PROJECT DESCRIPTION SUMMARY DOCUMENT: Alamos Gold Inc. Lynn Lake Gold Project

FORMAL SUBMISSION

Prepared for:
Canadian Environmental Assessment Agency

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SUMMARY DOCUMENT

The Lynn Lake Gold Project (the Project) is the proposed redevelopment of two historical gold mines near Lynn Lake, Manitoba by Alamos Gold Inc. (Alamos; the Proponent). Alamos is a Canadian-based intermediate gold producer with diversified production from three operating mines in North America: the Young-Davidson Mine in northern Ontario, Canada, and the Mulatos and El Chanate Mines in Sonora, Mexico. Alamos has a leading growth profile with exploration and development projects in Mexico, Turkey, Canada, and the United States.

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This document is a summary of the Project Description (PD) that is intended to initiate the federal environmental assessment (EA) process under the *Canadian Environmental Assessment Act, 2012* (CEAA 2012) and inform the provincial EA process under *The Environment Act* of Manitoba.

Project Background, Overview, and Objectives

The Lynn Lake Gold Project consists of two primary deposit sites, which are both located near Lynn Lake, Manitoba: the 'Gordon' site and the 'MacLellan' site. Alamos intends to construct (redevelop), operate and eventually close/reclaim open pit gold mines at both these historical mine sites.

The Gordon site (14N 412400m E, 6307800m N) is located 37 km east of Lynn Lake in Manitoba, and the MacLellan site (14N 380900m E, 6307500 m N) is located 7 km northeast of Lynn Lake (**Map 1, Appendix A**). The distance between the Gordon and MacLellan sites is approximately 30 km. Lynn Lake is located approximately 820 km northwest of Winnipeg.

The Gordon site, historically referred to as the Farley Lake site, was formerly operated as a two-pit open pit gold mine between 1996 and 1999. After closure, the site underwent a reclamation process and currently consists of a 15-kilometre (km) gravel access road, a bridge across the Hughes River, two mine rock storage areas and two overburden storage areas that have been capped, and two water-filled open pits (**Map 2, Appendix A**). All buildings and infrastructure have been removed, as shown below in a present-day aerial photograph of the Gordon site (**Photo 1**).

Photo 1 Aerial Photograph of Gordon Site

The MacLellan site was formerly operated as an underground gold and silver mine between 1986 and 1989; closed as a result of high operating costs and falling gold prices. Ore was trucked to a mill facility in Lynn Lake for processing. The site has been in a 'care and maintenance' phase since closure with very little reclamation completed, as shown below in a present-day aerial photograph of the MacLellan site (**Photo 2**). The site currently consists of a 4.6-km gravel access road, power transmission line (abandoned pole line), infrastructure from the former underground mine, maintenance and other storage buildings, and former mine water settling ponds (**Map 3, Appendix A**). Some of the existing infrastructure will be demolished during the Project construction phase; however, some demolition activities may be phased, depending on the location of the former infrastructure and its overlap with the footprint for the new mine infrastructure.

Photo 2 Aerial Photograph of MacLellan Site

Alamos proposes to develop new mine infrastructure at the MacLellan site, including a new 2.6-km access road, a central ore milling and processing plant, associated infrastructure, ore and overburden stockpiles, a mine rock (waste) storage area, and a Tailings Management Facility (TMF). Infrastructure at the Gordon site will be limited to the open pit, ore and overburden stockpiles, a mine rock (waste) storage area, and minor supporting infrastructure for equipment storage and maintenance. There will be no tailings storage at the Gordon site.

Construction, operation, decommissioning, reclamation, and closure of mining infrastructure at the Gordon and MacLellan sites are considered a single Project for the purposes of this PD Summary. The objective of the Project is to produce gold (doré bullion) for sale. The current estimates are for a total Project mine excavation of 220 million tonnes (Mt) with a maximum 8,000 tonnes per day (t/day) design processing rate and an estimated 11-year Project mine life. The total mineralized material to be mined from the open pits at both sites is estimated to be approximately 26.1 Mt (17.5 Mt from MacLellan and 8.6 Mt from Gordon), with an average recoverable grade of 1.75 grams per tonne (g/t) gold and 1.52 g/t silver, resulting in the production of 1,465,000 ounces (oz) of gold and 1,267,000 oz of silver.

