Spanish Mountain Gold Project

Initial Project Description

Spanish Mountain Gold Ltd.

15 March 2022

INITIAL PROJECT DESCRIPTION SUMMARY

This document is an Initial Project Description (IPD) for the proposed Spanish Mountain Gold Project (the Project), which is being developed by Spanish Mountain Gold Ltd. (SMG). The Project description is based on a Pre-Feasibility Study completed by SMG in 2021 that envisions an open pit gold mine with an estimated production of approximately 96 million tonnes of ore, mined and processed at a planned throughput of 20,000 tonnes per day over a mine life of 14 years.

The purpose of the IPD is to initiate the regulatory approval process of the Project and to provide information for interested parties to understand the proposed Project. This document is the basis for engagement with Indigenous Nations, the public, and government during early engagement.

The Project is subject to review under the BC *Environmental Assessment Act* (BCEAA) that is administered by the British Columbia Environmental Assessment Office (BCEAO). The production capacity of the proposed project will be 7,300,000 tonnes per year, which will exceed 75,000 tonnes per year of mineral ore specified in the Reviewable Projects Regulation to the BCEAA.

Similarly, the Project is expected to be identified as a 'designated project' under the federal *Impact Assessment Act* (IAA) as it will be captured under the *Physical Activities Regulations*. The Regulations specify that designated projects include a new metal mine with ore production capacity of 5,000 tonnes per day or more, and a new metal mill with an ore input capacity of 5,000 tonnes per day or more.

SMG will utilize the IPD for entry into the assessment process of the BC EAA and IAA. In accordance with the Impact Assessment Cooperation Agreement between Canada and British Columbia (2019), SMG will ask that the Province make a request to the federal Minister of Environment and Climate Change to approve the substitution of the BC Environmental Assessment process for the federal Impact Assessment process, in which case the Province would commit to meet the legislative requirements of the federal Impact Assessment process and provide its report to both the Provincial and Federal Ministers for their consideration and decision.

SMG anticipates that several provincial and federal permits will be required to support construction and operation of the Project, as summarized in Tables S1 and S2.

Table S1 Summary of Possible Provincial Authorizations

Legislation	Authorization	Authorization Purpose
Drinking Water Protection Act	1) Water System Construction Permit 2) Water System Operating Permit	To construct and operate potable water supply systems for camps and process plant
Drinking Water Protection Act	Food Facility - Health Approval Application	Opening and operating a food service facility
Environmental Management Act	Effluent Discharge Permit	Authorizes discharges from sedimentation ponds, water treatment plants, tailings storage facility and seepage
Environmental Management Act	Air Emissions Discharge Permit	Authorizes discharges from incinerator and process plant
Environmental Management Act	Solid Waste Discharge Permit	Authorizes disposal of solid waste
Environmental Management Act	Hazardous Waste Registration	Authorizes hazardous waste transfer facility, plant truck shop
Environmental Management Act	Fuel Storage Registration	Authorizes fuel storage
Environmental Management Act	Sewage Registration	Authorizes sewage treatment plant
Forest Act	Occupant License(s) to Cut (Mines Act permit area, mine access road, airstrip and access road, waterline License of Occupation area, Transmission line License of Occupation area (and associated roads, laydown areas)	Authorizes Crown timber harvesting
Forest Act	Road Use Permit	Authorizes use of FSRs
Forest and Range Practices Act	Special Use Permit	Authorizes construction and operation of the Mine Access Road
Forest and Range Practices Act	Consent to connect Mine Access Road to FSR	Authorizes connection of FSR to Mine Access Road
Heritage Conservation Act	Permits (Archaeological Impact Assessment [AIA]/site alteration)	Authorizes site alteration and inspection
Land Act	License of Occupation (transmission line)	Authorizes occupancy and use of Crown Land
Land Act	Temporary use permit	Temporary access roads
Mineral Tenure Act	Mining lease	Production of minerals
Land Title Act	Easement (transmission line)	Authorizes occupancy and use of private land
Mines Act	Permit Approving Mine Plan and Reclamation Program	Approves mine plan and reclamation program
Mines Act	Explosives Storage and Use Permit	Use, care, transportation of explosives
Safety Standards Act	Permit	Connect a powerline
Water Sustainability Act	License (Section 9/7)	Diversion, storage or use of surface water or

Legislation	Authorization	Authorization Purpose
		groundwater for one or more purposes Construction of water storage dams, groundwater wells
Water Sustainability Act	Approvals/Notifications of changes in or about a stream (Section 11)	Changes in or about a stream for the water line and crossings associated with the water line access road, transmission line, Mine Access Road.
Wildlife Act	License	Designate no shooting area, relocate wildlife during construction

Table S1 Summary of Possible Federal Authorizations

Legislation	Authorization	Authorization Purpose
Explosives Act	License	Manufacturing and use of explosives
Fisheries Act Metal and Diamond Mining Effluent Regulations	Schedule 2 Amendment	Deposition of mine waste to fish bearing waterbodies
Fisheries Act (Section 34 and 35)	Authorization	Harmful, alteration, disruption of fish habitat (HADD; Section 35(1))
Migratory Birds Convention Act (Section 5)	Permit	Authorizes periods during which migratory birds and/or their nests may be impacted
Radio Communications Act	License	Issuance and operation of designated frequency
Species at Risk Act (Section 32 and 33)	Permit	Provides for protection of listed species in accordance with regulations
Transportation of Dangerous Goods Act	Permit	Transport of dangerous goods

Review of the Project was initiated in 2011 under the former (2002) BCEAA and Canadian Environmental Assessment Act (1992). Detailed environmental and socio-economic baseline studies were conducted in 2010 and 2011. Advancement on the EA was halted by SMG in 2012 while project design updates were completed. Between 2012 and 2019, both provincial and federal reviews were kept open, with SMG providing annual updates regarding its intention to continue the process. In recognition of new provincial and federal EA legislation coming into force, the Project was withdrawn from environmental assessment in 2019. This document represents the Project's re-entry to the provincial and federal review processes.

The impact assessment process will be initiated when the BCEAO and the Impact Assessment Agency of Canada (IAAC) each accept the IPD and seek public comments on it. Regulators, agencies, Indigenous Nations, and the public will have an opportunity to provide comments.

The primary representative from SMG during the regulatory review of the Project is:

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Project Location

The Project is located in the Cariboo Mining Division and the Cariboo Regional District of central British Columbia (Figure S1). The Property is located approximately 70 km northeast of Williams Lake, BC, with the closest population centre being the village of Likely, located about 6 km northwest. The Project is centred at 52 degrees 35 minutes North, 121 degrees 26 minutes West. The area of disturbance estimated for the mine site is 27 km^2, along with approximately 37 km^2 of transmission line footprint and buffer, which primarily follows an existing road and power corridor.

The Project lies within the traditional territories of the following First Nations:

Northern Shuswap Tribal Council

- Williams Lake First Nation (T'exelcemc)
- Xatśūll First Nation

Carrier Chilcotin Tribal Council

- Lhtako Dene Nation (Red Bluff Indian Band)

The Williams Lake First Nation reserve lands comprise 8 parcels, totaling approximately 1921 ha, centred approximately 52 km southwest of the Project site and 10 km east of Williams Lake (Figure S2). The WLFN office and primary community is located near Williams Lake, approximately 63 km from the Project.

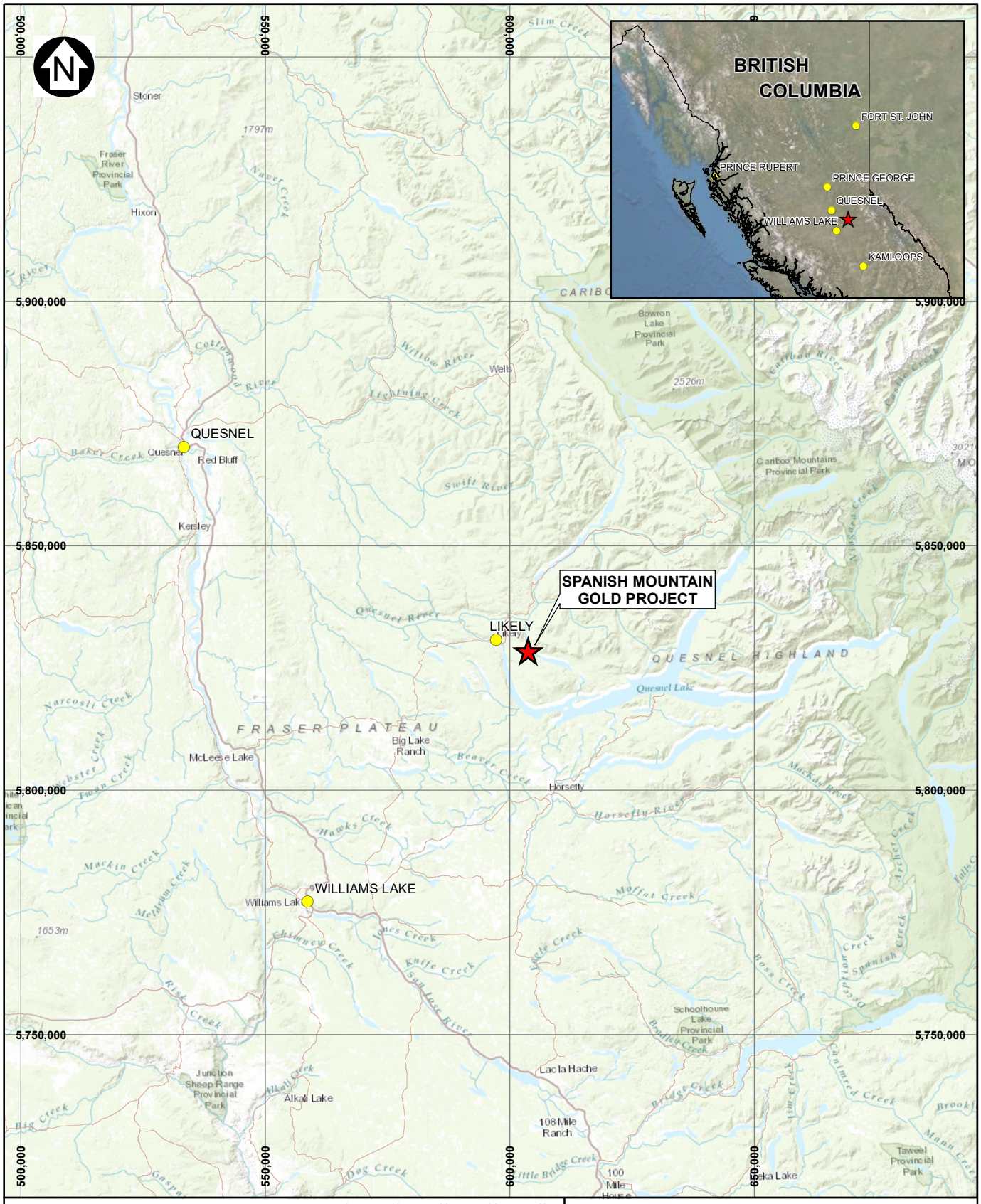
The Xatśūll First Nation reserve lands total 2093 ha, centred approximately 50 km southwest of the Project site, approximately 13 km north of Williams Lake (Figure S2). The Xatśūll First Nation office is located approximately 58 km from the Project.

The Lhtako Dene Nation reserve lands total approximately 683 ha, centred approximately 72 km northwest of the Project site and adjacent to the City of Quesnel (Figure S2). The LDN office is located approximately 80 km from the Project.

The point of interconnection of the powerline for the project, at McLeese Lake, occurs within the eastern margin of the asserted traditional territory of the Tsilhqot'in Nation.

The Métis Nation British Columbia assert Aboriginal rights in and around the Project area. The Cariboo-Chilcotin Métis Association, a Chartered Métis community based in Williams Lake, asserts harvesting and hunting rights in the region.

The Project is located on provincial crown land within mineral tenures held by SMG. The Project will not use any federal lands. The Williams Lake First Nation has signed a First Nations Land Management Act agreement with Canada, which enables the nation to opt-out of 40 sections of the Indian Act relating to land management. The nation can then develop their own laws about land use, the environment and natural resources and take advantage of cultural and economic development opportunities with their new land management authorities.



LEGEND:

- PROJECT LOCATION
- COMMUNITY

NOTES:

0 5 10 20 30 40 Km

1. BASE MAP: ESRI ONLINE WORLD TOPOGRAPHIC MAP
2. COORDINATE GRID IS IN METRES.
   COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:1,100,000 FOR 8.5x11 (LETTER) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

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PROJECT LOCATION

Knight Piésold CONSULTING

P/A NO. VA102-272/15 | REF NO. 1

FIGURE S.1 | REV 0

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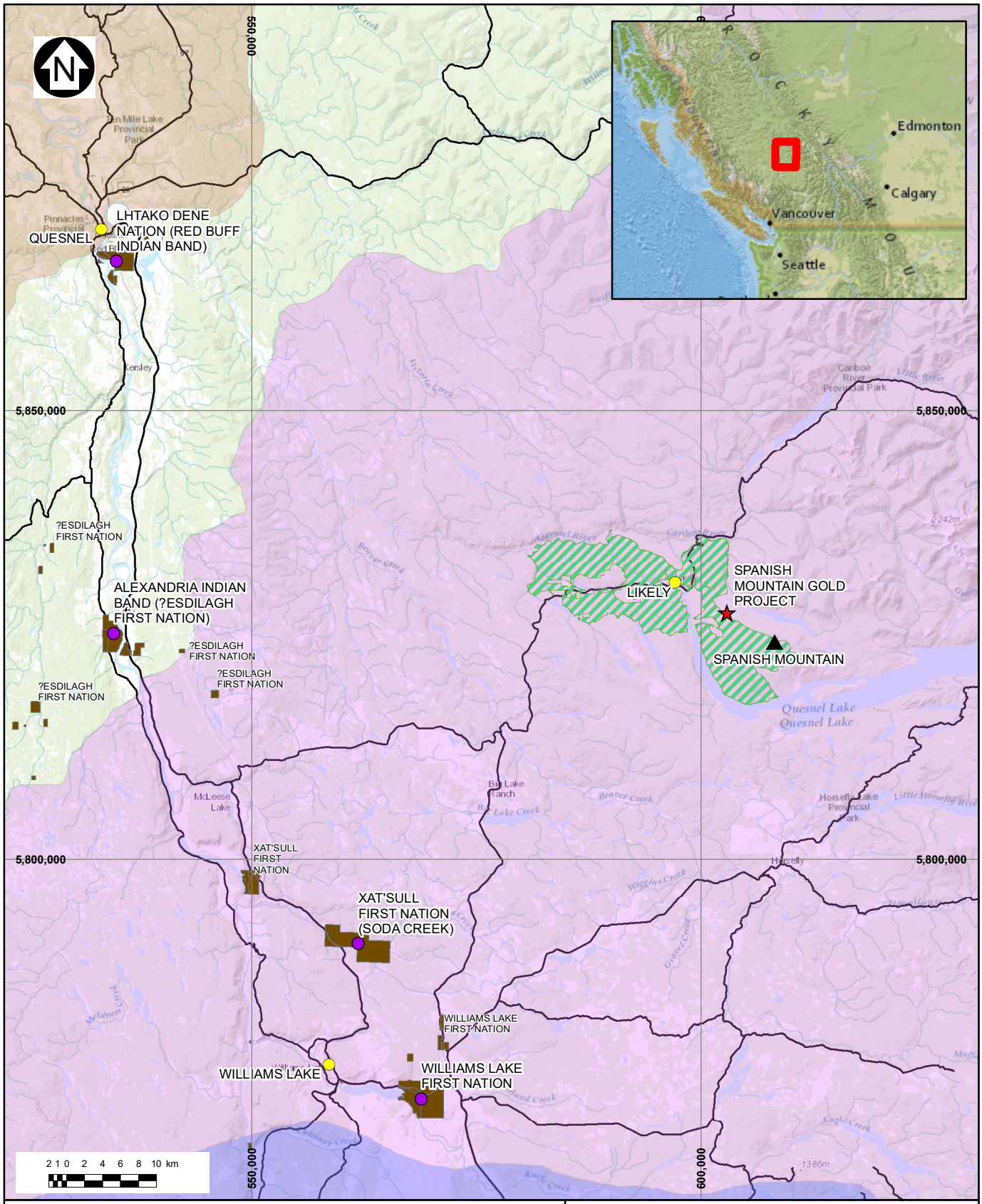

LEGEND:

- PROJECT LOCATION
- FIRST NATIONS COMMUNITY
- COMMUNITY
- ROADS
- INDIAN RESERVE
- LIKELY - XATS'ULL COMMUNITY FOREST
- NORTHERN SHUSWAP TRIBAL COUNCIL STATEMENT OF INTENT
- NAZKO FIRST NATION STATEMENT OF INTENT
- ESK'ETEMC FIRST NATION STATEMENT OF INTENT

NOTES:

1. BASE MAP: MAIN - ESRI TOPOGRAPHIC, INSET - ESRI NATIONAL GEOGRAPHIC
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:600,000 FOR 8.5x11 (LETTER) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FIRST NATIONS DATA OBTAINED FROM IMAPBC
5. DARK BLUE STATEMENT OF INTENT AREA SHOWN AT BOTTOM OF FIGURE REPRESENTS COMBINATION OF NORTHERN SHUSWAP AND ESK'ETEMC FIRST NATIONS

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SPANISH MOUNTAIN FIRST NATION INTEREST

Knight Piésold CONSULTING

P/A NO. VA102-272/15 | REF NO. 1

FIGURE S.2 | REV 0

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Project Purpose and Justification

The purpose of the Spanish Mountain Gold Project is to produce 2.1 million ounces of gold and 0.9 million ounces of silver over its projected operational life of 14 years. The Project justification includes the provision of jobs and economic opportunities for local First Nations, and the people of BC and Canada. In addition, the Project will contribute financially to the Provincial and Federal Governments through corporate taxes, Provincial net proceeds and net revenue taxes, and sales taxes. The Project is expected to provide between 2000 and 2500 person-years of employment during construction and at peak operations, the Project is expected to employ 360 people.

Project Description and Alternatives

The Spanish Mountain deposit will be mined using a conventional drill and blast open pit mining method. The mining fleet will include hydraulic excavators and wheel loaders for mine loading, 140 tonne payload haul trucks and 40 tonne articulated trucks for production hauling.

Ore will be hauled to a crusher 0.5 km west of the pit and crushed to feed the process plant. Waste rock will be deposited into waste rock storage facilities (WRSF) 0.5 to 2.0 km west of the pit or used as rockfill to construct a tailings dam embankment 4.0 km southwest of the pit.

The tailings storage facility (TSF) will comprise a north embankment (dam) and a south embankment (dam) with the east and west margins confined by local topography. The embankments will be built as earthfill/rockfill structures with a low-permeability core. The TSF embankments will be expanded in stages throughout the mine life using the centerline construction method, with each stage providing the required capacity for the period until the next stage of construction is completed. The TSF north embankment will be approximately 31 m high at the starter configuration and 58 m high at its ultimate height. The TSF south embankment will be approximately 17 m at the starter configuration and 44 m high at its ultimate height. Seven stages of construction are expected to be required to reach the final crest elevations. Each stage will be constructed in advance of the storage needs of the project, at approximately one-to two-year intervals.

Mining dams in BC are regulated by the BC Health Safety and Reclamation Code issued by the Ministry of Energy, Mines and Low Carbon Innovation. Additionally, the new Global Industry Standard on Tailings Management recommendations further strengthens the design approach (GISTM 2020). The TSF for the Project has been designed in accordance with these most recent and modern tailings standards.

The process plant will separate metals from the ore by gravity flotation, then by leaching using cyanide to collect the gold and silver, with electrowinning as the final step to produce gold doré bars as the product. The doré will be shipped from site by specialized security contractors using

armoured vehicle or helicopter. Shipments will be infrequent, expected to be approximately one truck or helicopter per week on average, but on an irregular schedule for purposes of security.

The majority of water used for ore processing will be collected/recycled from site operations. Surface runoff from the waste rock management areas, water pumped from the open pit, clarified water from the TSF, and overflow from the process plant, will all be directed to the water management pond. The process plant will draw makeup water from the water management pond as needed. Make-up freshwater supply will be from two groundwater wells pumped to a storage tank, from which water will be used for processing, fire suppression, and cooling. The water storage tank will also supply potable water, after it is sterilized and stored separately in a potable water tank.

Construction equipment and materials will be shipped to the Project by heavy trucks on existing public access roads over the 24-month construction period. A temporary, 265-person, construction camp will be established on site for the construction phase of the project. This camp, along with the existing 50-person exploration camp, will house most of the construction workers for the project. Some construction workers will reside in their residences locally and be transported from Likely and the surrounding area to the construction site on buses. The temporary camp will be decommissioned at the end of the construction period and the 50-person camp will be maintained as onsite accommodation. The remainder of the operations workforce will reside within the region.

Access to the Spanish Mountain Property will be along a 1.9 km Main Access Road that ties into the existing Spanish Lake Road west of Hepburn Lake. The main access road will provide access to the process plant site, accommodations, and laydown yard after passing the gatehouse for the property. Immediately after the tie-in point to the Main Access Road, Spanish Lake Road will be re-routed to avoid Project infrastructure such as Waste Rock Storage Facilities and the ultimate pit. The re-routing covers a 5.4 km portion of Spanish Lake Road, shifting the road north around the Project, and ties the road back into the existing portion south of Spanish Lake.

Administration and service infrastructure will include:

- An office administration building, which will also house first aid, control station, and kitchen services
- Truck shop and warehouse
- Assay laboratory and cold storage building

Explosives will be stored in an authorized magazine located at least 1 km away from the mill site, pit, roads, highways, and all working and public areas to meet regulatory safety clearance guidelines. The facility will separately store Ammonium Nitrate Prill (granules) and Ammonium Nitrate Emulsion (suspended in a liquid). There will be one container for booster storage and one for

detonators. The explosives storage facility will be situated within a secure area that will be surrounded by a perimeter fence and gated.

Water management infrastructure will be designed to minimize water stored on site and to divert clean runoff away from the Project. Temporary and permanent site water diversion and collection ditches will be used during construction, operations, and closure to minimize sediment mobilization and erosion, collect, and convey mine contact water, and protect natural drainages and watercourses. Non-contact runoff from catchments directly upstream of the TSF will be diverted around the around the west side of the TSF to Cedar Creek, while runoff from catchments upstream of the south embankment will be diverted to Boswell Lake, where it will be pumped around the west side of the TSF to be discharged into Cedar Creek during initial operations. In Year 10, the Boswell Lake South Diversion Channel will be constructed to redirect the Boswell Lake catchment south into Winkley Creek.

Sediment and erosion control measures will be necessary to limit effects on the surrounding environment and water sources due to earth-moving activities related to the construction and operations of the Project.

The treatment of mining-influenced waters (MIW) will be required during all stages of the Project. During the initial construction SMG will manage the suspended solids generated during earthwork and construction through best practices and water management; active treatment is not required in the first year. Active treatment will be required to treat nitrogen compounds derived from blasting used to generate clean rock for later construction components; SMG will continue to manage suspended solids without active treatment. During operations, active treatment of mine-influenced water will be required. In the active closure period, active treatment will transition to the passive treatment of MIW.

All MIW runoff water will report to a water management pond (WMP), a fully lined pond with an HDPE geomembrane liner. This pond will store and supply recycled water to the process plant. Any water that is excess to the process plant requirement will be treated in the active water treatment plant (WTP) for discharge to Cedar Creek, which flows to Quesnel Lake. The WTP will incorporate a variety of process technologies including oxidation, settling and clarification, microfiltration, denitrification, and reverse osmosis.

Electric power will be provided at 138 kV from BC Hydro, who will establish a new 138 kV substation near Highway 97 at McLeese Lake adjacent to their existing substation. The new substation will be fed at 230 kV from existing BC Hydro line 2L95 and will contain a step-down transformer to 138 kV. A set of outgoing suspension insulators will form the Point of Interconnection (POI). The new substation will be owned and operated by BC Hydro. A new 138 kV transmission line will be installed between the POI and the receiving substation at the Spanish Mountain mine

site. The transmission line will be single pole type. The 77.8 km long transmission line will generally follow the road, to a point just west of the town of Likely, then it will be routed north, around Likely, to the mine site. The transmission line will be owned and operated by Spanish Mountain.

Diesel fuel will be supplied in mobile 75,000 litre tanks and stored in a concrete bunded fuel storage area located at the plant site. The mobile fuel tanks will be double-walled and will be equipped with pre-packaged fuel unloading modules. These tanks will also supply fuel for the plant site mobile equipment. Fuel will be trucked to storage tanks for other facilities such as emergency generators and incinerators. Liquid propane for building heating will be provided by contractor road tanker, from supply depots in Williams Lake.

Alternative means for carrying out the Project have been considered, including: ore processing; tailings and waste rock storage management, location and technology; power source; camp facilities; waste and water management; on-site materials transport; and worker transport and rotation. SMG through their engineering and design work as captured in the Pre-Feasibility Study did not identify an economically viable alternative to the Project.

Project Wastes and Emissions

Potential waste produced by the Project includes:

- mined waste rock which must be removed to access the ore
- tailings from milling the ore
- hazardous and non-hazardous waste (office, domestic waste, and vehicle maintenance wastes)
- sewage
- contaminated soil in the event of spills or leaks

The current mine production schedule produces approximately 304 Mt of waste (overburden and waste rock), and an additional 77 Mt of subgrade ore over the mine life. Suitable mine waste rock that is Non- Potentially Acid Generating (Non-PAG) will be hauled from the pit and placed on two external WRSF's, North WRSF and West WRSF, both adjacent to the pit. Non-PAG mine waste rock will also be used for dam embankment construction at the tailings facility and water management ponds, as required.

The TSF will be used to provide secure and permanent containment for all tailings solids and potentially acid-generating (PAG) waste rock, and to provide temporary containment for impounded process water prior to being recycled. A total of 72 Mt of PAG waste rock has been planned for subaqueous disposal in the tailings pond. Some of the PAG waste rock will be used for upstream tailings embankment construction, in locations where this material will be kept under water.

Wastewater and sewage will be directed to an on-site septic treatment facility. An incinerator will be used for the disposal of non-hazardous, combustible waste materials and will be located within the accommodation complex. Inert solid waste will be collected and transported off-site to existing authorized landfills. Hazardous waste will be collected and transported to authorized off-site facilities for disposal.

Potential sources of air emissions from the Project include:

- fugitive dust (total suspended particulate and fine particulate matter) from blasting and crushing, material handling by mining equipment and hauling, coarse ore stockpiles, and road use
- Nitrogen and sulphur oxides, and carbon dioxide from combustion of fossil fuels
- The maximum annual net Greenhouse Gas (GHG) emissions for the construction phase of the Project were calculated to be 26,394 t CO2e. The maximum annual net GHG emissions for the operations phase of the Project are 78,736 t CO2e. Annual net GHG emissions for the decommissioning phase of the Project are 2,203 t CO2e.

The Project is subject to Environment and Climate Change Canada's Strategic Assessment of Climate Change.

Water emissions will include: the discharge of contact water that has been in contact with potential sources of contamination and treated as necessary, and the diversion of non-contact water from upstream catchments that has not been in contact with mine workings.

Any water that has the potential for its quality to be adversely affected by Project activities, including runoff and seepage from tailings, waste rock and overburden management facilities, will be handled as contact water, and will be collected and managed on site prior to treatment and discharge to the environment.

Surface water runoff generated upstream of Project areas is considered to be non-contact water and will be diverted around the Project area with perimeter containment diversion ditches established during the pre-production phase and expanded and maintained through the operations phase.

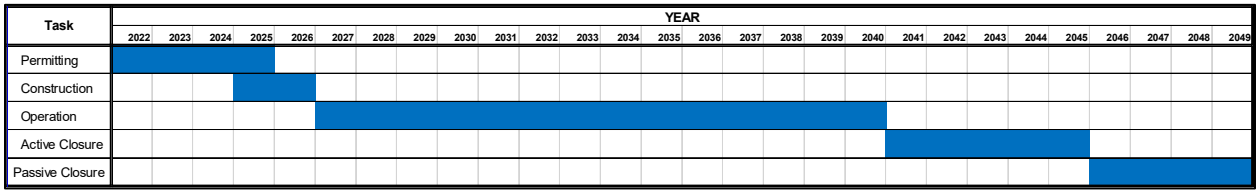
Non-contact water from Boswell Lake will be pumped around the west side of the TSF and discharged into Cedar Creek until approximately Year 11 of operations via a diversion ditch to be extended from the eastern side of the TSF to convey flows north to Cedar Creek. This will reduce the flows requiring pumping around the TSF and maximize the amount that can be conveyed via gravity in ditches. A south diversion channel will be excavated in approximately Year 10 to discharge flows from Boswell Lake to the south into Winkley Creek.

Project Schedule

Permitting of the project will precede physical development of the Project, which will be initiated with a Construction Phase, followed by the Operation Phase, Active Closure Phase, and Passive Closure Phase. A generalized schedule for each phase is provided in Figure S3.

Appropriate seasonal work windows will be incorporated into the Project construction schedule. No other seasonal timing constraints have been identified.

Figure S3 Generalized Project Schedule



Biophysical Environment

The biophysical environment was extensively studied in 2010 and 2011 in support of the regulatory review process initiated in 2012, and these studies resumed in 2020 and continue.

Topography is locally rugged with steep slopes and cliffs along deeply incised creek valleys. Elevations on the Property vary from 930 masl at Spanish Lake to 1,460 masl near the top of Spanish Mountain and 1,325 masl at the top of Mount Warren. Water is abundant in the area, with several lakes and year-round streams close to the Project property.

Vegetation is heavy forest, consisting primarily of thick stands of hemlock, balsam, cedar, and Douglas-fir in the valley bottoms, with spruce, fir, and pine on the ridges. Underbrush is thick, especially in logged areas. The effects from the 1999-2015 mountain pine beetle outbreak are still observed. For the past 10 years, all harvesting in the Williams Lake Supply Area has been focused on salvage of beetle-killed trees.

The Property has been logged historically and includes several recent large cut blocks and forestry roads, and both historical and active placer mining operations. A gravel airstrip is located west of the Property and immediately west of Hepburn Lake.

The climate in the area is modified continental with moderately warm summers and cold snowy winters. Typical daytime temperature ranges are from 25°C to 35°C in summer and -15°C to -35°C in winter. The area lies within the interior dry belt; precipitation averages about 700 mm annually (rainfall equivalent) at Likely. The 24-hour peak maximum precipitation was 198 mm (based on long term precipitation data from the Barkerville station, approximately 35 km north of Spanish Mountain). Thick accumulations of snow (as much as 2m) are common in winter at the Project.

The Spanish Mountain Gold Project spans the Spanish Creek, Cedar Creek, Fisher Creek, Grogan Creek, and Poquette Creek watersheds. The larger watersheds in the Project area are generally characterised by high flows in the spring due to snowmelt, and rainfall combined with snowmelt; medium flows in the late summer/ fall; and very low flows in the winter. There are several minor, unnamed tributary creeks flowing through the Project area. These creeks are affected by ice formation during the winter, with the smaller intermittent systems typically freezing over, or drying up, for extended periods. Generally, Spanish Creek flows continually throughout the year, but flows can be affected by ice formation during winter.

A water quality monitoring program was conducted from 2007 to 2012 to characterize baseline conditions and was restarted in September 2020, continuing monthly. Water quality samples are collected from 14 established monitoring sites. Sample sites within the Project claim boundary tend to have higher metals concentrations, with total and dissolved metals often exceeding Provincial (British Columbia Water Quality Guidelines) and Federal guidelines (CCME Canadian Water Quality Guidelines) for the protection of aquatic life, notably aluminium, cadmium, and iron. This likely reflects both the natural mineralization of the claims area and disturbance from historical placer mining activity. Water samples collected outside of the claim boundary (Cedar Creek, Spanish Creek, Blackbear Creek, Hepburn Lake and Winkley Creek) have all been within guideline concentrations.

Fisheries baseline studies confirmed the presence of Rainbow Trout in Spanish Creek, Cedar Creek, Boswell Lake, and the lowermost portion of Winkley Creek. Chinook Salmon juveniles were sampled from lower Spanish Creek and lower Cedar Creek. Burbot and Longnose Dace were also captured from lower Cedar Creek. Adult Coho Salmon were detected in lower Spanish Creek downstream of a fish migration barrier located 1.5 km upstream from the Cariboo River. Hepburn Lake, upper Winkley Creek and many of the small unnamed tributaries to Cedar Creek, Winkley Creek and Spanish Creek below Spanish Lake, are non fish bearing. Fish presence into the upper reaches of these tributaries is either limited by steep gradients or insufficient surface flow.

The Project is located within the Quesnel Highlands ecosection, which is a highland area intermediate between the plateau to the west and the high, rugged mountains to the east. The forest in the Project area is composed primarily of hybrid white spruce, balsam, western redcedar, Douglas-fir, and hemlock in the valley bottoms, with Douglas-fir and pine on the ridges. Cottonwood and alder occur in some localities as well.

Potential plant species or communities of concern in the Project area include:

- Short-flowered evening primrose
- Haller's Apple Moss
- Scrub birch / sedges/ peat mosses

- Awned sedge Fen – Marsh
- Tamarack / low birch / bluejoint reedgrass – sedges / peat mosses
- Hybrid white spruce / foam lichens
- Douglas-fir / Rocky Mountain juniper / kinnikinnick
- Douglas-fir – western redcedar / wavy-leaved moss
- Nuttall's alkaligrass – foxtail barley
- Seaside arrow-grass Marsh

Potential wildlife species of concern in the Project area include:

- Black Swift (Endangered; *Species at Risk Act* (SARA))
- Peregrine Falcon (*anatum* subspecies) (Red listed in BC)
- Swainson's Hawk (Red listed in BC)
- Western Grebe (Red listed in BC)
- American Badger (Endangered; SARA)
- Southern Mountain Caribou (Red listed in BC)
- Fisher (Columbian population) (Red listed in BC)

Additionally, a number of migratory birds frequent the Project area.

Additional work in progress includes a full analysis of species presence, breeding, and habitat use and development of wildlife habitat suitability models.

Human Environment

The Project is located within the Cariboo Regional District, a regional government consisting of 12 electoral areas (A through L). Each electoral area elects a Director, except for the incorporated member municipalities (Williams Lake (population 10,000), Quesnel (population 12,000), 100 Mile House (population 1,900)), which are represented by an elected Mayor and Council. The Project resides in Cariboo Regional District Electoral Area F, which includes the communities of Likely, Big Lake, and Horsefly.

The Project will be located approximately 6.5 km away from the unincorporated community of Likely, with the closest school located approximately 7 km away. Likely has basic amenities including a motel, hotel, rental cabins, corner store, gas pumps, and a seasonal restaurant. Some heavy equipment is also available for hire from local contractors. SMG has a modern, full-service facility on purchased land near the Project that provides a base for exploration activity.

Major industries that support the Cariboo Regional District include forestry, agriculture, mining, oil and gas, and tourism. Several wood processing and value-added wood manufacturing plants exist throughout the area. There are several large mines in the region, including the Mount Polley Mine near Likely and the Gibraltar Gold and Copper Mine approximately 70 km north of Williams Lake.

There are also significant mining exploration activities that are ongoing. The region's agriculture industry includes cattle ranching and farming, floriculture, and nursery production, as well as some other types of crop and livestock production.

The Project lies within the Williams Lake Timber Supply Area, within which there are individual license holders.

Commercial activities in the area are largely derived from outdoor recreation, including back country guiding and fishing, and hunting.

Health care in the Project area is governed, planned, and delivered by the Interior Regional Health Authority within the Cariboo/Chilcotin Local Health Area of the Thompson Cariboo Shuswap Health Service Area. The administration of funding derived from property taxes for hospitals and medical services is done by the Cariboo Chilcotin Regional Hospital District shared with the Ministry of Health. The main health facilities include:

- South Cariboo Health Centre in 100 Mile House
- Cariboo Memorial Hospital in Williams Lake
- G.R. Baker Memorial Hospital in Quesnel (operated by the Northern Health Authority)

Life expectancy in the Cariboo/Chilcotin Local Health Area is 79.6 years, compared to 82.6 years for the province. In 2015-2016, 68% of the Thompson Cariboo Shuswap Health Service Area population (aged 12 and up) reported very good or excellent mental health. Incidents of chronic diseases, including asthma, chronic obstructive pulmonary disease, heart failure, and high blood pressure are generally higher than the provincial average, with the exception of diabetes, which is slightly lower.

Indigenous Engagement

SMG understands that meaningful engagement with Indigenous nations and all stakeholders is an essential component of any successful project. SMG will continue to build upon the engagement activities that have already been completed to implement methods that have proven to work within the communities.

Three Indigenous Nations were identified for deep engagement during the early project development in 2010 and earlier. The relationships established at that time have been supported by all parties and continue to the present. The Nations are:

- Williams Lake First Nation (WLFN), a member of the Northern Shuswap Tribal Council
- Xatśūll First Nation (XFN), also a member of the Northern Shuswap Tribal Council
- Lhtako Dene Nation (LDFN), a member of the Carrier Chilcotin Tribal Council

SMG has been actively engaging with Williams Lake First Nation and Xatśūll First Nation since 2011 and with Lhtako Dené Nation since 2012, through meetings, teleconferences, workshops, e-mails,

presentations, and site visits. The engagement has assisted SMG in the development of a broader understanding of First Nation interests and concerns regarding the Project and in the application of that understanding in Project design, potential mitigation measures, and potential Project benefits.

SMG signed Memoranda of Understanding with each of WLFN, in 2011, XFN, in 2011, and LDFN, in 2012. All these agreements were initiated in relation to the previous project plan. SMG signed an Engagement Agreement with XFN in October 2021 that is the first step toward negotiation of a Relationship Agreement to cover the life of the Project – the Relationship Agreement is presently in negotiation. SMG signed an Engagement Agreement with LDN in December 2021 that is the first step toward negotiation of a Relationship Agreement to cover the life of the Project. SMG also is currently in negotiations with WLFN for a life-of-project participation agreement.

Through ongoing engagement, Indigenous Interests regarding the Project are becoming understood.

Key interests were largely shared by each nation and include:

- Interest and expectations regarding education and training, employment, and business opportunities with the Project
- Interest in direct economic benefits of the Project
- Ensure that results of an updated Traditional Land Use study are considered in the Project development
- Ensure protection of water and water quality
- Ensure appropriate design, construction, and operation of the Tailings Storage Facility
- Interest in how the Project will look and behave in its post-closure phase

Public Engagement

SMG completed a significant level of public and community engagement during the original entry to the approval process. Public engagement took the form of open houses, information sessions, letters, emails, news circulars, and online information. Targeted meetings were held with several stakeholder groups within the following communities:

- Likely
- Horsefly
- Big Lake
- Williams Lake
- 150 Mile House
- Quesnel

Key issues raised by the public and stakeholder groups included the following:

- Protection of water quantity and quality

- Robust design and operation of the tailings storage facility
- Impacts to viewscapes and potential for increased dust and noise
- Changes to housing supply and real estate costs

Potential Project Interactions

A preliminary list of potential Project interactions, along with possible mitigation to be applied is summarized in Table S3 below. Note that there are no anticipated interactions or impacts outside of the province of British Columbia, or on federal land.

Table S3 Preliminary Identification of Potential Project Interactions

Environment Component	Issue/Potential Effect	Example of Potential Mitigation
Indigenous Interests		
Current Use of Lands for Traditional Purposes, Sites of Historical, Archaeological or Cultural Importance, and Physical and Cultural Heritage	The Project-environment interactions have the potential to affect the harvesting of plants for food and medicinal and ceremonial purposes, exercising of Aboriginal rights and traditional land uses in and around the Project area, camping and gathering at sites of cultural, spiritual, and historic importance.	The assessment of the Project will consider the rights and interests of Indigenous peoples in consultation. The participating Indigenous Peoples will be engaged on the evaluation and selection of mitigation measures to minimize potential effects. This may include avoiding/minimizing Project interaction with identified sites.
Indigenous Peoples' Health, Social or Economic Conditions	The Project-environment interactions have the potential to affect biophysical components, resulting in a potential impact to Indigenous health, social, or economic conditions.	Health: implementing environmental monitoring programs Social: Implement a socio-economic baseline survey update every 5 to 10 years Economic: support Indigenous communities' agencies with training and skills development.
Physical Environment		
Geology, Soils and Terrain	Changes to geology, soils, and terrain from vegetation removal, storage of waste rock, construction of Project facilities. Loss of soil profile and structure. Modification of slopes and vegetation resulting in potential soil erosion. Changes to soil quality due to changes in soil chemical and physical characteristics.	Management practices for soil erosion control and soil. contamination management. Implement a reclamation and closure plan. Soil salvage, soil stockpile, and soil placement management.
Hydrogeology	Changes to groundwater quality and quantity. Groundwater withdrawals for pit dewatering and the mine process may change local groundwater flow patterns during the period of dewatering. Altered groundwater flow patterns may affect baseflows in creeks that receive groundwater inflows or creeks that provide groundwater recharge. Groundwater quality may be altered by infiltration of mine-influenced water from surface operations.	Collect and manage mine-influenced water to minimize potential for infiltration to groundwater (e.g., lined water management pond and TSF, contact water collection system and segregation from clean runoff). Implementation of erosion control and spills management plans. Implement groundwater monitoring plans (quality and flow patterns) during construction and operation and adapt to findings. Implement a reclamation and closure plan, including a closure water management plan.

