049	0.0296												7.87E-03				1.97E-04	3.41E-05	7.66E-05	3.36E-02	6.50E-08	6.29E-03	7.03E-04	2.35E-05	1.48E-05	1.67E-03	5.45E-04
Material Handling	MH_CWP1	Material Handling at CWP #1 Dam	MH_CWP1	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_CWP2	Material Handling at CWP #2 (Sump #1)	MH_CWP2	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_CWP3	Material Handling at CWP #3 (Sump #2)	MH_CWP3	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_DVC1	Material Handling at Diversion Channel #1	MH_DVC1	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_DVC2	Material Handling at Diversion Channel #2	MH_DVC2	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_DCB	Material Handling at Dixie Creek Berm	MH_DCB	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_ROAD	Material Handling at Haul Roads	MH_ROAD	0.0055	0.0022	0.0006												1.66E-04				4.15E-06	7.19E-07	1.62E-06	7.08E-04	1.37E-09	1.33E-04	1.48E-05	4.96E-07	3.12E-07	3.53E-05	1.15E-05
Material Handling	MH_IFP	Material Handling at Infrastructure Pad	MH_IFP	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_LGOE	Material Handling at LGO Stockpile - East (#2)	MH_LGOE	0.0691	0.0276	0.0078												2.07E-03				5.18E-05	8.98E-06	2.02E-05	8.84E-03	1.71E-08	1.66E-03	1.85E-04	6.19E-06	3.90E-06	4.41E-04	1.44E-04
Material Handling	MH_LGOW	Material Handling at LGO Stockpile - West (#1)	MH_LGOW	0.0863	0.0345	0.0098												2.59E-03				6.47E-05	1.12E-05	2.52E-05	1.10E-02	2.14E-08	2.07E-03	2.31E-04	7.73E-06	4.87E-06	5.50E-04	1.79E-04
Material Handling	MH_LPC	Material Handling at LP Central	MH_LPC	0.9929	0.3972	0.1122												2.98E-02				7.45E-04	1.29E-04	2.90E-04	1.27E-01	2.46E-07	2.38E-02	2.66E-03	8.90E-05	5.60E-05	6.33E-03	2.07E-03
Material Handling	MH_MWP	Material Handling at MWP Pond Dam	MH_MWP	0.0180	0.0072	0.0020												5.41E-04				1.35E-05	2.34E-06	5.26E-06	2.31E-03	4.47E-09	4.33E-04	4.83E-05	1.62E-06	1.02E-06	1.15E-04	3.75E-05
Material Handling	MH_TND	Material Handling at North Dam	MH_TND	0.0142	0.0057	0.0016												4.27E-04				1.07E-05	1.85E-06	4.16E-06	1.82E-03	3.53E-09	3.42E-04	3.82E-05	1.28E-06	8.03E-07	9.08E-05	2.96E-05
Material Handling	MH_NPAG	Material Handling at NPAG Stockpile	MH_NPAG	0.2671	0.1068	0.0302												8.01E-03				2.00E-04	3.47E-05	7.80E-05	3.42E-02	6.62E-08	6.41E-03	7.16E-04	2.39E-05	1.51E-05	1.70E-03	5.56E-04
Material Handling	MH_OVB1	Material Handling at Overburden #1	MH_OVB1	0.0726	0.0291	0.0082												2.18E-03				5.45E-05	9.44E-06	2.12E-05	9.30E-03	1.80E-08	1.74E-03	1.95E-04	6.51E-06	4.10E-06	4.63E-04	1.51E-04
Material Handling	MH_OVB2	Material Handling at Overburden #2	MH_OVB2	0.1007	0.0403	0.0114												3.02E-03				7.56E-05	1.31E-05	2.94E-05	1.29E-02	2.50E-08	2.42E-03	2.70E-04	9.03E-06	5.68E-06	6.43E-04	2.10E-04
Material Handling	MH_OVB3	Material Handling at Overburden #3	MH_OVB3	0.0016	0.0007	0.0002												4.94E-05				1.24E-06	2.14E-07	4.81E-07	2.11E-04	4.08E-10	3.95E-05	4.41E-06	1.48E-07	9.29E-08	1.05E-05	3.43E-06
Material Handling	MH_OVB5	Material Handling at Overburden #5	MH_OVB5	0.0006	0.0002	0.0001												1.85E-05				4.62E-07	8.01E-08	1.80E-07	7.89E-05	1.53E-10	1.48E-05	1.65E-06	5.52E-08	3.48E-08	3.93E-06	1.28E-06
Material Handling	MH_OVB6	Material Handling at Overburden #6	MH_OVB6	0.0008	0.0003	0.0001												2.32E-05				5.79E-07	1.00E-07	2.25E-07	9.88E-05	1.91E-10	1.85E-05	2.07E-06	6.92E-08	4.35E-08	4.92E-06	1.61E-06
Material Handling	MH_PAG	Material Handling at PAG Stockpile	MH_PAG	0.5803	0.2321	0.0656												1.74E-02				4.35E-04	7.54E-05	1.69E-04	7.43E-02	1.44E-07	1.39E-02	1.56E-03	5.20E-05	3.27E-05	3.70E-03	1.21E-03
Material Handling	MH_PSTP	Material Handling at Paste Plant	MH_PSTP	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_PRCP	Material Handling at Process Plant	MH_PRCP	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_Q1	Material Handling at Quarry #1	MH_Q1	0.0002	0.0001	0.0000												7.15E-06				1.79E-07	3.10E-08	6.96E-08	3.05E-05	5.91E-11	5.72E-06	6.39E-07	2.13E-08	1.34E-08	1.52E-06	4.96E-07
Material Handling	MH_Q2	Material Handling at Quarry #2	MH_Q2	0.0002	0.0001	0.0000												7.15E-06				1.79E-07	3.10E-08	6.96E-08	3.05E-05	5.91E-11	5.72E-06	6.39E-07	2.13E-08	1.34E-08	1.52E-06	4.96E-07
Material Handling	MH_ROM	Material Handling at ROM Stockpile	MH_ROM	0.0240	0.0096	0.0027												7.21E-04				1.80E-05	3.12E-06	7.02E-06	3.08E-03	5.96E-09	5.77E-04	6.44E-05	2.15E-06	1.35E-06	1.53E-04	5.00E-05
Material Handling	MH_SHAFT	Material Handling at Shaft	MH_SHAFT	0.0314	0.0125	0.0035												9.41E-04				2.35E-05	4.08E-06	9.16E-06	4.01E-03	7.78E-09	7.53E-04	8.40E-05	2.81E-06	1.77E-06	2.00E-04	6.52E-05
Material Handling	MH_TSD	Material Handling at South Dam	MH_TSD	0.0640	0.0256	0.0072												1.92E-03				4.80E-05	8.31E-06	1.87E-05	8.19E-03	1.59E-08	1.53E-03	1.71E-04	5.73E-06	3.61E-06	4.08E-04	1.33E-04
Material Handling	MH_TSDS	Material Handling at South Dam - spillway	MH_TSDS	0.0048	0.0019	0.0005												1.44E-04				3.60E-06	6.23E-07	1.40E-06	6.14E-04	1.19E-09	1.15E-04	1.28E-05	4.30E-07	2.70E-07	3.06E-05	9.97E-06
Material Handling	MH_TPIPE	Material Handling at Tailings Pipeline	MH_TPIPE	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_TMF	Material Handling at TMF Facility	MH_TMF	0.0120	0.0048	0.0014												3.60E-04				9.01E-06	1.56E-06	3.51E-06	1.54E-03	2.98E-09	2.88E-04	3.22E-05	1.08E-06	6.77E-07	7.66E-05	2.50E-05
Material Handling	MH_TPD	Material Handling at TMF Pond Dam	MH_TPD	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_VP	Material Handling at Viggo Pit	MH_VP	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Material Handling	MH_TWD	Material Handling at West Dam	MH_TWD	0.0115	0.0046	0.0013												3.46E-04				8.65E-06	1.50E-06	3.37E-06	1.48E-03	2.86E-09	2.77E-04	3.09E-05	1.03E-06	6.51E-07	7.36E-05	2.40E-05
Dozer	DZ_ANPAG	Dozer at AEX NPAG	DZ_ANPAG	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_APAG	Dozer at AEX PAG	DZ_APAG	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_APRTL	Dozer at AEX Portal	DZ_APRTL	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_BS1	Dozer at Borrow Source #1	DZ_BS1	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_BS3	Dozer at Borrow Source #3	DZ_BS3	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_BS3B	Dozer at Borrow Source #3BS3B	DZ_BS3B	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_COS	Dozer at Coarse Ore Storage	DZ_COS	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_CRUSH	Dozer at Crusher	DZ_CRUSH	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_CWP1	Dozer at CWP #1 Dam	DZ_CWP1	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_CWP2	Dozer at CWP #2 (Sump #1)	DZ_CWP2	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_CWP3	Dozer at CWP #3 (Sump #2)	DZ_CWP3	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_DVC1	Dozer at Diversion Channel #1	DZ_DVC1	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_DVC2	Dozer at Diversion Channel #2	DZ_DVC2	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_DCB	Dozer at Dixie Creek Berm	DZ_DCB	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_ROAD	Dozer at Haul Roads	DZ_ROAD	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_IFP	Dozer at Infrastructure Pad	DZ_IFP	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_LGOE	Dozer at LGO Stockpile - East (#2)	DZ_LGOE	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_LGOW	Dozer at LGO Stockpile - West (#1)	DZ_LGOW	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_LPC	Dozer at LP Central	DZ_LPC	1.7318	1.3021	0.1937												9.77E-02				1.30E-03	2.25E-04	5.06E-04	2.22E-01	4.29E-07	4.16E-02	4.64E-03	1.55E-04	9.77E-05	1.10E-02	3.60E-03
Dozer	DZ_MWP	Dozer at MWP Pond Dam	DZ_MWP	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_TND	Dozer at North Dam	DZ_TND	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_NPAG	Dozer at NPAG Stockpile	DZ_NPAG	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_OVB1	Dozer at Overburden #1	DZ_OVB1	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_OVB2	Dozer at Overburden #2	DZ_OVB2	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_OVB3	Dozer at Overburden #3	DZ_OVB3	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_OVB5	Dozer at Overburden #5	DZ_OVB5	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_OVB6	Dozer at Overburden #6	DZ_OVB6	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_PAG	Dozer at PAG Stockpile	DZ_PAG	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_PSTP	Dozer at Paste Plant	DZ_PSTP	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_PRCP	Dozer at Process Plant	DZ_PRCP	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_Q1	Dozer at Quarry #1	DZ_Q1	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_Q2	Dozer at Quarry #2	DZ_Q2	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_ROM	Dozer at ROM Stockpile	DZ_ROM	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_SHAFT	Dozer at Shaft	DZ_SHAFT	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_TSD	Dozer at South Dam	DZ_TSD	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_TSDS	Dozer at South Dam - spillway	DZ_TSDS	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_TPIPE	Dozer at Tailings Pipeline	DZ_TPIPE	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_TMF	Dozer at TMF Facility	DZ_TMF	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Dozer	DZ_TPD	Dozer at TMF Pond Dam	DZ_TPD	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_VP	Dozer at Viggo Pit	DZ_VP	0.0000	0.0000	0.0000												0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozer	DZ_TWD	Dozer at West Dam	DZ_TWD	0.2474	0.1860	0.0277												1.40E-02				1.86E-04	3.22E-05	7.22E-05	3.17E-02	6.14E-08	5.94E-03	6.63E-04	2.22E-05	1.40E-05	1.58E-03	5.15E-04
Equipment (Tailpipe)	TP_Q1	Quarry 1 Tailpipe Emissions	TP_Q1	0.0125	0.0125	0.0125	0.6230	0.6230	1.7772	1.7772	0.0031	0.0029						9.34E-04	4.59E-07	4.89E-03	2.87E-04											
Equipment (Tailpipe)	TP_Q2	Quarry 2 Tailpipe Emissions	TP_Q2	0.0125	0.0125	0.0125	0.6230	0.6230	1.7772	1.7772	0.0031	0.0029						9.34E-04	4.59E-07	4.89E-03	2.87E-04											
Equipment (Tailpipe)	TP_LPC	LP Central Pit Tailpipe Emissions	TP_LPC	0.1146	0.1146	0.1146	6.3026	6.3026	15.1911	15.1911	0.0258	0.0247						8.60E-03	3.86E-06	3.78E-02	2.19E-03											
Equipment (Tailpipe)	TP_VP	Viggo Pit Tailpipe Emissions	TP_VP	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000						0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Equipment (Tailpipe)	TP_BS1	Borrow Source 1 Tailpipe Emissions	TP_BS1	0.0024	0.0024	0.0024	0.0486	0.0486	0.5246	0.5246	0.0009	0.0008						1.82E-04	1.72E-07	1.52E-03	6.89E-05											
Equipment (Tailpipe)	TP_BS3	Borrow Source 3 Tailpipe Emissions	TP_BS3	0.0024	0.0024	0.0024	0.0486	0.0486	0.5246	0.5246	0.0009	0.0008						1.82E-04	1.72E-07	1.52E-03	6.89E-05											
Equipment (Tailpipe)	TP_BS3B	Borrow Source 3B Tailpipe Emissions	TP_BS3B	0.0024	0.0024	0.0024	0.0486	0.0486	0.5246	0.5246	0.0009	0.0008						1.82E-04	1.72E-07	1.52E-03	6.89E-05											
Equipment (Tailpipe)	TP_TMF	TMF Tailpipe Emissions	TP_TMF	0.0164	0.0164	0.0164	0.3273	0.3273	3.1146	3.1146	0.0049	0.0047						1.23E-03	6.31E-07	4.64E-03	1.93E-04											
Concrete	BATCH	Batch Plant	BATCH	0.7921	0.3508	0.0566												2.63E-02				5.94E-04	1.03E-04	2.31E-04	1.01E-01	1.96E-07	1.90E-02	2.12E-03	7.10E-05	4.47E-05	5.05E-03	1.65E-03
Concrete	CRF	CRF Plant	CRF	0.7921	0.3508	0.0566												2.63E-02				5.94E-04	1.03E-04	2.31E-04	1.01E-01	1.96E-07	1.90E-02	2.12E-03	7.10E-05	4.47E-05	5.05E-03	1.65E-03
Concrete	PASTE	Paste Plant	PASTE	0.7921	0.3508	0.0566												2.63E-02				5.94E-04	1.03E-04	2.31E-04	1.01E-01	1.96E-07	1.90E-02	2.12E-03	7.10E-05	4.47E-05	5.05E-03	1.65E-03
Major Baghouses	BH1_JC	Baghouse for jaw crusher	BH1_JC	0.0566	0.0566	0.0566												4.25E-03				4.25E-05	7.36E-06	1.65E-05	7.25E-03	1.40E-08	1.36E-03	1.52E-04	5.07E-06	3.19E-06	3.61E-04	1.18E-04
Major Baghouses	BH2_PC	Baghouse for pebble crusher	BH2_PC	0.0189	0.0189	0.0189												1.42E-03				1.42E-05	2.45E-06	5.51E-06	2.42E-03	4.68E-09	4.53E-04	5.06E-05	1.69E-06	1.06E-06	1.20E-04	3.93E-05
Major Baghouses	BH3_AF1	Baghouse for apron feeder	BH3_AF1	0.0118	0.0118	0.0118												8.85E-04				8.85E-06	1.53E-06	3.45E-06	1.51E-03	2.93E-09	2.83E-04	3.16E-05	1.06E-06	6.65E-07	7.53E-05	2.45E-05
Major Baghouses	BH4_AF2	Baghouse for apron feeder	BH4_AF2	0.0118	0.0118	0.0118												8.85E-04				8.85E-06	1.53E-06	3.45E-06	1.51E-03	2.93E-09	2.83E-04	3.16E-05	1.06E-06	6.65E-07	7.53E-05	2.45E-05
Major Baghouses	BH5_AF3	Baghouse for apron feeder	BH5_AF3	0.0118	0.0118	0.0118												8.85E-04				8.85E-06	1.53E-06	3.45E-06	1.51E-03	2.93E-09	2.83E-04	3.16E-05	1.06E-06	6.65E-07	7.53E-05	2.45E-05
Major Baghouses	BH6_TP	Baghouse for transfer point (sacrificial to stockpile feed conveyor)	BH6_TP	0.0850	0.0850	0.0850												6.37E-03				6.37E-05	1.10E-05	2.48E-05	1.09E-02	2.11E-08	2.04E-03	2.28E-04	7.61E-06	4.79E-06	5.42E-04	1.77E-04
Process Plant - Leach	LEACH	Leach Tanks 1-6	LEACH												0.4781																	
Process Plant - Lime	LIME	exhaust for lime bin dust collector	LIME	0.0472	0.0472	0.0472											0.0472	3.54E-03				3.54E-05	6.14E-06	1.38E-05	6.04E-03	1.17E-08	1.13E-03	1.26E-04	4.23E-06	2.66E-06	3.01E-04	9.82E-05
Process Plant - Lime	LS	scrubber for lime slaker	LS	0.0800	0.0800	0.0800											0.0800	6.00E-03				6.00E-05	1.04E-05	2.34E-05	1.02E-02	1.98E-08	1.92E-03	2.14E-04	7.17E-06	4.51E-06	5.10E-04	1.66E-04
Process Plant - Gold Recovery Area	FLOCC	flocculant handling cartridge filter	FLOCC	0.0472	0.0472	0.0472												3.54E-03				3.54E-05	6.14E-06	1.38E-05	6.04E-03	1.17E-08	1.13E-03	1.26E-04	4.23E-06	2.66E-06	3.01E-04	9.82E-05
Process Plant - Gold Recovery Area	CUSO4	CuSO4 dust filter	CUSO4	0.0400	0.0400	0.0400										0.0400		3.00E-03				3.00E-05	5.20E-06	1.17E-05	5.12E-03	9.92E-09	9.60E-04	1.07E-04	3.58E-06	2.26E-06	2.55E-04	8.32E-05
Process Plant - Gold Recovery Area	SMBS	SMBS dust collector	SMBS	0.0472	0.0472	0.0472												3.54E-03				3.54E-05	6.14E-06	1.38E-05	6.04E-03	1.17E-08	1.13E-03	1.26E-04	4.23E-06	2.66E-06	3.01E-04	9.82E-05
Process Plant - Gold Recovery Area	CMIX	Cyanide Mix Ventilation	CMIX												0.0797																	
Process Plant - Gold Recovery Area	FURN	Baghouse for Induction Furnace	FURN	0.0940	0.0940	0.0940																										
Natural Gas Substation	NGG1	Natural Gas Generator Emissions	NGG1				1.8625	1.8625																								
Natural Gas Substation	NGG2	Natural Gas Generator Emissions	NGG2				1.8625	1.8625																								
Natural Gas Substation	NGG3	Natural Gas Generator Emissions	NGG3				1.8625	1.8625																								
Natural Gas Substation	NGG4	Natural Gas Generator Emissions	NGG4				1.8625	1.8625																								
Natural Gas Substation	NGG5	Natural Gas Generator Emissions	NGG5				1.8625	1.8625																								
Natural Gas Substation	NGG6	Natural Gas Generator Emissions	NGG6				1.8625	1.8625																								
Natural Gas Substation	NGG7	Natural Gas Generator Emissions	NGG7				1.8625	1.8625																								
Natural Gas Substation	NGG8	Natural Gas Generator Emissions	NGG8				1.8625	1.8625																								
Natural Gas Substation	NGG9	Natural Gas Generator Emissions	NGG9				1.8625	1.8625																								
Ventilation	AEX_NG	Natural Gas Heating Emissions	AEX_NG				1.0562	1.0562																								
Ventilation	DISC_NG	Natural Gas Heating Emissions	DISC_NG				2.1123	2.1123																								
Ventilation	LP1_NG	Natural Gas Heating Emissions	LP1_NG				2.5113	2.5113																								
General Generators	DG1	TMF Dam Raises Generator	DG1	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	DG2	Water Intake Dixie Creek Generator	DG2	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	DG3	Explosives Storage Generator	DG3	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	DG4	Explosives Magazine Generator	DG4	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	DG5	Water Effluent - Booster Pump Generator	DG5	0.0558	0.0558	0.0558	0.7857	0.7857	0.1693	0.1693	0.0003	0.0003						4.18E-03	3.34E-08	2.36E-02	9.91E-04											
General Generators	DG6	Water Booster Pump PSV Generator	DG6	0.0186	0.0186	0.0186	0.2619	0.2619	0.0564	0.0564	0.0001	0.0001						1.39E-03	1.11E-08	7.88E-03	3.30E-04											
General Generators	DG7	Quarry Power & Dewatering Generator	DG7	0.0743	0.0743	0.0743	1.0476	1.0476	0.2257	0.2257	0.0004	0.0004						5.58E-03	4.45E-08	3.15E-02	1.32E-03											
General Generators	DG8	Shaft Construction Generator	DG8	0.0558	0.0558	0.0558	0.7857	0.7857	0.1693	0.1693	0.0003	0.0003						4.18E-03	3.34E-08	2.36E-02	9.91E-04											
General Generators	ADG1	AEX DG1	ADG1	0.3717	0.3717	0.3717	5.2379	5.2379	1.1287	1.1287	0.0021	0.0021						2.79E-02	2.22E-07	1.58E-01	6.61E-03											
General Generators	ADG2	AEX DG2	ADG2	0.3717	0.3717	0.3717	5.2379	5.2379	1.1287	1.1287	0.0021	0.0021						2.79E-02	2.22E-07	1.58E-01	6.61E-03											
General Generators	ADG3	AEX DG3	ADG3	0.3717	0.3717	0.3717	5.2379	5.2379	1.1287	1.1287	0.0021	0.0021						2.79E-02	2.22E-07	1.58E-01	6.61E-03											
General Generators	ADG4	AEX DG4	ADG4	0.1859	0.1859	0.1859	2.6190	2.6190	0.5643	0.5643	0.0010	0.0010						1.39E-02	1.11E-07	7.88E-02	3.30E-03											
General Generators	ADG5	AEX DG5	ADG5	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG6	AEX DG6	ADG6	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002						2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG7	AEX DG7	ADG7	0.0743	0.0743	0.0743	1.0476	1.0476	0.2257	0.2257	0.0004	0.0004						5.58E-03	4.45E-08	3.15E-02	1.32E-03											

General Generators	ADG8	AEX DG8	ADG8	0.0186	0.0186	0.0186	0.2619	0.2619	0.0564	0.0564	0.0001	0.0001					1.39E-03	1.11E-08	7.88E-03	3.30E-04											
General Generators	ADG9	AEX DG9	ADG9	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG10	AEX DG10	ADG10	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG11	AEX DG11	ADG11	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG12	AEX DG12	ADG12	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG13	AEX DG13	ADG13	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG14	AEX DG14	ADG14	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG15	AEX DG15	ADG15	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG16	AEX DG16	ADG16	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG17	AEX DG17	ADG17	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
General Generators	ADG18	AEX DG18	ADG18	0.0372	0.0372	0.0372	0.5238	0.5238	0.1129	0.1129	0.0002	0.0002					2.79E-03	2.22E-08	1.58E-02	6.61E-04											
Haul Roads (Dust)	RD1	Node Section Haul Road Dust Emissions	RD1	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD2	Node Section Haul Road Dust Emissions	RD2	0.0544	0.0144	0.0014											1.08E-03				4.08E-05	7.07E-06	1.59E-05	6.96E-03	1.35E-08	1.30E-03	1.46E-04	4.87E-06	3.07E-06	3.47E-04	1.13E-04
Haul Roads (Dust)	RD3	Node Section Haul Road Dust Emissions	RD3	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD4	Node Section Haul Road Dust Emissions	RD4	0.0429	0.0114	0.0011											8.52E-04				3.22E-05	5.58E-06	1.25E-05	5.49E-03	1.06E-08	1.03E-03	1.15E-04	3.85E-06	2.42E-06	2.74E-04	8.93E-05
Haul Roads (Dust)	RD5	Node Section Haul Road Dust Emissions	RD5	7.7039	2.0392	0.2039											1.53E-01				5.78E-03	1.00E-03	2.25E-03	9.86E-01	1.91E-06	1.85E-01	2.06E-02	6.90E-04	4.34E-04	4.92E-02	1.60E-02
Haul Roads (Dust)	RD6	Node Section Haul Road Dust Emissions	RD6	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD7	Node Section Haul Road Dust Emissions	RD7	0.0143	0.0038	0.0004											2.84E-04				1.07E-05	1.86E-06	4.18E-06	1.83E-03	3.55E-09	3.43E-04	3.83E-05	1.28E-06	8.07E-07	9.13E-05	2.98E-05
Haul Roads (Dust)	RD8	Node Section Haul Road Dust Emissions	RD8	1.0176	0.2693	0.0269											2.02E-02				7.63E-04	1.32E-04	2.97E-04	1.30E-01	2.52E-07	2.44E-02	2.73E-03	9.12E-05	5.74E-05	6.49E-03	2.12E-03
Haul Roads (Dust)	RD9	Node Section Haul Road Dust Emissions	RD9	3.0527	0.8080	0.0808											6.06E-02				2.29E-03	3.97E-04	8.91E-04	3.91E-01	7.57E-07	7.33E-02	8.18E-03	2.74E-04	1.72E-04	1.95E-02	6.35E-03
Haul Roads (Dust)	RD10	Node Section Haul Road Dust Emissions	RD10	0.6012	0.1591	0.0159											1.19E-02				4.51E-04	7.82E-05	1.76E-04	7.70E-02	1.49E-07	1.44E-02	1.61E-03	5.39E-05	3.39E-05	3.84E-03	1.25E-03
Haul Roads (Dust)	RD11	Node Section Haul Road Dust Emissions	RD11	10.5047	2.7805	0.2781											2.09E-01				7.88E-03	1.37E-03	3.07E-03	1.34E+00	2.61E-06	2.52E-01	2.82E-02	9.41E-04	5.92E-04	6.70E-02	2.18E-02
Haul Roads (Dust)	RD12	Node Section Haul Road Dust Emissions	RD12	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD13	Node Section Haul Road Dust Emissions	RD13	1.4496	0.3837	0.0384											2.88E-02				1.09E-03	1.88E-04	4.23E-04	1.86E-01	3.60E-07	3.48E-02	3.88E-03	1.30E-04	8.18E-05	9.25E-03	3.02E-03
Haul Roads (Dust)	RD14	Node Section Haul Road Dust Emissions	RD14	1.0997	0.2911	0.0291											2.18E-02				8.25E-04	1.43E-04	3.21E-04	1.41E-01	2.73E-07	2.64E-02	2.95E-03	9.85E-05	6.20E-05	7.02E-03	2.29E-03
Haul Roads (Dust)	RD15	Node Section Haul Road Dust Emissions	RD15	0.8666	0.2294	0.0229											1.72E-02				6.50E-04	1.13E-04	2.53E-04	1.11E-01	2.15E-07	2.08E-02	2.32E-03	7.76E-05	4.89E-05	5.53E-03	1.80E-03
Haul Roads (Dust)	RD16	Node Section Haul Road Dust Emissions	RD16	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD17	Node Section Haul Road Dust Emissions	RD17	0.8048	0.2130	0.0213											1.60E-02				6.04E-04	1.05E-04	2.35E-04	1.03E-01	2.00E-07	1.93E-02	2.16E-03	7.21E-05	4.54E-05	5.13E-03	1.67E-03
Haul Roads (Dust)	RD18	Node Section Haul Road Dust Emissions	RD18	3.2530	0.8610	0.0861											6.46E-02				2.44E-03	4.23E-04	9.50E-04	4.16E-01	8.07E-07	7.81E-02	8.72E-03	2.91E-04	1.83E-04	2.08E-02	6.77E-03
Haul Roads (Dust)	RD19	Node Section Haul Road Dust Emissions	RD19	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD20	Node Section Haul Road Dust Emissions	RD20	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD21	Node Section Haul Road Dust Emissions	RD21	1.5503	0.4103	0.0410											3.08E-02				1.16E-03	2.02E-04	4.53E-04	1.98E-01	3.84E-07	3.72E-02	4.15E-03	1.39E-04	8.74E-05	9.89E-03	3.22E-03
Haul Roads (Dust)	RD22	Node Section Haul Road Dust Emissions	RD22	0.9426	0.2495	0.0249											1.87E-02				7.07E-04	1.23E-04	2.75E-04	1.21E-01	2.34E-07	2.26E-02	2.53E-03	8.45E-05	5.32E-05	6.01E-03	1.96E-03
Haul Roads (Dust)	RD23	Node Section Haul Road Dust Emissions	RD23	0.0487	0.0129	0.0013											9.66E-04				3.65E-05	6.33E-06	1.42E-05	6.23E-03	1.21E-08	1.17E-03	1.30E-04	4.36E-06	2.74E-06	3.10E-04	1.01E-04
Haul Roads (Dust)	RD24	Node Section Haul Road Dust Emissions	RD24	0.6331	0.1676	0.0168											1.26E-02				4.75E-04	8.23E-05	1.85E-04	8.10E-02	1.57E-07	1.52E-02	1.70E-03	5.67E-05	3.57E-05	4.04E-03	1.32E-03
Haul Roads (Dust)	RD25	Node Section Haul Road Dust Emissions	RD25	1.3532	0.3582	0.0358											2.69E-02				1.01E-03	1.76E-04	3.95E-04	1.73E-01	3.36E-07	3.25E-02	3.63E-03	1.21E-04	7.63E-05	8.63E-03	2.81E-03
Haul Roads (Dust)	RD26	Node Section Haul Road Dust Emissions	RD26	0.6694	0.1772	0.0177											1.33E-02				5.02E-04	8.70E-05	1.95E-04	8.57E-02	1.66E-07	1.61E-02	1.79E-03	6.00E-05	3.78E-05	4.27E-03	1.39E-03
Haul Roads (Dust)	RD27	Node Section Haul Road Dust Emissions	RD27	0.2501	0.0662	0.0066											4.97E-03				1.88E-04	3.25E-05	7.30E-05	3.20E-02	6.20E-08	6.00E-03	6.70E-04	2.24E-05	1.41E-05	1.60E-03	5.20E-04
Haul Roads (Dust)	RD28	Node Section Haul Road Dust Emissions	RD28	1.1417	0.3022	0.0302											2.27E-02				8.56E-04	1.48E-04	3.33E-04	1.46E-01	2.83E-07	2.74E-02	3.06E-03	1.02E-04	6.44E-05	7.28E-03	2.37E-03
Haul Roads (Dust)	RD29	Node Section Haul Road Dust Emissions	RD29	1.3319	0.3526	0.0353											2.64E-02				9.99E-04	1.73E-04	3.89E-04	1.70E-01	3.30E-07	3.20E-02	3.57E-03	1.19E-04	7.51E-05	8.50E-03	2.77E-03
Haul Roads (Dust)	RD30	Node Section Haul Road Dust Emissions	RD30	0.3806	0.1007	0.0101											7.55E-03				2.85E-04	4.95E-05	1.11E-04	4.87E-02	9.44E-08	9.13E-03	1.02E-03	3.41E-05	2.15E-05	2.43E-03	7.92E-04
Haul Roads (Dust)	RD31	Node Section Haul Road Dust Emissions	RD31	0.4169	0.1103	0.0110											8.28E-03				3.13E-04	5.42E-05	1.22E-04	5.34E-02	1.03E-07	1.00E-02	1.12E-03	3.74E-05	2.35E-05	2.66E-03	8.67E-04
Haul Roads (Dust)	RD32	Node Section Haul Road Dust Emissions	RD32	2.0725	0.5486	0.0549											4.11E-02				1.55E-03	2.69E-04	6.05E-04	2.65E-01	5.14E-07	4.97E-02	5.55E-03	1.86E-04	1.17E-04	1.32E-02	4.31E-03
Haul Roads (Dust)	RD33	Node Section Haul Road Dust Emissions	RD33	0.7403	0.1960	0.0196											1.47E-02				5.55E-04	9.62E-05	2.16E-04	9.48E-02	1.84E-07	1.78E-02	1.98E-03	6.63E-05	4.18E-05	4.72E-03	1.54E-03
Haul Roads (Dust)	RD34	Node Section Haul Road Dust Emissions	RD34	0.9090	0.2406	0.0241											1.80E-02				6.82E-04	1.18E-04	2.65E-04	1.16E-01	2.25E-07	2.18E-02	2.44E-03	8.14E-05	5.13E-05	5.80E-03	1.89E-03
Haul Roads (Dust)	RD35	Node Section Haul Road Dust Emissions	RD35	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD36	Node Section Haul Road Dust Emissions	RD36	0.1180	0.0312	0.0031											2.34E-03				8.85E-05	1.53E-05	3.44E-05	1.51E-02	2.93E-08	2.83E-03	3.16E-04	1.06E-05	6.65E-06	7.53E-04	2.45E-04
Haul Roads (Dust)	RD37	Node Section Haul Road Dust Emissions	RD37	0.7104	0.1880	0.0188											1.41E-02				5.33E-04	9.24E-05	2.07E-04	9.09E-02	1.76E-07	1.71E-02	1.90E-03	6.37E-05	4.01E-05	4.53E-03	1.48E-03
Haul Roads (Dust)	RD38	Node Section Haul Road Dust Emissions	RD38	0.0466	0.0123	0.0012											9.25E-04				3.50E-05	6.06E-06	1.36E-05	5.97E-03	1.16E-08	1.12E-03	1.25E-04	4.18E-06	2.63E-06	2.97E-04	9.70E-05
Haul Roads (Dust)	RD39	Node Section Haul Road Dust Emissions	RD39	0.1779	0.0471	0.0047											3.53E-03				1.33E-04	2.31E-05	5.19E-05	2.28E-02	4.41E-08	4.27E-03	4.77E-04	1.59E-05	1.00E-05	1.13E-03	3.70E-04
Haul Roads (Dust)	RD40	Node Section Haul Road Dust Emissions	RD40	0.1022	0.0270	0.0027											2.03E-03				7.66E-05	1.33E-05	2.98E-05	1.31E-02	2.53E-08	2.45E-03	2.74E-04	9.16E-06	5.76E-06	6.52E-04	2.13E-04
Haul Roads (Dust)	RD41	Node Section Haul Road Dust Emissions	RD41	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD42	Node Section Haul Road Dust Emissions	RD42	0.0009	0.0002	0.0000											1.71E-05				6.47E-07	1.12E-07	2.52E-07	1.10E-04	2.14E-10	2.07E-05	2.31E-06	7.73E-08	4.87E-08	5.50E-06	1.79E-06
Haul Roads (Dust)	RD43	Node Section Haul Road Dust Emissions	RD43	0.0274	0.0072	0.0007											5.43E-04				2.05E-05	3.56E-06	7.99E-06	3.50E-03	6.78E-09	6.57E-04	7.33E-05	2.45E-06	1.54E-06	1.75E-04	5.69E-05
Haul Roads (Dust)	RD44	Node Section Haul Road Dust Emissions	RD44	0.0024	0.0006	0.0001											4.76E-05				1.80E-06	3.11E-07	6.99E-07	3.07E-04	5.94E-10	5.75E-05	6.42E-06	2.15E-07	1.35E-07	1.53E-05	4.98E-06
Haul Roads (Dust)	RD45	Node Section Haul Road Dust Emissions	RD45	0.0365	0.0097	0.0010											7.26E-04				2.74E-05	4.75E-06	1.07E-05	4.68E-03	9.06E-09	8.77E-04	9.79E-05	3.27E-06	2.06E-06	2.33E-04	7.60E-05
Haul Roads (Dust)	RD46	Node Section Haul Road Dust Emissions	RD46	0.0059	0.0016	0.0002											1.17E-04				4.42E-06	7.65E-07	1.72E-06	7.54E-04	1.46E-09	1.41E-04	1.58E-05	5.28E-07	3.32E-07	3.76E-05	1.22E-05
Haul Roads (Dust)	RD47	Node Section Haul Road Dust Emissions	RD47	0.0006	0.0002	0.0000											1.22E-05				4.62E-07	8.01E-08	1.80E-07	7.89E-05	1.53E-10	1.48E-05	1.65E-06	5.52E-08	3.48E-08	3.93E-06	1.28E-06
Haul Roads (Dust)	RD48	Node Section Haul Road Dust Emissions	RD48	0.0070	0.0019	0.0002											1.39E-04				5.25E-06	9.11E-07	2.05E-06	8.97E-04	1.74E-09	1.68E-04	1.88E-05	6.28E-07	3.95E-07	4.47E-05	1.46E-05
Haul Roads (Dust)	RD49	Node Section Haul Road Dust Emissions	RD49	0.1163	0.0308	0.0031											2.31E-03				8.72E-05	1.51E-05	3.40E-05	1.49E-02	2.88E-08	2.79E-03	3.12E-04	1.04E-05	6.56E-06	7.42E-04	2.42E-04
Haul Roads (Dust)	RD50	Node Section Haul Road Dust Emissions	RD50	0.0264	0.0070	0.0007											5.23E-04				1.98E-05	3.43E-06	7.70E-06	3.37E-03	6.54E-09	6.33E-04	7.06E-05	2.36E-06	1.49E-06	1.68E-04	5.48E-05
Haul Roads (Dust)	RD51	Node Section Haul Road Dust Emissions	RD51	0.0026	0.0007	0.0001											5.06E-05				1.91E-06	3.32E-07	7.45E-07	3.26E-04	6.33E-10	6.12E-05	6.84E-06	2.29E-07	1.44E-07	1.63E-05	5.31E-06
Haul Roads (Dust)	RD52	Node Section Haul Road Dust Emissions	RD52	0.2645	0.0700	0.0070											5.25E-03				1.98E-04	3.44E-05	7.72E-05	3.39E-02	6.56E-08	6.35E-03	7.09E-04	2.37E-05	1.49E-05	1.69E-03	5.50E-04
Haul Roads (Dust)	RD53	Node Section Haul Road Dust Emissions	RD53	0.0117	0.0031	0.0003											2.33E-04				8.79E-06	1.52E-06	3.42E-06	1.50E-03	2.91E-09	2.81E-04	3.14E-05	1.05E-06	6.61E-07	7.47E-05	2.44E-05
Haul Roads (Dust)	RD54	Node Section Haul Road Dust Emissions	RD54	0.0112	0.0030	0.0003											2.23E-04				8.42E-06	1.46E-06	3.28E-06	1.44E-03	2.78E-09	2.69E-04	3.01E-05	1.01E-06	6.33E-07	7.16E-05	2.33E-05
Haul Roads (Dust)	RD55	Node Section Haul Road Dust Emissions	RD55	0.0252	0.0067	0.0007											5.01E-04				1.89E-05	3.28E-06	7.37E-06	3.23E-03	6.26E-09	6.06E-04	6.77E-05	2.26E-06	1.42E-06	1.61E-04	5.25E-05
Haul Roads (Dust)	RD56	Node Section Haul Road Dust Emissions	RD56	0.0112	0.0030	0.0003											2.23E-04				8.42E-06	1.46E-06	3.28E-06	1.44E-03	2.78E-09	2.69E-04	3.01E-05	1.01E-06	6.33E-07	7.16E-05	2.33E-05
Haul Roads (Dust)	RD57	Node Section Haul Road Dust Emissions	RD57	0.5533	0.1465	0.0146											1.10E-02				4.15E-04	7.19E-05	1.62E-04	7.08E-02	1.37E-07	1.33E-02	1.48E-03	4.96E-05	3.12E-05	3.53E-03	1.15E-03
Haul Roads (Dust)	RD58	Node Section Haul Road Dust Emissions	RD58	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD59	Node Section Haul Road Dust Emissions	RD59	0.2179	0.0577	0.0058											4.33E-03				1.63E-04	2.83E-05	6.36E-05	2.79E-02	5.40E-08	5.23E-03	5.84E-04	1.95E-05	1.23E-05	1.39E-03	4.53E-04
Haul Roads (Dust)	RD60	Node Section Haul Road Dust Emissions	RD60	0.0397	0.0105	0.0011											7.88E-04				2.98E-05	5.16E-06	1.16E-05	5.08E-03	9.84E-09	9.52E-04	1.06E-04	3.56E-06	2.24E-06	2.53E-04	8.25E-05
Haul Roads (Dust)	RD61	Node Section Haul Road Dust Emissions	RD61	0.0471	0.0125	0.0012											9.35E-04				3.53E-05	6.13E-06	1.38E-05	6.03E-03	1.17E-08	1.13E-03	1.26E-04	4.22E-06	2.66E-06	3.01E-04	9.80E-05
Haul Roads (Dust)	RD62	Node Section Haul Road Dust Emissions	RD62	0.0000	0.0000	0.0000											0.00E+00				0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Haul Roads (Dust)	RD63	Node Section Haul Road Dust Emissions	RD63	0.0411	0.0109	0.0011											8.16E-04				3.08E-05	5.34E-06	1.20E-05	5.26E-03	1.02E-08	9.87E-04	1.10E-04	3.68E-06	2.32E-06	2.62E-04	8.55E-05
Haul Roads (Dust)	RD64	Node Section Haul Road Dust Emissions	RD64	0.0307	0.0081	0.0008											6.10E-04				2.31E-05	4.00E-06	8.98E-06	3.94E-03	7.63E-09	7.38E-04	8.24E-05	2.75E-06	1.73E-06	1.96E-04	6.40E-05
Haul Roads (Dust)	RD65	Node Section Haul Road Dust Emissions	RD65	0.0348	0.0092	0.0009											6.90E-04				2.61E-05	4.52E-06	1.02E-05	4.45E-03	8.62E-09	8.35E-04	9.32E-05	3.12E-06	1.96E-06	2.22E-04	7.23E-05
Haul Roads (Tailpipe)	RD1	Node Section Haul Road Tailpipe Emissions	RD1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD2	Node Section Haul Road Tailpipe Emissions	RD2	1.92E-04	1.92E-04	1.92E-04	1.68E-02	1.61E-02	1.68E-02	1.68E-02							1.44E-05	6.98E-10	7.98E-06	2.91E-07											
Haul Roads (Tailpipe)	RD3	Node Section Haul Road Tailpipe Emissions	RD3	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD4	Node Section Haul Road Tailpipe Emissions	RD4	1.52E-04	1.52E-04	1.52E-04	1.33E-02	1.27E-02	1.33E-02	1.33E-02							1.14E-05	5.51E-10	6.30E-06	2.29E-07											
Haul Roads (Tailpipe)	RD5	Node Section Haul Road Tailpipe Emissions	RD5	2.73E-02	2.73E-02	2.73E-02	2.39E+00	2.29E+00	2.39E+00	2.39E+00							2.05E-03	9.89E-08	1.13E-03	4.12E-05											
Haul Roads (Tailpipe)	RD6	Node Section Haul Road Tailpipe Emissions	RD6	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD7	Node Section Haul Road Tailpipe Emissions	RD7	5.06E-05	5.06E-05	5.06E-05	4.43E-03	4.25E-03	4.43E-03	4.43E-03							3.80E-06	1.84E-10	2.10E-06	7.65E-08											
Haul Roads (Tailpipe)	RD8	Node Section Haul Road Tailpipe Emissions	RD8	3.60E-03	3.60E-03	3.60E-03	3.15E-01	3.02E-01	3.15E-01	3.15E-01							2.70E-04	1.31E-08	1.49E-04	5.44E-06											
Haul Roads (Tailpipe)	RD9	Node Section Haul Road Tailpipe Emissions	RD9	1.08E-02	1.08E-02	1.08E-02	9.46E-01	9.06E-01	9.46E-01	9.46E-01							8.10E-04	3.92E-08	4.48E-04	1.63E-05											
Haul Roads (Tailpipe)	RD10	Node Section Haul Road Tailpipe Emissions	RD10	2.13E-03	2.13E-03	2.13E-03	1.86E-01	1.78E-01	1.86E-01	1.86E-01							1.60E-04	7.72E-09	8.83E-05	3.21E-06											
Haul Roads (Tailpipe)	RD11	Node Section Haul Road Tailpipe Emissions	RD11	3.72E-02	3.72E-02	3.72E-02	3.25E+00	3.12E+00	3.25E+00	3.25E+00							2.79E-03	1.35E-07	1.54E-03	5.62E-05											
Haul Roads (Tailpipe)	RD12	Node Section Haul Road Tailpipe Emissions	RD12	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD13	Node Section Haul Road Tailpipe Emissions	RD13	5.13E-03	5.13E-03	5.13E-03	4.49E-01	4.30E-01	4.49E-01	4.49E-01							3.85E-04	1.86E-08	2.13E-04	7.75E-06											
Haul Roads (Tailpipe)	RD14	Node Section Haul Road Tailpipe Emissions	RD14	3.89E-03	3.89E-03	3.89E-03	3.41E-01	3.26E-01	3.41E-01	3.41E-01							2.92E-04	1.41E-08	1.61E-04	5.88E-06											
Haul Roads (Tailpipe)	RD15	Node Section Haul Road Tailpipe Emissions	RD15	3.07E-03	3.07E-03	3.07E-03	2.68E-01	2.57E-01	2.68E-01	2.68E-01							2.30E-04	1.11E-08	1.27E-04	4.63E-06											
Haul Roads (Tailpipe)	RD16	Node Section Haul Road Tailpipe Emissions	RD16	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD17	Node Section Haul Road Tailpipe Emissions	RD17	2.85E-03	2.85E-03	2.85E-03	2.49E-01	2.39E-01	2.49E-01	2.49E-01							2.14E-04	1.03E-08	1.18E-04	4.30E-06											
Haul Roads (Tailpipe)	RD18	Node Section Haul Road Tailpipe Emissions	RD18	1.15E-02	1.15E-02	1.15E-02	1.01E+00	9.66E-01	1.01E+00	1.01E+00							8.64E-04	4.18E-08	4.78E-04	1.74E-05											
Haul Roads (Tailpipe)	RD19	Node Section Haul Road Tailpipe Emissions	RD19	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD20	Node Section Haul Road Tailpipe Emissions	RD20	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD21	Node Section Haul Road Tailpipe Emissions	RD21	5.49E-03	5.49E-03	5.49E-03	4.80E-01	4.60E-01	4.80E-01	4.80E-01							4.12E-04	1.99E-08	2.28E-04	8.29E-06											
Haul Roads (Tailpipe)	RD22	Node Section Haul Road Tailpipe Emissions	RD22	3.34E-03	3.34E-03	3.34E-03	2.92E-01	2.80E-01	2.92E-01	2.92E-01							2.50E-04	1.21E-08	1.38E-04	5.04E-06											
Haul Roads (Tailpipe)	RD23	Node Section Haul Road Tailpipe Emissions	RD23	1.72E-04	1.72E-04	1.72E-04	1.51E-02	1.44E-02	1.51E-02	1.51E-02							1.29E-05	6.25E-10	7.15E-06	2.60E-07											
Haul Roads (Tailpipe)	RD24	Node Section Haul Road Tailpipe Emissions	RD24	2.24E-03	2.24E-03	2.24E-03	1.96E-01	1.88E-01	1.96E-01	1.96E-01							1.68E-04	8.13E-09	9.30E-05	3.38E-06											
Haul Roads (Tailpipe)	RD25	Node Section Haul Road Tailpipe Emissions	RD25	4.79E-03	4.79E-03	4.79E-03	4.19E-01	4.02E-01	4.19E-01	4.19E-01							3.59E-04	1.74E-08	1.99E-04	7.23E-06											
Haul Roads (Tailpipe)	RD26	Node Section Haul Road Tailpipe Emissions	RD26	2.37E-03	2.37E-03	2.37E-03	2.07E-01	1.99E-01	2.07E-01	2.07E-01							1.78E-04	8.60E-09	9.83E-05	3.58E-06											
Haul Roads (Tailpipe)	RD27	Node Section Haul Road Tailpipe Emissions	RD27	8.85E-04	8.85E-04	8.85E-04	7.75E-02	7.42E-02	7.75E-02	7.75E-02							6.64E-05	3.21E-09	3.67E-05	1.34E-06											
Haul Roads (Tailpipe)	RD28	Node Section Haul Road Tailpipe Emissions	RD28	4.04E-03	4.04E-03	4.04E-03	3.54E-01	3.39E-01	3.54E-01	3.54E-01							3.03E-04	1.47E-08	1.68E-04	6.10E-06											
Haul Roads (Tailpipe)	RD29	Node Section Haul Road Tailpipe Emissions	RD29	4.72E-03	4.72E-03	4.72E-03	4.13E-01	3.95E-01	4.13E-01	4.13E-01							3.54E-04	1.71E-08	1.96E-04	7.12E-06											
Haul Roads (Tailpipe)	RD30	Node Section Haul Road Tailpipe Emissions	RD30	1.35E-03	1.35E-03	1.35E-03	1.18E-01	1.13E-01	1.18E-01	1.18E-01							1.01E-04	4.89E-09	5.59E-05	2.03E-06											
Haul Roads (Tailpipe)	RD31	Node Section Haul Road Tailpipe Emissions	RD31	1.48E-03	1.48E-03	1.48E-03	1.29E-01	1.24E-01	1.29E-01	1.29E-01							1.11E-04	5.35E-09	6.12E-05	2.23E-06											
Haul Roads (Tailpipe)	RD32	Node Section Haul Road Tailpipe Emissions	RD32	7.34E-03	7.34E-03	7.34E-03	6.42E-01	6.15E-01	6.42E-01	6.42E-01							5.50E-04	2.66E-08	3.04E-04	1.11E-05											
Haul Roads (Tailpipe)	RD33	Node Section Haul Road Tailpipe Emissions	RD33	2.62E-03	2.62E-03	2.62E-03	2.29E-01	2.20E-01	2.29E-01	2.29E-01							1.97E-04	9.51E-09	1.09E-04	3.96E-06											
Haul Roads (Tailpipe)	RD34	Node Section Haul Road Tailpipe Emissions	RD34	3.22E-03	3.22E-03	3.22E-03	2.82E-01	2.70E-01	2.82E-01	2.82E-01							2.41E-04	1.17E-08	1.33E-04	4.86E-06											
Haul Roads (Tailpipe)	RD35	Node Section Haul Road Tailpipe Emissions	RD35	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD36	Node Section Haul Road Tailpipe Emissions	RD36	4.18E-04	4.18E-04	4.18E-04	3.65E-02	3.50E-02	3.65E-02	3.65E-02							3.13E-05	1.51E-09	1.73E-05	6.31E-07											
Haul Roads (Tailpipe)	RD37	Node Section Haul Road Tailpipe Emissions	RD37	2.51E-03	2.51E-03	2.51E-03	2.20E-01	2.11E-01	2.20E-01	2.20E-01							1.89E-04	9.12E-09	1.04E-04	3.80E-06											
Haul Roads (Tailpipe)	RD38	Node Section Haul Road Tailpipe Emissions	RD38	1.65E-04	1.65E-04	1.65E-04	1.44E-02	1.38E-02	1.44E-02	1.44E-02							1.24E-05	5.99E-10	6.85E-06	2.49E-07											
Haul Roads (Tailpipe)	RD39	Node Section Haul Road Tailpipe Emissions	RD39	6.30E-04	6.30E-04	6.30E-04	5.51E-02	5.28E-02	5.51E-02	5.51E-02							4.72E-05	2.28E-09	2.61E-05	9.51E-07											
Haul Roads (Tailpipe)	RD40	Node Section Haul Road Tailpipe Emissions	RD40	3.62E-04	3.62E-04	3.62E-04	3.17E-02	3.03E-02	3.17E-02	3.17E-02							2.71E-05	1.31E-09	1.50E-05	5.46E-07											
Haul Roads (Tailpipe)	RD41	Node Section Haul Road Tailpipe Emissions	RD41	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD42	Node Section Haul Road Tailpipe Emissions	RD42	3.05E-06	3.05E-06	3.05E-06	2.67E-04	2.56E-04	2.67E-04	2.67E-04							2.29E-07	1.11E-11	1.27E-07	4.61E-09											
Haul Roads (Tailpipe)	RD43	Node Section Haul Road Tailpipe Emissions	RD43	9.68E-05	9.68E-05	9.68E-05	8.47E-03	8.12E-03	8.47E-03	8.47E-03							7.26E-06	3.51E-10	4.02E-06	1.46E-07											
Haul Roads (Tailpipe)	RD44	Node Section Haul Road Tailpipe Emissions	RD44	8.48E-06	8.48E-06	8.48E-06	7.42E-04	7.11E-04	7.42E-04	7.42E-04							6.36E-07	3.08E-11	3.52E-07	1.28E-08											
Haul Roads (Tailpipe)	RD45	Node Section Haul Road Tailpipe Emissions	RD45	1.29E-04	1.29E-04	1.29E-04	1.13E-02	1.08E-02	1.13E-02	1.13E-02							9.70E-06	4.69E-10	5.37E-06	1.95E-07											
Haul Roads (Tailpipe)	RD46	Node Section Haul Road Tailpipe Emissions	RD46	2.08E-05	2.08E-05	2.08E-05	1.82E-03	1.75E-03	1.82E-03	1.82E-03							1.56E-06	7.56E-11	8.65E-07	3.15E-08											
Haul Roads (Tailpipe)	RD47	Node Section Haul Road Tailpipe Emissions	RD47	2.18E-06	2.18E-06	2.18E-06	1.91E-04	1.83E-04	1.91E-04	1.91E-04							1.64E-07	7.91E-12	9.05E-08	3.29E-09											
Haul Roads (Tailpipe)	RD48	Node Section Haul Road Tailpipe Emissions	RD48	2.48E-05	2.48E-05	2.48E-05	2.17E-03	2.08E-03	2.17E-03	2.17E-03							1.86E-06	8.99E-11	1.03E-06	3.75E-08											
Haul Roads (Tailpipe)	RD49	Node Section Haul Road Tailpipe Emissions	RD49	4.12E-04	4.12E-04	4.12E-04	3.60E-02	3.45E-02	3.60E-02	3.60E-02							3.09E-05	1.49E-09	1.71E-05	6.22E-07											
Haul Roads (Tailpipe)	RD50	Node Section Haul Road Tailpipe Emissions	RD50	9.33E-05	9.33E-05	9.33E-05	8.16E-03	7.82E-03	8.16E-03	8.16E-03							7.00E-06	3.38E-10	3.87E-06	1.41E-07											
Haul Roads (Tailpipe)	RD51	Node Section Haul Road Tailpipe Emissions	RD51	9.03E-06	9.03E-06	9.03E-06	7.90E-04	7.57E-04	7.90E-04	7.90E-04							6.77E-07	3.27E-11	3.75E-07	1.36E-08											
Haul Roads (Tailpipe)	RD52	Node Section Haul Road Tailpipe Emissions	RD52	9.36E-04	9.36E-04	9.36E-04	8.19E-02	7.85E-02	8.19E-02	8.19E-02							7.02E-05	3.40E-09	3.88E-05	1.41E-06											
Haul Roads (Tailpipe)	RD53	Node Section Haul Road Tailpipe Emissions	RD53	4.15E-05	4.15E-05	4.15E-05	3.63E-03	3.48E-03	3.63E-03	3.63E-03							3.11E-06	1.50E-10	1.72E-06	6.26E-08											
Haul Roads (Tailpipe)	RD54	Node Section Haul Road Tailpipe Emissions	RD54	3.97E-05	3.97E-05	3.97E-05	3.48E-03	3.33E-03	3.48E-03	3.48E-03							2.98E-06	1.44E-10	1.65E-06	6.00E-08											
Haul Roads (Tailpipe)	RD55	Node Section Haul Road Tailpipe Emissions	RD55	8.94E-05	8.94E-05	8.94E-05	7.82E-03	7.50E-03	7.82E-03	7.82E-03							6.70E-06	3.24E-10	3.71E-06	1.35E-07											
Haul Roads (Tailpipe)	RD56	Node Section Haul Road Tailpipe Emissions	RD56	3.97E-05	3.97E-05	3.97E-05	3.48E-03	3.33E-03	3.48E-03	3.48E-03							2.98E-06	1.44E-10	1.65E-06	6.00E-08											
Haul Roads (Tailpipe)	RD57	Node Section Haul Road Tailpipe Emissions	RD57	1.96E-03	1.96E-03	1.96E-03	1.71E-01	1.64E-01	1.71E-01	1.71E-01							1.47E-04	7.10E-09	8.12E-05	2.96E-06											
Haul Roads (Tailpipe)	RD58	Node Section Haul Road Tailpipe Emissions	RD58	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD59	Node Section Haul Road Tailpipe Emissions	RD59	7.71E-04	7.71E-04	7.71E-04	6.75E-02	6.47E-02	6.75E-02	6.75E-02							5.78E-05	2.80E-09	3.20E-05	1.16E-06											
Haul Roads (Tailpipe)	RD60	Node Section Haul Road Tailpipe Emissions	RD60	1.40E-04	1.40E-04	1.40E-04	1.23E-02	1.18E-02	1.23E-02	1.23E-02							1.05E-05	5.09E-10	5.83E-06	2.12E-07											
Haul Roads (Tailpipe)	RD61	Node Section Haul Road Tailpipe Emissions	RD61	1.67E-04	1.67E-04	1.67E-04	1.46E-02	1.40E-02	1.46E-02	1.46E-02							1.25E-05	6.05E-10	6.92E-06	2.52E-07											
Haul Roads (Tailpipe)	RD62	Node Section Haul Road Tailpipe Emissions	RD62	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00							0.00E+00	0.00E+00	0.00E+00	0.00E+00											
Haul Roads (Tailpipe)	RD63	Node Section Haul Road Tailpipe Emissions	RD63	1.46E-04	1.46E-04	1.46E-04	1.27E-02	1.22E-02	1.27E-02	1.27E-02							1.09E-05	5.28E-10	6.04E-06	2.20E-07											
Haul Roads (Tailpipe)	RD64	Node Section Haul Road Tailpipe Emissions	RD64	1.09E-04	1.09E-04	1.09E-04	9.52E-03	9.13E-03	9.52E-03	9.52E-03							8.16E-06	3.95E-10	4.51E-06	1.64E-07											
Haul Roads (Tailpipe)	RD65	Node Section Haul Road Tailpipe Emissions	RD65	1.23E-04	1.23E-04	1.23E-04	1.08E-02	1.03E-02	1.08E-02	1.08E-02							9.23E-06	4.46E-10	5.11E-06	1.86E-07											
Wind Erosion	WE_NPAG	Wind Erosion NPAG Stockpile	WE_NPAG	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_PAG	Wind Erosion PAG Stockpile	WE_PAG	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_LGOW	Wind Erosion LGO Stockpile West	WE_LGOW	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_LGOE	Wind Erosion LGO Stockpile East	WE_LGOE	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_OVB1	Wind Erosion Overburden #1	WE_OVB1	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_OVB2	Wind Erosion Overburden #2	WE_OVB2	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_OVB3	Wind Erosion Overburden #3	WE_OVB3	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_OVB5	Wind Erosion Overburden #5	WE_OVB5	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_OVB6	Wind Erosion Overburden #6	WE_OVB6	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_TMF	Wind Erosion TMF Facility	WE_TMF	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Wind Erosion	WE_ROM	Wind Erosion ROM Stockpile	WE_ROM	0.011	0.006	0.004											4.17E-04				8.33E-06	1.44E-06	3.24E-06	1.42E-03	2.76E-09	2.67E-04	2.98E-05	9.96E-07	6.27E-07	7.09E-05	2.31E-05
Assay Lab	AL_DC	Assay Lab Dust Collector	AL_DC	8.50E-02	4.42E-02	2.61E-02											3.31E-03				1.46E-03	1.96E-04	5.03E-04	1.39E-01	3.69E-07	2.73E-02	2.86E-03	3.75E-04	2.83E-02	7.54E-03	4.22E-03
Assay Lab	AL_FURN	Assay Lab Fire Assay Propane Furnace and Drying Oven	AL_FURN				5.50E-03	5.50E-03																							
Portable Crusher	PRC_Q	Quarry Portable Crusher	PRC_Q	3.52E-01	1.76E-01	8.80E-02											1.32E-02				2.64E-04	4.57E-05	1.03E-04	4.50E-02	8.72E-08	8.44E-03	9.43E-04	3.15E-05	1.98E-05	2.24E-03	7.32E-04
Portable Crusher	PRC_CRF	CRF Portable Crusher	PRC_CRF	1.17E-01	5.86E-02	2.93E-02											4.40E-03				8.80E-05	1.52E-05	3.42E-05	1.50E-02	2.91E-08	2.81E-03	3.14E-04	1.05E-05	6.61E-06	7.48E-04	2.44E-04