Regulatory Framework

There are several federal and provincial regulatory requirements that may apply to the Project, including environmental assessment and other environmental permitting obligations. A single Environmental Impact Statement (EIS) document will be submitted to satisfy any federal and provincial EA requirements.

Under CEAA 2012, federal EAs are possibly required for 'designated projects' consisting of one or more physical activities specified in the *Regulations Designating Physical Activities* (the Regulations). The Canadian Environmental Assessment Agency (the Agency) is responsible for the administration of federal EAs for metal mines under CEAA 2012.

Section 16 of the Regulations specifies ore production and input capacity thresholds for gold mines and metal mills. The maximum ore production capacity for the Project (i.e., total mineralized material to be extracted from the open pits at both sites, excluding overburden and mine rock [waste]) is estimated to be approximately 9,745 t/day (3.56 Mt/year), including material to be stockpiled for future processing. Ore production capacities for the Gordon and MacLellan sites will vary by year. This overall maximum production capacity occurs in year 5 of the Project. The ore milling and processing plant that will be constructed at the MacLellan site for the proposed Project is designed to have an average throughput of 2.6 Mt/year. These ore production and input capacities exceed the thresholds specified under the Regulations.

The Project may also be considered an expansion of an existing gold mine under Section 17 of the Regulations because the total area of mine operations will increase by more than 50% over the areas of both the original (historical) mine operations and current mine site footprints.

Additional federal legislation that is potentially relevant to the environmental aspects of the Project includes:

- *Canadian Environmental Protection Act* (CEPA)
- *Explosives Act*
- *Fisheries Act*
- *Migratory Birds Convention Act* (MBCA)
- *Navigation Protection Act* (NPA)
- *Species at Risk Act* (SARA)
- *Transportation of Dangerous Goods Act* (TDG Act)

The Project is not expected to receive financial support from any federal authorities, and the use of federal lands is not anticipated to be required in support of the Project. The nearest parcel of federal land is associated with a Royal Canadian Mounted Police (RCMP) detachment located approximately 6 km southwest of the MacLellan site.

Provincially, the *Classes of Development Regulation* (CD Regulation) under *The Environment Act* of Manitoba identifies 'Class 1', 'Class 2' and 'Class 3' developments that must undergo a

provincial EA and obtain a licence in accordance with the Act prior to construction, alteration, or operation. Section 3(5) of the CD Regulation classifies mines and milling facilities as Class 2 developments. The Project may also involve one or more water development and control activities that are considered Class 2 developments under section 3(9) of the CD Regulation, such as stream channel alterations that affect fish mobility and fish habitat. The Project is not expected to involve any of the water development activities listed as Class 3 development triggers under section 4(4) of the CD Regulation.

The Environmental Approvals Branch of Manitoba Sustainable Development (MSD) has advised that it considers the proposed Project activities at the Gordon and MacLellan sites to constitute separate "developments" that will require separate licences under *The Environment Act* of Manitoba. The Environmental Approvals Branch will allow both sites to be assessed in a single EIS under the provincial EA process.

Additional provincial legislation that is potentially relevant to the environmental aspects of the Project include:

- *The Mines and Minerals Act*
- *The Crown Lands Act*
- *The Dangerous Goods Handling and Transportation Act*
- *The Endangered Species and Ecosystems Act*
- *The Environment Act*
- *The Fisheries Act*
- *The Forest Act*
- *The Heritage Resources Act*
- *The Highways Protection Act*
- *The Public Health Act*
- *The Water Rights Act*
- *The Wildlife Act*
- *The Wildfires Act*
- *The Workplace Safety and Health Act*

Project Activities and Components

The proposed preliminary site layouts for the redeveloped Gordon and MacLellan sites are shown on **Maps 4 and 5** (**Appendix A**). Based upon the preliminary site layouts, the proposed Project infrastructure at the MacLellan and Gordon sites will be entirely located within the boundaries of existing mining claims and leasehold lands, which are registered with the provincial Mines Branch in the name of Carlisle Goldfields Limited, a wholly-owned subsidiary of Alamos.