Surface Hydrology and Water Quality	Potential effects on surface water quantity (i.e., hydrology) may include alteration of seasonal stream flow patterns due to: Stream diversion. Groundwater withdrawals affecting baseflows. Discharge to surface waters. Changes in erosion rates/timing and/or sediment deposition patterns/rates in streams due to changes in surface water flow regime. Changes in sediment loading in streams related to changes in flow/erosion. Changes in chemical water quality related to: contact with mineralized areas or materials exposed by the mining operation; emissions from the mining operation; and/or to changes in flow. Changes in groundwater/surface water interactions (e.g., increased or decreased groundwater recharge; groundwater withdrawals discharged to surface).	Divert non-contact water away from mine operations to: Collect and divert clean runoff away from mine operations. Divert creeks around mine facilities to maintain downstream flows. Collect all mine-influenced runoff from the site. Maximize use of mine-influenced water in the mine process to minimize the need for fresh makeup water. Treat any excess mine-influenced water before discharge to surface waters. A surface water monitoring program will be conducted during the construction, operations, active closure, and passive closure project phases.
Air Quality, Noise and Vibrations	The mining operation will be a source of particulate matter originating in fugitive emissions from: o Drilling, blasting, loading, and hauling of ore/waste rock from the mine. o Dumping of ore/waste on stockpiles. o Crushing, screening of ore at the plant. o Vehicle operation on gravel roads. The operation will be a source of greenhouse gases, including carbon dioxide, carbon monoxide, sulphur oxides and nitrous oxides produced in fossil fuel combustion by vehicles, back-up generators, building heating, and the carbon regeneration kiln in the gold plant. Noise and/or vibrations from mining operations including drilling, blasting, ore/waste loading.	Implement a dust control plan involving application of best management practices including water/dust suppressants on roads, dust collection and control at the crusher. Minimize the use of fossil fuel burning vehicles and appliances as much as technically and economically practical. Implementation of an air quality monitoring plan to monitor the effectiveness of management practices. Use of noise minimization equipment.
Biological Environment		

Terrestrial Resources	Loss and/or alteration of vegetation within the Project area as a result of site clearing, affecting vegetation and soils, during construction of mine facilities. The removal of vegetation will impact wildlife species due to habitat alteration, destruction, degradation, fragmentation, and/or obstruction. Duration of habitat loss will vary, depending on location: ○ Clearing and grubbing for staging, borrow, laydown, and spoil areas required during construction will result in the temporary loss of vegetation and wildlife habitat; staged reclamation will be used to minimize the duration of the impact. ○ Clearing, grubbing, and grading for facility construction will result in the longer-term (i.e., from construction through closure) loss of vegetation and wildlife habitat; vegetation cover will be re-established during reclamation. ○ Vegetation in the area of the open pit footprint will be permanently lost and replaced by a pit lake and cliff habitat on the pit highwall post-closure. Riparian vegetation will be removed where stream crossings need to be established for new roads and will be replaced when the stream crossings are removed at closure. Siting of the mine facilities has the potential to disrupt wildlife movement patterns in the regional landscape. Wildlife will be displaced from the mine site during construction, operation, and closure, with the site becoming available to wildlife again in post-closure. Temporary or permanent loss of nesting habitat of migratory birds, including passerines and water birds	Implement appropriate construction/operation/closure management practices and ecosystem/species management plans. Develop and implement a reclamation and closure plan appropriate to the terrain, local vegetation, and wildlife communities; including progressive reclamation to minimize the duration of any vegetation/habitat losses. Identify opportunities for the development of offsetting habitat through engagement with government and First Nations and incorporate these in the reclamation plan.

Aquatic Resources	Direct loss or change in quantity or quality of fish and fish habitat resulting from placement of waste rock, and other mine infrastructure. Development of the TSF in Cedar Creek, directly displacing fish and fish habitat Change in quantity and quality of aquatic habitat resulting from alteration of stream flows in Cedar Creek and Winkley Creek. Surface water quality effects associated with mine development may include alteration or deterioration of aquatic habitat, with potential direct or indirect effects on fish and aquatic species such as direct mortality, decreased food availability, life cycle disruption, and decreased habitat utilization.	Avoid and/or minimize Project direct loss of habitat through selection of waste rock storage locations and TSF that minimize interaction with fish bearing waterbodies. Treat any excess mine-influenced water before discharge. Implement appropriate environmental management plans including development of new fish habitat to offset potential losses of existing habitat.
Human Environment		
Archaeology	An updated Archaeological Impact assessment was conducted throughout the entire mineral concession in 2019 (Terra Archaeology, 2019). It confirmed that the Project is unlikely to impact heritage resources.	Implement management plans including chance find procedures.
Economy and Socio-community	Local effects and regional effects from worker migration. Economic and social effects of housing workforce in Quesnel, Williams Lake, and other smaller communities in the region. Employment, income, local revenue generation and gross domestic product effects. Changes to demand for local service industries and infrastructure, including housing, education, healthcare, social services, road maintenance, transport, consumables, catering, and equipment servicing.	Environment, Health, Safety and Community Plans. Implement local employment policies and planning. Planning for local procurement of goods and services. Support local initiatives to address demand for housing and local services, including early communication with local government agencies. Local business capacity inventory. Local skills inventory, training, and skills development programs.

Land Use	Changes in traffic volume on Keithley Creek Road, Spanish Lake Road, Likely Road, Highway 97, and access to/from the site. Changes to recreational fishing in areas within the mine area (e.g., Nina Lake). Potential disturbances from the construction of a new transmission line. Disturbances from the development of the Mine Site and associated infrastructure. Potential effects to recreation sites (including fishing and camping) including noise, air quality, water quality, and water quantity, and year-round and seasonal properties. Hunting restrictions on the Project site during construction, operations, and closure. Potential effects on Likely- Xatśūll Community Forest related to forest products harvest as well as to traditional plant, berry, and medicine collection.	A traffic management plan will be developed to mitigate the impacts of road use during construction and operation. Ongoing engagement and communication with stakeholders related to access and use. Management practices and environmental management plans for Ecosystems, Species, Aquatic Health, Air Quality, Noise, and Visual Quality. Development of end land use objectives for reclamation and closure planning in consultation with Indigenous nations and other local stakeholders.
Visual Aesthetics	Changes to the landscape will include but will not be limited to the development of the TSF, the Open Pit, and waste rock storage facilities. These changes may have indirect effects to cultural, recreational, and tourism values that are related to the visual quality and the enjoyment of scenic values.	An evaluation of the potential visual aesthetic changes to existing conditions during the construction, operation, and decommissioning phases of the Project will be addressed in the Application. Development and implementation of landscape design in reclamation and closure planning to mitigate adverse visual at project end.
Human and Terrestrial Wildlife Health		
Human and Terrestrial Wildlife Health	Increased particulate matter concentrations (i.e., $PM_{2.5}$ and PM_{10}), which may cause health risks to local communities. Potential effects to worker and community health, air quality, noise, and water quality. Deposition of dust to plants and soil. Water runoff may contribute to changes in water quality downstream waterbodies which may impact health of humans, fish, and wildlife.	Implementation of an air emissions and dust control plan and an air quality monitoring plan. Implementation of a Site Water monitoring and Management Plan. Engagement will be conducted with a range of stakeholders including the Public, First Nations, community administrators, public health and social services and infrastructure providers, educational institutions, and business representatives. Project effects on social, health, and community issues will be determined.

Note(s):

1. PM_{10} = particulate matter less than 10 µm (micrometres) in diameter.
2. PM2.5 = particulate matter less than 2.5 µm (micrometres) in diameter.

Effects of the Environment on the Project

Climate change could affect the frequency and intensity of severe weather events. The following environmental factors could lead to environmental effects on the Project's physical infrastructure:

- Natural Hazards
- Seismic events
- Landslides
- Drought
- Flooding
- Hailstorms
- Lightning
- Volcanic events
- Wildfires
- Erosion and sedimentation

The supply of water for mine facilities will be susceptible to environmental changes, such as changes to temperature, precipitation, and rates of evapotranspiration. Mine facilities rely on a continuous supply of water to sustain mining and processing activities throughout the operating period. For instance, water for the process plant for the processing of ore will be provided by a combination of freshwater from make-up sources, including the Open Pit, and reclaim water pumped from the WMP. Water supply from these make-up sources is influenced by precipitation and runoff from catchments in the Project area.

Although water supply will be susceptible to environmental changes, appropriate mitigations to severe weather events will be incorporated into designs and plans.

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ABBREVIATIONS

ARD	acid rock drainage
BC	British Columbia
BCEAA	British Columbia *Environmental Assessment Act*
BCEAO	British Columbia Environmental Assessment Office
CEAA	Canadian Environmental Assessment Act
EMLI	Ministry of Energy, Mines and Low Carbon Innovation
ERP	Emergency Response Plan
FSR	Forest Service Road
GHG	Greenhouse Gas
HADD	Harmful, alteration, disruption of fish habitat
HSRMP	Horsefly Sustainable Resource Management Plan
IAA	Impact Assessment Act
IAAC	Impact Assessment Agency of Canada
ICP	Inductively Coupled Plasma
IPD	Initial Project Description
IRR	Internal Rate of Return
LDN	Lhtako Dene Nation
LOM	Life of Mine
LPG	Liquid propane
MIW	mine-influenced water
ML	metal leaching
MSB	Meteorological Services Branch
Non-PAG	Non-Potentially Acid Generating
NStQ	Northern Secwepemc te Qelmucw
PAG	Potentially Acid Generating
PEA	Preliminary Economic Assessment
PFS	Prefeasibility Study
PMP	peak maximum precipitation
POI	Point of Interconnection
Project	Spanish Mountain Gold Project
PTS	Passive Treatment System
SARA	Species at Risk Act
SCP	Seepage Collection Pond
SMG	Spanish Mountain Gold Limited
SRMP	Sustainable Resource Management Plan

TEM ..... Terrestrial Ecosystem Mapping
TOC ..... Total organic carbon
tpd ..... tonnes per day
TSF ..... Tailings Storage Facility
WHA ..... wildlife habitat area
WLFN ..... Williams Lake First Nation
WMP ..... Water Management Pond
WMU ..... Wildlife Management Unit
WRSF ..... Waste Rock Storage Facility
WTP ..... Water Treatment Plant
XFN ..... Xatśūll First Nation

1.0 INTRODUCTION

1.1 General Information and Contacts

This document is an Initial Project Description (IPD) for the Spanish Mountain Gold Ltd. (SMG) Spanish Mountain Gold Project (the Project) under the British Columbia (BC) *Environmental Assessment Act* (BC EAA) and the federal *Impact Assessment Act* (IAA). The Spanish Mountain Gold Project (the Project) is a proposed open pit gold mine located approximately 70 km northeast of Williams Lake, BC, with the closest population centre being the village of Likely, located about 6 km northwest of the Spanish Mountain Property.

SMG published a Pre-Feasibility Study (PFS) compliant with National Instrument 43-101 in May 2021, which forms the basis of the project design information in this document.

1.1.1 Proponent

The Spanish Mountain Gold Project proponent is Spanish Mountain Gold Ltd. (SMG). The corporate office contact information is as follows:

Spanish Mountain Gold Ltd.
1120 - 1095 West Pender St.
Vancouver, BC, Canada V6E 2M6
Phone: 604-601-3651
Fax: 604-681-6866
Email: info@spanishmountaingold.com
Web: www.spanishmountaingold.com

Company Representative:
Doug Ramsey
Director, Sustainability and Indigenous Affairs

Doug Ramsey, M.Sc., R.P.Bio. is a Registered Professional Biologist in B.C. with four decades of comprehensive experience in environmental consulting with a focus on the mining and mineral sector involving well over 100 projects with a diverse range of environmental scenarios in Canada and around the globe. Most recently, he was Vice-President, Sustainability and Environmental Affairs and then Chief Executive Officer (until a takeover in 2020) at Copper North Mining Corp. where he successfully concluded the project's first consultation agreement with the indigenous community by overcoming a previous impasse in negotiation that had lasted 20 years. For over a decade, Doug played a senior consultant role at a number of international engineering firms including Tetra Tech WEI Inc. and Wardrop Engineering Inc., specializing in environmental assessment, permitting and natural resources. He has also consulted for several First Nations in

Canada. Doug is regularly called upon to present and discuss scientific and engineering information with indigenous stakeholders and has made presentations on projects and mine environmental planning and reclamation issues at various Canadian and international conferences.

2.0 PROJECT PURPOSE AND RATIONALE

The purpose of the Spanish Mountain Gold Project is to produce 2.1 million ounces of gold and 0.9 million ounces of silver over the Life of Mine (LOM). With an expected mine life of 14 years. The Project justification includes the provision of jobs and economic opportunities for local First Nations, and the people of BC and Canada. In addition, the Project will contribute financially to the Provincial (BC) and Federal Governments through corporate taxes, Provincial net proceeds and net revenue taxes, and sales taxes. LOM capital costs are expected to be $897.7 million, and the estimated LOM operating costs are $19.38/t of mill feed. The Project is expected to provide between 2000 and 2500 person-years of employment during construction and at peak operations, the Project is expected to employ 224 people in Mining, 85 in the Process Plant, and 51 in Administration.

The Project is distinguished by several favourable attributes:

- An existing all weather access road
- Grid power to the Property
- Located in a region of historical and existing mining
- An experienced, available workforce
- Proximity to Williams Lake: a transportation, logistics, and supply hub

The Project will be constructed, operated, and decommissioned in compliance with modern environmental best practices. The Project will contribute positively to the sustainability of the Cariboo Region and British Columbia, by providing economic stimulus and job opportunities for the existing and expanding labour market.

3.0 PROJECT INFORMATION

3.1 Estimated Resource

The mineral resources of the Spanish Mountain deposit were classified in accordance with Canadian Institute of Mining definition standards and reported in the NI 43-101 compliant PFS (MMTS 2021).

The mineralization of the Project satisfies criteria to be classified into Measured, Indicated, and Inferred mineral resource categories. At a 0.15 g/t Au cut-off, the Measured and Indicated resource totals 294.15 Mt at an average diluted grade of 0.50 g/t Au, with an additional 18.34 Mt of Inferred resource tonnage at 0.63 g/t Au.

The economic analysis indicated that with a LOM average gold price of US$1,600/oz the Project has a potential net present value of $848 M with a discount rate of 5%.

3.2 Capital Cost and Taxation

SMG benefits from significant existing infrastructure, which helps reduce the initial capital cost. Total initial pre-production capital cost is $607.2M inclusive of construction indirect costs, engineering-procurement-construction-management, contingencies and owners' costs. The sustaining capital is $290.5M inclusive of mine development capital, and process plant. The LOM capital expenditure is $897.7M exclusive of closure costs. Total Closure costs are estimated at $159.6M including reclamation of the open pit, process, and non-process facilities, tailings storage facility, surface site water management, environmental items, project indirects, Owners costs, and contingencies. No federal funding is expected for the Project. The Project will contribute financially to the Provincial and Federal Governments through corporate taxes, Provincial net proceeds and net revenue taxes, and sales taxes. Table 3.1 presents the Project capital cost breakdown.

Table 3.1 Total Project Cost Summary by Area

	Description	Total Cost ($ '000s)		
		Initial	Sustaining	LOM Total
Direct Costs				
	Overall Site Development	25,600	1,950	27,550
	Mining	73,438	163,731	237,169
	Ore Handling	33,743	-	33,743
	Process	125,527	8,057	133,584
	Tailings and Water Management	40,318	35,611	75,929
	Environmental	1,600	7,200	8,800
	On-Site Infrastructure	41,617	-	41,617
	Off-Site Infrastructure	64,170	3,250	67,420
	Water Treatment Facilities	10,347	35,006	45,353
Indirect Costs				
	Project Indirect Costs	101,964	18,510	120,474
Owner's Costs				
	Owner's Costs	13,654	-	13,654
Contingency				
	Contingency	75,225	17,175	92,400
Total Project Costs		607,203	290,490	897,693

Note(s):

1. Data from MMTS (2021).

3.3 Project Location

The Spanish Mountain Property is located in the Cariboo Mining Division within the Cariboo Region of central British Columbia (Figure 3.1). The Property is located approximately 70 km northeast of Williams Lake, BC, with the closest population centre being the village of Likely, located about 6 km northwest of the Spanish Mountain Property. The Project is centred at 52 degrees 35 minutes North, 121 degrees 26 minutes West.

The Project lies within the traditional territories of the following First Nations:

Northern Shuswap Tribal Council

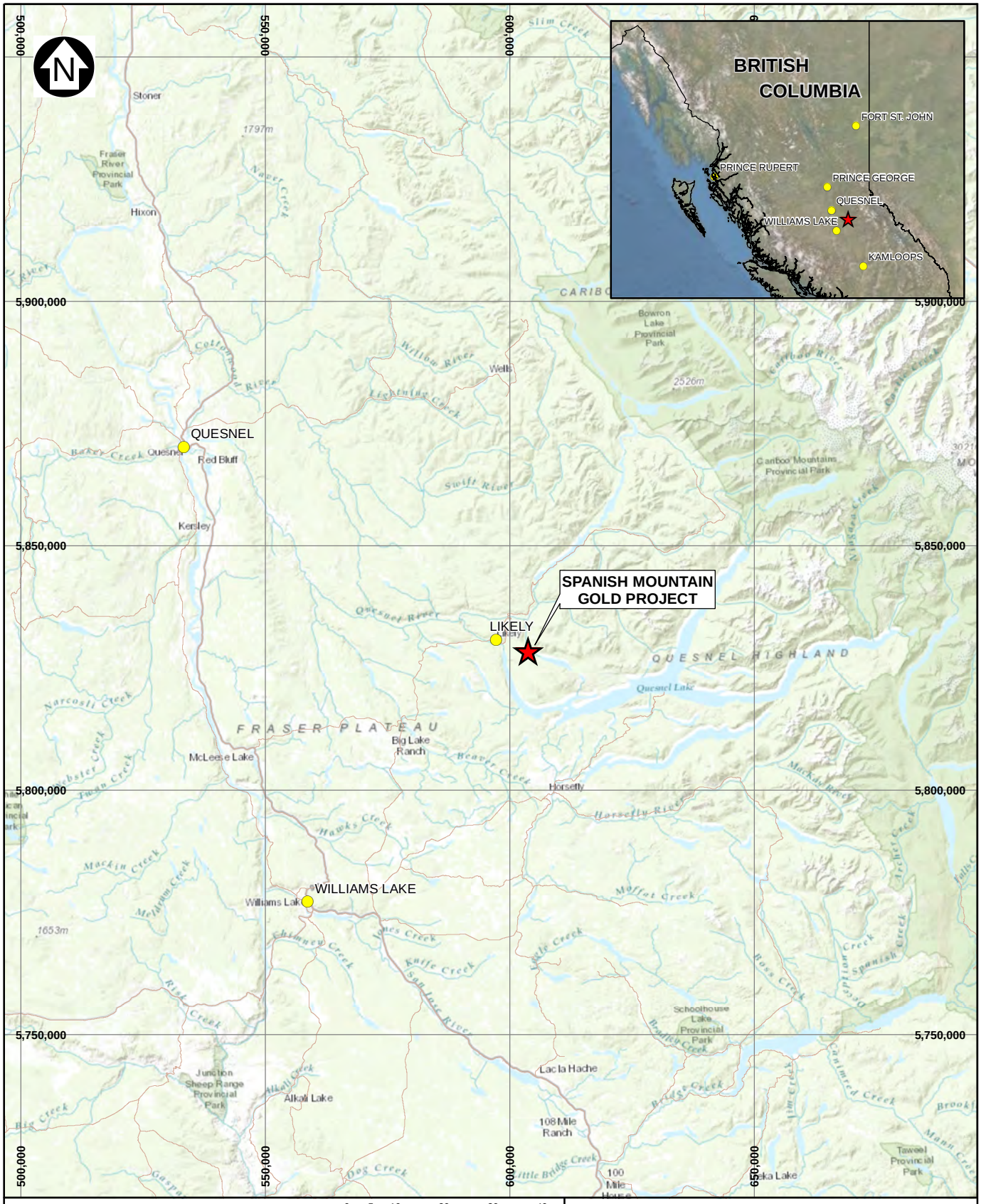
- Williams Lake First Nation (T'exelcemc)
- Xatśūll First Nation

Carrier Chilcotin Tribal Council

- Lhtako Dene Nation (Red Bluff Indian Band)

SMG holds 50 mineral claims and 12 placer claims in the Project area (Figure 3.2). All but two of the mineral claims make up a single contiguous block. The presently defined mineral resource is located largely within the boundaries of the CPW claim (No. 204667); however, it also extends southward into the PESO claim (No. 204021) and claim No. 512542. The claim block is surrounded by mineral claims held by various third parties.

The Project will not use any federal lands.



LEGEND:

- PROJECT LOCATION
- COMMUNITY

NOTES:

0 5 10 20 30 40 Km

1. BASE MAP: ESRI ONLINE WORLD TOPOGRAPHIC MAP
2. COORDINATE GRID IS IN METRES.
   COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:1,100,000 FOR 8.5x11 (LETTER) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	04MAR'22	ISSUED WITH REPORT	ACC	BH	RCB

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN GOLD PROJECT

PROJECT LOCATION

Knight Piésold CONSULTING

P/A NO. VA102-272/15 | REF NO. 1

FIGURE 3.1 | REV 0

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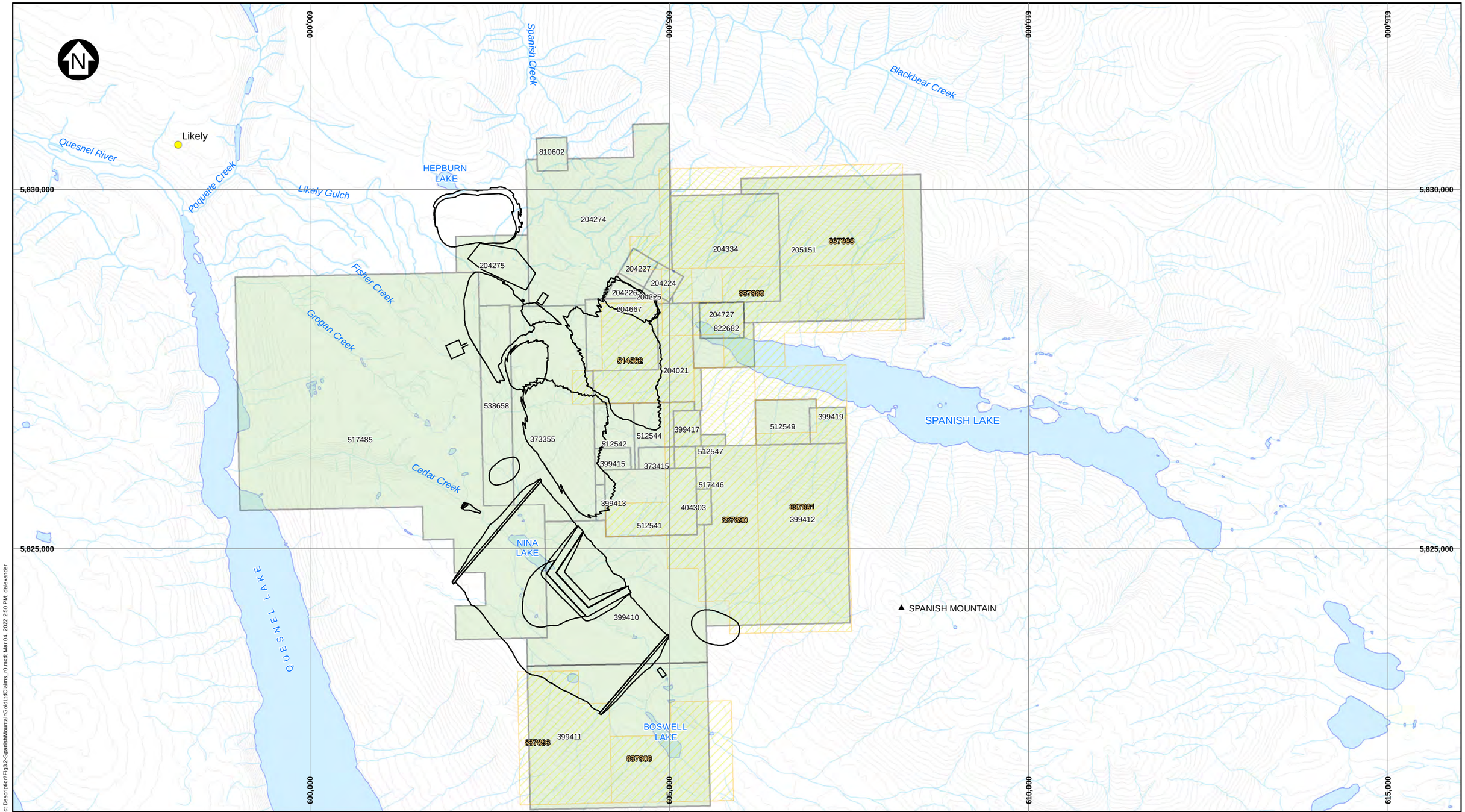

LEGEND

- MINE FACILITIES
- RIVER/CREEK
- COMMUNITY
- CONTOUR 20 m
- PLACER CLAIM
- LAKE
- MINERAL CLAIM

1 0.5 0 1 2 3 4 5 km

NOTES:

1. ONLY THOSE CLAIMS BELONGING TO SPANISH MOUNTAIN GOLD LTD. ARE SHOWN.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 83 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:50,000 FOR 11x17 ("B" SIZE) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. MINERAL CLAIMS DATA DOWNLOADED FROM GEO BC.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	04MAR'22	ISSUED WITH REPORT	ACC	BH	RCB

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SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN GOLD PROJECT

SPANISH MOUNTAIN GOLD LTD. CLAIMS

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA102-272/15	1

FIGURE 3.2 REV 0

4.0 LEGISLATIVE AND REGULATORY CONTEXT

4.1 Environmental Assessment Review Process

Major mining projects in BC are subject to environmental assessment as part of the legislated provincial and federal permitting processes. The environmental review process achieves the following:

- Opportunities for all stakeholders and First Nations to identify potential issues and provide input
- An understanding of the environmental, social, economic, heritage, and health effects of the Project
- Opportunity to identify ways to prevent or minimize negative effects from the Project or Project related activities
- Provides an opportunity for input from all interested parties during the Environmental Assessment process

4.1.1 British Columbia Environmental Assessment Act

The BC *Environmental Assessment Act* (BCEAA) is the legal framework for the province's environmental assessment process for proposed major projects. The BCEAA is supported by several regulations, including the Reviewable Projects Regulation, as well as a variety of policy, procedure, and technical guidelines.

The Project is subject to review under the BCEAA that is administered by the British Columbia Environmental Assessment Office (BCEAO). The production capacity of the proposed project will be 7,300,000 tonnes per year, which will exceed 75,000 tonnes per year of mineral ore, and therefore will trigger an Environmental Assessment under Section 10(1) and Table 6 of the Reviewable Projects Regulation to the BCEAA.

For more information, please visit the BCEAO website:
https://www2.gov.bc.ca/gov/content/environment/natural-resource-stewardship/environmental-assessments

4.1.2 Canadian Impact Assessment Act

The Project is expected to be identified as a 'designated project' under the federal *Impact Assessment Act* (IAA) as it will be captured under the *Physical Activities Regulations*. A project can be identified as a 'designated project' in two ways: projects described in the *Physical Activities Regulations* (the Project List) and projects designated by the Minister of Environment and Climate Change.

The criteria listed for a mine project under the *Physical Activities Regulation* (the Project List) include the following (see Item 18(c) and (d) of the *Regulation*):

The construction, operation, decommissioning and abandonment of one of the following:

- A new metal mine, other than a rare earth element mine, placer mine or uranium mine, with an ore production capacity of 5 000 t/day or more
- A new metal mill, other than a uranium mill, with an ore input capacity of 5 000 t/day or more

The Project, which will have an ore production and input capacity of 20,000 t/d, meets criteria listed in the *Physical Activities Regulation*. Therefore, the Project will be subject to the IAA.

As part of the consideration of the scope of the federal review under the IAA, the following are specified:

- The Project is not expected to receive federal funding
- The Project will not use federal lands, nor is it expected to cause changes to the environment on federal lands, in a province other than British Columbia, or outside Canada
- The Project will not have effects on marine plants in the coastal waters of Canada (defined as per subsection 47 of the *Fisheries Act*

In accordance with the Impact Assessment Cooperation Agreement between Canada and British Columbia (2019), SMG will ask that the Province make a request to the federal Minister of Environment and Climate Change to approve the substitution of the BC Environmental Assessment process for the federal Impact Assessment process. If the substitution request is approved for the Project, the Province would commit to meet the legislative requirements of the federal Impact Assessment process and fulfil the conditions for substitution under the IAA set out in the Impact Assessment Cooperation Agreement between Canada and British Columbia (2019) and the Substitution Decision. At the end of the assessment process, the BC EAO would provide its report to both the Provincial and Federal Ministers for their consideration and decision.

4.2 British Columbia Authorizations, Licenses, and Permits

Table 4.1 Summary of Possible Provincial Authorizations

Legislation	Authorization	Authorization Purpose
Drinking Water Protection Act	1) Water System Construction Permit 2) Water System Operating Permit	To construct and operate potable water supply systems for camps and process plant
Drinking Water Protection Act	Food Facility - Health Approval Application	Opening and operating a food service facility
Environmental Management Act	Effluent Discharge Permit	Authorizes discharges from sedimentation ponds, water treatment plants, tailings storage facility and seepage
Environmental Management Act	Air Emissions Discharge Permit	Authorizes discharges from incinerator and process plant
Environmental Management Act	Solid Waste Discharge Permit	Authorizes disposal of solid waste
Environmental Management Act	Hazardous Waste Registration	Authorizes hazardous waste transfer facility, plant truck shop
Environmental Management Act	Fuel Storage Registration	Authorizes fuel storage
Environmental Management Act	Sewage Registration	Authorizes sewage treatment plant
Forest Act	Occupant License(s) to Cut (Mines Act permit area, mine access road, airstrip and access road, waterline License of Occupation area, Transmission line License of Occupation area (and associated roads, laydown areas)	Authorizes Crown timber harvesting
Forest Act	Road Use Permit	Authorizes use of FSRs
Forest and Range Practices Act	Special Use Permit	Authorizes construction and operation of the Mine Access Road
Forest and Range Practices Act	Consent to connect Mine Access Road to FSR	Authorizes connection of FSR to Mine Access Road
Heritage Conservation Act	Permits (Archaeological Impact Assessment [AIA]/site alteration)	Authorizes site alteration and inspection
Land Act	License of Occupation (transmission line)	Authorizes occupancy and use of Crown Land
Land Act	Temporary use permit	Temporary access roads
Mineral Tenure Act	Mining lease	Production of minerals
Land Title Act	Easement (transmission line)	Authorizes occupancy and use of private land
Mines Act	Permit Approving Mine Plan and Reclamation Program	Approves mine plan and reclamation program
Mines Act	Explosives Storage and Use Permit	Use, care, transportation of explosives

Legislation	Authorization	Authorization Purpose
Safety Standards Act	Permit	Connect a powerline
Water Sustainability Act	License (Section 9/7)	Diversion, storage or use of surface water or groundwater for one or more purposes Construction of water storage dams, groundwater wells
Water Sustainability Act	Approvals/Notifications of changes in or about a stream (Section 11)	Changes in or about a stream for the water line and crossings associated with the water line access road, transmission line, Mine Access Road.
Wildlife Act	License	Designate no shooting area, relocate wildlife during construction

4.3 Federal Authorizations, Licenses, and Permits

Table 4.2 Summary of Possible Federal Authorizations

Legislation	Authorization	Authorization Purpose
Explosives Act	License	Manufacturing and use of explosives
Fisheries Act Metal and Diamond Mining Effluent Regulations	Schedule 2 Amendment	Deposition of mine waste to fish bearing waterbodies
Fisheries Act (Section 34 and 35)	Authorization	Harmful, alteration, disruption of fish habitat (HADD; Section 35(1))
Migratory Birds Convention Act (Section 5)	Permit	Authorizes periods during which migratory birds and/or their nests may be impacted
Radio Communications Act	License	Issuance and operation of designated frequency
Species at Risk Act (Section 32 and 33)	Permit	Provides for protection of listed species in accordance with regulations
Transportation of Dangerous Goods Act	Permit	Transport of dangerous goods

SMG anticipates that there are no changes to the environment or to health, social or economic conditions that may occur in Canada that are directly linked, or necessarily incidental, to the involvement of a federal authority that would permit or enable the Project to be carried out in whole or in part.

4.4 Other Agreements

4.4.1 Provincial Government Policy

The Project is located within the Horsefly Sustainable Management Plan unit of the Cariboo-Chilcotin Land-Use Plan. Development of a mineral project within the Horsefly Sustainable Management Plan area is compatible with policy planning objectives. As stated in the Horsefly Sustainable Management Plan: "The HSRMP ensures access to 100 percent of the plan area for mineral and aggregate exploration and potential development, excluding protected areas and Goal 2 areas". Goal 2 areas are areas identified for "protection of special natural, cultural heritage, and recreational features, including rare and endangered species and critical habitats, outstanding or unique botanical, zoological, geological, and paleontological features, outstanding or fragile cultural heritage features, and outstanding recreational features". The Project does not intrude upon any Goal 2 areas identified in the Horsefly Sustainable Management Plan.

4.4.2 Provincial - Federal Agreements

The Impact Assessment Cooperation Agreement between Canada and British Columbia (2019) identifies how the two jurisdictions will work together on project impact assessments that are required by both levels of government. This agreement is intended to provide a more predictable and timely process, increase efficiency and certainty, and result in quality assessments that draw on the best available expertise, supporting the shared principle of "one project, one assessment". The agreement would facilitate the substituted review of the Project, if approved by the federal government.

5.0 PROJECT STATUS AND HISTORY

Mineral exploration in the Spanish Mountain area dates to 1921 when placer deposits were discovered above Cedar Creek, to the south of the deposit. Exploration of the Spanish Mountain area continued from 1921 to the 1990s, focusing on placer and vein-hosted deposits. Placer claims still exist near Spanish Creek and Cedar Creek and placer operations continue in the area.

The Spanish Mountain Property was consolidated by Eastfield Resources Ltd. in 1992, transferred to Wildrose Resources Ltd. (Wildrose) in 1997, and acquired by Skygold Ventures Ltd. (Skygold) in 2003 via an option to form a joint venture with Wildrose. In early 2010, Skygold changed its name to Spanish Mountain Gold Ltd. after completing the acquisition in 2008. SMG acquired additional property to the west of the deposit in the spring of 2010, resulting in the current extent of the Spanish Mountain claim boundary.

Mineral exploration activity is conducted under the multi-year *Mines Act* permit MX-10-199. Bonding in the amount of $85,000 for disturbances during exploration are held in trust by the government of British Columbia. Spanish Mountain Gold also holds Water License C129822 to extract water from Likely Gulch for drilling and fire suppression.

An Environmental Assessment (EA) for the Project, as it was previously planned, was initiated under the former (2002) act on July 8, 2011, with the submission of a Project Description to the BC Environmental Assessment Office and the federal Impact Assessment Agency, at that time known as the Canadian Environmental Assessment Agency. Detailed environmental and socio-economic baseline studies were conducted in 2010 and 2011. Advancement on the EA was halted by SMG in 2012 while project design updates were completed. Between 2012 and 2019, both provincial and federal processes were kept open, with SMG providing annual updates regarding its intention to continue the EA process. In recognition of new provincial and federal EA legislation coming into force, the Project was withdrawn from the federal process on August 28, 2019, and from the provincial process on December 20, 2019. This document represents the Project's re-entry to the EA process.

The proponent, Spanish Mountain Gold Limited (SMG), formerly Skygold Ventures Ltd., is a junior resource exploration stage company incorporated on February 22, 1996 under the Alberta Business Corporations Act. The company continued into British Columbia on August 13, 2004 under the Business Corporations Act of British Columbia. On January 14, 2010, the company changed its name from Skygold Ventures Ltd. to Spanish Mountain Gold Ltd. SMG is engaged in the acquisition, exploration, and development of mineral properties. The Company's primary asset is the Spanish Mountain Gold Project. The Project consists of 33 mineral claims and eight placer claims over 4,960 ha. SMG has 100% ownership of the advanced-stage Project.

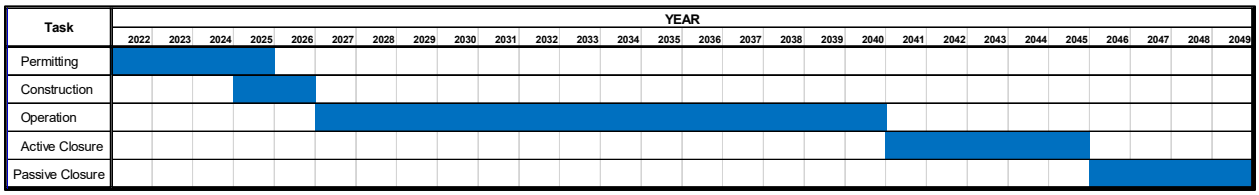
6.0 PROJECT TIMING

6.1 Schedule of Project Phases

Permitting of the project will precede physical development of the Project, which will be initiated with a Construction Phase, followed by the Operation Phase, Active Closure Phase, and Passive Closure Phase. A generalized schedule for each phase is provided in Figure 6.1.

Appropriate seasonal work windows will be incorporated into the Project construction schedule. No other seasonal timing constraints have been identified.

Figure 6.1 Generalized Project Schedule



6.2 Permitting Process

SMG is conducting First Nations and public consultation in the Early Engagement phase of the Project. Baseline environmental studies and exploration drilling, condemnation drilling, preliminary engineering and site surveys will continue throughout the Early Engagement phase. Permitting of the Project will occur prior to the initiation of the Construction Phase. The permitting process has been initiated based on the Project design developed in the May 2021 Prefeasibility Study.

The major milestones in the Spanish Mountain Project Environmental Assessment process include:

- Initial Project Description and Early Engagement Plan Submission
- Substitution Request submitted to the Impact Assessment Agency by the BC Minister of the Environment
- Federal Minister of Environment and Climate Change grants the Substitution Request and issues a Substitution Decision
- IA Readiness Decision and Federal IA determination
- Detailed Project Description and Draft AIR Submission
- Approved AIR
- Draft Application Submission
- Final Application Submission
- EA Certificate Decision
- Federal Decision

It is anticipated that these milestones will be completed between Q1 of 2022 and Q3 of 2025.

6.3 Construction

Upon receipt of the EA Certificate, Federal Decision, and any required permitting, construction will be initiated. It is estimated that a period of two years will be required to move from the initiation of construction to mechanical completion. Start-up and commissioning will require an additional two to three months to complete.

The main construction activities include the following:

- Upgrade the access road to the site and selected site roads
- Establish the site water management system (sediment sumps, creek coffer dams, collection ditches, etc.)
- Clear and grub, strip topsoil and level Plant Site
- Commence transmission line pole construction
- Clear and grub, strip topsoil and construct TSF starter dam
- Install recycle pump in seepage recovery pond
- Complete civil works for the TSF starter embankment
- Complete civil works for the Plant Site
- Complete substation and Mine Site powerlines
- Clear and grub and strip topsoil within Open Pit, waste dumps, and TSF footprints

6.4 Operations

The anticipated operational phase of the Project is 14 years, which is contingent on material changes that could arise during the continued exploration work, process refinement or throughput modifications.

6.5 Decommissioning and Reclamation

Timing and duration of closure and reclamation activities will be determined when the detailed reclamation plan is submitted as part of the *BC Mines Act* permit application. Conceptually, it is estimated that closure and reclamation will be completed over four years, followed by three years of reclamation monitoring.

7.0 PROJECT DEVELOPMENT AND COMPONENTS

7.1 Project Design Team

The Project design is the product of a close collaboration between SMG and their engineering and environmental consultants, who are described below.