Table B-6: Operations Phase - List of Primary Emissions Control Equipment

Source ID	Source Description	Make & Model	Flowrate (acfm)	Flowrate (m3/s)
Emissions Controls				
BH1_JC	Baghouse for jaw crusher	Not yet identified. Will be consistent with specifications	6000	2.8
BH2_PC	Baghouse for pebble crusher	Not yet identified. Will be consistent with specifications	2000	0.9
BH3_AF1	Baghouse for apron feeder	Not yet identified. Will be consistent with specifications	1250	0.6
BH4_AF2	Baghouse for apron feeder	Not yet identified. Will be consistent with specifications	1250	0.6
BH5_AF3	Baghouse for apron feeder	Not yet identified. Will be consistent with specifications	1250	0.6
BH6_TP	Baghouse for transfer point (sacrificial to stockpile feed conveyor)	Not yet identified. Will be consistent with specifications	9000	4.2
LIME	Baghouse for lime silo	Not yet identified. Will be consistent with specifications	5000	2.4
LS	Copper sulphate filter	Not yet identified. Will be consistent with specifications	5000	2.4
FLOCC	Flocculant dust collector	Not yet identified. Will be consistent with specifications	5000	2.4
FURN	Furnace dust collector	Not yet identified. Will be consistent with specifications	10000	4.7
EWIN	Electrowinning Area Exhaust Fan	Not yet identified. Will be consistent with specifications	5000	2.4
LS	Lime Slaking Scrubber	Not yet identified. Will be consistent with specifications	5000	2.4

Appendix C
Emission Rate Calculations

Table C-1: Geochemistry (Metals in Dust)

Use this column for IDs	Sample Info																					
Corrected Mineralogy IDs	Litho Group for Plot	Silver	Aluminum	Arsenic	Barium	Beryllium	Bismuth	Calcium	Cadmium	Cobalt	Chromium	Copper	Iron	Potassium	Magnesium	Manganese	Molybdenum	Sodium	Nickel	Phosphorus	Lead	Sulfur
		ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g
DX450052	Felsic Volcanic 1	8.5	71000	85	380	1.3	0.14	15000	33	9.8	28	100	41000	36000	5000	1100	1.8	4700	16	570	6200	33000
DX550083	Felsic Volcanic 1	2.1	73000	1100	130	0.88	4.9	30000	0.35	10	78	40	27000	3500	7500	760	2.2	55000	16	690	62	12000
DX450204	Felsic Volcanic 1	0.75	86000	5	430	0.97	0.67	26000	0.09	16	75	41	44000	25000	12000	550	1.3	17000	30	690	9	4400
DX450176	Felsic Volcanic 1	7.2	80000	9.2	470	0.98	2.8	9000	69	13	100	300	50000	34000	10000	2000	2.2	5400	19	560	1800	25000
DX450032	Metasediment 3	0.75	90000	7.3	300	1	0.31	14000	0.06	8	12	19	30000	27000	5600	480	1.2	18000	17	510	14	3100
DX450181	Felsic Volcanic 1	0.75	67000	2	410	0.95	0.085	19000	0.19	8.4	84	14	24000	21000	6700	330	0.7	28000	16	490	7.9	650
DX450002	Felsic Volcanic 1	0.75	74000	13	520	1	0.31	26000	0.08	8	84	260	28000	21000	7800	390	8.4	29000	12	500	10	1800
DX450108	Felsic Volcanic 1	0.75	61000	23	350	0.86	1.9	25000	0.19	8.2	12	14	24000	11000	6300	460	20	44000	13	590	9.8	5100
DX450076	Felsic Volcanic 1	9.4	77000	96	85	1.2	14	5700	210	20	15	480	70000	54000	7700	690	2	5100	31	910	910	73000
DX450186	Felsic Volcanic 2	0.75	58000	110	400	0.67	0.34	14000	0.13	2.1	60	12	17000	12000	1400	360	2.1	35000	3.4	160	13	4800
DX450118	Felsic Volcanic 2	0.75	56000	14	400	0.9	0.43	12000	0.19	1.8	3.7	9.7	14000	10000	1500	250	1.4	40000	0.91	160	6.5	1200
DX550107	Felsic Volcanic 2	0.5	79000	12	460	1.4	3	24000	0.26	9.6	130	17	26000	21000	8600	520	1.1	19000	19	610	22	24000
DX450159	Felsic Volcanic 2	0.75	75000	91	510	1.1	1.1	9600	0.07	3	83	5.7	20000	28000	3700	190	1.9	15000	4	230	10	13000
DX450171	Metasediment 2	0.75	90000	87	630	1.4	1.3	11000	0.096	23	180	75	71000	19000	17000	790	2	41000	67	570	25	12000
DX450134	Metasediment 2	1.3	63000	6000	230	0.7	12	34000	0.61	400	85	1400	120000	13000	19000	590	1.2	18000	6100	620	8.8	53000
DX450185	Metasediment 2	0.75	77000	13	490	0.99	0.79	26000	0.18	16	110	41	32000	26000	12000	430	1.7	15000	41	780	12	4300
DX450232	Felsic Volcanic 1	0.75	78000	19	470	0.92	2.5	33000	1	10	62	8.7	28000	16000	10000	1300	1.6	23000	17	880	9	9800
DX550064	Metasediment 3	0.5	99000	12	500	1.2	0.14	19000	0.09	3.5	70	11	10000	24000	3100	190	0.8	31000	7.6	270	8.3	1500
DX450008	Metasediment 3	0.75	71000	1.7	450	1	0.69	13000	0.09	2.1	31	20	9300	20000	2300	120	3.7	21000	1.7	81	12	1600
DX550056	Basalt	0.5	72000	2.5	140	0.47	0.085	65000	0.13	56	100	190	130000	2300	33000	3800	0.6	15000	63	350	1.2	4600
DX450022	Basalt	0.75	78000	8.4	46	0.35	0.085	87000	0.15	50	110	99	90000	880	26000	2100	0.4	15000	92	320	0.62	490
DX450077	Basalt	0.5	65000	4.2	290	0.68	0.085	63000	0.6	47	91	97	110000	4700	22000	2700	0.8	17000	64	560	6.8	1400
DX450113	Basalt	0.75	33000	390	18	0.35	0.14	50000	0.07	19	52	56	150000	1000	15000	4700	0.48	3300	44	370	1.1	6400
DX550101	Basalt	0.5	79000	2.3	32	0.38	0.085	81000	0.12	50	320	77	94000	1300	34000	2000	0.6	15000	120	290	1.5	2300
DX450128	Basalt	0.75	60000	22	190	0.69	0.23	59000	0.3	41	100	59	120000	7300	20000	3600	0.5	11000	80	420	3.5	8000
DX450021	Argillite	0.75	61000	2	130	1	4	18000	4	64	92	340	160000	9300	6800	1100	4.3	20000	99	330	9	74000
DX450222	Fragmental 1	0.75	76000	21	520	1	0.48	22000	0.11	10	69	16	26000	23000	7100	370	2.1	24000	16	550	12	15000
DX450119	Argillite	0.87	45000	5.1	180	0.62	3.8	22000	5.2	93	41	420	170000	10000	7600	670	4.5	10000	130	300	13	85000
DX450080	Metasediment 2	0.5	77000	190	560	1.8	0.53	18000	0.27	23	91	42	48000	23000	13000	850	1.7	17000	60	650	15	1700
DX450143	Metasediment 2	0.75	73000	160	300	1.1	0.79	13000	0.15	28	120	180	130000	26000	24000	1000	2.4	20000	73	830	12	14000
DX450153	Metasediment 2	0.75	87000	3.7	160	1.1	6.9	14000	0.15	23	130	78	48000	25000	12000	310	1.4	20000	49	580	7	41000
DX450017	Metasediment 3	0.75	76000	14	450	1	0.19	12000	0.21	10	28	29	35000	28000	8100	400	2.8	11000	23	500	5	1800
DX450144	Metasediment 3	0.75	65000	34	290	0.85	0.18	22000	0.22	14	26	26	30000	15000	6100	470	3.8	24000	40	660	9.1	470
DX550073	Basalt	0.5	87000	46	400	0.95	0.09	49000	0.06	42	290	51	77000	13000	24000	2500	0.7	28000	120	510	5.1	2900
DX550053	Basalt	0.5	70000	2.2	79	0.38	0.085	76000	0.12	46	130	170	120000	1900	34000	3600	0.3	13000	67	260	1.1	3400
DX550089	Basalt	0.5	67000	2.2	150	0.46	0.085	69000	0.2	48	180	210	130000	7100	30000	3900	2.2	9900	55	330	2.6	11000
DX450051	Felsic Volcanic 1	14.7	71000	103	370	0.95	0.58	11000	37	10	38	77	39000	40000	6000	1200	1.6	4000	17	550	9000	29000
DX450239	Felsic Volcanic 1	1.2	66000	63	66	0.76	15	4400	0.04	19	100	3.2	83000	40000	6500	390	2.7	1400	13	510	6.4	64000
DX450071	Felsic Volcanic 1	1.7	68000	5500	450	0.84	0.78	32000	0.18	7	8.9	18	20000	11000	4400	500	4.7	39000	11	410	21	6800
DX450130	Felsic Volcanic 1	0.75	61000	2300	230	0.68	0.9	26000	0.17	7.5	15	17	24000	4900	6500	480	1	50000	13	500	15	4000
DX450039	Felsic Volcanic 1	0.75	57000	840	460	1	2	16000	0.65	16	120	39	32000	21000	8500	880	2.5	24000	52	370	16	21000
DX450089	Felsic Volcanic 1	0.5	58000	11	480	0.95	0.085	26000	0.12	11	57	21	26000	21000	7900	550	2.2	21000	17	750	23	3800
DX450137	Felsic Volcanic 1	0.75	59000	4.2	400	0.9	0.11	31000	0.09	9.9	19	23	26000	20000	7800	530	0.46	25000	17	500	8	1200
DX450233	Felsic Volcanic 1	1.5	76000	5.3	540	0.79	3.8	19000	14	10	90	140	71000	38000	12000	1900	2.8	7900	19	580	14	22000
DX450200	Felsic Volcanic 1	26	76000	13	340	0.9	3.2	33000	130	9	66	4800	38000	32000	9500	2600	11	18000	16	510	25	23000
DX450155	Felsic Volcanic 1	1	70000	14	430	0.9	2.1	27000	4.1	8.4	89	170	25000	20000	7700	960	34	18000	16	490	28	9700
DX450030	Felsic Volcanic 2	0.75	52000	20	1000	1	0.48	17000	0.55	2	3.3	9	13000	22000	1700	930	1	22000	1.2	140	27	5500
DX450049	Felsic Volcanic 2	0.75	57000	81	350	0.86	0.85	11000	0.21	3	29	23	14000	3000	2700	320	1.9	49000	8.1	130	18	2700
DX450105	Felsic Volcanic 2	0.75	58000	13000	500	1.1	0.38	3400	0.079	2.4	3.4	14	32000	28000	2400	120	2.2	5600	0.5	160	25	19000
DX450170	Felsic Volcanic 2	5.6	69000	28	50	0.8	13	11000	9.3	4.2	77	160	58000	30000	3000	390	4.7	18000	3.8	170	500	53000
DX450227	Felsic Volcanic 1	0.75	62000	1.5	340	0.91	0.085	22000	0.06	9	60	13	25000	17000	4700	370	1.7	31000	14	490	8	10
DX450230	Felsic Volcanic 1	0.75	84000	1.1	540	0.95	0.25	29000	0.07	10	57	25	29000	21000	9200	410	1.7	26000	18	600	9	280
DX450135	Felsic Volcanic 1	0.75	61000	37	400	0.95	0.76	26000	1.3	4.7	6.4	5.7	18000	21000	3800	1900	0.8	16000	8	330	34	97

	Silver	Aluminum	Arsenic	Barium	Beryllium	Bismuth	Calcium	Cadmium	Cobalt	Chromium	Copper	Iron	Potassium	Magnesium	Manganese	Molybdenum	Sodium	Nickel	Phosphorus	Lead	Sulfur
Min	0.50	33000.00	1.10	18.00	0.35	0.09	3400.00	0.04	1.80	3.30	3.20	9300.00	880.00	1400.00	120.00	0.30	1400.00	0.50	81.00	0.62	10.00
Max	26.00	99000.00	13000.00	1000.00	1.80	15.00	87000.00	210.00	400.00	320.00	4800.00	170000.00	54000.00	34000.00	4700.00	34.00	55000.00	6100.00	910.00	9000.00	85000.00
Average	2.05	69830.19	577.96	348.98	0.90	2.07	27360.38	9.92	26.03	77.58	199.36	55213.21	19060.00	10833.96	1132.08	3.09	21005.66	148.51	469.26	359.10	15505.60
Median	0.75	71000.00	14.00	400.00	0.95	0.58	22000.00	0.19	10.00	75.00	41.00	32000.00	21000.00	7800.00	590.00	1.80	18000.00	17.00	500.00	12.00	5500.00
Standard Deviation	4.27	11967.48	2080.31	187.39	0.27	3.61	20088.88	34.90	55.72	62.88	677.47	43917.99	11680.75	8687.37	1127.60	5.32	12400.60	833.88	199.41	1499.60	21122.25
10th Percentile	0.50	57200.00	2.20	80.20	0.50	0.09	11000.00	0.07	3.00	12.00	9.96	17200.00	3100.00	2760.00	312.00	0.60	5440.00	3.84	162.00	2.78	760.00
90th Percentile	4.90	85600.00	750.00	520.00	1.18	4.72	62200.00	13.06	49.60	130.00	292.00	128000.00	33600.00	24000.00	2680.00	4.66	39800.00	89.60	690.00	56.40	50600.00

	Silver	Aluminum	Arsenic	Barium	Beryllium	Bismuth	Calcium	Cadmium	Cobalt	Chromium	Copper	Iron	Potassium	Magnesium	Manganese	Molybdenum	Sodium	Nickel	Phosphorus	Lead	Sulfur
ACB Criteria	1	120	0.3	10	0.01	2.5	10	0.025	0.1	0.5	50	25	10	72	0.4	120	N/A	0.2	0.5	0.5	25
Max Concentration (24 hour)	8.50E-05	1.49E+00	1.30E-02	9.02E-03	2.05E-05	8.19E-05	1.08E+00	2.27E-04	8.61E-04	2.26E-03	5.07E-03	2.22E+00	5.83E-01	4.16E-01	4.65E-02	8.09E-05	6.91E-01	1.55E-03	1.20E-02	9.79E-04	8.78E-01
% ACB	0%	1%	4%	0%	0%	0%	11%	1%	1%	0%	0%	9%	6%	1%	12%	0%	N/A	1%	2%	0%	4%

Metal screening as a percent of AAQC completed to identify predicted maximum 24-hour concentrations greater than 4%. Exception for calcium and potassium as AAQC is only for oxide forms. Additional metals carried forward where applicable.

SPM 24 hr Max POI (ug/m3)	17.4	Construction Phase

Table C-1: Geochemistry (Metals in Dust)

Use this column for IDs	Sample Info														
Corrected Mineralogy IDs	**Litho Group for Plot**	Antimony	Selenium	Tin	Strontium	Thorium	Titanium	Thallium	Uranium	Vanadium	Tungsten	Yttrium	Zinc	Zirconium	Mercury	Boron
		ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g
DX450052	Felsic Volcanic 1	7	2.2	6	110	40	2200	0.93	2.1	46	4	8	6200	250	0.09	5
DX550083	Felsic Volcanic 1	2	9.3	6	330	34.7	3000	0.14	1.7	38	14	9.4	75	200	0.14	1
DX450204	Felsic Volcanic 1	2	0.5	6	270	12.1	3000	0.38	1.75	69	1	11	77	65	0.05	2
DX450176	Felsic Volcanic 1	3	3.5	6	95	11	3100	0.85	2	49	2.4	10.5	12000	66	0.3	3
DX450032	Metasediment 3	2	0.5	6	300	8	3500	0.63	1.91	54	1	8.38	55	130	0.05	1
DX450181	Felsic Volcanic 1	2	0.5	6	230	9.5	2700	0.42	1.7	37	1.1	7.1	78	66	0.05	4
DX450002	Felsic Volcanic 1	2	0.5	6	230	20.1	2300	0.5	1.95	40	3	7.74	53	290	0.05	2
DX450108	Felsic Volcanic 1	2	0.56	6	350	20	2300	0.24	1.3	39	6.3	6.1	61	160	0.13	1
DX450076	Felsic Volcanic 1	2	14	6	100	75	3700	1.5	2.9	75	10	9.4	34000	360	2.16	2
DX450186	Felsic Volcanic 2	2	1.3	6	150	12.2	1400	0.2	1.9	2.7	2	11	72	96	0.05	1
DX450118	Felsic Volcanic 2	2	0.5	6	190	16	1200	0.16	2.1	6.8	5.7	9	52	120	0.1	1
DX550107	Felsic Volcanic 2	2	1.3	6	300	37.4	1600	0.81	2.1	42	29	7.6	71	290	0.32	2
DX450159	Felsic Volcanic 2	2	0.5	6	120	19.7	1600	0.52	2.2	7.7	2.7	13.7	31	130	0.05	2
DX450171	Metasediment 2	2	2.1	6	230	12.5	4600	0.54	1.8	140	4.1	16.5	87	86	0.06	1
DX450134	Metasediment 2	14	13	6	260	11	1800	0.4	1.4	100	1.1	11	78	85	0.05	7
DX450185	Metasediment 2	2	0.5	6	270	9.9	3100	0.52	1.9	58	2.8	13.2	77	60	0.05	1
DX450232	Felsic Volcanic 1	2	0.9	6	320	8.7	2900	0.66	1.89	46	0.92	11	250	42	0.05	2
DX550064	Metasediment 3	2	0.1	6	270	16.8	1600	0.5	1.5	23	0.55	2.3	29	280	0.05	2
DX450008	Metasediment 3	2	0.5	6	190	14.4	1100	0.35	2.3	2.8	1	13.4	37	230	0.05	1
DX550056	Basalt	2	0.8	6	120	4.6	6900	0.12	0.13	320	0.25	23	110	130	0.05	1
DX450022	Basalt	2	0.5	6	130	2.6	6600	0.02	0.075	290	0.24	22.7	97	56	0.05	1
DX450077	Basalt	2	0.4	6	170	7.8	9600	0.05	0.16	270	0.45	22	170	170	0.05	1
DX450113	Basalt	2	0.5	6	96	2.6	1200	0.02	0.23	84	0.54	13	46	8	0.05	2
DX550101	Basalt	2	0.1	6	110	1.2	6700	0.02	0.065	330	0.38	22	89	31	0.05	1
DX450128	Basalt	2	0.5	6	190	3.7	5900	0.11	0.29	240	5.6	24	140	49	0.08	1
DX450021	Argillite	2	6.5	6	130	6.8	2700	0.16	1.14	77	0.4	10.2	610	110	0.05	4
DX450222	Fragmental 1	2	0.5	6	270	9.5	1900	0.44	1.83	40	1	9.19	67	43	0.05	2
DX450119	Argillite	2	9.6	6	58	10	1800	0.32	0.95	63	0.56	7.2	2000	76	0.05	5
DX450080	Metasediment 2	2	0.17	6	310	21	3700	0.53	2	100	8.1	14	53	310	0.11	2
DX450143	Metasediment 2	2	1	6	210	14	4700	0.59	1.7	140	5.6	16	130	160	0.07	1
DX450153	Metasediment 2	2	1.3	6	320	27.8	1400	0.88	1.6	80	0.61	7.5	87	220	0.05	1
DX450017	Metasediment 3	2	0.5	6	110	8	2500	0.36	1.67	40	2	7.97	96	140	0.05	6
DX450144	Metasediment 3	2	0.5	6	320	6.9	2500	0.22	0.84	48	2.3	5.5	96	100	0.05	3
DX550073	Basalt	2	0.2	6	370	8.4	6900	0.25	0.37	290	3.2	18	61	190	0.05	3
DX550053	Basalt	2	0.5	6	100	2.8	5600	0.02	0.098	290	0.26	21	92	110	0.05	1
DX550089	Basalt	2	1.7	6	89	3.9	6500	0.25	0.14	280	0.45	20	120	130	0.05	1
DX450051	Felsic Volcanic 1	19	1.7	6	78	8.9	2400	0.97	2.26	46	14	6.66	7300	96	0.12	2
DX450239	Felsic Volcanic 1	2	6.6	6	33	10.1	2400	1	1.84	44	7	6.08	31	37	0.05	5
DX450071	Felsic Volcanic 1	2	12	6	340	29	2000	0.2	2.5	32	22	11	58	340	0.24	4
DX450130	Felsic Volcanic 1	2	1.2	6	290	9.4	2200	0.11	1.7	32	25	6.9	69	80	0.53	1
DX450039	Felsic Volcanic 1	2	0.5	6	120	6.5	1500	0.39	2	54	0.96	8.09	160	76	0.05	1
DX450089	Felsic Volcanic 1	2	0.1	6	320	39	2800	0.62	1.5	48	1.5	8.9	74	220	0.05	1
DX450137	Felsic Volcanic 1	2	0.5	6	260	7.8	2400	0.35	1.3	39	0.53	6.6	63	71	0.05	2
DX450233	Felsic Volcanic 1	2	2.3	6	96	10.7	2700	1.1	1.88	46	3	9.92	2100	42	0.05	4
DX450200	Felsic Volcanic 1	2	2.9	6	220	11.1	2400	0.88	2.3	46	7.4	8.17	18000	54	1.17	1
DX450155	Felsic Volcanic 1	2	1.7	6	250	6.2	2100	0.59	2.1	37	3	8.64	670	14	0.09	2
DX450030	Felsic Volcanic 2	2	0.5	6	160	10.7	1100	0.49	1.7	6.2	3	7.47	140	120	0.05	2
DX450049	Felsic Volcanic 2	2	0.6	6	170	9	1100	0.07	1.94	11	2	5.68	74	110	0.05	1
DX450105	Felsic Volcanic 2	13	0.5	6	65	14	1200	0.45	2.9	2.8	1.2	13	49	74	0.05	1
DX450170	Felsic Volcanic 2	2	12	6	150	17	960	0.74	2.5	17	6.4	12.2	2000	100	0.25	2
DX450227	Felsic Volcanic 1	2	0.5	6	200	7.8	2700	0.29	1.4	37	0.91	6.14	58	36	0.05	1
DX450230	Felsic Volcanic 1	2	0.5	6	450	9.7	3000	0.39	1.8	46	4	9.54	70	49	0.05	1
DX450135	Felsic Volcanic 1	2	0.5	6	200	9.2	1600	0.46	1.8	21	0.87	3.4	210	92	0.05	2
		Antimony	**Selenium**	**Tin**	**Strontium**	**Thorium**	**Titanium**	**Thallium**	**Uranium**	**Vanadium**	**Tungsten**	**Yttrium**	**Zinc**	**Zirconium**	**Mercury**	**Boron**
	Min	2.00	0.10	6.00	33.00	1.20	960.00	0.02	0.07	2.70	0.24	2.30	29.00	8.00	0.05	1.00
	Max	19.00	14.00	6.00	450.00	75.00	9600.00	1.50	2.90	330.00	29.00	24.00	34000.00	360.00	2.16	7.00
	Average	2.87	2.30	6.00	204.15	14.09	2987.92	0.45	1.57	83.45	4.29	11.09	1671.19	125.47	0.15	2.08
	Median	2.00	0.50	6.00	200.00	10.00	2400.00	0.40	1.80	46.00	2.00	9.40	78.00	100.00	0.05	2.00
	Standard Deviation	3.22	3.66	0.00	96.87	12.53	1887.07	0.32	0.75	92.60	6.14	5.33	5514.57	87.80	0.33	1.47
	10th Percentile	2.00	0.42	6.00	95.20	4.04	1200.00	0.08	0.17	8.36	0.45	6.11	49.60	42.00	0.05	1.00
	90th Percentile	2.00	8.76	6.00	320.00	28.76	6380.00	0.88	2.29	278.00	9.62	20.80	2080.00	274.00	0.25	4.00
	ACB Criteria	25	10	10	120	N/A	120	0.5	0.03	2	5	5	120	25	2	120
	Max Concentration (24 hour)	3.47E-05	1.52E-04	1.04E-04	5.55E-03	4.99E-04	1.11E-01	1.53E-05	3.98E-05	4.82E-03	1.67E-04	3.61E-04	3.61E-02	4.75E-03	4.30E-06	6.94E-05
	% ACB	0%	0%	0%	0%	N/A	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Metal screening as a percent of AAQC compl															
	SPM 24 hr Max POI (ug/m3)															

Table C-2: Material Movement by Year

Maximum material movement scaled to 120,000 tonnes per day.			**Maximum Year**	**Maximum Daily**	**Maximum Hourly**	**Maximum Year**	**Maximum Daily**	**Maximum Hourly**	**Maximum Tonnes Per Year (Construction)**	**Total (tonnes)**	**Units =>**	**Total**
Material	Material Origin	Material Destination	**43800000.00**	**120 000**	**5000**	**43 633 636**	**119 544**	**4 981**				
Overburden	Viggo Pit	Overburden #1	3503128	9598	400	3 489 822	9 561	398	3 489 822	3489822	t	3489822
PAG	Viggo Pit	PAG Stockpile	8691780	23813	992	8 658 767	23 723	988	8 658 767	11617807	t	11617807
PAG	Viggo Pit	PAG Stockpile	147215	403	17	146 656	402	17	146 656	251179	t	251179
NPAG	Viggo Pit	NPAG stockpile	4487120	12293	512	4 470 076	12 247	510	4 470 076	6466539	t	6466539
Overburden	LP Central	Overburden #1	9971675	27320	1138	9 933 800	27 216	1 134	9 933 800	15889737	t	15889737
Overburden	LP Central	Overburden #2	—	—	—	—	—	—	—	5570154	t	5570154
PAG	LP Central	PAG Stockpile	4542011	12444	518	4 524 760	12 397	517	4 524 760	108483185	t	108483185
NPAG	LP Central	NPAG stockpile	387676	1062	44	386 203	1 058	44	386 203	15953444	t	15953444
PAG	LP Central	PAG Stockpile	160950	441	18	160 339	439	18	160 339	5652981	t	5652981
Ore	Viggo Pit	Crusher	7129	20	1	7 101	19	1	7 101	7101	t	7101
Ore	Viggo Pit	LGO Stockpile - West (#1)	177784	487	20	177 109	485	20	177 109	315644	t	315644
Ore	Viggo Pit	LGO Stockpile - West (#1)	162608	446	19	161 990	444	18	161 990	245617	t	245617
Ore	Viggo Pit	LGO Stockpile - East (#2)	208324	571	24	207 533	569	24	207 533	327597	t	327597
Ore	Viggo Pit	ROM Stockpile	69310	190	8	69 046	189	8	69 046	136898	t	136898
Ore	LP Central	Crusher	111302	305	13	110 879	304	13	110 879	13853567	t	13853567
Ore	LP Central	LGO Stockpile - West (#1)	41852	115	5	41 693	114	5	41 693	41693	t	41693
Ore	LP Central	LGO Stockpile - West (#1)	76498	210	9	76 208	209	9	76 208	1055218	t	1055218
Ore	LP Central	LGO Stockpile - East (#2)	140468	385	16	139 934	383	16	139 934	5557954	t	5557954
Ore	ROM Stockpile	Crusher	137420	376	16	136 898	375	16	136 898	136898	t	136898
Ore	LGO Stockpile - West (#1)	Crusher	43116	118	5	42 953	118	5	42 953	1658172	t	1658172
Ore	LGO Stockpile - East (#2)	Crusher	—	—	—	—	—	—	—	5885551	t	5885551
Ore	AEX Portal	ROM Stockpile	137509	377	16	136 987	375	16	136 987	8142380	t	8142380
Ore	AEX Portal	LGO Stockpile - West (#1)	—	—	—	—	—	—	—	7995801	t	7995801
Ore	LGO Stockpile - West (#1)	Crusher	—	—	—	—	—	—	—	7995801	t	7995801
Ore	AEX Portal	Crusher	552066	1513	63	549 969	1 507	63	549 969	41579765	t	41579765
Ore	Shaft	Crusher	—	—	—	—	—	—	—	9470811	t	9470811
PAG	AEX PAG	PAG Stockpile	448277	1228	51	446 574	1 223	51	446 574	446574	t	446574
NPAG	AEX NPAG	NPAG Stockpile	422355	1157	48	420 751	1 153	48	420 751	477655	t	477655
PAG	AEX Portal	PAG Stockpile	225217	617	26	224 362	615	26	224 362	5662438	t	5662438
NPAG	AEX Portal	NPAG Stockpile	35068	96	4	34 934	96	4	34 934	4286438	t	4286438
PAG	PAG Stockpile	AEX Portal	—	—	—	—	—	—	—	0	t	0
NPAG	NPAG Stockpile	AEX Portal	—	—	—	—	—	—	—	376519	t	376519
Overburden	North Dam	Overburden #3	—	—	—	—	—	—	—	0	m3	0
Overburden	North Dam	Overburden #5	17064	47	2	16 999	47	2	16 999	29605	m3	15500
Overburden	North Dam	Overburden #6	—	—	—	—	—	—	—	0	m3	0
Overburden	South Dam	Overburden #3	476732	1306	54	474 922	1 301	54	474 922	1051646	m3	550600
Overburden	South Dam	Overburden #5	—	—	—	—	—	—	—	0	m3	0
Overburden	South Dam	Overburden #6	—	—	—	—	—	—	—	0	m3	0
NPAG	South Dam - spillway	South Dam	22116	61	3	22 032	60	3	22 032	198832	m3	73100
Overburden	West Dam	Overburden #3	—	—	—	—	—	—	—	0	m3	0
Overburden	West Dam	Overburden #5	—	—	—	—	—	—	—	0	m3	0
Overburden	West Dam	Overburden #6	—	—	—	—	—	—	—	25212	m3	13200
Overburden	TMF Pond Dam	Overburden #3	20036	55	2	19 960	55	2	19 960	39919	m3	20900
Overburden	TMF Pond Dam	Overburden #3	9586	26	1	9 550	26	1	9 550	19100	m3	10000
Overburden	Quarry #1	Overburden #6	19173	53	2	19 100	52	2	19 100	46986	m3	24600
Overburden	Quarry #2	Overburden #6	14380	39	2	14 325	39	2	14 325	37436	m3	19600
Overburden	Borrow Source #3	Overburden #5	7669	21	1	7 640	21	1	7 640	24066	m3	12600
Overburden	Borrow Source #3BS3B	Overburden #5	7669	21	1	7 640	21	1	7 640	24066	m3	12600
Overburden	MWP Pond Dam	Overburden #3	—	—	—	—	—	—	—	7258	m3	3800
Overburden	MWP Pond Dam	Overburden #3	—	—	—	—	—	—	—	23111	m3	12100
Overburden	CWP #1 Dam	Overburden #1	23678	65	3	23 589	65	3	23 589	47177	m3	24700
NPAG	Borrow Source #3	North Dam	27304	75	3	27 200	75	3	27 200	54400	m3	20000
NPAG	Quarry #2 - Q1	North Dam	35495	97	4	35 360	97	4	35 360	70720	m3	26000
NPAG	Quarry #2 - Q1	North Dam	30034	82	3	29 920	82	3	29 920	59840	m3	22000
NPAG	Quarry #2 - Q1	North Dam	29351	80	3	29 240	80	3	29 240	58480	m3	21500
Overburden	TMF Facility	North Dam	—	—	—	—	—	—	—	123195	m3	64500
NPAG	Borrow Source #3	North Dam	—	—	—	—	—	—	—	48416	m3	17800
NPAG	NPAG stockpile	North Dam	—	—	—	—	—	—	—	48416	m3	17800
NPAG	NPAG stockpile	North Dam	—	—	—	—	—	—	—	597584	m3	219700
NPAG	NPAG stockpile	North Dam	—	—	—	—	—	—	—	145792	m3	53600
NPAG	NPAG stockpile	North Dam	—	—	—	—	—	—	—	8704	m3	3200
NPAG	NPAG stockpile	North Dam	—	—	—	—	—	—	—	43248	m3	15900
NPAG	Borrow Source #3	South Dam	40000	110	5	39 848	109	5	39 848	79696	m3	29300
NPAG	Quarry #1 - Q1	South Dam	52150	143	6	51 952	142	6	51 952	103904	m3	38200
NPAG	Quarry #1 - Q1	South Dam	702688	1925	80	700 019	1 918	80	700 019	875024	m3	321700
NPAG	NPAG stockpile	South Dam	709896	1945	81	707 200	1 938	81	707 200	707200	m3	260000
NPAG	Quarry #1 - Q1	South Dam	33584	92	4	33 456	92	4	33 456	66912	m3	24600
Overburden	TMF Facility	South Dam	—	—	—	—	—	—	—	203224	m3	106400
NPAG	Borrow Source #3	South Dam	—	—	—	—	—	—	—	82960	m3	30500
NPAG	NPAG stockpile	South Dam	—	—	—	—	—	—	—	82960	m3	30500
NPAG	NPAG stockpile	South Dam	—	—	—	—	—	—	—	3000160	m3	1103000
NPAG	NPAG stockpile	South Dam	—	—	—	—	—	—	—	194480	m3	71500
NPAG	NPAG stockpile	South Dam	—	—	—	—	—	—	—	6800	m3	2500
NPAG	NPAG stockpile	South Dam	—	—	—	—	—	—	—	69904	m3	25700
Overburden	TMF Facility	West Dam	—	—	—	—	—	—	—	71625	m3	37500
NPAG	Borrow Source #3	West Dam	—	—	—	—	—	—	—	47328	m3	17400
NPAG	NPAG stockpile	West Dam	—	—	—	—	—	—	—	47328	m3	17400
NPAG	NPAG stockpile	West Dam	—	—	—	—	—	—	—	172720	m3	63500
NPAG	NPAG stockpile	West Dam	—	—	—	—	—	—	—	51136	m3	18800

Table C-2: Material Movement by Year

NPAG	NPAG stockpile	West Dam	—	—	—	—	—	—	—	23936	m3	8800
NPAG	Borrow Source #3	TMF Pond Dam	88054	241	10	87 720	240	10	87 720	175440	m3	64500
NPAG	Quarry #1 - Q1	TMF Pond Dam	21297	58	2	21 216	58	2	21 216	42432	m3	15600
NPAG	Quarry #1 - Q1	TMF Pond Dam	242184	664	28	241 264	661	28	241 264	482528	m3	177400
NPAG	Quarry #1 - Q1	TMF Pond Dam	36041	99	4	35 904	98	4	35 904	71808	m3	26400
NPAG	Quarry #1 - Q1	TMF Pond Dam	13925	38	2	13 872	38	2	13 872	27744	m3	10200
NPAG	Borrow Source #3	MWP Pond Dam	—	—	—	—	—	—	—	99824	m3	36700
NPAG	NPAG Stockpile	MWP Pond Dam	—	—	—	—	—	—	—	32640	m3	12000
NPAG	NPAG Stockpile	MWP Pond Dam	—	—	—	—	—	—	—	442544	m3	162700
NPAG	NPAG Stockpile	MWP Pond Dam	—	—	—	—	—	—	—	47056	m3	17300
NPAG	NPAG Stockpile	MWP Pond Dam	—	—	—	—	—	—	—	12240	m3	4500
NPAG	NPAG Stockpile	LP Central Pit	189870	520	22	189 149	518	22	189 149	945744	m3	347700
NPAG	NPAG Stockpile	Viggo Pit	25939	71	3	25 840	71	3	25 840	25840	m3	9500
NPAG	NPAG Stockpile	Road Base	204778	561	23	204 000	559	23	204 000	4488000	m3	1650000
Overburden	Overburden #1	CWP #1 Dam	18022	49	2	17 954	49	2	17 954	35908	m3	18800
NPAG	NPAG Stockpile	CWP #1 Dam	83413	229	10	83 096	228	9	83 096	166192	m3	61100
NPAG	NPAG Stockpile	CWP #1 Dam	43276	119	5	43 112	118	5	43 112	86224	m3	31700
NPAG	NPAG Stockpile	CWP #1 Dam	2048	6	0	2 040	6		2 040	4080	m3	1500
Overburden	Diversion Channel #1	Overburden #1	21090	58	2	21 010	58	2	21 010	21010	m3	11000
Overburden	Diversion Channel #1	Overburden #1	6327	17	1	6 303	17	1	6 303	6303	m3	3300
Overburden	Diversion Channel #1	Overburden #1	332265	910	38	331 003	907	38	331 003	331003	m3	173300
Overburden	Diversion Channel #1	Overburden #1	5560	15	1	5 539	15	1	5 539	5539	m3	2900
PAG	Diversion Channel #1	PAG Stockpile	34949	96	4	34 816	95	4	34 816	34816	m3	12800
NPAG	Overburden #1	Diversion Channel #1	126962	348	14	126 480	347	14	126 480	126480	m3	46500
NPAG	NPAG stockpile	Diversion Channel #1	293242	803	33	292 128	800	33	292 128	292128	m3	107400
NPAG	NPAG stockpile	Diversion Channel #1	65802	180	8	65 552	180	7	65 552	65552	m3	24100
PAG	Diversion Channel #2	PAG Stockpile	7918	22	1	7 888	22	1	7 888	7888	m3	2900
Overburden	Overburden #1	Diversion Channel #2	33936	93	4	33 807	93	4	33 807	33807	m3	17700
NPAG	NPAG stockpile	Diversion Channel #2	102116	280	12	101 728	279	12	101 728	101728	m3	37400
NPAG	NPAG stockpile	Diversion Channel #2	6280	17	1	6 256	17	1	6 256	6256	m3	2300
Overburden	CWP #2 (Sump #1)	Overburden #2	1534	4	0	1 528	4		1 528	1528	m3	800
Overburden	CWP #3 (Sump #2)	Overburden #2	27417	75	3	27 313	75	3	27 313	27313	m3	14300
Overburden	CWP #2 (Sump #1)	Overburden #2	1534	4	0	1 528	4		1 528	1528	m3	800
Overburden	CWP #3 (Sump #2)	Overburden #2	27417	75	3	27 313	75	3	27 313	27313	m3	14300
Overburden	CWP #2 (Sump #1)	Overburden #2	4218	12	0	4 202	12		4 202	4202	m3	2200
Overburden	CWP #2 (Sump #1)	Overburden #2	2492	7	0	2 483	7		2 483	2483	m3	1300
Overburden	CWP #3 (Sump #2)	Overburden #2	4218	12	0	4 202	12		4 202	4202	m3	2200
Overburden	CWP #3 (Sump #2)	Overburden #2	2492	7	0	2 483	7		2 483	2483	m3	1300
Overburden	TMF Facility	North Dam	—	—	—	—	—	—	—	123195	m3	64500
Overburden	TMF Facility	South Dam	—	—	—	—	—	—	—	203224	m3	106400
Overburden	TMF Facility	West Dam	—	—	—	—	—	—	—	71625	m3	37500
Overburden	Tailings Pipeline	Overburden #3	150020	411	17	149 450	409	17	149 450	256030	m3	134047
Overburden	Borrow Source #1	Tailings Pipeline	108988	299	12	108 574	297	12	108 574	108574	m3	56845
NPAG	NPAG Stockpile	Tailings Pipeline	27031	74	3	26 928	74	3	26 928	26928	m3	9900
NPAG	NPAG Stockpile	Shaft	—	—	—	—	—	—	—	204000	m3	75000
NPAG	Paste Plant	Overburden #2	36491	100	4	36 353	100	4	36 353	36353	m3	13365
NPAG	NPAG Stockpile	Paste Plant	10949	30	1	10 907	30	1	10 907	10907	m3	4010
NPAG	NPAG Stockpile	Paste Plant	21895	60	2	21 812	60	2	21 812	21812	m3	8019
Overburden	Primary Crusher	Overburden #2	43648	120	5	43 482	119	5	43 482	43482	m3	22765
Overburden	Coarse Ore Storage	Overburden #2	91580	251	10	91 232	250	10	91 232	91232	m3	47765
Overburden	Process Plant	Overburden #2	35681	98	4	35 546	97	4	35 546	35546	m3	18610
Overburden	Borrow Source #1	Primary Crusher	167530	459	19	166 894	457	19	166 894	278157	m3	145632
Overburden	Borrow Source #1	Coarse Ore Storage	253	1	0	252	1		252	252	m3	132
Overburden	Borrow Source #1	Process Plant	8660	24	1	8 627	24	1	8 627	8627	m3	4517
NPAG	NPAG Stockpile	Primary Crusher	159051	436	18	158 447	434	18	158 447	158447	m3	58253
Overburden	Overburden #2	Dixie Creek Berm	51209	140	6	51 014	140	6	51 014	51014	m3	26709
NPAG	NPAG Stockpile	Haul Roads	2192891	6008	250	2 184 562	5 985	249	2 184 562	3034114	m3	1115483
Overburden	Haul Roads	Overburden #2	231452	634	26	230 573	632	26	230 573	461147	m3	241438
Overburden	Borrow Source #1	Haul Roads	184314	505	21	183 614	503	21	183 614	183614	m3	96133
NPAG	NPAG Stockpile	Haul Roads	486306	1332	56	484 459	1 327	55	484 459	484459	m3	178110
NPAG	NPAG Stockpile	ROM Stockpile	204778	561	23	204 000	559	23	204 000	237510	m3	87320
Overburden	ROM Stockpile	Overburden #2	83517	229	10	83 200	228	9	83 200	83200	m3	43560
Overburden	Borrow Source #1	Infrastructure Pad	95864	263	11	95 500	262	11	95 500	286500	m3	150000
Overburden	PAG Stockpile	Overburden #1	164813	452	19	164 187	450	19	164 187	640177	m3	335171

Material Handling Area	Area ID	Maximum Hourly Loading(tonnes)	Maximum Hourly Unloading(tonnes)
AEX NPAG	ANPAG	48.2	0.0
AEX PAG	APAG	51.2	0.0
AEX Portal	APRTL	108.4	0.0
Borrow Source #1	BS1	64.6	0.0
Borrow Source #3	BS3	18.6	0.0
Borrow Source #3BS3B	BS3B	0.9	0.0
Coarse Ore Storage	COS	10.5	0.0
Crusher	CRUSH	0.0	97.1
CWP #1 Dam	CWP1	2.7	16.8
CWP #2 (Sump #1)	CWP2	1.1	0.0
CWP #3 (Sump #2)	CWP3	7.0	0.0
Diversion Channel #1	DVC1	45.7	55.5
Diversion Channel #2	DVC2	0.9	16.2
Dixie Creek Berm	DCB	0.0	5.8
Haul Roads	ROAD	26.4	326.9
Infrastructure Pad	IFP	0.0	10.9
LGO Stockpile - East (#2)	LGOE	0.0	39.8
LGO Stockpile - West (#1)	LGOW	4.9	52.4
LP Central	LPC	1761.7	0.0

Table C-2: Material Movement by Year

LP Central Pit	LPC	0.0	21.7
MWP Pond Dam	MWP	0.0	0.0
North Dam	TND	1.9	13.9
NPAG Stockpile	NPAG	551.3	608.7
Overburden #1	OVB1	20.4	1601.4
Overburden #2	OVB2	5.8	67.8
Overburden #3	OVB3	0.0	74.9
Overburden #5	OVB5	0.0	3.7
Overburden #6	OVB6	0.0	3.8
PAG Stockpile	PAG	18.8	1627.7
Paste Plant	PSTP	4.2	3.7
Primary Crusher	CRUSH	5.0	37.3
Process Plant	PRCP	4.1	1.0
Quarry #1	Q1	2.2	0.0
Quarry #1 - Q1	Q1	125.8	0.0
Quarry #2	Q2	1.6	0.0
Quarry #2 - Q1	Q2	10.8	0.0
Road Base	ROAD	0.0	23.4
ROM Stockpile	ROM	25.2	47.0
Shaft	SHAFT	0.0	0.0
South Dam	TSD	54.4	178.1
South Dam - spillway	TSDS	2.5	0.0
Tailings Pipeline	TPIPE	17.1	15.5
TMF Facility	TMF	0.0	0.0
TMF Pond Dam	TPD	3.4	45.8
Viggo Pit	VP	1992.5	3.0
West Dam	TWD	0.0	0.0
Totals		**5000.0**	**5000.0**

Area ID	Maximum Hourly Loading(tonnes)	Maximum Hourly Unloading(tonnes)
ANPAG	48.2	0.0
APAG	51.2	0.0
APRTL	108.4	0.0
BS1	64.6	0.0
BS3	18.6	0.0
BS3B	0.9	0.0
COS	10.5	0.0
CRUSH	5.0	134.4
CWP1	2.7	16.8
CWP2	1.1	0.0
CWP3	7.0	0.0
DVC1	45.7	55.5
DVC2	0.9	16.2
DCB	0.0	5.8
ROAD	26.4	350.3
IFP	0.0	10.9
LGOE	0.0	39.8
LGOW	4.9	52.4
LPC	1761.7	21.7
MWP	0.0	0.0
TND	1.9	13.9
NPAG	551.3	608.7
OVB1	20.4	1601.4
OVB2	5.8	67.8
OVB3	0.0	74.9
OVB5	0.0	3.7
OVB6	0.0	3.8
PAG	18.8	1627.7
PSTP	4.2	3.7
PRCP	4.1	1.0
Q1	128.0	0.0
Q2	12.5	0.0
ROM	25.2	47.0
SHAFT	0.0	0.0
TSD	54.4	178.1
TSDS	2.5	0.0
TPIPE	17.1	15.5
TMF	0.0	0.0
TPD	3.4	45.8
VP	1992.5	3.0
TWD	0.0	0.0
Totals	**5000.0**	**5000.0**

Material	Density
Overburden	1.91
PAG	2.72
NPAG	2.72
Ore	2.71

Table C-3: Construction Phase Generator Sets

Natural Gas Power Generation & Diesel Power Generation

Natural Gas									
Unit Description	**Unit Size (kW)**	**# of Units**	**Total Power Input (kW)**	**Use**	**UTM Easting**	**UTM Northing**	**Make/Model**	**Source ID**	**Notes**
Natural Gas Generators	5000	10	50000	Prime Power Generators - Bridging Phase	456,984	5,636,548	Generic	NG_Gen1-9	11 Units [1 spinning reserve (generating all the time), 1 redundancy]
		Total=	**50000**	**kW**					
		Total=	**50**	**MW**					

US EPA AP-42 Section 3.2: Natural Gas-fired Reciprocating Engines emission factors were used.
Specific make/model not known at this time, AP-42, 4-stroke uncontrolled factors used.