The proposed mine operation at both sites is a conventional open pit with shovel and truck removal of the mine rock and ore produced during blasting. The key activities and components associated with each mine site comprising the proposed Project are described below.

Gordon Site

Open Pit - The current mine plan[1] calls for removal of 3.8 Mt of rock and overburden during pre-production, and the stockpiling of 0.12 Mt of ore during this period. The current mine plan considers that the run-of-mine (ROM) ore (i.e., raw/unprocessed ore that is intended for immediate processing rather than stockpiling) from the Gordon site will be transported via highway trucks to the mill feed storage area and crushing plant at the MacLellan site for short-term storage and initial crushing before it is used as feedstock for the adjacent ore milling and processing plant.

The total quantity of material to be mined from the Gordon open pit during Project mine operations is approximately 58.6 Mt, which includes ore material of 8.6 Mt. The anticipated depth of the Gordon open pit is approximately 190 m. The open pit will be developed in a series of benches with drilling and blasting completed on each bench.

The Gordon site will provide ore as mill feed starting in year 1, through to year 7 of the Project. The mining rate (including all ore destined for immediate milling and processing, as well as all ore, overburden [if applicable and including top soil, muskeg, etc.], and mine rock to be stockpiled) at the Gordon site is planned to peak at 13 Mt/year or approximately 35,590 t/day (rounded for seasonal considerations) in year 3. Mine operations at the Gordon site are currently planned to cease after year 6. The transfer of stockpiled ore, however, will continue into year 7 of the Project.

Ore, Overburden, and Mine Rock Stockpiles/Storage Areas - Ore will be stockpiled at the Gordon site and used as feedstock for the ore milling and processing plant at the MacLellan site when the MacLellan site ore production is less than the plant capacity. The current mine plan is for a peak stockpile of 0.83 Mt at the Gordon site, which will be stored within ore stockpiles located south of the open pit. Depletion of this stockpiled material is anticipated in year 7.

The estimated maximum volumes of each material based on the current mine plan for the Gordon site are: 0.37 cubic megametres (Mm^3) of ore, 0.75 Mm^3 of overburden and 21.8 Mm^3 of mine rock. The anticipated maximum surface area of each stockpile/storage area ranges from 33,800 m^2 for the ore stockpiles to 618,100 m^2 for the mine rock storage area. The anticipated maximum total heights range from 10-50 m. Seepage/runoff collection ditches will be constructed around the perimeter of each stockpile/storage area and directed to a series of sumps and/or small ponds at topographic lows. Water collected in the sumps and/or small ponds will be pumped to a site water management pond for management and/or treatment (if required) prior to discharge.

The Project may result in the generation of mine rock that could have the potential for acid rock drainage (ARD) and metal leaching (ML). Geochemical testing and water quality modelling is ongoing; however, preliminary sampling results indicate that mine rock from the Gordon site contains potentially acid generating (PAG) materials and shows a leaching potential for arsenic. Any mine rock that is classified as PAG and/or ML that is expected to produce runoff may require additional mitigation, such as blending, dry and/or wet covers, and/or treatment. Final required

[1] Mine Plan Reference No. G12A M12B_MAC5V

mitigation measures will be determined as the Project plan and environmental assessment are advanced.

Sewage Treatment & Domestic Waste Handling – Required sewage treatment is proposed to consist of a septic tank with subsurface disposal or a small treatment plant designed in accordance with applicable regulatory requirements. All domestic waste disposal will follow a Waste Management Plan for the Project, which will be developed in accordance with applicable regulations and best practices. Where feasible, paper and cardboard will be recycled, waste steel will be sold as scrap, and wood and plastic will be salvaged and recycled. Non-hazardous domestic solid waste will be deposited at the landfill in Lynn Lake. Waste oils, fuels, and hazardous wastes (if any) will be safely handled and transported in compliance with applicable federal, provincial, or municipal regulations.