Knight-Piésold Ltd. (KP) – has been involved in the Project from the start of environmental and engineering planning in 2007. They are responsible for:

- Engineering planning for the Tailings Storage Facility and site water management facilities
- Baseline studies of:
  - Surface water quality and hydrology
  - Groundwater quality and hydrogeology
  - Aquatic resources including fish and fish habitat

Environmental Dynamics Inc. (EDI) – joined the Project team in 2020, and are responsible for:

- Baseline studies of:
  - Terrestrial vegetation
  - Wildlife
  - Species-at-risk
  - Terrestrial Ecosystem Mapping

pHase Geochemistry Inc. – joined the project team in 2020 and are responsible for geochemical assessment of project tailings, waste rock, and soils.

Linkan Engineering – joined the Project team in 2021 and are responsible for planning of the active and passive water treatment systems.

Allnorth Consultants Limited – joined the Project team in 2021 and are responsible for powerline planning.

Ausenco Engineering – joined the Project team in 2020 and are responsible for planning of the process plant and related facilities.

Moose Mountain Technical Services – joined the Project team in 2011 and are responsible for open pit mine and waste rock management planning.

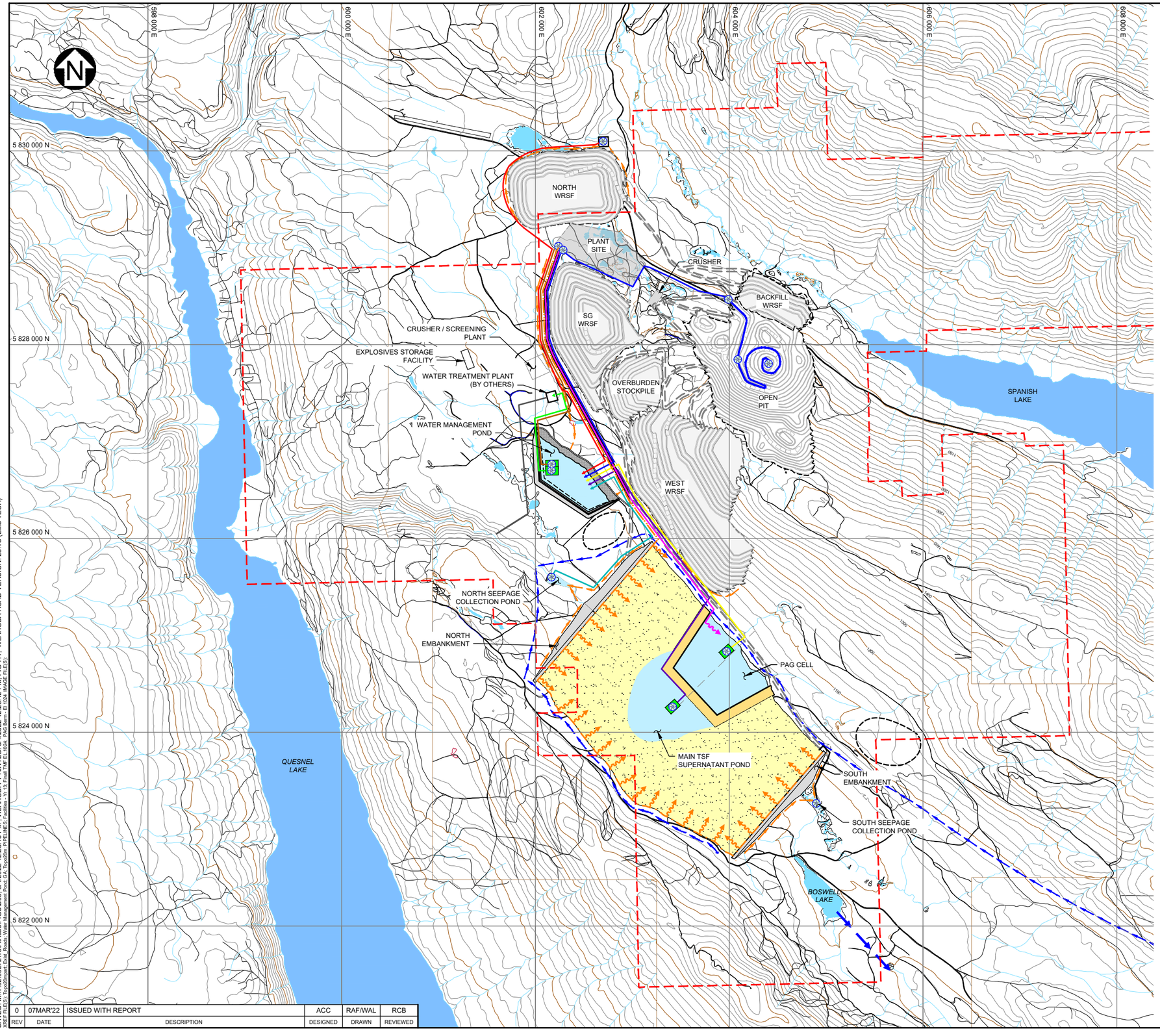
BGC Engineering Inc. – joined the Project team in 2011 and are responsible for geotechnical and hydrogeological aspects of open pit wall stability planning.

7.2 Project Components

Project components are expected to include the following:

- Open pit
- Waste Rock Storage Facilities
- Plant site: primary crusher, crushed ore stockpile, process plant
- Access road, site roads and Spanish Lake Road re-routing
- Administration facilities, mine dry, truck shop, and maintenance facilities
- Assay laboratory/cold storage building
- Waste treatment systems
- Solid waste disposal facilities
- Tailings storage facility
- Overall site water management
- Water treatment facilities
- Temporary construction camp
- Power supply and distribution system
- Transmission line to substation
- Site services
- Fuel storage
- Medical station
- Water supply
- Communication system

See General Arrangement on Figure 7.1, and Mine Site Development Phases on Figure 7.2.



LEGEND:

- ZONE C (TYPE Ai)
- WATER
- WASTE ROCK (TYPE Aii, Bi, Bii)
- TAILINGS
- FACILITIES (BY OTHERS)
- MINE HAUL ROADS (BY OTHERS)
- PROPERTY BOUNDARY
- POTENTIAL STOCKPILE LOCATIONS
- DIVERSION DITCH
- COLLECTION DITCH
- ROUGHER TAILINGS PIPELINE
- CLEANER TAILINGS PIPELINE
- OPEN PIT DEWATERING
- WMP RECLAIM SYSTEM
- WTP DELIVERY SYSTEM
- TSF RECLAIM SYSTEM
- PAG CELL RECLAIM SYSTEM
- NORTH SEEPAGE COLLECTION POND DEWATERING SYSTEM
- SOUTH SEEPAGE COLLECTION POND DEWATERING SYSTEM
- BOSWELL LAKE SOUTH CHANNEL
- NORTH RSF SEEPAGE COLLECTION POND DEWATERING SYSTEM
- WTP DISCHARGE TO ENVIRONMENT (BY OTHERS)
- EXISTING ROADS
- TAILINGS SPIGOT
- BARGE
- PUMP

NOTES:

1. COORDINATE GRID IS UTM (NAD83) ZONE 10.
2. CONTOUR INTERVAL IS 20m, CONTOURS ARE FROM EAGLE MAPPING.
3. DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS NOTED OTHERWISE.
4. PLANT SITE OUTLINE PROVIDED RECEIVED FROM AUSENCO , NOV. 12, 2020.
5. PIT OUTLINE, RSF'S, STOCKPILES, AND HAUL ROADS RECEIVED FROM MMTS, FEB. 4, 2021.

SCALE A: 400 200 0 400 800 1200 1600 2000 m

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	07MAR'22	ISSUED WITH REPORT	ACC	RAF/WAL	RCB

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN

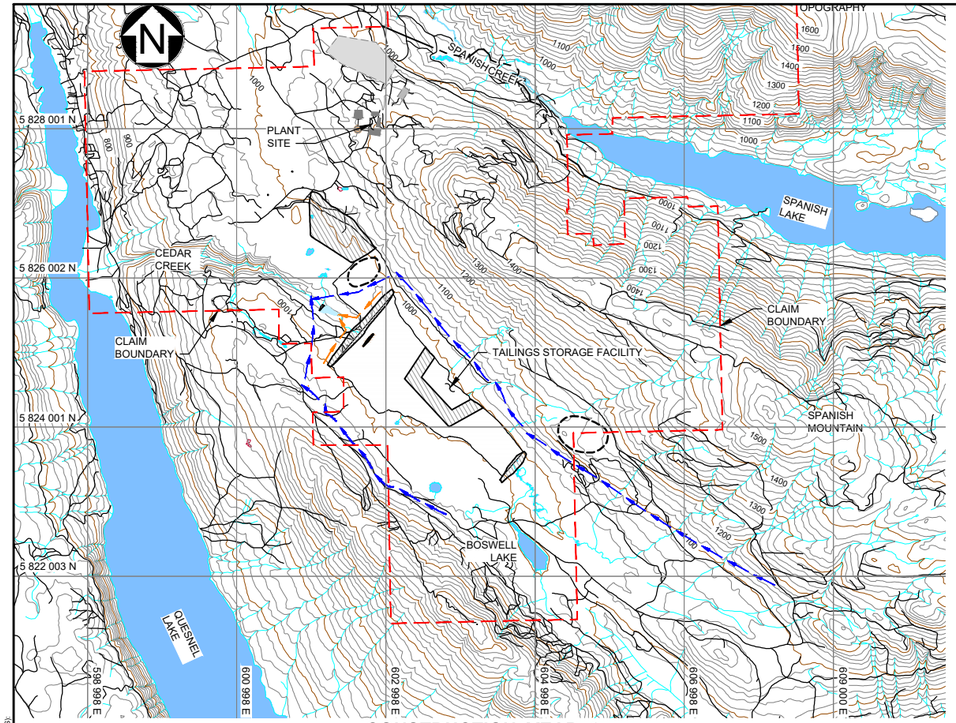
TSF GENERAL ARRANGEMENT

Knight Piésold CONSULTING

P/A NO. VA102-272/15 | REF NO. 1

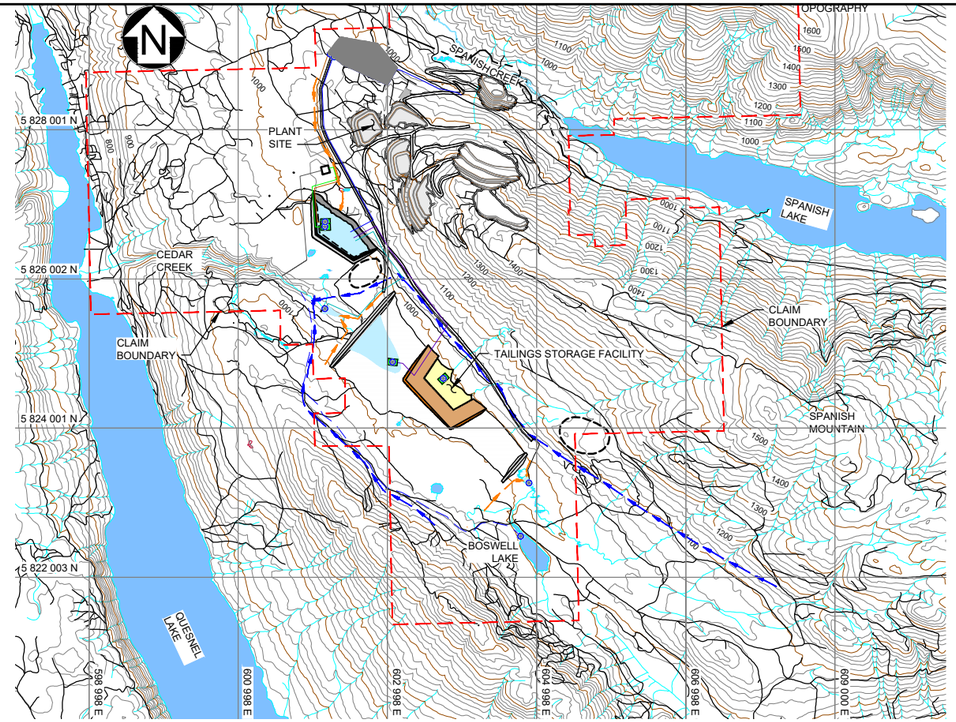
FIGURE 7.1 | REV 0

SAVED: M:\1\02\00272\15\A\Acad\FIG\SB06 3/4/2022 12:28:16 PM, WLAHODA PRINTED: 3/4/2022 12:28:42 PM, FIG 7.1, WLAHODA ACAD VERSION: 23.1S (LMS TECH)
XREF FILES: Tcm2Dmpnt, Exist_Roads, Water Management Pond, GA Tcm2Dm, PIPELINES Faadlee - Y-1S Final TMF EL 1024, PAG Berm - El 1024 IMAGE FILES:



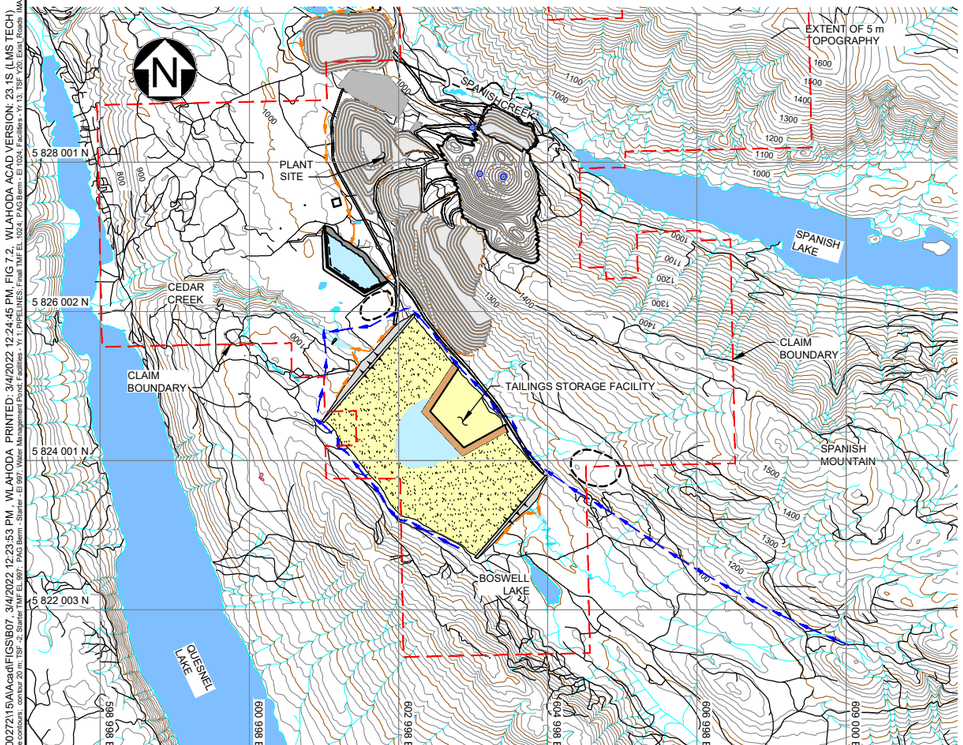
CONSTRUCTION YEAR -2

SCALE A



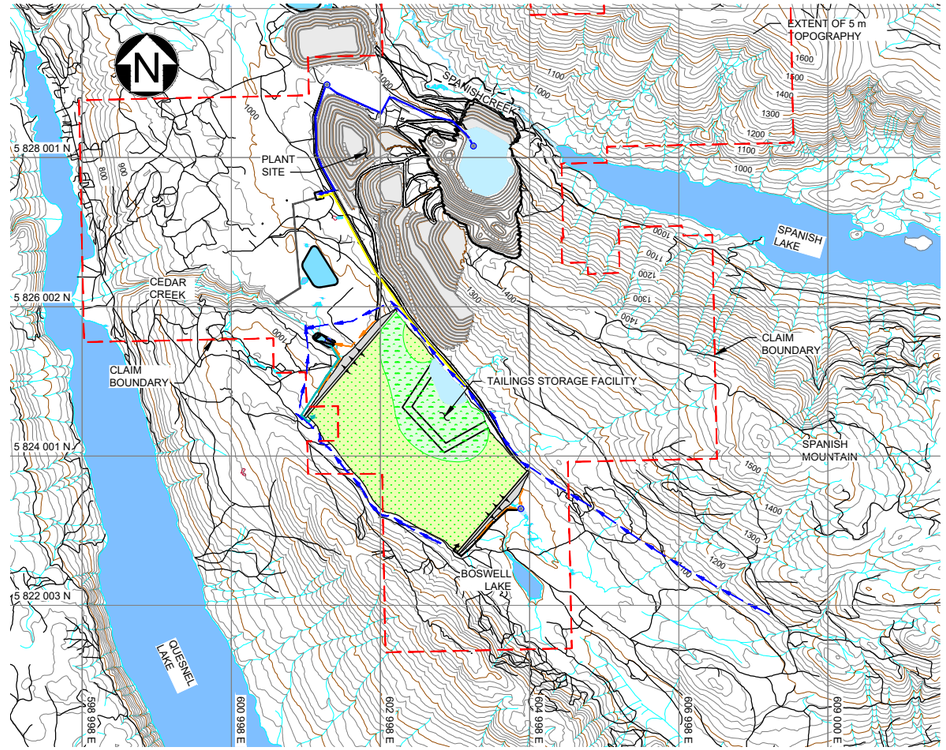
MINE START UP

SCALE A



END OF OPERATION

SCALE A



END OF ACTIVE CLOSURE

SCALE A

KEY PLAN

NTS

LEGEND:

- SUPERNATANT POND
- TAILINGS BEACH
- WASTE DUMP
- PAG ROCK WASTE DUMP
- CLEANER SCAVENGER TAILINGS (CST)
- ROUGHER SCAVENGER TAILINGS (RST)
- RECLAIM PIPELINE
- DIVERSION DITCH
- SEEPAGE POND
- CONCEPTUAL SPANISH CREEK DIVERSION
- HAUL ROADS

NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10.
2. PIT OUTLINE RECEIVED FROM AGP, JANUARY 2011.
3. CONTOUR INTERVAL IS 20 METRES, GENERATED FROM EAGLE MAPPING AND TRIM MAP.
4. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.
5. PRELIMINARY WASTE DUMP DESIGN - SUBJECT TO CHANGE.
6. SEE FIG. 5.4 FOR PLANT SITE DETAILS.

800 400 0 1000 2000 3000 4000 m

SCALE A

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	07MAR'22	ISSUED WITH REPORT	ACC	RAF	RCB

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN

MINE SITE DEVELOPMENT PHASES

Knight Piésold CONSULTING

P/A NO. VA102-272/15

REF NO. 1

FIGURE 7.2

REV 0

7.3 Project Activities

The Project has an estimated mine operations phase of 14 years with a total production of approximately 96 million tonnes (Mt) of ore, processed at a planned throughput of 20,000 tonnes per day (tpd) or 7,300,000 t/a over the mine life.

The Spanish Mountain deposit will be mined using a conventional open pit mining method. A PFS level mine operation design, 14-year open pit production schedule, and mining cost model have been developed.

The mining fleet will include diesel-powered rotary drills with 200 mm bit size for production drilling and down the hole drills with 127 mm bit size for wall control drilling; diesel-powered reverse circulation drills for bench-scale grade control drilling; 15.5 m^3 bucket sized hydraulic excavators and 13 m^3 bucket sized wheel loaders for production loading; 140 tonne payload rigid-frame haul trucks and 40 tonne articulated trucks for production hauling; plus ancillary and service equipment to support the mining operations. In-pit dewatering systems will be established for the pit.

Ore will be hauled to a crusher 0.5 km west of the pit and crushed to feed the process plant. Waste rock will be deposited into waste rock storage facilities (WRSF) 0.5 to 2.0 km west of the pit or used as rockfill to construct a tailings dam 4.0 km southwest of the pit.

Ultimate pit limits are split into phases or pushbacks to target higher economic margin material earlier in the mine life. The pits are split into nine distinct phases, with the initial phases containing mineralisation with a higher gold grade and lower strip ratio than later phases.

During the pre-stripping phase, all ore mined in the pit will be stockpiled. Cut-off grade optimisation on the mine production schedule will also send ore to a high-grade ore stockpile near the primary crusher. The stockpiled Mineral Reserves are planned to be re-handled and fed to the crusher once the pits are exhausted.

Mining operations will be based on 365 operating days per year with two 12-hour shifts per day. An allowance of 5 days per year of no mine production has been built into the mine schedule to allow for adverse weather conditions.

Construction equipment and materials will be shipped to the Project by heavy trucks on existing public access roads over the 24-month construction period. A temporary, 265-person, construction camp will be established on site for the construction phase of the project. This camp, along with the existing 50-person exploration camp, will house most of the construction workers for the project. Some construction workers will reside in their residences locally and be transported from Likely and the surrounding area to the construction site on buses. The temporary camp will be decommissioned

at the end of the construction period and the 50-person camp will be maintained as onsite accommodation. The remainder of the operations workforce will reside within the region, including those required during active and passive closure.

The Project will yield gold doré as its final product, which will be shipped from site by specialized security contractors by armoured vehicle, or by helicopter. Shipments will be infrequent, expected to be approximately one truck or helicopter per week on average, but on an irregular schedule for purposes of security.

7.4 Mine Site Layout and Facilities

7.5 Construction

7.5.1 Open Pit

The ultimate pit limit will be developed in phases or pushbacks to target higher economic margin material earlier in the mine life and to even out strip ratio over the mine life.

7.5.2 Plant Site

The Spanish Mountain Plant Site is located approximately 1.0 km west of the pit and has been positioned to avoid areas identified to have artesian groundwater conditions as well as previously excavated areas now functioning as manmade ponds. The plant site uses a stepped layout which positions infrastructure pads to better balance cut and fill quantities.

The primary crusher area will feature a concrete tower to support the crusher and provide a dump pocket above the crusher and a crushed ore pocket beneath.

The process plant building will have an approximate area of 3,325 m^2, and will house all the milling, flotation, and reagent equipment. The building will be divided into two sections. The first section will contain the mills and will have dimensions of 45 x 35 m; the second section will contain the flotation, regrind and reagent equipment and will be 50 x 35 m in size. Both sections will be serviced by overhead cranes. This building will be a pre-engineered steel frame and metal-clad building with internal insulation to reduce heat loss. Buildings housing the intensive leach reactor circuit (234 m^2) and gold room (216 m^2) will be attached to the main process building. The buildings will be heated using unit heater and air handling systems utilizing propane as a fuel.

7.5.3 Access Road, Site Roads, and Spanish Lake Road Re-Routing

The access road upgrade and extension from Spanish Lake Forest Service Road to the plant site, and the rerouted Spanish Lake Road will be constructed to maintain public access around the site.

The Project will be accessed along a 1.9 km Main Access Road, which will tie into the existing Spanish Lake Road west of Hepburn Lake. The main access road provides access to the process plant site, accommodations, and laydown yard after passing the gatehouse for the property.

Immediately after the tie-in point to the main access road, Spanish Lake Road will be re-routed to avoid Project infrastructure such as Waste Rock Storage Facilities (WRSF) and the ultimate pit. The re-routing covers a 5.4 km portion of Spanish Lake Road, shifting the road north around the project site, and ties the road back into the existing portion south of Spanish Lake.

Two categories of roads are proposed within the site: in-plant roads and maintenance roads. In-plant roads are two lane roads, consisting of 3.0 m lanes and 0.5 m shoulders, and will be used for all haul roads and high traffic areas. The maintenance roads are single lane roads consisting of a 4.0 m lane and 0.5 m shoulders and will be used for light vehicle access.

7.5.4 Administration Facilities/Dry Building

The administration and dry building will be a modular building supported on concrete spread footings, complete with furniture and equipment. The building footprint will be 1,008 m^2. The administration building includes working space and offices for engineering, technical, surveying, and administration personnel. The offices of the general manager, mine manager, mill superintendent, mine operations superintendent, maintenance superintendent, and mine supervisors will be in this building. A first aid safety area, control station, kitchen, and lunchroom facilities will also be in the building.

7.5.5 Truck Shop and Warehouse

The truck shop will be a pre-engineered building 72 m long x 34 m wide and fitted with insulated metal cladding and two 30 t overhead cranes. The building was sized to accommodate 140 t haul trucks and it will have service bays for lubrication, truck washing, heavy and light vehicle repair, welding, and tire replacement. The facility will also have space for maintenance workshops and a warehouse facility.

7.5.6 Assay Laboratory/Cold Storage Building

The assay laboratory will be a modular building, 160 m^2 in area, and will be situated adjacent to the administration building, close to the process building. The building will house all laboratory equipment for the daily operational process control including the metallurgical and geological requirements.

The cold storage warehouse will be a pre-engineered light steel framed structure with an un-insulated fabric cover. The building will have a footprint of 800 m^2 and will be supported on pre-cast concrete lock blocks on a prepared gravel surface.

7.5.7 Explosives Storage Facility

The explosives bulk depot will be located at least 1 km away from the mill site, pit, roads, highways, and all working and public areas to meet regulatory safety clearance guidelines. The facility will store Ammonium Nitrate Prill (granules) in a 60-ton overhead silo and Ammonium Nitrate Emulsion in a 40-ton overhead silo, with storage capacities of 7 days and 5.6 days, respectively. There will be one container for booster storage and one for detonators. Containers will be modified shipping containers approved for explosives storage and separated by earthen mounds as a safety precaution. The explosives storage facility will be situated within a secure area that will be surrounded by a perimeter fence and gated.

Explosives and Ammonium Nitrate will be trucked to site and stored at the explosives facility site until required. The quantities noted above are sufficient for only a few days' supply during peak periods. Therefore, regular deliveries will be needed to meet demand.

7.5.8 Waste Treatment Systems

Domestic wastewater and sewage will be directed to an on-site septic treatment facility. Treated effluent generated at the sewage treatment plant will be compliant with Environmental Management Act.

All potable water that is generated and consumed on-site for domestic use will be reported to the sewage treatment facility for treatment prior to being discharged to the environment.

7.5.9 Tailings Storage Facility

The tailings storage facility (TSF) will comprise a north embankment and a south embankment. The embankments will be zoned earthfill/rockfill structures with a low-permeability core for seepage management. The embankments will include filter and transition zones to ensure proper filter relationships between adjacent zones, and to convey drainage within the embankment. A downstream shell zone, which comprises most of the embankment material, will be constructed with Non-Potentially Acid Generating (Non-PAG) mine waste. The TSF embankments will be expanded in stages throughout the mine life using the centerline construction method, with each stage providing the required capacity for the period until the next stage of construction is completed. The TSF north embankment will be approximately 31 m high at the starter configuration and 58 m high at its ultimate height. The TSF south embankment will be approximately 17 m at the

starter configuration and 44 m high at its ultimate height. It is estimated that seven stages of construction will be required to achieve the final crest elevations. Each stage will be constructed in advance of the storage needs of the project, expected to be approximately every one to two years.

The ultimate TSF is sized to store approximately 92 Mt of tailings, 66 Mt of Potentially Acid Generating (PAG) waste rock, the Inflow Design Flood, an operational supernatant pond, plus freeboard. The TSF starter embankment which will be constructed during the pre-production phase, has been sized to store the estimated volume of tailings and PAG waste rock produced during the first two years of operation.

Tailings from the Process Plant will be delivered to the TSF in two different streams, a rougher tailings stream, and a cleaner and detox tailings stream. The rougher tailings distribution system conveys tailings from the Process Plant for discharge into the TSF from the North and South Embankments, and the west side of the TSF, throughout operations. The rougher tailings will be discharged into the TSF from a series of large diameter valved off-takes located along the embankments. The cleaner tailings will be discharged to the internal PAG Cell for subaqueous storage. The PAG cell will be constructed with an low-permeability till liner within the TSF.

Mining dams in BC are regulated by the BC Health Safety and Reclamation Code issued by the Ministry of Energy, Mines and Low Carbon Innovation (EMLI) (EMLI 2021). Additionally, the new Global Industry Standard on Tailings Management recommendations further strengthens design approach (GISTM 2020). The TSF for the Project has been designed in accordance with these recent tailings standards.

7.5.10 Overall Site Water Management

Temporary and permanent site water diversion and collection ditches will be used during construction, operations, and closure to minimize sediment mobilization and erosion, collect, and convey mine contact water, and protect natural drainages and watercourses, as shown on Figure 7.1. Non-contact runoff from catchments directly upstream of the TSF will be diverted to Cedar Creek, while runoff from catchments upstream of the south embankment will be diverted to Boswell Lake, where it will be pumped around the west side of the TSF to be discharged into Cedar Creek during initial operations. In Year 10, the Boswell Lake South Diversion Channel will be constructed to redirect the Boswell Lake catchment towards the south and into Winkley Creek.

Sediment and erosion control measures will be necessary to limit effects on the surrounding environment and water sources due to earth-moving activities related to the construction and operations of the Project. Common construction activities that have the potential to expose soils to erosive forces include, but are not limited to:

- Clearing vegetation and soil

- Excavations
- Blasting
- Road and trail construction
- Watercourse diversions or crossings
- Stockpiling material
- Runoff from active work areas

The Project will take a proactive approach to sediment and erosion control by:

- Limiting the area of exposed soils by minimizing vegetation clearing
- Installing erosion and sediment control mitigations before construction begins
- Directing runoff and surface water around active construction and operation areas
- Regular inspection of the operation of erosion and sediment control works, and maintenance/repair as needed
- Progressively revegetate disturbed areas to improve soil stability and reduce erodible surfaces

Seepage Collection Ponds (SCPs) and pumping systems are included downstream of each of the embankments to collect runoff and seepage from the embankments. Water from the seepage collection ponds will be pumped back to the TSF. SCPs have been designed to store a 1 in 200-year return period 24-hr rainfall event, plus an operational pond volume of 2,000 m^3 (an estimate of a minimum-allowed volume, assuming the ponds are kept operationally pumped down), plus a one-meter freeboard allowance. The ponds will include spillways to pass flows exceeding the design storm event.

7.5.11 Water Treatment Facilities

The treatment of mining-influenced waters (MIW) will be required during all stages of the Project. During the initial Pre-Production year (Y-2), SMG will manage the suspended solids generated during earthwork and construction through best practices and water management; active treatment is not required in the first year. In the second Pre-Production Year, Y-1, active treatment will be required to treat nitrogen compounds derived from blasting used to generate clean rock for construction; SMG will continue to manage suspended solids without active treatment. Beginning Production Year 1 (Y1) and continuing through active closure (Y15 through Y18), active treatment of mine-influenced water will be required. In the active closure period, active treatment will transition to the passive treatment of MIW.

All MIW runoff water will report to a water management pond (WMP), a fully lined pond with an HDPE geomembrane liner. A water treatment plant (WTP) will actively treat influent from the WMP. The WTP will incorporate a variety of process technologies including oxidation, settling and clarification, microfiltration (MF), denitrification, and reverse osmosis. The WTP effluent will

discharge to Cedar Creek. Design and construction of a 15,000 m^3/day WTP will occur in Y-2, with operations beginning in Y-1. The WTP will initially be equipped to treat nitrogen compounds (blasting residuals) in Y-1. In Y1, the WTP will be fitted with additional treatment equipment to address MIW generated during mining including removal of parameters such as sulphate and metals from the WMP influent.

7.5.12 Temporary Construction Camp

SMG assumes that local labour is readily available from the surrounding area, where staff will reside in their private residences. However, SMG has made provision for a temporary 265-person construction camp close to the existing mill facility. Some construction personnel will be accommodated in the temporary construction camp and some in the existing 50-person exploration camp. Access for the personnel will be via surrounding local and national roads.

The temporary construction camp may not be entirely dismantled after the construction phase. Depending on demand, some rooms may be retained and upgraded as required to accommodate operations staff.

The existing exploration camp will also be utilized as a permanent camp facility for the mine life.

7.5.13 Power Supply Distribution System

The Spanish Mountain site will be served at 138 kV from BC Hydro.

BC Hydro will establish a new 138 kV Substation near Highway 97 adjacent to their existing substation at McLeese Lake. The new substation will be fed at 230 kV from existing BC Hydro line 2L95. The new substation will contain a 30 MVA step-down transformer to 138 kV, and metering at 138 kV. A set of outgoing suspension insulators will form the Point of Interconnection (POI). The new substation will be owned and operated by BC Hydro. Everything downstream of the POI will be owned and operated by Spanish Mountain.

A new 138 kV transmission line will be installed between the POI and the receiving substation at the Spanish Mountain mine site over a distance of 77.8 km. The transmission line will be single pole type. The transmission line will generally follow the road, to a point just west of the town of Likely, then it will be routed north, around Likely, to the mine site. The transmission line will be owned and operated by Spanish Mountain.

The on-site infrastructure consists of an incoming 138 kV substation, and electrical distribution at 13.8 kV on-site.

The 138 kV substation will consist of:

- An incoming structure complete with 138 kV disconnect switch

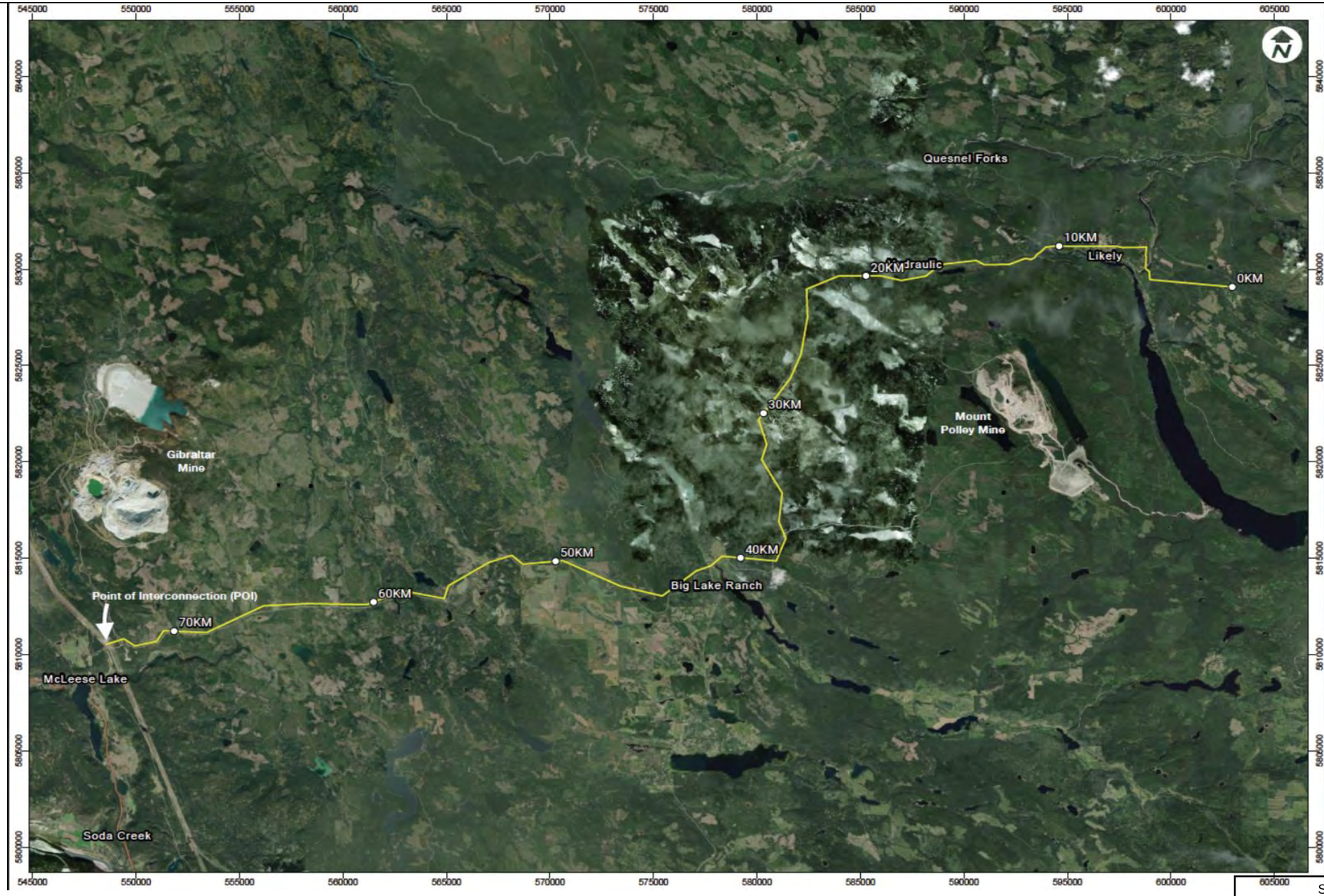
- An incoming 138 kV SF6 circuit breaker
- A 30/40/50 MVA transformer, 138 kV/13.8 kV
- A building containing 13.8 circuit breakers
- A lineup of 13.8 distribution circuit breakers
- A 13.8 kV capacitor bank

The 13.8 kV distribution will be housed inside a building within the substation. The 13.8 kV circuit breaker lineup will consist of 2 high units. The distribution to the Process Area will consist of:

- A 13.8 kV feeder (3C#250MCM) to a 7.5 MVA, 13.8 kV/4.16 kV transformer serving the Mills Area
- A 13.8 kV feeder (3 runs of 3C#250MCM) to a 13.8 kV bus serving the SAG and Ball Mill
- A 13.8 kV feeder (3C#250MCM) to a 1.5 MVA, 13.8 kV/4.16 kV transformer serving the Crushing Area
- A 13.8 kV feeder (3C#250MCM) to a 2 MVA, 13.8 kV/4.16 kV transformer serving the Pebble Crusher Area
- A 13.8 kV feeder (3C#250MCM) to a 10 MVA, 13.8 kV/4.16 kV transformer serving the Reagents/CIL Area
- A 13.8 kV feeder (3C#250MCM) to an overhead distribution line feeding all loads outside of the Process Building (see below)
- A 13.8 kV feeder (3C#250MCM) feeding a capacitor bank located within the substation
- A spare 13.8 kV circuit breaker
- Transmission Line layout route is presented in Figure 7.3.

The overhead 13.8 kV line will service the following areas:

- Maintenance and Truck Shop
- Waste and Sewage Systems
- Administration/Dry Building
- Assay Lab
- Cold Storage Warehouse
- Explosives Manufacturing and Storage
- Water Treatment Plant
- Tailings/Reclaim Systems



NOTES:

1. FIGURE AS PROVIDED BY SMG ON FEBRUARY 25, 2022

REV	DATE	DESCRIPTION	PREP'D	RVW'D
B	28NOV'21	ISSUED WITH REPORT	ACC	RCB

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN PROJECT

Transmission Line Corridor

Knight Piésold CONSULTING

P/A NO. VA102-272/15

REF. NO. 1

FIGURE 7.3

REV B

7.5.14 Fuel

Diesel fuel, the primary Project fuel, will be supplied in mobile 75,000 litre tanks and stored in a concrete bunded fuel storage area located at the plant site. The anticipated mining fleet diesel consumption was calculated to be 16 Ml per year for the first six years and then it will ramp-up to 27 Ml from Year 7 onwards. The fuel storage area will initially store four mobile fuel storage tanks and expanded later to store seven as fuel consumption ramps-up. The mobile fuel tanks will be double-walled and will be equipped with pre-packaged fuel unloading modules. These tanks will also supply fuel for the plant site mobile equipment. Fuel will be trucked to storage tanks for other facilities such as emergency generators and incinerators.

Liquid propane for building heating will be provided by contractor road tanker, from supply depots in Williams Lake.

7.6 Operation

7.6.1 Tailings Storage Facility

The principal objective of the Tailings Storage Facility is to provide secure containment of all tailings solids and potentially acid generating (PAG)/metal leaching (ML) waste rock. The metallurgical process involves a gravity circuit followed by a rougher flotation circuit to produce rougher tailings. The process feed is reground and subjected to carbon-in-leach and cyanide detoxification circuits before being combined with a pre-float concentrate to produce the cleaner tailings and detox tailings stream, which is assumed to be PAG and ML if allowed to oxidize. The tailings streams will be transported from the plant site to the TSF in separate pipelines. The rougher tailings will be discharged from spigots located at the embankments and the west side of the TSF forming extensive drained tailings beaches. The cleaner tailings and detox tailings stream will be pumped and discharged sub-aqueously into a separate location within the facility, referred to as the PAG Cell.

The project includes a separate water management pond (WMP) which will serve as the primary site water management component during operations. Site runoff, including the water in the TSF supernatant pond, is pumped to the WMP. This significantly reduces the volume of water stored within the TSF. The WMP provides a storage buffer for the water treatment plant to reduce the peak flows requiring treatment.

7.6.2 Overall Site Water Management

The WMP will serve as the primary site water management component during operations, providing storage for process water, direct precipitation, and runoff. Site runoff, including the water in the separate TSF supernatant ponds, is pumped to the WMP. This significantly reduces the

volume of free water stored within the TSF. The WMP provides a buffer for the water treatment plant to reduce the peak flows requiring treatment. The WMP has the capacity to store:

- 3.0 Mm^3 from the 95th percentile water balance volume
- Runoff from the 1 in 1,000-year return period storm event from the upstream catchment
- Approximately 800,000 m^3 assuming the water treatment system is not operating for one month

An emergency spillway will be constructed at the right abutment to safely pass the peak flows from extreme storm events above the 1,000 year 24-hour storm event.