ESDM Procedure Document (Guideline A-10) Section 7.1.1 states that contaminants other than nitrogen oxides are generally emitted in negligible amounts.

Contaminant	**Emission Factor**	**Data Quality**	**Units**	
Nitrogen Oxides (90-105% Load), 4-stroke lean-burn	4.08	A	lb/MMBTU	US EPA AP-42 Chapter 3.2
Nitrogen Oxides	1.00		g/HP-hr	EPA: Table 1 to Subpart JJJJ of Part 60, Title 40
Large Wall-Fired Boilers, Uncontrolled (Post NSPS)	0.19	A	lb/MMBTU	US EPA AP-42 Chapter 1.4
Heat content of natural gas =	1020	BTU/ft^3		US EPA AP-42 Chapter 3.2 and 1.4
	3.20E-01			

					Emission Rate (g/s)	
Natural Gas Generator	**Source ID**	**Total Power Input (kW)**	**Total Power Input (BTU/h)**	**Total Power Input (MMBTU/h)**	**NOx**	**Horsepower (HP)**
Natural Gas Generator 1 (Mill)	NGG-1		6,000,000	6	0.65	2,357
Natural Gas Generator 2 (Warm Storage Structure)	NGG-2		5,000,000	5	0.55	1,964
Natural Gas Generator 3 (Truck Shop)	NGG-3		14,000,000	14	1.53	5,500
Natural Gas Generator 4 (Admin Building)	NGG-4		7,000,000	7	0.76	2,750
Natural Gas Generator 5 (Truck Wash Bay)	NGG-5		8,000,000	8	0.87	3,143
Natural Gas Generator 6 (Water Treatment Plant)	NGG-6		5,000,000	5	0.55	1,964
Natural Gas Generator 7 (Security Gatehouse)	NGG-7		50,000	0.05	0.01	20
Natural Gas Generator 8 (Security Gatehouse 2)	NGG-8		50,000	0.05	0.01	20
Natural Gas Generator 9 (Operations Camp)	NGG-9		18,000,000	18	1.96	7,071
Natural Gas Generator 10 (Paste Backfill Plant)	NGG-10		5,000,000	5	0.55	1,964
Natural Gas Generator 11 (AEX Main Power - 6 Units)	NGG-11	1,300	26,614,708	26.6147076	2.90	10,456
AEX Portal Heating	AEX_NG		45,000,000	45	1.06	
Discovery FAR	DISC_NG		90,000,000	90	2.11	
LP #1 FAR	LP1_NG		107,000,000	107	2.51	
LP #2 FAR (LP#2 is the same as LP#1, replaces LP#1 in 2040).	LP2_NG		0	0	0.00	
				Total =	**16.02**	

Sample Calculation **1465.416178**

Natural Gas Generator 1 (NGG-1) - NOx Emissions

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Total\ Power\ Input\ \left(\frac{kW}{h}\right) * \frac{BTU}{kW} * \frac{1\ MMBTU}{1{,}000{,}000\ BTU} * Emission\ Factor\ \left(\frac{lb}{MMBTU}\right) * \frac{g}{lb} * \frac{1\ h}{3600\ s}$$

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Total\ Power\ Input\ \left(\frac{5{,}000\ kW}{h}\right) * \frac{3{,}412\ BTU}{kW} * \frac{1\ MMBTU}{1{,}000{,}000\ BTU} * Emission\ Factor\ \left(\frac{4.08\ lb}{MMBTU}\right) * \frac{453.592\ g}{lb} * \frac{1\ h}{3600\ s}$$

$$Emission\ Rate\ \left(\frac{g}{s}\right) = 8.77\ \ g/s$$

Diesel Power Generation								
Unit Description	**Unit Size (kW)**	**# of Units**	**Total Power Input (kW)**	**Use**	**UTM Easting**	**UTM Northing**	**Make/Model**	**Source ID**
TMF Dam Raises Generator	100	1	100	Raises	453,824	5,635,915	Generic	DG1
Water Intake Dixie Creek Generator	100	1	100	Dixie Creek bridge area	455,662	5,633,868	Generic	DG2
Explosives Storage Generator	100	1	100	Explosives Storage - power	459,209	5,634,334	Generic	DG3
Explosives Magazine Generator	100	1	100	Explosives Magazine - power	458,277	5,634,505	Generic	DG4
Water Effluent - Booster Pump Generator	150	1	150	Water Effluent - booster Pump	464,942	5,633,802	Generic	DG5
Water Booster Pump PSV Generator	50	1	50	Water PSV station	463,813	5,633,822	Generic	DG6
Quarry Power & Dewatering Generator	500	1	500	Quarry Power + Dewatering	452,142	5,636,658	Generic	DG7
Construction Dewatering - Viggo	100	1	100	Shaft construction misc power	458577	5634452	Generic	DG8
Operations Camp - construction power	100	3	300	Operations Camp - construction power	457214	5637232	Generic	DG9
Mill -Misc Power	100	5	500	Mill -Misc Power	456433	5636485	Generic	DG10
Water Treatment - Misc Power	100	1	100	Water Treatment - Misc Power	457452	5634413	Generic	DG11
Admin - Misc Power	100	2	200	Admin - Misc Power	455661	5635757	Generic	DG12
Security Shack - Misc Power	100	1	100	Security Shack - Misc Power	455661	5635757	Generic	DG13
AEX DG1	1000	1	1000	Site Prime Power			Generic	ADG1
AEX DG2	1000	1	1000	Site Prime Power			Generic	ADG2
AEX DG3	1000	1	1000	Site Prime Power			Generic	ADG3
AEX DG4	500	1	500	Site Prime Power			Generic	ADG4
AEX DG5	100	1	100	Misc. Loads			Generic	ADG5
AEX DG6	100	1	100	Misc. Loads			Generic	ADG6
AEX DG7	200	1	200	Misc. Loads			Generic	ADG7
AEX DG8	50	1	50	Misc. Loads			Generic	ADG8
AEX DG9	100	1	100	Contractor Load			Generic	ADG9
AEX DG10	100	1	100	Contractor Load			Generic	ADG10
AEX DG11	100	1	100	Contractor Load			Generic	ADG11
AEX DG12	100	1	100	Contractor Load			Generic	ADG12
AEX DG13	100	1	100	Contractor Load			Generic	ADG13
AEX DG14	100	1	100	Contractor Load			Generic	ADG14
AEX DG15	100	1	100	Contractor Load			Generic	ADG15
AEX DG16	100	1	100	Contractor Load			Generic	ADG16
AEX DG17	100	1	100	Contractor Load			Generic	ADG17
AEX DG18	100	1	100	Contractor Load			Generic	ADG18
		Total=	**7.35**	**MW**				

Notes:

Generic generation data is based on US EPA AP-42 fuel combustion emission factors.
Below Emission Factors utilized for generic generators as exact models are currently unknown.
Emission Factors for Contaminants (AP-42 Chapter 3.3: Gasoline and Diesel Industrial Engines) < 600 horsepower (447 kW)

Contaminant	Emission Factor (lb/hp-h)	Emission Factor Rating	Emission Factor (g/hp-hr)
Nitrogen Oxides	0.031	D	14.06
Suspended Particulate Matter	2.20E-03	D	1.00
Carbon Monoxide	6.68E-03	D	3.03
Sulphur Dioxide	1.21E-05	B	0.006

Sulphur Dioxide Emission Factor is a component of sulphur content of the burned fuel

SO_2 Emission Factor (lb/hp-hr) = 8.09E-03 * S1
SO_2 Emission Factor (lb/MMBTU) = 1.01 * S1
Where:
S1 = % Sulphur in the Fuel (e.g. 1.5% = 1.5)

15 mg sulphur per kg of fuel, as per Sulphur in Diesel Fuel Regulations (SOR/2002-254)
1 kg = 1,000,000 mg
0.0015 % Sulphur in Diesel Fuel

SO_2 Emission Factor (lb/hp-hr) = 1.21E-05
SO_2 Emission Factor (lb/MMBTU) = 0.0015

			Emission Factor (g/hp-hr)				1-Hour Emission Rate (g/s)				
Diesel Generator Unit	**Unit Power (kW)**	**Unit Brake-Horsepower (bhp)**	**NOx**	**SPM**	**SO_2**	**CO**	**NO_X**	**SPM**	**SO_2**	**CO**	**Emission Factor**
TMF Dam Raises Generator	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Water Intake Dixie Creek Generator	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Explosives Storage Generator	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Explosives Magazine Generator	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Water Effluent - Booster Pump Generator	150	201	14.06	1.00	0.01	3.03	0.79	0.06	3.1E-04	0.17	Diesel Engine
Water Booster Pump PSV Generator	50	67	14.06	1.00	0.01	3.03	0.26	0.02	1.0E-04	0.06	Diesel Engine
Quarry Power & Dewatering Generator	500	671	14.06	1.00	0.01	3.03	2.62	0.19	1.0E-03	0.56	Diesel Engine
Construction Dewatering - Viggo	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Operations Camp - construction power	300	402	14.06	1.00	0.01	3.03	1.57	0.11	6.2E-04	0.34	Diesel Engine
Mill -Misc Power	500	671	14.06	1.00	0.01	3.03	2.62	0.19	1.0E-03	0.56	Diesel Engine
Water Treatment - Misc Power	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Admin - Misc Power	200	268	14.06	1.00	0.01	3.03	1.05	0.07	4.1E-04	0.23	Diesel Engine
Security Shack - Misc Power	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG1	1000	1341	14.06	1.00	0.01	3.03	5.24	0.37	2.1E-03	1.13	Diesel Engine
AEX DG2	1000	1341	14.06	1.00	0.01	3.03	5.24	0.37	2.1E-03	1.13	Diesel Engine
AEX DG3	1000	1341	14.06	1.00	0.01	3.03	5.24	0.37	2.1E-03	1.13	Diesel Engine
AEX DG4	500	671	14.06	1.00	0.01	3.03	2.62	0.19	1.0E-03	0.56	Diesel Engine
AEX DG5	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG6	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG7	200	268	14.06	1.00	0.01	3.03	1.05	0.07	4.1E-04	0.23	Diesel Engine
AEX DG8	50	67	14.06	1.00	0.01	3.03	0.26	0.02	1.0E-04	0.06	Diesel Engine
AEX DG9	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG10	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG11	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG12	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG13	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG14	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG15	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG16	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG17	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG18	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Total	**1,200**	**1609**	**-**	**-**	**-**	**-**	**6.29**	**0.45**	**0.00**	**1.35**	-

Sample Calculation

Diesel Generator 1 (DG-1) - NOx Emissions

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Emission\ Factor\ \left(\frac{g}{hp*h}\right)*\frac{kW}{h}*\frac{hp}{kW}*\frac{1\ h}{3600\ s}$$

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Emission\ Factor\ \left(\frac{14.06\ g}{hp*h}\right)*\frac{1000\ kW}{h}*\frac{1.34102\ hp}{kW}*\frac{1\ h}{3600\ s}$$

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Emission\ Factor\ \left(\frac{14.06\ g}{hp*h}\right)*\frac{1000\ kW}{h}*\frac{1.34102\ hp}{kW}*\frac{1\ h}{3600\ s}$$

		U.S. EPA AP42 Table 3.3-2		
		BaP	**Benzene**	**1,3-Butadiene**
Emission Factor (g/hp-h)		5.97E-07	4.23E-01	1.77E-02
Diesel Generator Unit	**Unit Brake-Horsepower (bhp)**			
TMF Dam Raises Generator	134	2.22E-08	1.58E-02	6.61E-04
Water Intake Dixie Creek Generator	134	2.22E-08	1.58E-02	6.61E-04
Explosives Storage Generator	134	2.22E-08	1.58E-02	6.61E-04
Explosives Magazine Generator	134	2.22E-08	1.58E-02	6.61E-04
Water Effluent - Booster Pump Generator	201	3.34E-08	1.52E-02	9.91E-04
Water Booster Pump PSV Generator	67	1.11E-08	7.88E-03	3.30E-04
Quarry Power & Dewatering Generator	671	1.11E-07	7.88E-02	3.30E-03
Construction Dewatering - Viggo	134	2.22E-08	1.58E-02	6.61E-04
Operations Camp - construction power	402	6.67E-08	4.73E-02	1.98E-03
Mill -Misc Power	671	1.11E-07	7.88E-02	3.30E-03
Water Treatment - Misc Power	134	2.22E-08	1.58E-02	6.61E-04
Admin - Misc Power	268	4.45E-08	3.15E-02	1.32E-03
Security Shack - Misc Power	134	2.22E-08	1.58E-02	6.61E-04
AEX DG1	1341	2.22E-07	1.58E-01	6.61E-03
AEX DG2	1341	2.22E-07	1.58E-01	6.61E-03
AEX DG3	1341	2.22E-07	1.58E-01	6.61E-03
AEX DG4	671	1.11E-07	7.88E-02	3.30E-03
AEX DG5	134	2.22E-08	1.58E-02	6.61E-04
AEX DG6	134	2.22E-08	1.58E-02	6.61E-04
AEX DG7	268	4.45E-08	3.15E-02	1.32E-03
AEX DG8	67	1.11E-08	7.88E-03	3.30E-04
AEX DG9	134	2.22E-08	1.58E-02	6.61E-04
AEX DG10	134	2.22E-08	1.58E-02	6.61E-04
AEX DG11	134	2.22E-08	1.58E-02	6.61E-04
AEX DG12	134	2.22E-08	1.58E-02	6.61E-04
AEX DG13	134	2.22E-08	1.58E-02	6.61E-04
AEX DG14	134	2.22E-08	1.58E-02	6.61E-04
AEX DG15	134	2.22E-08	1.58E-02	6.61E-04
AEX DG16	134	2.22E-08	1.58E-02	6.61E-04
AEX DG17	134	2.22E-08	1.58E-02	6.61E-04
AEX DG18	134	2.22E-08	1.58E-02	6.61E-04

Table C-4: Construction Phase - Drilling and Blasting

Drilling

Particulate Matter

	Emission Factor					
	SPM	**PM_{10}**	**$PM_{2.5}$**	**Units**	**Notes**	**Emission Factor Rating**
Uncontrolled emission Factor	0.59	0.3068	0.3068	kg/hole	AP-42, Table 11.9-4	C-rating
Control Level (%)	70	70	70	%	PM_{10}/$PM_{2.5}$: NPRI based on Mojave Desert report	

				Emission Rate (g/s)		
Source ID	**Location**	**Holes per Shift**	**# of Shifts**	**SPM**	**PM_{10}**	**$PM_{2.5}$**
	Quarry Source 1+2	139	2	0.570	0.296	0.296
	Process Plant Infrastructure	93	1	0.190	0.099	0.099
	Viggo Pit	31	2	0.127	0.066	0.066

Sample Calculation
Step 1: Determine the total drilled holes per day
Drilled Holes = Holes per Shift x Shifts per Day
= 31 x 2 = 62 holes/day
Step 2: Claculate the emission rate based no the emission factor and total number of holes (TPM as example)
Emission Rate (g/s) = Emission Factor (kg/hole) x Control Level (%) x Drilled Holes per Day
= 0.59 (kg/day) x (100% - 70%) x 62 (holes/day) x 1000 (g/kg) / 24 (h/day) / 3600 (s/h) = 0.127 g/s

Blasting

Particulate Matter

References: US EPA AP-42 Section 11.9 Western Surface Coal Mining Table 11.9-2

US EPA Emission Factor Rating: C — Data Quality: Average

Emission Factor (kg/blast) = 0.00022 $A^{1.5}$ — Area being dimensions of blast face.

PM_{10} Scaling Factor 0.52 ECCC NPRI / US EPA Table 11.9-2

$PM_{2.5}$ Scaling Factor 0.03 ECCC NPRI / US EPA Table 11.9-2

					Emission Rate (g/s)					
					24-hour			1-hour		
Source ID	Location	Blast Area	Emission (kg/blast)	Blasts Per Day	**TSP**	**PM_{10}**	**$PM_{2.5}$**	**TSP**	**PM_{10}**	**$PM_{2.5}$**
	Quarry Source 1+2	651	3.7	0.86	3.62E-02	1.88E-02	1.09E-03	8.69E-01	4.52E-01	2.61E-02
	Process Plant Infrastructure	372	1.6	1.00	1.83E-02	9.50E-03	5.48E-04	4.38E-01	2.28E-01	1.32E-02
	Viggo Pit	4,428	64.8	1.00	7.50E-01	3.90E-01	2.25E-02	1.80E+01	9.36E+00	5.40E-01

Other Contaminants

Client has specified that emulsion explosives are the preferred alternative.

Emission Factors from US EPA AP-42 Emission Factor Tables 13.3-1 for Explosives Detonation.

US EPA Emission Factor Rating: D — Data Quality: Marginal / Uncertain

Table C-4: Construction Phase - Drilling and Blasting

Source ID	Location	Emulsion Per Blast		NO_x	CO	SO_2	NH_3
			Emission Factor	3.08	17.12	0.22	1.14
			Emission Per Blast				
	Quarry Source 1+2	6,188		19065	105938	1361	7054
	Process Plant Infrastructure	3,538		10901	60572	778	4033
	Viggo Pit	42,120		129773	721094	9266	48017

			Emission Rate (g/s)							
			1-hour				**24-hour**			
Source ID	Location	Blasts Per Day	NO_x	CO	SO_2	NH_3	NO_x	CO	SO_2	NH_3
	Quarry Source 1+2	0.86	4.5	25.2	0.3	1.7	1.89E-01	1.05E+00	1.35E-02	7.00E-02
	Process Plant Infrastructure	1.00	3.0	16.8	0.2	1.1	1.26E-01	7.01E-01	9.01E-03	4.67E-02
	Viggo Pit	1.00	36.0	200.3	2.6	13.3	1.50E+00	8.35E+00	1.07E-01	5.56E-01

Manufacturer's Emission Factors - Dyno Nobel

Det within	NO_x l/kg	NO_x g/kg	NO_x lb/ton	NO_2 l/kg	NO_2 g/kg	NO_2 lb/ton
Steel pipe	1.50	3.08	6.16	0.50	1.03	2.05
sheet metal	2.50	5.14	10.27	0.90	1.85	3.70
sheet metal	3.00	6.16	12.32	1.30	2.67	5.34
AVERAGE			9.59			3.70

Det within	CO l/kg	CO g/kg	CO lb/ton
Steel pipe	13.00	16.26	32.51
sheet metal	14.00	17.51	35.01
sheet metal	21.00	26.26	52.52
AVERAGE			40.01

Emission Factors from Blasting - Orica

Species	**g/kg**
NO_x	3.08
CO	17.1
NH_3	1.1
SO_2	0.22

Table C-5: Construction Phase - Material Handling

Crushing and Screening						
Reference:	ESDM Procedure Document Table C-1 (March 2009)					
	Emission Factor kg/Mg (kg/tonne)					
	SCC	**TSP**	**EPA Rating**	**PM_{10}**	**EPA Rating**	**$PM_{2.5}$**
Primary Crusher	3-03-024-01	0.01	C	0.004	C	–
Secondary Crusher	3-03-024-01	0.03	C	0.012	C	–
Crushing Capacity	625	tonnes/hour				
CFM to m3/s conversion factor	4.72E-04					

	Flowrate (m^3/s)	**Concentration (mg/m^3)**	**TSP**	**PM_{10}**	**$PM_{2.5}$**	**Unit**
Primary Crusher Baghouse	2.8	20	0.06	0.06	0.06	g/s
Pebble Crusher Baghouse	0.9	20	0.02	0.02	0.02	g/s
Apron Feeder Baghouse 1	0.6	20	0.01	0.01	0.01	g/s
Apron Feeder Baghouse 2	0.6	20	0.01	0.01	0.01	g/s
Apron Feeder Baghouse 3	0.6	20	0.01	0.01	0.01	g/s
Transfer Point Baghouse	4.2	20	0.08	0.08	0.08	g/s

Material Loading and Unloading, and Drops at Stockpiles

Reference: AP 42 - Section 11.24 (based on high moisture > 4%)		**Quantity**	**Unit**	**Area ID**	**Source ID**	**Description**
Activity Data:	**Loading**	48.2	tonnes/hour	ANPAG	MH_ANPAG	Loading at AEX NPAG
		51.2	tonnes/hour	APAG	MH_APAG	Loading at AEX PAG
		108.4	tonnes/hour	APRTL	MH_APRTL	Loading at AEX Portal
		64.6	tonnes/hour	BS1	MH_BS1	Loading at Borrow Source #1
		18.6	tonnes/hour	BS3	MH_BS3	Loading at Borrow Source #3
		0.9	tonnes/hour	BS3B	MH_BS3B	Loading at Borrow Source #3BS3B
		10.5	tonnes/hour	COS	MH_COS	Loading at Coarse Ore Storage
		5.0	tonnes/hour	CRUSH	MH_CRUSH	Loading at Crusher
		2.7	tonnes/hour	CWP1	MH_CWP1	Loading at CWP #1 Dam
		1.1	tonnes/hour	CWP2	MH_CWP2	Loading at CWP #2 (Sump #1)
		7.0	tonnes/hour	CWP3	MH_CWP3	Loading at CWP #3 (Sump #2)
		45.7	tonnes/hour	DVC1	MH_DVC1	Loading at Diversion Channel #1
		0.9	tonnes/hour	DVC2	MH_DVC2	Loading at Diversion Channel #2
		0.0	tonnes/hour	DCB	MH_DCB	Loading at Dixie Creek Berm
		26.4	tonnes/hour	ROAD	MH_ROAD	Loading at Haul Roads
		0.0	tonnes/hour	IFP	MH_IFP	Loading at Infrastructure Pad
		0.0	tonnes/hour	LGOE	MH_LGOE	Loading at LGO Stockpile - East (#2)
		4.9	tonnes/hour	LGOW	MH_LGOW	Loading at LGO Stockpile - West (#1)
		1761.7	tonnes/hour	LPC	MH_LPC	Loading at LP Central
		0.0	tonnes/hour	MWP	MH_MWP	Loading at MWP Pond Dam
		1.9	tonnes/hour	TND	MH_TND	Loading at North Dam
		551.3	tonnes/hour	NPAG	MH_NPAG	Loading at NPAG Stockpile
		20.4	tonnes/hour	OVB1	MH_OVB1	Loading at Overburden #1
		5.8	tonnes/hour	OVB2	MH_OVB2	Loading at Overburden #2
		0.0	tonnes/hour	OVB3	MH_OVB3	Loading at Overburden #3
		0.0	tonnes/hour	OVB5	MH_OVB5	Loading at Overburden #5
		0.0	tonnes/hour	OVB6	MH_OVB6	Loading at Overburden #6
		18.8	tonnes/hour	PAG	MH_PAG	Loading at PAG Stockpile
		4.2	tonnes/hour	PSTP	MH_PSTP	Loading at Paste Plant
		4.1	tonnes/hour	PRCP	MH_PRCP	Loading at Process Plant
		128.0	tonnes/hour	Q1	MH_Q1	Loading at Quarry #1
		12.5	tonnes/hour	Q2	MH_Q2	Loading at Quarry #2
		25.2	tonnes/hour	ROM	MH_ROM	Loading at ROM Stockpile
		0.0	tonnes/hour	SHAFT	MH_SHAFT	Loading at Shaft
		54.4	tonnes/hour	TSD	MH_TSD	Loading at South Dam
		2.5	tonnes/hour	TSDS	MH_TSDS	Loading at South Dam - spillway
		17.1	tonnes/hour	TPIPE	MH_TPIPE	Loading at Tailings Pipeline
		0.0	tonnes/hour	TMF	MH_TMF	Loading at TMF Facility
		3.4	tonnes/hour	TPD	MH_TPD	Loading at TMF Pond Dam
		1992.5	tonnes/hour	VP	MH_VP	Loading at Viggo Pit
		0.0	tonnes/hour	TWD	MH_TWD	Loading at West Dam
	Unloading	0.0	tonnes/hour	ANPAG	MH_ANPAG	Unloading at AEX NPAG
		0.0	tonnes/hour	APAG	MH_APAG	Unloading at AEX PAG
		0.0	tonnes/hour	APRTL	MH_APRTL	Unloading at AEX Portal
		0.0	tonnes/hour	BS1	MH_BS1	Unloading at Borrow Source #1
		0.0	tonnes/hour	BS3	MH_BS3	Unloading at Borrow Source #3
		0.0	tonnes/hour	BS3B	MH_BS3B	Unloading at Borrow Source #3BS3B
		0.0	tonnes/hour	COS	MH_COS	Unloading at Coarse Ore Storage
		134.4	tonnes/hour	CRUSH	MH_CRUSH	Unloading at Crusher
		16.8	tonnes/hour	CWP1	MH_CWP1	Unloading at CWP #1 Dam
		0.0	tonnes/hour	CWP2	MH_CWP2	Unloading at CWP #2 (Sump #1)
		0.0	tonnes/hour	CWP3	MH_CWP3	Unloading at CWP #3 (Sump #2)
		55.5	tonnes/hour	DVC1	MH_DVC1	Unloading at Diversion Channel #1
		16.2	tonnes/hour	DVC2	MH_DVC2	Unloading at Diversion Channel #2
		5.8	tonnes/hour	DCB	MH_DCB	Unloading at Dixie Creek Berm
		350.3	tonnes/hour	ROAD	MH_ROAD	Unloading at Haul Roads
		10.9	tonnes/hour	IFP	MH_IFP	Unloading at Infrastructure Pad
		39.8	tonnes/hour	LGOE	MH_LGOE	Unloading at LGO Stockpile - East (#2)
		52.4	tonnes/hour	LGOW	MH_LGOW	Unloading at LGO Stockpile - West (#1)
		21.7	tonnes/hour	LPC	MH_LPC	Unloading at LP Central
		0.0	tonnes/hour	MWP	MH_MWP	Unloading at MWP Pond Dam
		13.9	tonnes/hour	TND	MH_TND	Unloading at North Dam
		608.7	tonnes/hour	NPAG	MH_NPAG	Unloading at NPAG Stockpile
		1601.4	tonnes/hour	OVB1	MH_OVB1	Unloading at Overburden #1
		67.8	tonnes/hour	OVB2	MH_OVB2	Unloading at Overburden #2
		74.9	tonnes/hour	OVB3	MH_OVB3	Unloading at Overburden #3
		3.7	tonnes/hour	OVB5	MH_OVB5	Unloading at Overburden #5
		3.8	tonnes/hour	OVB6	MH_OVB6	Unloading at Overburden #6
		1627.7	tonnes/hour	PAG	MH_PAG	Unloading at PAG Stockpile
		3.7	tonnes/hour	PSTP	MH_PSTP	Unloading at Paste Plant
		1.0	tonnes/hour	PRCP	MH_PRCP	Unloading at Process Plant
		0.0	tonnes/hour	Q1	MH_Q1	Unloading at Quarry #1
		0.0	tonnes/hour	Q2	MH_Q2	Unloading at Quarry #2
		47.0	tonnes/hour	ROM	MH_ROM	Unloading at ROM Stockpile
		0.0	tonnes/hour	SHAFT	MH_SHAFT	Unloading at Shaft
		178.1	tonnes/hour	TSD	MH_TSD	Unloading at South Dam

Table C-5: Construction Phase - Material Handling

		0.0	tonnes/hour	TSDS	MH_TSDS	Unloading at South Dam - spillway
		15.5	tonnes/hour	TPIPE	MH_TPIPE	Unloading at Tailings Pipeline
		0.0	tonnes/hour	TMF	MH_TMF	Unloading at TMF Facility
		45.8	tonnes/hour	TPD	MH_TPD	Unloading at TMF Pond Dam
		3.0	tonnes/hour	VP	MH_VP	Unloading at Viggo Pit
		0.0	tonnes/hour	TWD	MH_TWD	Unloading at West Dam

Emission Factors:		Uncontrolled			Control Efficiency (water spray or enclosed drop)	Controlled kg/Mg
	SCC	kg/Mg (kg/tonne)	Size Fraction	EPA Rating		
Material Transfer:	3-03-024-08	0.005	TSP	C	80%	0.001
		0.002	PM_{10}	C	80%	0.0004
		0.00057	$PM_{2.5}$	NA	80%	0.00011

The material transfer is used for all conveyor drops, stock pile drops, ore dumps and other locations where material is allowed to fall freely, as per AP42 - Section 11.24

Source ID	Description	Total Material Handling (tonnes/hour)	Speciated Emission Rate (g/s) *TSP*	*PM 10*	*PM 2.5*
MH_ANPAG	Material Handling at AEX NPAG	48.2	1.34E-02	5.36E-03	1.51E-03
MH_APAG	Material Handling at AEX PAG	51.2	1.42E-02	5.69E-03	1.61E-03
MH_APRTL	Material Handling at AEX Portal	108.4	3.01E-02	1.20E-02	3.40E-03
MH_BS1	Material Handling at Borrow Source #1	64.6	1.79E-02	7.17E-03	2.03E-03
MH_BS3	Material Handling at Borrow Source #3	18.6	5.17E-03	2.07E-03	5.84E-04
MH_BS3B	Material Handling at Borrow Source #3BS3B	0.9	2.43E-04	9.73E-05	2.75E-05
MH_COS	Material Handling at Coarse Ore Storage	10.5	2.91E-03	1.16E-03	3.29E-04
MH_CRUSH	Material Handling at Crusher	139.4	3.87E-02	1.55E-02	4.38E-03
MH_CWP1	Material Handling at CWP #1 Dam	19.5	5.40E-03	2.16E-03	6.11E-04
MH_CWP2	Material Handling at CWP #2 (Sump #1)	1.1	3.10E-04	1.24E-04	3.51E-05
MH_CWP3	Material Handling at CWP #3 (Sump #2)	7.0	1.95E-03	7.81E-04	2.21E-04
MH_DVC1	Material Handling at Diversion Channel #1	101.2	2.81E-02	1.12E-02	3.18E-03
MH_DVC2	Material Handling at Diversion Channel #2	17.2	4.76E-03	1.91E-03	5.39E-04
MH_DCB	Material Handling at Dixie Creek Berm	5.8	1.62E-03	6.50E-04	1.84E-04
MH_ROAD	Material Handling at Haul Roads	376.7	1.05E-01	4.19E-02	1.18E-02
MH_IFP	Material Handling at Infrastructure Pad	10.9	3.04E-03	1.22E-03	3.44E-04
MH_LGOE	Material Handling at LGO Stockpile - East (#2)	39.8	1.11E-02	4.42E-03	1.25E-03
MH_LGOW	Material Handling at LGO Stockpile - West (#1)	57.3	1.59E-02	6.37E-03	1.80E-03
MH_LPC	Material Handling at LP Central	1783.4	4.95E-01	1.98E-01	5.60E-02
MH_MWP	Material Handling at MWP Pond Dam	0.0	0.00E+00	0.00E+00	0.00E+00
MH_TND	Material Handling at North Dam	15.9	4.42E-03	1.77E-03	4.99E-04
MH_NPAG	Material Handling at NPAG Stockpile	1160.0	3.22E-01	1.29E-01	3.64E-02
MH_OVB1	Material Handling at Overburden #1	1621.9	4.51E-01	1.80E-01	5.09E-02
MH_OVB2	Material Handling at Overburden #2	73.6	2.04E-02	8.18E-03	2.31E-03
MH_OVB3	Material Handling at Overburden #3	74.9	2.08E-02	8.33E-03	2.35E-03
MH_OVB5	Material Handling at Overburden #5	3.7	1.03E-03	4.11E-04	1.16E-04
MH_OVB6	Material Handling at Overburden #6	3.8	1.06E-03	4.26E-04	1.20E-04
MH_PAG	Material Handling at PAG Stockpile	1646.5	4.57E-01	1.83E-01	5.17E-02
MH_PSTP	Material Handling at Paste Plant	7.9	2.20E-03	8.79E-04	2.49E-04
MH_PRCP	Material Handling at Process Plant	5.1	1.41E-03	5.62E-04	1.59E-04
MH_Q1	Material Handling at Quarry #1	128.0	3.55E-02	1.42E-02	4.02E-03
MH_Q2	Material Handling at Quarry #2	12.5	3.46E-03	1.39E-03	3.92E-04
MH_ROM	Material Handling at ROM Stockpile	72.2	2.01E-02	8.02E-03	2.27E-03
MH_SHAFT	Material Handling at Shaft	0.0	0.00E+00	0.00E+00	0.00E+00
MH_TSD	Material Handling at South Dam	232.6	6.46E-02	2.58E-02	7.30E-03
MH_TSDS	Material Handling at South Dam - spillway	2.5	7.01E-04	2.81E-04	7.93E-05
MH_TPIPE	Material Handling at Tailings Pipeline	32.7	9.07E-03	3.63E-03	1.03E-03
MH_TMF	Material Handling at TMF Facility	0.0	0.00E+00	0.00E+00	0.00E+00
MH_TPD	Material Handling at TMF Pond Dam	49.2	1.37E-02	5.47E-03	1.55E-03
MH_VP	Material Handling at Viggo Pit	1995.5	5.54E-01	2.22E-01	6.27E-02
MH_TWD	Material Handling at West Dam	0.0	0.00E+00	0.00E+00	0.00E+00

Table C-6: Construction Phase - HCN Emissions

HCN Emissions from Leaching Process
Based on Australian NPI (version 2) Dec. 2006
HCN emission from page 28
E (kg of CN) = (0.013 * aqueous concentration of NaCN in tank +0.46) * area of tank * time * 0.96/1000 (equation 1)
aqueous concentration of HCN = concentration as mg/L of NaCN in tank * 10 ^ (9.2 - pH) (equation 2)

The leach process will be operated at a pH of 10.5 to 11, and the target NaCN concentration is 1000 ppm.
The HCN emissions for the scenario with 1000 ppm NaCN in solution was used to ensure estimates are conservative.

	Concentrate Leach			Source of Data
pH = pH in the leach/adsorption tank	> 10.5	> 10.5	> 10.5	Process Design
[NaCN] = Concentration (as mg/l) of NaCN in the leach/adsorption tank	1000	500	250	Estimated
[HCN(aq)] = [NaCN] x $10^{(9.2 - pH)}$	50.12	25.06	12.53	calculated from equation (2)
A = Surface area (m2) of the leach/adsorption tank	269	269	269	Process Design
T = Period of emissions (hours)	24	24	24	Process Design
E = Emission of CN (kg) per tank per day	6.88	4.87	3.86	calculated from equation (1)
E = emission of CN g/s per tank	0.080	0.056	0.045	= kg*1000/24/60/60
Total Emissions for Leach circuit overall (g/s)	0.48	0.338	0.27	Total = E (g/s per tank) x number of tanks

6.2.1 Cyanide emissions from the ore processing area

Based on research performed by CSIRO on investigating HCN emissions from process tanks, it was estimated that approximately **1%** of the total cyanide added to the circuit is lost through HCN volatilisation across all tanks (Heath *et al.*, 1998). A figure of 1% of total cyanide added to the leach circuit may therefore be used as a default value for loss of cyanide as HCN from the leach/adsorption train.

Alternatively, a site specific figure for emissions may be calculated using the equation below. The equation estimates the HCN emissions from an individual process tank and is derived from the work reported by Heath et al.

$$\mathbf{E = ([0.013 \times [HCN_{(aq)}] + 0.46\} \times A \times T \times 0.96/10^3)}$$

Where:

E	=	Emission of CN (kg)
$[HCN_{(aq)}]$	=	[NaCN] x $10^{(9.2 - pH)}$
[NaCN]	=	Concentration (as mg/l) of NaCN in the leach/adsorption tank
pH	=	pH in the leach/adsorption tank
A	=	Surface area (m^2) of the leach/adsorption tank
T	=	Period of emissions (hours)

Table C-7: Construction Phase - Road Dust Emissions (Haul Roads)

Table 1: Particulate Emission Coefficients for Truck Traffic on Unpaved Industrial Roads from AP42 (Chapter 13.2 - Unpaved Roads; Nov 2006)

Constant	Expressed Units	PM_{30} (TPM)[3]	PM_{10}	$PM_{2.5}$	US EPA Data Quality
k	lb/VMT [(1)]	4.9	1.5	0.15	B
a	-	0.7	0.9	0.9	B
b	-	0.45	0.45	0.45	B
Conversion	lb/VMT to g/VKT	281.9	281.9	281.9	–

Notes:
1. "lb/VMT" means pounds pre vehicle mile travelled.
2. "g/VKT" means grams per vehicle kilometre
3. TPM means total particulate matter

Road Emission Assumptions (needed for AP42)					
Mean Silt Content	5.8	%	based on AP42 Chapter 13.2.2 for taconite mining		
Assumed average speed of trucks	50	km/hour	31.1	miles/hour	(not used in calculations)
Assumed Control Efficiency	90	%	based on watering, vehicle speed, lack of silt, dust suppressant		

Table 2: Trip Details

Vehicle Travel Pathway		Tonnes per hour	Load per Truck (tonnes)	Equivalent Round Trips per hour	Vehicle Weight Empty (tonnes)	Vehicle Weight Loaded (tonnes)	Mean Vehicle Weight (tonnes)	TPM Emission Factor lb/VKT	PM_{10} Emission Factor lb/VKT	$PM_{2.5}$ Emission Factor lb/VKT	TPM Emission Factor kg/VKT	PM_{10} Emission Factor kg/VKT	$PM_{2.5}$ Emission Factor kg/VKT
Viggo Pit	Overburden #1	399.9	120	3.33	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	PAG Stockpile	992.2	120	8.27	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	PAG Stockpile	16.8	120	0.14	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	NPAG stockpile	512.2	120	4.27	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	Overburden #1	1138.3	120	9.49	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	PAG Stockpile	518.5	120	4.32	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	NPAG stockpile	44.3	120	0.37	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	PAG Stockpile	18.4	120	0.15	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	Crusher	0.8	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	LGO Stockpile - West (#1)	20.3	120	0.17	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	LGO Stockpile - West (#1)	18.6	120	0.15	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	LGO Stockpile - East (#2)	23.8	120	0.20	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	ROM Stockpile	7.9	120	0.07	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	Crusher	12.7	120	0.11	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	LGO Stockpile - West (#1)	4.8	120	0.04	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	LGO Stockpile - West (#1)	8.7	120	0.07	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	LGO Stockpile - East (#2)	16.0	120	0.13	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
ROM Stockpile	Crusher	15.7	120	0.13	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LGO Stockpile - West (#1)	Crusher	4.9	120	0.04	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LGO Stockpile - East (#2)	Crusher	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	ROM Stockpile	15.7	120	0.13	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	LGO Stockpile - West (#1)	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LGO Stockpile - West (#1)	Crusher	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	Crusher	63.0	120	0.53	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Shaft	Crusher	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX PAG	PAG Stockpile	51.2	120	0.43	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX NPAG	NPAG Stockpile	48.2	120	0.40	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	PAG Stockpile	25.7	120	0.21	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	NPAG Stockpile	4.0	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
PAG Stockpile	AEX Portal	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	AEX Portal	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
North Dam	Overburden #3	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
North Dam	Overburden #5	1.9	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
North Dam	Overburden #6	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
South Dam	Overburden #3	54.4	120	0.45	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
South Dam	Overburden #5	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
South Dam	Overburden #6	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
South Dam - spillway	South Dam	2.5	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
West Dam	Overburden #3	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
West Dam	Overburden #5	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
West Dam	Overburden #6	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Pond Dam	Overburden #3	2.3	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Pond Dam	Overburden #3	1.1	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1	Overburden #6	2.2	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #2	Overburden #6	1.6	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	Overburden #5	0.9	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3BS3B	Overburden #5	0.9	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
MWP Pond Dam	Overburden #3	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
MWP Pond Dam	Overburden #3	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #1 Dam	Overburden #1	2.7	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	North Dam	3.1	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #2 - Q1	North Dam	4.1	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #2 - Q1	North Dam	3.4	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #2 - Q1	North Dam	3.4	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	South Dam	4.6	120	0.04	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	South Dam	6.0	120	0.05	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	South Dam	80.2	120	0.67	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	81.0	120	0.68	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	South Dam	3.8	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	West Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	West Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	West Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	West Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	West Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	West Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	TMF Pond Dam	10.1	120	0.08	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	TMF Pond Dam	2.4	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	TMF Pond Dam	27.6	120	0.23	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	TMF Pond Dam	4.1	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	TMF Pond Dam	1.6	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	MWP Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	MWP Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	MWP Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	MWP Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	MWP Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	LP Central Pit	21.7	120	0.18	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Viggo Pit	3.0	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Road Base	23.4	120	0.19	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Overburden #1	CWP #1 Dam	2.1	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	CWP #1 Dam	9.5	120	0.08	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	CWP #1 Dam	4.9	120	0.04	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	CWP #1 Dam	0.2	120	0.00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	Overburden #1	2.4	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	Overburden #1	0.7	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	Overburden #1	37.9	120	0.32	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	Overburden #1	0.6	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	PAG Stockpile	4.0	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Overburden #1	Diversion Channel #1	14.5	120	0.12	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	Diversion Channel #1	33.5	120	0.28	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	Diversion Channel #1	7.5	120	0.06	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #2	PAG Stockpile	0.9	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Overburden #1	Diversion Channel #2	3.9	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	Diversion Channel #2	11.7	120	0.10	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	Diversion Channel #2	0.7	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #2 (Sump #1)	Overburden #2	0.2	120	0.00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #3 (Sump #2)	Overburden #2	3.1	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #2 (Sump #1)	Overburden #2	0.2	120	0.00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #3 (Sump #2)	Overburden #2	3.1	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #2 (Sump #1)	Overburden #2	0.5	120	0.00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #2 (Sump #1)	Overburden #2	0.3	120	0.00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16

Table C-7: Construction Phase - Road Dust Emissions (Haul Roads)

CWP #3 (Sump #2)	Overburden #2	0.5	120	0.00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #3 (Sump #2)	Overburden #2	0.3	120	0.00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	West Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Tailings Pipeline	Overburden #3	17.1	120	0.14	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Tailings Pipeline	12.4	120	0.10	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Tailings Pipeline	3.1	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Shaft	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Paste Plant	Overburden #2	4.2	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Paste Plant	1.2	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Paste Plant	2.5	120	0.02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Primary Crusher	Overburden #2	5.0	120	0.04	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Coarse Ore Storage	Overburden #2	10.5	120	0.09	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Process Plant	Overburden #2	4.1	120	0.03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Primary Crusher	19.1	120	0.16	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Coarse Ore Storage	0.0	120	0.00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Process Plant	1.0	120	0.01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Primary Crusher	18.2	120	0.15	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Overburden #2	Dixie Creek Berm	5.8	120	0.05	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Haul Roads	250.3	120	2.09	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Haul Roads	Overburden #2	26.4	120	0.22	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Haul Roads	21.0	120	0.18	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Haul Roads	55.5	120	0.46	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	ROM Stockpile	23.4	120	0.19	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
ROM Stockpile	Overburden #2	9.5	120	0.08	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Infrastructure Pad	10.9	120	0.09	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
PAG Stockpile	Overburden #1	18.8	120	0.16	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16

Table 3: Overall Pathway Emissions

Road Source ID Segment		Road Dimensions		Total VKT per hour per segment	Uncontrolled kg/hour			Uncontrolled (g/s)			Controlled (g/s)		
		Distance (km)	Length (Round Trip) (m)		TPM Emission Rate	PM_{10} Emission Rate	$PM_{2.5}$ Emission Rate	TPM Emission per segment	PM_{10} Emission Rate	$PM_{2.5}$ Emission Rate	TPM Emission per segment	PM_{10} Emission Rate	$PM_{2.5}$ Emission Rate
Viggo Pit	Overburden #1	3.55	7100	23.66	146.9	38.9	3.9	40.79	10.80	1.08	4.079	1.080	0.108
Viggo Pit	PAG Stockpile	4.5	9000	74.42	461.9	122.3	12.2	128.31	33.96	3.40	12.831	3.396	0.340
Viggo Pit	PAG Stockpile	4.5	9000	1.26	7.8	2.1	0.2	2.17	0.58	0.06	0.217	0.058	0.006
Viggo Pit	NPAG stockpile	4.7	9400	40.12	249.1	65.9	6.6	69.18	18.31	1.83	6.918	1.831	0.183
LP Central	Overburden #1	2.3	4600	43.64	270.8	71.7	7.2	75.23	19.91	1.99	7.523	1.991	0.199
LP Central	Overburden #2	2.65	5300	—	—	—	—	—	—	—	—	—	—
LP Central	PAG Stockpile	3.25	6500	28.09	174.3	46.1	4.6	48.42	12.82	1.28	4.842	1.282	0.128
LP Central	NPAG stockpile	3	6000	2.21	13.7	3.6	0.4	3.82	1.01	0.10	0.382	0.101	0.010
LP Central	PAG Stockpile	3.25	6500	1.00	6.2	1.6	0.2	1.72	0.45	0.05	0.172	0.045	0.005
Viggo Pit	Crusher	5.65	11300	0.08	0.5	0.1	0.0	0.13	0.03	0.00	0.013	0.003	0.000
Viggo Pit	LGO Stockpile - West (#1)	4.55	9100	1.54	9.6	2.5	0.3	2.65	0.70	0.07	0.265	0.070	0.007
Viggo Pit	LGO Stockpile - West (#1)	4.55	9100	1.41	8.7	2.3	0.2	2.43	0.64	0.06	0.243	0.064	0.006
Viggo Pit	LGO Stockpile - East (#2)	4.15	8300	1.64	10.2	2.7	0.3	2.84	0.75	0.08	0.284	0.075	0.008
Viggo Pit	ROM Stockpile	5.7	11400	0.75	4.7	1.2	0.1	1.30	0.34	0.03	0.130	0.034	0.003
LP Central	Crusher	3.05	6100	0.65	4.0	1.1	0.1	1.11	0.29	0.03	0.111	0.029	0.003
LP Central	LGO Stockpile - West (#1)	2.25	4500	0.18	1.1	0.3	0.0	0.31	0.08	0.01	0.031	0.008	0.001
LP Central	LGO Stockpile - West (#1)	2.25	4500	0.33	2.0	0.5	0.1	0.56	0.15	0.01	0.056	0.015	0.001
LP Central	LGO Stockpile - East (#2)	1.85	3700	0.49	3.1	0.8	0.1	0.85	0.23	0.02	0.085	0.023	0.002
ROM Stockpile	Crusher	0.25	500	0.07	0.4	0.1	0.0	0.11	0.03	0.00	0.011	0.003	0.000
LGO Stockpile - West (#1)	Crusher	3.15	6300	0.26	1.6	0.4	0.0	0.45	0.12	0.01	0.045	0.012	0.001
LGO Stockpile - East (#2)	Crusher	2.75	5500	—	—	—	—	—	—	—	—	—	—
AEX Portal	ROM Stockpile	1.95	3900	0.51	3.2	0.8	0.1	0.88	0.23	0.02	0.088	0.023	0.002
AEX Portal	LGO Stockpile - West (#1)	2.4	4800	—	—	—	—	—	—	—	—	—	—
LGO Stockpile - West (#1)	Crusher	3.15	6300	—	—	—	—	—	—	—	—	—	—
AEX Portal	Crusher	1.95	3900	2.05	12.7	3.4	0.3	3.53	0.93	0.09	0.353	0.093	0.009
Shaft	Crusher	2.05	4100	—	—	—	—	—	—	—	—	—	—
AEX PAG	PAG Stockpile	4.1	8200	3.50	21.7	5.7	0.6	6.03	1.60	0.16	0.603	0.160	0.016
AEX NPAG	NPAG Stockpile	3.15	6300	2.53	15.7	4.2	0.4	4.36	1.16	0.12	0.436	0.116	0.012
AEX Portal	PAG Stockpile	4.1	8200	1.76	10.9	2.9	0.3	3.03	0.80	0.08	0.303	0.080	0.008
AEX Portal	NPAG Stockpile	3.15	6300	0.21	1.3	0.3	0.0	0.36	0.10	0.01	0.036	0.010	0.001
PAG Stockpile	AEX Portal	4.1	8200	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	AEX Portal	3.15	6300	—	—	—	—	—	—	—	—	—	—
North Dam	Overburden #3	3.15	6300	—	—	—	—	—	—	—	—	—	—
North Dam	Overburden #5	1.35	2700	0.04	0.3	0.1	0.0	0.08	0.02	0.00	0.008	0.002	0.000
North Dam	Overburden #6	2.15	4300	—	—	—	—	—	—	—	—	—	—
South Dam	Overburden #3	1.4	2800	1.27	7.9	2.1	0.2	2.19	0.58	0.06	0.219	0.058	0.006
South Dam	Overburden #5	3.2	6400	—	—	—	—	—	—	—	—	—	—
South Dam	Overburden #6	5.9	11800	—	—	—	—	—	—	—	—	—	—
South Dam - spillway	South Dam	3.05	6100	0.13	0.8	0.2	0.0	0.22	0.06	0.01	0.022	0.006	0.001
West Dam	Overburden #3	5.6	11200	—	—	—	—	—	—	—	—	—	—
West Dam	Overburden #5	2.75	5500	—	—	—	—	—	—	—	—	—	—
West Dam	Overburden #6	0.75	1500	—	—	—	—	—	—	—	—	—	—
TMF Pond Dam	Overburden #3	1.5	3000	0.06	0.4	0.1	0.0	0.10	0.03	0.00	0.010	0.003	0.000
TMF Pond Dam	Overburden #3	1.5	3000	0.03	0.2	0.0	0.0	0.05	0.01	0.00	0.005	0.001	0.000
Quarry #1	Overburden #6	1	2000	0.04	0.2	0.1	0.0	0.06	0.02	0.00	0.006	0.002	0.000
Quarry #2	Overburden #6	1.55	3100	0.04	0.3	0.1	0.0	0.07	0.02	0.00	0.007	0.002	0.000
Borrow Source #3	Overburden #5	1.9	3800	0.03	0.2	0.0	0.0	0.05	0.01	0.00	0.005	0.001	0.000
Borrow Source #3BS3B	Overburden #5	1.05	2100	0.02	0.1	0.0	0.0	0.03	0.01	0.00	0.003	0.001	0.000
MWP Pond Dam	Overburden #3	2.45	4900	—	—	—	—	—	—	—	—	—	—
MWP Pond Dam	Overburden #3	2.45	4900	—	—	—	—	—	—	—	—	—	—
CWP #1 Dam	Overburden #1	2	4000	0.09	0.6	0.1	0.0	0.16	0.04	0.00	0.016	0.004	0.000
Borrow Source #3	North Dam	2.45	4900	0.13	0.8	0.2	0.0	0.22	0.06	0.01	0.022	0.006	0.001
Quarry #2 - Q1	North Dam	1.1	2200	0.07	0.5	0.1	0.0	0.13	0.03	0.00	0.013	0.003	0.000
Quarry #2 - Q1	North Dam	1.1	2200	0.06	0.4	0.1	0.0	0.11	0.03	0.00	0.011	0.003	0.000
Quarry #2 - Q1	North Dam	1.1	2200	0.06	0.4	0.1	0.0	0.11	0.03	0.00	0.011	0.003	0.000
TMF Facility	North Dam	1.05	2100	—	—	—	—	—	—	—	—	—	—
Borrow Source #3	North Dam	2.45	4900	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	North Dam	8.8	17600	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	North Dam	8.8	17600	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	North Dam	8.8	17600	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	North Dam	8.8	17600	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	North Dam	8.8	17600	—	—	—	—	—	—	—	—	—	—
Borrow Source #3	South Dam	4.3	8600	0.33	2.0	0.5	0.1	0.56	0.15	0.01	0.056	0.015	0.001
Quarry #1 - Q1	South Dam	5.75	11500	0.57	3.5	0.9	0.1	0.98	0.26	0.03	0.098	0.026	0.003
Quarry #1 - Q1	South Dam	5.75	11500	7.69	47.7	12.6	1.3	13.25	3.51	0.35	1.325	0.351	0.035
NPAG stockpile	South Dam	7.05	14100	9.52	59.1	15.6	1.6	16.42	4.35	0.43	1.642	0.435	0.043
Quarry #1 - Q1	South Dam	5.75	11500	0.37	2.3	0.6	0.1	0.63	0.17	0.02	0.063	0.017	0.002
TMF Facility	South Dam	0.7	1400	—	—	—	—	—	—	—	—	—	—
Borrow Source #3	South Dam	4.3	8600	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	South Dam	7.05	14100	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	South Dam	7.05	14100	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	South Dam	7.05	14100	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	South Dam	7.05	14100	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	South Dam	7.05	14100	—	—	—	—	—	—	—	—	—	—
TMF Facility	West Dam	0.95	1900	—	—	—	—	—	—	—	—	—	—
Borrow Source #3	West Dam	3.85	7700	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	West Dam	9.65	19300	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	West Dam	9.65	19300	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	West Dam	9.65	19300	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	West Dam	9.65	19300	—	—	—	—	—	—	—	—	—	—
Borrow Source #3	TMF Pond Dam	4.4	8800	0.74	4.6	1.2	0.1	1.27	0.34	0.03	0.127	0.034	0.003
Quarry #1 - Q1	TMF Pond Dam	3.65	7300	0.15	0.9	0.2	0.0	0.25	0.07	0.01	0.025	0.007	0.001
Quarry #1 - Q1	TMF Pond Dam	3.65	7300	1.68	10.4	2.8	0.3	2.90	0.77	0.08	0.290	0.077	0.008
Quarry #1 - Q1	TMF Pond Dam	3.65	7300	0.25	1.6	0.4	0.0	0.43	0.11	0.01	0.043	0.011	0.001
Quarry #1 - Q1	TMF Pond Dam	3.65	7300	0.10	0.6	0.2	0.0	0.17	0.04	0.00	0.017	0.004	0.000
Borrow Source #3	MWP Pond Dam	5.35	10700	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	MWP Pond Dam	5.4	10800	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	MWP Pond Dam	5.4	10800	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	MWP Pond Dam	5.4	10800	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	MWP Pond Dam	5.4	10800	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	LP Central Pit	3	6000	1.08	6.7	1.8	0.2	1.87	0.49	0.05	0.187	0.049	0.005
NPAG Stockpile	Viggo Pit	4.7	9400	0.23	1.4	0.4	0.0	0.40	0.11	0.01	0.040	0.011	0.001
NPAG Stockpile	Road Base	6.7	13400	2.61	16.2	4.3	0.4	4.50	1.19	0.12	0.450	0.119	0.012
Overburden #1	CWP #1 Dam	2	4000	0.07	0.4	0.1	0.0	0.12	0.03	0.00	0.012	0.003	0.000
NPAG Stockpile	CWP #1 Dam	2	4000	0.32	2.0	0.5	0.1	0.55	0.14	0.01	0.055	0.014	0.001
NPAG Stockpile	CWP #1 Dam	2	4000	0.16	1.0	0.3	0.0	0.28	0.08	0.01	0.028	0.008	0.001
NPAG Stockpile	CWP #1 Dam	2	4000	0.01	0.0	0.0	0.0	0.01	0.00	0.00	0.001	0.000	0.000
Diversion Channel #1	Overburden #1	1.8	3600	0.07	0.4	0.1	0.0	0.12	0.03	0.00	0.012	0.003	0.000
Diversion Channel #1	Overburden #1	1.8	3600	0.02	0.1	0.0	0.0	0.04	0.01	0.00	0.004	0.001	0.000
Diversion Channel #1	Overburden #1	1.8	3600	1.14	7.1	1.9	0.2	1.96	0.52	0.05	0.196	0.052	0.005
Diversion Channel #1	Overburden #1	1.8	3600	0.02	0.1	0.0	0.0	0.03	0.01	0.00	0.003	0.001	0.000
Diversion Channel #1	PAG Stockpile	2.75	5500	0.18	1.1	0.3	0.0	0.32	0.08	0.01	0.032	0.008	0.001
Overburden #1	Diversion Channel #1	1.8	3600	0.43	2.7	0.7	0.1	0.75	0.20	0.02	0.075	0.020	0.002
NPAG stockpile	Diversion Channel #1	2.95	5900	1.65	10.2	2.7	0.3	2.84	0.75	0.08	0.284	0.075	0.008
NPAG stockpile	Diversion Channel #1	2.95	5900	0.37	2.3	0.6	0.1	0.64	0.17	0.02	0.064	0.017	0.002