Utilities and Infrastructure - Potable water for the Gordon Site will be obtained from the potable water treatment plant located at the MacLellan Site. The water will be trucked to a central storage facility that will be set up on the Gordon site. Raw water will be used at the Gordon Site for non-potable use such as fire water.

Power for the Gordon site will be supplied via on-site diesel generators. Diesel and gasoline fuels will be delivered to the Gordon site by tanker trucks on an as-needed basis for use by site generators, heavy equipment, and Project vehicles. Propane will be considered for space heating. Fuels will be stored in approved above-ground storage tanks equipped with secondary containment. Fuel storage and distribution infrastructure will be constructed in accordance with applicable legislation requirements. Stationary and mobile mine equipment will be fueled with a fuel-dispensing truck.

The main access to the Gordon site will be via the existing, all-weather Provincial Road (PR) 391. The PR will be used by personnel, material deliveries, and haulage trucks transporting material from the Gordon site to the ore milling and processing plant at the MacLellan site. The potential need for upgrades to PR 391 and/or weight exception requirements to support the Project is currently being discussed with the highway authority (i.e., Manitoba Infrastructure). Project-related truck traffic between the Gordon and MacLellan sites is included in the scope of the Project to be assessed.

The existing 15-km site access road from PR 391 is expected to be upgraded as required; these upgrades are included in the scope of the Project to be assessed. Alamos will own and maintain internal site roads at the Gordon site, which will allow movement of Project personnel, equipment, and materials on the site.

Proposed buildings and yards include a security building, small office, truck shop, and parking and laydown areas.

Emulsion explosives with non-electric detonators will be used during mine operations at the Gordon site, but all explosives storage will be located at the MacLellan site.

Water Development and Control - The existing built diversion channel from Gordon Lake to Farley Lake will require adjustment to the north. The channel will be designed for 1 in 100-year storm flows and consider long-term fish passage and habitat between Gordon and Farley lakes. Based on the current mine plan, no Schedule 2 amendment(s) are anticipated to be required for the Project under the *Metal Mining Effluent Regulations* (MMER) pursuant to the federal *Fisheries Act*, and no habitat used by any commercial, recreational, or Aboriginal (CRA) fish species will be physically affected by construction of the Project.

A series of dewatering wells located between the ultimate footprint of the open pit and Gordon and Farley lakes will be used to reduce groundwater inflow into the open pit during mine operation. Baseline water quality testing has indicated that groundwater extracted from the dewatering wells (originating from the adjacent lakes) will be able to be discharged directly to the environment without treatment and it is anticipated that the water will be recirculated back into the lakes. The engineering design for these wells will be finalized during the detailed design phase for the Project and will be included in the scope of the Project to be assessed.

MacLellan Site

Open Pit - The current mine plan[2] calls for the removal of 4.9 Mt of rock and overburden during pre-production, and the stockpiling of 0.14 Mt of ore during this period. The total quantity of material to be excavated from the MacLellan open pit during Project mine operations is approximately 163.3 Mt; this includes 17.5 Mt of ore. The anticipated depth of the MacLellan open pit is approximately 340 m. The open pit will be developed in a series of benches with drilling and blasting completed on each bench. Mining operations after year 6 will take place exclusively at the MacLellan site, with an expected peak mining rate (including all ore destined for immediate milling and processing, as well as all ore, overburden [if applicable and including top soil, muskeg, etc.], and mine rock to be stockpiled) of 24.7 Mt/year (in year 6).

The current mine plan calls for the stockpiling of ore at the MacLellan site, which will be used as feedstock for the ore milling and processing plant when ore production is less than the plant capacity. The ore stockpiles at MacLellan are planned to be active until the end of mine operations.