7.6.3 Water Treatment Facilities

A 15,000 m^3/day WTP will be constructed in Y-2, with operations beginning in Y-1 to treat water from the WMP, which will receive and store MIW generated from the active portions of the Site. The WTP will initially be equipped to treat nitrogen compounds (blasting residuals) in Y-1. In Y1, the WTP will be fitted with additional treatment equipment to address MIW generated during mining including removal of parameters such as sulphate and metals from the WMP influent. The WTP will incorporate a variety of process technologies including oxidation, settling and clarification, microfiltration, denitrification, and RO. The WTP capacity will be expanded to 18,000 m^3/day in Y6.

Passive treatment systems will be constructed in Y6, and commissioned through Y7 and Y8, to augment the active WTP capacity, treating runoff from the North and West Rock Storage Facilities and the North Seepage Collection Pond. The passive systems will have the following components/treatment functions:

- Iron terrace for arsenic removal and ammonia oxidation to nitrate.
- Biochemical reactor for nitrate, sulphate, and most heavy metal removal (as sulphides).
- Aerobic polishing wetland (for minor removal of biochemical oxygen demand).

The total capacity of the passive systems will be 3,800 m^3/day once commissioning is complete, for a combined active/passive treatment capacity of 21,800 m^3/day functioning in Y9.

The open pit will begin filling with water once pumping from the pit is discontinued in Y14. An in-pit passive system will be used to treat pit water, which will be in place prior to filling of the pit. It is expected that water in the pit will eventually rise to above the pit rim, from where the treated water will be discharged to Spanish Creek. Ongoing hydrogeology studies will assess the time to discharge in the pit once pumping is discontinued.

Both the WTP and the passive systems will operate through the active closure period (Y15 through Y18). Active treatment will not be required beyond Y18 and the WTP will be dismantled and transported offsite in late Y18. The passive systems will continue operating through and beyond the passive closure period.

7.6.4 Water Supply

Fresh water is supplied from two freshwater wells to a fresh/fire water tank. Fresh water is used for all purposes requiring clean water with low dissolved solids and low salt content, primarily as follows:

- gland water for pumps
- reagent make-up
- elution circuit make-up
- raw water is treated and stored in the potable water storage tank for use in safety showers and other similar applications
- fire water for use in the sprinkler and hydrant system
- cooling water for mill motors and mill lubrication systems (closed loop)

Potable water is pumped from the fresh fire water tank to a sterilization skid and stored in a potable water tank before being sent to potable water uses via the potable water pump.

Overflow from the thickeners, as well as water stored in the water management pond meet the majority of the process water requirements. Raw water and contact water provide any additional make-up water requirements. The water management pond is fed with clarified water from the non-acid generating sections of the tailings pond. Seepage water from the north and south seepage ponds is pumped back into the non-acid generating sections of the tailings pond. Treated water from the WTP can also be reclaimed and used as make-up water in the event that water from the WMP is not of suitable quality.

7.6.5 Solid Waste Disposal Facilities

An incinerator will be used for the disposal of non-hazardous, combustible waste materials and will be located within the accommodation complex.

No provision has been made for an on-site landfill. Inert solid waste will be collected and transported off-site to the nearest landfill. Hazardous waste will be collected and transported off-site for disposal.

7.7 Decommissioning

7.7.1 Active Closure

The mine plan includes four years of active closure, which involves the following water management activities:

- Constructing a closure spillway at the TSF north embankment.

- Re-grading the tailings surface to encourage natural drainage towards the closure spillway at the north embankment. Selective discharge of tailings will occur in the latter years of operations to grade the TSF surface to the maximum practicable extent and minimize the final grading requirement at closure.
- Construction of a closure cover and revegetating the regraded tailings surface. The tailings facility cover is envisioned to be comprised of three meters of Type Ai rock (see Table 8.1), 0.5 m of Zone S (glacial till), a 0.3 m drainage layer, and 0.6 of overburden and topsoil.
- Construction of a wetland cover in the area of the PAG cell.
- Reclamation and revegetation of the TSF embankments.
- Revegetation of any WRSFs which have not been progressively reclaimed during operations.
- Decommissioning and reclamation of the process plant.
- Progressive reclamation and decommissioning of roads, ditching, and other structures when no longer needed.
- Continued operation of the WMP until it is no longer required at which time it will be decommissioned and the area reclaimed.
- Continued operation of the passive water treatment systems.
- Monitoring.

7.7.2 Passive Closure

The passive closure phase will follow active closure. The passive closure phase includes:

- Continued operation of the passive water treatment systems.
- Directing water from the TSF South Embankment SCP to the Boswell Lake south diversion channel where it will discharge to the south via Winkley Creek.
- Passive, in-pit, treatment of the Open Pit lake within the pit prior to discharge to the environment via gravity drainage.
- Discharge of runoff from the TSF catchment through the TSF closure spillway towards Cedar Creek.
- Monitoring.

7.7.3 Open Pit

Once mining has ceased, pumping will be discontinued, and the Open Pit will begin filling with water. The initial indication from evaluation of the pit wall geochemistry is that treatment will be required, and an in-pit passive treatment approach is planned to address this treatment requirement. Water quality in the Open Pit will be further modelled prior to filling to further refine treatment requirements for the eventual overflow discharge and adjust the passive treatment plan accordingly.

Water quality in the developing pit lake will be sampled to verify the model and the effectiveness of any passive treatment applied. The passive treatment can then be adjusted as needed to meet established discharge criteria in advance of any discharge from the Open Pit.

An earthen safety berm will be constructed around the Open Pit to prevent accidental entry over the pit rim.

7.7.4 Plant Site

All buildings and structures will be dismantled and/or demolished and then removed from the Mine Site. Where possible, salvageable material will be re-used, recycled, or transformed into other useful forms.

All materials removed from the site will be disposed of in accordance with applicable legislation and regulations. Any contaminated material (e.g., petroleum hydrocarbons or heavy metals) will also be stored, handled, and disposed of in accordance with applicable legislation and regulations. Once the buildings and structures have been removed, the areas will be contoured and graded, covered with growth medium, and vegetated with appropriate plant species.

7.7.5 Access and Project Roads

Basic access to the passive treatment systems will be required post-closure.

Closure will include the following:

- Reclamation of access, in-plant, and maintenance roads
- Removal of bridges, culverts, and other watercourse crossing structures
- Restoration of affected stream banks and riparian areas
- Re-vegetation of affected areas with appropriate plant species

7.8 Mineral Processing

The Spanish Mountain Gold deposit has been the subject of several metallurgical test programs, the most recent of which was carried out at McClelland Laboratories in 2019. For the 2020 PFS, metallurgical test work conducted by SGS, G&T, Met-Solve, Knelson, and McClelland Laboratories was reviewed.

Tests were performed on mineralization that is representative of the material that will be sent to the plant. Composite samples representing major lithologies and a range of head grades aligned with the minimum and maximum values expected in the plant feed over the life of mine. Gold and silver grades in the variability samples ranged from 0.15-3.25 g/t Au and 0.5–4.4 g/t Ag.

Most of the metallurgical testwork was performed on samples from the central part of the planned open pit (called the main zone).

Bulk mineralogy on select composites showed that pyrite was the main sulfide mineral present, representing between 0.5-2.5% by mass. Sphalerite and chalcopyrite were also present in relative order of abundance. Gold occurs as free gold associated with quartz veins and as attachments to and occlusions in pyrite.

Comminution testing showed that the materials tested are highly variable in competency. The breakage data showed the ore can be classified as competent and moderately hard, and moderately abrasive with SAG Mill Comminution tests ranging from 26-51.7. Conventional Bond tests showed significant variation in hardness, with Bond rod mill work indices ranging 12.4-17.5 kWh/t and Bond ball mill work indices ranging from 10.9-16.7 kWh/t.

Rougher flotation tests showed high sulfide recovery was generally achieved within 8 minutes of flotation time. Flotation recoveries to cleaner concentrate ranged 80-92% for gold, 25-55% for silver.

Total organic carbon (TOC) occurs in high enough concentrations in the feed to negatively impact gold leach recoveries because of preg-robbing. TOC was successfully depressed in the cleaner flotation circuit using CMC. No other deleterious elements are present at levels to be cause for concern.

High leach recoveries were achieved when leach feed was reduced to <0.5% TOC and following regrind to a P80 of 22µm.

Overall plant recoveries for gold are predicted to range from 85–92% for head grades ranging from 0.6-1 g/t Au. Overall plant recoveries for silver are predicted to range from 38–42%.

Cyanide detoxification tests reduced WAD cyanide levels to 1.5 mg/L with moderate reagent consumption rates.

7.9 Transportation

Access to the area is via the paved Likely Road (the "Gold Rush Trail") from Provincial Highway 97 near the village of 150 Mile House to the village of Likely, which covers a distance of 75 km. From the Likely Road, access to the north side of the Property is via the seasonally maintained Keithley Creek Road and Spanish Lake Road (also known as the 1300 Road), and to the southern portions of the Project by Black Bear Road (2900 Road) from Cedar Creek Road (3900 Road). Upgrades are anticipated to these existing roads to accommodate mine construction and operations traffic.

Construction equipment and materials will be shipped to the Mine Site by heavy trucks over the 24-month construction period. It is estimated this may include up to 1,000 heavy loads over the

construction period. Estimates of daily and monthly heavy load frequency will be developed at later stages of project planning Most construction workers will reside at the onsite camps, which will accommodate up to 315 persons. Camp-resident workers will travel to site in their service vehicles or on buses from Williams Lake. Local residents involved in construction will travel in their service vehicles or will and be transported from Likely and the surrounding area to the construction site on buses. Small truck traffic will increase over the construction period.

8.0 INDIGENOUS NATION AND PUBLIC INTERESTS

8.1 Indigenous Nations

Three Indigenous nations were identified for deep engagement during the previous entry to EA and the relationships established at that time have been supported by all parties and continue to the present. Early engagement in relation to the present project plan also has focused on these nations.

The point of interconnection of the powerline for the project, at McLeese Lake, occurs within the eastern margin of the asserted traditional territory of the Tsilhqot'in Nation.

The Métis Nation British Columbia assert Aboriginal rights in and around the Project area. The Cariboo-Chilcotin Métis Association, a Chartered Métis community based in Williams Lake, asserts harvesting and hunting rights in the region.

Additional information is available in the Early Engagement Plan submitted under separate cover from SMG.

8.1.1 Williams Lake First Nation

Williams Lake First Nation is a member of the Northern Shuswap Tribal Council which comprises four Northern Secwepemc te Qelmucw (NStQ) communities: WLFN, Canim Lake Band, Stswēceḿc/Xget'tem First Nation, and Xatśūll First Nation. As of April 2021, total nation membership was 857, with 235 band members living on reserve, 578 living off reserve, and 43 living in other First Nations communities.

The WLFN reserve lands comprise 8 parcels, totalling approximately 1921 ha, centred approximately 52 km southwest of the Project site and 10 km east of Williams Lake (Figure 8.1). The WLFN office and primary community is located near Williams Lake, approximately 63 km from the Project.

The Northern Shuswap Tribal Council Statement of Intent Territory (Figure 8.1), which includes the Project site, includes the WLFN Traditional Territory. The proposed Project powerline, originating at McCleese Lake, occurs entirely within WLFN Traditional Territory.

The WLFN has entered into First Nations Land Management under the *First Nations Land Management Act*. Under First Nations Land Management, land administration is transferred to First Nations which includes the authority to enact laws with respect to land, the environment, and resources. The nearest parcel of land managed by the WLFN under the Act is the Carpenter Mountain Indian Reserve No. 15, approximately 56 km from the Project.

8.1.2 Xatśūll First Nation

Xatśūll First Nation also is a member of the Northern Shuswap Tribal Council. As of the 2016 census, total nation membership was 447. Approximately 100 members live in the Cmetēm (Deep Creek) and Xatśūll (Soda Creek) communities.

The XFN reserve lands total 2093 ha, centred approximately 50 km southwest of the Project site, approximately 13 km north of Williams Lake (Figure 8.1). The XFN office is located approximately 58 km from the Project.

The Northern Shuswap Tribal Council Statement of Intent Territory (Figure 8.1), which includes the Project site, includes the XFN Traditional Territory. The proposed Project powerline, originating at McCleese Lake, occurs entirely within XFN Traditional Territory.

Likely-Xatsull Community Forest – The community forest is a partnership between the Xatśūll First Nation and the Community of Likely covering 20,000 ha (Figure 8.1). The forest is jointly managed by the partners, and they share profits from forest harvest activities. The Project site overlaps the northeastern edge of the Community Forest and the proposed power line will traverse the forest to reach the mine site.

8.1.3 Lhtako Dené Nation

The Lhtako Dene Nation is a member of the Carrier Chilcotin Tribal Council, which also includes Lhoosk'uz Dené Nation, Tl'esqox of the Tsilhqot'in, and Ulkatcho First Nation. As of the 2019, total nation membership was 180, with 85 living on reserve.

The LDN reserve lands total approximately 683 ha, centred approximately 72 km northwest of the Project site and adjacent to the City of Quesnel (Figure 8.1). The LDN office is located approximately 80 km from the Project.

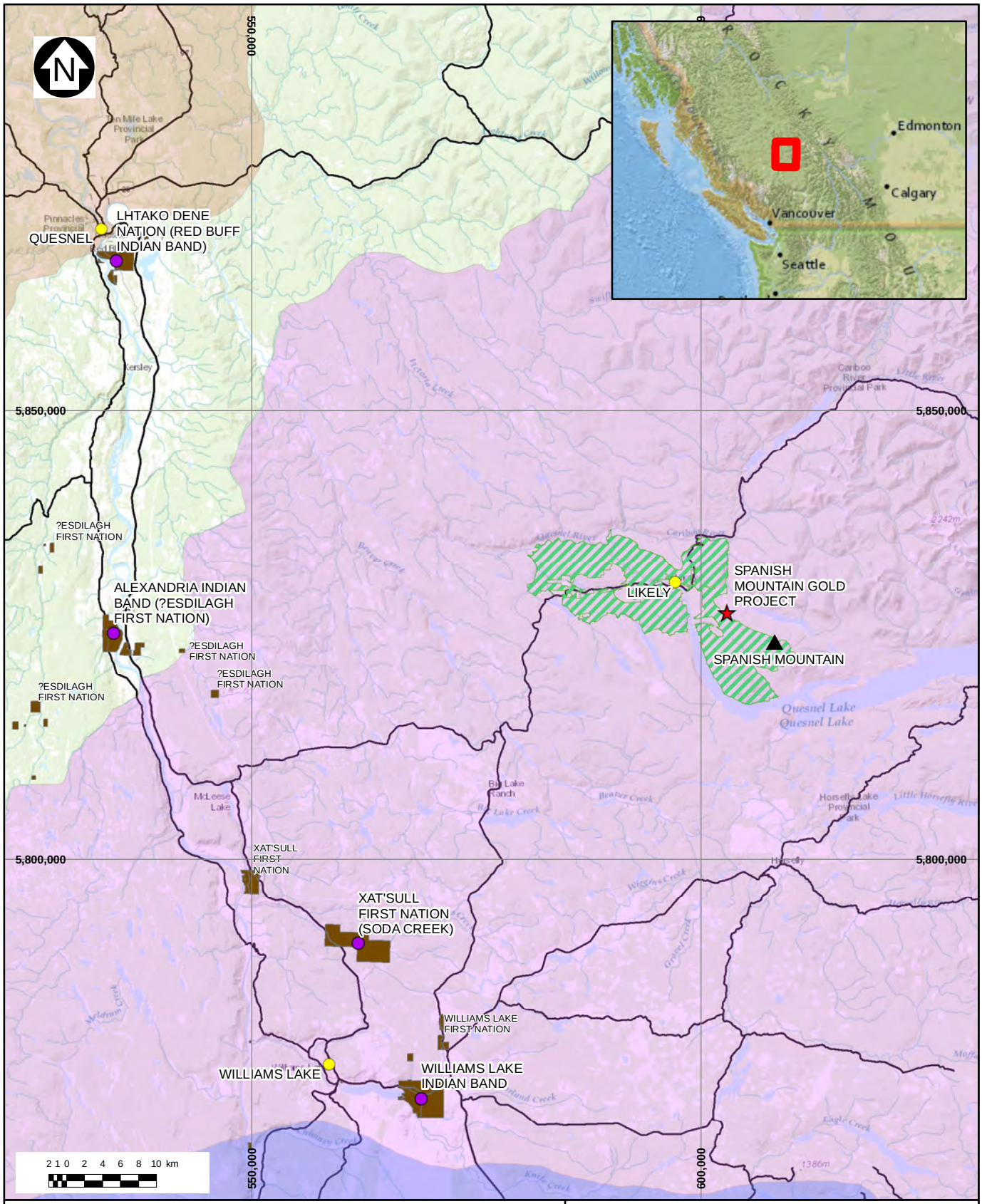
The asserted traditional territory of LDN, which is not available for publication, includes the Project site at its extreme southern edge, which terminates along the northern shore of Quesnel Lake. The proposed power line route avoids LDN territory for most of its length except for the final approach to and around Likely to the site.

8.1.4 Indigenous Nation Treaties

The Northern Secwepemc te Qelmucw (NStQ) nations formally entered the BC Treaty Process in 1993, although they have been asserting the process was first initiated in 1879 when Chief William submitted a grievance letter to the Victoria Colonist to voice his discontent over the loss of his lands and authority over his people.

The treaty process is now in Stage 5 (out of 6 stages) with the Agreement-in-Principle signed in July 2018. The province of BC signed Incremental Treaty Agreements with each of the four nations in 2016 and, in October 2018, it and NStQ signed a Government-to-Government Agreement.

The LDN is not participating in the BC Treaty Process.



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LEGEND:

- PROJECT LOCATION
- FIRST NATIONS COMMUNITY
- COMMUNITY
- ROADS
- INDIAN RESERVE
- LIKELY - XATS'ULL COMMUNITY FOREST
- NORTHERN SHUSWAP TRIBAL COUNCIL STATEMENT OF INTENT
- NAZKO FIRST NATION STATEMENT OF INTENT
- ESK'ETEMC FIRST NATION STATEMENT OF INTENT

NOTES:

1. BASE MAP: MAIN - ESRI TOPOGRAPHIC, INSET - ESRI NATIONAL GEOGRAPHIC
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 1983 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:600,000 FOR 8.5x11 (LETTER) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. FIRST NATIONS DATA OBTAINED FROM IMAPBC
5. DARK BLUE STATEMENT OF INTENT AREA SHOWN AT BOTTOM OF FIGURE REPRESENTS COMBINATION OF NORTHERN SHUSWAP AND ESK'ETEMC FIRST NATIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	04MAR'22	ISSUED WITH REPORT	CB	DEA	CB

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN GOLD PROJECT

SPANISH MOUNTAIN FIRST NATION INTEREST

Knight Piésold CONSULTING

P/A NO. VA102-272/15

REF NO. 1

FIGURE 8.1

REV 0

8.2 Local Areas of Importance to Indigenous Nations

The WLFN and XFN jointly prepared a Traditional Land Use study in 2012 related to the Project, as planned at that time, and their traditional knowledge. In keeping with the proprietary nature of this information, specific areas of use and value are not presented in the present public document, although the information is being used to inform project planning. Each of WLFN, XFN, and LDN will be preparing updated Traditional Land Use studies in 2022 and these will further inform project planning.

8.3 Engagement Principles

SMG understands that meaningful engagement with Indigenous nations and all stakeholders is an essential component of any successful EA. SMG will continue to build upon the engagement activities that have already been completed to implement methods that have proven to work within the communities.

The engagement activities for the Project are framed by the following principles:

Shared Process – SMG's engagement program is developed based on a shared process that seeks and considers input from potentially affected parties.

Respect – SMG commits to establishing positive, productive, and lasting relationships based on mutual respect and understanding, and supported by appropriate engagement opportunities.

Timeliness – SMG commits to early engagement with the public and stakeholders, and to providing timely and accurate exchange of information about the Project and about opportunities to participate in engagement activities.

Relationships – SMG establishes and maintains long-term relationships with those with an interest in the Project, with an understanding that these relationships will evolve through ongoing engagement.

Inclusiveness – SMG is inclusive in its engagement activities and works to identify those potentially affected by the Project in a manner consistent with the principles of Gender-Based Analysis Plus (GBA+). SMG works with the public and stakeholders to identify means through which they feel comfortable being engaged and having their input reflected.

Responsiveness – SMG considers and responds to input from the public and stakeholders and demonstrates how their input had been considered in Project designs, including management and mitigation plans.

Open communication – SMG is open and transparent in its operations and communications. SMG openly listens to input and works with the Indigenous nations, stakeholders, and the public to identify and address Project-related concerns. All input received is reported.

8.4 Indigenous Nation Engagement

The Indigenous Nation Engagement program continues the engagement activities with three Nations that were initiated prior to the, since withdrawn, entry to the BC and federal EA processes in 2011.

SMG's objectives specific to Indigenous nation engagement are to:

- Identify Indigenous nations who may be affected by the Project and, through ongoing engagement, determine how they wish to be engaged
- Provide timely and reasonable levels of capacity resources, in addition to potential funding through the BC EAO and IAAC, to assist potentially affected Indigenous nations to participate in Project engagement
- Provide timely and relevant Project information and seek feedback from Indigenous nations on Project-related effects, interests, and concerns
- Understand Indigenous nations governance and community interests and priorities
- Determine what practices, traditions, or customs have been or are currently being engaged in by Indigenous nations near the proposed Project and determine how these practices, traditions or customs may potentially be impacted by the Project

8.4.1 Relevant Agreements

SMG signed Memoranda of Understanding with each of WLFN, in 2011, XFN, in 2011, and LDFN, in 2012. All these agreements were initiated in relation to the previous project plan. SMG signed an Engagement Agreement with XFN in October 2021 that is the first step toward negotiation of a Relationship Agreement to cover the life of the Project – the Relationship Agreement is presently in negotiation. SMG signed an Engagement Agreement with LDN in December 2021 that is the first step toward negotiation of a Relationship Agreement to cover the life of the Project. SMG also is currently in negotiations with WLFN for a life-of-project participation agreement.

WLFN has signed a First Nations Land Management Agreement with Canada, which enables the nation to opt-out of 40 sections of the Indian Act relating to land management. The nation can then develop their own laws about land use, the environment and natural resources and take advantage of cultural and economic development opportunities with their new land management authorities.

8.4.2 Recent And Planned Engagement

SMG has been actively engaging with Williams Lake First Nation and Xatśūll First Nation since 2011 and with Lhtako Dené Nation since 2012, through meetings, teleconferences, workshops, e-mails, presentations, and site visits. The engagement has assisted SMG in the development of a broader understanding of First Nation interests and concerns regarding the Project and in the application of that understanding in Project design, potential mitigation measures, and potential Project benefits.

SMG will continue to thoughtfully engage Indigenous nations, building on the decade of engagement experience that all parties have developed and continue to support. Our objective is to ensure Indigenous nations have sufficient time to review, understand, and provide feedback on the Project throughout the EA process. Engagement activities will be scheduled in collaboration with each Indigenous nation and remain flexible to accommodate the individual nation interests and needs.

SMG recognizes the uncertainty surrounding the COVID-19 pandemic and its influence on the willingness of communities to welcome in-person meetings and events. SMG will adapt its engagement activities as required to meet health and safety requirements and Indigenous nation concerns.

Recent engagement activities, findings from engagement and SMG responses, and planned engagement activities specific to each nation are detailed in the following sections.

8.4.2.1 Xatśūll First Nation

Recent engagement activities Xatśūll First Nation, findings from engagement and related SMG responses, and planned engagement activities specific to the IPD and are detailed in Tables 8.1, 8.2, and 8.3.

Table 8.1 Xatśūll First Nation – Summary of Engagement Methods and Related Recent Engagement Activities and Findings

Engagement Method	Recent Activities
Letter or emails	Project update letters/emails are sent periodically to Chief and Council to communicate details regarding planned activities on the Project site and plans and activities related to the Environmental Assessment process. These communications began in 2010-2012 and continue. Regular update emails are sent to the Natural Resources Department related to plans and activities. These communications began in 2010-2012 and continue.
Initial Project Description (IPD) Review	Pre-submission Review – the draft IPD was provided to XFN for review and comment in November 2021, prior to submission. XFN provided comments on the draft in December 2021. The draft IPD was revised based on the pre-submission review comments A digital copy of the final revised IPD will be provided to XFN
Meetings with Chief and Council	IPD Pre-submission – SMG management met with Chief and Council at their regular meeting of 14 October 2021 to introduce the project, identify key environmental protection measures built into the project plan, and discuss how the current project plan differs from that previously proposed in 2011. The meeting was broadcast via Zoom and was available to all community members. Chief and Council also approved the Engagement Agreement with SMG at the meeting Future meetings will occur as requested by XFN
Community Meetings	No community meetings were held prior to initiating the early Engagement phase of the EA process. Community meetings will be held to present and discuss the project plans and the EA as appropriate to the phase of the EA
Technical Workshops	Technical workshops will be hosted as mutually agreed with XFN to discuss and work through technical matters related to the project. No technical meetings were identified as necessary by XFN during review of the draft IPD.
Regular Project Meetings	SMG met bi-weekly with representatives of the XFN Natural Resources Department from June 30 through December 1, 2021.
Phone/E-mail Contact	SMG management has established regular contact by telephone and email with XFN leadership and management to discuss the Project, activities on site, and for any other continuing discussions as may be necessary
Social Media	Planned and current project activities and news and progress of the EA process will be shared using social media – Facebook and Twitter

Table 8.2 Xatśūll First Nation – Recent Engagement Findings and Responses

Subject	Response
Capacity Support, Education and Training, Employment opportunities, Business/Contracting opportunities, Direct Economic Benefits	SMG has committed to providing capacity support for XFN participation in the EA process. Specific budgets are being determined as part of Relationship Agreement negotiation, with interim funding offered to bridge costs incurred prior to completion of negotiations. XFN has interests and expectations with respect to education and training, employment, and business opportunities related to the Project. Specific commitments in these areas are being determined as part of Relationship Agreement negotiation. In addition to the above, XFN has an interest in direct economic benefits related to the project. Specific commitments in these areas are being determined as part of Relationship Agreement negotiation.
Traditional Land Use/Cultural Heritage Study Update	XFN and WLFN collaborated on a TLU study in 2012. SMG, XFN, and WLFN discussed developing an update to the previous study and both nations have indicated an interest in preparing their own updates to the study. SMG has committed to funding preparation of the XFN update and to applying the findings of the study in the environmental assessment.
Protection of water quantity and water quality	The Nation has particular interests and concerns related to water and water quality protection, which were stated to SMG early in our engagement conversations and restated during our presentation and discussion with Chief and Council. The Project does not require withdrawals from surface water sources and uses diversions and collection ditches to isolate mine contact water from clean surface runoff. SMG has included a significant water treatment capability/capacity in the project plan that will provide for treatment of all mine contact water scheduled for release to meet the BC Water Quality Guidelines: Aquatic Life at the point of discharge. This approach was taken so that we did not have to rely on the assimilative capacity in the local watercourses to attenuate any discharges of contact water from the Project.
Tailings management	The failure of the Mount Polley Mine tailings dam in August 2014 elevated overall public attention and concerns related to tailings management for mining projects and the local communities are well informed regarding tailings management best practices. Our presentations discuss how our planned approach to tailings management has evolved since the Project was previously in the EA process, and specifically how our plan has been informed by the learnings from Mount Polley, including: • relocation of the tailings area to make use of local topography for containment and reduce the height and length of the tailings dams required • provide a separate water management pond outside the tailings facility to manage mine-contact water and thereby minimize water storage in the tailings facility • manage the tailings facility so that water is not stored against the tailings dams • provide the facility to treat and safely discharge excess water from the mine site so that water storage on site is limited to the process water requirements of the operation
Closure planning	XFN Council are interested in better understanding what is involved in mine closure. During our presentation to Council, their questions indicated an interest in what closed conditions look like and learning how successful closure is in practice. This is a subject that can perhaps best be addressed through site visits to other mines in BC where closure has been completed, either in whole or in part. SMG plans to arrange site visits for this purpose as part of continuing engagement related to specific conversations around closure planning that will occur later in project planning.
IPD Review	The draft IPD was reviewed by XFN Natural Resources department staff. Two items were identified: • The site drawing did not include the locations of the explosives magazine or explosives plant – this information has been added to the site drawing in the final IPD • The means by which run-on of clean surface runoff to the site is minimized/prevented through the use of diversion berms and/or ditches was not seen as being clear in the site plans – this detail has been added in the final IPD.

Table 8.3 Xatśūll First Nation - Planned Engagement Activities

Engagement Method	Planned Activities
Regular Project Meetings	SMG will continue regular meetings with XFN Natural Resources Department staff
Chief and Council Meetings	Meetings will be held as requested by XFN
Community Meetings	SMG will work with XFN staff to plan and schedule community meetings: • In-person open-house style meetings may be held, subject to specific XFN and provincial Covid-19 related guidelines and policies, in combination with virtual meetings. • Virtual meetings will be recorded so that community members who are otherwise unable to participate in-person or during the virtual meeting can still become informed about the project. Questions or comments can then be provided to SMG by email, telephone, or comment form on the project website. • This combination of meeting approaches provides a diversity of opportunities for community members to learn about the project and express their interests and concerns. • Follow-up meetings may be scheduled to discuss, as necessary, how the input provided by community members in the first round of meetings has informed subsequent project planning and the subsequent Detailed Project Description.
Technical Workshops	Technical workshops will be hosted as mutually agreed with XFN to discuss and work through technical matters related to the project.
Site Tours	Site tours are hosted periodically, in response to Nation requests Visits to operating mines can be arranged to understand mine operation and to see examples of closure applications.
Social Media	Planned and current project activities and news and progress of the EA process will be shared using social media – Facebook and Twitter
Cross-cultural training	Cross-cultural training requirements for SMG staff and consultants will be reviewed periodically and XFN will be invited to provide Nation-specific training opportunities for our staff to learn about Nation history and cultural practices that can assist staff in their collaboration with XFN.

8.4.2.2 Williams Lake First Nation

Recent engagement activities with Williams Lake First Nation, findings from engagement and related SMG responses, and planned engagement activities specific to the IPD review and development of the Detailed Project Description are detailed in Tables 8.4, 8.5, and 8.6.

Table 8.4 Williams Lake First Nation - Summary of Engagement Methods and Related Recent Engagement Activities and Findings

Engagement Method	Recent Activities
Letter or emails	Project update letters/emails are sent periodically to Chief and Council to communicate details regarding planned activities on the Project site and plans and activities related to the Environmental Assessment process. These communications started in 2010-2012 and continue. Periodic update emails are sent to the Natural Resources Department related to plans and activities
Initial Project Description (IPD) Review	Pre-submission Review – the draft IPD was provided to WLFN for review and comment on 14 December 2021. Review comments were received on 23 February 2022. No specific revisions to the IPD were necessary as a result of the review because the review focussed on concerns to be examined in detail during the A digital copy of the final revised IPD will be provided to WLFN.
Meetings with Chief and Council	SMG has not recently met with Chief and Council. The protocol with WLFN is that submissions, such as the IPD, are first reviewed by staff and typically are followed by a meeting with Chief and Council and then by community meetings.
Community Meetings	Community meetings are held as requested by WLFN No meetings have been requested in relation to the draft IPD review
Technical Workshops and Review	Technical workshops will be hosted as mutually agreed with WLFN to discuss and work through technical matters related to the project WLFN did not require a technical workshop for review of the IPD.
Regular Project Meetings	SMG meets periodically with representatives of the WLFN Natural Resources Department SMG provided an overview presentation of the project plan to Natural Resources Department staff on 12 November 2021.
Phone/E-mail Contact	SMG management has established regular contact by telephone and email with WLFN leadership and management to discuss the Project, activities on site, and for any other continuing discussions as may be necessary
Social Media	Planned and current project activities and progress of the EA process will be shared using social media – Facebook and Twitter

Table 8.5 Williams Lake First Nation – Recent Engagement Subjects and Responses

Subject	Response
Capacity Support, Education and Training, Employment opportunities, Business/Contracting opportunities, Direct Economic Benefits	SMG has committed to providing capacity support for WLFN participation in the EA process. Specific budgets are being determined as part of Relationship Agreement negotiation, with interim funding offered to bridge costs incurred prior to completion of negotiations. WLFN has interests and expectations with respect to education and training, employment, and business opportunities related to the Project. Specific commitments in these areas are being determined as part of Relationship Agreement negotiation. In addition to the above, WLFN has an interest in direct economic benefits related to the project. Specific commitments in these areas are being determined as part of Relationship Agreement negotiation.
Traditional Land Use/Cultural Heritage Study Update	XFN and WLFN collaborated on a TLU study in 2012. SMG, XFN, and WLFN discussed developing an update to the previous study and both nations have indicated an interest in preparing their own updates to the study. SMG has committed to funding preparation of the WLFN update and to applying the findings of the study in the environmental assessment.
Protection of water quantity and water quality	The Nation has particular interests and concerns related to water and water quality protection, which were stated to SMG early in our engagement conversations. The Project does not require withdrawals from surface water sources and uses diversions and collection ditches to isolate mine contact water from clean surface runoff. SMG has included a significant water treatment capability/capacity in the project plan that will provide for treatment of all mine contact water scheduled for release to meet the BC Water Quality Guidelines: Aquatic Life at the point of discharge. This approach was taken so that we did not have to rely on the assimilative capacity in the local watercourses to attenuate any discharges of contact water from the Project.
Tailings management	The failure of the Mount Polley Mine tailings dam in August 2014 elevated overall public attention and concerns related to tailings management for mining projects and the local communities are well informed regarding tailings management best practices. Our presentations discuss how our planned approach to tailings management has evolved since the Project was previously in the EA process, and specifically how our plan has been informed by the learnings from Mount Polley, including: • Relocation of the tailings area to make use of local topography for containment and reduce the height and length of the tailings dams required • Provide a separate water management pond outside the tailings facility to manage mine-contact water and thereby minimize water storage in the tailings facility • Manage the tailings facility so that water is not stored against the tailings dams • Provide the facility to treat and safely discharge excess water from the mine site so that water storage on site is limited to the process water requirements of the operation.
Consideration of Dry Stack Tailings	WLFN staff asked if dry stack tailings have been considered as a tailings management approach for the project. SMG has conducted filtration testing of bench scale tailings and, thus far, has found that an approximately 60% solids content is the highest that could be achieved. This is about the same final solids content as is achieved by placement of slurry tailings. Although further testing is warranted before this approach can be ruled out entirely, the work to date indicates it may not be a suitable option for the Project tailings.
Draft IPD Review	The draft IPD was reviewed by WLFN Natural Resources department staff. This review identified potential concerns including, but not limited to: • environmental • wildlife • hydrological • chemical • cumulative effects • and potential impacts on traditional use activities. In further discussion with WLFN, the intention is to jointly work through and hopefully address these concerns in the process of working through the formal IPD review and subsequent development of the Detailed Project Description (DPD) (including direct engagement with the community and technical workshops as may be necessary) such that the final DPD and later EA Readiness Decision will reflect the results of that work.

Table 8.6 Williams Lake First Nation - Planned Engagement Activities

Engagement Method	Planned Activities
Regular Project Meetings	SMG will continue regular meetings with WLFN Natural Resources Department staff
Chief and Council Meetings	Meetings will be held as requested by WLFN
Community Meetings	SMG will work with WLFN staff to plan and schedule community meetings: • In-person open-house style meetings may be held, subject to specific WLFN and provincial Covid-19 related guidelines and policies, in combination with virtual meetings. • Virtual meetings will be recorded so that community members who are otherwise unable to participate in-person or during the virtual meeting can still become informed about the project. Questions or comments can then be provided to SMG by email, telephone, or comment form on the project website. • This combination of meeting approaches provides a diversity of opportunities for community members to learn about the project and express their interests and concerns. • Follow-up meetings may be scheduled to discuss, as necessary, how the input provided by community members in the first round of meetings has informed subsequent project planning and the subsequent Detailed Project Description.
Technical Workshops	Technical workshops will be hosted as mutually agreed with WLFN to discuss and work through technical matters related to the project.
Site Tours	Site tours are hosted periodically, in response to Nation requests Visits to operating mines can be arranged to understand mine operation and to see examples of closure applications.
Social Media	Planned and current project activities and news and progress of the EA process will be shared using social media – Facebook and Twitter
Cross-cultural training	Cross-cultural training requirements for SMG staff and consultants will be reviewed periodically and WLFN will be invited to provide Nation-specific training opportunities for our staff to learn about Nation history and cultural practices that can assist staff in their collaboration with WLFN.

8.4.2.3 Lhtako Dené Nation

Recent engagement activities with Lhtako Dené Nation, findings from engagement and related SMG responses, and planned engagement activities specific to the IPD review and development of the Detailed Project Description are detailed in Tables 8.7, 8.8, and 8.9.

Table 8.7 Lhtako Dené Nation - Summary of Engagement Methods and Related Recent Engagement Activities and Findings

Engagement Method	Recent Activities
Letter or emails	Project update letters/emails are sent periodically to Chief and Council to communicate details regarding planned activities on the Project site and plans and activities related to the Environmental Assessment process. These communications started in 2010-2012 and continue. Periodic update emails are sent to the Natural Resources Department related to plans and activities. These communications started in 2010-2012 and continue.
Initial Project Description (IPD) Review	Pre-submission Review – the draft IPD was provided to LDN for review and comment on 10 December 2021 Bruce MacDonald, Referral Officer in the LDN Department of Natural Resources, responded on 27 January 2022 indicating there were no concerns regarding the IPD. A digital copy of the final revised IPD will be provided to LDN
Meetings with Chief and Council	Chief and Council determined that a meeting was not needed at this stage of the project. Future meetings will occur as requested by LDN.
Community Meetings	A community meeting was not identified by LDN as necessary prior to initiating the formal EA process
Technical Workshops and Review	Technical workshops will be hosted as mutually agreed with LDN to discuss and work through technical matters related to the project. LDN did not require a technical workshop during draft IPD review.
Regular Project Meetings	LDN has not indicated a need for regular project meetings at this time. SMG met with Bruce MacDonald, Referral Officer in the LDN Department of Natural Resources, on 29 November 2021 to provide an overview of the project plans and how the current plan differs from the previous 2011 proposal.
Phone/E-mail Contact	SMG management has established regular contact by telephone and email with LDN leadership and management to discuss the Project, activities on site, and for any other continuing discussions as may be necessary
Social Media	Planned and current project activities and progress of the EA process are shared using social media – Facebook and Twitter.

Table 8.8 Lhtako Dené Nation – Recent Engagement Subjects and Responses

Subject	Response
Capacity Support, Education and Training, Employment opportunities, Business/Contracting opportunities, Direct Economic Benefits	SMG has committed to providing capacity support for LDN participation in the EA process. Specific budgets are being determined as part of Relationship Agreement negotiation, with interim funding offered to bridge costs incurred prior to completion of negotiations. LDN has interests and expectations with respect to education and training, employment, and business opportunities related to the Project. Specific commitments in these areas are being determined as part of Relationship Agreement negotiation. In addition to the above, LDN has an interest in direct economic benefits related to the project. Specific commitments in these areas are being determined as part of Relationship Agreement negotiation.
Traditional Land Use/Cultural Heritage Study Update	LDN has not yet prepared a TLU study in relation to the Project. SMG has committed to funding preparation of the study and to applying the findings of the study in the environmental assessment.
Protection of Water Quantity and Water Quality	The Nation has particular interests and concerns related to water and water quality protection, which were stated to SMG early in our engagement conversations and restated during our presentation and discussion with Chief and Council. The Project does not require withdrawals from surface water sources and uses diversions and collection ditches to isolate mine contact water from clean surface runoff. SMG has included a significant water treatment capability/capacity in the project plan that will provide for treatment of all mine contact water scheduled for release to meet the BC Water Quality Guidelines: Aquatic Life at the point of discharge. This approach was taken so that we did not have to rely on the assimilative capacity in the local watercourses to attenuate any discharges of contact water from the Project.
Tailings Management	The failure of the Mount Polley Mine tailings dam in August 2014 elevated overall public attention and concerns related to tailings management for mining projects and the local communities are well informed regarding tailings management best practices. Questions regarding Our presentations discuss how our planned approach to tailings management has evolved since the Project was previously in the EA process, and specifically how our plan has been informed by the learnings from Mount Polley, including: • Relocation of the tailings area to make use of local topography for containment and reduce the height and length of the tailings dams required • Provide a separate water management pond outside the tailings facility to manage mine-contact water and thereby minimize water storage in the tailings facility • Manage the tailings facility so that water is not stored against the tailings dams • Provide the facility to treat and safely discharge excess water from the mine site so that water storage on site is limited to the process water requirements of the operation
IPD Review	The draft IPD was reviewed by LDN Natural Resources Department staff – there were no comments or concerns indicated in the review.