Table C-7: Construction Phase - Road Dust Emissions (Haul Roads)

Diversion Channel #2	PAG Stockpile	2.75	5500	0.04	0.3	0.1	0.0	0.07	0.02	0.00	0.007	0.002	0.000
Overburden #1	Diversion Channel #2	1.8	3600	0.12	0.7	0.2	0.0	0.20	0.05	0.01	0.020	0.005	0.001
NPAG stockpile	Diversion Channel #2	2.95	5900	0.57	3.6	0.9	0.1	0.99	0.26	0.03	0.099	0.026	0.003
NPAG stockpile	Diversion Channel #2	2.95	5900	0.04	0.2	0.1	0.0	0.06	0.02	0.00	0.006	0.002	0.000
CWP #2 (Sump #1)	Overburden #2	2.2	4400	0.01	0.0	0.0	0.0	0.01	0.00	0.00	0.001	0.000	0.000
CWP #3 (Sump #2)	Overburden #2	2.2	4400	0.11	0.7	0.2	0.0	0.20	0.05	0.01	0.020	0.005	0.001
CWP #2 (Sump #1)	Overburden #2	2.2	4400	0.01	0.0	0.0	0.0	0.01	0.00	0.00	0.001	0.000	0.000
CWP #3 (Sump #2)	Overburden #2	2.2	4400	0.11	0.7	0.2	0.0	0.20	0.05	0.01	0.020	0.005	0.001
CWP #2 (Sump #1)	Overburden #2	2.2	4400	0.02	0.1	0.0	0.0	0.03	0.01	0.00	0.003	0.001	0.000
CWP #2 (Sump #1)	Overburden #2	2.2	4400	0.01	0.1	0.0	0.0	0.02	0.00	0.00	0.002	0.000	0.000
CWP #3 (Sump #2)	Overburden #2	2.2	4400	0.02	0.1	0.0	0.0	0.03	0.01	0.00	0.003	0.001	0.000
CWP #3 (Sump #2)	Overburden #2	2.2	4400	0.01	0.1	0.0	0.0	0.02	0.00	0.00	0.002	0.000	0.000
TMF Facility	North Dam	1.05	2100	—	—	—	—	—	—	—	—	—	—
TMF Facility	South Dam	0.7	1400	—	—	—	—	—	—	—	—	—	—
TMF Facility	West Dam	0.95	1900	—	—	—	—	—	—	—	—	—	—
Tailings Pipeline	Overburden #3	2.2	4400	0.63	3.9	1.0	0.1	1.08	0.29	0.03	0.108	0.029	0.003
Borrow Source #1	Tailings Pipeline	4.95	9900	1.03	6.4	1.7	0.2	1.77	0.47	0.05	0.177	0.047	0.005
NPAG Stockpile	Tailings Pipeline	8.6	17200	0.44	2.7	0.7	0.1	0.76	0.20	0.02	0.076	0.020	0.002
NPAG Stockpile	Shaft	2.15	4300	—	—	—	—	—	—	—	—	—	—
Paste Plant	Overburden #2	3.1	6200	0.22	1.3	0.4	0.0	0.37	0.10	0.01	0.037	0.010	0.001
NPAG Stockpile	Paste Plant	3.45	6900	0.07	0.4	0.1	0.0	0.12	0.03	0.00	0.012	0.003	0.000
NPAG Stockpile	Paste Plant	3.45	6900	0.14	0.9	0.2	0.0	0.25	0.07	0.01	0.025	0.007	0.001
Primary Crusher	Overburden #2	3.55	7100	0.29	1.8	0.5	0.0	0.51	0.13	0.01	0.051	0.013	0.001
Coarse Ore Storage	Overburden #2	3.55	7100	0.62	3.8	1.0	0.1	1.07	0.28	0.03	0.107	0.028	0.003
Process Plant	Overburden #2	3.65	7300	0.25	1.5	0.4	0.0	0.43	0.11	0.01	0.043	0.011	0.001
Borrow Source #1	Primary Crusher	1.3	2600	0.41	2.6	0.7	0.1	0.71	0.19	0.02	0.071	0.019	0.002
Borrow Source #1	Coarse Ore Storage	1.3	2600	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.000	0.000	0.000
Borrow Source #1	Process Plant	1.3	2600	0.02	0.1	0.0	0.0	0.04	0.01	0.00	0.004	0.001	0.000
NPAG Stockpile	Primary Crusher	3.9	7800	1.18	7.3	1.9	0.2	2.03	0.54	0.05	0.203	0.054	0.005
Overburden #2	Dixie Creek Berm	4.5	9000	0.44	2.7	0.7	0.1	0.76	0.20	0.02	0.076	0.020	0.002
NPAG Stockpile	Haul Roads	6.7	13400	27.95	173.5	45.9	4.6	48.20	12.76	1.28	4.820	1.276	0.128
Haul Roads	Overburden #2	6.2	12400	2.73	16.9	4.5	0.4	4.71	1.25	0.12	0.471	0.125	0.012
Borrow Source #1	Haul Roads	1.9	3800	0.67	4.1	1.1	0.1	1.15	0.30	0.03	0.115	0.030	0.003
NPAG Stockpile	Haul Roads	6.7	13400	6.20	38.5	10.2	1.0	10.69	2.83	0.28	1.069	0.283	0.028
NPAG Stockpile	ROM Stockpile	3.9	7800	1.52	9.4	2.5	0.2	2.62	0.69	0.07	0.262	0.069	0.007
ROM Stockpile	Overburden #2	3.55	7100	0.56	3.5	0.9	0.1	0.97	0.26	0.03	0.097	0.026	0.003
Borrow Source #1	Infrastructure Pad	1.05	2100	0.19	1.2	0.3	0.0	0.33	0.09	0.01	0.033	0.009	0.001
PAG Stockpile	Overburden #1	2.55	5100	0.80	5.0	1.3	0.1	1.38	0.36	0.04	0.138	0.036	0.004
										TOTALS	**53.722645**	**14.22008**	**1.422008**

Table 4: Node Segment Emissions

Node Segment		Model ID	Controlled (g/s)		
			TPM Emission per segment	**PM_{10} Emission Rate**	**$PM_{2.5}$ Emission Rate**
VP	1	RD1	4.59E+00	1.21E+00	1.21E-01
1	2	RD2	6.42E+00	1.70E+00	1.70E-01
2	LPC	RD3	0.00E+00	0.00E+00	0.00E+00
2	3	RD4	5.32E+00	1.41E+00	1.41E-01
LPC	7	RD5	3.84E+00	1.02E+00	1.02E-01
3	4	RD6	2.52E-02	6.68E-03	6.68E-04
3	5	RD7	1.75E+00	4.63E-01	4.63E-02
4	5	RD8	8.99E-01	2.38E-01	2.38E-02
4	6	RD9	2.74E+00	7.26E-01	7.26E-02
5	OVB1	RD10	3.73E+00	9.87E-01	9.87E-02
5	PAG	RD11	8.32E+00	2.20E+00	2.20E-01
5	13	RD12	1.36E+00	3.60E-01	3.60E-02
6	7	RD13	9.17E-01	2.43E-01	2.43E-02
6	11	RD14	1.86E-01	4.93E-02	4.93E-03
7	8	RD15	1.27E+00	3.37E-01	3.37E-02
PAG	15	RD16	0.00E+00	0.00E+00	0.00E+00
8	9	RD17	4.42E-01	1.17E-01	1.17E-02
8	16	RD18	6.86E-01	1.82E-01	1.82E-02
8	PSTP	RD19	2.57E-02	6.80E-03	6.80E-04
PSTP	DCB	RD20	2.35E-02	6.22E-03	6.22E-04
9	10	RD21	1.07E+00	2.82E-01	2.82E-02
9	AEXP	RD22	3.58E-01	9.48E-02	9.48E-03
10	SHAFT	RD23	0.00E+00	0.00E+00	0.00E+00
10	11	RD24	4.98E-01	1.32E-01	1.32E-02
11	12	RD25	5.03E-01	1.33E-01	1.33E-02
12	LGOW	RD26	1.23E-01	3.27E-02	3.27E-03
12	LGOE	RD27	4.00E-02	1.06E-02	1.06E-03
12	13	RD28	6.27E-01	1.66E-01	1.66E-02
13	14	RD29	1.24E+00	3.28E-01	3.28E-02
14	15	RD30	3.54E-01	9.38E-02	9.38E-03
15	OVB2	RD31	8.46E-02	2.24E-02	2.24E-03
15	NPAG	RD32	2.50E+00	6.62E-01	6.62E-02
16	CRUSH	RD33	1.52E-01	4.02E-02	4.02E-03
16	17	RD34	4.49E-01	1.19E-01	1.19E-02
CRUSH	PRCP	RD35	1.17E-03	3.10E-04	3.10E-05
17	18	RD36	0.00E+00	0.00E+00	0.00E+00
17	28	RD37	2.91E-01	7.71E-02	7.71E-03
18	MWPD	RD38	0.00E+00	0.00E+00	0.00E+00
18	19	RD39	0.00E+00	0.00E+00	0.00E+00
19	20	RD40	4.88E-01	1.29E-01	1.29E-02
19	29	RD41	1.81E-01	4.78E-02	4.78E-03
20	Q1	RD42	1.29E-01	3.41E-02	3.41E-03
20	21	RD43	2.20E-03	5.83E-04	5.83E-05
21	OVB6	RD44	3.30E-03	8.74E-04	8.74E-05
21	TWD	RD45	2.12E-03	5.62E-04	5.62E-05
TWD	22	RD46	2.59E-03	6.87E-04	6.87E-05
22	Q2	RD47	8.96E-03	2.37E-03	2.37E-04
22	TND	RD48	2.65E-02	7.00E-03	7.00E-04
TND	23	RD49	1.38E-02	3.66E-03	3.66E-04
23	24	RD50	2.52E-02	6.67E-03	6.67E-04
23	OVB5	RD51	4.25E-03	1.13E-03	1.13E-04
23	27	RD52	2.45E-01	6.47E-02	6.47E-03
24	BS3B	RD53	1.12E-02	2.96E-03	2.96E-04
BS3B	25	RD54	1.07E-02	2.83E-03	2.83E-04
25	26	RD55	2.41E-02	6.37E-03	6.37E-04
26	BS3	RD56	1.07E-02	2.83E-03	2.83E-04
27	TSD	RD57	6.68E-01	1.77E-01	1.77E-02
27	OVB3	RD58	8.61E-02	2.28E-02	2.28E-03
27	28	RD59	1.75E-01	4.62E-02	4.62E-03
28	TPD	RD60	2.44E-01	6.45E-02	6.45E-03
TPD	SDS	RD61	3.50E-01	9.27E-02	9.27E-03
SDS	29	RD62	1.81E-01	4.78E-02	4.78E-03
TMF	TSD	RD63	0.00E+00	0.00E+00	0.00E+00
TMF	TWD	RD64	0.00E+00	0.00E+00	0.00E+00
TMF	TND	RD65	0.00E+00	0.00E+00	0.00E+00
		TOTALS	**53.7**	**14.2**	**1.4**

Step 1: Caculation of lb/VKT (from AP42 - Chapter 13.2.2)
E (lb/vkt) (for TSP) = k x (silt %/12)^a x (mean weight/3)^b (see values for k, a, b above)

Step 2: convert to kg/VKT

Step 3: total VKT is obtained from distance travelled x number of round trips per hour.

Step 4: Total emission rate (kg/hour)

Step 5: Uncontrolled emission rate (g/s)

Step 6: Controlled emission rate (g/s)

Table C-8: Construction Phase - Concrete Batching

Reference: US EPA AP-42 Chapter 11.12 Concrete Batching	Rating ranges from E to B			
Activity Data:				
	Concrete Processing Rate			
	m^3/hr	**cubic yard per hour**		
Batch Plant 1	80	157		
Emission Factors:	**Uncontrolled**		**Controlled**	
	PM (lb/yd^3)	**PM_{10} (lb/yd^3)**	**PM (lb/yd^3)**	**PM_{10} (lb/yd^3)**
Aggregate delivery to ground storage (3-05-011-21)	0.0064	0.0031	0.0064	0.0031
Sand delivery to ground storage (3-05-011-22)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to conveyor (3-05-011-23)	0.0064	0.0031	0.0064	0.0031
Sand transfer to conveyor (3-05-011-24)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to elevated storage (3-05-011-04)	0.0064	0.0031	0.0064	0.0031
Sand transfer to elevated storage (3-05-011-05)	0.0015	0.0007	0.0015	0.0007
Cement delivery to Silo (3-05-011-07 controlled)	0.0002	0.0001	0.0002	0.0001
Cement supplement delivery to Silo (3-05-011-17 controlled)	0.0003	0.0002	0.0003	0.0002
Weigh hopper loading (3-05-011-08)	0.0079	0.0038	0.0079	0.0038
Truck mix loading (3-05-011-10)	1.39E-01	3.89E-02	7.95E-03	2.24E-03
Emission Rates:	**Batch Plant 1 - Controlled Emissions**			
	PM	PM_{10}	$PM_{2.5}$	
Aggregate delivery to ground storage (3-05-011-21)	1.27E-01	6.13E-02	9.89E-03	
Sand delivery to ground storage (3-05-011-22)	2.97E-02	1.38E-02	2.23E-03	
Aggregate transfer to conveyor (3-05-011-23)	1.27E-01	6.13E-02	9.89E-03	
Sand transfer to conveyor (3-05-011-24)	2.97E-02	1.38E-02	2.23E-03	
Aggregate transfer to elevated storage (3-05-011-04)	1.27E-01	6.13E-02	9.89E-03	
Sand transfer to elevated storage (3-05-011-05)	2.97E-02	1.38E-02	2.23E-03	
Cement delivery to Silo (3-05-011-07 controlled)	3.96E-03	1.98E-03	3.19E-04	
Cement supplement delivery to Silo (3-05-011-17 controlled)	5.93E-03	3.96E-03	6.38E-04	
Weigh hopper loading (3-05-011-08)	1.56E-01	7.51E-02	1.21E-02	
Truck mix loading (3-05-011-10)	1.57E-01	4.43E-02	7.14E-03	
Total:	**0.79**	**0.35**	**0.06**	

*PM2.5 not specifically calculated in AP42: Table 11.12-3 ratio of PM10/PM2.5 used to estimate emission

Table C-9: Construction Phase - CRF Plant

Reference: US EPA AP-42 Chapter 11.12 Con	Rating ranges from E to B			
Activity Data:				
	Concrete Processing Rate			
	m^3/hr	**cubic yard per hour**		
Batch Plant 1	80	157		
Emission Factors:	**Uncontrolled**		**Controlled**	
	PM (lb/yd^3)	**PM_{10} (lb/yd^3)**	**PM (lb/yd^3)**	**PM_{10} (lb/yd^3)**
Aggregate delivery to ground storage (3-05-011-21)	0.0064	0.0031	0.0064	0.0031
Sand delivery to ground storage (3-05-011-22)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to conveyor (3-05-011-23)	0.0064	0.0031	0.0064	0.0031
Sand transfer to conveyor (3-05-011-24)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to elevated storage (3-05-011-04)	0.0064	0.0031	0.0064	0.0031
Sand transfer to elevated storage (3-05-011-05)	0.0015	0.0007	0.0015	0.0007
Cement delivery to Silo (3-05-011-07 controlled)	0.0002	0.0001	0.0002	0.0001
Cement supplement delivery to Silo (3-05-011-17 controlled)	0.0003	0.0002	0.0003	0.0002
Weigh hopper loading (3-05-011-08)	0.0079	0.0038	0.0079	0.0038
Truck mix loading (3-05-011-10)	1.39E-01	3.89E-02	7.95E-03	2.24E-03
Emission Rates:	**Batch Plant 1 - Controlled Emissions**			
	PM	PM_{10}	$PM_{2.5}$	
Aggregate delivery to ground storage (3-05-011-21)	1.27E-01	6.13E-02	9.89E-03	
Sand delivery to ground storage (3-05-011-22)	2.97E-02	1.38E-02	2.23E-03	
Aggregate transfer to conveyor (3-05-011-23)	1.27E-01	6.13E-02	9.89E-03	
Sand transfer to conveyor (3-05-011-24)	2.97E-02	1.38E-02	2.23E-03	
Aggregate transfer to elevated storage (3-05-011-04)	1.27E-01	6.13E-02	9.89E-03	
Sand transfer to elevated storage (3-05-011-05)	2.97E-02	1.38E-02	2.23E-03	
Cement delivery to Silo (3-05-011-07 controlled)	3.96E-03	1.98E-03	3.19E-04	
Cement supplement delivery to Silo (3-05-011-17 controlled)	5.93E-03	3.96E-03	6.38E-04	
Weigh hopper loading (3-05-011-08)	1.56E-01	7.51E-02	1.21E-02	
Truck mix loading (3-05-011-10)	1.57E-01	4.43E-02	7.14E-03	
Total:	**0.79**	**0.35**	**0.06**	

*PM2.5 not specifically calculated in AP42: Table 11.12-3 ratio of PM10/PM2.5 used to estimate emission

Table C-10: Construction Phase - Paste Plant

Reference: US EPA AP-42 Chapter 11.12 Con	Rating ranges from E to B			
Activity Data:				
	Concrete Processing Rate			
	m^3/hr	**cubic yard per hour**		
Batch Plant 1	80	157		
Emission Factors:	**Uncontrolled**		**Controlled**	
	PM (lb/yd^3)	**PM_{10} (lb/yd^3)**	**PM (lb/yd^3)**	**PM_{10} (lb/yd^3)**
Aggregate delivery to ground storage (3-05-011-21)	0.0064	0.0031	0.0064	0.0031
Sand delivery to ground storage (3-05-011-22)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to conveyor (3-05-011-23)	0.0064	0.0031	0.0064	0.0031
Sand transfer to conveyor (3-05-011-24)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to elevated storage (3-05-011-04)	0.0064	0.0031	0.0064	0.0031
Sand transfer to elevated storage (3-05-011-05)	0.0015	0.0007	0.0015	0.0007
Cement delivery to Silo (3-05-011-07 controlled)	0.0002	0.0001	0.0002	0.0001
Cement supplement delivery to Silo (3-05-011-17 controlled)	0.0003	0.0002	0.0003	0.0002
Weigh hopper loading (3-05-011-08)	0.0079	0.0038	0.0079	0.0038
Truck mix loading (3-05-011-10)	1.39E-01	3.89E-02	7.95E-03	2.24E-03
Emission Rates:	**Batch Plant 1 - Controlled Emissions**			
	PM	PM_{10}	$PM_{2.5}$	
Aggregate delivery to ground storage (3-05-011-21)	1.27E-01	6.13E-02	9.89E-03	
Sand delivery to ground storage (3-05-011-22)	2.97E-02	1.38E-02	2.23E-03	
Aggregate transfer to conveyor (3-05-011-23)	1.27E-01	6.13E-02	9.89E-03	
Sand transfer to conveyor (3-05-011-24)	2.97E-02	1.38E-02	2.23E-03	
Aggregate transfer to elevated storage (3-05-011-04)	1.27E-01	6.13E-02	9.89E-03	
Sand transfer to elevated storage (3-05-011-05)	2.97E-02	1.38E-02	2.23E-03	
Cement delivery to Silo (3-05-011-07 controlled)	3.96E-03	1.98E-03	3.19E-04	
Cement supplement delivery to Silo (3-05-011-17 controlled)	5.93E-03	3.96E-03	6.38E-04	
Weigh hopper loading (3-05-011-08)	1.56E-01	7.51E-02	1.21E-02	
Truck mix loading (3-05-011-10)	1.57E-01	4.43E-02	7.14E-03	
Total:	**0.79**	**0.35**	**0.06**	

*PM2.5 not specifically calculated in AP42: Table 11.12-3 ratio of PM10/PM2.5 used to estimate emission

Table C-11: Construction Phase - Mill Process and Misc Sources

CN Destruction				
Excess SO_2 from CN Destruction				
Use of SO_2	399	kg/hour	(see Key Data sheet)	
Percent Excess	1	%	excess assumed to ensure reaction complete	
Emission Rate	**1.11**	**g/s**	Closed loop, so no emissions.	

Lime Bin Dust Collector System (GT0095-48200-01-PFD-3020)				
Reference:	ESDM Procedure Document Table C-1 (March 2009)			
Controlled by baghouse.	Data Quality "AA"			
Flowrate	5000	acfm	assumed	
	2.36	am^3/s		
PM Concentration	20	mg/m^3		
Emission Rate	**PM (g/s)**	**PM_{10}**	**$PM_{2.5}$**	
	0.0472	**0.0472**	**0.0472**	**g/s**

Induction Furnace (GT0095-47300-01-PFD-3015)				
Reference:	ESDM Procedure Document Table C-1 (March 2009)			
Controlled by baghouse.	Data Quality "AA"			
Flowrate	5000	acfm	assumed	
	4.70	am^3/s		
PM Concentration	20.00	mg/m^3		
Emission Rate (total)	**0.09**	**g/s**	assumed same for PM_{10} and $PM_{2.5}$	

Lime Slaker (GT0095-48200-01-PFD-3020)				
Slaker controlled by wet scrubber --- emission based on engineering estimate				
Assumed concentration	20	mg/m^3	(estimated maximum)	
Flowrate from scrubber	2.00	am^3/s	(assumed 4000 cfm)	
Emission Rate (per slaker)	0.04			
Emission Rate (total)	**0.08**	**g/s**	assumed same for PM_{10} and $PM_{2.5}$	

CuSO4 Dust Collector (GT0095-48500-01-PFD-3025)			
Reference:	ESDM Procedure Document Table C-1 (March 2009)		
Controlled by baghouse.	Data Quality "AA"		
$CuSO_4$ mixing controlled baghouse			
Assumed concentration	20.00	mg/m^3	
Flowrate from scrubber	2.00	am^3/s	assumed
Emission Rate	**0.040**	**g/s**	assumed same for PM_{10} and $PM_{2.5}$

SMBS Dust Collector (GT0095-48500-01-PFD-3024)			
Reference:	ESDM Procedure Document Table C-1 (March 2009)		
Controlled by baghouse.	Data Quality "AA"		
Flowrate	5000	acfm	assumed
	2.36	am^3/s	
PM Concentration	20	mg/m^3	
Emission Rate	**PM (g/s)**		
	0.0472	**g/s**	assumed same for PM_{10} and $PM_{2.5}$

Electrowinning Area Exhaust Fan (GT0095-47200-01-PFD-3014) N/A for Emissions			
Reference:	ESDM Procedure Document Table C-1 (March 2009)		
Controlled by baghouse.	Data Quality "AA"		
Flowrate	5000	acfm	
	2.36	am^3/s	
PM Concentration	20	mg/m^3	
Emission Rate	**PM (g/s)**		
	0.0472	**g/s**	assumed same for PM_{10} and $PM_{2.5}$

Cyanide Mix Area Ventilation Fan (GT0095-48100-01-PFD-3019)				
Reference:	ESDM Procedure Document Table C-1 (March 2009)			
Controlled by baghouse.	Data Quality "AA"			
Flowrate	5000	acfm		
	2.36	am^3/s		
Emission Rate	**HCN (g/s)**			
	0.0797	**g/s**		

Table C-12: Construction Phase - Ore / Rock Handling at Stockpiles (Dozers)

Bulldozers at Rock / Ore Stockpiles			
Reference:	US EPA AP-42 Table 11.9-2		
Equation: EF(kg/hour) = k*2.6*silt^1.2*moisture^-1.3, k = 1 for TSP			
Silt	5.8	assumed	AP42 Taconite mining
Moisture	4	assumed	
Emission Factor (kg/hour)	3.54		EPA Rating
TSP	Emmission Rate (g/s)	0.98	B
Control Efficiency	75	%	assumed based on watering and BMP
	0.75	scaling factor for PM10	
	0.105	scaling factor for PM2.5	

Number of Dozers		
Dozers	Dozer at AEX NPAG	1
	Dozer at AEX PAG	1
	Dozer at AEX Portal	1
	Dozer at Borrow Source #1	1
	Dozer at Borrow Source #3	1
	Dozer at Borrow Source #3BS3B	1
	Dozer at Coarse Ore Storage	1
	Dozer at Crusher	1
	Dozer at CWP #1 Dam	1
	Dozer at CWP #2 (Sump #1)	1
	Dozer at CWP #3 (Sump #2)	1
	Dozer at Diversion Channel #1	1
	Dozer at Diversion Channel #2	1
	Dozer at Dixie Creek Berm	1
	Dozer at Haul Roads	1
	Dozer at Infrastructure Pad	1
	Dozer at LGO Stockpile - East (#2)	1
	Dozer at LGO Stockpile - West (#1)	1
	Dozer at LP Central	7
	Dozer at MWP Pond Dam	1
	Dozer at North Dam	1
	Dozer at NPAG Stockpile	1
	Dozer at Overburden #1	1
	Dozer at Overburden #2	1
	Dozer at Overburden #3	1
	Dozer at Overburden #5	1
	Dozer at Overburden #6	1
	Dozer at PAG Stockpile	1
	Dozer at Paste Plant	1
	Dozer at Process Plant	1
	Dozer at Quarry #1	1
	Dozer at Quarry #2	1
	Dozer at ROM Stockpile	1
	Dozer at Shaft	1
	Dozer at South Dam	1
	Dozer at South Dam - spillway	1
	Dozer at Tailings Pipeline	1
	Dozer at TMF Facility	1
	Dozer at TMF Pond Dam	1
	Dozer at Viggo Pit	7
	Dozer at West Dam	1

Dust Dozers Emissions		**TSP**	**PM_{10}**	**$PM_{2.5}$**	**Unit**
Dozers	Dozer at AEX NPAG	0.25	0.18	0.03	g/s
	Dozer at AEX PAG	0.25	0.18	0.03	g/s
	Dozer at AEX Portal	0.25	0.18	0.03	g/s
	Dozer at Borrow Source #1	0.25	0.18	0.03	g/s
	Dozer at Borrow Source #3	0.25	0.18	0.03	g/s
	Dozer at Borrow Source #3BS3B	0.25	0.18	0.03	g/s
	Dozer at Coarse Ore Storage	0.25	0.18	0.03	g/s
	Dozer at Crusher	0.25	0.18	0.03	g/s
	Dozer at CWP #1 Dam	0.25	0.18	0.03	g/s
	Dozer at CWP #2 (Sump #1)	0.25	0.18	0.03	g/s
	Dozer at CWP #3 (Sump #2)	0.25	0.18	0.03	g/s
	Dozer at Diversion Channel #1	0.25	0.18	0.03	g/s
	Dozer at Diversion Channel #2	0.25	0.18	0.03	g/s
	Dozer at Dixie Creek Berm	0.25	0.18	0.03	g/s
	Dozer at Haul Roads	0.25	0.18	0.03	g/s
	Dozer at Infrastructure Pad	0.25	0.18	0.03	g/s
	Dozer at LGO Stockpile - East (#2)	0.25	0.18	0.03	g/s
	Dozer at LGO Stockpile - West (#1)	0.25	0.18	0.03	g/s
	Dozer at LP Central	1.72	1.29	0.18	g/s
	Dozer at MWP Pond Dam	0.25	0.18	0.03	g/s
	Dozer at North Dam	0.25	0.18	0.03	g/s
	Dozer at NPAG Stockpile	0.25	0.18	0.03	g/s
	Dozer at Overburden #1	0.25	0.18	0.03	g/s
	Dozer at Overburden #2	0.25	0.18	0.03	g/s
	Dozer at Overburden #3	0.25	0.18	0.03	g/s
	Dozer at Overburden #5	0.25	0.18	0.03	g/s
	Dozer at Overburden #6	0.25	0.18	0.03	g/s
	Dozer at PAG Stockpile	0.25	0.18	0.03	g/s
	Dozer at Paste Plant	0.25	0.18	0.03	g/s
	Dozer at Process Plant	0.25	0.18	0.03	g/s
	Dozer at Quarry #1	0.25	0.18	0.03	g/s
	Dozer at Quarry #2	0.25	0.18	0.03	g/s
	Dozer at ROM Stockpile	0.25	0.18	0.03	g/s
	Dozer at Shaft	0.25	0.18	0.03	g/s
	Dozer at South Dam	0.25	0.18	0.03	g/s
	Dozer at South Dam - spillway	0.25	0.18	0.03	g/s
	Dozer at Tailings Pipeline	0.25	0.18	0.03	g/s
	Dozer at TMF Facility	0.25	0.18	0.03	g/s
	Dozer at TMF Pond Dam	0.25	0.18	0.03	g/s
	Dozer at Viggo Pit	1.72	1.29	0.18	g/s
	Dozer at West Dam	0.25	0.18	0.03	g/s

Dozer Tailpipe Emissions		**Material Handling (tonnes/hour)**	NO_x (g/s)	CO (g/s)	SO_2 (g/s)	PM (g/s)	BaP (g/s)	Benzene (g/s)	1,3-Butadiene (g/s)
	Dozer at AEX NPAG	**48.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at AEX PAG	**51.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at AEX Portal	**108.4**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #1	**64.6**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #3	**18.6**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #3BS3B	**0.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Coarse Ore Storage	**10.5**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Crusher	**139.4**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at CWP #1 Dam	**19.5**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at CWP #2 (Sump #1)	**1.1**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at CWP #3 (Sump #2)	**7.0**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Diversion Channel #1	**101.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Diversion Channel #2	**17.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Dixie Creek Berm	**5.8**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Haul Roads	**376.7**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Infrastructure Pad	**10.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05

Table C-12: Construction Phase - Ore / Rock Handling at Stockpiles (Dozers)

	Dozer at LGO Stockpile - East (#2)	**39.8**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at LGO Stockpile - West (#1)	**57.3**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at LP Central	**1783.4**	—	—	—	—	—	—	—
	Dozer at MWP Pond Dam	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozers	Dozer at North Dam	**15.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at NPAG Stockpile	**1160.0**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #1	**1621.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #2	**73.6**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #3	**74.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #5	**3.7**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #6	**3.8**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at PAG Stockpile	**1646.5**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Paste Plant	**7.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Process Plant	**5.1**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Quarry #1	**128.0**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Quarry #2	**12.5**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at ROM Stockpile	**72.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Shaft	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at South Dam	**232.6**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at South Dam - spillway	**2.5**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Tailings Pipeline	**32.7**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at TMF Facility	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at TMF Pond Dam	**49.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Viggo Pit	**1995.5**	—	—	—	—	—	—	—
	Dozer at West Dam	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Dozer Summary Emissions		**Material Handling (tonnes/hour)**	**TSP (g/s)**	**PM_{10} (g/s)**	**$PM_{2.5}$ (g/s)**	**NO_x (g/s)**	**CO (g/s)**	**SO_2 (g/s)**	**BaP (g/s)**	**Benzene (g/s)**	**1,3-Butadiene (g/s)**
	Dozer at AEX NPAG	48.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at AEX PAG	51.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at AEX Portal	108.4	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #1	64.6	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #3	18.6	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #3BS3B	0.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Coarse Ore Storage	10.5	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Crusher	139.4	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at CWP #1 Dam	19.5	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at CWP #2 (Sump #1)	1.1	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at CWP #3 (Sump #2)	7.0	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Diversion Channel #1	101.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Diversion Channel #2	17.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Dixie Creek Berm	5.8	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Haul Roads	376.7	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Infrastructure Pad	10.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at LGO Stockpile - East (#2)	39.8	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at LGO Stockpile - West (#1)	57.3	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at LP Central	1783.4	1.72E+00	1.29E+00	1.80E-01	—	—	—	—	—	—
	Dozer at MWP Pond Dam	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Dozers	Dozer at North Dam	15.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at NPAG Stockpile	1160.0	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #1	1621.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #2	73.6	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #3	74.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #5	3.7	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #6	3.8	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at PAG Stockpile	1646.5	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Paste Plant	7.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Process Plant	5.1	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Quarry #1	128.0	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Quarry #2	12.5	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at ROM Stockpile	72.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Shaft	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at South Dam	232.6	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at South Dam - spillway	2.5	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Tailings Pipeline	32.7	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at TMF Facility	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at TMF Pond Dam	49.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Viggo Pit	1995.5	1.72E+00	1.29E+00	1.80E-01	—	—	—	—	—	—
	Dozer at West Dam	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Table C-13: Construction Phase Road Emissions (Tailpipe)

Haul Trucks

Haul Truck Engine kW (average)	1268.181818
Total # Trucks	22
Load Factor	40%

Node Segment		ID	Effective # of Trucks*	NO_x (g/s)	CO (g/s)	SO_2 (g/s)	PM (g/s)	BaP (g/s)	Benzene (g/s)	1,3-Butadiene (g/s)
VP	1	RD1	1.88	9.26E-01	9.26E-01	1.11E-03	1.06E-02	4.02E-08	4.60E-04	1.68E-05
1	2	RD2	2.63	1.30E+00	1.30E+00	1.56E-03	1.48E-02	5.63E-08	6.44E-04	2.34E-05
2	LPC	RD3	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	3	RD4	2.18	1.07E+00	1.07E+00	1.29E-03	1.23E-02	4.67E-08	5.34E-04	1.94E-05
LPC	7	RD5	1.57	7.76E-01	7.76E-01	9.32E-04	8.87E-03	3.37E-08	3.86E-04	1.40E-05
3	4	RD6	0.01	5.10E-03	5.10E-03	6.13E-06	5.83E-05	2.22E-10	2.53E-06	9.22E-08
3	5	RD7	0.72	3.53E-01	3.53E-01	4.24E-04	4.04E-03	1.53E-08	1.75E-04	6.39E-06
4	5	RD8	0.37	1.82E-01	1.82E-01	2.18E-04	2.08E-03	7.89E-09	9.02E-05	3.29E-06
4	6	RD9	1.12	5.54E-01	5.54E-01	6.65E-04	6.33E-03	2.41E-08	2.75E-04	1.00E-05
5	OVB1	RD10	1.53	7.53E-01	7.53E-01	9.04E-04	8.61E-03	3.27E-08	3.74E-04	1.36E-05
5	PAG	RD11	3.41	1.68E+00	1.68E+00	2.02E-03	1.92E-02	7.30E-08	8.35E-04	3.04E-05
5	13	RD12	0.56	2.75E-01	2.75E-01	3.30E-04	3.14E-03	1.19E-08	1.36E-04	4.97E-06
6	7	RD13	0.38	1.85E-01	1.85E-01	2.22E-04	2.12E-03	8.04E-09	9.20E-05	3.35E-06
6	11	RD14	0.08	3.76E-02	3.76E-02	4.51E-05	4.29E-04	1.63E-09	1.87E-05	6.80E-07
7	8	RD15	0.52	2.57E-01	2.57E-01	3.09E-04	2.94E-03	1.12E-08	1.28E-04	4.65E-06
PAG	15	RD16	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	9	RD17	0.18	8.93E-02	8.93E-02	1.07E-04	1.02E-03	3.88E-09	4.44E-05	1.62E-06
8	16	RD18	0.28	1.39E-01	1.39E-01	1.66E-04	1.58E-03	6.02E-09	6.88E-05	2.51E-06
8	PSTP	RD19	0.01	5.19E-03	5.19E-03	6.24E-06	5.93E-05	2.26E-10	2.58E-06	9.39E-08
PSTP	DCB	RD20	0.01	4.75E-03	4.75E-03	5.71E-06	5.43E-05	2.06E-10	2.36E-06	8.59E-08
9	10	RD21	0.44	2.15E-01	2.15E-01	2.58E-04	2.46E-03	9.35E-09	1.07E-04	3.89E-06
9	AEXP	RD22	0.15	7.24E-02	7.24E-02	8.69E-05	8.27E-04	3.14E-09	3.60E-05	1.31E-06
10	SHAFT	RD23	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
10	11	RD24	0.20	1.01E-01	1.01E-01	1.21E-04	1.15E-03	4.37E-09	5.00E-05	1.82E-06
11	12	RD25	0.21	1.01E-01	1.01E-01	1.22E-04	1.16E-03	4.41E-09	5.04E-05	1.84E-06
12	LGOW	RD26	0.05	2.49E-02	2.49E-02	3.00E-05	2.85E-04	1.08E-09	1.24E-05	4.51E-07
12	LGOE	RD27	0.02	8.09E-03	8.09E-03	9.71E-06	9.24E-05	3.51E-10	4.02E-06	1.46E-07
12	13	RD28	0.26	1.27E-01	1.27E-01	1.52E-04	1.45E-03	5.50E-09	6.29E-05	2.29E-06
13	14	RD29	0.51	2.51E-01	2.51E-01	3.01E-04	2.86E-03	1.09E-08	1.24E-04	4.53E-06
14	15	RD30	0.15	7.16E-02	7.16E-02	8.60E-05	8.18E-04	3.11E-09	3.56E-05	1.30E-06
15	OVB2	RD31	0.03	1.71E-02	1.71E-02	2.05E-05	1.95E-04	7.42E-10	8.49E-06	3.09E-07
15	NPAG	RD32	1.02	5.05E-01	5.05E-01	6.06E-04	5.77E-03	2.19E-08	2.51E-04	9.13E-06
16	CRUSH	RD33	0.06	3.07E-02	3.07E-02	3.69E-05	3.51E-04	1.33E-09	1.52E-05	5.55E-07
16	17	RD34	0.18	9.06E-02	9.06E-02	1.09E-04	1.04E-03	3.94E-09	4.50E-05	1.64E-06
CRUSH	PRCP	RD35	0.00	2.36E-04	2.36E-04	2.84E-07	2.70E-06	1.03E-11	1.17E-07	4.28E-09
17	18	RD36	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
17	28	RD37	0.12	5.88E-02	5.88E-02	7.07E-05	6.72E-04	2.56E-09	2.92E-05	1.06E-06
18	MWPD	RD38	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
18	19	RD39	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
19	20	RD40	0.20	9.85E-02	9.85E-02	1.18E-04	1.13E-03	4.28E-09	4.90E-05	1.78E-06
19	29	RD41	0.07	3.65E-02	3.65E-02	4.38E-05	4.17E-04	1.59E-09	1.81E-05	6.60E-07
20	Q1	RD42	0.05	2.60E-02	2.60E-02	3.12E-05	2.97E-04	1.13E-09	1.29E-05	4.70E-07
20	21	RD43	0.00	4.45E-04	4.45E-04	5.34E-07	5.08E-06	1.93E-11	2.21E-07	8.04E-09
21	OVB6	RD44	0.00	6.67E-04	6.67E-04	8.01E-07	7.62E-06	2.90E-11	3.31E-07	1.21E-08
21	TWD	RD45	0.00	4.29E-04	4.29E-04	5.15E-07	4.90E-06	1.86E-11	2.13E-07	7.75E-09
TWD	22	RD46	0.00	5.24E-04	5.24E-04	6.29E-07	5.99E-06	2.28E-11	2.60E-07	9.48E-09
22	Q2	RD47	0.00	1.81E-03	1.81E-03	2.17E-06	2.07E-05	7.86E-11	8.99E-07	3.27E-08
22	TND	RD48	0.01	5.34E-03	5.34E-03	6.42E-06	6.11E-05	2.32E-10	2.65E-06	9.67E-08
TND	23	RD49	0.01	2.79E-03	2.79E-03	3.35E-06	3.19E-05	1.21E-10	1.39E-06	5.05E-08
23	24	RD50	0.01	5.09E-03	5.09E-03	6.11E-06	5.82E-05	2.21E-10	2.53E-06	9.21E-08
23	OVB5	RD51	0.00	8.59E-04	8.59E-04	1.03E-06	9.81E-06	3.73E-11	4.27E-07	1.55E-08
23	27	RD52	0.10	4.94E-02	4.94E-02	5.93E-05	5.64E-04	2.15E-09	2.45E-05	8.93E-07
24	BS3B	RD53	0.00	2.26E-03	2.26E-03	2.72E-06	2.58E-05	9.83E-11	1.12E-06	4.09E-08
BS3B	25	RD54	0.00	2.16E-03	2.16E-03	2.59E-06	2.47E-05	9.38E-11	1.07E-06	3.91E-08
25	26	RD55	0.01	4.86E-03	4.86E-03	5.84E-06	5.55E-05	2.11E-10	2.41E-06	8.79E-08
26	BS3	RD56	0.00	2.16E-03	2.16E-03	2.59E-06	2.47E-05	9.38E-11	1.07E-06	3.91E-08
27	TSD	RD57	0.27	1.35E-01	1.35E-01	1.62E-04	1.54E-03	5.86E-09	6.71E-05	2.44E-06
27	OVB3	RD58	0.04	1.74E-02	1.74E-02	2.09E-05	1.99E-04	7.56E-10	8.64E-06	3.15E-07
27	28	RD59	0.07	3.53E-02	3.53E-02	4.24E-05	4.03E-04	1.53E-09	1.75E-05	6.38E-07
28	TPD	RD60	0.10	4.92E-02	4.92E-02	5.91E-05	5.62E-04	2.14E-09	2.44E-05	8.90E-07
TPD	SDS	RD61	0.14	7.07E-02	7.07E-02	8.50E-05	8.08E-04	3.07E-09	3.51E-05	1.28E-06
SDS	29	RD62	0.07	3.65E-02	3.65E-02	4.38E-05	4.17E-04	1.59E-09	1.81E-05	6.60E-07
TMF	TSD	RD63	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TMF	TWD	RD64	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TMF	TND	RD65	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00

Summary

Location	Model ID	NO_x (g/s)	CO (g/s)	SO_2 (g/s)	PM (g/s)	BaP (g/s)	Benzene (g/s)	1,3-Butadiene (g/s)
Quarry #1	TP_Q1	0.623023697	1.777177564	0.00305243	0.012453188	4.58588E-07	0.004885325	0.000286513
Quarry #2	TP_Q2	0.623023697	1.777177564	0.00305243	0.012453188	4.58588E-07	0.004885325	0.000286513
LP Central Pit	TP_LPC	0	0	0	0	0	0	0
Viggo Pit	TP_VP	4.27302841	10.77909323	0.018372191	0.085342226	2.62701E-06	0.025368999	0.001422959
Borrow Source #1	TP_BS1	0.048594775	0.524630929	0.000856879	0.002429739	1.71765E-07	0.00151658	6.88705E-05
Borrow Source #3	TP_BS3	0.048594775	0.524630929	0.000856879	0.002429739	1.71765E-07	0.00151658	6.88705E-05
Borrow Source #3BS3B	TP_BS3B	0.048594775	0.524630929	0.000856879	0.002429739	1.71765E-07	0.00151658	6.88705E-05
TMF Facility	TP_TMF	0.327264888	3.114588986	0.004871875	0.016363244	6.31375E-07	0.004638127	0.000193069
Dozers (Single Dozer)	Refer to Dozer C11 Tab	0.037914696	0.331753587	5.68E-04	0.001895735	1.05198E-07	0.000697108	2.65142E-05
Dozers (Open Pits)	Refer to Dozer C11 Tab	—	—	—	—	—	—	—

Table C-13: Construction Phase Road Emissions (Tailpipe)

Table 1: Tier 4 emission standards—Engines up to 560 kW, g/kWh (g/bhp-hr)

Emission Standards: USA: Nonroad Diesel Engines (dieselnet.com)

Engine Power	Year		CO	NMHC	NOx	PM (2.5)
kW < 8	2008		8.0	-	-	0.4[a]
8 ≤ kW < 19	2008		6.6	-	-	0.40
19 ≤ kW < 37	2008		5.5	-	-	0.30
	2013		5.5	-	-	0.03
37 ≤ kW < 56	2008		5.0	-	-	0.3[b]
	2013		5.0	-	-	0.03
56 ≤ kW < 130	2012-2014c		5.0	0.19	0.40	0.020
130 ≤ kW ≤ 560	2011-2014d		3.5	0.19	0.40	0.020

a - hand-startable, air-cooled, DI engines may be certified to Tier 2 standards through 2009 and to an optional PM standard of 0.6 g/kWh starting in 2010

b - 0.4 g/kWh (Tier 2) if manufacturer complies with the 0.03 g/kWh standard from 2012

c - PM/CO: full compliance from 2012; NOx/HC: Option 1 (if banked Tier 2 credits used)—50% engines must comply in 2012-2013; Option 2 (if no Tier 2 credits claimed)—25% engines must comply in 2012-2014, with full compliance from 2014.12.31

d - PM/CO: full compliance from 2011; NOx/HC: 50% engines must comply in 2011-2013

Table 2: Tier 4 emission standards—Engines above 560 kW, g/kWh (g/bhp-hr)

Emission Standards: USA: Nonroad Diesel Engines (dieselnet.com)

Category	Year		CO	NMHC	NOx	PM (2.5)
All engines except gensets > 900 kW	2011		3.5	0.4	3.5	0.10
All engines except gensets	2015		3.5	0.19	3.5	0.04

Table 3: MOVES Emissio Factors for PAHs and VOCs (g/hp-hr)