Table 8.9 Lhtako Dené Nation - Planned Engagement Activities

Engagement Method	Planned Activities
Regular Project Meetings	No regular meeting schedule has yet been established. SMG proposes to implement periodic meetings with LDN Natural Resources Department staff, as mutually agreed, with frequency increasing as necessary on the basis of specific issues.
Chief and Council Meetings	Meetings will be held as requested by LDN
Community Meetings	SMG will work with LDN staff to plan and schedule community meetings: • In-person open-house style meetings may be held, subject to specific LDN and provincial Covid-19 related guidelines and policies, in combination with virtual meetings. • Virtual meetings will be recorded so that community members who are otherwise unable to participate in-person or during the virtual meeting can still become informed about the project. Questions or comments can then be provided to SMG by email, telephone, or comment form on the project website. • This combination of meeting approaches provides a diversity of opportunities for community members to learn about the project and express their interests and concerns. • Follow-up meetings may be scheduled to discuss, as necessary, how the input provided by community members in the first round of meetings has informed subsequent project planning and the subsequent Detailed Project Description.
Technical Workshops	Technical workshops will be hosted as mutually agreed with LDN to discuss and work through technical matters related to the project.
Site Tours	Site tours are hosted periodically, in response to Nation requests Visits to operating mines can be arranged to understand mine operation and to see examples of closure applications.
Social Media	Planned and current project activities and news and progress of the EA process will be shared using social media – Facebook and Twitter
Cross-cultural training	Cross-cultural training requirements for SMG staff and consultants will be reviewed periodically and LDN will be invited to provide Nation-specific training opportunities for our staff to learn about Nation history and cultural practices that can assist staff in their collaboration with LDN.

8.5 Public Engagement

8.5.1 Local Community Groups and Local Stakeholders

Local community groups that SMG has engaged with previously listed in Table 8.10, and engagement activities are summarized in Table 8.11. Other stakeholders may be added to the engagement list in the course of Early Engagement.

Table 8.10 Local Community Groups

Local Community Groups	Contacts
Likely Community	Likely Community Coordinator Likely-Xatśūll Community Forest Likely & District Chamber of Commerce Likely Rod and Gun Club Likely Seniors Assoc.
Quesnel Lake Area	Concerned Citizens of Quesnel Lake
Big Lake Ranch Community	Big Lake Community Association
Horsefly Community	Horsefly District Board of Trade Horsefly River Roundtable
150 Mile House Community	150 Mile Greenbelt and Trail Society
Cariboo-Chilcotin	Cariboo Chilcotin Conservation Society
Williams Lake	Williams Lake & District Chamber of Commerce

Table 8.11 Local Community Groups and Stakeholders - Recent and Historical Engagement Activities

Engagement Method	Activities
Recent and Historical	
Letter or emails	Project update letters/emails are sent periodically to the Likely & District Chamber of Commerce and Likely Community Coordinator regarding planned activities on the Project site and plans and activities related to the Environmental Assessment process. These communications started in 2010-2012 and continue. In November 2021, the Concerned Citizens of Quesnel Lake requested that they receive information regarding company activities on the Project site and, since that time, they have been receiving updates directly.
Historical	
Community Meetings	Community meetings were held in Likely and Big Lake Ranch in 2012

Through engagement activities conducted to date, the primary issues raised include:

- Protection of water quantity and quality
- Appropriate management of the TSF
- Visual impact management
- Dust and noise management
- Influence of the Project on housing and real estate (positive and negative)

As the Project advances, additional engagement with the public and stakeholders is planned, as summarized in Table 8.12.

Table 8.12 Local Community Groups and Stakeholders - Planned Engagement Methods and Activities

Engagement Method	Planned Activities
Letter or emails	Emails will be distributed to the established contact list to advise of IPD/Early Engagement Plan filing, to indicate where copies of the documents can be obtained and how to become involved in the EA/IA processes
Community Meetings	Community meetings will be held in Likely, Big Lake Ranch, McCleese Lake, Williams Lake and Quesnel Meetings may also be held in 150 Mile House and Horsefly, depending on local interest and concerns. SMG will work with local community representatives to plan and schedule community meetings: • In-person open-house style meetings may be held, subject to specific local and provincial Covid-19 related guidelines and policies, in combination with virtual meetings. • Virtual meetings will be recorded so that community members who are otherwise unable to participate in-person or during the virtual meeting can still become informed about the project. Questions or comments can then be provided to SMG by email, telephone, or comment form on the project website. • This combination of meeting approaches provides a diversity of opportunities for community members to learn about the project and express their interests and concerns. • Follow-up meetings may be scheduled to discuss, as necessary, how the input provided by community members in the first round of meetings has informed subsequent project planning and the subsequent Detailed Project Description. • Meeting notifications will be distributed by multiple means, including email, social media and the Project website, advertisements in local newspapers and newsletters, and in local posters.
Technical Workshops	Technical workshops may be hosted as mutually agreed to discuss and work through technical matters related to the project.
Site Tours	Site tours are hosted periodically, in response to requests Visits to operating mines can be arranged to understand mine operation and to see examples of closure applications.
Social Media	Planned and current project activities and news and progress of the EA process will be shared using social media – Facebook and Twitter

9.0 BIOPHYSICAL ENVIRONMENT

9.1 Existing Conditions

Topography is locally rugged with steep slopes and cliffs along deeply incised creek valleys. Elevations on the Property vary from 930 masl at Spanish Lake to 1,460 masl near the top of Spanish Mountain and 1,325 masl at the top of Mount Warren. Water is abundant in the area, with several lakes and year-round streams close to the Project property.

Vegetation is heavy forest, consisting primarily of thick stands of hemlock, balsam, cedar, and Douglas-fir in the valley bottoms, with spruce, fir, and pine on the ridges. Underbrush is thick, especially in logged areas. The effects from the 1999-2015 mountain pine beetle outbreak are still observed. For the past 10 years, all harvesting in the Williams Lake Supply Area has been focused on salvage of beetle-killed trees.

The Property has been logged historically and includes several recent large cut blocks and forestry roads, and both historical and active placer mining operations. A gravel airstrip is located west of the Property and immediately west of Hepburn Lake.

SMG has a modern full-service camp on purchased land near the Spanish Mountain Property to provide a base for operations. Limited services are available in the village of Likely and supplies are generally brought to the Property from Williams Lake. The main access route to the area is the Likely Road, which connects to Highway 97.

9.2 Geology and Mineralization

9.2.1 Geology

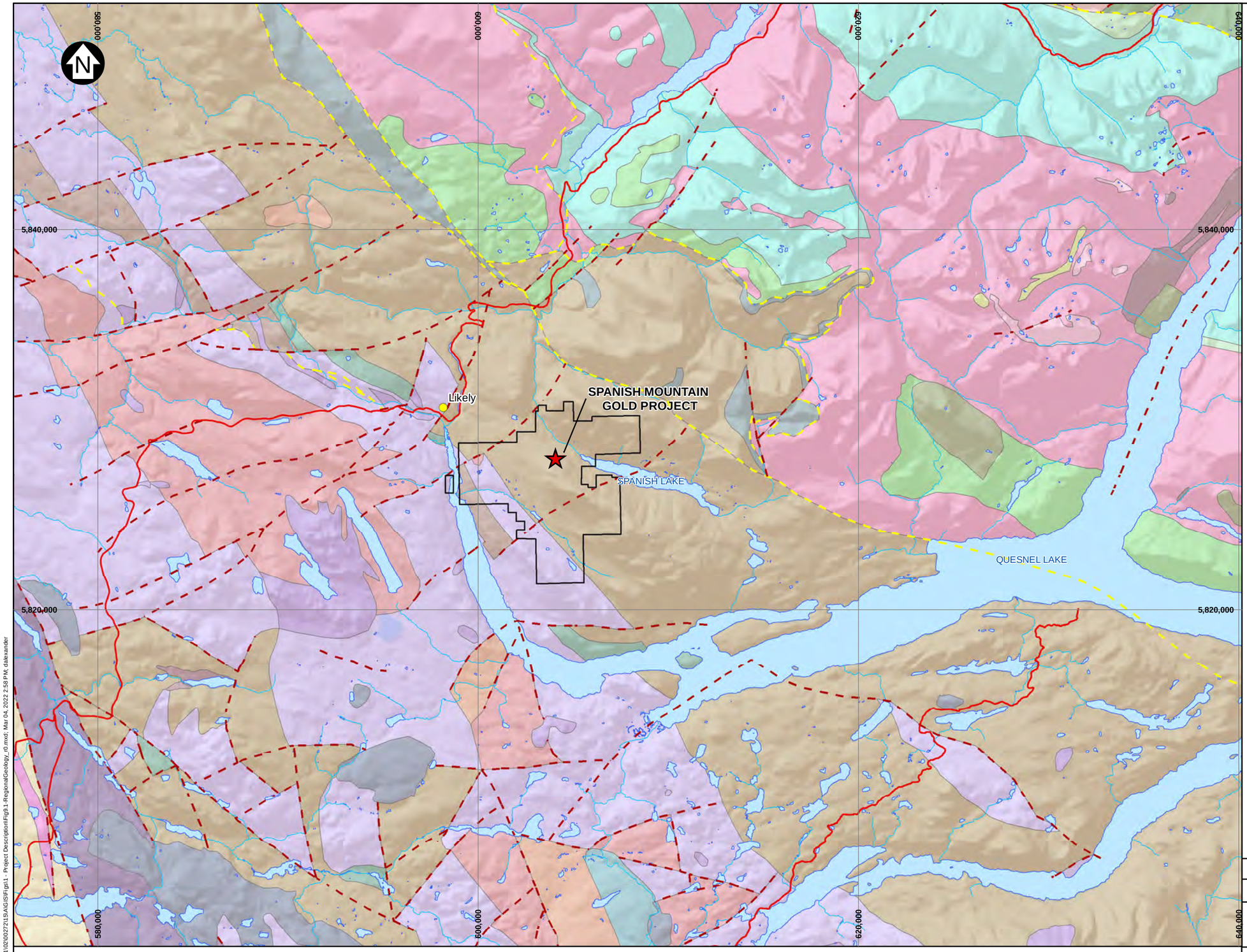
The following sections describe the regional and local geology in the Project area focusing on mining aspects based on information from AGP (2010) and Peatfield et al. (2009).

9.2.1.1 Regional Geology

The Spanish Mountain deposit lies within the Quesnel Terrane, where this has been overthrust from the west onto the pericratonic Kootenay Terrane (see Figure 9.1). The Project area consists of alkaline volcanic and associated clastic sedimentary rocks from the Triassic period to the Jurassic period including alkalic, grey lithic tuffs, and black graphitic, phyllitic siltstones with minor crystal tuff and carbonate bearing wackes. Gold is found in quartz stockworks, within shears cutting graphitic shaley siltstone, as fine particles and wires with quartz and oxides after pyrite in pyritic shaley siltstone, and as free gold with galena in narrow quartz veins cutting silicified and carbonitized tuff.

The Spanish Mountain Property is underlain by a northwest trending transitional package of metasediments and minor intercalated volcaniclastics that become more dominantly volcanic to the southwest, south of the Spanish Mountain claim area.

Gold mineralization displays characteristics of both structural and stratigraphic processes. Stratigraphic mineralization occurs as layers of pyritized dark shale, near stratigraphic contacts with carbonate altered sediment sand tuffs. Structural mineralization occurs within sheared and broken material often with quartz veins or secondary silicification.



LEGEND:

- PROJECT LOCATION
- COMMUNITY
- ROAD
- RIVER/CREEK
- LAKE
- CLAIM BOUNDARY

BEDROCK GEOLOGY

DMQ	QUESNEL LAKE GENISS ORTHOGNEISS METAMORPHIC ROCKS
EJSY	UNNAMED SYENITIC TO MONZONITIC INTRUSIVE ROCKS
EKACA	KAMLOOPS GROUP CALC-ALKALINE VOLCANIC ROCKS
EKASF	KAMLOOPS GROUP MUDSTONE, SILTSTONE, SHALE FINE CLASTIC SEDIMENTARY ROCKS
HOVB	UNNAMED BASALTIC VOLCANIC ROCKS
KG	UNNAMED INTRUSIVE ROCKS, UNDIVIDED
LKTPG	UNNAMED PEGMATITIC INTRUSIVE ROCKS
MDR	UNNAMED DIORITIC INTRUSIVE ROCKS
MIPLCVB	CHILCOTIN GROUP BASALTIC VOLCANIC ROCKS
PSB	SNOWSHOE GROUP - BRALCO SUCCESSION LIMESTONE, MARBLE, CALCEROUS SEDIMENTARY ROCKS
PTRCM	CACHE CREEK COMPLEX, MARBLE CANYON FORMATION LIMESTONE, MARBLE, CALCEROUS SEDIMENTARY ROCKS
PTRCSVB	CACHE CREEK COMPLEX - SOWCHEA SUCCESSION BASALTIC VOLCANIC ROCKS
PTRCSV	CACHE CREEK COMPLEX MARINE SEDIMENTARY AND VOLCANIC ROCKS
PZSGS	SNOWSHOE GROUP GREENSTONE, GREENSCHIST METAMORPHIC ROCKS
LJNST	NICOLA GROUP - ARGILLITE, GREYWACKE, WACKE, CONGLOMERATE TURBIDITES
LJNVC	NICOLA GROUP - VOLCANICLASTIC ROCKS
LMJCG	UNNAMED CONGLOMERATE COARSE CLASTIC SEDIMENTARY ROCKS
LMJS	UNNAMED DIVIDED SEDIMENTARY ROCKS
MUTRN	NICOLA GROUP - UNDIVIDED SEDIMENTARY ROCKS
UCMLY	LYNX FORMATION LIMESTONE, SLATE, SILTSTONE, ARGILLITE
UPRCIC	CUNNINGHAM AND YANKEE BELLE FORMATIONS MUDSTONE, SILTSTONE, SHALE FINE CLASTIC SEDIMENTARY ROCKS
UPRCMCYMD	YANKS PEAK, MIDAS, MURAL AND DOME CREEK FORMATIONS UNDIVIDED SEDIMENTARY ROCKS
UPRPZS	SNOWSHOE GROUP - METAMORPHIC ROCKS, UNDIVIDED
UPZC	CROOKED AMPHIBOLITE SERPENTINITE ULTRAMAFIC ROCKS
UTRNVB	NICOLA GROUP - BASALTIC VOLCANIC ROCKS

NOTES:

1. GEOLOGY OBTAINED FROM BC GOVERNMENT.

2. CO-ORDINATE GRID IS IN METRES.
DATUM: NAD83.
PROJECTION: UTM ZONE 10.

3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:200,000 FOR 11x17 ("B" SIZE) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	04MAR'22	ISSUED WITH REPORT	ACC	BH	RCB

SCALE 2 1 0 2 4 6 8 10 km

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN GOLD PROJECT

REGIONAL GEOLOGY

Knight Piésold CONSULTING

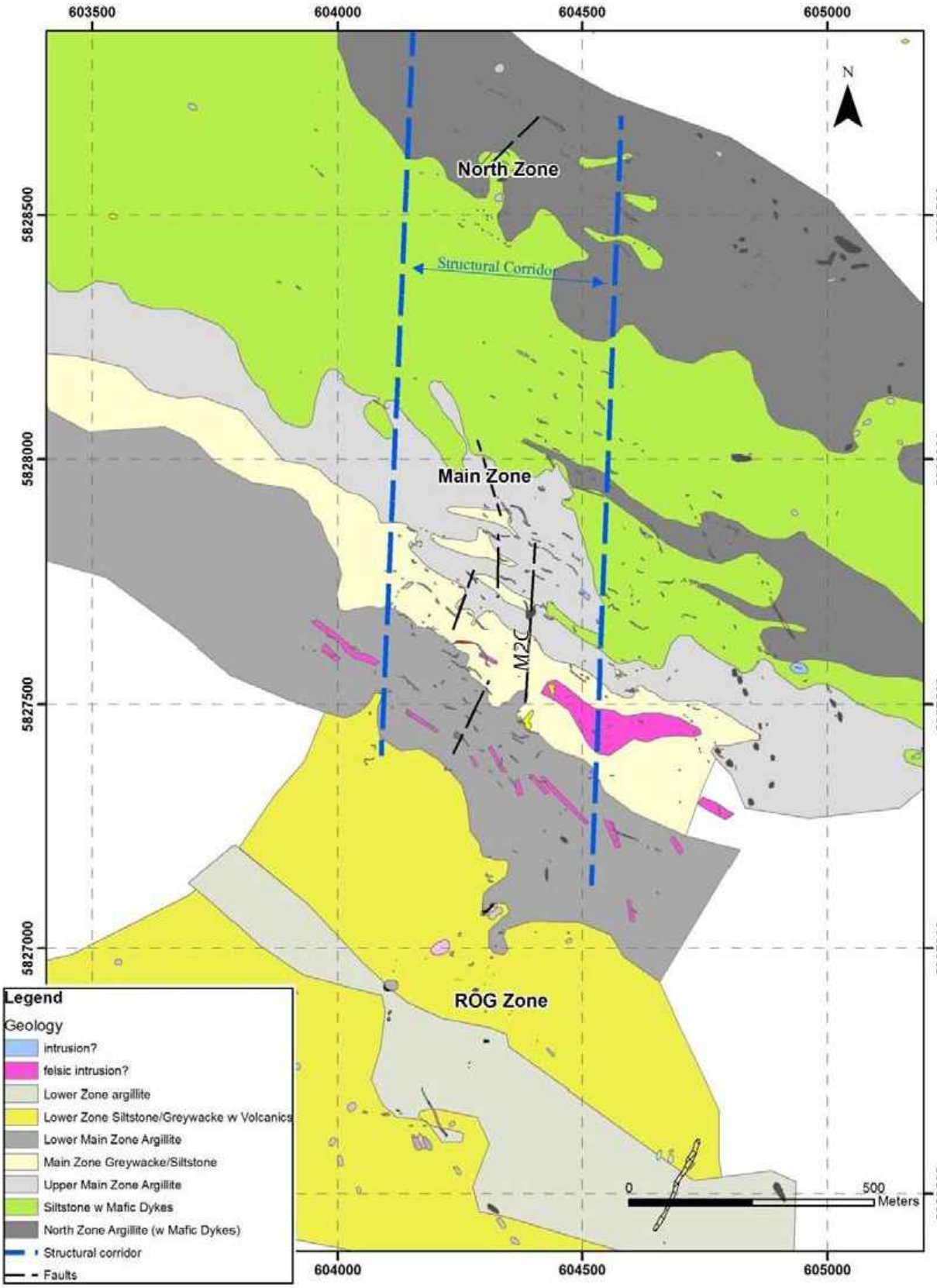
P/A NO. VA102-272/15 | REF NO. 1

FIGURE 9.1 | REV 0

SAVED: M:\1\02\00272\15\A\GIS\Figs\1 - Project Description\Fig9.1-RegionalGeology_r0.mxd; Mar 04, 2022 2:58 PM; dalexander

9.2.1.2 Local Geology

The Spanish Mountain Property is typically overburdened by up to 10 m of glacial deposits consisting of gravels, sand, till, and local colluvium. Outcrop exposures on the Property consist mainly of sedimentary rocks (phyllite, argillite, shale, wacke, conglomerate, and siltstone), minor volcanic facies (mafic volcanics, pillow basalts), and minor intrusive (quartz-feldspar porphyry) (see Figure 9.2). Heavy overburden cover impedes geological map interpretation for much of the Property. Sub-surface information from diamond and reverse circulation drilling along with airborne geophysics have aided greatly in the geological interpretation of the Property. Strong evidence of faulting and folding exist in both mapping and drilling. Folds are typically isoclinal and open "warps". Faults are manifest as thrusts and as normal and strike-slip faults.



NOTES:

GEOLOGICAL MAP PROVIDED BY AGP MINING CONSULTANTS INC.,
(FIGURE 7.4 - TECHNICAL REPORT NI 43-101)

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN GOLD PROJECT

PROJECT AREA GEOLOGY

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	07MAR'22	ISSUED WITH REPORT	ACC	RAF	RCB

Knight Piésold CONSULTING

P/A NO. VA102-272/15 | REF NO. 1

FIGURE 9.2 | REV 0

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XREF FILE(S): IMAGE FILE(S): PROPERTY GEOLOGY MAP,

9.2.2 Mineralization

Several styles of mineralization have been documented within the Quesnel Terrane in this region. The most prominent is the alkalic copper-gold porphyry-style mineralization such as that at the producing Mount Polley Mine. The QR deposit (Minfile number 093A121 – classified therein as Au skarn) is located approximately 25 km west-northwest of Spanish Mountain. Other styles include copper-zinc massive sulphides in limey quartzite (Sellers Creek – Minfile number 093A 131 – classified therein as "Besshi type"); various gold vein occurrences; and placer gold deposits. The Spanish Mountain deposit is one of several similar sediment-hosted veins and disseminated gold deposits in the region.

Alteration has obliterated many primary textures particularly in wacke sequences. It is therefore necessary to use geochemistry and petrography to aid with descriptions and correlation within this unit. Fortunately, the altered sections of wacke have a very distinctive geochemical signature (magnesium, manganese, potassium, and aluminum) and can be correlated with confidence on cross-sections.

9.3 Geochemistry

The PFS utilized results of a geochemical characterization program undertaken by SRK in 2012 to assess the acid rock drainage and metal leaching (ARD/ML) potential of waste rock and tailings expected from the proposed open pit development of the Spanish Mountain deposit (SRK, 2012). The study consisted of composite samples of drill core representing potential waste rock and low-grade ore from four main rock types, as well as available samples of flotation tailings and cyanide leach tailings generated from bench scale metallurgical testing. Static tests included acid-base accounting, trace element analyses and mineralogical evaluation. Kinetic tests included laboratory humidity cells and field barrels to assess sulphate oxidation rates and metal leaching potential.

Results of the 2012 study stated that the proportion of rock with ARD potential at Spanish Mountain is relatively low. Potential leaching of several parameters were identified regardless of ARD potential though arsenic appears to be the most significant. Surrogates for sulphur and carbonate content were identified in order to support block modelling utilizing the ICP database. Results have been used for waste management planning. Rougher tailings tested in the study had low potential for ARD and low metal leaching potential. The cyanide leach tailings had a high potential to produce ARD and leach molybdenum, lead, silver, arsenic, cadmium, and selenium.

An expanded geochemical characterization program is currently in progress. This expanded program includes additional sampling and testing of drill core representing potential waste rock and low-grade ore from the eight geological domains within the proposed open pit. The ongoing geochemical program includes ABA and trace element chemistry, followed by mineralogical

characterization, leach extraction testing and kinetic testing including humidity cells and re-starting the original field barrels. In addition, samples of flotation tailings and detoxified cyanide tailings solids and supernatant from pilot plant metallurgical testing will also be characterized.

Results of the geochemical characterization and SMG's Inductively Coupled Plasma database were used to create an ARD/ML block model. Total sulphur and arsenic leaching rates were correlated with sulphur and arsenic, respectively, from ICP analysis to develop five ARD/ML categories. The five ARD/ML categories are provided in Table 9.1.

Table 9.1 ARD/ML Block Model Criteria Summary

Category	Category Description	NP/AP Range	As (mg/kg)
Ai	-Very unlikely to generate ARD -"Low" arsenic leaching	AP>3 kg $CaCO_3$/t or NP/AP>2	As<150
Aii	-Very unlikely to generate ARD -Arsenic leaching potential significant	AP>3 kg $CaCO_3$/t or NP/AP>2	As>150
Bi	-Unlikely to generate ARD but may be considered potentially acid generating when permitted -Low arsenic leaching	1<NP/AP≤2	As<150
Bii	-Unlikely to generate ARD but may be considered potentially acid generating when permitted -Arsenic leaching potential significant	1<NP/AP≤2	As>150
C	-Potentially ARD generating	NP/AP≤1	All

Note(s):

1. Table sourced from SRK report "Spanish Mountain Geochemical Characterization Results" (SRK, 2012).

These categories were integrated into the mine production schedule.

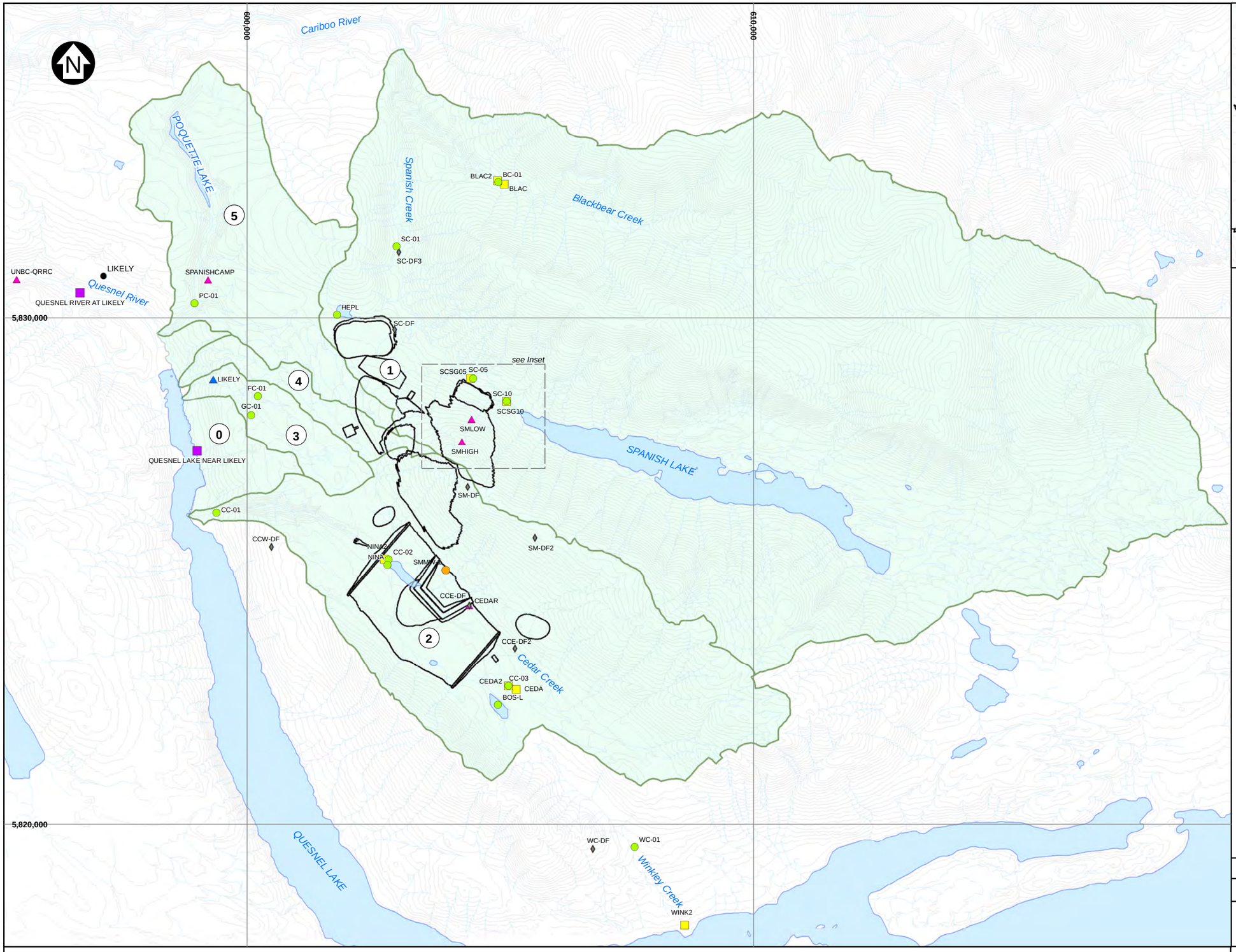
9.4 Terrain

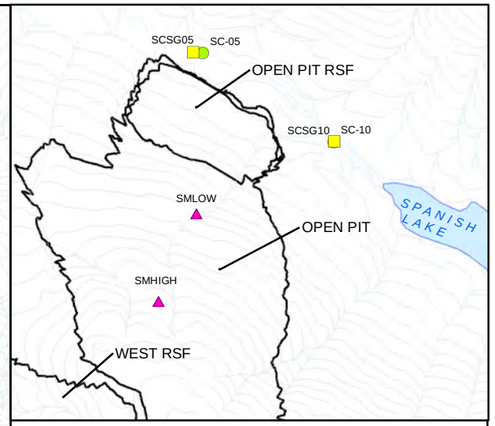
The Spanish Mountain deposit is situated on a northwest facing slope of Spanish Mountain, which is part of the Quesnel Highlands in the Cariboo Region of British Columbia. The topography is rugged with steep slopes and cliffs along incised creek valleys in the Spanish and Blackbear watersheds. Cedar Creek is located within a gentler valley.

9.5 Climate

The climate in the area is modified continental with moderately warm summers and cold snowy winters. Typical daytime temperature ranges are from 25°C to 35°C in summer and -15°C to -35°C in winter. The area lies within the interior dry belt; precipitation averages about 700 mm annually (rainfall equivalent) at Likely. The 24-hour peak maximum precipitation (PMP) was 198 mm (based on long term precipitation data from the Barkerville station, approximately 35 km north of Spanish Mountain). Thick accumulations of snow (as much as 2 m) are common in winter on the Property. A number of climate stations operated by the Meteorological Services Branch (MSB) of Environment Canada are located in the Project region, the closest being at Likely and Horsefly. The Likely station

has historical data available from 1971 to 2000 and is located at an elevation of 723.90 masl (Figure 9.3).





LEGEND:

- CONTOUR (20M)
- RIVER/CREEK
- MINE FACILITIES
- LAKE
- WATERSHED BOUNDARY

PROJECT AREA WATERSHEDS

1. SPANISH CREEK (~13020 HA)
2. CEDAR CREEK (~3700 HA)
3. GROGAN CREEK (~330 HA)
4. FISHER CREEK (~270 HA)
5. POQUETTE CREEK (~1600 HA)

ENVIRONMENTAL ANALYSES STATIONS

- AIR QUALITY SITE

STREAMFLOW MONITORING STATIONS

- PROJECT STREAMFLOW STATION
- WATER SURVEY OF CANADA STREAMFLOW STATION

WATER QUALITY MONITORING STATIONS

- EXISTING AND PROPOSED SURFACE WATER MONITORING STATION
- GROUNDWATER MONITORING STATION

METEOROLOGICAL STATIONS

- PROJECT METEOROLOGICAL STATION
- ENVIRONMENT CANADA CLIMATE STATION

NOTES:

1. BASE MAP: BC TRIM AND GEOBC DATA.

2. CO-ORDINATE GRID IS IN METRES.
DATUM: NAD83.
PROJECTION: UTM ZONE 10.

3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:75,000 FOR 11x17 ("B" SIZE) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

5. MONITORING STATION DATA OBTAINED FROM FULCRUM. HYDROMETRIC STATION DATA DOWNLOADED FROM GEO BC.

6. PRELIMINARY WASTE DUMP DESIGN - SUBJECT TO CHANGE.

7. METEOROLOGICAL STATION SMHIGH MOVED TO CEDAR IN SEPTEMBER 2010.

8. THE LIKELY CLIMATE STATION DECOMMISSIONED IN 2000.

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ENVIRONMENTAL MONITORING STATIONS

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	04MAR'22	ISSUED WITH REPORT	ACC	BH	RCB

Knight Piésold CONSULTING

P/A NO. VA102-272/15 | REF NO. 1

FIGURE 9.3 | REV 0

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Meteorological data were collected in the Project area from two SMG automated weather stations located within the proposed pit: SMLOW at an elevation of 1,080 masl and SMHIGH at an elevation of 1,260 masl beginning in May 2007. An additional weather station was installed at the Spanish Mountain Camp (SPANISHCAMP) at an elevation of 920 masl in late August 2010. The SPANISHCAMP weather station was active from August 2010 to November 2012 and was reactivated in September 2020. The SMHIGH weather station was relocated to the Cedar Creek catchment (CEDAR) at an elevation of 1,020 masl in early September 2010. The CEDAR weather station was active from September 2010 to November 2010. Parameters recorded at these stations include temperature, relative humidity, precipitation, and wind speed and direction. The periods of record for the SMHIGH and SMLOW weather stations are from May 2007 to September 2010 and May 2007 to October 2010, respectively. The historical locations of the climate stations are presented on Figure 9.3.

Below is a summary of meteorological information for SMHIGH and SMLOW10:

- Average annual temperature at SMHIGH using monthly average data is 3.3°C
- Average annual temperature at SMLOW using monthly average data is 4.3°C
- Relative humidity varies annually, with the highest relative humidity values occurring in winter months, and the lowest relative humidity values occurring in summer months
- Wind direction is predominantly from the southeast
- Monthly average wind speeds are lowest in August at both sites, and highest in March at SMHIGH and November at SMLOW
- The maximum wind speed (gust speed) recorded at SMHIGH was 16.70 m/s in November 2007 and the maximum wind speed (gust speed) recorded at SMLOW was 17.63 m/s in March 2010

9.6 Air Quality

The closest regional air quality monitoring stations are in Williams Lake, Quesnel, and McBride. Dustfall samples were collected by SMG in the Project area from five monitoring locations: CCW-DF and CCE-DF within the Cedar Creek watershed, WC-DF within the Winkley Creek watershed, and SM-DF and SC-DF within the Spanish Creek watershed. Dustfall samples were collected approximately monthly from October 2010 to November 2012. Samples were sent to ALS Environmental in Burnaby, BC for analysis for total solids (soluble and insoluble) and total metals.

The dustfall monitoring program was resumed in 2021. Three stations that were located within the proposed mine footprint were decommissioned: SM-DF, SC-DF, CCE-DF. These stations were replaced with SM-DF2, SC-DF3, and CCE-DF2. Stations that are currently active include SM-DF2 and SC-DF3. The locations of the air quality stations are presented on Figure 9.3.

9.7 Hydrology

The Spanish Mountain Gold Project spans the Spanish Creek, Cedar Creek, Fisher Creek, Grogan Creek, and Poquette Creek watersheds. The larger watersheds in the Project area are generally characterised by high flows in the spring due to snowmelt, and rainfall combined with snowmelt; medium flows in the late summer/ fall; and very low flows in the winter. There are several minor, unnamed tributary creeks flowing through the Project area. These creeks are affected by ice formation during the winter, with the smaller intermittent systems typically freezing over, or drying up, for extended periods. Generally, Spanish Creek flows continually throughout the year, but flows can be affected by ice formation during winter.

Spanish Creek drains an area of approximately 13,300 ha, flowing northwest from Spanish Lake to its confluence with the Cariboo River 8.4 km downstream. The Cariboo River discharges to the Quesnel River near Quesnel Forks. The Cedar Creek watershed is located southwest of Spanish Creek and contains Boswell Lake (999 masl). Nina Lake was created during construction of the Cedar Lake Dam in the mid-1930's and was used as a water storage reservoir for placer mining operations (Hartman and Miles 2001). In 2013, a permanent open spillway was constructed in the Cedar Lake Dam such that Nina Lake has reverted to a wetland. Cedar Creek flows northwest from the Project area, discharging into Quesnel Lake at approximately 729 masl. Grogan Creek, Fisher Creek, and Poquette Creek are smaller watersheds, with respective areas of 330 ha, 270 ha, and 1600 ha, within the northern section of the Project area draining northwest directly into Quesnel Lake. The upper watersheds of Fisher and Grogan Creek are small, shallow, intermittent creeks. Drainage patterns have been disturbed by a network of logging roads and landings. The 500 ha Winkley Creek watershed lies to the south of Cedar Creek and discharges to Quesnel Lake near Hobson Arm.

Streamflow monitoring for the Project was initiated in 2007 with the installation of two continuous streamflow monitoring stations on Spanish Creek. Station SCSG-10 is located immediately downstream of Spanish Lake and SCSG-05, approximately 900 m downstream of SCSG-10 on Spanish Creek (Figure

9.3). During 2010, the SCSG-05 station was removed, and an additional four monitoring stations were installed, including two stations on Cedar Creek (at the outlet of Nina Lake (NINA) and upstream of Boswell Creek (CEDA)), one station on Winkley Creek (WINK), and one on Blackbear Creek (BLAC), a tributary of Spanish Creek. These stations recorded data from 2010 to 2012.

In 2020, streamflow monitoring was resumed with the installation of dataloggers and staff gauges at five stations: SCSG-10, BLAC2, CEDA2, NINA2, and WINK2 (Table 9.2). Routine site visits and discharge measurements are ongoing at all active stations.

Regional streamflow data were collected by the Water Survey of Canada at several stations within the Project area. Regional data indicate that almost 70% of the annual streamflow occurs in April to July, with May and June typically discharging over 40% of the total annual flow in response to spring snowmelt.

Site-specific streamflow data will be used in conjunction with concurrent regional streamflow records to further refine flow estimates and to develop discharge rating curves for the Project in the future.

Table 9.2 Periods of Record for Streamflow Monitoring Stations.

Station Name	Active / Inactive	Period of Record
SCSG-10	Active	May 2007 to November 2012 October 2020 to Present
SCSG-05	Inactive	May 2007 to September 2010
CEDA	Inactive	September 2010 to November 2012
NINA	Inactive	September 2010 to November 2012
WINK	Inactive	September 2010 to August 2011
BLAC2	Active	August 2011 to November 2012 October 2020 to Present
CEDA2	Active	October 2020 to Present
NINA2	Active	October 2020 to Present
WINK2	Active	August 2011 to November 2012 October 2020 to Present

9.8 Hydrogeology

A groundwater quality investigation was initiated in September 2009. Initial results indicated elevated alkalinity and hardness, as evidenced by the concentrations of Na, Cl, Ca, Fe, Mg, and SO_4.

A hydrogeological site investigation in 2011 was conducted to develop baseline groundwater conditions and support ongoing design studies. Sixteen wells were installed at nine locations as part of the site investigation to collect geological information, on-going water levels and groundwater quality information to aid with characterizing baseline conditions to support monitoring and contingency planning as mine planning proceeded. Water quality samples were collected from these wells between October 2011 and September 2012. Several of the samples had metal concentrations that exceeded provincial freshwater aquatic life guidelines, including arsenic, copper, iron, manganese, selenium, and zinc.

In 2012 an additional hydrogeological site investigation program was completed downgradient of the waste management area proposed at the time. Six groundwater wells were installed as part of this program. All 2012 monitoring wells were installed in bedrock and had estimated hydraulic conductivities ranging between 2.0×10^{-8} m/s and 7.0×10^{-6} m/s.

In 2021, an updated hydrogeological program was initiated, with analysis results and reporting expected early in 2022. It is expected to install up to 14 new monitoring locations, with each location consisting of a paired shallow and deep well. The 2021 program is also reviewing the status of wells installed in previous years, with the objective of redeveloping them for ongoing monitoring where possible.

9.9 Water Quality

A water quality monitoring program was initiated for the Project in 2007 to characterize baseline conditions on Spanish Creek and within the claim boundary on Spanish Mountain. The program was expanded in 2010 to include the Cedar Creek watershed, the Winkley Creek watershed, and a larger area of the Spanish Creek watershed both upstream and downstream of the claims area. Water quality samples were collected from 16 monitoring sites from 2010 to 2012.

The water quality program was resumed in September 2020. Water quality samples were collected from 14 of the established monitoring sites. The ongoing monitoring program for surface water quality and physical parameters are at the following locations (Figure 9.3):

- Cedar Creek mainstem and associated lakes (Nina Lake and Boswell Lake)
- Spanish Creek mainstem above and below Spanish Lake
- Blackbear Creek, a tributary of Spanish Creek, downstream of the Project area
- Hepburn Lake within the Spanish Creek watershed
- Spanish Mountain tributary streams contributing to the Cedar Creek and Spanish Creek watersheds
- Fisher Creek
- Grogan Creek
- Winkley Creek

Sample sites on Spanish Mountain within the Project claim boundary tend to have higher metals concentrations, with total and dissolved metals often exceeding Provincial (British Columbia Water Quality Guidelines) and Federal guidelines (CCME Canadian Water Quality Guidelines) for the protection of aquatic life, notably aluminium, cadmium, and iron. This likely reflects both the natural mineralization of the claims area and disturbance from historical placer mining activity on Spanish Mountain. Water samples collected outside of the claim boundary (Cedar Creek, Spanish Creek, Blackbear Creek, Hepburn Lake and Winkley Creek) have all been within guideline concentrations.

Streambed sediments have been collected at several water quality monitoring locations within and outside of the Project area. The concentrations of several metals consistently exceeded the Federal guidelines for sediment quality in water (CCME Canadian Sediment Quality Guidelines) at all

locations, including arsenic, cadmium, chromium, and copper. This likely reflects natural conditions within bed sediments in this region; however, ongoing sampling will provide confirmation of the baseline condition.

9.10 Fish and Fish Habitat

Provincial fisheries databases indicate that both Rainbow Trout (*Oncorhynchus mykiss*) and Bull Trout (*Salvelinus confluentus*) are widely distributed in tributaries to the Quesnel River, Quesnel Lake, and the Cariboo River. Chinook Salmon (*O. tshawytscha*), Coho Salmon (*O. kisutch*), and Sockeye Salmon (*O. nerka*) are present in the Quesnel River and Cariboo River. Chinook Salmon, Coho Salmon, Sockeye Salmon, Kokanee (*O. nerka*), Bull Trout, Lake Trout (*S. namaycush*), Mountain Whitefish (*Prosopium williamsoni*), Redside Shiner (*Richardsonius balteatus*), Longnose Dace (*Rhinichthys cataractae*), Burbot (*Lota lota*), Northern Pikeminnow (*Ptychocheilus oregonensis*), Peamouth Chub (*Mylocheilus caurinus*), and sucker (general) are reported from Quesnel Lake. Rainbow Trout, Bull Trout, and Lake Trout are present in Spanish Lake. Dace (general), Rainbow Trout, and Longnose Sucker (*Catostomus catostomus*) are reported from Poquette Lake (MOE 2011).

In March 1997 Carmanah Research Limited conducted a survey of the Spanish Creek Watershed. This survey included identification of fish migration barriers, reach break analysis, and assessment of fish habitat. They also confirmed the presence of Rainbow Trout and Bull Trout within the Spanish Lake watershed and Sockeye Salmon within the lower reaches of Spanish Creek, downstream of its confluence with Blackbear Creek (Brydges 1997).

Fisheries baseline studies in 2010 confirmed the presence of Rainbow Trout in Spanish Creek, Cedar Creek, Nina Lake, Boswell Lake, and the lowermost portion of Winkley Creek. Chinook Salmon juveniles were sampled from lower Spanish Creek and lower Cedar Creek. Burbot and Longnose Dace were also captured from lower Cedar Creek. Adult Coho Salmon were detected in lower Spanish Creek downstream of a fish migration barrier located 1.5 km upstream from the Cariboo River. No Bull Trout were captured during 2010 sampling.

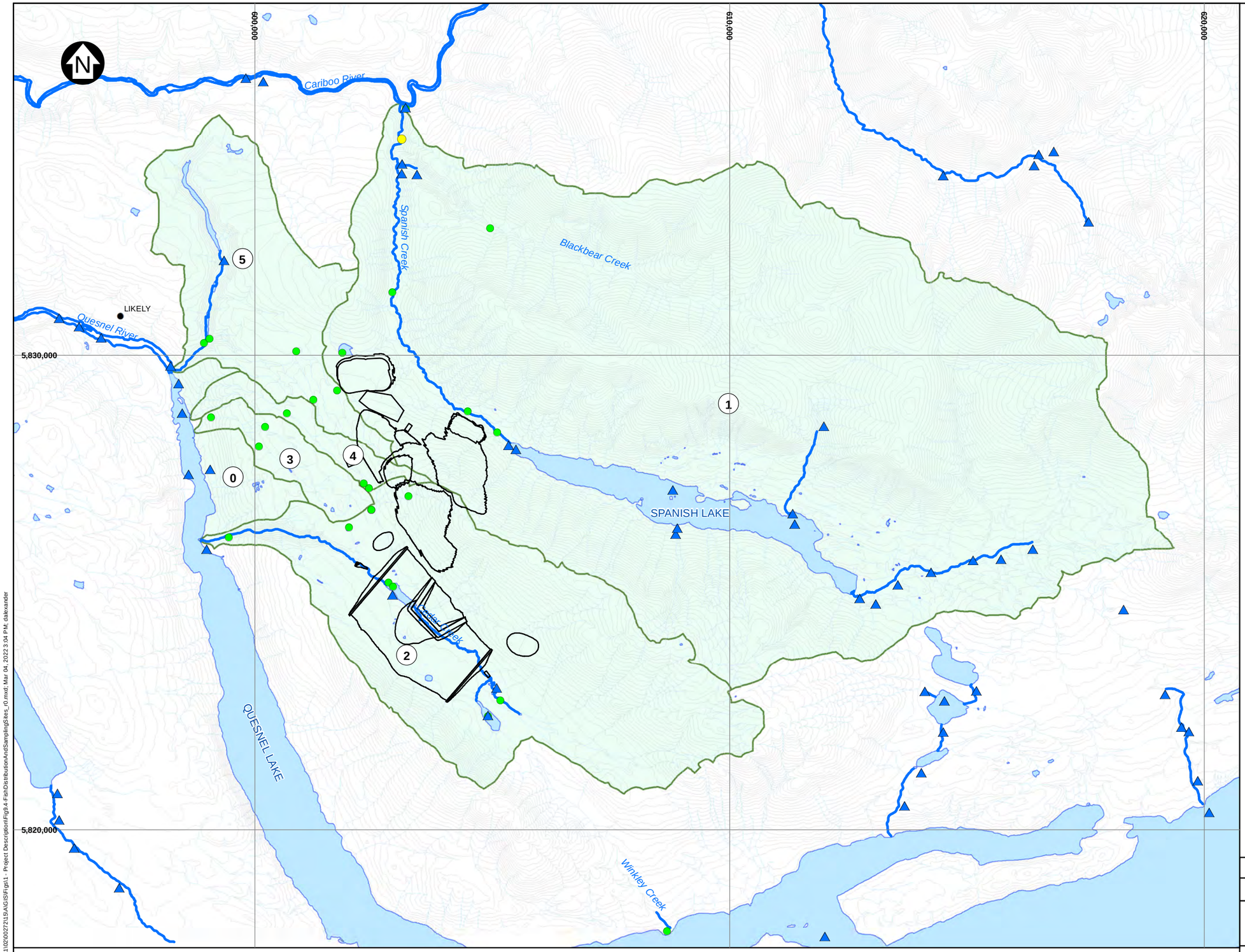
The data collected during 2010 indicate that Hepburn Lake, upper Winkley Creek and many of the small unnamed tributaries to Cedar Creek, Winkley Creek and Spanish Creek below Spanish Lake, are non fish bearing. Fish presence into the upper reaches of these tributaries is either limited by steep gradients or insufficient surface flow. Surface flow was observed to be a limiting factor for fish in smaller streams throughout the study area. For example, the first 0.5 km of Cedar Creek was observed to be devoid of surface flow during summer 2010 field work.

KP conducted overview fish and fish habitat surveys in September 2020 to assess presence / not detected of fish species and assess any changes in fish habitat and access to the monitoring sites previously visited between 2007 and 2012. The most notable change in habitat between 2012 and

2020 was in Nina Lake, as a result of the enlargement of the spillway in late 2013, following updated requirements to the provincial Dam Safety Program. Although the spatial extent of Nina Lake has decreased, the dam still impounds standing water and Rainbow Trout were observed in 2020. Longnose Sucker, Longnose Dace, and Rainbow Trout were captured in lower Cedar Creek during September 2020. Rainbow Trout were sampled in upper Cedar Creek and Spanish Creek during the same period.

Figure 9.4 shows fish-bearing waters in the sub-region around the Mine Site estimated from project-related fish sampling and Provincial fisheries database point records. Based on this information, the footprint of the TSF directly affects 13 ha of Cedar Creek (in the former Nina Lake area), 6 km of fish-bearing Cedar Creek mainstem, and 1.5 km of unnamed fish-bearing tributaries. Cedar Creek drains to Quesnel Lake. The location of this TSF requires that a large portion of the upper Cedar Creek drainage be diverted, either around the TSF for discharge into Cedar Creek downstream of the TSF, or via overflow diversion channel to the Winkley Creek drainage as shown on Figure 9.4. Flow contributions to Winkley Creek are not considered a harmful alteration. These areas are being assessed in detail as part of ongoing fisheries baseline studies.

Provincially and federally listed fish species in the region were identified for the Cariboo Regional District using the BC Species and Ecosystem Explorer database search utility (CDC 2011). Bull Trout are blue-listed (of Special Concern) provincially. Additional species within the region include the middle Fraser River population of White Sturgeon (*Acipenser transmontanus*) (red-listed), Chiselmouth (*Acrocheilus alutaceus*) (blue-listed), Coho Salmon (yellow-listed), and Dolly Varden (*Salvelinus malma*) (blue-listed). The nearest recorded observations of the White Sturgeon and the Chiselmouth are in the Fraser River, west of the Project site. The nearest recorded observations of Dolly Varden are in Quesnel Lake and the Cariboo River.



LEGEND

- FISH SAMPLING LOCATION
- FISH BARRIER LOCATION
- FISH POINT RECORD (FISS)
- MINE FACILITIES
- CONTOUR - 20 M
- LAKE
- BC CWB WATERSHEDS (GOVT DATA) SELECTION
- PROJECTWATERSHEDS
- FISH STREAM

PROJECT AREA WATERSHEDS

1. SPANISH CREEK (~13020 HA)
2. CEDAR CREEK (~3700 HA)
3. GROGAN CREEK (~330 HA)
4. FISHER CREEK (~270 HA)
5. POQUETTE CREEK (~1600 HA)

NOTES:

1. BASE MAP: BC TRIM AND GEOBC DATA.
2. COORDINATE GRID IS IN METRES.
   COORDINATE SYSTEM: NAD83 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:80,000 FOR 11x17 ("B" SIZE) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.
4. PRELIMINARY WASTE DUMP DESIGN - SUBJECT TO CHANGE.
5. FISH BEARING WATERS ESTIMATED FROM FISH SAMPLING OR INFERRED FROM FISS.

SCALE 0.5 0.25 0 0.5 1 1.5 2 2.5 3 3.5 4 km

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	04MAR'22	ISSUED WITH REPORT	ACC	BH	RCB

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FISH DISTRIBUTION AND SAMPLING SITES

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA102-272/15	1

FIGURE 9.4 REV 0

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9.11 Vegetation

The Project is located in the Central Cariboo Forest District of the Southern Interior Forest Region, as well as the Williams Lake Timber Supply Area. It is in the Quesnel Highlands (QUH) ecosection, which is a highland area intermediate between the plateau to the west and the high, rugged mountains to the east. Precipitation is higher in this region relative to areas to the south. The forest in the Project area is composed primarily of hybrid White Spruce (*Picea glauca x engelmanni*), Balsam (*Abies amabilis*), Western Redcedar (*Thuja plicata*), Douglas-fir (*Pseudotsuga menziesii*) and Hemlock (*Tsuga heterophylla*) in the valley bottoms, with Douglas-fir and pine (*Pinus contorta*) on the ridges. Cottonwood (*Populus balsamifera*) and alder (*Alnus spp*.) occur in some localities as well.

The six biogeoclimatic variants in the Project area include:

- Engelmann Spruce-Subalpine Fir wet cool, Cariboo variant (ESSFwk1), found in the northeastern portions of the Project area
- Interior Cedar-Hemlock wet cool, Quesnel variant (ICHwk2), found predominantly through the mine site portion of the Project area
- Interior Cedar-Hemlock moist cool variant (ICHmk3), found along the transmission line portion of the Project area
- Interior Douglas-fir Fraser dry cool variant (IDFdk3); found along the transmission line portion of the Project area
- Sub-Boreal Spruce Horsefly dry warm variant (SBSdw1), found along the transmission line portion of the Project area
- Sub-Boreal Spruce Blackwater dry warm variant (SBSdw2), found along the transmission line portion of the Project area

A desktop analysis of potential rare plants, mosses and lichens (Table 9.3), and ecological communities at risk (Table 9.4) in the region was completed. Terrestrial Ecosystem Mapping (TEM) was prepared for much of the Project area in 2012 and is the process of being updated. Vegetation field studies conducted between 2010 and 2012 and currently underway in 2021 are being used to confirm the presence of vegetation species and ecosystems and confirm habitat characteristics and accuracy of the typed ecosystem polygons within mapped areas.

Table 9.3 Potential Rare Plant Species of Concern

Common Name	Scientific Name	BC List
American Sweet-Flag	*Acorus americanus*	Blue
Short-flowered evening primrose	*Taraxia breviflora*	Red
Cascade Rockcress	*Boechera cascadensis*	Blue
Mountain Moonwort	*Botrychium montanum*	Blue
Whitebark Pine	*Pinus albicaulis*	Blue
Close-flowered Knotweed	*Polygonum polygaloides ssp. Confertiflorum)*	Blue
Sprengel's Sedge	*Carex sprengelii*	Blue
Heart-leaved Springbeauty	*Claytonia cordifolia*	Blue
Haller's Apple Moss	*Bartramia halleriana*	Red
Columbian Carpet Moss	*Bryoerythrophyllum columbianum*	Blue
Alkaline Wing-nerved Moss	*Pterygoneurum kozlovii*	Blue
Smoker's Lung	*Lobaria retigera*	Blue
Pebbled Paw	*Nephroma Isidiosum*	Blue
Cryptic Paw	*Nephroma occultum*	Blue

Table 9.4 Potential Ecological Communities of Concern

Common Name	Scientific Name	BC list
Scrub birch / water sedge	*Betula nana / Carex aquatilis*	Blue
Scrub birch / sedges/ peat mosses	*Betula nana / Carex spp. / Sphagnum spp.*	Red
Awned sedge Fen - Marsh	*Carex atherodes* Fen - Marsh	Red
Slender sedge / common hook-moss	Carex lasiocarpa / Drepanocladus aduncus	Blue
Shore sedge – buckbean / peat mosses	*Carex limosa – Menyanthes trifoliata / Sphagnum spp.*	Blue
Alkali saltgrass – foxtail barley	*Distichlis spicata – Hordeum jubatum*	Blue
Baltic rush – field sedge	*Juncus balticus – Carex praegracilis*	Red
Tamarack / low birch / bluejoint reedgrass – sedges / peat mosses	*Larix laricina / Betula pumila / Calamagrostis canadensis – Carex spp. / Sphagnum spp.*	Red
Hybrid white spruce / horsetails / leafy mosses	*Picea engelmannii x glauca / Equisetum spp. / Mnium spp.*	Blue
Hybrid white spruce / foam lichens	*Picea engelmannii x glauca / Stereocaulon spp.*	Red
Black spruce / buckbean / peat-mosses	*Picea mariana / Menyanthes trifoliata / Sphagnum spp.*	Blue
Lodgepole pine / water sedge / peat-mosses	*Pinus contorta / Carex aquatilis / Sphagnum spp.*	Blue
Lodgepole pine / few-flowered sedge / peat-mosses	*Pinus contorta / Carex pauciflora / Sphagnum spp.*	Blue
Lodgepole pine – black spruce / red-stemmed feathermoss	*Pinus contorta – Picea mariana / Pleurozium schreberi*	Blue
Bluebunch wheatgrass - junegrass	*Pseudoroegneria spicata – Koeleria macrantha*	Blue
Douglas-fir / Rocky Mountain juniper / kinnikinnick	*Pseudotsuga menziesii / Juniperus scopulorum / Arctostaphylos uva-ursi*	Red
Douglas-fir / Rocky Mountain juniper / shrubby penstemon	*Pseudotsuga menziesii / Juniperus scopulorum / Penstemon fruticosus*	Blue
Douglas-fir – hybrid white spruce / electrified cat's-tail moss	*Pseudotsuga menziesii – Picea engelmannii x glauca / Rhytidiadelphus triquetrus*	Blue
Douglas-fir – hybrid white spruce / thimbleberry	*Pseudotsuga menziesii – Picea engelmannii x glauca / Rubus parviflorus*	Blue
Douglas-fir – lodgepole pine / clad lichens	*Pseudotsuga menziesii – Pinus contorta / Cladonia spp.*	Blue
Douglas-fir / red-stemmed feathermoss – step moss	*Pseudotsuga menziesii / Pleurozium schreberi – Hylocomium splendens*	Blue
Douglas-fir – western redcedar / wavy-leaved moss	*Pseudotsuga menziesii – Thuja plicata / Dicranum polysetum*	Red
Nuttall's alkaligrass – foxtail barley	Puccinelia nuttalliana – Hordeum jubatum	Red
MacCalla's willow / beaked sedge	*Salix maccalliana / Carex utriculata*	Blue
Tall willows / Sartwell's sedge	*Salix spp. / Carex sartwellii*	Blue
Scheuchzeria / peat-mosses	*Scheuchzeria palustris / Sphagnum spp.*	Blue
Hard-stemmed bulrush Deep Marsh	*Schoenoplectus acutus* Deep Marsh	Blue
Western redcedar / oak fern / electrified cat's-tail moss	*Thuja plicata / Gymnocarpium Dryopteris / Rhytidiadelphus triquetrus*	Blue
Western redcedar / falsebox	*Thuja plicata / Paxistima myrsinites*	Blue
Tufted clubrush / golden star-moss	*Trichophorum cespitosum / Campylium stellatum*	Blue
Seaside arrow-grass Marsh	*Triglochin maritima* Marsh	Red
Western hemlock / common juniper - falsebox	*Tsuga heterophylla / Juniperus communis – Paxistima myrsinites*	Blue
Western hemlock – western redcedar / clad lichens	*Tsuga heterophylla – Thuja plicata / Cladonia spp.*	Blue
Common cattail Marsh	*Typha latifolia* Marsh	Blue

Baseline vegetation studies included ecosystem mapping, rare plant surveys, exotic/invasive species surveys, vegetation/soil baseline trace metals sampling, and wetland function assessments.

Draft TEM maps were completed for the Project area and a 2021 field verification program is underway. Potential rare ecological communities and old growth forest within the project area were prioritized for field verification. Significant effort was expended during historic surveys to ground truth the original Project area, and 2021 efforts have focused on newly mapped areas.

9.12 Wildlife

The Project is located in the Central Cariboo Forest District, as well as Wildlife Management Unit (WMU) 5-15. It overlaps with several areas of wildlife management and conservation priority, including Williams Lake Sustainable Resource Management Plan area, Caribou Chilcotin Land Use Plan area, Quesnel Lake North Grizzly Bear Population Unit, Ungulate Winter Range U-5-002 for mule deer, and "matrix critical habitat" for the Quesnel Highlands herd of southern mountain caribou. "High elevation critical habitat" for the Quesnel Highlands herd does not overlap with the Project. The Quesnel Lake North Grizzly Bear Population Unit has a Moderate conservation ranking.

A desktop analysis identified 31 potential species of conservation concern within the project area based on conservation ranking, confirmed records, and/or potential habitat (Table 9.5). Initial baseline wildlife studies conducted in 2010 and 2011 confirmed the presence of 11 species of conservation concern and supplementary studies in 2021 detected an additional six species.

Table 9.5 Wildlife Potential Species of Conservation Concern

English Name	Scientific Name	BC Listing	COSEWIC Listing	SARA Listing
American Bittern	*Botaurus lentiginosus*	Blue	-	-
Bank Swallow^	*Riparia riparia*	Yellow	Threatened	Threatened
Barn Swallow*^	*Hirundo rustica*	Blue	Special Concern	Threatened
Black Swift	*Cypseloides niger*	Blue	Endangered	Endangered
Bobolink	*Dolichonyx oryzivorus*	Blue	Threatened	Threatened
Broad-winged Hawk^	*Buteo platypterus*	Blue	-	-
Common Nighthawk*^	*Chordeiles minor*	Yellow	Special Concern	Threatened
Eared Grebe	*Podiceps nigricollis*	Blue	-	-
Evening Grosbeak*^	*Coccothraustes vespertinus*	Yellow	Special Concern	Special Concern
Flammulated Owl	*Psiloscops flammeolus*	Blue	Special Concern	Special Concern
Great Blue Heron, *herodias* subspecies^	*Ardea herodias herodias*	Blue	-	-
Lewis's Woodpecker	*Melanerpes lewis*	Blue	Threatened	Threatened
Long-billed Curlew^	*Numenius americanus*	Blue	Special Concern	Special Concern
Northern Goshawk, *atricapillus* subspecies	*Accipiter gentilis atricapillus*	Blue	Not at Risk	-
Olive-sided Flycatcher*^	*Contopus cooperi*	Blue	Special Concern	Threatened
Peregrine Falcon, *anatum* subspecies	*Falco peregrinus anatum*	Red	Not at Risk	Special Concern
Rusty Blackbird	*Euphagus carolinus*	Blue	Special Concern	Special Concern
Sharp-tailed Grouse, *columbianus* subspecies	*Tympanuchus phasianellus columbianus*	Blue	-	-
Short-eared Owl	*Asio flammeus*	Blue	Threatened	Special Concern
Swainson's Hawk	*Buteo swainsoni*	Red	-	-
Western Grebe	*Aechmophorus occidentalis*	Red	Special Concern	Special Concern
American Badger	*Taxidea taxus*	Red	Endangered	Endangered
Caribou (Southern Mountain Population)*	*Rangifer tarandus* pop. 1	Red	Endangered	Threatened
Fisher – Columbian population*	*Pekania pennanti pop. 5*	Red	-	-
Fringed Myotis	*Myotis thysanodes*	Blue	Data Deficient	-
Grizzly Bear*^	*Ursus arctos*	Blue	Special Concern	Special Concern
Little Brown Myotis*^	*Myotis lucifugus*	Yellow	Endangered	Endangered
Northern Myotis*^	*Myotis septentrionalis*	Blue	Endangered	Endangered
Townsend's Big-eared Bat^	*Corynorhinus townsendii*	Blue	-	-
Western Small-footed Myotis^	*Myotis ciliolabrum*	Blue	-	-
Wolverine, *luscus* subspecies*	*Gulo gulo luscus*	Blue	Special Concern	Special Concern
Western Toad*^	*Anaxyrus boreas*	Yellow	Special Concern	Special Concern

Note(s):

1. * = detected during 2010/2011 baseline wildlife surveys; ^ = detected during 2021 baseline wildlife surveys.

Baseline wildlife studies that were initially completed in 2010 and 2011 included winter track surveys for ungulates and furbearers, and surveys during the growing season for pond-breeding amphibians, breeding birds, Northern Goshawk, waterfowl, bats, invertebrates, and wildlife habitat suitability. Supplementary studies in 2021 included winter wildlife camera and track surveys for ungulates and furbearers, and surveys for pond-breeding amphibians, breeding birds, Northern Goshawk, bats, and wildlife habitat suitability.

Amphibian surveys confirmed the presence of five species with detections of breeding by all species except Pacific Chorus Frog. Western Toad, a species of conservation concern, was potentially detected at 17 locations, including breeding at seven locations during the 2021 baseline studies. Breeding bird surveys in 2021 detected 93 species and an additional 28 bird species were detected incidentally during other surveys. These surveys confirmed the presence of eight species of conservation concern (Bank Swallow, Barn Swallow, Broad-winged Hawk, Common Nighthawk, Evening Grosbeak, Great Blue Heron, Long-billed Curlew, and Olive-sided Flycatcher), most of which were detected at multiple locations, and including confirmed nesting by Bank Swallow, Barn Swallow, and Great Blue Heron. A total of 27 mammal species were detected, although this includes only a preliminary analysis of the acoustic bat data, including eight species of conservation concern. Caribou, fisher, and wolverine were detected during the 2010 and 2011 studies, but not during the 2021 supplementary studies. Grizzly bears were detected during both initial baseline and supplementary studies, including a female with cubs detected in 2021. A preliminary review of the supplementary acoustic bat surveys results suggest that 11 species of bats were detected including four species of conservation concern: Townsend's Big-eared Bat, Western Small-footed Myotis, Little Brown Myotis, and Northern Myotis, and the latter two were also detected during the initial baseline studies.

Additional work in progress includes a full analysis of the supplementary study data to confirm species presence, breeding, and habitat use. Wildlife habitat suitability models are being prepared for 10 species: caribou, moose, grizzly bear, fisher, Northern Myotis, Northern Goshawk, Common Nighthawk, Olive-sided flycatcher, Evening Grosbeak, and Western Toad. The initial habitat suitability models will be completed and evaluated against the baseline study data, followed by model adjustments to accurately reflect areas of potential suitable habitat within the study area.

Migratory birds frequent the Project area. Table 9.6 lists all the bird species that have been observed in the area that would be protected under the federal *Migratory Birds Convention Act*.

Table 9.6 Birds Observed in the Project Area Subject to the *Migratory Birds Convention Act*

English Name	*Scientific Name*
Alder Flycatcher	*Empidonax alnorum*
American Pipit	*Anthus rubescens*
American Redstart	*Setophaga ruticilla*
American Robin	*Turdus migratorius*
American Three-toed Woodpecker	*Picoides dorsalis*
Barrow's Goldeneye	*Bucephala islandica*
Bank Swallow	*Riparia riparia*
Barn Swallow	*Hirundo rustica*
Black-capped Chickadee	*Poecile atricapillus*
Brewer's Blackbird	*Euphagus cyanocephalus*
Brown Creeper	*Certhia americana*
Bufflehead	*Bucephala albeola*
Cassin's Finch	*Haemorhous cassinii*
Canada Goose	*Branta canadensis*
Cassin's Vireo	*Vireo cassinii*
Chestnut-backed Chickadee	*Poecile rufescens*
Clay-colored Sparrow	*Spizella pallida*
Cedar Waxwing	*Bombycilla cedrorum*
Chipping Sparrow	*Spizella passerina*
Cliff Swallow	*Petrochelidon pyrrhonota*
Common Loon	*Gavia immer*
Common Nighthawk	*Chordeiles minor*
Common Yellowthroat	*Geothlypis trichas*
Dark-eyed Junco	*Junco hyemalis*
Downy Woodpecker	*Dryobates pubescens*
Dusky Flycatcher	*Empidonax oberholseri*
Eastern Kingbird	*Tyrannus tyrannus*
European Starling	*Sturnus vulgaris*
Evening Grosbeak	*Coccothraustes vespertinus*
Fox Sparrow	*Passerella iliaca*
Golden-crowned Kinglet	*Regulus satrapa*
Green-winged Teal	*Anas carolinensis*
Hammond's Flycatcher	*Empidonax hammondii*
Hairy Woodpecker	*Leuconotopicus villosus*

Hermit Thrush	*Catharus guttatus*
Killdeer	*Charadrius vociferus*
Long-billed Curlew	*Numenius americanus*
Least Flycatcher	*Empidonax minimus*
Lincoln's Sparrow	*Melospiza lincolnii*
English Name	**Scientific Name**
Mallard	*Anas platyrhynchos*
Magnolia Warbler	*Setophaga magnolia*
Marsh Wren	*Cistothorus palustris*
MacGillivray's Warbler	*Geothlypis tolmiei*
Mountain Chickadee	*Poecile gambeli*
Nashville Warbler	*Leiothlypis ruficapilla*
Northern Flicker	*Colaptes auratus*
Northern Waterthrush	*Parkesia noveboracensis*
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Orange-crowned Warbler	*Vermivora celata*
Olive-sided Flycatcher	*Contopus cooperi*
Pacific Wren	*Troglodytes pacificus*
Pine Grosbeak	*Pinocula enucleator*
Pine Siskin	*Spinus pinus*
Pileated Woodpecker	*Dryocopus pileatus*
Pacific-slope Flycatcher	*Empidonax difficilis*
Purple Finch	*Haemorhous purpureus*
Red-breasted Nuthatch	*Sitta canadensis*
Red-breasted Sapsucker	*Sphyrapicus ruber*
Ruby-crowned Kinglet	*Regulus calendula*
Red Crossbill	*Loxia curvirostra*
Red-eyed Vireo	*Vireo olivaceus*
Ring-necked Duck	*Aythya collaris*
Red-naped Sapsucker	*Sphyrapicus nuchalis*
Rufous Hummingbird	*Selasphorus rufus*
Sandhill Crane	*Antigone canadensis*
Savannah Sparrow	*Passerculus sandwichensis*
Sora	*Porzana carolina*
Song Sparrow	*Melospiza melodia*
Spotted Sandpiper	*Actitis macularius*
Swainson's Thrush	*Catharus ustulatus*
Townsend's Solitaire	*Myadestes townsendi*
Townsend's Warbler	*Setophaga townsendi*
Tree Swallow	*Tachycineta bicolor*
Vaux Swift	*Chaetura vauxi*

Varied Thrush	*Ixoreus naevius*
Veery	*Catharus fuscescens*
Violet-green Swallow	*Tachycineta thalassina*
Virginia Rail	*Rallus limicola*
Warbling Vireo	*Vireo gilvus*
English Name	**Scientific Name**
White-crowned Sparrow	*onotrichia leucophrys*
Western Tanager	*Piranga ludoviciana*
Western Wood-pewee	*Contopus sordidulus*
Willow Flycatcher	*Empidonax traillii*
Wilson's Snipe	*Gallinago delicata*
Wilson's Warbler	*Cardellina pusilla*
Wood Duck	*Aix sponsa*
White-throated Sparrow	*Zonotrichia albicollis*
White-winged Crossbill	*Loxia leucoptera*
Yellow Warbler	*Setophaga petechia*
Yellow-rumped Warbler	*Setophaga coronata*

10.0 HUMAN AND COMMUNITY WELLBEING

10.1 Local Government

The Cariboo Regional District is a regional government consisting of 12 electoral areas (A through L). Each electoral area elects a Director, except for the incorporated member municipalities (Williams Lake (population 10,000), Quesnel (population 12,000), 100 Mile House (population 1,900)), which are represented by an elected Mayor and Council. The Project resides in Cariboo Regional District Electoral Area F, which includes the communities of Likely, Big Lake, and Horsefly.

The Project will be located approximately 6.5 km away from the unincorporated community of Likely, with the closest school located approximately 7 km away. Likely has basic amenities including a motel, hotel, rental cabins, corner store, gas pumps, and a seasonal restaurant. Some heavy equipment is also available for hire from local contractors. SMG has a modern, full-service facility on purchased land near the Project that provides a base for exploration activity.

The village of Likely is expected to receive the highest concentration of direct activity during mine life and will be the community primarily affected by Project activities and related infrastructure. The two other communities located inside electoral area F, Big Lake and Horsefly, will also see project related activity. The anticipated project footprint and proposed area of disturbance is shown on Figure 10.1. The mine area of the Project occupies an area of approximately 27 km^2, and the transmission line and associated buffer occupies an area of approximately 37 km^2.

All services and supplies are readily available in Williams Lake, an hour's drive from Likely. The Williams Lake airport is serviced by Central Mountain Air and Pacific Coastal Airlines, which provide daily service with Vancouver, BC, and by Air Canada, which provides less frequent service.

Williams Lake and Quesnel are the two largest cities in the Cariboo Regional District. According to the Statistics Canada 2016 Census, demographics of the two cities are as follows:

Williams Lake

- Population: 10,508
- Total private dwellings: 4,927
- Land area: 21.26 km^2
- Density: 494.2 /km^2
- Aboriginal population: 2,065 (19.65%)
- Growth rate (2011–2016): -3.6%

Quesnel

- Population: 12,064

- Total private dwellings: 5,690
- Land area: 24.47 km²
- Density: 493.0 /km²
- Aboriginal population: 1,800 (14.92%)
- Growth rate (2011–2016): -1.2%

The closest unincorporated communities to the Project are Likely, Big Lake, Horsefly, and McLeese Lake.

Big Lake

- Population: 323
- Total private dwellings: 161
- Land area: 41.16 km²
- Density: 7.85 /km²
- Aboriginal population: 25 (7.73 %)
- Growth rate (2011-2016): 12.5%

Horsefly

- Population: 186
- Total private dwellings: 95
- Land area: 6.20 /km²
- Density: 30 /km²
- Aboriginal population: 20 (10.75%)
- Growth rate (2011-2016): 35.8%

McLeese Lake

- Population: 148
- Total private dwellings: 102
- Land area: 6.56 km²
- Density: 22.56 /km²
- Aboriginal population: 40 (27.02%)
- Growth rate (2011-2016): -24.9%

10.2 Local and Regional Economy

Major industries that support the Cariboo Regional District include forestry, agriculture, mining, oil and gas, and tourism. Several wood processing and value-added wood manufacturing plants exist throughout the area. There are several large mines in the region, including the Mount Polley Mine near Likely and the Gibraltar Gold and Copper Mine approximately 70 km north of Williams Lake.

There are also significant mining exploration activities that are ongoing. The region's agriculture industry includes cattle ranching and farming, floriculture, and nursery production, as well as some other types of crop and livestock production.

The 2016 Census Profile prepared by Statistics Canada shows the regional labour force of the Cariboo Regional District to be comprised of 30,930 individuals in the 15+ age category (BC Stats 2016).

10.3 Commercial Land Use and Tenure

The Project lies within the Williams Lake Timber Supply Area, within which there are individual license holders.

Commercial activities in the area are largely derived from outdoor recreation, including back country guiding and fishing, and hunting.

Tenures in the Project area include two traplines:

- TR0515T020, overlaying the mine site
- TR0502T043, overlaying the transmission line

The area surrounding Spanish Lake has been identified as a backcountry recreational area (Backcountry Unit DHO-7). The unit was identified because of the wilderness setting for fishing and visual quality around Spanish Lake, Benny Lake, Freshette Lake, Annette Lake, and Spanish Mountain. A number of recreational sites exist throughout the Project area, including the Boswell Lake Recreation Site, and the Winkley Creek Recreation Site, and Cedar Creek Provincial Park. In addition, a licence of occupation exists at the outlet of Spanish Lake for guided nature viewing and commercial recreation.

An active guide outfitter tenure within management units 5-02 and 5-15 overlaps the Project area. Big game animals covered under the tenure include black bear, grizzly bear, caribou, cougar, deer, moose, mountain goat, and wolf.

Surface rights within the SMG mineral claim boundary includes several surveyed land parcels held under the *Land Act*, primarily situated along the east shore of Quesnel Lake, and two Crown Land parcels, including Cedar Creek Provincial Park. Twelve placer leases under the *Mineral Tenure Act* are also within the mineral claim boundary, northeast of the proposed Open Pit.

10.4 Non-traditional Land Use

Land uses surrounding the Project include outdoor recreation, fishing, and hunting.

10.5 Health Conditions

Health care in the Project area is governed, planned, and delivered by the Interior Regional Health Authority within the Cariboo/Chilcotin Local Health Area of the Thompson Cariboo Shuswap Health Service Area. The administration of funding derived from property taxes for hospitals and medical services is done by the Cariboo Chilcotin Regional Hospital District shared with the Ministry of Health. The main health facilities include:

- South Cariboo Health Centre in 100 Mile House
- Cariboo Memorial Hospital in Williams Lake
- G.R. Baker Memorial Hospital in Quesnel

The hospital in Quesnel is operated by the Northern Health Authority.

The Project area is characterized by urban, rural, and remote communities of varying sizes. Factors that affect health include income, education, employment, physical environments, health services, social supports, early childhood development and personal health practices.

Overall health conditions are summarized by the Provincial Health Services Authority (http://communityhealth.phsa.ca/HealthProfiles/PdfGenerator/Williams%20Lake), and are generally characterized as good.

Life expectancy in the Cariboo/Chilcotin Local Health Area is 79.6 years, compared to 82.6 years for the province. In 2015-2016, 68% of the Thompson Cariboo Shuswap Health Service Area population (aged 12 and up) reported very good or excellent mental health. Incidents of chronic diseases, including asthma, chronic obstructive pulmonary disease (COPD), heart failure, and high blood pressure are generally higher than the provincial average, with the exception of diabetes, which is slightly lower.

10.6 Public and Environmental Safety

An Emergency Response Plan (ERP) will be developed to outline the response procedures and preventive measures for potential malfunctions and accidents. The plan will be designed to address potential incidents that could occur for each major mine infrastructure component and activity. In particular, this would include the: Open Pit, processing facilities, tailings storage facility, waste rock storage facilities, water treatment facilities, water management pond, camp and operational activities, and the Spanish Lake Road realignment.

The ERP will be informed through completion of a Formal Risk Assessment, which will review each aspect of the Project, identify potential Risks, and quantify them based on their assessed Consequence and Likelihood.

10.6.1 Preliminary Identification of Potential Accidents and Malfunctions

During the construction period, there could be a temporary increase of risk to the public and environmental safety due to an increase in Project related traffic. Changes in traffic volume will be observed on Keithley Creek Road, Spanish Lake Road, and Likely Road. A traffic management plan will be developed to mitigate the impacts of road use during construction and operation, that will include radio controls, speed limit control, and time of use restrictions if necessary.

During Project operations, there is a potential for increased risks to public and environmental safety due to malfunctions and accidents from operating mine infrastructure. However, these risks are minimized and managed through ERPs and mitigated by studies including waste and water management alternatives assessments, siting studies, detailed site investigations, and external technical reviews.

Specific accidents or malfunctions that may occur are discussed below. Additional accidents or malfunctions may be added for consideration during the review of the Project, including from input received by First Nations, government, or the public.

10.6.1.1 FUEL OR REAGENT SPILLS

The risk that spills occur while refueling vehicles or unloading process reagents exists. Impacts from spills will be minimized as all areas where fueling and reagent handling take place will be bunded and contained, allowing for control and immediate clean up should a spill occur.

10.6.1.2 UNTREATED WATER DISCHARGE

In the case of a malfunction in the water diversion or storage system, overflow of untreated water may be discharged, compromising the water quality in the environment.

The water management system for the Project is designed to collect, store, and treat all contact using a system of pumps, ditches and piping. Ditches or pipes may fail, leading to the release of contact water on the mine site. The potential for off-site runoff as a result of a failure in any of the water management system components exists, however the nature of the system is such that failures would direct water by gravity further within the Project footprint rather than outside of its catchment.

All contact water ultimately reports to the Water Management Pond. Water is recycled from the pond to the process plant and water that is excess to process requirements is treated and discharged to minimize the volume of water that is stored.

To further mitigate against this potential malfunction, the water management system, including diversion ditches, embankments, and storage ponds, will be designed to contain higher than anticipated flows, with consideration of uncertainty due to climate change.

10.6.1.3 CYANIDE RELEASE

Sodium cyanide will be used in the processing of gold at the Project. An accidental release of cyanide to the environment would be dangerous to humans, and to terrestrial and aquatic flora and fauna. In Canada, the Environmental Code of Practice for Metal Mines (Environment Canada, 2009) offers guidance on cyanide management, which includes reliance on the International Cyanide Management Code developed by the United Nations Environment Programme.

There are three situations in which cyanide, or cyanide containing materials, may potentially be released from project activities:

- During shipment of the sodium cyanide reagent to the project site
- During storage or use in the process plant
- In seepage of tailings from the tailings line or from the TSF.

Cyanide will periodically be delivered to the site by qualified shippers experienced in the handling and shipping of cyanide. The primary potential cause of a cyanide spill during transport is a vehicle accident. The potential for an accident will be minimized through the use of qualified and experienced shippers but cannot be eliminated as this potential also is related to the skills and actions of other drivers on the roads.

Cyanide will be stored at the mine site in a segregated secure storage area in the process plant. All cyanide handling will be restricted to a designated area of the plant that will be designed to provide containment for any spills that may occur and prevent the release of spilled cyanide from the plant. Specific spill containment measures will include a liner beneath the concrete slab and curbing around all handling areas to provide containment and to isolate any spilled material from contact with other process chemicals and to confine any spills within the process plant. The cyanide handling area in the plant also will be isolated from other chemicals that could react with the cyanide and produce more hazardous compounds. Personnel working in the cyanide handling area of the plant will be extensively trained in the handling of sodium cyanide and in the safe cleanup of spills. Any spill sin the plant will be contained within the plant.

Approximately 10% of the tailings produced, the cleaner tailings, will be subjected to leaching with cyanide for recovery of gold and silver. These tailings will be treated using a proven cyanide destruction technology to reduce the cyanide content in the plant before they are pumped to the lined PAG cell in the TSF. Tailings discharge line failures are considered in Section 10.6.1.4.

SMG will operate the Project in accordance with the Environmental Code of Practice for Metal Mines, which will include the following commitments:

- written agreements with producers, distributors and transporters to establish responsibility for safety, security, release prevention, training and emergency response

- requirement for cyanide transporters to develop and implement emergency response plans.
- the design of unloading, storage, and mixing facilities consistent with sound, accepted engineering practices and quality control and quality assurance procedures, spill prevention and spill containment measures.
- operate unloading, storage, and mixing facilities using inspections, preventive maintenance and contingency plans to prevent or contain releases and control and respond to worker exposures.
- the implementation of management and operating systems designed to protect human health and the environment including contingency planning and inspection and preventive maintenance procedures.
- design for the minimum cyanide use requirement, thereby limiting concentrations of cyanide in tailings.
- design spill prevention or containment measures for process tanks and pipelines.
- monitoring programs to evaluate the effects of cyanide use on wildlife, surface and ground water quality

10.6.1.4 TAILINGS DISCHARGE LINE FAILURE

Tailings will be pumped to the TSF as a slurry. The Non-PAG rougher tailings will be pumped through a dedicated tailings line and the PAG cleaner tailings will be pumped in a second dedicated line. There is the potential for a tailings line to leak or rupture, either due to a failure of the pipeline material or to damage by heavy equipment during site activities, resulting in the release of tailings. In recognition of this possibility, the tailings pumping system will be designed and constructed with safety measures to protect the pipelines and minimize the quantity of tailings that may be released in such an event and to prevent the offsite movement of leaked tailings including:

- placement of the tailings lines within containment berms that will protect the pipeline from equipment activity and will contain and prevent the offsite movement of any tailings that may be released from the pipeline
- a pressure monitoring system will be installed on the tailings lines that will detect a drop in tailings pressure, indicating a leak on the pipeline, and shut down the tailings pump to minimize the quantity of tailings spilled
- In the event of failure of the secondary containment berms to contain any tailings spills, offsite movement of the spilled tailings will be prevented by the perimeter clean runoff management works (berms and ditches) that are used to prevent run-on of clean surface runoff to the mine site.