Equipment	Engine (HP)		Emission Factors (g/hp-h)						Load Factors (%)	Emission Rate (g/s)		
			BaP	Benzene	1,3-Butadiene	Formaldehyde	Acetaldehyde	Acrolein		BaP	Benzene	1,3-Butadiene
Track Dozer (CAT D10T)	704	Crawler Tractor/Dozers	8.28E-07	5.48E-03	2.09E-04	3.15E-02	1.13E-02	2.13E-03	65%	1.62E-07	1.07E-03	4.08E-05
Shovel 16.5 m3	1,672	Excavators	5.01E-07	5.65E-03	2.52E-04	3.58E-02	1.27E-02	2.54E-03	65%	2.33E-07	2.62E-03	1.17E-04
Shovel 12.0 m3	1,055	Excavators	5.01E-07	5.65E-03	2.52E-04	3.58E-02	1.27E-02	2.54E-03	65%	1.47E-07	1.65E-03	7.40E-05
Shovel 10.0 m3	824	Excavators	5.01E-07	5.65E-03	2.52E-04	3.58E-02	1.27E-02	2.54E-03	65%	1.15E-07	1.29E-03	5.78E-05
Front End Loader	1,039	Rubber Tire Loaders	6.64E-07	7.80E-03	4.54E-04	5.86E-02	2.09E-02	5.34E-03	65%	1.92E-07	2.25E-03	1.31E-04
Production Drill	871	Bore/Drill Rigs	7.79E-07	1.10E-02	8.81E-04	1.03E-01	3.69E-02	1.34E-02	100%	1.88E-07	2.67E-03	2.13E-04
Primary Drill	540	Bore/Drill Rigs	6.92E-07	8.55E-03	6.38E-04	7.60E-02	2.73E-02	9.10E-03	100%	1.04E-07	1.28E-03	9.57E-05
Front End Loader (smaller)	309	Rubber Tire Loaders	8.63E-07	6.53E-03	2.89E-04	4.10E-02	1.47E-02	3.25E-03	65%	7.41E-08	5.60E-04	2.48E-05
Road Grader	374	Graders	8.26E-07	5.52E-03	2.07E-04	3.15E-02	1.13E-02	2.09E-03	65%	8.58E-08	5.73E-04	2.15E-05
Forklift	73	Rough Terrain Forklifts	1.07E-06	1.09E-02	4.40E-04	6.50E-02	2.31E-02	4.44E-03	65%	2.16E-08	2.21E-04	8.91E-06
50t Mobile Crane	363	Cranes	5.61E-07	6.45E-03	2.98E-04	4.16E-02	1.49E-02	3.46E-03	30%	5.66E-08	6.50E-04	3.01E-05
150t Mobile Crane	544	Cranes	5.61E-07	6.45E-03	2.98E-04	4.16E-02	1.49E-02	3.46E-03	30%	8.48E-08	9.74E-04	4.51E-05
Dozer - D10	602	Crawler Tractor/Dozers	8.28E-07	5.48E-03	2.09E-04	3.15E-02	1.13E-02	2.13E-03	65%	1.38E-07	9.17E-04	3.49E-05
Dozer - D8 LPG	354	Crawler Tractor/Dozers	8.41E-07	5.68E-03	2.17E-04	3.27E-02	1.17E-02	2.21E-03	65%	8.26E-08	5.58E-04	2.13E-05
Dozer - D6	215	Crawler Tractor/Dozers	3.79E-07	3.14E-03	1.14E-04	1.77E-02	6.38E-03	1.14E-03	65%	2.26E-08	1.87E-04	6.82E-06
Wheel Dozer	620	Crawler Tractor/Dozers	8.28E-07	5.48E-03	2.09E-04	3.15E-02	1.13E-02	2.13E-03	65%	1.43E-07	9.45E-04	3.59E-05
Excavator	490	Excavators	6.18E-07	4.13E-03	1.49E-04	2.30E-02	8.28E-03	1.49E-03	65%	8.41E-08	5.62E-04	2.02E-05
Diesel Pump	440	Other Construction Equipment	8.37E-07	6.83E-03	3.93E-04	5.08E-02	1.82E-02	5.03E-03	100%	1.02E-07	8.35E-04	4.81E-05
Fusion Machine	13	Other Construction Equipment	1.20E-06	2.02E-02	6.95E-04	1.09E-01	3.88E-02	7.00E-03	100%	4.35E-09	7.28E-05	2.51E-06
Fire Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.69E-08	2.42E-04	8.44E-06
Dewatering Pump	125	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04	5.44E-02	1.94E-02	3.77E-03	100%	4.04E-08	3.20E-04	1.28E-05
Skid Steer	75	Skid Steer Loaders	2.71E-06	3.73E-02	2.76E-03	3.29E-01	1.18E-01	3.97E-02	65%	5.65E-08	7.77E-04	5.76E-05
TLB	72	Other Construction Equipment	1.56E-06	1.21E-02	5.10E-04	7.39E-02	2.63E-02	5.33E-03	100%	3.11E-08	2.42E-04	1.02E-05
Fire Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.69E-08	2.42E-04	8.44E-06
Ambulance	250	Off-highway Trucks	1.99E-07	1.41E-03	4.85E-05	7.77E-03	2.89E-03	5.03E-04	50%	1.38E-08	9.77E-05	3.37E-06
Container Trailer Truck	250	Off-highway Trucks	1.99E-07	1.41E-03	4.85E-05	7.77E-03	2.89E-03	5.03E-04	50%	1.38E-08	9.77E-05	3.37E-06
Flat Deck Truck	250	Off-highway Trucks	1.99E-07	1.41E-03	4.85E-05	7.77E-03	2.89E-03	5.03E-04	50%	1.38E-08	9.77E-05	3.37E-06
Fuel Tanker Truck (30,000 L)	353	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.25E-08	2.13E-04	7.45E-06
Water Truck (30,000 L)	353	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.25E-08	2.13E-04	7.45E-06
Portable Water Truck	353	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.25E-08	2.13E-04	7.45E-06
Sewage Collection Truck	353	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.25E-08	2.13E-04	7.45E-06
High Cube Truck	334	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.08E-08	2.02E-04	7.05E-06
Pick-up	200	Off-highway Trucks	1.99E-07	1.41E-03	4.85E-05	7.77E-03	2.89E-03	5.03E-04	50%	1.10E-08	7.82E-05	2.70E-06
Bus (60 seats)	116	Off-highway Trucks	4.29E-07	2.01E-03	6.92E-05	1.09E-02	3.94E-03	7.02E-04	50%	1.38E-08	6.48E-05	2.23E-06
Fire Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.69E-08	2.42E-04	8.44E-06

Table C-13: Construction Phase Road Emissions (Tailpipe)

Integrated Tool Carrier	126	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04	5.44E-02	1.94E-02	3.77E-03	100%	4.07E-08	3.22E-04	1.29E-05
Crusher	350	Crushing/Proc. Equipment	5.55E-07	6.43E-03	3.11E-04	4.26E-02	1.52E-02	3.69E-03	100%	5.39E-08	6.25E-04	3.02E-05
Lowboy and Tractor	500	Off-Highway Tractors	8.99E-07	6.43E-03	2.60E-04	3.83E-02	1.37E-02	2.75E-03	50%	1.25E-07	8.93E-04	3.61E-05
Mechanics Truck	350	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.22E-08	2.12E-04	7.38E-06
Ore Control Drill	110	Bore/Drill Rigs	8.59E-07	1.03E-02	6.98E-04	8.55E-02	3.06E-02	9.39E-03	100%	2.62E-08	3.13E-04	2.13E-05
Snow Plow/Water Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.69E-08	2.42E-04	8.44E-06
Tire Manipulator	353	Other Construction Equipment	8.37E-07	6.83E-03	3.93E-04	5.08E-02	1.82E-02	5.03E-03	100%	8.20E-08	6.70E-04	3.86E-05
Blasters Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.69E-08	2.42E-04	8.44E-06
Blasting Loader	75	Tractors/Loaders/Backhoes	2.16E-06	2.93E-02	1.68E-03	2.17E-01	7.75E-02	2.11E-02	65%	4.50E-08	6.10E-04	3.50E-05
D6 EX Dozer	215	Crawler Tractor/Dozers	3.79E-07	3.14E-03	1.14E-04	1.77E-02	6.38E-03	1.14E-03	65%	2.26E-08	1.87E-04	6.82E-06
Loader (FEL) Cat 966	330	Rubber Tire Loaders	8.63E-07	6.53E-03	2.89E-04	4.10E-02	1.47E-02	3.25E-03	65%	7.91E-08	5.98E-04	2.65E-05
Backhoe 330	275	Tractors/Loaders/Backhoes	1.42E-06	1.78E-02	1.02E-03	1.32E-01	4.72E-02	1.25E-02	65%	1.09E-07	1.36E-03	7.79E-05
Dewatering Pump	125	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04	5.44E-02	1.94E-02	3.77E-03	100%	4.04E-08	3.20E-04	1.28E-05
Screening Plant	140	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04	5.44E-02	1.94E-02	3.77E-03	100%	4.52E-08	3.58E-04	1.43E-05
D6 EX Dozer	215	Crawler Tractor/Dozers	3.79E-07	3.14E-03	1.14E-04	1.77E-02	6.38E-03	1.14E-03	65%	2.26E-08	1.87E-04	6.82E-06
D8 Dozer	354	Crawler Tractor/Dozers	8.41E-07	5.68E-03	2.17E-04	3.27E-02	1.17E-02	2.21E-03	65%	8.26E-08	5.58E-04	2.13E-05
D6 Dozer	165	Crawler Tractor/Dozers	6.51E-07	4.06E-03	1.46E-04	2.26E-02	8.08E-03	1.46E-03	65%	2.98E-08	1.86E-04	6.71E-06
336 CAT Excavator	300	Excavators	6.18E-07	4.13E-03	1.49E-04	2.30E-02	8.28E-03	1.49E-03	65%	5.15E-08	3.44E-04	1.24E-05
Tandem Truck	500	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	4.61E-08	3.02E-04	1.05E-05
CAT 740 EJ Articulated Trucks	496	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	4.57E-08	3.00E-04	1.05E-05
CAT CS64B Compactor	131	Rollers	8.42E-07	5.49E-03	2.04E-04	3.11E-02	1.11E-02	2.02E-03	65%	3.06E-08	2.00E-04	7.41E-06
JD 640L Skidder	237	Skid Steer Loaders	1.97E-06	2.67E-02	1.99E-03	2.37E-01	8.50E-02	2.83E-02	65%	1.30E-07	1.76E-03	1.31E-04
Flat Bed or Boom Truck	600	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	5.53E-08	3.63E-04	1.27E-05
Light Duty Pickup Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	50%	3.69E-08	2.42E-04	8.44E-06
Dewatering Pump	125	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04	5.44E-02	1.94E-02	3.77E-03	100%	4.04E-08	3.20E-04	1.28E-05
Blasters Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	65%	3.69E-08	2.42E-04	8.44E-06
Blasting Loader	75	Tractors/Loaders/Backhoes	2.16E-06	2.93E-02	1.68E-03	2.17E-01	7.75E-02	2.11E-02	65%	4.50E-08	6.10E-04	3.50E-05
Pickup Trucks	300	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05	1.21E-02	4.38E-03	7.74E-04	65%	2.76E-08	1.81E-04	6.33E-06
Primary Drill	540	Bore/Drill Rigs	6.92E-07	8.55E-03	6.38E-04	7.60E-02	2.73E-02	9.10E-03	100%	1.04E-07	1.28E-03	9.57E-05
Production Backhoe	785	Excavators	5.01E-07	5.65E-03	2.52E-04	3.58E-02	1.27E-02	2.54E-03	65%	1.09E-07	1.23E-03	5.50E-05
Production Loader	1,676	Rubber Tire Loaders	6.64E-07	7.80E-03	4.54E-04	5.86E-02	2.09E-02	5.34E-03	65%	3.09E-07	3.63E-03	2.11E-04
Rock Crusher	276	Crushing/Proc. Equipment	4.60E-07	5.56E-03	2.13E-04	3.21E-02	1.15E-02	2.09E-03	65%	3.53E-08	4.26E-04	1.63E-05
Dozer	354	Crawler Tractor/Dozers	8.41E-07	5.68E-03	2.17E-04	3.27E-02	1.17E-02	2.21E-03	65%	8.26E-08	5.58E-04	2.13E-05
Dewatering Pump	125	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04	5.44E-02	1.94E-02	3.77E-03	100%	4.04E-08	3.20E-04	1.28E-05
Screening Plant	200	Other Construction Equipment	8.73E-07	7.79E-03	3.12E-04	4.62E-02	1.65E-02	3.15E-03	100%	4.85E-08	4.33E-04	1.74E-05
Haul Trucks (777)	1050		4.32E-07	4.94E-03	1.80E-04	2.76E-02	9.81E-03	1.78E-03	40%	1.26E-07	1.44E-03	5.24E-05
Haul Trucks (785)	1450		4.32E-07	4.94E-03	1.80E-04	2.76E-02	9.81E-03	1.78E-03	40%	1.74E-07	1.99E-03	7.24E-05
Haul Truck Average	1268		4.32E-07	4.94E-03	1.80E-04	2.76E-02	9.81E-03	1.78E-03	40%	1.52E-07	1.74E-03	6.33E-05

Table C-14: Construction Equipment On Site

Source ID	Source Description	Engine Type (Example)	Engine Size / Description (if available)	Engine Output (HP)	Equipment Quantity	Percentage of time the equipment is operated (%)
Mine Pit Construction	Haul Truck	Diesel >=19kW, Tier 4	CAT 777F	1,030	10	64%
Mine Pit Construction	Haul Truck	Diesel >=19kW, Tier 4	CAT 785	1,450	12	64%
Mine Pit Construction	Shovel 16.5 m3	Diesel >=19kW, Tier 4	CAT 6030	1,672	1	64%
Mine Pit Construction	Shovel 12.0 m3	Diesel >=19kW, Tier 4	CAT 6020	1,055	1	64%
Mine Pit Construction	Shovel 10.0 m3	Diesel >=19kW, Tier 4	CAT 6015	824	1	64%
Mine Pit Construction	Front End Loader	Diesel >=19kW, Tier 4	CAT993	1,039	2	64%
Mine Pit Construction	Production Drill	Diesel >=19kW, Tier 4	Epiroc Pit Viper PV235	871	3	64%
Mine Pit Construction	Primary Drill	Diesel >=19kW, Tier 4	140mm SmartRoc D65	540	3	64%
Mine Pit Construction	Front End Loader (smaller)	Diesel >=19kW, Tier 4	CAT 966	309	4	75%
Mine Pit Construction	Road Grader	Diesel >=19kW, Tier 4	CAT 16	374	3	75%
Mine Pit Construction	Forklift	Diesel >=19kW, Tier 4	Cat DP40-55(C)N3, 5.5 tonne	73	3	25%
Mine Pit Construction	50t Mobile Crane	Diesel >=19kW, Tier 4	Tadano GR-500XL	363	2	25%
Mine Pit Construction	150t Mobile Crane	Diesel >=19kW, Tier 4		544	1	25%
Mine Pit Construction	Dozer - D10	Diesel >=19kW, Tier 4	CAT D10	602	3	64%
Mine Pit Construction	Dozer - D6	Diesel >=19kW, Tier 4	CAT D6	215	2	64%
Mine Pit Construction	Wheel Dozer	Diesel >=19kW, Tier 4	CAT 844 RTD	620	2	64%
Mine Pit Construction	Excavator	Diesel >=19kW, Tier 4	CAT 374	490	3	25%
Mine Pit Construction	Diesel Pump	Diesel >=19kW, Tier 4	HL250M	440	5	100%
Mine Pit Construction	Fusion Machine	Diesel < 19kW	24" HDPE	13	3	50%
Mine Pit Construction	Fire Truck	Diesel >=19kW, Tier 4	TBD	400	1	25%
Mine Pit Construction	Dewatering Pump	Diesel >=19kW, Tier 1–3		125	10	100%
Mine Pit Construction	Skid Steer	Diesel >=19kW, Tier 4	Bobcat S650	75	2	25%
Mine Pit Construction	TLB	Diesel >=19kW, Tier 4	Cat 422F2	72	2	25%
Mine Pit Construction	Fire Truck	Diesel >=19kW, Tier 4	TBD	400	1	25%
Mine Pit Construction	Ambulance	Diesel >=19kW, Tier 4	TBD	250	1	25%
Mine Pit Construction	Container Trailer Truck	Diesel >=19kW, Tier 4	TBD	250	2	25%
Mine Pit Construction	Flat Deck Truck	Diesel >=19kW, Tier 4	TBD	250	2	25%
Mine Pit Construction	Fuel Tanker Truck (30,000 L)	Diesel >=19kW, Tier 4	TBD	353	2	50%
Mine Pit Construction	Water Truck (30,000 L)	Diesel >=19kW, Tier 4	CAT 740	353	2	50%
Mine Pit Construction	Portable Water Truck	Diesel >=19kW, Tier 4	TBD	353	2	50%
Mine Pit Construction	Sewage Collection Truck	Diesel >=19kW, Tier 4	TBD	353	1	25%
Mine Pit Construction	High Cube Truck	Diesel >=19kW, Tier 4	Ford F-650® SD DIESEL	334	2	25%
Mine Pit Construction	Pick-up	Diesel >=19kW, Tier 4	TBD	200	30	25%
Mine Pit Construction	Bus (60 seats)	Diesel >=19kW, Tier 4	TBD	116	5	25%
Mine Pit Construction	Fire Truck	Diesel >=19kW, Tier 4		400	1	25%
Mine Pit Construction	Integrated Tool Carrier	Diesel >=19kW, Tier 4	WA200-7	126	1	25%
Mine Pit Construction	Crusher	Diesel >=19kW, Tier 1–3	Sandvik QJ341	350	1	50%
Mine Pit Construction	Lighting Plants	Solar		N/A	2	50%
Mine Pit Construction	Lowboy and Tractor	Diesel >=19kW, Tier 1–3	75ton - 100ton	500	1	25%
Mine Pit Construction	Mechanics Truck	Diesel >=19kW, Tier 4		350	5	50%
Mine Pit Construction	Ore Control Drill	Diesel >=19kW, Tier 1–3	Explorac E100	110	3	75%
Mine Pit Construction	Snow Plow/Water Truck	Diesel >=19kW, Tier 4	T880	400	2	25%
Mine Pit Construction	Tire Manipulator	Diesel >=19kW, Tier 4	WA-500-7	353	1	25%
Mine Pit Construction	Blasters Truck	Diesel >=19kW, Tier 4	F350	400	2	50%
Mine Pit Construction	Blasting Loader	Diesel >=19kW, Tier 4	CAT 262	75	2	50%
Tailings Facility	D6 EX Dozer	Diesel >=19kW, Tier 4		215	4	50%
Tailings Facility	D8 Dozer	Diesel >=19kW, Tier 1–3	D8	354	4	75%
Tailings Facility	336 CAT Excavator	Diesel >=19kW, Tier 1–3		300	6	100%
Tailings Facility	Truck (Dump) CAT 735B	Diesel >=19kW, Tier 4	17.9-24.8 Cy	317	10	50%
Tailings Facility	CAT 950 Loader	Diesel, Tier 4		249	1	50%
Tailings Facility	CAT 740 EJ Articulated Trucks	Diesel >=19kW, Tier 4		496	8	50%
Tailings Facility	CAT CS64B Compactor	Diesel		131	3	75%
Tailings Facility	JD 640L Skidder	Diesel		237	2	25%
Tailings Facility	Flat Bed or Boom Truck	Diesel >=19kW, Tier 1–3		600	1	50%
Tailings Facility	Ligth Duty Pickup Truck	LDDV (Moderate Control)		400	3	100%
Tailings Facility	Dewatering Pump	Diesel >=19kW, Tier 1–3		125	10	100%
Tailings Facility	CG630E Grout Plant	Compressed Air			1	50%
Tailings Facility	Sullair 375H Compressor	Diesel		122	1	50%
Tailings Facility	Sheet Piling Rig	Diesel >=19kW, Tier 4		1,006	1	50%
Infrastructure Construction	Backhoe 330	Diesel >=19kW, Tier 4		273	1	50%
Infrastructure Construction	Compactor Vib Cat 433	Diesel >=19kW, Tier 4		100	5	50%
Infrastructure Construction	Compactor Vib Cat CB434	Diesel >=19kW, Tier 4		83	1	50%
Infrastructure Construction	Crane Crawler 50 Ton	Diesel >=19kW, Tier 4		362	3	50%
Infrastructure Construction	Crane Hydraulic 31 Ton	Diesel >=19kW, Tier 4		280	1	50%
Infrastructure Construction	Dozer W/ Blade and Winch	Diesel >=19kW, Tier 4		240	5	50%
Infrastructure Construction	Dozer D4 LGP	Diesel >=19kW, Tier 4		96	1	50%
Infrastructure Construction	Dozer D8 Winch	Diesel >=19kW, Tier 4		310	4	50%
Infrastructure Construction	Excavator Hydraulic Cat 330	Diesel >=19kW, Tier 4		268	7	50%
Infrastructure Construction	Grader CAT 16 H	Diesel >=19kW, Tier 4		275	1	50%
Infrastructure Construction	Loader (FEL) Cat 966	Diesel >=19kW, Tier 4	5.5 Cy	330	7	50%
Infrastructure Construction	Telehandler	Diesel >=19kW, Tier 4	TL1055	134	1	50%
Infrastructure Construction	Truck (Dump) CAT 735B	Diesel >=19kW, Tier 4	17.9-24.8 Cy	317	3	50%
Infrastructure Construction	Truck (Dump) CAT 740B 40T	Diesel >=19kW, Tier 4	16.0-28.6 Cy	436	10	50%
Infrastructure Construction	Rigid Truck 150T	Diesel >=19kW, Tier 4	CAT 785	1,600	9	50%
Infrastructure Construction	Truck (Water)	Diesel >=19kW, Tier 4	CAT 735	317	1	50%
Infrastructure Construction	Dewatering Pump	Diesel >=19kW, Tier 1–3		125	10	100%
Infrastructure Construction	Truck Flatbead 10T	Diesel >=19kW, Tier 4		200	1	50%
Infrastructure Construction	Wheel Loader	Diesel >=19kW, Tier 4		287	2	50%
Infrastructure Construction	Zoom Boom	Diesel >=19kW, Tier 1–3		99	4	75%
Infrastructure Construction	JLG - 125'	Diesel >=19kW, Tier 1–3		75	2	75%
Infrastructure Construction	Welding machine, Diesel	Diesel >=19kW, Tier 1–3		66	3	75%
Infrastructure Construction	Genie 4 ton Ext boom FORKLIFT	Diesel >=19kW, Tier 1–3		99	6	75%
Infrastructure Construction	Light Tower	Diesel >=19kW, Tier 1–3		27	20	50%
Infrastructure Construction	Fusing Machine 2" - 8"	Diesel < 19kW		4	3	50%
Infrastructure Construction	Manlift Articulating 60'	Diesel >=19kW, Tier 1–3		74	6	75%
Infrastructure Construction	COMPRESOR DOOSAN XP-375	Diesel >=19kW, Tier 1–3		36	6	100%
Infrastructure Construction	80T RT Crane	HDDV (Moderate Control)		390	2	75%
DRA - Process Plant Construction	55T Crane Terex RT555, including 2-Stage Jib	Diesel		250	1	30%
DRA - Process Plant Construction	70T Crane - Terex RT670	Diesel		250	1	30%
DRA - Process Plant Construction	70T Crane - Terex RT670	Diesel		250	1	30%
DRA - Process Plant Construction	300T Crane - DEMAG	Diesel		400	1	30%
DRA - Process Plant Construction	Crawler Conventional Crane 150T (used)	Diesel		400	1	18%
DRA - Process Plant Construction	Boom Truck 25T Terex 5092, including 2-stage Jib	Diesel		250	1	48%
DRA - Process Plant Construction	Boom Truck 25T	Diesel		250	1	48%
DRA - Process Plant Construction	Lift Truck 2.5T Capacity, MH25-4, 4x4, 60HP	Gasoline		60	1	30%
DRA - Process Plant Construction	20' Service Platform Truck	Diesel		200	1	36%
DRA - Process Plant Construction	Dumper Truck 18m3 Capacity	Diesel		350	1	24%
DRA - Process Plant Construction	Dumper Truck 18m3 Capacity	Diesel		350	1	12%
DRA - Process Plant Construction	Service vehicle - Manlift 18m - 600 AJ JLG 4x4, Diesel, Rough Terrain	Diesel		60	3	48%
DRA - Process Plant Construction	Scissor lift - 13.1 m capacity, 4X4	Diesel		60	1	57%
DRA - Process Plant Construction	Scissor lift - 13.1 m capacity, 4X4	Diesel		60	1	57%

DRA - Process Plant Construction	Mini Excavator Cat 305D CR	Diesel		60	1	30%
DRA - Process Plant Construction	Backhoe Loader - Cat 430 4x4, E-Stick, 24" Bucket	Diesel		120	1	30%
DRA - Process Plant Construction	Skid Steer Loader Cat 252B - Bucket & Fork	Diesel		80	1	30%
DRA - Process Plant Construction	Wheel Loader Cat 950H - with Quick Coupler (Bucket & Fork)	Diesel		250	1	24%
DRA - Process Plant Construction	Air Compressor Sullair 185Q	Diesel		50	1	30%
DRA - Process Plant Construction	Air Compressor Sullair 185Q	Diesel		50	1	30%
DRA - Process Plant Construction	Lighting Plant	Diesel		12	4	18%
DRA - Process Plant Construction	Manual Roller Compactor	Diesel		12	1	18%
DRA - Process Plant Construction	Vibrating Plate Compactor 600mm x 600mm	Diesel		12	3	18%
DRA - Process Plant Construction	Compactor - Jumping Jack	Gasoline		12	1	18%
DRA - Process Plant Construction	Compactor - Jumping Jack	Gasoline		12	1	18%
DRA - Process Plant Construction	Telehandler Cat TL1055 - 4.54T, 1.36T/12.5m	Diesel		140	1	42%
DRA - Process Plant Construction	Telehandler Cat TL1055 - 4.54T, 1.36T/12.5m	Diesel		140	1	42%
DRA - Process Plant Construction	Pickup Truck 4WD 4x4, Twin Cab, 2500#	Gasoline		350	19	12%
DRA - Process Plant Construction	Godwin GSP10 Small Dewatering Pumps	Gasoline		1	5	6%
DRA - Process Plant Construction	Godwin Pump GTP80HX (3")	Gasoline		6	3	6%
DRA - Process Plant Construction	Welding Machine Lincoln Electric, Vantage 400	Diesel		35	4	18%
DRA - Process Plant Construction	Fusion Machine Ritmo Delta 250	Diesel		35	1	18%
DRA - Process Plant Construction	Concrete Truck 8m3 capacity, 6x4, 310 HP	Diesel		35	1	18%
DRA - Process Plant Construction	Concrete Truck 8m3 capacity, 6x4, 310 HP	Diesel		35	1	18%
DRA - Process Plant Construction	Concrete Pump Truck	Diesel		35	1	12%
DRA - Process Plant Construction	Concrete mixer - 250 L	Gasoline		10	1	12%
DRA - Process Plant Construction	Concrete Trowel Power	Gasoline		5	1	12%
DRA - Process Plant Construction	Concrete Trowel Power	Gasoline		5	1	12%
DRA - Process Plant Construction	Concrete Bucket 1.5 m3	N/A		0	1	30%
DRA - Process Plant Construction	Concrete Vibratory Power Screeds	Gasoline		5	1	12%
DRA - Process Plant Construction	Concrete Vibratory Power Screeds	Gasoline		5	1	12%
DRA - Process Plant Construction	Concrete Internal Vibrator	Gasoline		2	4	12%
DRA - Process Plant Construction	Portable Genset Diesel, Multiquip, 3kw, 120-240V 60HZ	Diesel		10	4	12%
DRA - Process Plant Construction	75kVA Genset	Diesel		100	1	6%
DRA - Process Plant Construction	75kVA Genset	Diesel		100	1	6%
Site Prep & Earthworks	40T Articuating Truck	HDDV (Moderate Control)		370	3	50%
Site Prep & Earthworks	35 Ton Excavator	Diesel >=19kW, Tier 1–3		300	2	50%
Site Prep & Earthworks	120 Ton Excavator	Diesel >=19kW, Tier 1–3		560	2	50%
Site Prep & Earthworks	D8 Dozer	Diesel >=19kW, Tier 1–3		350	3	50%
Site Prep & Earthworks	16' Grader	Diesel >=19kW, Tier 1–3		290	4	50%
Site Prep & Earthworks	Crane 80T	Diesel >=19kW, Tier 1–3		390	2	50%
Site Prep & Earthworks	Drum Roller	Diesel >=19kW, Tier 1–3		130	2	50%
Site Prep & Earthworks	Tadem Water Trucks 2500 gls	HDDV (Moderate Control)		420	4	75%
Concrete	Rock Crusher	Electric	Sandvik UD211	276	1	50%
Concrete	Batch Plant	Diesel >=19kW, Tier 1–3		711	1	100%
Concrete	80T RT Crane	HDDV (Moderate Control)		390	2	75%
Concrete	66" Drum Roller	HDDV (Moderate Control)		130	2	75%
Concrete	Flat Bed	HDDV (Moderate Control)		470	4	50%
Concrete	Generators 13kVA	Diesel < 19kW		15	6	75%
Structural Mechanical Piping (SMP)	COMPRESOR DOOSAN XP-375	Diesel >=19kW, Tier 1–3		36	6	75%
Structural Mechanical Piping (SMP)	COMPRESOR DOOSAN XP-375	Diesel >=19kW, Tier 1–3		36	1	75%
Structural Mechanical Piping (SMP)	Welding machine, Diesel	Diesel >=19kW, Tier 1–3		66	3	75%
Structural Mechanical Piping (SMP)	Genie 4 ton Ext boom FORKLIFT	Diesel >=19kW, Tier 1–3		99	6	75%
Structural Mechanical Piping (SMP)	Light Tower	Diesel >=19kW, Tier 1–3		27	20	50%
Structural Mechanical Piping (SMP)	Fusing Machine 2" - 8"	Diesel < 19kW		4	3	50%
Structural Mechanical Piping (SMP)	Heater - Indirect Fire 350000 BTU	Diesel >=19kW, Tier 1–3		145	1	50%
Electrical and Instrumentation (E&I)	COMPRESOR DOOSAN XP-375	Diesel >=19kW, Tier 1–3		36	6	100%
Concrete	Skidsteer	LDDV (Moderate Control)		80	2	75%
Blasting Foundation	Primary Drill	Diesel >=19kW, Tier 4	140mm SmartRoc D65	540	2	75%
Quarry Source	Blasters Truck	Diesel >=19kW, Tier 4	F350	400	2	50%
Quarry Source	Blasting Loader	Diesel >=19kW, Tier 4	CAT 262	75	1	50%
Quarry Source	Pickup Trucks	Diesel >=19kW, Tier 4		300	2	50%
Quarry Source	Primary Drill	Diesel >=19kW, Tier 4	140mm SmartRoc D65	540	2	75%
Quarry Source	Production Backhoe	Diesel >=19kW, Tier 4	PC1250 (6.7m3)	785	1	25%
Quarry Source	Production Loader	Diesel >=19kW, Tier 4	L-1350 (23m3)	1,676	1	50%
Quarry Source	Rock Crusher	Diesel >=19kW, Tier 1–3	Sandvik UD211	276	2	75%
Quarry Source	Lighting Plants	Solar		N/A	2	50%
Quarry Source	Mechanics Truck	Diesel >=19kW, Tier 4		350	1	50%
Quarry Source	Dozer	Diesel >=19kW, Tier 1–3	D8	354	1	50%
Quarry Source	Dewatering Pump	Diesel >=19kW, Tier 1–3		125	2	100%
Quarry Source	Screening Plant	Diesel >=19kW, Tier 1–3	SPYDER 622TH triple deck	140	1	50%
Borrow Sources	D6 EX Dozer	Diesel >=19kW, Tier 4		215	1	50%
Borrow Sources	Loader (FEL) Cat 966	Diesel >=19kW, Tier 4	5.5 Cy	330	1	50%
Borrow Sources	Backhoe 330	Diesel >=19kW, Tier 4			1	50%
Borrow Sources	Dewatering Pump	Diesel >=19kW, Tier 1–3		125	2	100%
Borrow Sources	Screening Plant	Diesel >=19kW, Tier 4	SPYDER 622TH triple deck	140	1	50%

Table C-15: Construction Phase - Open Face Wind Erosion

An average value for wind erosion from open areas and stockpiles was recommended by Australian NPI Australlia DSEWPC. 2012. National Pollutant Inventory Emission Estimation Technique Manual for Mining (Version 3.1), Table 2). This approach was used to avoid overestimating the disturbed areas that would be susceptible to wind erosion.

This estimated average value is more conservative in nature than the estimated wind erosion of overburden or graded areas at surface coal mine (AP-42 Section 11.9), which estimates that the annual losses from wind erosion are 0.85 Mg/ha/year (or 0.097 kg/ha/h).

Average Wind Erosion from Exposed Areas (kg/ha/hr)			**Average Wind Erosion from Exposed Areas ($g/m^2/s$)**		
TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
0.40	0.20	0.15	0.0000111	0.0000056	0.0000042
Site Activity per day		24	Control Efficiency %		80

Location	**Total Area (m^2)**	**Total Area (ha)**	**Emissions (kg/h)**		
			TSP	**PM_{10}**	**$PM_{2.5}$**
NPAG Stockpile	5,000	0.50	0.20	0.10	0.08
PAG Stockpile	5,000	0.50	0.20	0.10	0.08
LGO Stockpile - Small	5,000	0.50	0.20	0.10	0.08
LGO Stockpile - Big	5,000	0.50	0.20	0.10	0.08
Overburden #1	5,000	0.50	0.20	0.10	0.08
Overburden #2	5,000	0.50	0.20	0.10	0.08
Overburden #3	5,000	0.50	0.20	0.10	0.08
Overburden #5	5,000	0.50	0.20	0.10	0.08
Overburden #6	5,000	0.50	0.20	0.10	0.08
TMF Facility	5,000	0.50	0.20	0.10	0.08
ROM Stockpile	5,000	0.50	0.20	0.10	0.08

Location	**Uncontrolled Emission Rate (g/s)**					
	24-Hour Averaging Emissions			**1-Hour Averaging Emissions**		
	TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
NPAG Stockpile	0.06	0.03	0.02	0.06	0.03	0.02
PAG Stockpile	0.06	0.03	0.02	0.06	0.03	0.02
LGO Stockpile - Small	0.06	0.03	0.02	0.06	0.03	0.02
LGO Stockpile - Big	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #1	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #2	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #3	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #5	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #6	0.06	0.03	0.02	0.06	0.03	0.02
TMF Facility	0.06	0.03	0.02	0.06	0.03	0.02
ROM Stockpile	0.06	0.03	0.02	0.06	0.03	0.02

Location	**Controlled Emission Rate (g/s)**					
	24-Hour Averaging Emissions			**1-Hour Averaging Emissions**		
	TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
NPAG Stockpile	0.011	0.006	0.004	0.011	0.006	0.004
PAG Stockpile	0.011	0.006	0.004	0.011	0.006	0.004
LGO Stockpile - Small	0.011	0.006	0.004	0.011	0.006	0.004
LGO Stockpile - Big	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #1	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #2	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #3	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #5	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #6	0.011	0.006	0.004	0.011	0.006	0.004
TMF Facility	0.011	0.006	0.004	0.011	0.006	0.004
ROM Stockpile	0.011	0.006	0.004	0.011	0.006	0.004

It should be noted that the particulate emissions from disturbed, or active, stockpiles, may be significantly higher during periods of high winds. However the emission rate during such events decreases quickly as the particulate matter on the surface that is susceptible to the wind is finite. Such episodes or events are best managed by on-site practices such as water application and modified activity at stockpiles during high wind events.

The use of the current emission factors for wind erosion in the U.S. EPA's AP-42 document would require hourly input of emission values. In addition, that factor only applies to a limited number of hours above a high wind speed threshold. For these reasons, a more practical approach was used to avoid modelling a different emission value for each hour of meteorological data. An average value based on the emission factor for coal mines was used. Since this factor would lead to higher wind erosion because dust related wind erosion is more likely to occur than asphalt, limestone, or overburden type soil related wind erosion, that approach is considered conservative. In addition, wind erosion is only expected to significantly occur when the wind speed exceeds 10 m/s. The wind erosion was therefore modelled using a variable emission rate, assuming 0 g/s if the wind speed is less than 2.5 m/s, and as calculated for wind speeds greater than this threshold.

Table C-16: Construction Phase - Assay Lab

Emissions from assay lab operations include SPM, metals, and NOx. Emissions from reagent usage was not assessed due to likely meeting negligibility criteria (small quantities used per day, minimal vapour and all fume hoods connected to scrubbing systems.

Fire Assay (PM, Metals)- Benches and Furnaces

Emissions for dust collectors associated with bench work and furnaces were estimated using the emission factor for baghouses published in the MECP Guideline A-10, Table C-2, using an outlet loading of 20 mg/m³ for the

Data Quality: Above Average

			Flowrate (cfm)	Flowrate (m^3/s)	Concentration (mg/m^3)	PM10[1] Emission Rate (g/s)	SPM Emission Rate (g/s)	PM2.5[1] Emission Rate (g/s)
DC_FA	Fire Assay Dust Collector	DC_FA	9,000	4.2	20	0.044	0.085	0.026
			Metal	**Metal Content (mg/mg)**	**Concentration (mg/m^3) [2]**	**Metal Emission Rate (g/s)**	**% of Total**	
			Arsenic	1.72E-02	3.43E-01	1.46E-03	0.6875%	
			Chromium	2.30E-03	4.61E-02	1.96E-04	0.0923%	
			Copper	5.92E-03	1.18E-01	5.03E-04	0.2371%	
			Iron	1.64E+00	3.28E+01	1.39E-01	65.6790%	
			Mercury	4.35E-06	8.70E-05	3.69E-07	0.0002%	
			Magnesium	3.22E-01	6.44E+00	2.73E-02	12.8876%	
			Manganese	3.36E-02	6.72E-01	2.86E-03	1.3467%	
			Nickel	4.41E-03	8.82E-02	3.75E-04	0.1767%	
			Lead	1.07E-02	6.67	2.83E-02	13.3508%	
			Titanium	8.87E-02	1.77E+00	7.54E-03	3.5543%	
			Zinc	4.96E-02	9.93E-01	4.22E-03	1.9880%	

(1) PM10 Emission Rates based on a 0.52 ratio from TSP (SPM) (Lall et. al. 2004)
(1) The addition of Flux (containing Lead Oxide) is introduced during the fire assay process - the outlet concentration of Pb is therefore conservatively assumed to equal 1/3 of maximum concentration given by emission factor for baghouses.

Propane Fired Furnace and Oven (NOx)

As per ESDM Guideline A-10 Section 7.1.1, only NOx emissions are considered for propane.
The US EPA AP-42 Section 1.5 emission factor for liquified petroleum gas was used to estimate NOx from propane furnace and oven.
US EPA Emission Factor Rating: E — Data Quality: Uncertain

Equipment	Provided Heating Data	Maximum Propane Use (L/hour)	Emission Factor (lb/10^3 gal)	Emission Rate (g/s)
Furnace Fusion	N/A	12.7	13	5.50E-03
Drying Oven	N/A	39.7	13	1.72E-02
			Total	**2.27E-02**

Emission Rate =	L/hour x 0.264 gallon/L x EF x 454 g/lb / 1000 /3600 sec/hour
MJ to BTU	947.81708
Propane HV (MMBtu/10^3 gal)	91.5
gal to L	4.546

Table C-17: Construction Phase - Portable Crushers

Emission Factors Reference:

Emission Factors Reference: US EPA AP-42, Table 11.19.2-1

Portable crushing operations located west of the polishing pond where the MGO and LGO stockpiles meet.

Max Spec = 150 metric tonne per hour
Operates max 12 hours per day

Crusher Processing Rate	664	m3/day
	2.71	t/m3
	150	tph

Activity	SCC	PM Emission Factor kg/Mg	PM Emission Factor kg/hr	Client Crusher Operation Hours (Per Day)	Emission Rate (g/s)	EPA Rating	Final Rating*	Notes
Drop to Crusher	3-05-020-31	1.60E-05	2.40E-03	12	3.33E-04	E	F	factor only for PM10.TPM assumed to be 2 X
Primary Crushing (Jaw)	3-05-020-03	2.70E-03	4.05E-01	12	5.63E-02	E	F	no factor given, tertiary crushing factor used
Secondary Crushing (Cone)	3-05-020-03	2.70E-03	4.05E-01	12	5.63E-02	E	F	no factor given, tertiary crushing factor used
Screening	3-05-020-02	1.25E-02	1.88E+00	12	2.60E-01	E	E	1x screener
Conveyor Transfer Point	3-05-020-06	4.50E-03	6.75E-01	12	9.38E-02	E	E	3x Transfer Point (from jaw, from screen, from cone)
Load Out from Crusher	3-05-020-32	1.00E-04	1.50E-02	12	2.08E-03	E	F	factor only for PM10.TPM assumed to be 2 X
	Total Crushing Emission Rate per location				**0.47**			

* EPA rating downgraded one level where factor not specific

	Emission Rate (g/s)	Location Factor	**TSP (g/s)**	**PM_{10} (g/s)**	**$PM_{2.5}$ (g/s)**
Quarry Portable Crusher	0.35	75%	3.52E-01	1.76E-01	8.80E-02
CRF Portable Crusher	0.12	25%	1.17E-01	5.86E-02	2.93E-02

Table C-18: Geochemistry (Metals in Dust)

Use this column for IDs

Corrected Mineralogy IDs	Sample Info Litho Group for Plot	Silver	Aluminum	Arsenic	Barium	Beryllium	Bismuth	Calcium	Cadmium	Cobalt	Chromium	Copper	Iron	Potassium	Magnesium	Manganese	Molybdenum	Sodium	Nickel	Phosphorus	Lead	Sulfur
		ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g
DX450052	Felsic Volcanic 1	8.5	71000	85	380	1.3	0.14	15000	33	9.8	28	100	41000	36000	5000	1100	1.8	4700	16	570	6200	33000
DX550083	Felsic Volcanic 1	2.1	73000	1100	130	0.88	4.9	30000	0.35	10	78	40	27000	3500	7500	760	2.2	55000	16	690	62	12000
DX450204	Felsic Volcanic 1	0.75	86000	5	430	0.97	0.67	26000	0.09	16	75	41	44000	25000	12000	550	1.3	17000	30	690	9	4400
DX450176	Felsic Volcanic 1	7.2	80000	9.2	470	0.98	2.8	9000	69	13	100	300	50000	34000	10000	2000	2.2	5400	19	560	1800	25000
DX450032	Metasediment 3	0.75	90000	7.3	300	1	0.31	14000	0.06	8	12	19	30000	27000	5600	480	1.2	18000	17	510	14	3100
DX450181	Felsic Volcanic 1	0.75	67000	2	410	0.95	0.085	19000	0.19	8.4	84	14	24000	21000	6700	330	0.7	28000	16	490	7.9	650
DX450002	Felsic Volcanic 1	0.75	74000	13	520	1	0.31	26000	0.08	8	84	260	28000	21000	7800	390	8.4	29000	12	500	10	1800
DX450108	Felsic Volcanic 1	0.75	61000	23	350	0.86	1.9	25000	0.19	8.2	12	14	24000	11000	6300	460	20	44000	13	590	9.8	5100
DX450076	Felsic Volcanic 1	9.4	77000	96	85	1.2	14	5700	210	20	15	480	70000	54000	7700	690	2	5100	31	910	910	73000
DX450186	Felsic Volcanic 2	0.75	58000	110	400	0.67	0.34	14000	0.13	2.1	60	12	17000	12000	1400	360	2.1	35000	3.4	160	13	4800
DX450118	Felsic Volcanic 2	0.75	56000	14	400	0.9	0.43	12000	0.19	1.8	3.7	9.7	14000	10000	1500	250	1.4	40000	0.91	160	6.5	1200
DX550107	Felsic Volcanic 2	0.5	79000	12	460	1.4	3	24000	0.26	9.6	130	17	26000	21000	8600	520	1.1	19000	19	610	22	24000
DX450159	Felsic Volcanic 2	0.75	75000	91	510	1.1	1.1	9600	0.07	3	83	5.7	20000	28000	3700	190	1.9	15000	4	230	10	13000
DX450171	Metasediment 2	0.75	90000	87	630	1.4	1.3	11000	0.096	23	180	75	71000	19000	17000	790	2	41000	67	570	25	12000
DX450134	Metasediment 2	1.3	63000	6000	230	0.7	12	34000	0.61	400	85	1400	120000	13000	19000	590	1.2	18000	6100	620	8.8	53000
DX450185	Metasediment 2	0.75	77000	13	490	0.99	0.79	26000	0.18	16	110	41	32000	26000	12000	430	1.7	15000	41	780	12	4300
DX450232	Felsic Volcanic 1	0.75	78000	19	470	0.92	2.5	33000	1	10	62	8.7	28000	16000	10000	1300	1.6	23000	17	880	9	9800
DX550064	Metasediment 3	0.5	99000	12	500	1.2	0.14	19000	0.09	3.5	70	11	10000	24000	3100	190	0.8	31000	7.6	270	8.3	1500
DX450008	Metasediment 3	0.75	71000	1.7	450	1	0.69	13000	0.09	2.1	31	20	9300	20000	2300	120	3.7	21000	1.7	81	12	1600
DX550056	Basalt	0.5	72000	2.5	140	0.47	0.085	65000	0.13	56	100	190	130000	2300	33000	3800	0.6	15000	63	350	1.2	4600
DX450022	Basalt	0.75	78000	8.4	46	0.35	0.085	87000	0.15	50	110	99	90000	880	26000	2100	0.4	15000	92	320	0.62	490
DX450077	Basalt	0.5	65000	4.2	290	0.68	0.085	63000	0.6	47	91	97	110000	4700	22000	2700	0.8	17000	64	560	6.8	1400
DX450113	Basalt	0.75	33000	390	18	0.35	0.14	50000	0.07	19	52	56	150000	1000	15000	4700	0.48	3300	44	370	1.1	6400
DX550101	Basalt	0.5	79000	2.3	32	0.38	0.085	81000	0.12	50	320	77	94000	1300	34000	2000	0.6	15000	120	290	1.5	2300
DX450128	Basalt	0.75	60000	22	190	0.69	0.23	59000	0.3	41	100	59	120000	7300	20000	3600	0.5	11000	80	420	3.5	8000
DX450021	Argillite	0.75	61000	2	130	1	4	18000	4	64	92	340	160000	9300	6800	1100	4.3	20000	99	330	9	74000
DX450222	Fragmental 1	0.75	76000	21	520	1	0.48	22000	0.11	10	69	16	26000	23000	7100	370	2.1	24000	16	550	12	15000
DX450119	Argillite	0.87	45000	5.1	180	0.62	3.8	22000	5.2	93	41	420	170000	10000	7600	670	4.5	10000	130	300	13	85000
DX450080	Metasediment 2	0.5	77000	190	560	1.8	0.53	18000	0.27	23	91	42	48000	23000	13000	850	1.7	17000	60	650	15	1700
DX450143	Metasediment 2	0.75	73000	160	300	1.1	0.79	13000	0.15	28	120	180	130000	26000	24000	1000	2.4	20000	73	830	12	14000
DX450153	Metasediment 2	0.75	87000	3.7	160	1.1	6.9	14000	0.15	23	130	78	48000	25000	12000	310	1.4	20000	49	580	7	41000
DX450017	Metasediment 3	0.75	76000	14	450	1	0.19	12000	0.21	10	28	29	35000	28000	8100	400	2.8	11000	23	500	5	1800
DX450144	Metasediment 3	0.75	65000	34	290	0.85	0.18	22000	0.22	14	26	26	30000	15000	6100	470	3.8	24000	40	660	9.1	470
DX550073	Basalt	0.5	87000	46	400	0.95	0.09	49000	0.06	42	290	51	77000	13000	24000	2500	0.7	28000	120	510	5.1	2900
DX550053	Basalt	0.5	70000	2.2	79	0.38	0.085	76000	0.12	46	130	170	120000	1900	34000	3600	0.3	13000	67	260	1.1	3400
DX550089	Basalt	0.5	67000	2.2	150	0.46	0.085	69000	0.2	48	180	210	130000	7100	30000	3900	2.2	9900	55	330	2.6	11000
DX450051	Felsic Volcanic 1	14.7	71000	103	370	0.95	0.58	11000	37	10	38	77	39000	40000	6000	1200	1.6	4000	17	550	9000	29000
DX450239	Felsic Volcanic 1	1.2	66000	63	66	0.76	15	4400	0.04	19	100	3.2	83000	40000	6500	390	2.7	1400	13	510	6.4	64000
DX450071	Felsic Volcanic 1	1.7	68000	5500	450	0.84	0.78	32000	0.18	7	8.9	18	20000	11000	4400	500	4.7	39000	11	410	21	6800
DX450130	Felsic Volcanic 1	0.75	61000	2300	230	0.68	0.9	26000	0.17	7.5	15	17	24000	4900	6500	480	1	50000	13	500	15	4000
DX450039	Felsic Volcanic 1	0.75	57000	840	460	1	2	16000	0.65	16	120	39	32000	21000	8500	880	2.5	24000	52	370	16	21000
DX450089	Felsic Volcanic 1	0.5	58000	11	480	0.95	0.085	26000	0.12	11	57	21	26000	21000	7900	550	2.2	21000	17	750	23	3800
DX450137	Felsic Volcanic 1	0.75	59000	4.2	400	0.9	0.11	31000	0.09	9.9	19	23	26000	20000	7800	530	0.46	25000	17	500	8	1200
DX450233	Felsic Volcanic 1	1.5	76000	5.3	540	0.79	3.8	19000	14	10	90	140	71000	38000	12000	1900	2.8	7900	19	580	14	22000
DX450200	Felsic Volcanic 1	26	76000	13	340	0.9	3.2	33000	130	9	66	4800	38000	32000	9500	2600	11	18000	16	510	25	23000
DX450155	Felsic Volcanic 1	1	70000	14	430	0.9	2.1	27000	4.1	8.4	89	170	25000	20000	7700	960	34	18000	16	490	28	9700
DX450030	Felsic Volcanic 2	0.75	52000	20	1000	1	0.48	17000	0.55	2	3.3	9	13000	22000	1700	930	1	22000	1.2	140	27	5500
DX450049	Felsic Volcanic 2	0.75	57000	81	350	0.86	0.85	11000	0.21	3	29	23	14000	3000	2700	320	1.9	49000	8.1	130	18	2700
DX450105	Felsic Volcanic 2	0.75	58000	13000	500	1.1	0.38	3400	0.079	2.4	3.4	14	32000	28000	2400	120	2.2	5600	0.5	160	25	19000
DX450170	Felsic Volcanic 2	5.6	69000	28	50	0.8	13	11000	9.3	4.2	77	160	58000	30000	3000	390	4.7	18000	3.8	170	500	53000
DX450227	Felsic Volcanic 1	0.75	62000	1.5	340	0.91	0.085	22000	0.06	9	60	13	25000	17000	4700	370	1.7	31000	14	490	8	10
DX450230	Felsic Volcanic 1	0.75	84000	1.1	540	0.95	0.25	29000	0.07	10	57	25	29000	21000	9200	410	1.7	26000	18	600	9	280
DX450135	Felsic Volcanic 1	0.75	61000	37	400	0.95	0.76	26000	1.3	4.7	6.4	5.7	18000	21000	3800	1900	0.8	16000	8	330	34	97

	Silver	Aluminum	Arsenic	Barium	Beryllium	Bismuth	Calcium	Cadmium	Cobalt	Chromium	Copper	Iron	Potassium	Magnesium	Manganese	Molybdenum	Sodium	Nickel	Phosphorus	Lead	Sulfur
Min	0.50	33000.00	1.10	18.00	0.35	0.09	3400.00	0.04	1.80	3.30	3.20	9300.00	880.00	1400.00	120.00	0.30	1400.00	0.50	81.00	0.62	10.00
Max	26.00	99000.00	13000.00	1000.00	1.80	15.00	87000.00	210.00	400.00	320.00	4800.00	170000.00	54000.00	34000.00	4700.00	34.00	55000.00	6100.00	910.00	9000.00	85000.00
Average	2.05	69830.19	577.96	348.98	0.90	2.07	27360.38	9.92	26.03	77.58	199.36	55213.21	19060.00	10833.96	1132.08	3.09	21005.66	148.51	469.26	359.10	15505.60
Median	0.75	71000.00	14.00	400.00	0.95	0.58	22000.00	0.19	10.00	75.00	41.00	32000.00	21000.00	7800.00	590.00	1.80	18000.00	17.00	500.00	12.00	5500.00
Standard Deviation	4.27	11967.48	2080.31	187.39	0.27	3.61	20088.88	34.90	55.72	62.88	677.47	43917.99	11680.75	8687.37	1127.60	5.32	12400.60	833.88	199.41	1499.60	21122.25
10th Percentile	0.50	57200.00	2.20	80.20	0.50	0.09	11000.00	0.07	3.00	12.00	9.96	17200.00	3100.00	2760.00	312.00	0.60	5440.00	3.84	162.00	2.78	760.00
90th Percentile	4.90	85600.00	750.00	520.00	1.18	4.72	62200.00	13.06	49.60	130.00	292.00	128000.00	33600.00	24000.00	2680.00	4.66	39800.00	89.60	690.00	56.40	50600.00

AAQC	1	120	0.3	10	0.01	2.5	10	0.025	0.1	0.5	50	25	10	72	0.4	120	N/A	0.2	0.5	0.5	25
Max Concentration (24 hour)	8.26E-05	1.44E+00	1.26E-02	8.76E-03	1.99E-05	7.95E-05	1.05E+00	2.20E-04	8.36E-04	2.19E-03	4.92E-03	2.16E+00	5.66E-01	4.04E-01	4.52E-02	7.85E-05	6.71E-01	1.51E-03	1.16E-02	9.51E-04	8.53E-01
% AAQC	0.0083%	1.2022%	4.2134%	0.0876%	0.1989%	0.0032%	10.4829%	0.8804%	0.8359%	0.4382%	0.0098%	8.6290%	5.6628%	0.5618%	11.2919%	0.0001%	N/A	0.7550%	2.3258%	0.1901%	3.4112%

Metal screening as a percent of AAQC completed to identify predicted maximum 24-hour concentrations greater than 4%. Exception for calcium and potassium as AAQC is only for oxide forms. Additional metals carried forward where applicable.