10.6.1.5 TAILINGS LOSS OF CONTAINMENT

The potential for a containment failure at the tailings storage facility represents a malfunction that SMG anticipates will be of concern to many stakeholders, as this type of malfunction has occurred within the last decade at other mines in BC.

To minimize the potential for occurrence, the design of the TSF includes consideration through site selection, design, and tailings storage strategy, as discussed in Section 7, along with external review by technical experts. Monitoring of the TSF stability and static water levels will be conducted in real time throughout the life of the Project.

Knight Piésold Ltd. (KP) has completed five studies assessing the suitability of potential tailings storage facility locations. These studies have included: a preliminary TSF alternatives study in 2007 (KP, 2007), a waste and water management alternatives assessment in 2010 (KP 2010a), a waste and water management concept development study in 2010 (KP 2010b), an updated waste and water management concept development study in 2012 (KP, 2012), and a tailings and water management pre-feasibility design in 2021 (KP, 2021a). The results of these studies are summarized in Section 7 and provide a discussion of site selection, design infrastructure, and best available technology. Key elements of the TSF design to both reduce the potential for loss of containment and the consequences of a loss of containment should it occur, include:

- tailings facility design is now subject to review by an independent technical review panel comprised of technical experts who review all aspects of TSF design and operating plans
- designation of an Engineer of Record who will have the professional responsibility for assuring that a tailings storage facility has been designed and constructed in accordance with the applicable guidelines, standards and regulations, and will have a duty to report any infractions that are not rectified to the Chief Inspector of Mines of BC
- Dam safety inspections and reviews by qualified independent experts during operations, closure, and post-closure
- Installation of instrumentation in dam embankments to continuously monitor stability

Design elements to reduce the potential and magnitude of a loss of tailings containment already incorporated in the TSF design include:

- use of local topography for containment and reduce the height and length of the tailings dams required
- provision of a separate water management pond outside the tailings facility to manage mine-contact water and thereby minimize water storage in the tailings facility
- operation of the tailings deposition so that water is not stored against the tailings dams

- facility to treat and safely discharge excess water from the mine site so that water storage on site is limited to the process water requirements of the operation
- design of the overall tailings and water management system to manage extreme precipitation events during wet periods, and thereby minimize the potential for dam overtopping

The cleaner tailings and PAG waste rock are deposited into the lined central PAG cell constructed within the TSF. The PAG cell is centrally located, away from the north and south dams, and is segregated from the surrounding Non-PAG rougher tailings a containment berm. The PAG cell is located away from the north and south dams so that, in the unlikely event of a loss of containment at either dam, the PAG cell contents will remain contained in the TSF.

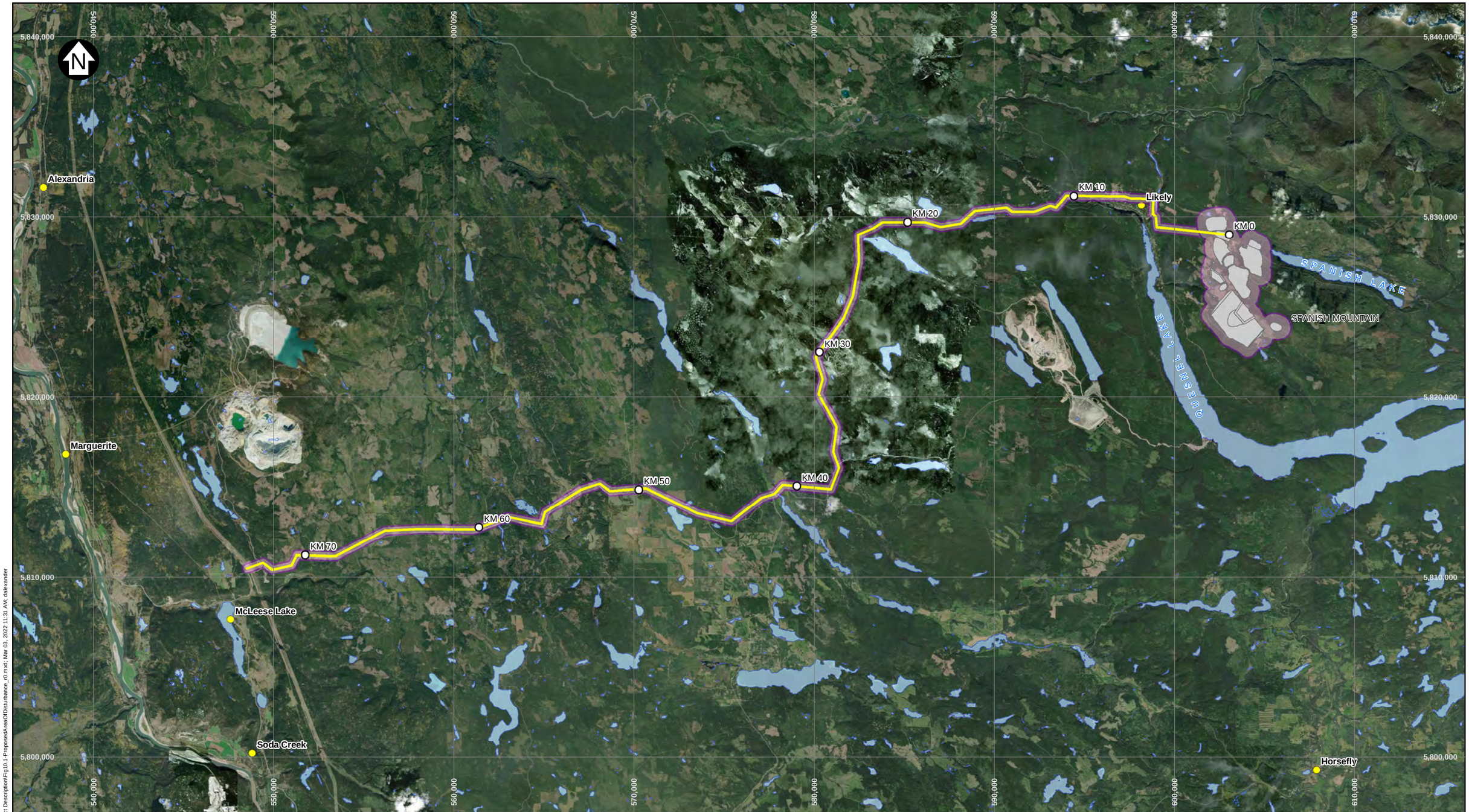
The tailings storage facility is designed in accordance with the most recent and stringent guidance, including:

- 2020 Global Industry Standard on Tailings Management (GISTM, 2020)
- 2021 Health, Safety, and Reclamation Code for Mines in British Columbia

These standards have incorporated lessons learned from previous accidents and malfunctions at tailings facilities, including where embankment failure and loss of containment has occurred. They supersede previous guidance issued in BC and internationally, including the 2015 Independent Expert Engineering Investigation and Review Panel Report on Mount Polley Tailings Storage Facility Breach and the 2015 Investigation Report of the Chief Inspector of Mines of the Mount Polley Mine Tailings Storage Facility Breach.

10.6.2 Outreach Regarding Project Risk

SMG has conducted outreach activities with Indigenous Nations, the public, and government as summarized in Section 8. Ongoing and future engagement activities include presentations and information distribution regarding the risks identified at the Project and proposed mitigation measures. To date, the primary concerns raised by Indigenous Nations and the public regarding potential risks are related to the conservation of water quantity and preservation of quality, and to ensure that the tailings storage facility is designed, constructed, and operated in accordance will all modern safety standards.



LEGEND

- TRANSMISSION LINE (PROPOSED)
- MINE FACILITY
- AREA OF DISTURBANCE
- COMMUNITY
- LAKE

2 1 0 2 4 6 8 10 km

NOTES:

1. ONLY THOSE CLAIMS BELONGING TO SPANISH MOUNTAIN GOLD LTD. ARE SHOWN.
2. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: NAD 83 UTM ZONE 10N.
3. THIS FIGURE IS PRODUCED AT A NOMINAL SCALE OF 1:200,000 FOR 11x17 ("B" SIZE) PAPER. ACTUAL SCALE MAY DIFFER ACCORDING TO CHANGES IN PRINTER SETTINGS OR PRINTED PAPER SIZE.

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SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN GOLD PROJECT

ANTICIPATED PROJECT FOOTPRINT AND PROPOSED AREA OF DISTURBANCE

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P/A NO.	REF NO.
VA102-272/15	1

FIGURE 10.1 REV 0

11.0 PROJECT WASTE, EMISSIONS, AND DISCHARGES

This section of the IPD includes a general discussion of anticipated direct project waste and emissions to land, air, and water, including estimating greenhouse gas (GHG) emissions.

11.1 Project Waste

SMG will manage construction and operation discharges and wastes to meet the requirement of applicable guidelines, policies, and regulations. The discharges and wastes from the Project are expected to include:

- Waste rock
- Processing plant waste, which includes tailings
- Sewage
- Contaminated soil (in the event of spills or leaks)
- Other wastes from both hazardous and non-hazardous sources (e.g., office / domestic waste and vehicle maintenance wastes)

The current mine production schedule produces approximately 304 Mt of waste (overburden and waste rock), and an additional 77 Mt of subgrade ore over the mine life. Suitable mine waste rock that is Non- Potentially Acid Generating (Non-PAG) will be hauled from the pit and placed on two external WRSF's, North WRSF and West WRSF, both adjacent to the pit (Figure 7.1). Non-PAG mine waste rock will also be used for dam embankment construction at the tailings facility and water management ponds, as required. Approximately 21 Mt of Non-PAG waste rock will be required for the north and south dam embankments and for the water management pond through the LOM, including 6.5 Mt during the pre-production period.

The TSF will be used to provide secure and permanent containment for all tailings solids and potentially acid-generating (PAG) waste rock, and to provide temporary containment for impounded process water prior to being transferred to the WMP. A total of 72 Mt of PAG waste rock has been planned for subaqueous disposal in the tailings pond. Some of the PAG waste rock will be used for upstream tailings embankment construction, where it is assumed that the material will be submersed in less than two years.

Wastewater and sewage will be directed to an on-site septic treatment facility.

Project related non-hazardous, combustible waste materials will be managed on site with an incinerator. No provision has been made for an on-site landfill. Inert solid waste will be collected and transported off site to a landfill. Hazardous waste will be collected and transported off-site for management/disposal through approved facilities.

11.2 Greenhouse Gases

Net GHG emissions for the Project have been estimated over the life of mine. The GHG emissions were calculated according to the methodology in Section 3 of the Strategic Assessment of Climate Change (ECCC, 2020). Net GHG emissions were estimated using Equation 1 (ECCC, 2020):

- Net Emissions = Direct GHG emissions + Acquired energy GHG emissions – CO_2 captured and stored – Avoided domestic GHG emissions – Offset credits

At this stage, only direct GHG emissions (Scope 1) and acquired energy GHG emissions (Scope 2) emissions can be quantified based on available information. All other terms in Equation 1 are assumed to equal zero. The following sections provide a description of the methods, data, and emissions factors used in quantifying the Project's net GHG emissions based on information available as of October 2021.

Net GHG emissions were calculated for the Project's construction, operations, and decommissioning/closure phases. With an expected mine life of 14 years, this includes:

- Construction phase from Y-2 to Y-1
- Operations phase from Y1 to Y14
- Decommissioning phase from Y15-21

Direct Emissions

Direct GHG emissions (Scope 1) are generated by activities that are within the defined scope of the Project (Table 11.1). These activities include mobile combustion, stationary combustion, industrial processes, land use changes, and fugitive emissions. At this stage of the Project, direct GHG emissions were estimated from diesel fuel and explosives usage values as provided by MMTS. Although no estimates are available at this time, direct GHG emissions will also be generated by stationary combustion of propane, industrial processes, land use changes, and fugitive emissions. It is assumed that emissions from diesel fuel consumption and explosives usage will be the largest contributor to direct GHG emissions.

Table 11.2 shows the litres of diesel, tonnes of explosives, and litres of blasting fuel associated with each year of the Project. No estimates of fuel usage and explosives are available for the decommissioning phase of the Project. It was assumed that the direct GHG emissions during the decommissioning phase will be equal to the direct emissions from the first year of construction.

The GHG emissions factors for diesel and blasting fuel was obtained from values published by ECCC (2021). The emission factor for emulsion (explosives) was obtained from The Mining Association of Canada (2015).

Total construction phase direct GHG emissions are estimated to be 28,597 t CO_2e, total operations phase direct GHG emissions are estimated to be 763,359 t CO_2e, and total decommissioning/closure phase direct GHG emissions are estimated to be 15,421 t CO_2e.

Acquired Energy Emissions

Acquired energy GHG emissions (Scope 2) account for the generation of GHG from acquired electricity from the grid. Scope 2 emissions from electricity consumption were based on annual process plant energy consumption estimates. The annual acquired energy GHG emissions for the Project are estimated to be 7787 t CO_2e. The estimate was obtained by multiplying the estimated electricity consumption with the GHG intensity (40.1 tonnes CO2e/GWh) for electricity generation in British Columbia from BC Hydro. It is assumed that this annual amount is the same for the construction, operations, and decommissioning phases of the Project. Based on this estimate, the total acquired energy GHG emissions for all phases of the Project is 179,111 t CO_2e.

Table 11.1 Scope 1 and 2 Emissions from the Project

Scope 1	Description
Mobile Combustion	Emissions from mobile combustion (e.g., mine fleet, cars, etc.)
Stationary Combustion	Emissions from stationary combustion (e.g., natural gas boilers, burners)
Industrial Processes	Emissions from industrial processes (e.g., metal production, incineration, etc.)
Land Use Changes	Emissions from land use change (e.g., land clearing including deforestation, biomass decay, etc.)
Fugitive Emissions	Emissions from the uncontrolled release of a substance, including releases resulting from the production, processing, transmission, storage, distribution, or use of fuels or other substances
Scope 2	
Acquired electricity	Emissions associated with the generation of electricity, heat, steam or cooling, purchased or acquired from a third-party for the project (i.e., generation of purchased or acquired electricity from the grid)

CO2 Captured and Stored, Avoided Domestic GHG Emissions, and Offset Credits

At this stage of the Project, CO_2 captured and stored, avoided domestic GHG emissions, and offset credits are not expected to be important contributors to the estimation of net GHG emissions. The contribution from these components will be confirmed once more detailed mitigation planning has been undertaken.

Net GHG Emissions

The maximum annual net GHG emissions for the construction phase of the Project are in Year -1 at 26,394 t CO_2e. The maximum annual net GHG emissions for the operations phase of the Project are in Year 8 with 78,736 t CO_2e. Annual net GHG emissions for the decommissioning phase of the Project are assumed to be the same for all years at 2,203 t CO_2e. See Table 11.3 for a summary of maximum emissions by Project phase.

Diesel consumption from mobile combustion is anticipated to be the largest contributor of GHG emissions during the life of mine. As such, SMG will evaluate potential options for mitigating GHG emissions from diesel consumption, including:

- Continual optimization of the mine plan to ensure efficiencies with materials handling
- Equipment retrofit and replacement with electric options
- Evaluation of alternative waste rock handling options

Under the *Climate Change Accountability Act* (CCAA), British Columbia has established target levels for the reduction of GHG emissions. BC has committed to reducing GHG emissions by at least 40% less than 2007 levels by 2030 (38,800,000 t CO2e/year), and 60% less than 2007 levels by 2040 (25,900,000 t CO2e/year). The annual maximum net GHG emissions from the Project are estimated to be 86,523 t CO_2e during operations, which represents 0.002% of the CCAA 2030 target. The Project is

not expected to affect the province's ability to meet its targets under the *Climate Change Accountability Act*.

Under the Paris Agreement, Canada has committed to reducing GHG emissions by 30% less than 2005 levels by 2030. In 2005, Canada's GHG emissions were 730 Mt CO_2e, resulting in a target value of 511 Mt CO_2e for 2030. The annual maximum net GHG emissions from the Project of 86,523 t CO_2e represents 0.0169% of the Canadian 2030 target. Based on current projections, the Project is not expected to affect the country's ability to meet GHG reduction targets.

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TABLE 11.2

SPANISH MOUNTAIN GOLD LTD.
SPANISH MOUNTAIN GOLD PROJECT

INITIAL PROJECT DESCRIPTION
PROJECT DIRECT GHG EMISSIONS BY YEAR IN CARBON DIOXIDE EQUIVALENT (CO2e)

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Year of Operation		-2	-1	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15-21
Emissions Source	**Units**																	
Diesel	Litres	817,274	9,531,328	17,705,450	18,030,077	17,761,896	19,094,815	19,542,046	27,563,044	27,329,856	27,934,213	27,860,624	25,760,226	21,136,904	13,046,506	7,349,506	886,133	-
Blasting Fuel	Litres	696	96,842	283,889	314,714	303,724	332,511	327,562	451,783	441,291	458,667	462,849	366,751	376,035	202,420	65,437	0	-
Emulsion (explosives)	Tonnes	17	2,421	7,097	7,868	7,593	8,313	8,189	11,295	11,032	11,467	11,571	9,169	9,401	5,060	1,636	0	-
Diesel GHG Emissions	CO2e (kg)	2,197,553	25,628,608	47,607,849	48,480,730	47,759,624	51,343,684	52,546,235	74,113,745	73,486,730	75,111,774	74,913,902	69,266,183	56,834,619	35,080,503	19,761,948	2,382,706	-
Blasting Fuel Emissions	CO2e (kg)	2,211	307,617	901,771	999,689	964,778	1,056,222	1,040,501	1,435,087	1,401,759	1,456,955	1,470,237	1,164,982	1,194,475	642,985	207,862	0	-
Emulsion (explosives) Emissions	CO2e (kg)	3,289	457,577	1,341,374	1,487,025	1,435,095	1,571,117	1,547,732	2,134,675	2,085,100	2,167,203	2,186,960	1,732,896	1,776,768	956,432	309,192	0	-
Total GHG Emissions	CO2e (t)	2,203	26,394	49,851	50,967	50,159	53,971	55,134	77,684	76,974	78,736	78,571	72,164	59,806	36,680	20,279	2,383	2203 per year
Total GHG Emissions	CO2e (t)	**28,597**		**763,359**														**15,421**

M:\1\02\00272\15\A\Report\1 - Project Description\Rev C\[Table 11.2 and 11.3- GHG Emissions.xlsx]Direct GHG Emissions by Year

REV	DATE	DESCRIPTION	PREP'D	RVW'D
A	28NOV'21	ISSUED WITH REPORT VA102-272/15-1	ACC	RCB

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TABLE 11.3

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN GOLD PROJECT

INITIAL PROJECT DESCRIPTION

MAXIMUM GHG EMISSIONS

2/25/2022 16:53

Project Phase	Maximum Net Emissions	Acquired Energy Emissions	Direct Emissions	CO2 Captured and Stored	Avoided Domestic GHG Emissions	Offset Credits	Total Net Emissions for the Project by Phase	Total Net Emissions for the Project
	Maximum Annual CO2e (t)						CO2e (t)	
Construction	34,181	7,787	26,394	0	0	0	18,434	
Operations	86,523	7,787	78,736	0	0	0	872,377	**960,741**
Decommissioning/Closure	9,990	7,787	2,203	0	0	0	69,930	

M:\1\02\00272\15\A\Report\1 - Project Description\Rev C\[Table 11.2 and 11.3- GHG Emissions.xlsx]Maximum GHG Emissions

REV	DATE	DESCRIPTION	PREP'D	RVW'D
A	28NOV'21	ISSUED WITH REPORT VA102-272/15-1	ACC	RCB

11.3 Project Discharges

Air

Potential discharges to the air are largely limited to fugitive dust and particulate matter emitted from:

- Drilling, blasting, loading, and hauling of ore/waste rock from the mine.
- Dumping of ore/waste on stockpiles.
- Crushing, screening of ore at the plant.
- Vehicle operation on gravel roads.

The operation will be a source of greenhouse gases as discussed above, including carbon dioxide, carbon monoxide, sulphur oxides and nitrous oxides produced in fossil fuel combustion by vehicles, back-up generators, building heating, and the carbon regeneration kiln in the gold plant.

Mitigation measures to reduce air discharges at the Project include implementation of a dust control plan involving application of best management practices including water/dust suppressants on roads, dust collection and control at the crusher. Additionally, the Project will minimize the use of fossil fuel burning vehicles and appliances as much as technically and economically practical.

An air quality monitoring plan will be implemented to assess the effectiveness of management practices

Water

Discharges of water from the Project will include both contact water and non-contact water. Contact water is defined as water that will contact areas of the project or mining activities, while non-contact water, conversely, is water that does not contact any project or mining activities. Table 11.4 lists the types of discharge during construction and operations phases of the Project and the associated water management infrastructure.

Table 11.4 Project Discharges and Mechanical Systems

Type of Discharge	Water Management Infrastructure During Construction	Water Management Infrastructure During Operations

Contact Water	• Water Management Pond
	• Seepage Collection Ponds:
	  ○ North Embankment SCP
	  ○ South Embankment SCP
	  ○ North WRSF SCP
	• Diversion and Collection Ditches
	• Water treatment facilities
		• Water Management Pond
		• Seepage Collection Ponds:
		  ○ North Embankment SCP
		  ○ South Embankment SCP
		  ○ North WRSF SCP
		• Tailings Storage Facility
		• Diversion and Collection Ditches
		• Water treatment facilities

Non-Contact Water	• Boswell Lake Diversion	• Boswell Lake Diversion and South Discharge Channel

The WMP is the primary water storage facility on site. Water is pumped from this facility to the Process Plant on an as-needed basis, meaning that sufficient water will be maintained within the WMP to provide process water for up to 3 months. The WMP will be constructed during the pre-production phase and will maintain a minimum operating volume equal to three months of production water. Surplus water in the WMP is treated and discharged to Cedar Creek, which drains to Quesnel Lake.

Seepage collection ponds (SCPs) will be required in select areas to manage contact water prior to release to the environment, or prior to treatment. The following ponds will be constructed during the pre-production period and will exist on site until no longer required, either because water quality meets requirements for discharge to the environment, or if the ponds have been integrated into planned passive treatment systems. Ponds no longer required will be decommissioned:

- North Embankment SCP
- South Embankment SCP
- North WRSF SCP

The North and South Embankment SCPs will collect seepage from the TSF as well as runoff from contributing areas and the North and South Embankments. The South Embankment SCP water will be pumped to the TSF until the end of active closure, at which time the water will outflow to Boswell Lake for release to the environment. Seepage collected at the TSF North Embankment SCP will be pumped to the WMP or passively treated at this location. The North WRSF SCP water will be pumped to the WMP or passively treated at this location.

Temporary and permanent site water diversion and collection ditches will be used during construction, operations, and closure to minimize sediment mobilization and erosion, collect, and convey mine contact water, and protect natural drainages and watercourses.

Surface water runoff generated upstream of Project areas is considered to be non-contact water and will be diverted around the Project area with perimeter containment diversion ditches established during the pre-production phase and expanded and maintained through the operations phase.

Non-contact water from Boswell Lake will be pumped around the west side of the TSF and discharged into Cedar Creek until approximately Year 11 of operations via a diversion ditch to be extended from the eastern side of the TSF to convey flows north to Cedar Creek. This will reduce the flows requiring pumping around the TSF and maximize the amount that can be conveyed via gravity in ditches. A south diversion channel will be excavated in approximately Year 10 to discharge flows from Boswell Lake to the south into Winkley Creek.

The principal objectives of the design and operation of the TSF are to provide secure permanent containment for all tailings solids and PAG mine waste, and temporary containment for process

water. The design and operation of the TSF is integrated with the overall water management objectives for the entire mine development, in that surface runoff from disturbed catchment areas is controlled, collected and either contained on site or treated and discharged. An additional requirement for the design and operation of the TSF is to allow for effective reclamation of the tailings impoundment and associated disturbed areas.

Any water that has the potential for its quality to be adversely affected by Project activities, including runoff and seepage from tailings, waste rock and overburden management facilities, will be treated as contact water, and will be collected and managed on site prior to treatment and discharge to the environment.

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12.0 ALTERNATIVE MEANS OF CARRYING OUT THE PROJECT

This section considers the potential alternative means of carrying out the Project that SMG is considering. At the current level of Project development, there are no technically nor economically feasible alternatives to the proposed project. An initial alternatives assessment was completed during the 2021 PFS for the tailings storage facility. Alternatives for each component will continue to be assessed and informed by engagement with Indigenous Peoples and stakeholders. Alternatives that are being considered are presented in Table 12.1.

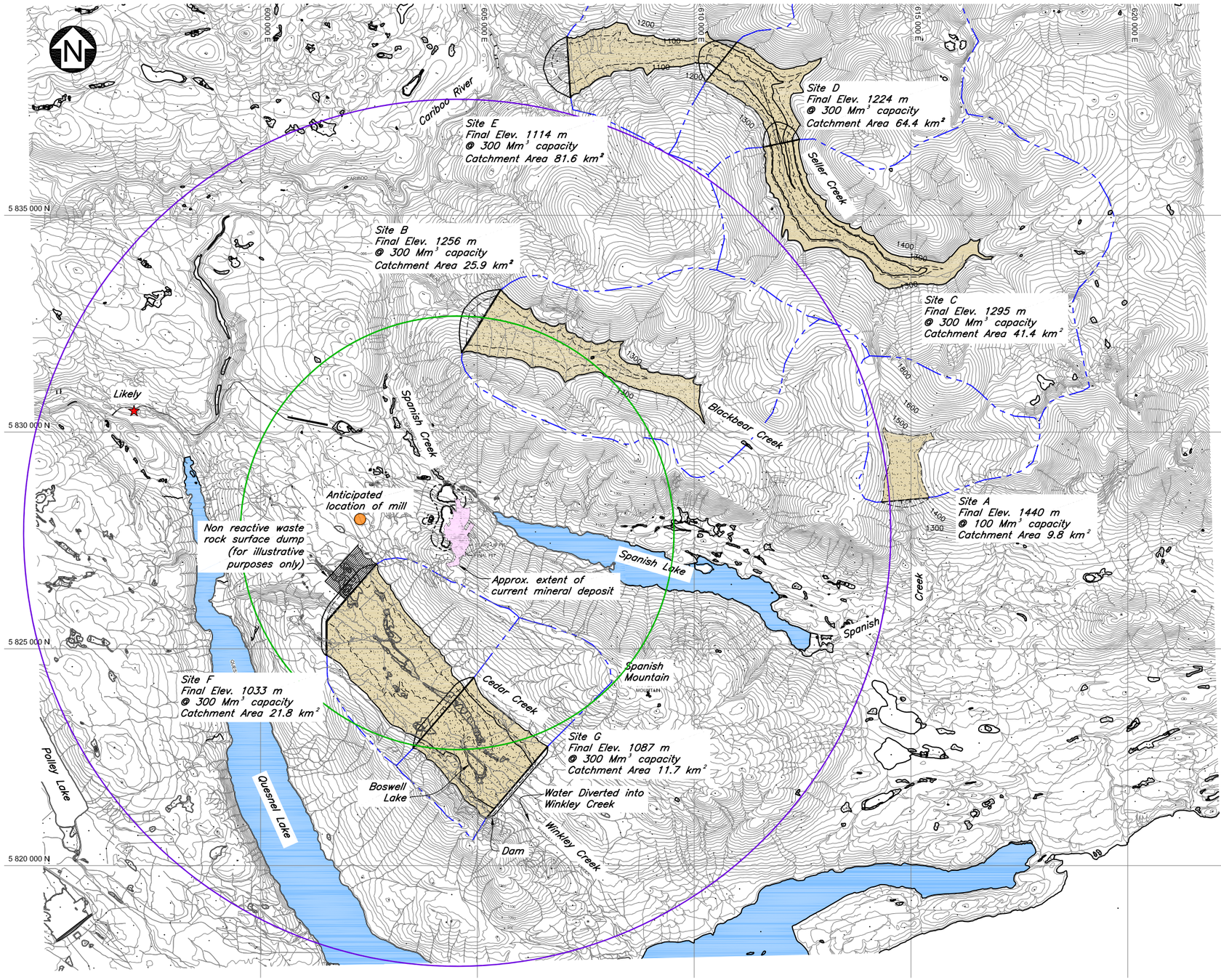
Table 12.1 Project Alternatives Summary

Component	Alternatives Considered	Preferred Option	Rationale
Ore processing location	• Process ore on-site • Ship ore off-site to processing facilities with spare capacity	Processing ore on site	Lower Environmental footprint, most economical
Ore processing	• Different milling techniques • Different metal separation techniques • Different reagent selection	Crushed ore will go to a SAG mill, followed by a ball mill. Metals will be separated by gravity flotation, then leaching, then electrowinning. Reagents are specific to these processes	Best Technical Feasibility given the geology
Mining method	• Open pit • Underground	Open pit mining method	Most technically feasible and economical
Power	• Connect to provincial grid • On-site diesel, hydroelectric, wind, solar or combination	Grid power will supply the majority of electricity needs	Lower emission and carbon reliance, and most economical
Tailings management	• Conventional vs thickened vs paste vs filtered tailings for disposal • Siting of tailings facility	Conventional tails sited in a location that offers storage capacity and stability	Most technically feasible
	• Dam construction method • Dry or wet cover on TSF at closure	Earthfill / rockfill structures with low-permeability core zones Dry (vegetated) closure cover	Most technically feasible
Waste rock management	• Location of ore, waste rock, overburden, and soil stockpiles	Incorporated to the footprint to maximize efficiency of water management	Lowest environmental footprint, and most economical
Waste management (hazardous and solid)	• Solid waste disposal of on site/off site landfill vs incineration • Hazardous waste disposal on site vs off site	Off site in approved management locations. Limited onsite incineration of non-hazardous materials	Most economical
Water management	• Freshwater source • Alternative water treatment systems • Alternative discharge locations	Most water will be recycled from the process. Makeup water will be supplied from groundwater wells. Discharge will be minimized and treated prior to release	Lowest environmental effect
Logistics (transportation and accommodation)	• Worker accommodations on-site vs off-site • Worker transportation	During operations, SMG will transport mine operational staff from local pick-up hubs to the Project site. A temporary 265-person camp will be provided during construction and an existing 50-person permanent camp will be available at the site during construction and for the operational phase of the project.	Lowest environmental footprint, most comfortable for employees

12.1 Waste and Water Management Alternatives

Throughout the evolution of the Project design, several studies have examined alternatives for the management of tailings and waste rock, with associated water management.

A preliminary TSF alternatives study was completed in 2007 which identified several potential sites. The study assumed economic constraints would limit TSF location to within a 15 km radius, as shown in Figure 12.1 (KP, 2007). The suitability of these sites was evaluated based on proximity to the deposit, volumetric storage efficiency (the ratio of the volume of waste stored to the volume of embankment fill material, which is often an indicator of cost, with higher storage efficiencies resulting in a lower cost per tonne of tailings stored), and upstream catchment area. This preliminary study was completed prior to definition of the mineable resource and assumed two cases: a TSF capacity requirement of 100 Mm^3 and an expanded case of 300 Mm^3. The TSF sites located within Cedar Creek (Sites F and G) and Blackbear Creek watersheds (Site B) were identified as preferred options for further study, because they were rated as having high storage efficiency, and were associated with lower capital cost.



LEGEND

- Catchment area
- Proposed Ultimate TSF Dam
- Limits of Base Case Tailings (100 Mm³)
- Limits of Ultimate Tailings (300 Mm³)
- 5 km radius from center of ore body
- 10 km radius from center of ore body

NOTE:

Site A capacity is insufficient to impound the expanded case. (300 Mm³)

NOTES:

1. FIGURE FROM 'SPANISH MOUNTAIN PROJECT - PRELIMINARY TAILINGS STORAGE FACILITY ALTERNATIVES ASSESSMENT STUDY', BY KNIGHT PIÉSOLD LTD., 2007.
2. COORDINATE GRID IS UTM NAD83 ZONE 10N.
3. CONTOUR INTERVAL IS 20 METRES.
4. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 1 0,5 0 1 2 3 4 5 km

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SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN

2007 ALTERNATIVES STUDY
TAILINGS STORAGE FACILITY ALTERNATIVES

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P/A NO. VA102-272/15 | REF NO. 1

FIGURE 12.1 | REV 0

A subsequent waste and water management alternatives assessment was completed in 2010 (KP, 2010a) expanding on the preliminary assessment of KP (2007). The 2010 assessment assumed approximately 200 million tonnes (Mt) of ore processed over 16 years (at 35,000 tonnes per day), which is approximately 2 times larger than the capacity of the Project as currently proposed. Six options for tailings management were examined (Figure 12.2).

The 2010 study was completed to provide a more detailed basis for selection of a preferred TSF location for the 2010 Preliminary Economic Assessment (AGP, 2010). This study assessed several waste and water management alternatives with consideration of the following components: potential TSFs, tailings distribution and reclaim water systems, diversion ditches, seepage collection ponds, haul roads, plant site, monitoring and instrumentation, and fish compensation. Preliminary initial capital, sustaining capital and operating comparative cost estimates were prepared for each alternative to assist in identifying a preferred waste and water management alternative for inclusion in the 2010 PEA. The results of this study indicated that TSF H1 and F1, which both include a TSF within the Cedar Creek watershed, were the preferred options from a cost perspective. Of TSF H1 and F1, TSF H1 was preferred due to its smaller footprint and reduced fisheries impact.

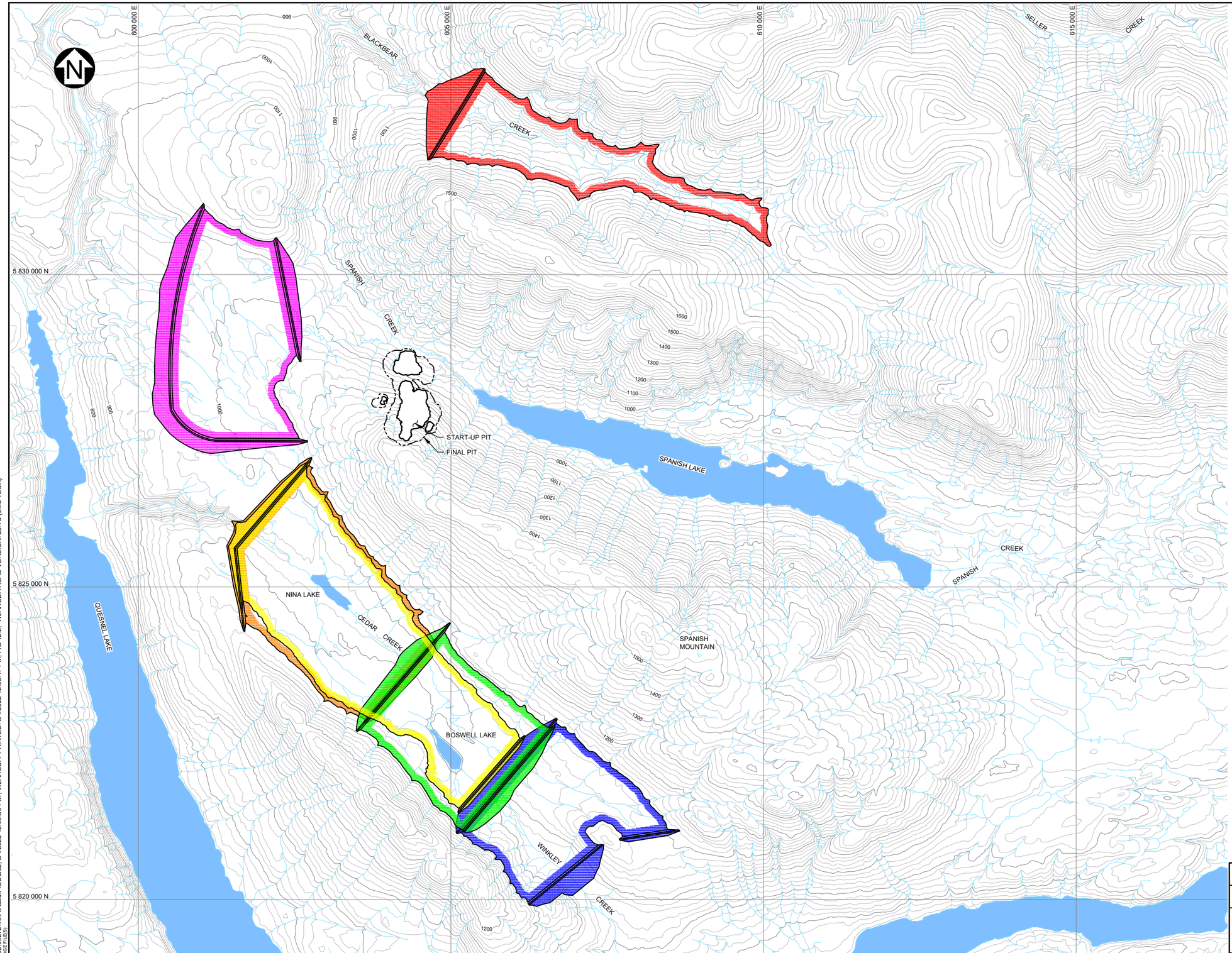
A 2010 waste and water management concept development study followed completion of the alternatives study to focus on the optimization of Options H1 and OJ1 (KP, 2010b). The study included the evaluation of three concepts with various TSF configurations (Options H2 and J2, optimizations of Options H1 and J1, respectively), throughput (25,000 tpd and 40,000 tpd) and mine life (10 years and 12 years). Options H2 and J2 can be seen on Figure 12.3.

The three concepts considered potential optimizations of throughput and location. Further study was pursued based on economic evaluations for the entire mine development. Each concept evaluated the following waste and water management components: potential TSFs, tailings distribution and reclaim water systems, diversion ditches, seepage collection ponds, plant site, monitoring and instrumentation, fish compensation and closure and reclamation bonding. Concept 2, which includes TSF Option H2, with a throughput of 40,000 tpd and a mine life of 10 years, was found to have the best economics for the entire mine development; this concept was included in the 2010 PEA (AGP, 2010).

Following completion of the 2010 PEA, SMG decided to explore TSF options that did not involve placement of mine waste in fish bearing waters. This resulted in Area J, the height of land between the Cedar Creek and Spanish Creek drainages, being the only potential location for tailings management at that time. A TSF in Blackbear Creek was not considered for further study as TSF B1 was identified to be less economic than TSF J1 in the 2010 alternatives assessment.

Additional study, investigation and optimization of the mine development and resource was undertaken from late 2011 to mid 2012 resulting in the creation of several TSF configurations in Area

J (TSFs J3 through J6). An updated mine development concept, including a TSF in Area J (TSF J7, see Figure 12.4), was completed in September of 2012. Initial costs for a mine plan that included TSF J7 indicated that further optimization was required to improve the financial model.