SPM 24 hr Max POI (ug/m3)	16.9	Operations Phase

Table C-18: Geochemistry (Metals in Dust)

Use this column for IDs	Sample Info															
Corrected Mineralogy IDs	Litho Group for Plot	Antimony	Selenium	Tin	Strontium	Thorium	Titanium	Thallium	Uranium	Vanadium	Tungsten	Yttrium	Zinc	Zirconium	Mercury	Boron
		ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g	ug/g
DX450052	Felsic Volcanic 1	7	2.2	6	110	40	2200	0.93	2.1	46	4	8	6200	250	0.09	5
DX550083	Felsic Volcanic 1	2	9.3	6	330	34.7	3000	0.14	1.7	38	14	9.4	75	200	0.14	1
DX450204	Felsic Volcanic 1	2	0.5	6	270	12.1	3000	0.38	1.75	69	1	11	77	65	0.05	2
DX450176	Felsic Volcanic 1	3	3.5	6	95	11	3100	0.85	2	49	2.4	10.5	12000	66	0.3	3
DX450032	Metasediment 3	2	0.5	6	300	8	3500	0.63	1.91	54	1	8.38	55	130	0.05	1
DX450181	Felsic Volcanic 1	2	0.5	6	230	9.5	2700	0.42	1.7	37	1.1	7.1	78	66	0.05	4
DX450002	Felsic Volcanic 1	2	0.5	6	230	20.1	2300	0.5	1.95	40	3	7.74	53	290	0.05	2
DX450108	Felsic Volcanic 1	2	0.56	6	350	20	2300	0.24	1.3	39	6.3	6.1	61	160	0.13	1
DX450076	Felsic Volcanic 1	2	14	6	100	75	3700	1.5	2.9	75	10	9.4	34000	360	2.16	2
DX450186	Felsic Volcanic 2	2	1.3	6	150	12.2	1400	0.2	1.9	2.7	2	11	72	96	0.05	1
DX450118	Felsic Volcanic 2	2	0.5	6	190	16	1200	0.16	2.1	6.8	5.7	9	52	120	0.1	1
DX550107	Felsic Volcanic 2	2	1.3	6	300	37.4	1600	0.81	2.1	42	29	7.6	71	290	0.32	2
DX450159	Felsic Volcanic 2	2	0.5	6	120	19.7	1600	0.52	2.2	7.7	2.7	13.7	31	130	0.05	2
DX450171	Metasediment 2	2	2.1	6	230	12.5	4600	0.54	1.8	140	4.1	16.5	87	86	0.06	1
DX450134	Metasediment 2	14	13	6	260	11	1800	0.4	1.4	100	1.1	11	78	85	0.05	7
DX450185	Metasediment 2	2	0.5	6	270	9.9	3100	0.52	1.9	58	2.8	13.2	77	60	0.05	1
DX450232	Felsic Volcanic 1	2	0.9	6	320	8.7	2900	0.66	1.89	46	0.92	11	250	42	0.05	2
DX550064	Metasediment 3	2	0.1	6	270	16.8	1600	0.5	1.5	23	0.55	2.3	29	280	0.05	2
DX450008	Metasediment 3	2	0.5	6	190	14.4	1100	0.35	2.3	2.8	1	13.4	37	230	0.05	1
DX550056	Basalt	2	0.8	6	120	4.6	6900	0.12	0.13	320	0.25	23	110	130	0.05	1
DX450022	Basalt	2	0.5	6	130	2.6	6600	0.02	0.075	290	0.24	22.7	97	56	0.05	1
DX450077	Basalt	2	0.4	6	170	7.8	9600	0.05	0.16	270	0.45	22	170	170	0.05	1
DX450113	Basalt	2	0.5	6	96	2.6	1200	0.02	0.23	84	0.54	13	46	8	0.05	2
DX550101	Basalt	2	0.1	6	110	1.2	6700	0.02	0.065	330	0.38	22	89	31	0.05	1
DX450128	Basalt	2	0.5	6	190	3.7	5900	0.11	0.29	240	5.6	24	140	49	0.08	1
DX450021	Argillite	2	6.5	6	130	6.8	2700	0.16	1.14	77	0.4	10.2	610	110	0.05	4
DX450222	Fragmental 1	2	0.5	6	270	9.5	1900	0.44	1.83	40	1	9.19	67	43	0.05	2
DX450119	Argillite	2	9.6	6	58	10	1800	0.32	0.95	63	0.56	7.2	2000	76	0.05	5
DX450080	Metasediment 2	2	0.17	6	310	21	3700	0.53	2	100	8.1	14	53	310	0.11	2
DX450143	Metasediment 2	2	1	6	210	14	4700	0.59	1.7	140	5.6	16	130	160	0.07	1
DX450153	Metasediment 2	2	1.3	6	320	27.8	1400	0.88	1.6	80	0.61	7.5	87	220	0.05	1
DX450017	Metasediment 3	2	0.5	6	110	8	2500	0.36	1.67	40	2	7.97	96	140	0.05	6
DX450144	Metasediment 3	2	0.5	6	320	6.9	2500	0.22	0.84	48	2.3	5.5	96	100	0.05	3
DX550073	Basalt	2	0.2	6	370	8.4	6900	0.25	0.37	290	3.2	18	61	190	0.05	3
DX550053	Basalt	2	0.5	6	100	2.8	5600	0.02	0.098	290	0.26	21	92	110	0.05	1
DX550089	Basalt	2	1.7	6	89	3.9	6500	0.25	0.14	280	0.45	20	120	130	0.05	1
DX450051	Felsic Volcanic 1	19	1.7	6	78	8.9	2400	0.97	2.26	46	14	6.66	7300	96	0.12	2
DX450239	Felsic Volcanic 1	2	6.6	6	33	10.1	2400	1	1.84	44	7	6.08	31	37	0.05	5
DX450071	Felsic Volcanic 1	2	12	6	340	29	2000	0.2	2.5	32	22	11	58	340	0.24	4
DX450130	Felsic Volcanic 1	2	1.2	6	290	9.4	2200	0.11	1.7	32	25	6.9	69	80	0.53	1
DX450039	Felsic Volcanic 1	2	0.5	6	120	6.5	1500	0.39	2	54	0.96	8.09	160	76	0.05	1
DX450089	Felsic Volcanic 1	2	0.1	6	320	39	2800	0.62	1.5	48	1.5	8.9	74	220	0.05	1
DX450137	Felsic Volcanic 1	2	0.5	6	260	7.8	2400	0.35	1.3	39	0.53	6.6	63	71	0.05	2
DX450233	Felsic Volcanic 1	2	2.3	6	96	10.7	2700	1.1	1.88	46	3	9.92	2100	42	0.05	4
DX450200	Felsic Volcanic 1	2	2.9	6	220	11.1	2400	0.88	2.3	46	7.4	8.17	18000	54	1.17	1
DX450155	Felsic Volcanic 1	2	1.7	6	250	6.2	2100	0.59	2.1	37	3	8.64	670	14	0.09	2
DX450030	Felsic Volcanic 2	2	0.5	6	160	10.7	1100	0.49	1.7	6.2	3	7.47	140	120	0.05	2
DX450049	Felsic Volcanic 2	2	0.6	6	170	9	1100	0.07	1.94	11	2	5.68	74	110	0.05	1
DX450105	Felsic Volcanic 2	13	0.5	6	65	14	1200	0.45	2.9	2.8	1.2	13	49	74	0.05	1
DX450170	Felsic Volcanic 2	2	12	6	150	17	960	0.74	2.5	17	6.4	12.2	2000	100	0.25	2
DX450227	Felsic Volcanic 1	2	0.5	6	200	7.8	2700	0.29	1.4	37	0.91	6.14	58	36	0.05	1
DX450230	Felsic Volcanic 1	2	0.5	6	450	9.7	3000	0.39	1.8	46	4	9.54	70	49	0.05	1
DX450135	Felsic Volcanic 1	2	0.5	6	200	9.2	1600	0.46	1.8	21	0.87	3.4	210	92	0.05	2
		Antimony	**Selenium**	**Tin**	**Strontium**	**Thorium**	**Titanium**	**Thallium**	**Uranium**	**Vanadium**	**Tungsten**	**Yttrium**	**Zinc**	**Zirconium**	**Mercury**	**Boron**
	Min	2.00	0.10	6.00	33.00	1.20	960.00	0.02	0.07	2.70	0.24	2.30	29.00	8.00	0.05	1.00
	Max	19.00	14.00	6.00	450.00	75.00	9600.00	1.50	2.90	330.00	29.00	24.00	34000.00	360.00	2.16	7.00
	Average	2.87	2.30	6.00	204.15	14.09	2987.92	0.45	1.57	83.45	4.29	11.09	1671.19	125.47	0.15	2.08
	Median	2.00	0.50	6.00	200.00	10.00	2400.00	0.40	1.80	46.00	2.00	9.40	78.00	100.00	0.05	2.00
	Standard Deviation	3.22	3.66	0.00	96.87	12.53	1887.07	0.32	0.75	92.60	6.14	5.33	5514.57	87.80	0.33	1.47
	10th Percentile	2.00	0.42	6.00	95.20	4.04	1200.00	0.08	0.17	8.36	0.45	6.11	49.60	42.00	0.05	1.00
	90th Percentile	2.00	8.76	6.00	320.00	28.76	6380.00	0.88	2.29	278.00	9.62	20.80	2080.00	274.00	0.25	4.00

AAQC	25	10	10	120	N/A	120	0.5	0.03	2	5	5	120	25	2	120
Max Concentration (24 hour)	3.37E-05	1.48E-04	1.01E-04	5.39E-03	4.85E-04	1.08E-01	1.48E-05	3.86E-05	4.69E-03	1.62E-04	3.51E-04	3.51E-02	4.62E-03	4.18E-06	6.74E-05
% AAQC	0.0001%	0.0015%	0.0010%	0.0045%	N/A	0.0896%	0.0030%	0.1288%	0.2343%	0.0032%	0.0070%	0.0292%	0.0185%	0.0002%	0.0001%

Metal screening as a percent of AAQC complet

SPM 24 hr Max POI (ug/m3)

Table C-19: Operations Phase - Material Movement by Year

Maximum material movement scaled to 120,000 tonnes per day.			Maximum Year	Maximum Daily	Maximum Hourly	Maximum Year	Maximum Daily	Maximum Hourly	Maximum Tonnes Per Year (Operations)	Total (tonnes)	Units =>	Total
Material	Material Origin	Material Destination	43800000.00	120 000	5000	51 214 007	140 312	5 846				
Overburden	Viggo Pit	Overburden #1	—	—	—	—	—	—	—	1685024	t	1685024
PAG	Viggo Pit	PAG Stockpile	—	—	—	—	—	—	—	7174935	t	7174935
PAG	Viggo Pit	PAG Stockpile	—	—	—	—	—	—	—	251179	t	251179
NPAG	Viggo Pit	NPAG stockpile	—	—	—	—	—	—	—	5737056	t	5737056
Overburden	LP Central	Overburden #1	2248825	6161	257	2 629 483	7 204	300	2 629 483	15889737	t	15889737
Overburden	LP Central	Overburden #2	3177119	8704	363	3 714 908	10 178	424	3 714 908	5570154	t	5570154
PAG	LP Central	PAG Stockpile	16988813	46545	1939	19 864 502	54 423	2 268	19 864 502	108483185	t	108483185
NPAG	LP Central	NPAG stockpile	4763117	13050	544	5 569 367	15 259	636	5 569 367	15953444	t	15953444
PAG	LP Central	PAG Stockpile	869017	2381	99	1 016 115	2 784	116	1 016 115	5652981	t	5652981
Ore	Viggo Pit	Crusher	—	—	—	—	—	—	—	7101	t	7101
Ore	Viggo Pit	LGO Stockpile - West (#1)	—	—	—	—	—	—	—	315644	t	315644
Ore	Viggo Pit	LGO Stockpile - West (#1)	—	—	—	—	—	—	—	245617	t	245617
Ore	Viggo Pit	LGO Stockpile - East (#2)	—	—	—	—	—	—	—	327597	t	327597
Ore	Viggo Pit	ROM Stockpile	—	—	—	—	—	—	—	136898	t	136898
Ore	LP Central	Crusher	2027006	5553	231	2 370 117	6 493	271	2 370 117	13853567	t	13853567
Ore	LP Central	LGO Stockpile - West (#1)	—	—	—	—	—	—	—	41693	t	41693
Ore	LP Central	LGO Stockpile - West (#1)	308558	845	35	360 788	988	41	360 788	1055218	t	1055218
Ore	LP Central	LGO Stockpile - East (#2)	768804	2106	88	898 939	2 463	103	898 939	5557954	t	5557954
Ore	ROM Stockpile	Crusher	—	—	—	—	—	—	—	136898	t	136898
Ore	LGO Stockpile - West (#1)	Crusher	449327	1231	51	525 384	1 439	60	525 384	1658172	t	1658172
Ore	LGO Stockpile - East (#2)	Crusher	1409565	3862	161	1 648 161	4 516	188	1 648 161	5885551	t	5885551
Ore	AEX Portal	ROM Stockpile	757623	2076	86	885 865	2 427	101	885 865	8142380	t	8142380
Ore	AEX Portal	LGO Stockpile - West (#1)	757623	2076	86	885 865	2 427	101	885 865	7995801	t	7995801
Ore	LGO Stockpile - West (#1)	Crusher	1205429	3303	138	1 409 472	3 862	161	1 409 472	7995801	t	7995801
Ore	AEX Portal	Crusher	2247557	6158	257	2 628 000	7 200	300	2 628 000	41579765	t	41579765
Ore	Shaft	Crusher	930773	2550	106	1 088 324	2 982	124	1 088 324	9470811	t	9470811
PAG	AEX PAG	PAG Stockpile	—	—	—	—	—	—	—	446574	t	446574
NPAG	AEX NPAG	NPAG Stockpile	—	—	—	—	—	—	—	477655	t	477655
PAG	AEX Portal	PAG Stockpile	398914	1093	46	466 438	1 278	53	466 438	5662438	t	5662438
NPAG	AEX Portal	NPAG Stockpile	460889	1263	53	538 904	1 476	62	538 904	4286438	t	4286438
PAG	PAG Stockpile	AEX Portal	—	—	—	—	—	—	—	0	t	0
NPAG	NPAG Stockpile	AEX Portal	166344	456	19	194 501	533	22	194 501	376519	t	376519
Overburden	North Dam	Overburden #3	—	—	—	—	—	—	—	0	m3	0
Overburden	North Dam	Overburden #5	4410	12	1	5 157	14	1	5 157	29605	m3	15500
Overburden	North Dam	Overburden #6	—	—	—	—	—	—	—	0	m3	0
Overburden	South Dam	Overburden #3	25973	71	3	30 369	83	3	30 369	1051646	m3	550600
Overburden	South Dam	Overburden #5	—	—	—	—	—	—	—	0	m3	0
Overburden	South Dam	Overburden #6	—	—	—	—	—	—	—	0	m3	0
NPAG	South Dam - spillway	South Dam	151206	414	17	176 800	484	20	176 800	198832	m3	73100
Overburden	West Dam	Overburden #3	—	—	—	—	—	—	—	0	m3	0
Overburden	West Dam	Overburden #5	—	—	—	—	—	—	—	0	m3	0
Overburden	West Dam	Overburden #6	9311	26	1	10 887	30	1	10 887	25212	m3	13200
Overburden	TMF Pond Dam	Overburden #3	—	—	—	—	—	—	—	39919	m3	20900
Overburden	TMF Pond Dam	Overburden #3	—	—	—	—	—	—	—	19100	m3	10000
Overburden	Quarry #1	Overburden #6	7514	21	1	8 786	24	1	8 786	46986	m3	24600
Overburden	Quarry #2	Overburden #6	7514	21	1	8 786	24	1	8 786	37436	m3	19600
Overburden	Borrow Source #3	Overburden #5	7514	21	1	8 786	24	1	8 786	24066	m3	12600
Overburden	Borrow Source #3BS3B	Overburden #5	7514	21	1	8 786	24	1	8 786	24066	m3	12600
Overburden	MWP Pond Dam	Overburden #3	6207	17	1	7 258	20	1	7 258	7258	m3	3800
Overburden	MWP Pond Dam	Overburden #3	19765	54	2	23 111	63	3	23 111	23111	m3	12100
Overburden	CWP #1 Dam	Overburden #1	—	—	—	—	—	—	—	47177	m3	24700
NPAG	Borrow Source #3	North Dam	—	—	—	—	—	—	—	54400	m3	20000
NPAG	Quarry #2 - Q1	North Dam	—	—	—	—	—	—	—	70720	m3	26000
NPAG	Quarry #2 - Q1	North Dam	—	—	—	—	—	—	—	59840	m3	22000
NPAG	Quarry #2 - Q1	North Dam	—	—	—	—	—	—	—	58480	m3	21500
Overburden	TMF Facility	North Dam	50475	138	6	59 019	162	7	59 019	123195	m3	64500
NPAG	Borrow Source #3	North Dam	16982	47	2	19 856	54	2	19 856	48416	m3	17800
NPAG	NPAG stockpile	North Dam	16982	47	2	19 856	54	2	19 856	48416	m3	17800
NPAG	NPAG stockpile	North Dam	233322	639	27	272 816	747	31	272 816	597584	m3	219700
NPAG	NPAG stockpile	North Dam	51177	140	6	59 840	164	7	59 840	145792	m3	53600
NPAG	NPAG stockpile	North Dam	7444	20	1	8 704	24	1	8 704	8704	m3	3200
NPAG	NPAG stockpile	North Dam	17679	48	2	20 672	57	2	20 672	43248	m3	15900
NPAG	Borrow Source #3	South Dam	—	—	—	—	—	—	—	79696	m3	29300
NPAG	Quarry #1 - Q1	South Dam	—	—	—	—	—	—	—	103904	m3	38200
NPAG	Quarry #1 - Q1	South Dam	—	—	—	—	—	—	—	875024	m3	321700
NPAG	NPAG stockpile	South Dam	—	—	—	—	—	—	—	707200	m3	260000
NPAG	Quarry #1 - Q1	South Dam	—	—	—	—	—	—	—	66912	m3	24600
Overburden	TMF Facility	South Dam	89516	245	10	104 668	287	12	104 668	203224	m3	106400
NPAG	Borrow Source #3	South Dam	36057	99	4	42 160	116	5	42 160	82960	m3	30500
NPAG	NPAG stockpile	South Dam	36057	99	4	42 160	116	5	42 160	82960	m3	30500
NPAG	NPAG stockpile	South Dam	1479023	4052	169	1 729 376	4 738	197	1 729 376	3000160	m3	1103000
NPAG	NPAG stockpile	South Dam	73044	200	8	85 408	234	10	85 408	194480	m3	71500
NPAG	NPAG stockpile	South Dam	5816	16	1	6 800	19	1	6 800	6800	m3	2500
NPAG	NPAG stockpile	South Dam	30706	84	4	35 904	98	4	35 904	69904	m3	25700
Overburden	TMF Facility	West Dam	49332	135	6	57 682	158	7	57 682	71625	m3	37500
NPAG	Borrow Source #3	West Dam	25123	69	3	29 376	80	3	29 376	47328	m3	17400
NPAG	NPAG stockpile	West Dam	25123	69	3	29 376	80	3	29 376	47328	m3	17400
NPAG	NPAG stockpile	West Dam	147484	404	17	172 448	472	20	172 448	172720	m3	63500

Table C-19: Operations Phase - Material Movement by Year

NPAG	NPAG stockpile	West Dam	41407	113	5	48 416	133	6	48 416	51136	m3	18800
NPAG	NPAG stockpile	West Dam	16749	46	2	19 584	54	2	19 584	23936	m3	8800
NPAG	Borrow Source #3	TMF Pond Dam	—	—	—	—	—	—	—	175440	m3	64500
NPAG	Quarry #1 - Q1	TMF Pond Dam	—	—	—	—	—	—	—	42432	m3	15600
NPAG	Quarry #1 - Q1	TMF Pond Dam	—	—	—	—	—	—	—	482528	m3	177400
NPAG	Quarry #1 - Q1	TMF Pond Dam	—	—	—	—	—	—	—	71808	m3	26400
NPAG	Quarry #1 - Q1	TMF Pond Dam	—	—	—	—	—	—	—	27744	m3	10200
NPAG	Borrow Source #3	MWP Pond Dam	85373	234	10	99 824	273	11	99 824	99824	m3	36700
NPAG	NPAG Stockpile	MWP Pond Dam	27915	76	3	32 640	89	4	32 640	32640	m3	12000
NPAG	NPAG Stockpile	MWP Pond Dam	378479	1037	43	442 544	1 212	51	442 544	442544	m3	162700
NPAG	NPAG Stockpile	MWP Pond Dam	40244	110	5	47 056	129	5	47 056	47056	m3	17300
NPAG	NPAG Stockpile	MWP Pond Dam	10468	29	1	12 240	34	1	12 240	12240	m3	4500
NPAG	NPAG Stockpile	LP Central Pit	161767	443	18	189 149	518	22	189 149	945744	m3	347700
NPAG	NPAG Stockpile	Viggo Pit	—	—	—	—	—	—	—	25840	m3	9500
NPAG	NPAG Stockpile	Road Base	174468	478	20	204 000	559	23	204 000	4488000	m3	1650000
Overburden	Overburden #1	CWP #1 Dam	—	—	—	—	—	—	—	35908	m3	18800
NPAG	NPAG Stockpile	CWP #1 Dam	—	—	—	—	—	—	—	166192	m3	61100
NPAG	NPAG Stockpile	CWP #1 Dam	—	—	—	—	—	—	—	86224	m3	31700
NPAG	NPAG Stockpile	CWP #1 Dam	—	—	—	—	—	—	—	4080	m3	1500
Overburden	Diversion Channel #1	Overburden #1	—	—	—	—	—	—	—	21010	m3	11000
Overburden	Diversion Channel #1	Overburden #1	—	—	—	—	—	—	—	6303	m3	3300
Overburden	Diversion Channel #1	Overburden #1	—	—	—	—	—	—	—	331003	m3	173300
Overburden	Diversion Channel #1	Overburden #1	—	—	—	—	—	—	—	5539	m3	2900
PAG	Diversion Channel #1	PAG Stockpile	—	—	—	—	—	—	—	34816	m3	12800
NPAG	Overburden #1	Diversion Channel #1	—	—	—	—	—	—	—	126480	m3	46500
NPAG	NPAG stockpile	Diversion Channel #1	—	—	—	—	—	—	—	292128	m3	107400
NPAG	NPAG stockpile	Diversion Channel #1	—	—	—	—	—	—	—	65552	m3	24100
PAG	Diversion Channel #2	PAG Stockpile	—	—	—	—	—	—	—	7888	m3	2900
Overburden	Overburden #1	Diversion Channel #2	—	—	—	—	—	—	—	33807	m3	17700
NPAG	NPAG stockpile	Diversion Channel #2	—	—	—	—	—	—	—	101728	m3	37400
NPAG	NPAG stockpile	Diversion Channel #2	—	—	—	—	—	—	—	6256	m3	2300
Overburden	CWP #2 (Sump #1)	Overburden #2	—	—	—	—	—	—	—	1528	m3	800
Overburden	CWP #3 (Sump #2)	Overburden #2	—	—	—	—	—	—	—	27313	m3	14300
Overburden	CWP #2 (Sump #1)	Overburden #2	—	—	—	—	—	—	—	1528	m3	800
Overburden	CWP #3 (Sump #2)	Overburden #2	—	—	—	—	—	—	—	27313	m3	14300
Overburden	CWP #2 (Sump #1)	Overburden #2	—	—	—	—	—	—	—	4202	m3	2200
Overburden	CWP #2 (Sump #1)	Overburden #2	—	—	—	—	—	—	—	2483	m3	1300
Overburden	CWP #3 (Sump #2)	Overburden #2	—	—	—	—	—	—	—	4202	m3	2200
Overburden	CWP #3 (Sump #2)	Overburden #2	—	—	—	—	—	—	—	2483	m3	1300
Overburden	TMF Facility	North Dam	50475	138	6	59 019	162	7	59 019	123195	m3	64500
Overburden	TMF Facility	South Dam	89516	245	10	104 668	287	12	104 668	203224	m3	106400
Overburden	TMF Facility	West Dam	49332	135	6	57 682	158	7	57 682	71625	m3	37500
Overburden	Tailings Pipeline	Overburden #3	—	—	—	—	—	—	—	256030	m3	134047
Overburden	Borrow Source #1	Tailings Pipeline	—	—	—	—	—	—	—	108574	m3	56845
NPAG	NPAG Stockpile	Tailings Pipeline	—	—	—	—	—	—	—	26928	m3	9900
NPAG	NPAG Stockpile	Shaft	58156	159	7	68 000	186	8	68 000	204000	m3	75000
NPAG	Paste Plant	Overburden #2	—	—	—	—	—	—	—	36353	m3	13365
NPAG	NPAG Stockpile	Paste Plant	—	—	—	—	—	—	—	10907	m3	4010
NPAG	NPAG Stockpile	Paste Plant	—	—	—	—	—	—	—	21812	m3	8019
Overburden	Primary Crusher	Overburden #2	—	—	—	—	—	—	—	43482	m3	22765
Overburden	Coarse Ore Storage	Overburden #2	—	—	—	—	—	—	—	91232	m3	47765
Overburden	Process Plant	Overburden #2	—	—	—	—	—	—	—	35546	m3	18610
Overburden	Borrow Source #1	Primary Crusher	—	—	—	—	—	—	—	278157	m3	145632
Overburden	Borrow Source #1	Coarse Ore Storage	—	—	—	—	—	—	—	252	m3	132
Overburden	Borrow Source #1	Process Plant	—	—	—	—	—	—	—	8627	m3	4517
NPAG	NPAG Stockpile	Primary Crusher	—	—	—	—	—	—	—	158447	m3	58253
Overburden	Overburden #2	Dixie Creek Berm	—	—	—	—	—	—	—	51014	m3	26709
NPAG	NPAG Stockpile	Haul Roads	—	—	—	—	—	—	—	3034114	m3	1115483
Overburden	Haul Roads	Overburden #2	—	—	—	—	—	—	—	461147	m3	241438
Overburden	Borrow Source #1	Haul Roads	—	—	—	—	—	—	—	183614	m3	96133
NPAG	NPAG Stockpile	Haul Roads	—	—	—	—	—	—	—	484459	m3	178110
NPAG	NPAG Stockpile	ROM Stockpile	—	—	—	—	—	—	—	237510	m3	87320
Overburden	ROM Stockpile	Overburden #2	—	—	—	—	—	—	—	83200	m3	43560
Overburden	Borrow Source #1	Infrastructure Pad	—	—	—	—	—	—	—	286500	m3	150000
Overburden	PAG Stockpile	Overburden #1	42082	115	5	49 205	135	6	49 205	640177	m3	335171

Material Handling Area	Area ID	Maximum Hourly Loading(tonnes)	Maximum Hourly Unloading(tonnes)
AEX NPAG	ANPAG	0.0	0.0
AEX PAG	APAG	0.0	0.0
AEX Portal	APRTL	527.7	19.0
Borrow Source #1	BS1	0.0	0.0
Borrow Source #3	BS3	19.5	0.0
Borrow Source #3BS3B	BS3B	0.9	0.0
Coarse Ore Storage	COS	0.0	0.0
Crusher	CRUSH	0.0	944.0
CWP #1 Dam	CWP1	0.0	0.0
CWP #2 (Sump #1)	CWP2	0.0	0.0
CWP #3 (Sump #2)	CWP3	0.0	0.0
Diversion Channel #1	DVC1	0.0	0.0
Diversion Channel #2	DVC2	0.0	0.0
Dixie Creek Berm	DCB	0.0	0.0
Haul Roads	ROAD	0.0	0.0
Infrastructure Pad	IFP	0.0	0.0

Table C-19: Operations Phase - Material Movement by Year

LGO Stockpile - East (#2)	LGOE	160.9	87.8
LGO Stockpile - West (#1)	LGOW	188.9	121.7
LP Central	LPC	3556.1	0.0
LP Central Pit	LPC	0.0	18.5
MWP Pond Dam	MWP	3.0	61.9
North Dam	TND	0.5	50.7
NPAG Stockpile	NPAG	365.3	596.3
Overburden #1	OVB1	0.0	261.5
Overburden #2	OVB2	0.0	362.7
Overburden #3	OVB3	0.0	5.9
Overburden #5	OVB5	0.0	2.2
Overburden #6	OVB6	0.0	2.8
PAG Stockpile	PAG	4.8	2084.1
Paste Plant	PSTP	0.0	0.0
Primary Crusher	CRUSH	0.0	0.0
Process Plant	PRCP	0.0	0.0
Quarry #1	Q1	0.9	0.0
Quarry #1 - Q1	Q1	0.0	0.0
Quarry #2	Q2	0.9	0.0
Quarry #2 - Q1	Q2	0.0	0.0
Road Base	ROAD	0.0	19.9
ROM Stockpile	ROM	0.0	86.5
Shaft	SHAFT	106.3	6.6
South Dam	TSD	3.0	227.3
South Dam - spillway	TSDS	17.3	0.0
Tailings Pipeline	TPIPE	0.0	0.0
TMF Facility	TMF	43.2	0.0
TMF Pond Dam	TPD	0.0	0.0
Viggo Pit	VP	0.0	0.0
West Dam	TWD	1.1	40.5
Totals		**5000.0**	**5000.0**

Area ID	Maximum Hourly Loading(tonnes)	Maximum Hourly Unloading(tonnes)
ANPAG	0.0	0.0
APAG	0.0	0.0
APRTL	527.7	19.0
BS1	0.0	0.0
BS3	19.5	0.0
BS3B	0.9	0.0
COS	0.0	0.0
CRUSH	0.0	944.0
CWP1	0.0	0.0
CWP2	0.0	0.0
CWP3	0.0	0.0
DVC1	0.0	0.0
DVC2	0.0	0.0
DCB	0.0	0.0
ROAD	0.0	19.9
IFP	0.0	0.0
LGOE	160.9	87.8
LGOW	188.9	121.7
LPC	3556.1	18.5
MWP	3.0	61.9
TND	0.5	50.7
NPAG	365.3	596.3
OVB1	0.0	261.5
OVB2	0.0	362.7
OVB3	0.0	5.9
OVB5	0.0	2.2
OVB6	0.0	2.8
PAG	4.8	2084.1
PSTP	0.0	0.0
PRCP	0.0	0.0
Q1	0.9	0.0
Q2	0.9	0.0
ROM	0.0	86.5
SHAFT	106.3	6.6
TSD	3.0	227.3
TSDS	17.3	0.0
TPIPE	0.0	0.0
TMF	43.2	0.0
TPD	0.0	0.0
VP	0.0	0.0
TWD	1.1	40.5
Totals	**5000.0**	**5000.0**

Material	Density
Overburden	1.91
PAG	2.72
NPAG	2.72
Ore	2.71

Table C-20: Operations Phase Generator Sets

HydroOne Site Hookup

On-site power generation would be considerably lower with grid power. Not included as Scenario 2 and 3 have greater emissions (as power is generated on-site)

Natural Gas Power Generation & Diesel Power Generation

Natural Gas

Unit Description	Unit Size (kW)	# of Units	Total Power Input (kW)	Use	Make/Model	Source ID	Notes
Natural Gas Generators	5000	10	50000	Prime Power Generators - Bridging Phase	Generic	NG_Gen1-9	11 Units, 1 spinning reserve (generating all the time), 1 redundancy
		Total=	**50000**	**kW**			
		Total=	**50**	**MW**			

US EPA AP-42 Section 3.2: Natural Gas-fired Reciprocating Engines emission factors were used.
Specific make/model not known at this time, AP-42, 4-stroke uncontrolled factors used.
ESDM Procedure Document (Guideline A-10) Section 7.1.1 states that contaminants other than nitrogen oxides are generally emitted in negligible amounts.

Contaminant	Emission Factor	Data Quality	Units	
Nitrogen Oxides (90-105% Load), 4-stroke lean-burn	4.08	A	lb/MMBTU	US EPA AP-42 Chapter 3.2
Nitrogen Oxides	1.00		g/HP-hr	EPA: Table 1 to Subpart JJJJ of Part 60, Title 40
Large Wall-Fired Boilers, Uncontrolled (Post NSPS)	0.19	A	lb/MMBTU	US EPA AP-42 Chapter 1.4
Heat content of natural gas =	1020	BTU/ft^3		US EPA AP-42 Chapter 3.2 and 1.4
	3.20E-01			

Natural Gas Generator	Source ID		Total Power Input (BTU/h)	Total Power Input (MMBTU/h)	Emission Rate (g/s) NOx	Horsepower (HP)
Natural Gas Generator 1	NGG-1		17,060,000	17.06	1.86	6,705
Natural Gas Generator 2	NGG-2		17,060,000	17.06	1.86	6,705
Natural Gas Generator 3	NGG-3		17,060,000	17.06	1.86	6,705
Natural Gas Generator 4	NGG-4		17,060,000	17.06	1.86	6,705
Natural Gas Generator 5	NGG-5		17,060,000	17.06	1.86	6,705
Natural Gas Generator 6	NGG-6		17,060,000	17.06	1.86	6,705
Natural Gas Generator 7	NGG-7		17,060,000	17.06	1.86	6,705
Natural Gas Generator 8	NGG-8		17,060,000	17.06	1.86	6,705
Natural Gas Generator 9	NGG-9		17,060,000	17.06	1.86	6,705
AEX Portal Heating	AEX_NG		45,000,000	45	1.06	-
Discovery FAR	DISC_NG		90,000,000	90	2.11	-
LP #1 FAR	LP1_NG		107,000,000	107	2.51	-
LP #2 FAR (same as LP#1, replaces LP#1 in 2040)	LP2_NG		0	0	0.00	-
				Total =	**22.44**	

Sample Calculation

Natural Gas Generator 1 (NGG-1) - NOx Emissions

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Total\ Power\ Input\ \left(\frac{kW}{h}\right) * \frac{BTU}{kW} * \frac{1\ MMBTU}{1{,}000{,}000\ BTU} * Emission\ Factor\ \left(\frac{lb}{MMBTU}\right) * \frac{g}{lb} * \frac{1\ h}{3600\ s}$$

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Total\ Power\ Input\ \left(\frac{5{,}000\ kW}{h}\right) * \frac{3{,}412\ BTU}{kW} * \frac{1\ MMBTU}{1{,}000{,}000\ BTU} * Emission\ Factor\ \left(\frac{4.08\ lb}{MMBTU}\right) * \frac{453.592\ g}{lb} * \frac{1\ h}{3600\ s}$$

$$Emission\ Rate\ \left(\frac{g}{s}\right) = 8.77\ \ g/s$$

Diesel Power Generation

Unit Description	Unit Size (kW)	# of Units	Total Power Input (kW)	Use	UTM Easting	UTM Northing	Make/Model	Source ID
TMF Dam Raises Generator	100	1	100	Raises	453,824	5,635,915	Generic	DG1
Water Intake Dixie Creek Generator	100	1	100	Dixie Creek bridge area	455,662	5,633,868	Generic	DG2
Explosives Storage Generator	100	1	100	Explosives Storage - power	459,209	5,634,334	Generic	DG3
Explosives Magazine Generator	100	1	100	Explosives Magazine - power	458,277	5,634,505	Generic	DG4
Water Effluent - Booster Pump Generator	150	1	150	Water Effluent - booster Pump	464,942	5,633,802	Generic	DG5
Water Booster Pump PSV Generator	50	1	50	Water PSV station	463,813	5,633,822	Generic	DG6
Quarry Power & Dewatering Generator	200	1	200	Quarry Power + Dewatering	452,142	5,636,658	Generic	DG7
Shaft Construction Generator	150	1	150	Shaft construction misc power	456147	5634308	Generic	DG8
AEX DG1	1000	1	1000	Site Prime Power			Generic	ADG1
AEX DG2	1000	1	1000	Site Prime Power			Generic	ADG2
AEX DG3	1000	1	1000	Site Prime Power			Generic	ADG3
AEX DG4	500	1	500	Site Prime Power			Generic	ADG4
AEX DG5	100	1	100	Misc. Loads			Generic	ADG5
AEX DG6	100	1	100	Misc. Loads			Generic	ADG6
AEX DG7	200	1	200	Misc. Loads			Generic	ADG7
AEX DG8	50	1	50	Misc. Loads			Generic	ADG8
AEX DG9	100	1	100	Contractor Load			Generic	ADG9
AEX DG10	100	1	100	Contractor Load			Generic	ADG10
AEX DG11	100	1	100	Contractor Load			Generic	ADG11
AEX DG12	100	1	100	Contractor Load			Generic	ADG12
AEX DG13	100	1	100	Contractor Load			Generic	ADG13
AEX DG14	100	1	100	Contractor Load			Generic	ADG14
AEX DG15	100	1	100	Contractor Load			Generic	ADG15
AEX DG16	100	1	100	Contractor Load			Generic	ADG16
AEX DG17	100	1	100	Contractor Load			Generic	ADG17
AEX DG18	100	1	100	Contractor Load			Generic	ADG18
		Total=	**5.9**	**MW**				

Notes:

Generic generation data is based on US EPA AP-42 fuel combustion emission factors.

Table C-20: Operations Phase Generator Sets

Below Emission Factors utilized for generic generators as exact models are currently unknown.

Emission Factors for Contaminants (AP-42 Chapter 3.3: Gasoline and Diesel Industrial Engines) < 600 horsepower (447 kW)

Contaminant	Emission Factor (lb/hp-h)	Emission Factor Rating	Emission Factor (g/hp-hr)
Nitrogen Oxides	0.031	D	14.06
Suspended Particulate Matter	2.20E-03	D	1.00
Carbon Monoxide	6.68E-03	D	3.03
Sulphur Dioxide	1.21E-05	B	0.006

Sulphur Dioxide Emission Factor is a component of sulphur content of the burned fuel

SO_2 Emission Factor (lb/hp-hr) = 8.09E-03 * S1
SO_2 Emission Factor (lb/MMBTU) = 1.01 * S1
Where:
S1 = % Sulphur in the Fuel (e.g. 1.5% = 1.5)

15 mg sulphur per kg of fuel, as per Sulphur in Diesel Fuel Regulations (SOR/2002-254)
1 kg = 1,000,000 mg
0.0015 % Sulphur in Diesel Fuel

SO_2 Emission Factor (lb/hp-hr) = 1.21E-05
SO_2 Emission Factor (lb/MMBTU) = 0.0015

			Emission Factor (g/hp-hr)				1-Hour Emission Rate (g/s)				
Diesel Generator Unit	Unit Power (kW)	Unit Brake-Horsepower (bhp)	NOx	SPM	SO_2	CO	NO_X	SPM	SO_2	CO	Emission Factor
TMF Dam Raises Generator	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Water Intake Dixie Creek Generator	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Explosives Storage Generator	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Explosives Magazine Generator	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Water Effluent - Booster Pump Generator	150	201	14.06	1.00	0.01	3.03	0.79	0.06	3.1E-04	0.17	Diesel Engine
Water Booster Pump PSV Generator	50	67	14.06	1.00	0.01	3.03	0.26	0.02	1.0E-04	0.06	Diesel Engine
Quarry Power & Dewatering Generator	200	268	14.06	1.00	0.01	3.03	1.05	0.07	4.1E-04	0.23	Diesel Engine
Shaft Construction Generator	150	201	14.06	1.00	0.01	3.03	0.79	0.06	3.1E-04	0.17	Diesel Engine
AEX DG1	1000	1341	14.06	1.00	0.01	3.03	5.24	0.37	2.1E-03	1.13	Diesel Engine
AEX DG2	1000	1341	14.06	1.00	0.01	3.03	5.24	0.37	2.1E-03	1.13	Diesel Engine
AEX DG3	1000	1341	14.06	1.00	0.01	3.03	5.24	0.37	2.1E-03	1.13	Diesel Engine
AEX DG4	500	671	14.06	1.00	0.01	3.03	2.62	0.19	1.0E-03	0.56	Diesel Engine
AEX DG5	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG6	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG7	200	268	14.06	1.00	0.01	3.03	1.05	0.07	4.1E-04	0.23	Diesel Engine
AEX DG8	50	67	14.06	1.00	0.01	3.03	0.26	0.02	1.0E-04	0.06	Diesel Engine
AEX DG9	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG10	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG11	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG12	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG13	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG14	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG15	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG16	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG17	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
AEX DG18	100	134	14.06	1.00	0.01	3.03	0.52	0.04	2.1E-04	0.11	Diesel Engine
Total	**950**	**1274**	-	-	-	-	**4.98**	**0.35**	**0.00**	**1.07**	-

Sample Calculation

Diesel Generator 1 (DG-1) - NOx Emissions

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Emission\ Factor\ \left(\frac{g}{hp*h}\right)*\frac{kW}{h}*\frac{hp}{kW}*\frac{1\ h}{3600\ s}$$

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Emission\ Factor\ \left(\frac{14.06\ g}{hp*h}\right)*\frac{1000\ kW}{h}*\frac{1.34102\ hp}{kW}*\frac{1\ h}{3600\ s}$$

$$Emission\ Rate\ \left(\frac{g}{s}\right) = Emission\ Factor\ \left(\frac{14.06\ g}{hp*h}\right)*\frac{1000\ kW}{h}*\frac{1.34102\ hp}{kW}*\frac{1\ h}{3600\ s}$$

		U.S. EPA AP42 Table 3.3-2					
		BaP	Benzene	1,3-Butadiene	Formaldehyde	Acetaldehyde	Acrolein
Emission Factor (g/hp-h)		5.97E-07	4.23E-01	1.77E-02	5.35E-01	3.48E-01	4.20E-02
Diesel Generator Unit	Unit Brake-Horsepower (bhp)						
TMF Dam Raises Generator	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
Water Intake Dixie Creek Generator	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
Explosives Storage Generator	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
Explosives Magazine Generator	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
Water Effluent - Booster Pump Generator	201	3.34E-08	2.36E-02	9.91E-04	2.99E-02	1.94E-02	2.34E-03
Water Booster Pump PSV Generator	67	1.11E-08	7.88E-03	3.30E-04	9.97E-03	6.48E-03	7.81E-04
Quarry Power & Dewatering Generator	268	4.45E-08	3.15E-02	1.32E-03	3.99E-02	2.59E-02	3.13E-03
Shaft Construction Generator	201	3.34E-08	2.36E-02	9.91E-04	2.99E-02	1.94E-02	2.34E-03
AEX DG1	1341	2.22E-07	1.58E-01	6.61E-03	1.99E-01	1.30E-01	1.56E-02
AEX DG2	1341	2.22E-07	1.58E-01	6.61E-03	1.99E-01	1.30E-01	1.56E-02
AEX DG3	1341	2.22E-07	1.58E-01	6.61E-03	1.99E-01	1.30E-01	1.56E-02
AEX DG4	671	1.11E-07	7.88E-02	3.30E-03	9.97E-02	6.48E-02	7.81E-03
AEX DG5	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG6	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG7	268	4.45E-08	3.15E-02	1.32E-03	3.99E-02	2.59E-02	3.13E-03
AEX DG8	67	1.11E-08	7.88E-03	3.30E-04	9.97E-03	6.48E-03	7.81E-04
AEX DG9	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG10	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG11	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG12	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG13	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG14	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG15	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG16	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG17	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03
AEX DG18	134	2.22E-08	1.58E-02	6.61E-04	1.99E-02	1.30E-02	1.56E-03

Table C-21: Operations Phase - Drilling and Blasting

Drilling

Particulate Matter

	Emission Factor					
	SPM	**PM_{10}**	**$PM_{2.5}$**	**Units**	**Notes**	**Emission Factor Rating**
Uncontrolled emission Factor	0.59	0.3068	0.3068	kg/hole	AP-42, Table 11.9-4	C-rating
Control Level (%)	70	70	70	%	PM_{10}/$PM_{2.5}$: NPRI based on Mojave Desert report	

				Emission Rate (g/s)		
Source ID	**Location**	**Holes per Shift**	**# of Shifts**	**SPM**	**PM_{10}**	**$PM_{2.5}$**
	Quarry Source 1+2	69	2	0.283	0.147	0.147
	Main Pit	98	2	0.402	0.209	0.209
	Viggo Pit	31	2	0.127	0.066	0.066

Sample Calculation
Step 1: Determine the total drilled holes per day
Drilled Holes = Holes per Shift x Shifts per Day
= 98 x 2 = 196 holes/day
Step 2: Calculate the emission rate based no the emission factor and total number of holes (TPM as example)
Emission Rate (g/s) = Emission Factor (kg/hole) x Control Level (%) x Drilled Holes per Day
= 0.59 (kg/day) x (100% - 70%) x 196 (holes/day) x 1000 (g/kg) / 24 (h/day) / 3600 (s/h) = 0.402 g/s

Blasting

Particulate Matter

References: US EPA AP-42 Section 11.9 Western Surface Coal Mining Table 11.9-2

US EPA Emission Factor Rating: C   Data Quality: Average

Emission Factor (kg/blast) = 0.00022 $A^{1.5}$ Area being dimensions of blast face.

PM_{10} Scaling Factor 0.52 ECCC NPRI / US EPA Table 11.9-2

$PM_{2.5}$ Scaling Factor 0.03 ECCC NPRI / US EPA Table 11.9-2

					Emission Rate (g/s)					
					24-hour			1-hour		
Source ID	Location	Blast Area	Emission (kg/blast)	Blasts Per Day	**TSP**	**PM_{10}**	**$PM_{2.5}$**	**TSP**	**PM_{10}**	**$PM_{2.5}$**
	Quarry Source 1+2	325	1.3	0.86	1.28E-02	6.66E-03	3.84E-04	3.07E-01	1.60E-01	9.22E-03
	Main Pit	4,428	64.8	1.00	7.50E-01	3.90E-01	2.25E-02	1.80E+01	9.36E+00	5.40E-01
	Viggo Pit	4,428	64.8	1.00	7.50E-01	3.90E-01	2.25E-02	1.80E+01	9.36E+00	5.40E-01

Other Contaminants

Client has specified that emulsion explosives are the preferred alternative.