LEGEND:

- OPTION B1
- OPTION F1
- OPTION G1
- OPTION H1
- OPTION I1
- OPTION J1

NOTES:

1. FIGURE FROM 'ALTERNATIVES ASSESSMENT FOR WASTE & WATER MANAGEMENT' BY KNIGHT PIÉSOLD LTD., 2010.
2. COORDINATE GRID IS UTM NAD83 ZONE 10N.
3. PIT OUTLINE RECEIVED FROM SPANISH MOUNTAIN GOLD LTD., MAY 2010.
4. CONTOUR INTERVAL IS 20 METRES.
5. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 600 300 0 1000 2000 3000 m

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SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN

2010 ALTERNATIVES ASSESSMENT
TAILINGS STORAGE FACILITY ALTERNATIVES

Knight Piésold CONSULTING

P/A NO. VA102-272/15 | REF NO. 1

FIGURE 12.2 | REV 0

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605 000 E
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5 830 000 N
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N
BLACKBEAR CREEK
SELLER CREEK
HEPBURN LAKE
SPANISH CREEK
FINAL 40,000 tpd PIT
J2
H2
CEDAR POINT PROVINCIAL PARK
NINA LAKE
CEDAR CREEK
QUESNEL LAKE
SPANISH LAKE
CLAIM BOUNDARY
SPANISH MOUNTAIN
BOSWELL LAKE
WINKLEY CREEK
SPANISH CREEK
900
1000
1100
1200
1300
1400
1500
1600
1700
1800

NOTES:

1. FIGURE FROM 'WASTE AND WATER MANAGEMENT CONCEPT DEVELOPMENT STUDY' BY KNIGHT PIÉSOLD LTD., 2010.
2. COORDINATE GRID IS UTM NAD83 ZONE 10N.
3. PIT OUTLINE RECEIVED FROM AGP, NOVEMBER 2010.
4. CONTOUR INTERVAL IS 20 METRES.
5. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

600 300 0 1000 2000 3000 m
SCALE A

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0	07MAR'22	ISSUED WITH REPORT	ACC	RAF	RCB

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN

2010 CONCEPT DEVELOPMENT STUDY
TAILINGS STORAGE FACILITY CONCEPTS

Knight Piésold CONSULTING

P/A NO. VA102-272/15
REF NO. 1
FIGURE 12.3
REV 0

SAVED: M:\1102\00272\15\A\Acad\FIGS\B03, 3/4/2022 12:01:41 PM, WLAHODA PRINTED: 3/4/2022 12:01:58 PM, FIG 12.3, WLAHODA ACAD VERSION: 23.1S (LMS TECH)
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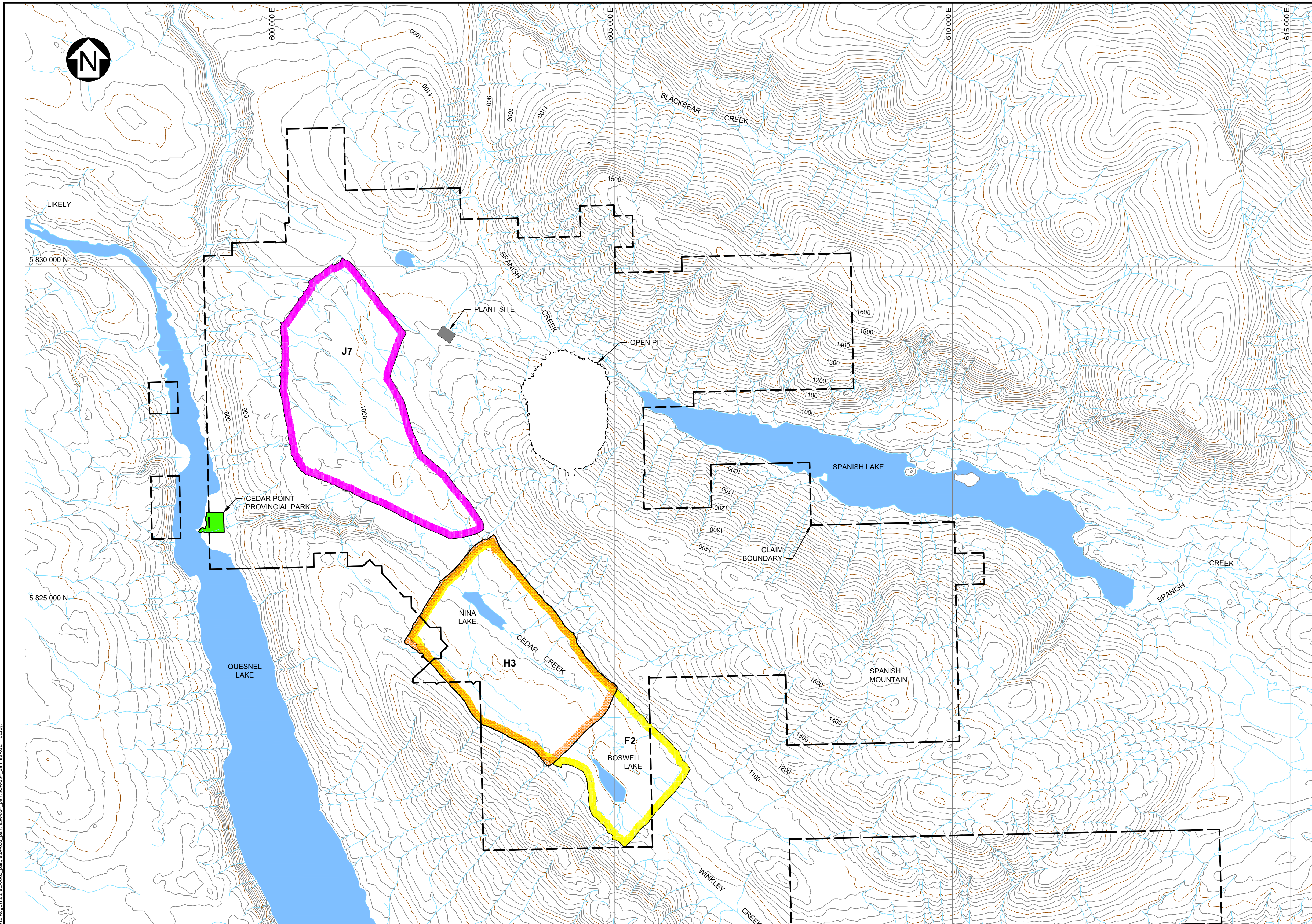


NOTES:

1. COORDINATE GRID IS UTM NAD83 ZONE 10N.
2. PIT OUTLINE RECEIVED FROM MMTS, SEPTEMBER 10, 2012.
3. CONTOUR INTERVAL IS 20 METRES.
4. DIMENSIONS AND ELEVATIONS ARE IN METRES, UNLESS NOTED OTHERWISE.

SCALE A 600 300 0 1000 2000 3000 m

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN

UPDATED CONCEPT DEVELOPMENT STUDY
TAILINGS STORAGE FACILITY CONCEPTS

Knight Piésold CONSULTING

P/A NO.	REF NO.
VA102-272/15	1

FIGURE 12.4 REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	07MAR'22	ISSUED WITH REPORT	ACC	RAF	RCB

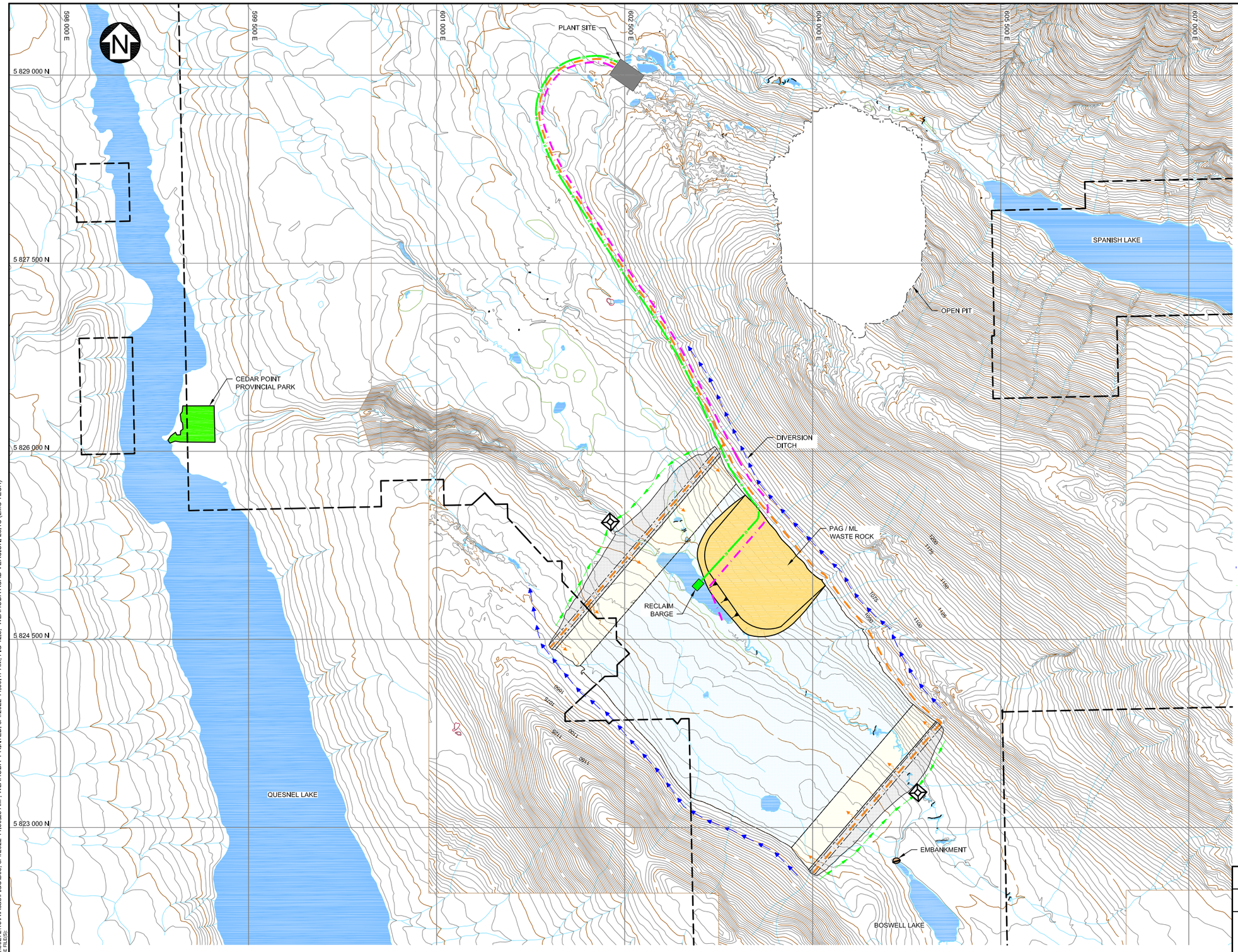
SAVED: M:\1\02\00272\15\A\Acad\FIGS\B04, 3/4/2022 11:56:19 AM, WLAHODA PRINTED: 3/4/2022 11:56:43 AM, FIG 12.4, WLAHODA ACAD VERSION: 23.1S (LMS TECH)

TSF options previously explored by SMG were reconsidered for inclusion in the 2012 PEA. The TSFs reconsidered were the configurations evaluated to have the best economics in the 2010 waste and water management alternatives assessment, namely, revisions of TSF H2 and TSF F1 now called TSF H3 and F2, respectively.

An updated study was subsequently undertaken, which considered three further mine development concept optimizations (KP, 2012):

- TSF J7
- TSF H3
- TSF F2

Of the three concepts, TSF H3 was selected for inclusion in the 2012 PEA. TSF H3 is shown in Figure 12.5.



LEGEND:

- SPANISH MOUNTAIN CLAIM BOUNDARY
- RECLAIM PIPELINE
- ROUGHER TAILINGS (RT) PIPELINE
- CLEANER TAILINGS (CT) PIPELINE
- DIVERSION DITCH
- RUNOFF COLLECTION DITCH
- SEEPAGE COLLECTION AND RECYCLE POND
- TAILINGS EMBANKMENT
- TAILINGS BEACH
- SUPERNATANT POND

NOTES:

1. COORDINATE GRID IS UTM (NAD83) ZONE 10N.
2. PIT OUTLINE RECEIVED FROM MMTS, SEPT. 10, 2012.
3. CONTOUR INTERVAL IS 5m AND 20m, 5m CONTOURS ARE FROM EAGLE MAPPING.
4. DIMENSIONS AND ELEVATIONS ARE IN METERS, UNLESS NOTED OTHERWISE.

SCALE A: 300 150 0 500 1000 1500 m

SPANISH MOUNTAIN GOLD LTD.

SPANISH MOUNTAIN

CONCEPT 5 - TAILINGS STORAGE FACILITY H3 GENERAL ARRANGEMENT

Knight Piésold CONSULTING

P/A NO. VA102-272/15 | REF NO. 1

FIGURE 12.5 | REV 0

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	07MAR'22	ISSUED WITH REPORT	ACC	RAF	RCB

SAVED: M:\1\02\00272\15\A\Acad\FIGS\B05, 3/4/2022 11:50:25 AM, WLAHODA PRINTED: 3/4/2022 11:50:47 AM, FIG 12.5, WLAHODA ACAD VERSION: 23.1S (LMS TECH)
XREF FILE(S): IMAGE FILE(S):

TSF location H3 represents the TSF location selected by SMG for the 2012, 2017 and 2019 PEAs, as well as the 2021 PFS, as this location provided the most cost-effective and technically feasible location for tailings management, reduced the environmental footprint, and is not anticipated to sterilize the mine resource. Site J was assessed as higher cost and located in the area of the Phoenix deposit, which could sterilize a resource. Site J was not considered further.

12.2 Best Available Tailings Management Technology

Initial tests were completed on two flotation tailings samples to evaluate whether dewatering of the tailings and dry stacking could be a viable option. The tailings exhibited very poor solid-liquid separation characteristics. The addition of an anionic flocculant increased the settling rate and supernatant clarity significantly, but the final density was only about 60% solids w/w. Filtration of the flocculated tailings gave very poor filtrate quality and extremely long filtration times. The net conclusion of these tests was that filtration and dry-stacking of the tailings is not a viable option and further testwork was not pursued (MMTS, 2019).

The following tailings management strategies were considered for the PFS.

- Managing slurry tailings in a facility with a low permeability core zone in the embankments.
    - This option was carried over as the base case from the 2019 PEA. This option includes a low permeability core zone constructed with local glacial till materials and performs as a water retaining structure. Filter and transition zones would be located downstream of the core zone to provide the necessary filter relationships with the core zone material and to control drainage within the dam. Large tailings beaches would be developed during operations with the surplus water managed in the separate WMP. Seepage rates would be relatively low, reducing the downstream seepage management requirements during operations and post closure.
- Managing slurry tailings in a facility that does not have a low permeability core zone.
    - Instead of a low permeability core zone, the embankments would have successive filters to manage seepage through the dam. A flow-through dam for tailings management would create a drained tailings mass adjacent to the dams in addition to large tailings beaches. The removal of water would reduce the flowability of the tailings mass thereby reducing the long-term risk of the facility.

  Seepage analyses were completed for the low permeability core zone and the flow-through dam options and are included in Table 12.2.

Table 12.2 TSF Alternatives Seepage Assessment

Embankment Type	Variations	Condition	Flux ($m^3/s/m2$)			Seepage (L/s)		
			Total Seepage	Embankment	Foundation	Total Seepage	Embankment	Foundation
Flow Through	Till Foundation (1e-7 m/s)	Emergency Operating Condition	4.5E-05	4.3E-05	2.2E-06	60.3	57.4	2.9
		500 m Beach	2.1E-06	5.2E-08	2.1E-06	2.9	0.1	2.8
		1000 m Beach	1.3E-06	7.2E-19	1.3E-06	1.7	0.0	1.7
Flow Through	Till Foundation (1e-8 m/s)	Emergency Operating Condition	4.5E-05	4.3E-05	2.1E-06	59.9	57.0	2.9
		500 m Beach	2.1E-06	2.3E-08	2.1E-06	2.8	0.0	2.8
		1000 m Beach	1.3E-06	1.8E-19	1.3E-06	1.7	0.0	1.7
Flow Through	Till Foundation (1e-9 m/s)	Emergency Operating Condition	4.5E-05	4.3E-05	2.1E-06	59.7	56.8	2.9
		500 m Beach	2.1E-06	1.2E-08	2.1E-06	2.8	0.0	2.8
		1000 m Beach	1.3E-06	5.2E-19	1.3E-06	1.7	0.0	1.7
Low Permeability Core Zone	Core Zone and Till Foundation (1e-7 m/s)	Emergency Operating Condition	1.2E-05	1.0E-05	2.1E-06	16.6	13.8	2.8
		500 m Beach	1.9E-06	2.7E-20	1.9E-06	2.5	0.0	2.5
		1000 m Beach	1.1E-06	4.7E-19	1.1E-06	1.5	0.0	1.5
Low Permeability Core Zone	Core Zone and Till Foundation (1e-8 m/s)	Emergency Operating Condition	1.8E-06	4.4E-17	1.8E-06	2.4	0.0	2.4
		500 m Beach	9.6E-07	3.3E-19	9.6E-07	1.3	0.0	1.3
		1000 m Beach	6.7E-07	5.4E-19	6.7E-07	0.9	0.0	0.9
Low Permeability Core Zone	Core Zone and Till Foundation (1e-9 m/s)	Emergency Operating Condition	4.6E-07	4.7E-18	4.6E-07	0.6	0.0	0.6
		500 m Beach	3.8E-07	3.3E-19	3.8E-07	0.5	0.0	0.5
		1000 m Beach	3.2E-07	1.1E-19	3.2E-07	0.4	0.0	0.4

The seepage analyses were completed for varying permeability values for the glacial till materials, and for different beach lengths. The results indicate that the seepage rates are higher for the flow-through dam concept, as expected, and reduce significantly for both options with an established tailings beach as compared to the emergency operating condition that considered water up against the dam.

Stability analyses completed for the core zone and the flow-through dam options and are included in Table 12.3.

Table 12.3 TSF Alternatives Stability Assessment

Embankment Type	Variations	Condition	FoS	
			Static	Pseudo-static
Flow Through	Till Foundation (1e-7 m/s)	Emergency Operating Condition	1.9	1.3
		500 m Beach	1.9	1.4
		1000 m Beach	1.9	1.4
Flow Through	Till Foundation (1e-8 m/s)	Emergency Operating Condition	1.9	1.3
		500 m Beach	1.9	1.4
		1000 m Beach	1.9	1.4
Flow Through	Till Foundation (1e-9 m/s)	Emergency Operating Condition	1.9	1.3
		500 m Beach	1.9	1.4
		1000 m Beach	1.9	1.4
Water Retaining	Core Zone and Till Foundation (1e-7 m/s)	Emergency Operating Condition	1.9	1.4
		500 m Beach	1.9	1.4
		1000 m Beach	1.9	1.4
Water Retaining	Core Zone and Till Foundation (1e-8 m/s)	Emergency Operating Condition	1.9	1.4
		500 m Beach	1.9	1.4
		1000 m Beach	2.0	1.4
Water Retaining	Core Zone and Till Foundation (1e-9 m/s)	Emergency Operating Condition	1.9	1.3
		500 m Beach	1.9	1.4
		1000 m Beach	1.9	1.4

The results indicate that there is little difference in the Factor of Safety values for these two options.

The tailings management option selected for the PFS was the slurry tailings with a low permeability core zone. A key consideration in this selection was the unknown water quality of the impoundment seepage water, and the larger seepage flows required to be managed from a flow through dam during the Emergency Operating Condition.

The tailings management alternatives assessment was completed at a high-level to select a preferred option for the PFS. A more comprehensive alternatives assessment, with input from First Nations and local stakeholders, will be required in the future and may result in a change in the tailings management option selected to support the PFS. Tailings management design will also be reviewed by an external technical review board to ensure compliance with best practice.

13.0 EFFECTS OF THE ENVIRONMENT ON THE PROJECT

Climate change could affect the frequency and intensity of severe weather events. The following environmental factors could lead to environmental effects on the Project's physical infrastructure:

Natural Hazards

- Seismic events
- Landslides
- Drought
- Flooding
- Hailstorms
- Lightning
- Volcanic events
- Wildfires
- Erosion and sedimentation

Climate Change

- Warmer and dryer climate in summer could lead to more frequent wildfires
- Higher precipitation, especially in winter, could lead to more frequent flooding
- Combination of dryer summer and wetter winter could result in more frequent landslides
- Warmer temperatures could result in earlier peak spring flow
- Potential increased frequency and duration of heatwaves and droughts

The supply of water for mine facilities will be susceptible to environmental changes, such as changes to temperature, precipitation, and rates of evapotranspiration. Mine facilities rely on a continuous supply of water to sustain mining and processing activities throughout the operating period. For instance, water for the process plant for the processing of ore will be provided by a combination of freshwater from make-up sources, including the Open Pit, and reclaim water pumped from the WMP. Water supply from these make-up sources is influenced by precipitation and runoff from catchments in the Project area.

Although water supply will be susceptible to environmental changes, appropriate mitigations to severe weather events will be incorporated into designs and plans. In particular, KP has developed a tailings and water management strategy (KP, 2021a) and water balance model (KP, 2021b) for the 2021 Prefeasibility Study (MMTS, 2021).

Baseline studies have been completed to develop an understanding of the Project area. Section 9.0 provides a description of baseline environmental studies completed to date.

14.0 LAND AND WATER USE

14.1 Land Use Plans

The Project is located on provincial crown lands within the boundaries of the Horsefly Sustainable Resource Management Plan (HSRMP), which is one of seven plans covering the Cariboo-Chilcotin Region (ILMB 2005). The area covered by the HSRMP (813,021 ha with 547,435 ha being productive forest land base) was formerly recognized as the Horsefly Forest District and now exists as the eastern portion of the Central Cariboo Forest District. The Project is zoned within the Central Cariboo Area Rural Land Use Bylaw, which allows for economic development of mining.

The forest industry is a major economic driver in the Cariboo-Chilcotin Region (HSRMP 2005). A few transition and permanent old growth management areas exist within the Project area, on Mount Warren and along the shores of Spanish Lake and Quesnel Lake.

The Likely Xatśūll Community Forest is a community forest located in crown land surrounding the community of Likely. The community forest is operated as a partnership between the community of Likely and the Xatśūll First Nation, who claims traditional territory over the community forest operating area. Each community owns 50% of the shares in the limited company and profits are distributed equally.

Mining is important for the economy of the Cariboo-Chilcotin Region, which has hosted mining activity since the 1800's. The region is host to copper, gold, and fluorite deposits, as well as building materials such as aggregate and dimensional stone. The Bullion Pit Hydraulic Placer Mine produced at least 175,000 ounces of placer gold during operations between 1892 and 1942 and is now part of the rich mining heritage of the area. Placer mining on property occurred historically in the Cedar Creek watershed. The Redgold property, Mount Polley mine, QR mine and mill, Gibraltar mine, and Bonanza Ledge mine are other recent/current mining activities in the area.

Tourism and recreation are also important economic contributors within the HSRMP area. The area surrounding Spanish Lake has been identified as a backcountry recreational area (Backcountry Unit DHO-7). The unit was identified because of the wilderness setting for fishing and visual quality around Spanish Lake, Benny Lake, Freshette Lake, Annette Lake, and Spanish Mountain. A number of recreational sites exist throughout the Project area, including the Cedar Creek (Nina Lake) Recreation Site, the Boswell Lake Recreation Site, and the Winkley Creek Recreation Site, and Cedar Creek Provincial Park. In addition, a licence of occupation exists at the outlet of Spanish Lake for guided nature viewing and commercial recreation.

An active guide outfitter tenure within management units 5-02 and 5-15 overlaps the Project area. Big game animals covered under the tenure include black bear, grizzly bear, caribou, cougar, deer, moose, mountain goat, and wolf.

14.2 Parks and Protected Areas

There are no federal or regional parks, wilderness or conservancy areas, ecological reserves, or protected areas immediately adjacent to the Project. However, there is one recreational area, Boswell Lake Recreation Site, that is within the Project footprint.

The closest recreation sites and provincial parks are as follows:

- Spanish Lake Recreation Site approximately 4 km southeast of the Project
- Cedar Point Park approximately 10 km west of the Project
- Winkley Creek Recreation Site, approximately 6 km south of the Project
- Horsefly Lake Park approximately 40 km southeast of the Project
- Long Creek Park approximately 50 km northeast of the Project
- Cariboo River Park approximately 51 km northeast of the Project
- Quesnel Lake Park approximately 65 km northeast of the Project
- Mount Tinsdale Ecological Reserve approximately 81 km northeast of the Project

14.3 Federal Lands

There are no federal lands within the Project footprint. There are several navigation lights on Quesnel Lake, associated with federal land use permits, the closest being:

- Plato Island, approximately 15 km from the Project
- Cariboo Island, approximately 11 km from the Project
- Hazeltine Creek, approximately 10 km from the Project
- Cedar Creek, approximately 6 km from the Project

Additionally, there are federally held areas associated with fisheries rearing land holding on the Quesnel River, including:

- Likely rearing channels, approximately 10 km from the Project
- Cariboo fishway, approximately 13 km from the Project

14.4 Archaeology

Terra Archaeology Limited (Terra) completed five archaeological impact assessments under a *Heritage Conservation Act* permit within Clearance Areas 2 through 6 in 2019 (Terra Archaeology, 2019). The sections that follow provide a summary of the findings.

In Clearance Area 3, one archaeological site (FdRi-2) was identified on the southwestern bank of Cedar Creek. The artifact, a piece of fine-grained volcanic debitage was recovered from below the ground surface.

No archaeological resources were identified within Clearance Areas 2, 4, and 5, or within the three exploratory drill site locations (18-CCR-040, 18-CCR-041, and 18-CCR-042) which were assessed within Clearance Area 6. Therefore, no further archaeological work is recommended prior to the proposed developments within these areas provided development boundaries are not altered to include unassessed terrain. If impacts to Clearance Area 6 are proposed in the future, beyond the assessed drill sites, it is recommended that the development plans be reviewed by a qualified professional archaeologist. Terra (2019) concluded that the potential presence of additional archaeological sites is considered to be low in the remainder of the assessed lands.

14.5 Water Use

The following table presents a list of water requirements for the proposed Project, including proposed sources of water.

Table 14.1 Water Use for the Spanish Mountain Project

Water Use	Proposed Source of Water
Processing Water Non potable water used at the Processing Plant.	Overflow from the thickeners, as well as water stored in the Water Management Pond meet the majority of the process water requirements. Raw water and contact water provide any additional make-up water requirements. Treated water from the WTP can be used for make-up water in the event of a shortfall in raw water. The Water Management Pond is fed with clarified water form the non-acid generating sections of the tailings pond. Seepage water from the north and south seepage ponds is pumped back into the non-acid generating sections to the tailings pond.
Potable Water Potable water for human consumption.	Fresh water will be supplied from two freshwater wells and will be sterilized before being stored in a potable water tank and distributed to the process plant, plant site buildings, and camp. Extraction of fresh water from wells for potable water use will require an application for Water Licenses under the Water Sustainability Act.
Domestic Water Non-potable water used for domestic use in offices and mechanical shops.	Fresh water will be supplied from two freshwater wells and will be sterilized before being stored in a potable water tank and distributed to the process plant, plant site buildings, and camp. Extraction of fresh water from wells for domestic water use will require an application for Water Licenses under the Water Sustainability Act.
Dust Control Water Non-potable water sprayed on roads, stockpiles, or other areas to reduce dust entering the air.	Dust control water needs could be met by collection of non-contact runoff, treated water from the WTP, local groundwater wells or use of and possibly storage of surface water. Dust control water for the Project may require obtaining new licenses for groundwater wells or use of and/or storage of surface water.
Drilling Water Non-potable water used to operate drills for construction and mining.	Drilling water needs could be met by the pit sump, local ground water wells or use of and possibly storage of surface water. Drilling water for the Project may require obtaining new licenses for groundwater wells or use of and/or storage of surface water.

15.0 PROJECT INTERACTIONS

15.1 Preliminary List of Possible Project Effects and Mitigations

Table 15.1 Preliminary Identification of Potential Project Effects

Environment Component	Issue/Potential Effect	Example of Potential Mitigation
Indigenous Interests		
Current Use of Lands for Traditional Purposes, Sites of Historical, Archaeological or Cultural Importance, and Physical and Cultural Heritage	• The Project-environment interactions have the potential to affect the harvesting of plants for food and medicinal and ceremonial purposes, exercising of Aboriginal rights and traditional land uses in and around the Project area, camping and gathering at sites of cultural, spiritual, and historic importance.	• The assessment of the Project will consider the rights and interests of Indigenous peoples in consultation. The participating Indigenous Peoples will be engaged on the evaluation and selection of mitigation measures to minimize potential effects. This may include avoiding/minimizing Project interaction with identified sites.
Indigenous Peoples' Health, Social or Economic Conditions	• The Project-environment interactions have the potential to affect biophysical components, resulting in a potential impact to Indigenous health, social, or economic conditions.	• Health: implementing environmental monitoring programs • Social: Implement a socio-economic baseline survey update every 5 to 10 years • Economic: support Indigenous communities' agencies with training and skills development.
Physical Environment		
Geology, Soils and Terrain	• Changes to geology, soils, and terrain from vegetation removal, storage of waste rock, construction of Project facilities. • Loss of soil profile and structure. • Modification of slopes and vegetation resulting in potential soil erosion. • Changes to soil quality due to changes in soil chemical and physical characteristics.	• Management practices for soil erosion control and soil. contamination management. • Implement a reclamation and closure plan. • Soil salvage, soil stockpile, and soil placement management.
Hydrogeology	• Changes to groundwater quality and quantity. • Groundwater withdrawals for pit dewatering and the mine process may change local groundwater flow patterns during the period of dewatering. • Altered groundwater flow patterns may affect baseflows in creeks that receive groundwater inflows or creeks that provide groundwater recharge. • Groundwater quality may be altered by infiltration of mine-influenced water from surface operations.	• Collect and manage mine-influenced water to minimize potential for infiltration to groundwater (e.g., lined water management pond and TSF, contact water collection system and segregation from clean runoff). • Implementation of erosion control and spills management plans. • Implement groundwater monitoring plans (quality and flow patterns) during construction and operation and adapt to findings. • Implement a reclamation and closure plan, including a closure water management plan.

Environment Component	Issue/Potential Effect	Example of Potential Mitigation
Surface Hydrology and Water Quality	• Potential effects on surface water quantity (i.e., hydrology) may include alteration of seasonal stream flow patterns due to: o Stream diversion. o Groundwater withdrawals affecting baseflows. o Discharge to surface waters. • Changes in erosion rates/timing and/or sediment deposition patterns/rates in streams due to changes in surface water flow regime. • Changes in sediment loading in streams related to changes in flow/erosion. • Changes in chemical water quality related to: contact with mineralized areas or materials exposed by the mining operation; emissions from the mining operation; and/or to changes in flow. • Changes in groundwater/surface water interactions (e.g., increased or decreased groundwater recharge; groundwater withdrawals discharged to surface).	• Divert non-contact water away from mine operations to: o Collect and divert clean runoff away from mine operations. o Divert creeks around mine facilities to maintain downstream flows. • Collect all mine-influenced runoff from the site. • Maximize use of mine-influenced water in the mine process to minimize the need for fresh makeup water. • Treat any excess mine-influenced water before discharge to surface waters. • A surface water monitoring program will be conducted during the construction, operations, active closure, and passive closure project phases.
Air Quality, Noise and Vibrations	• The mining operation will be a source of particulate matter originating in fugitive emissions from: o Drilling, blasting, loading, and hauling of ore/waste rock from the mine. o Dumping of ore/waste on stockpiles. o Crushing, screening of ore at the plant. o Vehicle operation on gravel roads. • The operation will be a source of greenhouse gases, including carbon dioxide, carbon monoxide, sulphur oxides and nitrous oxides produced in fossil fuel combustion by vehicles, back-up generators, building heating, and the carbon regeneration kiln in the gold plant. • Noise and/or vibrations from mining operations including drilling, blasting, ore/waste loading.	• Implement a dust control plan involving application of best management practices including water/dust suppressants on roads, dust collection and control at the crusher. • Minimize the use of fossil fuel burning vehicles and appliances as much as technically and economically practical. • Implementation of an air quality monitoring plan to monitor the effectiveness of management practices. • Use of noise minimization equipment.
Biological Environment		

Environment Component	Issue/Potential Effect	Example of Potential Mitigation

Terrestrial Resources	• Loss and/or alteration of vegetation within the Project area as a result of site clearing, affecting vegetation and soils, during construction of mine facilities.
	• The removal of vegetation will impact wildlife species due to habitat alteration, destruction, degradation, fragmentation, and/or obstruction.
	• Duration of habitat loss will vary, depending on location:
	  ○ Clearing and grubbing for staging, borrow, laydown, and spoil areas required during construction will result in the temporary loss of vegetation and wildlife habitat; staged reclamation will be used to minimize the duration of the impact.
	  ○ Clearing, grubbing, and grading for facility construction will result in the longer-term (i.e., from construction through closure) loss of vegetation and wildlife habitat; vegetation cover will be re-established during reclamation.
	  ○ Vegetation in the area of the open pit footprint will be permanently lost and replaced by a pit lake and cliff habitat on the pit highwall post-closure.
	• Riparian vegetation will be removed where stream crossings need to be established for new roads and will be replaced when the stream crossings are removed at closure.
	• Siting of the mine facilities has the potential to disrupt wildlife movement patterns in the regional landscape.
	• Wildlife will be displaced from the mine site during construction, operation, and closure, with the site becoming available to wildlife again in post-closure.
	• Temporary or permanent loss of nesting habitat of migratory birds, including passerines and water birds
		• Implement appropriate construction/operation/closure management practices and ecosystem/species management plans.
		• Develop and implement a reclamation and closure plan appropriate to the terrain, local vegetation, and wildlife communities; including progressive reclamation to minimize the duration of any vegetation/habitat losses.
		• Identify opportunities for the development of offsetting habitat through engagement with government and First Nations and incorporate these in the reclamation plan.

Environment Component	Issue/Potential Effect	Example of Potential Mitigation
Aquatic Resources	• Direct loss or change in quantity or quality of fish and fish habitat resulting from placement of waste rock, and other mine infrastructure. • Development of the TSF in Cedar Creek, directly displacing fish and fish habitat • Change in quantity and quality of aquatic habitat resulting from alteration of stream flows in Cedar Creek and Winkley Creek. • Surface water quality effects associated with mine development may include alteration or deterioration of aquatic habitat, with potential direct or indirect effects on fish and aquatic species such as direct mortality, decreased food availability, life cycle disruption, and decreased habitat utilization.	• Avoid and/or minimize Project direct loss of habitat through selection of waste rock storage locations and TSF that minimize interaction with fish bearing waterbodies. • Treat any excess mine-influenced water before discharge. • Implement appropriate environmental management plans.
Human Environment		
Archaeology	• An updated Archaeological Impact assessment was conducted throughout the entire mineral concession in 2019 (Terra Archaeology, 2019). It confirmed that the Project is unlikely to impact heritage resources.	• Implement management plans including chance find procedures.
Economy and Socio-community	• Local effects and regional effects from worker migration. • Economic and social effects of housing workforce in Quesnel, Williams Lake, and other smaller communities in the region. • Employment, income, local revenue generation and gross domestic product effects. • Changes to demand for local service industries and infrastructure, including housing, education, healthcare, social services, road maintenance, transport, consumables, catering, and equipment servicing.	• Environment, Health, Safety and Community Plans. • Implement local employment policies and planning. • Planning for local procurement of goods and services. • Support local initiatives to address demand for housing and local services, including early communication with local government agencies. • Local business capacity inventory. • Local skills inventory, training, and skills development programs.

Environment Component	Issue/Potential Effect	Example of Potential Mitigation
Land Use	• Changes in traffic volume on Keithley Creek Road, Spanish Lake Road, Likely Road, Highway 97, and access to/from the site. • Changes to recreational fishing in areas within the mine area (e.g., Nina Lake). • Potential disturbances from the construction of a new transmission line. • Disturbances from the development of the Mine Site and associated infrastructure. • Potential effects to recreation sites (including fishing and camping) including noise, air quality, water quality, and water quantity, and year-round and seasonal properties. • Hunting restrictions on the Project site during construction, operations, and closure. • Potential effects on Likely- Xatśūll Community Forest related to forest products harvest as well as to traditional plant, berry, and medicine collection.	• A traffic management plan will be developed to mitigate the impacts of road use during construction and operation. • Ongoing engagement and communication with stakeholders related to access and use. • Management practices and environmental management plans for Ecosystems, Species, Aquatic Health, Air Quality, Noise, and Visual Quality. • Development of end land use objectives for reclamation and closure planning in consultation with Indigenous nations and other local stakeholders.
Visual Aesthetics	• Changes to the landscape will include but will not be limited to the development of the TSF, the Open Pit, and waste rock storage facilities. • These changes may have indirect effects to cultural, recreational, and tourism values that are related to the visual quality and the enjoyment of scenic values.	• An evaluation of the potential visual aesthetic changes to existing conditions during the construction, operation, and decommissioning phases of the Project will be addressed in the Application. • Development and implementation of landscape design in reclamation and closure planning to mitigate adverse visual at project end.
Human and Terrestrial Wildlife Health		
Human and Terrestrial Wildlife Health	• Increased particulate matter concentrations (i.e., $PM_{2.5}$ and PM_{10}), which may cause health risks to local communities. • Potential effects to worker and community health, air quality, noise, and water quality. ○ Deposition of dust to plants and soil. • Water runoff may contribute to changes in water quality downstream waterbodies which may impact health of humans, fish, and wildlife.	• Implementation of an air emissions and dust control plan and an air quality monitoring plan. • Implementation of a Site Water monitoring and Management Plan. • Engagement will be conducted with a range of stakeholders including the Public, First Nations, community administrators, public health and social services and infrastructure providers, educational institutions, and business representatives. • Project effects on social, health, and community issues will be determined.

Note(s):

1. PM_{10} = particulate matter less than 10 µm (micrometres) in diameter.
2. PM2.5 = particulate matter less than 2.5 µm (micrometres) in diameter.

15.2 Potential Project Cumulative Effects

As the assessment of the Project progresses, analysis will be completed of potential cumulative effects as a result of changes to environmental, economic, social, cultural and health values caused by the combined effect of past, present and potential future human activities. Table 15.2 summarizes historical, active, and likely projects to occur within the vicinity of the Project in the Cariboo region of British Columbia.

Table 15.2 Preliminary Identification of Past, Present, and Reasonably Foreseeable Projects

Past Projects	Present Projects	Reasonably Foreseeable Projects
Bullion Pit	Bonanza Ledge Mine and QR Mill Site	Cariboo Gold Project
Wingdam Mine	Gibraltar Mine	Blackwater Gold Project
Various historic placer workings	Mount Polley Mine	Yellowhead Mine
Forestry Operations	Forestry Operations	Forestry Operations

As Past and Existing Projects may have caused changes to environmental, economic, social, cultural or health values, it is important to understand the context of the how the Project can minimize additive or synergistic effects.

Through appropriate Project design and planning, SMG has worked to avoid, minimize, or mitigate any foreseeable negative changes to environmental, economic, social, cultural or health values. As a result, SMG anticipates that many cumulative effects can be avoided. Further, it should be kept in mind that Valued Components have yet been defined for the Project, which will occur later in the process. However, a preliminary range of impacts caused by past and present resource projects that have the potential to interact with the Project to produce cumulative effects is presented below for discussion. These are outlined in Table 15.3, along with preliminary comments regarding Project response.

Table 15.3 Preliminary Identification of Interactions with the Project from Past and Present Projects

Potential Existing Change from Other Projects	Preliminary Project Response
Alteration of water flow	The Project will affect flows in specific streams during operations and post-closure. Flows in Cedar Creek are expected to be higher than baseline during operations, as a result of the discharge of treated groundwater from pit dewatering. Post-closure, flows in Cedar Creek will be lower than at baseline whereas flows in Winkley Creek will be correspondingly higher than at baseline, with no net change in total water flow to Quesnel Lake
Alteration of water quality	All sources of discharge water will be treated to meet the BC water quality objectives for protection of aquatic life at the point of discharge. In this regard, the Project is not expected to have an incremental cumulative effect on water quality
Alteration of fish habitat	Specific elements of the Project will alter fish habitat, but all such alterations will require the provision of offsetting habitat, such that the Project is not expected to cause a cumulative reduction in fish habitat availability or quality
Loss or fragmentation of terrestrial habitat	The Project will alter terrestrial habitat quality as a result of development, which will cause temporary losses of habitat. Closure will involve the provision of new habitat through site reclamation measures that will be defined later in project planning. The Project occurs within the footprint of a working forest, and much of the project footprint would eventually be harvested whether the Project is developed or not. Site preparation for project development would involve forest harvest, with eventual reforestation work completed as part of project closure. Areas of permanent terrestrial habitat loss will be limited to project components such as the planned open pit.
Increased air emissions	There is the potential for temporary increases in emissions of dust and greenhouse gases during Project operations and closure, but these will end on completion of closure.
Alteration of the local viewscapes	Infrastructure development of the Project may change local viewscapes in addition to those changes caused by previous and current mining projects and due to previous, active, and planned forestry cut blocks in the area
Influence on employment and taxes	The Project will make a cumulative contribution to employment opportunities and tax revenues
Influence on housing, municipal, and social services	The Project may result in an increase in local housing demand, and in demands on municipal and social

	services. The residual effect following project closure is difficult to assess at this time.
Alteration of traditional use of the land through changes to the land and/or access	The Project may disturb and limit access to areas of traditional use through development of infrastructure. This disturbance will be incremental to that caused by past and present resource development projects. SMG will work with traditional land users to mitigate these disturbances and to minimize any limitation of access to the extent possible.

A thorough analysis of how residual effects from the Project may interact with identified changes that already exist will be completed, within a designated temporal and geographic area. This is consistent with guidance from the BCEAO (BCEAO, 2020) and the IAA (Canadian Environmental Assessment Agency, 2015).

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