				NO_x	CO	SO_2	NH_3
			Emission Factor	3.08	17.12	0.22	1.14
Source ID	Location	Emulsion Per Blast	Emission Per Blast				
	Quarry Source 1+2	3,094		9533	52969	681	3527
	Main Pit	42,120		129773	721094	9266	48017
	Viggo Pit	42,120		129773	721094	9266	48017

Table C-21: Operations Phase - Drilling and Blasting

			Emission Rate (g/s)							
			1-hour				**24-hour**			
Source ID	Location	Blasts Per Day	NO_x	CO	SO_2	NH_3	NO_x	CO	SO_2	NH_3
	Quarry Source 1+2	0.86	2.3	12.6	0.2	0.8	9.46E-02	5.25E-01	6.75E-03	3.50E-02
	Main Pit	1.00	36.0	200.3	2.6	13.3	1.50E+00	8.35E+00	1.07E-01	5.56E-01
	Viggo Pit	1.00	36.0	200.3	2.6	13.3	1.50E+00	8.35E+00	1.07E-01	5.56E-01

Manufacturer's Emission Factors - Dyno Nobel

Det within	NO_x l/kg	NO_x g/kg	NO_x lb/ton	NO_2 l/kg	NO_2 g/kg	NO_2 lb/ton
Steel pipe	1.50	3.08	6.16	0.50	1.03	2.05
sheet metal	2.50	5.14	10.27	0.90	1.85	3.70
sheet metal	3.00	6.16	12.32	1.30	2.67	5.34
AVERAGE			9.59			3.70

Det within	CO l/kg	CO g/kg	CO lb/ton
Steel pipe	13.00	16.26	32.51
sheet metal	14.00	17.51	35.01
sheet metal	21.00	26.26	52.52
AVERAGE			40.01

Emission Factors from Blasting - Orica

Species	**g/kg**
NO_x	3.08
CO	17.1
NH_3	1.1
SO_2	0.22

Table C-22: Operations Phase - Material Handling

Crushing and Screening						
Reference:	ESDM Procedure Document Table C-1 (March 2009)					
	Emission Factor kg/Mg (kg/tonne)					
	SCC	TSP	EPA Rating	PM_{10}	EPA Rating	$PM_{2.5}$
Primary Crusher	3-03-024-01	0.01	C	0.004	C	–
Secondary Crusher	3-03-024-01	0.03	C	0.012	C	–
Crushing Capacity	625	tonnes/hour				
CFM to m3/s conversion factor	4.72E-04					

	Flowrate (m^3/s)	Concentration (mg/m^3)	TSP	PM_{10}	$PM_{2.5}$	Unit
Primary Crusher Baghouse	2.8	20	0.06	0.06	0.06	g/s
Pebble Crusher Baghouse	0.9	20	0.02	0.02	0.02	g/s
Apron Feeder Baghouse 1	0.6	20	0.01	0.01	0.01	g/s
Apron Feeder Baghouse 2	0.6	20	0.01	0.01	0.01	g/s
Apron Feeder Baghouse 3	0.6	20	0.01	0.01	0.01	g/s
Transfer Point Baghouse	4.2	20	0.08	0.08	0.08	g/s

Material Loading and Unloading, and Drops at Stockpiles

Reference: AP 42 - Section 11.24 (based on high moisture > 4%)		Quantity	Unit	Area ID	Source ID	Description
Activity Data:	Loading	0.0	tonnes/hour	ANPAG	MH_ANPAG	Loading at AEX NPAG
		0.0	tonnes/hour	APAG	MH_APAG	Loading at AEX PAG
		527.7	tonnes/hour	APRTL	MH_APRTL	Loading at AEX Portal
		0.0	tonnes/hour	BS1	MH_BS1	Loading at Borrow Source #1
		19.5	tonnes/hour	BS3	MH_BS3	Loading at Borrow Source #3
		0.9	tonnes/hour	BS3B	MH_BS3B	Loading at Borrow Source #3BS3B
		0.0	tonnes/hour	COS	MH_COS	Loading at Coarse Ore Storage
		0.0	tonnes/hour	CRUSH	MH_CRUSH	Loading at Crusher
		0.0	tonnes/hour	CWP1	MH_CWP1	Loading at CWP #1 Dam
		0.0	tonnes/hour	CWP2	MH_CWP2	Loading at CWP #2 (Sump #1)
		0.0	tonnes/hour	CWP3	MH_CWP3	Loading at CWP #3 (Sump #2)
		0.0	tonnes/hour	DVC1	MH_DVC1	Loading at Diversion Channel #1
		0.0	tonnes/hour	DVC2	MH_DVC2	Loading at Diversion Channel #2
		0.0	tonnes/hour	DCB	MH_DCB	Loading at Dixie Creek Berm
		0.0	tonnes/hour	ROAD	MH_ROAD	Loading at Haul Roads
		0.0	tonnes/hour	IFP	MH_IFP	Loading at Infrastructure Pad
		160.9	tonnes/hour	LGOE	MH_LGOE	Loading at LGO Stockpile - East (#2)
		188.9	tonnes/hour	LGOW	MH_LGOW	Loading at LGO Stockpile - West (#1)
		3556.1	tonnes/hour	LPC	MH_LPC	Loading at LP Central
		3.0	tonnes/hour	MWP	MH_MWP	Loading at MWP Pond Dam
		0.5	tonnes/hour	TND	MH_TND	Loading at North Dam
		365.3	tonnes/hour	NPAG	MH_NPAG	Loading at NPAG Stockpile
		0.0	tonnes/hour	OVB1	MH_OVB1	Loading at Overburden #1
		0.0	tonnes/hour	OVB2	MH_OVB2	Loading at Overburden #2
		0.0	tonnes/hour	OVB3	MH_OVB3	Loading at Overburden #3
		0.0	tonnes/hour	OVB5	MH_OVB5	Loading at Overburden #5
		0.0	tonnes/hour	OVB6	MH_OVB6	Loading at Overburden #6
		4.8	tonnes/hour	PAG	MH_PAG	Loading at PAG Stockpile
		0.0	tonnes/hour	PSTP	MH_PSTP	Loading at Paste Plant
		0.0	tonnes/hour	PRCP	MH_PRCP	Loading at Process Plant
		0.9	tonnes/hour	Q1	MH_Q1	Loading at Quarry #1
		0.9	tonnes/hour	Q2	MH_Q2	Loading at Quarry #2
		0.0	tonnes/hour	ROM	MH_ROM	Loading at ROM Stockpile
		106.3	tonnes/hour	SHAFT	MH_SHAFT	Loading at Shaft
		3.0	tonnes/hour	TSD	MH_TSD	Loading at South Dam
		17.3	tonnes/hour	TSDS	MH_TSDS	Loading at South Dam - spillway
		0.0	tonnes/hour	TPIPE	MH_TPIPE	Loading at Tailings Pipeline
		43.2	tonnes/hour	TMF	MH_TMF	Loading at TMF Facility
		0.0	tonnes/hour	TPD	MH_TPD	Loading at TMF Pond Dam
		0.0	tonnes/hour	VP	MH_VP	Loading at Viggo Pit
		1.1	tonnes/hour	TWD	MH_TWD	Loading at West Dam
	Unloading	0.0	tonnes/hour	ANPAG	MH_ANPAG	Unloading at AEX NPAG
		0.0	tonnes/hour	APAG	MH_APAG	Unloading at AEX PAG
		19.0	tonnes/hour	APRTL	MH_APRTL	Unloading at AEX Portal
		0.0	tonnes/hour	BS1	MH_BS1	Unloading at Borrow Source #1
		0.0	tonnes/hour	BS3	MH_BS3	Unloading at Borrow Source #3
		0.0	tonnes/hour	BS3B	MH_BS3B	Unloading at Borrow Source #3BS3B
		0.0	tonnes/hour	COS	MH_COS	Unloading at Coarse Ore Storage
		944.0	tonnes/hour	CRUSH	MH_CRUSH	Unloading at Crusher
		0.0	tonnes/hour	CWP1	MH_CWP1	Unloading at CWP #1 Dam
		0.0	tonnes/hour	CWP2	MH_CWP2	Unloading at CWP #2 (Sump #1)
		0.0	tonnes/hour	CWP3	MH_CWP3	Unloading at CWP #3 (Sump #2)
		0.0	tonnes/hour	DVC1	MH_DVC1	Unloading at Diversion Channel #1
		0.0	tonnes/hour	DVC2	MH_DVC2	Unloading at Diversion Channel #2
		0.0	tonnes/hour	DCB	MH_DCB	Unloading at Dixie Creek Berm
		19.9	tonnes/hour	ROAD	MH_ROAD	Unloading at Haul Roads
		0.0	tonnes/hour	IFP	MH_IFP	Unloading at Infrastructure Pad
		87.8	tonnes/hour	LGOE	MH_LGOE	Unloading at LGO Stockpile - East (#2)
		121.7	tonnes/hour	LGOW	MH_LGOW	Unloading at LGO Stockpile - West (#1)
		18.5	tonnes/hour	LPC	MH_LPC	Unloading at LP Central
		61.9	tonnes/hour	MWP	MH_MWP	Unloading at MWP Pond Dam
		50.7	tonnes/hour	TND	MH_TND	Unloading at North Dam
		596.3	tonnes/hour	NPAG	MH_NPAG	Unloading at NPAG Stockpile
		261.5	tonnes/hour	OVB1	MH_OVB1	Unloading at Overburden #1
		362.7	tonnes/hour	OVB2	MH_OVB2	Unloading at Overburden #2
		5.9	tonnes/hour	OVB3	MH_OVB3	Unloading at Overburden #3
		2.2	tonnes/hour	OVB5	MH_OVB5	Unloading at Overburden #5
		2.8	tonnes/hour	OVB6	MH_OVB6	Unloading at Overburden #6
		2084.1	tonnes/hour	PAG	MH_PAG	Unloading at PAG Stockpile
		0.0	tonnes/hour	PSTP	MH_PSTP	Unloading at Paste Plant
		0.0	tonnes/hour	PRCP	MH_PRCP	Unloading at Process Plant
		0.0	tonnes/hour	Q1	MH_Q1	Unloading at Quarry #1
		0.0	tonnes/hour	Q2	MH_Q2	Unloading at Quarry #2
		86.5	tonnes/hour	ROM	MH_ROM	Unloading at ROM Stockpile
		6.6	tonnes/hour	SHAFT	MH_SHAFT	Unloading at Shaft
		227.3	tonnes/hour	TSD	MH_TSD	Unloading at South Dam

Table C-22: Operations Phase - Material Handling

		0.0	tonnes/hour	TSDS	MH_TSDS	Unloading at South Dam - spillway
		0.0	tonnes/hour	TPIPE	MH_TPIPE	Unloading at Tailings Pipeline
		0.0	tonnes/hour	TMF	MH_TMF	Unloading at TMF Facility
		0.0	tonnes/hour	TPD	MH_TPD	Unloading at TMF Pond Dam
		0.0	tonnes/hour	VP	MH_VP	Unloading at Viggo Pit
		40.5	tonnes/hour	TWD	MH_TWD	Unloading at West Dam

Emission Factors:	SCC	Uncontrolled kg/Mg (kg/tonne)	Size Fraction	EPA Rating	Control Efficiency (water spray or enclosed drop)	Controlled kg/Mg
Material Transfer:	3-03-024-08	0.005	TSP	C	80%	0.001
		0.002	PM_{10}	C	80%	0.0004
		0.00057	$PM_{2.5}$	NA	80%	0.00011

The material transfer is used for all conveyor drops, stock pile drops, ore dumps and other locations where material is allowed to fall freely, as per AP42 - Section 11.24

Source ID	Description	Total Material Handling (tonnes/hour)	Speciated Emission Rate (g/s) *TSP*	*PM 10*	*PM 2.5*
MH_ANPAG	Material Handling at AEX NPAG	0.0	0.00E+00	0.00E+00	0.00E+00
MH_APAG	Material Handling at AEX PAG	0.0	0.00E+00	0.00E+00	0.00E+00
MH_APRTL	Material Handling at AEX Portal	546.7	1.52E-01	6.07E-02	1.72E-02
MH_BS1	Material Handling at Borrow Source #1	0.0	0.00E+00	0.00E+00	0.00E+00
MH_BS3	Material Handling at Borrow Source #3	19.5	5.42E-03	2.17E-03	6.13E-04
MH_BS3B	Material Handling at Borrow Source #3BS3B	0.9	2.38E-04	9.53E-05	2.69E-05
MH_COS	Material Handling at Coarse Ore Storage	0.0	0.00E+00	0.00E+00	0.00E+00
MH_CRUSH	Material Handling at Crusher	944.0	2.62E-01	1.05E-01	2.96E-02
MH_CWP1	Material Handling at CWP #1 Dam	0.0	0.00E+00	0.00E+00	0.00E+00
MH_CWP2	Material Handling at CWP #2 (Sump #1)	0.0	0.00E+00	0.00E+00	0.00E+00
MH_CWP3	Material Handling at CWP #3 (Sump #2)	0.0	0.00E+00	0.00E+00	0.00E+00
MH_DVC1	Material Handling at Diversion Channel #1	0.0	0.00E+00	0.00E+00	0.00E+00
MH_DVC2	Material Handling at Diversion Channel #2	0.0	0.00E+00	0.00E+00	0.00E+00
MH_DCB	Material Handling at Dixie Creek Berm	0.0	0.00E+00	0.00E+00	0.00E+00
MH_ROAD	Material Handling at Haul Roads	19.9	5.53E-03	2.21E-03	6.25E-04
MH_IFP	Material Handling at Infrastructure Pad	0.0	0.00E+00	0.00E+00	0.00E+00
MH_LGOE	Material Handling at LGO Stockpile - East (#2)	248.7	6.91E-02	2.76E-02	7.81E-03
MH_LGOW	Material Handling at LGO Stockpile - West (#1)	310.6	8.63E-02	3.45E-02	9.75E-03
MH_LPC	Material Handling at LP Central	3574.5	9.93E-01	3.97E-01	1.12E-01
MH_MWP	Material Handling at MWP Pond Dam	64.9	1.80E-02	7.21E-03	2.04E-03
MH_TND	Material Handling at North Dam	51.2	1.42E-02	5.69E-03	1.61E-03
MH_NPAG	Material Handling at NPAG Stockpile	961.6	2.67E-01	1.07E-01	3.02E-02
MH_OVB1	Material Handling at Overburden #1	261.5	7.26E-02	2.91E-02	8.21E-03
MH_OVB2	Material Handling at Overburden #2	362.7	1.01E-01	4.03E-02	1.14E-02
MH_OVB3	Material Handling at Overburden #3	5.9	1.65E-03	6.59E-04	1.86E-04
MH_OVB5	Material Handling at Overburden #5	2.2	6.16E-04	2.47E-04	6.97E-05
MH_OVB6	Material Handling at Overburden #6	2.8	7.72E-04	3.09E-04	8.72E-05
MH_PAG	Material Handling at PAG Stockpile	2088.9	5.80E-01	2.32E-01	6.56E-02
MH_PSTP	Material Handling at Paste Plant	0.0	0.00E+00	0.00E+00	0.00E+00
MH_PRCP	Material Handling at Process Plant	0.0	0.00E+00	0.00E+00	0.00E+00
MH_Q1	Material Handling at Quarry #1	0.9	2.38E-04	9.53E-05	2.69E-05
MH_Q2	Material Handling at Quarry #2	0.9	2.38E-04	9.53E-05	2.69E-05
MH_ROM	Material Handling at ROM Stockpile	86.5	2.40E-02	9.61E-03	2.72E-03
MH_SHAFT	Material Handling at Shaft	112.9	3.14E-02	1.25E-02	3.54E-03
MH_TSD	Material Handling at South Dam	230.2	6.40E-02	2.56E-02	7.23E-03
MH_TSDS	Material Handling at South Dam - spillway	17.3	4.79E-03	1.92E-03	5.42E-04
MH_TPIPE	Material Handling at Tailings Pipeline	0.0	0.00E+00	0.00E+00	0.00E+00
MH_TMF	Material Handling at TMF Facility	43.2	1.20E-02	4.80E-03	1.36E-03
MH_TPD	Material Handling at TMF Pond Dam	0.0	0.00E+00	0.00E+00	0.00E+00
MH_VP	Material Handling at Viggo Pit	0.0	0.00E+00	0.00E+00	0.00E+00
MH_TWD	Material Handling at West Dam	41.5	1.15E-02	4.62E-03	1.30E-03

Table C-23: Operations Phase - HCN Emissions

HCN Emissions from Leaching Process
Based on Australian NPI (version 2) Dec. 2006
HCN emission from page 28
E (kg of CN) = (0.013 * aqueous concentration of NaCN in tank +0.46) * area of tank * time * 0.96/1000 (equation 1)
aqueous concentration of HCN = concentration as mg/L of NaCN in tank * 10 ^ (9.2 - pH)   (equation 2)

The leach process will be operated at a pH of 10.5 to 11, and the target NaCN concentration is 1000 ppm.
The HCN emissions for the scenario with 1000 ppm NaCN in solution was used to ensure estimates are conservative.

	Concentrate Leach			Source of Data
pH = pH in the leach/adsorption tank	> 10.5	> 10.5	> 10.5	Process Design
[NaCN] = Concentration (as mg/l) of NaCN in the leach/adsorption tank	1000	500	250	Estimated
[HCN(aq)] = [NaCN] x $10^{(9.2 - pH)}$	50.12	25.06	12.53	calculated from equation (2)
A = Surface area (m2) of the leach/adsorption tank	269	269	269	Process Design
T = Period of emissions (hours)	24	24	24	Process Design
E = Emission of CN (kg) per tank per day	6.88	4.87	3.86	calculated from equation (1)
E = emission of CN g/s per tank	0.0797	0.056	0.045	= kg*1000/24/60/60
Total Emissions for Leach circuit overall (g/s)	0.48	0.338	0.27	Total = E (g/s per tank) x number of tanks

6.2.1 Cyanide emissions from the ore processing area

Based on research performed by CSIRO on investigating HCN emissions from process tanks, it was estimated that approximately **1%** of the total cyanide added to the circuit is lost through HCN volatilisation across all tanks (Heath *et al.*, 1998). A figure of 1% of total cyanide added to the leach circuit may therefore be used as a default value for loss of cyanide as HCN from the leach/adsorption train.

Alternatively, a site specific figure for emissions may be calculated using the equation below. The equation estimates the HCN emissions from an individual process tank and is derived from the work reported by Heath et al.

$$\mathbf{E = ([0.013 \times [HCN_{(aq)}] + 0.46\} \times A \times T \times 0.96/10^3)}$$

Where:

E	=	Emission of CN (kg)
$[HCN_{(aq)}]$	=	[NaCN] x $10^{(9.2 - pH)}$
[NaCN]	=	Concentration (as mg/l) of NaCN in the leach/adsorption tank
pH	=	pH in the leach/adsorption tank
A	=	Surface area (m^2) of the leach/adsorption tank
T	=	Period of emissions (hours)

Table C-24: Operations Phase - Road Dust Emissions (Haul Roads)

Table 1: Particulate Emission Coefficients for Truck Traffic on Unpaved Industrial Roads from AP42 (Chapter 13.2 - Unpaved Roads; Nov 2006)

Constant	Expressed Units	PM_{30} (TPM)[3]	PM_{10}	$PM_{2.5}$	US EPA Data Quality
k	lb/VMT [(1)]	4.9	1.5	0.15	B
a	-	0.7	0.9	0.9	B
b	-	0.45	0.45	0.45	B
Conversion	lb/VMT to g/VKT	281.9	281.9	281.9	–

Notes:
1. "lb/VMT" means pounds pre vehicle mile travelled.
2. "g/VKT" means grams per vehicle kilometre
3. TPM means total particulate matter

Road Emission Assumptions (needed for AP42)					
Mean Silt Content	5.8	%	based on AP42 Chapter 13.2.2 for taconite mining		
Assumed average speed of trucks	50	km/hour	31.1	miles/hour	(not used in calculations)
Assumed Control Efficiency	90	%	based on watering, vehicle speed, lack of silt, dust suppressant		

Table 2: Trip Details

Vehicle Travel Pathway		Tonnes per hour	Load per Truck (tonnes)	Round Trips per hour	Vehicle Weight Empty (tonnes)	Vehicle Weight Loaded (tonnes)	Mean Vehicle Weight (tons)	TPM Emission Factor lb/VKT	PM_{10} Emission Factor lb/VKT	$PM_{2.5}$ Emission Factor lb/VKT	TPM Emission Factor kg/VKT	PM_{10} Emission Factor kg/VKT	$PM_{2.5}$ Emission Factor kg/VKT
Viggo Pit	Overburden #1	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	PAG Stockpile	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	PAG Stockpile	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	NPAG stockpile	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	Overburden #1	2.57E+02	120	2.14E+00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	Overburden #2	3.63E+02	120	3.02E+00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	PAG Stockpile	1.94E+03	120	1.62E+01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	NPAG stockpile	5.44E+02	120	4.53E+00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	PAG Stockpile	9.92E+01	120	8.27E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	Crusher	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	LGO Stockpile - West (#1)	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	LGO Stockpile - West (#1)	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	LGO Stockpile - East (#2)	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Viggo Pit	ROM Stockpile	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	Crusher	2.31E+02	120	1.93E+00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	LGO Stockpile - West (#1)	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	LGO Stockpile - West (#1)	3.52E+01	120	2.94E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LP Central	LGO Stockpile - East (#2)	8.78E+01	120	7.31E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
ROM Stockpile	Crusher	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LGO Stockpile - West (#1)	Crusher	5.13E+01	120	4.27E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LGO Stockpile - East (#2)	Crusher	1.61E+02	120	1.34E+00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	ROM Stockpile	8.65E+01	120	7.21E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	LGO Stockpile - West (#1)	8.65E+01	120	7.21E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
LGO Stockpile - West (#1)	Crusher	1.38E+02	120	1.15E+00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	Crusher	2.57E+02	120	2.14E+00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Shaft	Crusher	1.06E+02	120	8.85E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX PAG	PAG Stockpile	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX NPAG	NPAG Stockpile	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	PAG Stockpile	4.55E+01	120	3.79E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
AEX Portal	NPAG Stockpile	5.26E+01	120	4.38E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
PAG Stockpile	AEX Portal	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	AEX Portal	1.90E+01	120	1.58E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
North Dam	Overburden #3	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
North Dam	Overburden #5	5.03E-01	120	4.20E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
North Dam	Overburden #6	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
South Dam	Overburden #3	2.96E+00	120	2.47E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
South Dam	Overburden #5	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
South Dam	Overburden #6	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
South Dam - spillway	South Dam	1.73E+01	120	1.44E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
West Dam	Overburden #3	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
West Dam	Overburden #5	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
West Dam	Overburden #6	1.06E+00	120	8.86E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Pond Dam	Overburden #3	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Pond Dam	Overburden #3	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1	Overburden #6	8.58E-01	120	7.15E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #2	Overburden #6	8.58E-01	120	7.15E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	Overburden #5	8.58E-01	120	7.15E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3BS3B	Overburden #5	8.58E-01	120	7.15E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
MWP Pond Dam	Overburden #3	7.09E-01	120	5.90E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
MWP Pond Dam	Overburden #3	2.26E+00	120	1.88E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #1 Dam	Overburden #1	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #2 - Q1	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #2 - Q1	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #2 - Q1	North Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	North Dam	5.76E+00	120	4.80E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	North Dam	1.94E+00	120	1.62E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	1.94E+00	120	1.62E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	2.66E+01	120	2.22E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	5.84E+00	120	4.87E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	8.50E-01	120	7.08E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	North Dam	2.02E+00	120	1.68E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	South Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	South Dam	1.02E+01	120	8.52E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	South Dam	4.12E+00	120	3.43E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	4.12E+00	120	3.43E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	1.69E+02	120	1.41E+00	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	8.34E+00	120	6.95E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	6.64E-01	120	5.53E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	South Dam	3.51E+00	120	2.92E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	West Dam	5.63E+00	120	4.69E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	West Dam	2.87E+00	120	2.39E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	West Dam	2.87E+00	120	2.39E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	West Dam	1.68E+01	120	1.40E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	West Dam	4.73E+00	120	3.94E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	West Dam	1.91E+00	120	1.59E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	TMF Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	TMF Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	TMF Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	TMF Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Quarry #1 - Q1	TMF Pond Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #3	MWP Pond Dam	9.75E+00	120	8.12E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	MWP Pond Dam	3.19E+00	120	2.66E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	MWP Pond Dam	4.32E+01	120	3.60E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	MWP Pond Dam	4.59E+00	120	3.83E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	MWP Pond Dam	1.19E+00	120	9.96E-03	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	LP Central Pit	1.85E+01	120	1.54E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Viggo Pit	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Road Base	1.99E+01	120	1.66E-01	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Overburden #1	CWP #1 Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	CWP #1 Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	CWP #1 Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	CWP #1 Dam	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	Overburden #1	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	Overburden #1	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	Overburden #1	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	Overburden #1	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #1	PAG Stockpile	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Overburden #1	Diversion Channel #1	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	Diversion Channel #1	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	Diversion Channel #1	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Diversion Channel #2	PAG Stockpile	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Overburden #1	Diversion Channel #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	Diversion Channel #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG stockpile	Diversion Channel #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #2 (Sump #1)	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #3 (Sump #2)	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #2 (Sump #1)	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #3 (Sump #2)	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16

Table C-24: Operations Phase - Road Dust Emissions (Haul Roads)

CWP #2 (Sump #1)	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #2 (Sump #1)	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #3 (Sump #2)	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
CWP #3 (Sump #2)	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	North Dam	5.76E+00	120	4.80E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	South Dam	1.02E+01	120	8.52E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
TMF Facility	West Dam	5.63E+00	120	4.69E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Tailings Pipeline	Overburden #3	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Tailings Pipeline	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Tailings Pipeline	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Shaft	6.64E+00	120	5.53E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Paste Plant	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Paste Plant	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Paste Plant	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Primary Crusher	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Coarse Ore Storage	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Process Plant	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Primary Crusher	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Coarse Ore Storage	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Process Plant	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Primary Crusher	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Overburden #2	Dixie Creek Berm	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Haul Roads	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Haul Roads	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Haul Roads	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	Haul Roads	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
NPAG Stockpile	ROM Stockpile	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
ROM Stockpile	Overburden #2	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
Borrow Source #1	Infrastructure Pad	—	120	—	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16
PAG Stockpile	Overburden #1	4.80E+00	120	4.00E-02	178	298	262.1	22.0	5.8	0.6	6.21	1.64	0.16

Table 3: Overall Pathway Emissions

Road Source ID Segment		Road Dimensions		Total VKT per hour per segment	Uncontrolled kg/hour			Uncontrolled (g/s)			Controlled (g/s)		
		Distance (km)	Length (Round Trip) (m)		TPM Emission Rate	PM_{10} Emission Rate	$PM_{2.5}$ Emission Rate	TPM Emission per segment	PM_{10} Emission Rate	$PM_{2.5}$ Emission Rate	TPM Emission per segment	PM_{10} Emission Rate	$PM_{2.5}$ Emission Rate
Viggo Pit	Overburden #1	3.55	7100	—	—	—	—	—	—	—	—	—	—
Viggo Pit	PAG Stockpile	4.5	9000	—	—	—	—	—	—	—	—	—	—
Viggo Pit	PAG Stockpile	4.5	9000	—	—	—	—	—	—	—	—	—	—
Viggo Pit	NPAG stockpile	4.7	9400	—	—	—	—	—	—	—	—	—	—
LP Central	Overburden #1	2.3	4600	9.84E+00	61.1	16.2	1.6	16.97	4.49	0.45	1.697	0.449	0.045
LP Central	Overburden #2	2.65	5300	1.60E+01	99.4	26.3	2.6	27.62	7.31	0.73	2.762	0.731	0.073
LP Central	PAG Stockpile	3.25	6500	1.05E+02	652.0	172.6	17.3	181.12	47.94	4.79	18.112	4.794	0.479
LP Central	NPAG stockpile	3	6000	2.72E+01	168.7	44.7	4.5	46.87	12.41	1.24	4.687	1.241	0.124
LP Central	PAG Stockpile	3.25	6500	5.37E+00	33.4	8.8	0.9	9.26	2.45	0.25	0.926	0.245	0.025
Viggo Pit	Crusher	5.65	11300	—	—	—	—	—	—	—	—	—	—
Viggo Pit	LGO Stockpile - West (#1)	4.55	9100	—	—	—	—	—	—	—	—	—	—
Viggo Pit	LGO Stockpile - West (#1)	4.55	9100	—	—	—	—	—	—	—	—	—	—
Viggo Pit	LGO Stockpile - East (#2)	4.15	8300	—	—	—	—	—	—	—	—	—	—
Viggo Pit	ROM Stockpile	5.7	11400	—	—	—	—	—	—	—	—	—	—
LP Central	Crusher	3.05	6100	1.18E+01	73.0	19.3	1.9	20.28	5.37	0.54	2.028	0.537	0.054
LP Central	LGO Stockpile - West (#1)	2.25	4500	—	—	—	—	—	—	—	—	—	—
LP Central	LGO Stockpile - West (#1)	2.25	4500	1.32E+00	8.2	2.2	0.2	2.28	0.60	0.06	0.228	0.060	0.006
LP Central	LGO Stockpile - East (#2)	1.85	3700	2.71E+00	16.8	4.4	0.4	4.67	1.23	0.12	0.467	0.123	0.012
ROM Stockpile	Crusher	0.25	500	—	—	—	—	—	—	—	—	—	—
LGO Stockpile - West (#1)	Crusher	3.15	6300	2.69E+00	16.7	4.4	0.4	4.64	1.23	0.12	0.464	0.123	0.012
LGO Stockpile - East (#2)	Crusher	2.75	5500	7.38E+00	45.8	12.1	1.2	12.72	3.37	0.34	1.272	0.337	0.034
AEX Portal	ROM Stockpile	1.95	3900	2.81E+00	17.4	4.6	0.5	4.85	1.28	0.13	0.485	0.128	0.013
AEX Portal	LGO Stockpile - West (#1)	2.4	4800	3.46E+00	21.5	5.7	0.6	5.96	1.58	0.16	0.596	0.158	0.016
LGO Stockpile - West (#1)	Crusher	3.15	6300	7.22E+00	44.8	11.9	1.2	12.46	3.30	0.33	1.246	0.330	0.033
AEX Portal	Crusher	1.95	3900	8.34E+00	51.8	13.7	1.4	14.38	3.81	0.38	1.438	0.381	0.038
Shaft	Crusher	2.05	4100	3.63E+00	22.5	6.0	0.6	6.26	1.66	0.17	0.626	0.166	0.017
AEX PAG	PAG Stockpile	4.1	8200	—	—	—	—	—	—	—	—	—	—
AEX NPAG	NPAG Stockpile	3.15	6300	—	—	—	—	—	—	—	—	—	—
AEX Portal	PAG Stockpile	4.1	8200	3.11E+00	19.3	5.1	0.5	5.37	1.42	0.14	0.537	0.142	0.014
AEX Portal	NPAG Stockpile	3.15	6300	2.76E+00	17.1	4.5	0.5	4.76	1.26	0.13	0.476	0.126	0.013
PAG Stockpile	AEX Portal	4.1	8200	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	AEX Portal	3.15	6300	9.97E-01	6.2	1.6	0.2	1.72	0.45	0.05	0.172	0.045	0.005
North Dam	Overburden #3	3.05	6100	—	—	—	—	—	—	—	—	—	—
North Dam	Overburden #5	1.35	2700	1.13E-02	0.1	0.0	0.0	0.02	0.01	0.00	0.002	0.001	0.000
North Dam	Overburden #6	2.15	4300	—	—	—	—	—	—	—	—	—	—
South Dam	Overburden #3	1.3	2600	6.42E-02	0.4	0.1	0.0	0.11	0.03	0.00	0.011	0.003	0.000
South Dam	Overburden #5	3.2	6400	—	—	—	—	—	—	—	—	—	—
South Dam	Overburden #6	5.9	11800	—	—	—	—	—	—	—	—	—	—
South Dam - spillway	South Dam	2.05	4100	5.90E-01	3.7	1.0	0.1	1.02	0.27	0.03	0.102	0.027	0.003
West Dam	Overburden #3	4.9	9800	—	—	—	—	—	—	—	—	—	—
West Dam	Overburden #5	2.75	5500	—	—	—	—	—	—	—	—	—	—
West Dam	Overburden #6	0.75	1500	1.33E-02	0.1	0.0	0.0	0.02	0.01	0.00	0.002	0.001	0.000
TMF Pond Dam	Overburden #3	0.8	1600	—	—	—	—	—	—	—	—	—	—
TMF Pond Dam	Overburden #3	0.8	1600	—	—	—	—	—	—	—	—	—	—
Quarry #1	Overburden #6	1	2000	1.43E-02	0.1	0.0	0.0	0.02	0.01	0.00	0.002	0.001	0.000
Quarry #2	Overburden #6	1.55	3100	2.22E-02	0.1	0.0	0.0	0.04	0.01	0.00	0.004	0.001	0.000
Borrow Source #3	Overburden #5	1.9	3800	2.72E-02	0.2	0.0	0.0	0.05	0.01	0.00	0.005	0.001	0.000
Borrow Source #3BS3B	Overburden #5	1.05	2100	1.50E-02	0.1	0.0	0.0	0.03	0.01	0.00	0.003	0.001	0.000
MWP Pond Dam	Overburden #3	1.75	3500	2.07E-02	0.1	0.0	0.0	0.04	0.01	0.00	0.004	0.001	0.000
MWP Pond Dam	Overburden #3	1.75	3500	6.58E-02	0.4	0.1	0.0	0.11	0.03	0.00	0.011	0.003	0.000
CWP #1 Dam	Overburden #1	2	4000	—	—	—	—	—	—	—	—	—	—
Borrow Source #3	North Dam	2.45	4900	—	—	—	—	—	—	—	—	—	—
Quarry #2 - Q1	North Dam	1.1	2200	—	—	—	—	—	—	—	—	—	—
Quarry #2 - Q1	North Dam	1.1	2200	—	—	—	—	—	—	—	—	—	—
Quarry #2 - Q1	North Dam	1.1	2200	—	—	—	—	—	—	—	—	—	—
TMF Facility	North Dam	1.05	2100	1.01E-01	0.6	0.2	0.0	0.17	0.05	0.00	0.017	0.005	0.000
Borrow Source #3	North Dam	2.45	4900	7.92E-02	0.5	0.1	0.0	0.14	0.04	0.00	0.014	0.004	0.000
NPAG stockpile	North Dam	8.8	17600	2.84E-01	1.8	0.5	0.0	0.49	0.13	0.01	0.049	0.013	0.001
NPAG stockpile	North Dam	8.8	17600	3.91E+00	24.2	6.4	0.6	6.74	1.78	0.18	0.674	0.178	0.018
NPAG stockpile	North Dam	8.8	17600	8.57E-01	5.3	1.4	0.1	1.48	0.39	0.04	0.148	0.039	0.004
NPAG stockpile	North Dam	8.8	17600	1.25E-01	0.8	0.2	0.0	0.21	0.06	0.01	0.021	0.006	0.001
NPAG stockpile	North Dam	8.8	17600	2.96E-01	1.8	0.5	0.0	0.51	0.14	0.01	0.051	0.014	0.001
Borrow Source #3	South Dam	4.3	8600	—	—	—	—	—	—	—	—	—	—
Quarry #1 - Q1	South Dam	5.75	11500	—	—	—	—	—	—	—	—	—	—
Quarry #1 - Q1	South Dam	5.75	11500	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	South Dam	7.05	14100	—	—	—	—	—	—	—	—	—	—
Quarry #1 - Q1	South Dam	5.75	11500	—	—	—	—	—	—	—	—	—	—
TMF Facility	South Dam	0.7	1400	1.19E-01	0.7	0.2	0.0	0.21	0.05	0.01	0.021	0.005	0.001
Borrow Source #3	South Dam	4.3	8600	2.95E-01	1.8	0.5	0.0	0.51	0.13	0.01	0.051	0.013	0.001
NPAG stockpile	South Dam	7.05	14100	4.84E-01	3.0	0.8	0.1	0.83	0.22	0.02	0.083	0.022	0.002
NPAG stockpile	South Dam	7.05	14100	1.98E+01	123.1	32.6	3.3	34.20	9.05	0.91	3.420	0.905	0.091
NPAG stockpile	South Dam	7.05	14100	9.80E-01	6.1	1.6	0.2	1.69	0.45	0.04	0.169	0.045	0.004
NPAG stockpile	South Dam	7.05	14100	7.80E-02	0.5	0.1	0.0	0.13	0.04	0.00	0.013	0.004	0.000
NPAG stockpile	South Dam	7.05	14100	4.12E-01	2.6	0.7	0.1	0.71	0.19	0.02	0.071	0.019	0.002
TMF Facility	West Dam	0.95	1900	8.92E-02	0.6	0.1	0.0	0.15	0.04	0.00	0.015	0.004	0.000
Borrow Source #3	West Dam	3.85	7700	1.84E-01	1.1	0.3	0.0	0.32	0.08	0.01	0.032	0.008	0.001
NPAG stockpile	West Dam	9.65	19300	4.61E-01	2.9	0.8	0.1	0.80	0.21	0.02	0.080	0.021	0.002
NPAG stockpile	West Dam	9.65	19300	2.71E+00	16.8	4.4	0.4	4.67	1.24	0.12	0.467	0.124	0.012
NPAG stockpile	West Dam	9.65	19300	7.60E-01	4.7	1.2	0.1	1.31	0.35	0.03	0.131	0.035	0.003
NPAG stockpile	West Dam	9.65	19300	3.08E-01	1.9	0.5	0.1	0.53	0.14	0.01	0.053	0.014	0.001
Borrow Source #3	TMF Pond Dam	4.4	8800	—	—	—	—	—	—	—	—	—	—
Quarry #1 - Q1	TMF Pond Dam	3.65	7300	—	—	—	—	—	—	—	—	—	—
Quarry #1 - Q1	TMF Pond Dam	3.65	7300	—	—	—	—	—	—	—	—	—	—
Quarry #1 - Q1	TMF Pond Dam	3.65	7300	—	—	—	—	—	—	—	—	—	—
Quarry #1 - Q1	TMF Pond Dam	3.65	7300	—	—	—	—	—	—	—	—	—	—
Borrow Source #3	MWP Pond Dam	5.35	10700	8.69E-01	5.4	1.4	0.1	1.50	0.40	0.04	0.150	0.040	0.004
NPAG Stockpile	MWP Pond Dam	5.4	10800	2.87E-01	1.8	0.5	0.0	0.49	0.13	0.01	0.049	0.013	0.001
NPAG Stockpile	MWP Pond Dam	5.4	10800	3.89E+00	24.1	6.4	0.6	6.70	1.77	0.18	0.670	0.177	0.018
NPAG Stockpile	MWP Pond Dam	5.4	10800	4.13E-01	2.6	0.7	0.1	0.71	0.19	0.02	0.071	0.019	0.002
NPAG Stockpile	MWP Pond Dam	5.4	10800	1.08E-01	0.7	0.2	0.0	0.19	0.05	0.00	0.019	0.005	0.000
NPAG Stockpile	LP Central Pit	3	6000	9.23E-01	5.7	1.5	0.2	1.59	0.42	0.04	0.159	0.042	0.004
NPAG Stockpile	Viggo Pit	4.7	9400	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	Road Base	6.7	13400	2.22E+00	13.8	3.7	0.4	3.83	1.01	0.10	0.383	0.101	0.010
Overburden #1	CWP #1 Dam	2	4000	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	CWP #1 Dam	2	4000	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	CWP #1 Dam	2	4000	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	CWP #1 Dam	2	4000	—	—	—	—	—	—	—	—	—	—
Diversion Channel #1	Overburden #1	1.8	3600	—	—	—	—	—	—	—	—	—	—
Diversion Channel #1	Overburden #1	1.8	3600	—	—	—	—	—	—	—	—	—	—

Table C-24: Operations Phase - Road Dust Emissions (Haul Roads)

Diversion Channel #1	Overburden #1	1.8	3600	—	—	—	—	—	—	—	—	—	—
Diversion Channel #1	Overburden #1	1.8	3600	—	—	—	—	—	—	—	—	—	—
Diversion Channel #1	PAG Stockpile	2.75	5500	—	—	—	—	—	—	—	—	—	—
Overburden #1	Diversion Channel #1	1.8	3600	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	Diversion Channel #1	2.95	5900	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	Diversion Channel #1	2.95	5900	—	—	—	—	—	—	—	—	—	—
Diversion Channel #2	PAG Stockpile	2.75	5500	—	—	—	—	—	—	—	—	—	—
Overburden #1	Diversion Channel #2	1.8	3600	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	Diversion Channel #2	2.95	5900	—	—	—	—	—	—	—	—	—	—
NPAG stockpile	Diversion Channel #2	2.95	5900	—	—	—	—	—	—	—	—	—	—
CWP #2 (Sump #1)	Overburden #2	2.2	4400	—	—	—	—	—	—	—	—	—	—
CWP #3 (Sump #2)	Overburden #2	2.2	4400	—	—	—	—	—	—	—	—	—	—
CWP #2 (Sump #1)	Overburden #2	2.2	4400	—	—	—	—	—	—	—	—	—	—
CWP #3 (Sump #2)	Overburden #2	2.2	4400	—	—	—	—	—	—	—	—	—	—
CWP #2 (Sump #1)	Overburden #2	2.2	4400	—	—	—	—	—	—	—	—	—	—
CWP #2 (Sump #1)	Overburden #2	2.2	4400	—	—	—	—	—	—	—	—	—	—
CWP #3 (Sump #2)	Overburden #2	2.2	4400	—	—	—	—	—	—	—	—	—	—
CWP #3 (Sump #2)	Overburden #2	2.2	4400	—	—	—	—	—	—	—	—	—	—
TMF Facility	North Dam	1.05	2100	1.01E-01	0.6	0.2	0.0	0.17	0.05	0.00	0.017	0.005	0.000
TMF Facility	South Dam	0.7	1400	1.19E-01	0.7	0.2	0.0	0.21	0.05	0.01	0.021	0.005	0.001
TMF Facility	West Dam	0.95	1900	8.92E-02	0.6	0.1	0.0	0.15	0.04	0.00	0.015	0.004	0.000
Tailings Pipeline	Overburden #3	2.1	4200	—	—	—	—	—	—	—	—	—	—
Borrow Source #1	Tailings Pipeline	4.95	9900	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	Tailings Pipeline	8.6	17200	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	Shaft	2.15	4300	2.38E-01	1.5	0.4	0.0	0.41	0.11	0.01	0.041	0.011	0.001
Paste Plant	Overburden #2	3.1	6200	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	Paste Plant	3.45	6900	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	Paste Plant	3.45	6900	—	—	—	—	—	—	—	—	—	—
Primary Crusher	Overburden #2	3.55	7100	—	—	—	—	—	—	—	—	—	—
Coarse Ore Storage	Overburden #2	3.55	7100	—	—	—	—	—	—	—	—	—	—
Process Plant	Overburden #2	3.65	7300	—	—	—	—	—	—	—	—	—	—
Borrow Source #1	Primary Crusher	1.3	2600	—	—	—	—	—	—	—	—	—	—
Borrow Source #1	Coarse Ore Storage	1.3	2600	—	—	—	—	—	—	—	—	—	—
Borrow Source #1	Process Plant	1.3	2600	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	Primary Crusher	3.9	7800	—	—	—	—	—	—	—	—	—	—
Overburden #2	Dixie Creek Berm	2.45	4900	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	Haul Roads	6.7	13400	—	—	—	—	—	—	—	—	—	—
Haul Roads	Overburden #2	6.2	12400	—	—	—	—	—	—	—	—	—	—
Borrow Source #1	Haul Roads	1.9	3800	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	Haul Roads	6.7	13400	—	—	—	—	—	—	—	—	—	—
NPAG Stockpile	ROM Stockpile	3.9	7800	—	—	—	—	—	—	—	—	—	—
ROM Stockpile	Overburden #2	3.55	7100	—	—	—	—	—	—	—	—	—	—
Borrow Source #1	Infrastructure Pad	1.05	2100	—	—	—	—	—	—	—	—	—	—
PAG Stockpile	Overburden #1	2.55	5100	2.04E-01	1.3	0.3	0.0	0.35	0.09	0.01	0.035	0.009	0.001
										TOTALS	**45.575047**	**12.06345**	**1.206345**

Table 4: Node Segment Emissions

Node Segment		**Model ID**	**Controlled (g/s)**		
			TPM Emission per segment	**PM_{10} Emission Rate**	**$PM_{2.5}$ Emission Rate**
VP	1	RD1	0.00E+00	0.00E+00	0.00E+00
1	2	RD2	5.44E-02	1.44E-02	1.44E-03
2	LPC	RD3	0.00E+00	0.00E+00	0.00E+00
2	3	RD4	4.29E-02	1.14E-02	1.14E-03
LPC	7	RD5	7.70E+00	2.04E+00	2.04E-01
3	4	RD6	0.00E+00	0.00E+00	0.00E+00
3	5	RD7	1.43E-02	3.79E-03	3.79E-04
4	5	RD8	1.02E+00	2.69E-01	2.69E-02
4	6	RD9	3.05E+00	8.08E-01	8.08E-02
5	OVB1	RD10	6.01E-01	1.59E-01	1.59E-02
5	PAG	RD11	1.05E+01	2.78E+00	2.78E-01
5	13	RD12	0.00E+00	0.00E+00	0.00E+00
6	7	RD13	1.45E+00	3.84E-01	3.84E-02
6	11	RD14	1.10E+00	2.91E-01	2.91E-02
7	8	RD15	8.67E-01	2.29E-01	2.29E-02
PAG	15	RD16	0.00E+00	0.00E+00	0.00E+00
8	9	RD17	8.05E-01	2.13E-01	2.13E-02
8	16	RD18	3.25E+00	8.61E-01	8.61E-02
8	PSTP	RD19	0.00E+00	0.00E+00	0.00E+00
PSTP	DCB	RD20	0.00E+00	0.00E+00	0.00E+00
9	10	RD21	1.55E+00	4.10E-01	4.10E-02
9	AEXP	RD22	9.43E-01	2.49E-01	2.49E-02
10	SHAFT	RD23	4.87E-02	1.29E-02	1.29E-03
10	11	RD24	6.33E-01	1.68E-01	1.68E-02
11	12	RD25	1.35E+00	3.58E-01	3.58E-02
12	LGOW	RD26	6.69E-01	1.77E-01	1.77E-02
12	LGOE	RD27	2.50E-01	6.62E-02	6.62E-03
12	13	RD28	1.14E+00	3.02E-01	3.02E-02
13	14	RD29	1.33E+00	3.53E-01	3.53E-02
14	15	RD30	3.81E-01	1.01E-01	1.01E-02
15	OVB2	RD31	4.17E-01	1.10E-01	1.10E-02
15	NPAG	RD32	2.07E+00	5.49E-01	5.49E-02
16	CRUSH	RD33	7.40E-01	1.96E-01	1.96E-02
16	17	RD34	9.09E-01	2.41E-01	2.41E-02
CRUSH	PRCP	RD35	0.00E+00	0.00E+00	0.00E+00
17	18	RD36	1.18E-01	3.12E-02	3.12E-03
17	28	RD37	7.10E-01	1.88E-01	1.88E-02
18	MWPD	RD38	4.66E-02	1.23E-02	1.23E-03
18	19	RD39	1.78E-01	4.71E-02	4.71E-03
19	20	RD40	1.02E-01	2.70E-02	2.70E-03
19	29	RD41	0.00E+00	0.00E+00	0.00E+00
20	Q1	RD42	8.63E-04	2.28E-04	2.28E-05
20	21	RD43	2.74E-02	7.24E-03	7.24E-04
21	OVB6	RD44	2.40E-03	6.34E-04	6.34E-05
21	TWD	RD45	3.65E-02	9.67E-03	9.67E-04
TWD	22	RD46	5.89E-03	1.56E-03	1.56E-04
22	Q2	RD47	6.16E-04	1.63E-04	1.63E-05
22	TND	RD48	7.01E-03	1.85E-03	1.85E-04
TND	23	RD49	1.16E-01	3.08E-02	3.08E-03
23	24	RD50	2.64E-02	6.98E-03	6.98E-04
23	OVB5	RD51	2.55E-03	6.75E-04	6.75E-05
23	27	RD52	2.65E-01	7.00E-02	7.00E-03
24	BS3B	RD53	1.17E-02	3.10E-03	3.10E-04
BS3B	25	RD54	1.12E-02	2.97E-03	2.97E-04
25	26	RD55	2.52E-02	6.68E-03	6.68E-04
26	BS3	RD56	1.12E-02	2.97E-03	2.97E-04
27	TSD	RD57	5.53E-01	1.46E-01	1.46E-02
27	OVB3	RD58	0.00E+00	0.00E+00	0.00E+00
27	28	RD59	2.18E-01	5.77E-02	5.77E-03
28	TPD	RD60	3.97E-02	1.05E-02	1.05E-03
TPD	SDS	RD61	4.71E-02	1.25E-02	1.25E-03
SDS	29	RD62	0.00E+00	0.00E+00	0.00E+00
TMF	TSD	RD63	4.11E-02	1.09E-02	1.09E-03
TMF	TWD	RD64	3.07E-02	8.14E-03	8.14E-04
TMF	TND	RD65	3.48E-02	9.20E-03	9.20E-04
	TOTALS		**45.6**	**12.1**	**1.2**

Sample Calculation:

Step 1: Caculation of lb/VKT (from AP42 - Chapter 13.2.2)
E (lb/vkt) (for TSP) = k x (silt %/12)^a x (mean weight/3)^b (see values for k, a, b above)

Step 2: convert to kg/VKT

Step 3: total VKT is obtained from distance travelled x number of round trips per hour.

Step 4: Total emission rate (kg/hour)

Step 5: Uncontrolled emission rate (g/s)

Table C-25: Operations Phase - Concrete Batching

Reference: US EPA AP-42 Chapter 11.12 Concrete Batching	Rating ranges from E to B			
Activity Data:				
	Concrete Processing Rate			
	m^3/hr	**cubic yard per hour**		
Batch Plant 1	80	157		
Emission Factors:	**Uncontrolled**		**Controlled**	
	PM (lb/yd^3)	**PM_{10} (lb/yd^3)**	**PM (lb/yd^3)**	**PM_{10} (lb/yd^3)**
Aggregate delivery to ground storage (3-05-011-21)	0.0064	0.0031	0.0064	0.0031
Sand delivery to ground storage (3-05-011-22)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to conveyor (3-05-011-23)	0.0064	0.0031	0.0064	0.0031
Sand transfer to conveyor (3-05-011-24)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to elevated storage (3-05-011-04)	0.0064	0.0031	0.0064	0.0031
Sand transfer to elevated storage (3-05-011-05)	0.0015	0.0007	0.0015	0.0007
Cement delivery to Silo (3-05-011-07 controlled)	0.0002	0.0001	0.0002	0.0001
Cement supplement delivery to Silo (3-05-011-17 controlled)	0.0003	0.0002	0.0003	0.0002
Weigh hopper loading (3-05-011-08)	0.0079	0.0038	0.0079	0.0038
Truck mix loading (3-05-011-10)	0.1393	0.03892	0.007952	0.00224
Emission Rates:	**Batch Plant 1 - Controlled Emissions**			
	PM	PM_{10}	$PM_{2.5}$	
Aggregate delivery to ground storage (3-05-011-21)	0.127	0.061	0.010	
Sand delivery to ground storage (3-05-011-22)	0.030	0.014	0.002	
Aggregate transfer to conveyor (3-05-011-23)	0.127	0.061	0.010	
Sand transfer to conveyor (3-05-011-24)	0.030	0.014	0.002	
Aggregate transfer to elevated storage (3-05-011-04)	0.127	0.061	0.010	
Sand transfer to elevated storage (3-05-011-05)	0.030	0.014	0.002	
Cement delivery to Silo (3-05-011-07 controlled)	0.004	0.002	0.0003	
Cement supplement delivery to Silo (3-05-011-17 controlled)	0.006	0.004	0.0006	
Weigh hopper loading (3-05-011-08)	0.156	0.075	0.012	
Truck mix loading (3-05-011-10)	0.157	0.044	0.007	
Total:	**0.79**	**0.35**	**0.06**	

*PM2.5 not specifically calculated in AP42: Table 11.12-3 ratio of PM10/PM2.5 used to estimate emission

Table C-26: Operations Phase - CRF Plant

Reference: US EPA AP-42 Chapter 11.12 Concrete Batching	Rating ranges from E to B			
Activity Data:				
	Concrete Processing Rate			
	m^3/hr	**cubic yard per hour**		
Batch Plant 1	80	157		
Emission Factors:	**Uncontrolled**		**Controlled**	
	PM (lb/yd^3)	**PM_{10} (lb/yd^3)**	**PM (lb/yd^3)**	**PM_{10} (lb/yd^3)**
Aggregate delivery to ground storage (3-05-011-21)	0.0064	0.0031	0.0064	0.0031
Sand delivery to ground storage (3-05-011-22)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to conveyor (3-05-011-23)	0.0064	0.0031	0.0064	0.0031
Sand transfer to conveyor (3-05-011-24)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to elevated storage (3-05-011-04)	0.0064	0.0031	0.0064	0.0031
Sand transfer to elevated storage (3-05-011-05)	0.0015	0.0007	0.0015	0.0007
Cement delivery to Silo (3-05-011-07 controlled)	0.0002	0.0001	0.0002	0.0001
Cement supplement delivery to Silo (3-05-011-17 controlled)	0.0003	0.0002	0.0003	0.0002
Weigh hopper loading (3-05-011-08)	0.0079	0.0038	0.0079	0.0038
Truck mix loading (3-05-011-10)	0.1393	0.03892	0.007952	0.00224
Emission Rates:	**Batch Plant 1 - Controlled Emissions**			
	PM	PM_{10}	$PM_{2.5}$	
Aggregate delivery to ground storage (3-05-011-21)	0.127	0.061	0.010	
Sand delivery to ground storage (3-05-011-22)	0.030	0.014	0.002	
Aggregate transfer to conveyor (3-05-011-23)	0.127	0.061	0.010	
Sand transfer to conveyor (3-05-011-24)	0.030	0.014	0.002	
Aggregate transfer to elevated storage (3-05-011-04)	0.127	0.061	0.010	
Sand transfer to elevated storage (3-05-011-05)	0.030	0.014	0.002	
Cement delivery to Silo (3-05-011-07 controlled)	0.004	0.002	0.0003	
Cement supplement delivery to Silo (3-05-011-17 controlled)	0.006	0.004	0.0006	
Weigh hopper loading (3-05-011-08)	0.156	0.075	0.012	
Truck mix loading (3-05-011-10)	0.157	0.044	0.007	
Total:	**0.792**	**0.351**	**0.057**	

*PM2.5 not specifically calculated in AP42: Table 11.12-3 ratio of PM10/PM2.5 used to estimate emission

Table C-27: Operations Phase - Paste Plant

Reference: US EPA AP-42 Chapter 11.12 Concrete Batching	Rating ranges from E to B			
Activity Data:				
	Concrete Processing Rate			
	m^3/hr	**cubic yard per hour**		
Batch Plant 1	80	157		
Emission Factors:	**Uncontrolled**		**Controlled**	
	PM (lb/yd^3)	**PM_{10} (lb/yd^3)**	**PM (lb/yd^3)**	**PM_{10} (lb/yd^3)**
Aggregate delivery to ground storage (3-05-011-21)	0.0064	0.0031	0.0064	0.0031
Sand delivery to ground storage (3-05-011-22)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to conveyor (3-05-011-23)	0.0064	0.0031	0.0064	0.0031
Sand transfer to conveyor (3-05-011-24)	0.0015	0.0007	0.0015	0.0007
Aggregate transfer to elevated storage (3-05-011-04)	0.0064	0.0031	0.0064	0.0031
Sand transfer to elevated storage (3-05-011-05)	0.0015	0.0007	0.0015	0.0007
Cement delivery to Silo (3-05-011-07 controlled)	0.0002	0.0001	0.0002	0.0001
Cement supplement delivery to Silo (3-05-011-17 controlled)	0.0003	0.0002	0.0003	0.0002
Weigh hopper loading (3-05-011-08)	0.0079	0.0038	0.0079	0.0038
Truck mix loading (3-05-011-10)	0.1393	0.03892	0.007952	0.00224
Emission Rates:	**Batch Plant 1 - Controlled Emissions**			
	PM	PM_{10}	$PM_{2.5}$	
Aggregate delivery to ground storage (3-05-011-21)	0.127	0.061	0.010	
Sand delivery to ground storage (3-05-011-22)	0.030	0.014	0.002	
Aggregate transfer to conveyor (3-05-011-23)	0.127	0.061	0.010	
Sand transfer to conveyor (3-05-011-24)	0.030	0.014	0.002	
Aggregate transfer to elevated storage (3-05-011-04)	0.127	0.061	0.010	
Sand transfer to elevated storage (3-05-011-05)	0.030	0.014	0.002	
Cement delivery to Silo (3-05-011-07 controlled)	0.004	0.002	0.0003	
Cement supplement delivery to Silo (3-05-011-17 controlled)	0.006	0.004	0.0006	
Weigh hopper loading (3-05-011-08)	0.156	0.075	0.012	
Truck mix loading (3-05-011-10)	0.157	0.044	0.007	
Total:	**0.792**	**0.351**	**0.057**	

*PM2.5 not specifically calculated in AP42: Table 11.12-3 ratio of PM10/PM2.5 used to estimate emission

Table C-28: Operations Phase - Mill Process and Misc Sources

CN Destruction				
Excess SO_2 from CN Destruction				
Use of SO_2	399	kg/hour	(see Key Data sheet)	
Percent Excess	1	%	excess assumed to ensure reaction complete	
Emission Rate	**1.11**	**g/s**	Closed loop, so no emissions.	

Lime Bin Dust Collector System (GT0095-48200-01-PFD-3020)				
Reference:	ESDM Procedure Document Table C-1 (March 2009)			
Controlled by baghouse.	Data Quality "AA"			
Flowrate	5000	acfm	assumed	
	2.36	am^3/s		
PM Concentration	20	mg/m^3		
Emission Rate	**PM (g/s)**	**PM_{10}**	**$PM_{2.5}$**	
	0.0472	**0.0472**	**0.0472**	**g/s**

Induction Furnace (GT0095-47300-01-PFD-3015)				
Reference:	ESDM Procedure Document Table C-1 (March 2009)			
Controlled by baghouse.	Data Quality "AA"			
Flowrate	5000	acfm	assumed	
	4.70	am^3/s		
PM Concentration	20.00	mg/m^3		
Emission Rate (total)	**0.09**	**g/s**	assumed same for PM_{10} and $PM_{2.5}$	

Lime Slaker (GT0095-48200-01-PFD-3020)				
Slaker controlled by wet scrubber --- emission based on engineering estimate				
Assumed concentration	20	mg/m^3	(estimated maximum)	
Flowrate from scrubber	2.00	am^3/s	(assumed 4000 cfm)	
Emission Rate (per slaker)	0.04			
Emission Rate (total)	**0.08**	**g/s**	assumed same for PM_{10} and $PM_{2.5}$	

CuSO4 Dust Collector (GT0095-48500-01-PFD-3025)				
Reference:	ESDM Procedure Document Table C-1 (March 2009)			
Controlled by baghouse.	Data Quality "AA"			
$CuSO_4$ mixing controlled baghouse				
Assumed concentration	20.00	mg/m^3		
Flowrate from scrubber	2.00	am^3/s	assumed	
Emission Rate	**0.040**	**g/s**	assumed same for PM_{10} and $PM_{2.5}$	

SMBS Dust Collector (GT0095-48500-01-PFD-3024)				
Reference:	ESDM Procedure Document Table C-1 (March 2009)			
Controlled by baghouse.	Data Quality "AA"			
Flowrate	5000	acfm	assumed	
	2.36	am^3/s		
PM Concentration	20	mg/m^3		
Emission Rate	**PM (g/s)**			
	0.0472	**g/s**	assumed same for PM_{10} and $PM_{2.5}$	

Electrowinning Area Exhaust Fan (GT0095-47200-01-PFD-3014) N/A for Emissions				
Reference:	ESDM Procedure Document Table C-1 (March 2009)			
Controlled by baghouse.	Data Quality "AA"			
Flowrate	5000	acfm		
	2.36	am^3/s		
PM Concentration	20	mg/m^3		
Emission Rate	**PM (g/s)**			
	0.0472	**g/s**	assumed same for PM_{10} and $PM_{2.5}$	

Cyanide Mix Area Ventilation Fan (GT0095-48100-01-PFD-3019)				
Reference:	ESDM Procedure Document Table C-1 (March 2009)			
Controlled by baghouse.	Data Quality "AA"			
Flowrate	5000	acfm		
	2.36	am^3/s		
Emission Rate	**HCN (g/s)**			
	0.0797	**g/s**		

Table C-29: Operations Phase - Ore / Rock Handling at Stockpiles (Dozers)

Bulldozers at Rock / Ore Stockpiles

Reference: US EPA AP-42 Table 11.9-2

Equation:
EF(kg/hour) = k*2.6*silt^1.2*moisture^-1.3, k = 1 for TSP

Silt	5.8	assumed	AP42 Taconite mining
Moisture	4	assumed	
Emission Factor (kg/hour)	3.54		EPA Rating
TSP	Emmission Rate (g/s)	0.98	B
Control Efficiency	75	%	assumed based on watering and BMP
	0.75	scaling factor for PM10	
	0.105	scaling factor for PM2.5	

Number of Dozers

Dozers	Dozer at AEX NPAG	1
	Dozer at AEX PAG	1
	Dozer at AEX Portal	1
	Dozer at Borrow Source #1	1
	Dozer at Borrow Source #3	1
	Dozer at Borrow Source #3BS3B	1
	Dozer at Coarse Ore Storage	1
	Dozer at Crusher	1
	Dozer at CWP #1 Dam	1
	Dozer at CWP #2 (Sump #1)	1
	Dozer at CWP #3 (Sump #2)	1
	Dozer at Diversion Channel #1	1
	Dozer at Diversion Channel #2	1
	Dozer at Dixie Creek Berm	1
	Dozer at Haul Roads	1
	Dozer at Infrastructure Pad	1
	Dozer at LGO Stockpile - East (#2)	1
	Dozer at LGO Stockpile - West (#1)	1
	Dozer at LP Central	7
	Dozer at MWP Pond Dam	1
	Dozer at North Dam	1
	Dozer at NPAG Stockpile	1
	Dozer at Overburden #1	1
	Dozer at Overburden #2	1
	Dozer at Overburden #3	1
	Dozer at Overburden #5	1
	Dozer at Overburden #6	1
	Dozer at PAG Stockpile	1
	Dozer at Paste Plant	1
	Dozer at Process Plant	1
	Dozer at Quarry #1	1
	Dozer at Quarry #2	1
	Dozer at ROM Stockpile	1
	Dozer at Shaft	1
	Dozer at South Dam	1
	Dozer at South Dam - spillway	1
	Dozer at Tailings Pipeline	1
	Dozer at TMF Facility	1
	Dozer at TMF Pond Dam	1
	Dozer at Viggo Pit	7
	Dozer at West Dam	1

Dust Dozers Emissions		TSP	PM_{10}	$PM_{2.5}$	Unit
Dozers	Dozer at AEX NPAG	0.25	0.18	0.03	g/s
	Dozer at AEX PAG	0.25	0.18	0.03	g/s
	Dozer at AEX Portal	0.25	0.18	0.03	g/s
	Dozer at Borrow Source #1	0.25	0.18	0.03	g/s
	Dozer at Borrow Source #3	0.25	0.18	0.03	g/s
	Dozer at Borrow Source #3BS3B	0.25	0.18	0.03	g/s
	Dozer at Coarse Ore Storage	0.25	0.18	0.03	g/s
	Dozer at Crusher	0.25	0.18	0.03	g/s
	Dozer at CWP #1 Dam	0.25	0.18	0.03	g/s
	Dozer at CWP #2 (Sump #1)	0.25	0.18	0.03	g/s
	Dozer at CWP #3 (Sump #2)	0.25	0.18	0.03	g/s
	Dozer at Diversion Channel #1	0.25	0.18	0.03	g/s
	Dozer at Diversion Channel #2	0.25	0.18	0.03	g/s
	Dozer at Dixie Creek Berm	0.25	0.18	0.03	g/s
	Dozer at Haul Roads	0.25	0.18	0.03	g/s
	Dozer at Infrastructure Pad	0.25	0.18	0.03	g/s
	Dozer at LGO Stockpile - East (#2)	0.25	0.18	0.03	g/s
	Dozer at LGO Stockpile - West (#1)	0.25	0.18	0.03	g/s
	Dozer at LP Central	1.72	1.29	0.18	g/s
	Dozer at MWP Pond Dam	0.25	0.18	0.03	g/s
	Dozer at North Dam	0.25	0.18	0.03	g/s
	Dozer at NPAG Stockpile	0.25	0.18	0.03	g/s
	Dozer at Overburden #1	0.25	0.18	0.03	g/s
	Dozer at Overburden #2	0.25	0.18	0.03	g/s
	Dozer at Overburden #3	0.25	0.18	0.03	g/s
	Dozer at Overburden #5	0.25	0.18	0.03	g/s
	Dozer at Overburden #6	0.25	0.18	0.03	g/s
	Dozer at PAG Stockpile	0.25	0.18	0.03	g/s
	Dozer at Paste Plant	0.25	0.18	0.03	g/s
	Dozer at Process Plant	0.25	0.18	0.03	g/s
	Dozer at Quarry #1	0.25	0.18	0.03	g/s
	Dozer at Quarry #2	0.25	0.18	0.03	g/s
	Dozer at ROM Stockpile	0.25	0.18	0.03	g/s
	Dozer at Shaft	0.25	0.18	0.03	g/s
	Dozer at South Dam	0.25	0.18	0.03	g/s
	Dozer at South Dam - spillway	0.25	0.18	0.03	g/s
	Dozer at Tailings Pipeline	0.25	0.18	0.03	g/s
	Dozer at TMF Facility	0.25	0.18	0.03	g/s
	Dozer at TMF Pond Dam	0.25	0.18	0.03	g/s
	Dozer at Viggo Pit	1.72	1.29	0.18	g/s
	Dozer at West Dam	0.25	0.18	0.03	g/s

Dozer Tailpipe Emissions		Material Handling (tonnes/hour)	NO_x (g/s)	CO (g/s)	SO_2 (g/s)	PM (g/s)	BaP (g/s)	Benzene (g/s)	1,3-Butadiene (g/s)
	Dozer at AEX NPAG	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at AEX PAG	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at AEX Portal	**546.7**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #1	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Borrow Source #3	**19.5**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #3BS3B	**0.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05

Table C-29: Operations Phase - Ore / Rock Handling at Stockpiles (Dozers)

	Dozer at Coarse Ore Storage	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Crusher	**944.0**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at CWP #1 Dam	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at CWP #2 (Sump #1)	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at CWP #3 (Sump #2)	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Diversion Channel #1	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Diversion Channel #2	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Dixie Creek Berm	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Haul Roads	**19.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Infrastructure Pad	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at LGO Stockpile - East (#2)	**248.7**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at LGO Stockpile - West (#1)	**310.6**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at LP Central	**3574.5**	2.65E-01	2.32E+00	3.97E-03	1.33E-02	7.36E-07	4.88E-03	1.86E-04
	Dozer at MWP Pond Dam	**64.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
Dozers	Dozer at North Dam	**51.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at NPAG Stockpile	**961.6**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #1	**261.5**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #2	**362.7**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #3	**5.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #5	**2.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #6	**2.8**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at PAG Stockpile	**2088.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Paste Plant	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Process Plant	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Quarry #1	**0.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Quarry #2	**0.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at ROM Stockpile	**86.5**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Shaft	**112.9**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at South Dam	**230.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at South Dam - spillway	**17.3**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at Tailings Pipeline	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at TMF Facility	**43.2**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05
	Dozer at TMF Pond Dam	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Viggo Pit	**0.0**	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at West Dam	**41.5**	3.79E-02	3.32E-01	5.68E-04	1.90E-03	1.05E-07	6.97E-04	2.65E-05

Dozer Summary Emissions		**Material Handling (tonnes/hour)**	**TSP (g/s)**	**PM_{10} (g/s)**	**$PM_{2.5}$ (g/s)**	**NO_x (g/s)**	**CO (g/s)**	**SO_2 (g/s)**	**BaP (g/s)**	**Benzene (g/s)**	**1,3-Butadiene (g/s)**
	Dozer at AEX NPAG	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at AEX PAG	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at AEX Portal	546.7	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #1	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Borrow Source #3	19.5	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Borrow Source #3BS3B	0.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Coarse Ore Storage	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Crusher	944.0	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at CWP #1 Dam	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at CWP #2 (Sump #1)	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at CWP #3 (Sump #2)	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Diversion Channel #1	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Diversion Channel #2	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Dixie Creek Berm	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Haul Roads	19.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Infrastructure Pad	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at LGO Stockpile - East (#2)	248.7	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at LGO Stockpile - West (#1)	310.6	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at LP Central	3574.5	1.73E+00	1.30E+00	1.94E-01	2.65E-01	2.32E+00	3.97E-03	7.36E-07	4.88E-03	1.86E-04
	Dozer at MWP Pond Dam	64.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
Dozers	Dozer at North Dam	51.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at NPAG Stockpile	961.6	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #1	261.5	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #2	362.7	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #3	5.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #5	2.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Overburden #6	2.8	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at PAG Stockpile	2088.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Paste Plant	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Process Plant	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Quarry #1	0.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Quarry #2	0.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at ROM Stockpile	86.5	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Shaft	112.9	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at South Dam	230.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at South Dam - spillway	17.3	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at Tailings Pipeline	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at TMF Facility	43.2	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05
	Dozer at TMF Pond Dam	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at Viggo Pit	0.0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
	Dozer at West Dam	41.5	2.47E-01	1.86E-01	2.77E-02	3.79E-02	3.32E-01	5.68E-04	1.05E-07	6.97E-04	2.65E-05

Table C-30: Operations Phase Road Emissions (Tailpipe)

Haul Trucks

Haul Truck Engine kW (average)	1210
Total # Trucks	30
Load Factor	40%

Node Segment		ID	Effective # of Trucks*	NO_x (g/s)	CO (g/s)	SO_2 (g/s)	PM (g/s)	BaP (g/s)	Benzene (g/s)	1,3-Butadiene (g/s)
VP	1	RD1	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
1	2	RD2	0.04	1.68E-02	1.68E-02	2.02E-05	1.92E-04	6.98E-10	7.98E-06	2.91E-07
2	LPC	RD3	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
2	3	RD4	0.03	1.33E-02	1.33E-02	1.60E-05	1.52E-04	5.51E-10	6.30E-06	2.29E-07
LPC	7	RD5	5.07	2.39E+00	2.39E+00	2.87E-03	2.73E-02	9.89E-08	1.13E-03	4.12E-05
3	4	RD6	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
3	5	RD7	0.01	4.43E-03	4.43E-03	5.32E-06	5.06E-05	1.84E-10	2.10E-06	7.65E-08
4	5	RD8	0.67	3.15E-01	3.15E-01	3.79E-04	3.60E-03	1.31E-08	1.49E-04	5.44E-06
4	6	RD9	2.01	9.46E-01	9.46E-01	1.14E-03	1.08E-02	3.92E-08	4.48E-04	1.63E-05
5	OVB1	RD10	0.40	1.86E-01	1.86E-01	2.24E-04	2.13E-03	7.72E-09	8.83E-05	3.21E-06
5	PAG	RD11	6.91	3.25E+00	3.25E+00	3.91E-03	3.72E-02	1.35E-07	1.54E-03	5.62E-05
5	13	RD12	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
6	7	RD13	0.95	4.49E-01	4.49E-01	5.39E-04	5.13E-03	1.86E-08	2.13E-04	7.75E-06
6	11	RD14	0.72	3.41E-01	3.41E-01	4.09E-04	3.89E-03	1.41E-08	1.61E-04	5.88E-06
7	8	RD15	0.57	2.68E-01	2.68E-01	3.22E-04	3.07E-03	1.11E-08	1.27E-04	4.63E-06
PAG	15	RD16	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
8	9	RD17	0.53	2.49E-01	2.49E-01	2.99E-04	2.85E-03	1.03E-08	1.18E-04	4.30E-06
8	16	RD18	2.14	1.01E+00	1.01E+00	1.21E-03	1.15E-02	4.18E-08	4.78E-04	1.74E-05
8	PSTP	RD19	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
PSTP	DCB	RD20	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
9	10	RD21	1.02	4.80E-01	4.80E-01	5.77E-04	5.49E-03	1.99E-08	2.28E-04	8.29E-06
9	AEXP	RD22	0.62	2.92E-01	2.92E-01	3.51E-04	3.34E-03	1.21E-08	1.38E-04	5.04E-06
10	SHAFT	RD23	0.03	1.51E-02	1.51E-02	1.81E-05	1.72E-04	6.25E-10	7.15E-06	2.60E-07
10	11	RD24	0.42	1.96E-01	1.96E-01	2.36E-04	2.24E-03	8.13E-09	9.30E-05	3.38E-06
11	12	RD25	0.89	4.19E-01	4.19E-01	5.03E-04	4.79E-03	1.74E-08	1.99E-04	7.23E-06
12	LGOW	RD26	0.44	2.07E-01	2.07E-01	2.49E-04	2.37E-03	8.60E-09	9.83E-05	3.58E-06
12	LGOE	RD27	0.16	7.75E-02	7.75E-02	9.31E-05	8.85E-04	3.21E-09	3.67E-05	1.34E-06
12	13	RD28	0.75	3.54E-01	3.54E-01	4.25E-04	4.04E-03	1.47E-08	1.68E-04	6.10E-06
13	14	RD29	0.88	4.13E-01	4.13E-01	4.96E-04	4.72E-03	1.71E-08	1.96E-04	7.12E-06
14	15	RD30	0.25	1.18E-01	1.18E-01	1.42E-04	1.35E-03	4.89E-09	5.59E-05	2.03E-06
15	OVB2	RD31	0.27	1.29E-01	1.29E-01	1.55E-04	1.48E-03	5.35E-09	6.12E-05	2.23E-06
15	NPAG	RD32	1.36	6.42E-01	6.42E-01	7.71E-04	7.34E-03	2.66E-08	3.04E-04	1.11E-05
16	CRUSH	RD33	0.49	2.29E-01	2.29E-01	2.75E-04	2.62E-03	9.51E-09	1.09E-04	3.96E-06
16	17	RD34	0.60	2.82E-01	2.82E-01	3.38E-04	3.22E-03	1.17E-08	1.33E-04	4.86E-06
CRUSH	PRCP	RD35	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
17	18	RD36	0.08	3.65E-02	3.65E-02	4.39E-05	4.18E-04	1.51E-09	1.73E-05	6.31E-07
17	28	RD37	0.47	2.20E-01	2.20E-01	2.64E-04	2.51E-03	9.12E-09	1.04E-04	3.80E-06
18	MWPD	RD38	0.03	1.44E-02	1.44E-02	1.73E-05	1.65E-04	5.99E-10	6.85E-06	2.49E-07
18	19	RD39	0.12	5.51E-02	5.51E-02	6.62E-05	6.30E-04	2.28E-09	2.61E-05	9.51E-07
19	20	RD40	0.07	3.17E-02	3.17E-02	3.80E-05	3.62E-04	1.31E-09	1.50E-05	5.46E-07
19	29	RD41	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
20	Q1	RD42	0.00	2.67E-04	2.67E-04	3.21E-07	3.05E-06	1.11E-11	1.27E-07	4.61E-09
20	21	RD43	0.02	8.47E-03	8.47E-03	1.02E-05	9.68E-05	3.51E-10	4.02E-06	1.46E-07
21	OVB6	RD44	0.00	7.42E-04	7.42E-04	8.91E-07	8.48E-06	3.08E-11	3.52E-07	1.28E-08
21	TWD	RD45	0.02	1.13E-02	1.13E-02	1.36E-05	1.29E-04	4.69E-10	5.37E-06	1.95E-07
TWD	22	RD46	0.00	1.82E-03	1.82E-03	2.19E-06	2.08E-05	7.56E-11	8.65E-07	3.15E-08
22	Q2	RD47	0.00	1.91E-04	1.91E-04	2.29E-07	2.18E-06	7.91E-12	9.05E-08	3.29E-09
22	TND	RD48	0.00	2.17E-03	2.17E-03	2.61E-06	2.48E-05	8.99E-11	1.03E-06	3.75E-08
TND	23	RD49	0.08	3.60E-02	3.60E-02	4.33E-05	4.12E-04	1.49E-09	1.71E-05	6.22E-07
23	24	RD50	0.02	8.16E-03	8.16E-03	9.81E-06	9.33E-05	3.38E-10	3.87E-06	1.41E-07
23	OVB5	RD51	0.00	7.90E-04	7.90E-04	9.49E-07	9.03E-06	3.27E-11	3.75E-07	1.36E-08
23	27	RD52	0.17	8.19E-02	8.19E-02	9.84E-05	9.36E-04	3.40E-09	3.88E-05	1.41E-06
24	BS3B	RD53	0.01	3.63E-03	3.63E-03	4.36E-06	4.15E-05	1.50E-10	1.72E-06	6.26E-08
BS3B	25	RD54	0.01	3.48E-03	3.48E-03	4.18E-06	3.97E-05	1.44E-10	1.65E-06	6.00E-08
25	26	RD55	0.02	7.82E-03	7.82E-03	9.39E-06	8.94E-05	3.24E-10	3.71E-06	1.35E-07
26	BS3	RD56	0.01	3.48E-03	3.48E-03	4.18E-06	3.97E-05	1.44E-10	1.65E-06	6.00E-08
27	TSD	RD57	0.36	1.71E-01	1.71E-01	2.06E-04	1.96E-03	7.10E-09	8.12E-05	2.96E-06
27	OVB3	RD58	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
27	28	RD59	0.14	6.75E-02	6.75E-02	8.11E-05	7.71E-04	2.80E-09	3.20E-05	1.16E-06
28	TPD	RD60	0.03	1.23E-02	1.23E-02	1.48E-05	1.40E-04	5.09E-10	5.83E-06	2.12E-07
TPD	SDS	RD61	0.03	1.46E-02	1.46E-02	1.75E-05	1.67E-04	6.05E-10	6.92E-06	2.52E-07
SDS	29	RD62	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
TMF	TSD	RD63	0.03	1.27E-02	1.27E-02	1.53E-05	1.46E-04	5.28E-10	6.04E-06	2.20E-07
TMF	TWD	RD64	0.02	9.52E-03	9.52E-03	1.14E-05	1.09E-04	3.95E-10	4.51E-06	1.64E-07
TMF	TND	RD65	0.02	1.08E-02	1.08E-02	1.29E-05	1.23E-04	4.46E-10	5.11E-06	1.86E-07

Summary

Location	Model ID	NO_x (g/s)	CO (g/s)	SO_2 (g/s)	PM (g/s)	BaP (g/s)	Benzene (g/s)	1,3-Butadiene (g/s)
Quarry #1	TP_Q1	0.623023697	1.777177564	0.00305243	0.012453188	4.58588E-07	0.004885325	0.000286513
Quarry #2	TP_Q2	0.623023697	1.777177564	0.00305243	0.012453188	4.58588E-07	0.004885325	0.000286513
LP Central Pit	TP_LPC	6.302611636	15.19109802	0.025817413	0.114624139	3.85862E-06	0.037812629	0.002190708
Viggo Pit	TP_VP	0	0	0	0	0	0	0
Borrow Source #1	TP_BS1	0.048594775	0.524630929	0.000856879	0.002429739	1.71765E-07	0.00151658	6.88705E-05
Borrow Source #3	TP_BS3	0.048594775	0.524630929	0.000856879	0.002429739	1.71765E-07	0.00151658	6.88705E-05
Borrow Source #3BS3B	TP_BS3B	0.048594775	0.524630929	0.000856879	0.002429739	1.71765E-07	0.00151658	6.88705E-05
TMF Facility	TP_TMF	0.327264888	3.114588986	0.004871875	0.016363244	6.31375E-07	0.004638127	0.000193069
Dozers (Single Dozer)	Refer to Dozer C11 Tab	0.037914696	0.331753587	5.68E-04	0.001895735	1.05198E-07	0.000697108	2.65142E-05
Dozers (Open Pits)	Refer to Dozer C11 Tab	0.265402869	2.322275106	3.97E-03	0.013270143	7.36386E-07	0.004879756	0.0001856

Table 1: Tier 4 emission standards—Engines up to 560 kW, g/kWh (g/bhp-hr)

Emission Standards: USA: Nonroad Diesel Engines (dieselnet.com)

Engine Power	Year		CO	NMHC	NOx	PM (2.5)
kW < 8	2008		8.0	-	-	0.4[a]
8 ≤ kW < 19	2008		6.6	-	-	0.40
19 ≤ kW < 37	2008		5.5	-	-	0.30
	2013		5.5	-	-	0.03
37 ≤ kW < 56	2008		5.0	-	-	0.3[b]
	2013		5.0	-	-	0.03
56 ≤ kW < 130	2012-2014c		5.0	0.19	0.40	0.020
130 ≤ kW ≤ 560	2011-2014d		3.5	0.19	0.40	0.020

a - hand-startable, air-cooled, DI engines may be certified to Tier 2 standards through 2009 and to an optional PM standard of 0.6 g/kWh starting in 2010

b - 0.4 g/kWh (Tier 2) if manufacturer complies with the 0.03 g/kWh standard from 2012

c - PM/CO: full compliance from 2012; NOx/HC: Option 1 (if banked Tier 2 credits used)—50% engines must comply in 2012-2013; Option 2 (if no Tier 2 credits claimed)—25% engines must comply in 2012-2014, with full compliance from 2014.12.31

d - PM/CO: full compliance from 2011; NOx/HC: 50% engines must comply in 2011-2013

Table 2: Tier 4 emission standards—Engines above 560 kW, g/kWh (g/bhp-hr)

Emission Standards: USA: Nonroad Diesel Engines (dieselnet.com)

Category	Year		CO	NMHC	NOx	PM (2.5)
All engines except gensets > 900 kW	2011		3.5	0.4	3.5	0.10
All engines except gensets	2015		3.5	0.19	3.5	0.04

Table 3: MOVES Emissio Factors for PAHs and VOCs (g/hp-hr)

Equipment	Engine (HP)		Emission Factors (g/hp-h)						Load Factors (%)	Emission Rate (g/s)		
			BaP	Benzene	1,3-Butadiene					BaP	Benzene	1,3-Butadiene
Track Dozer (CAT D10T)	704	Crawler Tractor/Dozers	8.28E-07	5.48E-03	2.09E-04				65%	1.62E-07	1.07E-03	4.08E-05
Shovel 16.5 m3	1,672	Excavators	5.01E-07	5.65E-03	2.52E-04				65%	2.33E-07	2.62E-03	1.17E-04
Shovel 12.0 m3	1,055	Excavators	5.01E-07	5.65E-03	2.52E-04				65%	1.47E-07	1.65E-03	7.40E-05
Shovel 10.0 m3	824	Excavators	5.01E-07	5.65E-03	2.52E-04				65%	1.15E-07	1.29E-03	5.78E-05
Front End Loader	1,039	Rubber Tire Loaders	6.64E-07	7.80E-03	4.54E-04				65%	1.92E-07	2.25E-03	1.31E-04
Production Drill	871	Bore/Drill Rigs	7.79E-07	1.10E-02	8.81E-04				100%	1.88E-07	2.67E-03	2.13E-04
Primary Drill	540	Bore/Drill Rigs	6.92E-07	8.55E-03	6.38E-04				100%	1.04E-07	1.28E-03	9.57E-05
Front End Loader (smaller)	309	Rubber Tire Loaders	8.63E-07	6.53E-03	2.89E-04				65%	7.41E-08	5.60E-04	2.48E-05
Road Grader	374	Graders	8.26E-07	5.52E-03	2.07E-04				65%	8.58E-08	5.73E-04	2.15E-05
Forklift	73	Rough Terrain Forklifts	1.07E-06	1.09E-02	4.40E-04				65%	2.16E-08	2.21E-04	8.91E-06
50t Mobile Crane	363	Cranes	5.61E-07	6.45E-03	2.98E-04				30%	5.66E-08	6.50E-04	3.01E-05
150t Mobile Crane	544	Cranes	5.61E-07	6.45E-03	2.98E-04				30%	8.48E-08	9.74E-04	4.51E-05
Dozer - D10	602	Crawler Tractor/Dozers	8.28E-07	5.48E-03	2.09E-04				65%	1.38E-07	9.17E-04	3.49E-05
Dozer - D8 LPG	354	Crawler Tractor/Dozers	8.41E-07	5.68E-03	2.17E-04				65%	8.26E-08	5.58E-04	2.13E-05
Dozer - D6	215	Crawler Tractor/Dozers	3.79E-07	3.14E-03	1.14E-04				65%	2.26E-08	1.87E-04	6.82E-06
Wheel Dozer	620	Crawler Tractor/Dozers	8.28E-07	5.48E-03	2.09E-04				65%	1.43E-07	9.45E-04	3.59E-05
Excavator	490	Excavators	6.18E-07	4.13E-03	1.49E-04				65%	8.41E-08	5.62E-04	2.02E-05
Diesel Pump	440	Other Construction Equipment	8.37E-07	6.83E-03	3.93E-04				100%	1.02E-07	8.35E-04	4.81E-05
Fusion Machine	13	Other Construction Equipment	1.20E-06	2.02E-02	6.95E-04				100%	4.35E-09	7.28E-05	2.51E-06
Fire Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.69E-08	2.42E-04	8.44E-06
Dewatering Pump	125	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04				100%	4.04E-08	3.20E-04	1.28E-05
Skid Steer	75	Skid Steer Loaders	2.71E-06	3.73E-02	2.76E-03				65%	5.65E-08	7.77E-04	5.76E-05
TLB	72	Other Construction Equipment	1.56E-06	1.21E-02	5.10E-04				100%	3.11E-08	2.42E-04	1.02E-05
Fire Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.69E-08	2.42E-04	8.44E-06
Ambulance	250	Off-highway Trucks	1.99E-07	1.41E-03	4.85E-05				50%	1.38E-08	9.77E-05	3.37E-06
Container Trailer Truck	250	Off-highway Trucks	1.99E-07	1.41E-03	4.85E-05				50%	1.38E-08	9.77E-05	3.37E-06
Flat Deck Truck	250	Off-highway Trucks	1.99E-07	1.41E-03	4.85E-05				50%	1.38E-08	9.77E-05	3.37E-06
Fuel Tanker Truck (30,000 L)	353	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.25E-08	2.13E-04	7.45E-06
Water Truck (30,000 L)	353	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.25E-08	2.13E-04	7.45E-06
Portable Water Truck	353	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.25E-08	2.13E-04	7.45E-06
Sewage Collection Truck	353	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.25E-08	2.13E-04	7.45E-06
High Cube Truck	334	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.08E-08	2.02E-04	7.05E-06
Pick-up	200	Off-highway Trucks	1.99E-07	1.41E-03	4.85E-05				50%	1.10E-08	7.82E-05	2.70E-06
Bus (60 seats)	116	Off-highway Trucks	4.29E-07	2.01E-03	6.92E-05				50%	1.38E-08	6.48E-05	2.23E-06
Fire Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.69E-08	2.42E-04	8.44E-06
Integrated Tool Carrier	126	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04				100%	4.07E-08	3.22E-04	1.29E-05
Crusher	350	Crushing/Proc. Equipment	5.55E-07	6.43E-03	3.11E-04				100%	5.39E-08	6.25E-04	3.02E-05

Table C-30: Operations Phase Road Emissions (Tailpipe)

Lowboy and Tractor	500	Off-Highway Tractors	8.99E-07	6.43E-03	2.60E-04				50%	1.25E-07	8.93E-04	3.61E-05
Mechanics Truck	350	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.22E-08	2.12E-04	7.38E-06
Ore Control Drill	110	Bore/Drill Rigs	8.59E-07	1.03E-02	6.98E-04				100%	2.62E-08	3.13E-04	2.13E-05
Snow Plow/Water Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.69E-08	2.42E-04	8.44E-06
Tire Manipulator	353	Other Construction Equipment	8.37E-07	6.83E-03	3.93E-04				100%	8.20E-08	6.70E-04	3.86E-05
Blasters Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.69E-08	2.42E-04	8.44E-06
Blasting Loader	75	Tractors/Loaders/Backhoes	2.16E-06	2.93E-02	1.68E-03				65%	4.50E-08	6.10E-04	3.50E-05
D6 EX Dozer	215	Crawler Tractor/Dozers	3.79E-07	3.14E-03	1.14E-04				65%	2.26E-08	1.87E-04	6.82E-06
Loader (FEL) Cat 966	330	Rubber Tire Loaders	8.63E-07	6.53E-03	2.89E-04				65%	7.91E-08	5.98E-04	2.65E-05
Backhoe 330	275	Tractors/Loaders/Backhoes	1.42E-06	1.78E-02	1.02E-03				65%	1.09E-07	1.36E-03	7.79E-05
Dewatering Pump	125	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04				100%	4.04E-08	3.20E-04	1.28E-05
Screening Plant	140	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04				100%	4.52E-08	3.58E-04	1.43E-05
D6 EX Dozer	215	Crawler Tractor/Dozers	3.79E-07	3.14E-03	1.14E-04				65%	2.26E-08	1.87E-04	6.82E-06
D8 Dozer	354	Crawler Tractor/Dozers	8.41E-07	5.68E-03	2.17E-04				65%	8.26E-08	5.58E-04	2.13E-05
D6 Dozer	165	Crawler Tractor/Dozers	6.51E-07	4.06E-03	1.46E-04				65%	2.98E-08	1.86E-04	6.71E-06
336 CAT Excavator	300	Excavators	6.18E-07	4.13E-03	1.49E-04				65%	5.15E-08	3.44E-04	1.24E-05
Tandem Truck	500	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	4.61E-08	3.02E-04	1.05E-05
CAT 740 EJ Articulated Trucks	496	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	4.57E-08	3.00E-04	1.05E-05
CAT CS64B Compactor	131	Rollers	8.42E-07	5.49E-03	2.04E-04				65%	3.06E-08	2.00E-04	7.41E-06
JD 640L Skidder	237	Skid Steer Loaders	1.97E-06	2.67E-02	1.99E-03				65%	1.30E-07	1.76E-03	1.31E-04
Flat Bed or Boom Truck	600	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	5.53E-08	3.63E-04	1.27E-05
Light Duty Pickup Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				50%	3.69E-08	2.42E-04	8.44E-06
Dewatering Pump	125	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04				100%	4.04E-08	3.20E-04	1.28E-05
Blasters Truck	400	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				65%	3.69E-08	2.42E-04	8.44E-06
Blasting Loader	75	Tractors/Loaders/Backhoes	2.16E-06	2.93E-02	1.68E-03				65%	4.50E-08	6.10E-04	3.50E-05
Pickup Trucks	300	Off-highway Trucks	3.32E-07	2.18E-03	7.60E-05				65%	2.76E-08	1.81E-04	6.33E-06
Primary Drill	540	Bore/Drill Rigs	6.92E-07	8.55E-03	6.38E-04				100%	1.04E-07	1.28E-03	9.57E-05
Production Backhoe	785	Excavators	5.01E-07	5.65E-03	2.52E-04				65%	1.09E-07	1.23E-03	5.50E-05
Production Loader	1,676	Rubber Tire Loaders	6.64E-07	7.80E-03	4.54E-04				65%	3.09E-07	3.63E-03	2.11E-04
Rock Crusher	276	Crushing/Proc. Equipment	4.60E-07	5.56E-03	2.13E-04				65%	3.53E-08	4.26E-04	1.63E-05
Dozer	354	Crawler Tractor/Dozers	8.41E-07	5.68E-03	2.17E-04				65%	8.26E-08	5.58E-04	2.13E-05
Dewatering Pump	125	Other Construction Equipment	1.16E-06	9.21E-03	3.68E-04				100%	4.04E-08	3.20E-04	1.28E-05
Screening Plant	200	Other Construction Equipment	8.73E-07	7.79E-03	3.12E-04				100%	4.85E-08	4.33E-04	1.74E-05
Haul Trucks (777)	1050		4.32E-07	4.94E-03	1.80E-04				40%	1.26E-07	1.44E-03	5.24E-05
Haul Trucks (785)	1450		4.32E-07	4.94E-03	1.80E-04				40%	1.74E-07	1.99E-03	7.24E-05
Haul Truck Average	1210		4.32E-07	4.94E-03	1.80E-04				40%	1.45E-07	1.66E-03	6.04E-05

Table C-31: Operations Equipment On Site

Source ID	Source Description	Engine Type (Example)	Engine Size / Description	Engine Output (HP)	Equipment Quantity	Percentage of time the equipment is operated (%)
Open Pit Mine	Haul Truck	Diesel >=19kW, Tier 4	CAT 777F	1,030	12	64%
Open Pit Mine	Haul Truck	Diesel >=19kW, Tier 4	CAT 785	1,450	18	64%
Open Pit Mine	Shovel 16.5 m3	Diesel >=19kW, Tier 4	CAT 6030	1,672	2	64%
Open Pit Mine	Shovel 12.0 m3	Diesel >=19kW, Tier 4	CAT 6020	1,055	2	64%
Open Pit Mine	Shovel 10.0 m3	Diesel >=19kW, Tier 4	CAT 6015	824	1	64%
Open Pit Mine	Front End Loader	Diesel >=19kW, Tier 4	CAT993	1,039	3	64%
Open Pit Mine	Production Drill	Diesel >=19kW, Tier 4	Epiroc Pit Viper PV235	871	6	64%
Open Pit Mine	Primary Drill	Diesel >=19kW, Tier 4	140mm SmartRoc D65	540	3	64%
Open Pit Mine	Front End Loader (smaller)	Diesel >=19kW, Tier 4	CAT 966	309	4	75%
Open Pit Mine	Road Grader	Diesel >=19kW, Tier 4	CAT 16	374	5	75%
Open Pit Mine	Forklift	Diesel >=19kW, Tier 4	Cat DP40-55(C)N3, 5.5 tonne	73	5	25%
Open Pit Mine	50t Mobile Crane	Diesel >=19kW, Tier 4	Tadano GR-500XL	363	2	25%
Open Pit Mine	150t Mobile Crane	Diesel >=19kW, Tier 4		544	1	25%
Open Pit Mine	Dozer - D10	Diesel >=19kW, Tier 4	CAT D10	602	5	64%
Open Pit Mine	Dozer - D8 LPG	Diesel >=19kW, Tier 4	CAT D8	354	2	64%
Open Pit Mine	Dozer - D6	Diesel >=19kW, Tier 4	CAT D6	215	3	64%
Open Pit Mine	Wheel Dozer	Diesel >=19kW, Tier 4	CAT 844 RTD	620	2	64%
Open Pit Mine	Excavator	Diesel >=19kW, Tier 4	CAT 374	490	3	25%
Open Pit Mine	Diesel Pump	Diesel >=19kW, Tier 4	HL250M	440	5	100%
Open Pit Mine	Fusion Machine	Diesel < 19kW	24" HDPE	13	3	50%
Open Pit Mine	Fire Truck	Diesel >=19kW, Tier 4	TBD	400	1	25%
Open Pit Mine	Dewatering Pump	Diesel >=19kW, Tier 1–3		125	10	100%
Open Pit Mine	Skid Steer	Diesel >=19kW, Tier 4	Bobcat S650	75	2	25%
Open Pit Mine	TLB	Diesel >=19kW, Tier 4	Cat 422F2	72	2	25%
Open Pit Mine	Fire Truck	Diesel >=19kW, Tier 4	TBD	400	1	25%
Open Pit Mine	Ambulance	Diesel >=19kW, Tier 4	TBD	250	1	25%
Open Pit Mine	Container Trailer Truck	Diesel >=19kW, Tier 4	TBD	250	2	25%
Open Pit Mine	Flat Deck Truck	Diesel >=19kW, Tier 4	TBD	250	2	25%
Open Pit Mine	Fuel Tanker Truck (30,000 L)	Diesel >=19kW, Tier 4	TBD	353	2	50%
Open Pit Mine	Water Truck (30,000 L)	Diesel >=19kW, Tier 4	CAT 740	353	2	50%
Open Pit Mine	Portable Water Truck	Diesel >=19kW, Tier 4	TBD	353	2	50%
Open Pit Mine	Sewage Collection Truck	Diesel >=19kW, Tier 4	TBD	353	1	25%
Open Pit Mine	High Cube Truck	Diesel >=19kW, Tier 4	Ford F-650® SD DIESEL	334	2	25%
Open Pit Mine	Pick-up	Diesel >=19kW, Tier 4	TBD	200	50	25%
Open Pit Mine	Bus (60 seats)	Diesel >=19kW, Tier 4	TBD	116	15	25%
Open Pit Mine	Fire Truck	Diesel >=19kW, Tier 4		400	1	25%
Open Pit Mine	Integrated Tool Carrier	Diesel >=19kW, Tier 4	WA200-7	126	1	25%
Open Pit Mine	Crusher	Diesel >=19kW, Tier 1–3	Sandvik QJ341	350	1	50%
Open Pit Mine	Lighting Plants	Solar		N/A	2	50%
Open Pit Mine	Lowboy and Tractor	Diesel >=19kW, Tier 1–3	75ton - 100ton	500	1	25%
Open Pit Mine	Mechanics Truck	Diesel >=19kW, Tier 4		350	5	50%
Open Pit Mine	Ore Control Drill	Diesel >=19kW, Tier 1–3	Explorac E100	110	5	75%
Open Pit Mine	Snow Plow/Water Truck	Diesel >=19kW, Tier 4	T880	400	2	25%
Open Pit Mine	Tire Manipulator	Diesel >=19kW, Tier 4	WA-500-7	353	1	25%
Open Pit Mine	Blasters Truck	Diesel >=19kW, Tier 4	F350	400	2	50%
Open Pit Mine	Blasting Loader	Diesel >=19kW, Tier 4	CAT 262	75	2	50%
Borrow Sources	D6 EX Dozer	Diesel >=19kW, Tier 4		215	1	50%
Borrow Sources	Loader (FEL) Cat 966	Diesel >=19kW, Tier 4	5.5 Cy	330	1	50%
Borrow Sources	Backhoe 330	Diesel >=19kW, Tier 4		275	1	50%
Borrow Sources	Dewatering Pump	Diesel >=19kW, Tier 1–3		125	2	100%
Borrow Sources	Screening Plant	Diesel >=19kW, Tier 4	SPYDER 622TH triple deck	140	1	50%
Tailings Facility	D6 EX Dozer	Diesel >=19kW, Tier 4		215	2	50%
Tailings Facility	D8 Dozer	Diesel >=19kW, Tier 1–3		354	2	75%
Tailings Facility	D6 Dozer	Diesel >=19kW, Tier 1–3		165	3	75%
Tailings Facility	336 CAT Excavator	Diesel >=19kW, Tier 1–3		300	3	100%
Tailings Facility	Tandem Truck	HDDV (Moderate Control)		500	5	50%
Tailings Facility	CAT 740 EJ Articulated Trucks	Diesel >=19kW, Tier 4		496	5	50%
Tailings Facility	CAT CS64B Compactor	Diesel		131	3	75%
Tailings Facility	JD 640L Skidder	Diesel		237	2	25%
Tailings Facility	Flat Bed or Boom Truck	Diesel >=19kW, Tier 1–3		600	1	50%
Tailings Facility	Light Duty Pickup Truck	LDDV (Moderate Control)		400	3	100%
Tailings Facility	Dewatering Pump	Diesel >=19kW, Tier 1–3		125	3	100%
Quarry Source	Blasters Truck	Diesel >=19kW, Tier 4	F350	400	1	50%
Quarry Source	Blasting Loader	Diesel >=19kW, Tier 4	CAT 262	75	1	50%
Quarry Source	Pickup Trucks	Diesel >=19kW, Tier 4		300	1	50%
Quarry Source	Primary Drill	Diesel >=19kW, Tier 4	140mm SmartRoc D65	540	2	75%
Quarry Source	Production Backhoe	Diesel >=19kW, Tier 4	PC1250 (6.7m3)	785	1	25%
Quarry Source	Production Loader	Diesel >=19kW, Tier 4	L-1350 (23m3)	1,676	1	50%
Quarry Source	Rock Crusher	Diesel >=19kW, Tier 1–3	Sandvik UD211	276	1	75%
Quarry Source	Lighting Plants	Solar		N/A	2	50%
Quarry Source	Dozer	Diesel >=19kW, Tier 1–3	D8	354	1	50%
Quarry Source	Dewatering Pump	Diesel >=19kW, Tier 1–3		125	2	100%
Quarry Source	Screening Plant	Diesel >=19kW, Tier 1–3		200	1	50%

Table C-32: Operations Phase - Open Face Wind Erosion

An average value for wind erosion from open areas and stockpiles was recommended by Australian NPI Australlia DSEWPC. 2012. National Pollutant Inventory Emission Estimation Technique Manual for Mining (Version 3.1), Table 2). This approach was used to avoid overestimating the disturbed areas that would be susceptible to wind erosion.

This estimated average value is more conservative in nature than the estimated wind erosion of overburden or graded areas at surface coal mine (AP-42 Section 11.9), which estimates that the annual losses from wind erosion are 0.85 Mg/ha/year (or 0.097 kg/ha/h).

Average Wind Erosion from Exposed Areas (kg/ha/hr)			**Average Wind Erosion from Exposed Areas ($g/m^2/s$)**		
TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
0.40	0.20	0.15	0.0000111	0.0000056	0.0000042

Site Activity per day	24	Control Efficiency %	80

Location	**Total Area (m^2)**	**Total Area (ha)**	**Emissions (kg/h)**		
			TSP	**PM_{10}**	**$PM_{2.5}$**
NPAG Stockpile	5,000	0.50	0.20	0.10	0.08
PAG Stockpile	5,000	0.50	0.20	0.10	0.08
LGO Stockpile - Small	5,000	0.50	0.20	0.10	0.08
LGO Stockpile - Big	5,000	0.50	0.20	0.10	0.08
Overburden #1	5,000	0.50	0.20	0.10	0.08
Overburden #2	5,000	0.50	0.20	0.10	0.08
Overburden #3	5,000	0.50	0.20	0.10	0.08
Overburden #5	5,000	0.50	0.20	0.10	0.08
Overburden #6	5,000	0.50	0.20	0.10	0.08
TMF Facility	5,000	0.50	0.20	0.10	0.08
ROM Stockpile	5,000	0.50	0.20	0.10	0.08

Location	**Uncontrolled Emission Rate (g/s)**					
	24-Hour Averaging Emissions			**1-Hour Averaging Emissions**		
	TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
NPAG Stockpile	0.06	0.03	0.02	0.06	0.03	0.02
PAG Stockpile	0.06	0.03	0.02	0.06	0.03	0.02
LGO Stockpile - Small	0.06	0.03	0.02	0.06	0.03	0.02
LGO Stockpile - Big	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #1	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #2	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #3	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #5	0.06	0.03	0.02	0.06	0.03	0.02
Overburden #6	0.06	0.03	0.02	0.06	0.03	0.02
TMF Facility	0.06	0.03	0.02	0.06	0.03	0.02
ROM Stockpile	0.06	0.03	0.02	0.06	0.03	0.02

Location	**Controlled Emission Rate (g/s)**					
	24-Hour Averaging Emissions			**1-Hour Averaging Emissions**		
	TSP	PM_{10}	$PM_{2.5}$	TSP	PM_{10}	$PM_{2.5}$
NPAG Stockpile	0.011	0.006	0.004	0.011	0.006	0.004
PAG Stockpile	0.011	0.006	0.004	0.011	0.006	0.004
LGO Stockpile - Small	0.011	0.006	0.004	0.011	0.006	0.004
LGO Stockpile - Big	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #1	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #2	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #3	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #5	0.011	0.006	0.004	0.011	0.006	0.004
Overburden #6	0.011	0.006	0.004	0.011	0.006	0.004
TMF Facility	0.011	0.006	0.004	0.011	0.006	0.004
ROM Stockpile	0.011	0.006	0.004	0.011	0.006	0.004

It should be noted that the particulate emissions from disturbed, or active, stockpiles, may be significantly higher during periods of high winds. However the emission rate during such events decreases quickly as the particulate matter on the surface that is susceptible to the wind is finite. Such episodes or events are best managed by on-site practices such as water application and modified activity at stockpiles during high wind events.

The use of the current emission factors for wind erosion in the U.S. EPA's AP-42 document would require hourly input of emission values. In addition, that factor only applies to a limited number of hours above a high wind speed threshold. For these reasons, a more practical approach was used to avoid modelling a different emission value for each hour of meteorological data. An average value based on the emission factor for coal mines was used. Since this factor would lead to higher wind erosion because dust related wind erosion is more likely to occur than asphalt, limestone, or overburden type soil related wind erosion, that approach is considered conservative. In addition, wind erosion is only expected to significantly occur when the wind speed exceeds 10 m/s. The wind erosion was therefore modelled using a variable emission rate, assuming 0 g/s if the wind speed is less than 2.5 m/s, and as calculated for wind speeds greater than this threshold.

Table C-33: Operations Phase - Assay Lab

Emissions from assay lab operations include SPM, metals, and NOx. Emissions from reagent usage was not assessed due to likely meeting negligibility criteria (small quantities used per day, minimal vapour and all fume hoods connected to scrubbing systems.

Fire Assay (PM, Metals)- Benches and Furnaces

Emissions for dust collectors associated with bench work and furnaces were estimated using the emission factor for baghouses published in the MECP Guideline A-10, Table C-2, using an outlet loading of 20 mg/m³ for the

Data Quality: Above Average

			Flowrate (cfm)	Flowrate (m^3/s)	Concentration (mg/m^3)	PM10[1] Emission Rate (g/s)	SPM Emission Rate (g/s)	PM2.5[1] Emission Rate (g/s)
DC_FA	Fire Assay Dust Collector	DC_FA	9,000	4.2	20	0.044	0.085	0.026
			Metal	**Metal Content (mg/mg)**	**Concentration (mg/m^3) [2]**	**Metal Emission Rate (g/s)**	**% of Total**	
			Arsenic	1.72E-02	3.43E-01	1.46E-03	0.6875%	
			Chromium	2.30E-03	4.61E-02	1.96E-04	0.0923%	
			Copper	5.92E-03	1.18E-01	5.03E-04	0.2371%	
			Iron	1.64E+00	3.28E+01	1.39E-01	65.6790%	
			Mercury	4.35E-06	8.70E-05	3.69E-07	0.0002%	
			Magnesium	3.22E-01	6.44E+00	2.73E-02	12.8876%	
			Manganese	3.36E-02	6.72E-01	2.86E-03	1.3467%	
			Nickel	4.41E-03	8.82E-02	3.75E-04	0.1767%	
			Lead	1.07E-02	6.67	2.83E-02	13.3508%	
			Titanium	8.87E-02	1.77E+00	7.54E-03	3.5543%	
			Zinc	4.96E-02	9.93E-01	4.22E-03	1.9880%	

(1) PM10 Emission Rates based on a 0.52 ratio from TSP (SPM) (Lall et. al. 2004)

(1) The addition of Flux (containing Lead Oxide) is introduced during the fire assay process - the outlet concentration of Pb is therefore conservatively assumed to equal 1/3 of maximum concentration given by emission factor for baghouses.

Propane Fired Furnace and Oven (NOx)

As per ESDM Guideline A-10 Section 7.1.1, only NOx emissions are considered for propane.
The US EPA AP-42 Section 1.5 emission factor for liquified petroleum gas was used to estimate NOx from propane furnace and oven.
US EPA Emission Factor Rating: E — Data Quality: Uncertain

Equipment	Provided Heating Data	Maximum Propane Use (L/hour)	Emission Factor (lb/10^3 gal)	Emission Rate (g/s)
Furnace Fusion	N/A	12.7	13	5.50E-03
Drying Oven	N/A	39.7	13	1.72E-02
			Total	**2.27E-02**

Emission Rate =	L/hour x 0.264 gallon/L x EF x 454 g/lb / 1000 /3600 sec/hour
MJ to BTU	947.81708
Propane HV (MMBtu/10^3 gal)	91.5
gal to L	4.546

Table C-34: Operations Phase - Portable Crushers

Emission Factors Reference:

Emission Factors Reference: US EPA AP-42, Table 11.19.2-1

Portable crushing operations located west of the polishing pond where the MGO and LGO stockpiles meet.

Max Spec = 150 metric tonne per hour
Operates max 12 hours per day

Crusher Processing Rate	664	m3/day
	2.71	t/m3
	150	tph

Activity	SCC	PM Emission Factor kg/Mg	PM Emission Factor kg/hr	Client Crusher Operation Hours (Per Day)	Emission Rate (g/s)	EPA Rating	Final Rating*	Notes
Drop to Crusher	3-05-020-31	0.000016	0.0024	12	0.0003	E	F	factor only for PM10.TPM assumed to be 2 X
Primary Crushing (Jaw)	3-05-020-03	0.0027	0.405	12	0.0563	E	F	no factor given, tertiary crushing factor used
Secondary Crushing (Cone)	3-05-020-03	0.0027	0.405	12	0.0563	E	F	no factor given, tertiary crushing factor used
Screening	3-05-020-02	0.0125	1.875	12	0.2604	E	E	1x screener
Conveyor Transfer Point	3-05-020-06	0.0045	0.675	12	0.0938	E	E	3x Transfer Point (from jaw, from screen, from cone)
Load Out from Crusher	3-05-020-32	0.00010	0.015	12	0.0021	E	F	factor only for PM10.TPM assumed to be 2 X
	Total Crushing Emission Rate per location				**0.47**			

* EPA rating downgraded one level where factor not specific

	Emission Rate (g/s)	Location Factor	**TSP (g/s)**	**PM_{10} (g/s)**	**$PM_{2.5}$ (g/s)**
Quarry Portable Crusher	0.35	75%	3.52E-01	1.76E-01	8.80E-02
CRF Portable Crusher	0.12	25%	1.17E-01	5.86E-02	2.93E-02