Mill Feed Storage & Crushing Plant - ROM ore (i.e., raw/unprocessed ore that is intended for immediate processing rather than stockpiling) from both sites will be transported to a pad directly adjacent to the ore milling and processing plant at the MacLellan site for short-term storage before it is used as feedstock for the plant. A truck dump and crushing circuit is proposed to be located west of the ore milling and processing plant at the MacLellan site and accessed by the open pit

[2] Mine Plan Reference No. G12A M12B_MAC5V

road. Potential dust emissions will be reduced through dust containment (e.g., enclosure) and collection systems.

Ore Milling & Processing Plant - Ore milling and processing will include: further ore crushing by a primary jaw crusher and secondary cone crusher; semi-autogenous grinding and grinding in a closed-circuit ball mill and cyclone circuit; pre-thickening to 55% solids; cyanidation for gold recovery (i.e., pre-aeration, leaching, and carbon-in-pulp); carbon stripping and carbon regeneration; and electrowinning, smelting, and refining gold sludge into gold doré bars ready for transport to a certified facility for further processing; and cyanide detoxification of the resultant tailings (via a conventional air and sulphur dioxide oxidation process) prior to discharge to the tailings pumpbox and then to the TMF (**Figure 1, Appendix A**). The ore milling and processing plant is designed to process up to a maximum of 8,000 t/day of ore.

Water demand at the ore milling and processing plant will be met with reclaimed water from the TMF (located approximately 3 km from the process plant) to reduce the need for fresh surface water demand. Dewatering water from the open pit and other mine contact water (i.e., any water, surface water or groundwater, that contacts mine workings or interacts with any mine rock material) will be collected in a site water management pond for management and/or treatment (if required) prior to discharge.

Ore, Overburden, and Mine Rock Stockpiles/Storage Areas - As previously noted, some ore will be stockpiled for future processing at the MacLellan site. The current mine plan is for a peak stockpile of 2.16 Mt at the MacLellan site, which will be stored within two ore stockpile areas located north of the mill and near the open pit exit.

The estimated maximum volumes of each material based on current mining plans are: 0.96 Mm^3 of ore, 4.1 Mm^3 of overburden, and 62.0 Mm^3 of mine rock. The anticipated maximum surface area of each stockpile/storage area ranges from 54,800 m^2 for the ore stockpiles to 1,489,150 m^2 for the mine rock storage area. The anticipated maximum total heights range from 20-60 m. Seepage/runoff collection ditches will be constructed around the perimeter of each stockpile/storage area and directed to a series of sumps and/or small ponds at topographic lows. Water collected in the sumps and/or small ponds will be pumped to a site water management pond for management and/or treatment (if required) prior to discharge.

The results of preliminary geochemical testing indicate that the Project may result in the generation of mine rock that could have the potential for ARD and ML. Geochemical testing and water quality modelling is ongoing. Any mine rock that is classified as PAG and/or ML that is expected to produce runoff may require additional mitigation, such as blending, dry and/or wet covers, and/or treatment. Final required mitigation measures will be determined as the Project plan and environmental assessment are advanced.

Tailings Management Facility - The TMF will initially be constructed to store two years' worth of tailings production at a maximum 8,000 t/day (a total of 3.65 Mm^3). The TMF dams will be raised

progressively to provide additional storage capacity. Currently, it is projected that three dam raises will be required during the operating period, with construction occurring on average once every three years. All containment structures for the TMF will be designed in accordance with the Canadian Dam Association *Dam Safety Guidelines* (CDA 2013, 2014).

Following discussions with DFO and ECCC in September 2016, the preliminary TMF design was revised to avoid the potential deposition of mine tailings into any watercourses or waterbodies frequented by fish. The currently proposed design of the TMF (including start-up and ultimate TMF infrastructure) does not overlap spatially with any fish-bearing waters (**Map 5**, **Appendix A**).

Testing and water quality modelling is ongoing. The potential effects for any ARD and ML to reach the environment from the TMF will be mitigated by collecting and containing seepage/runoff and/or covering the tailings (wet, including water, and/or dry covers). Addition of a circuit for removal of sulphides from tailings and containment of produced concentrate will also be considered.

Sewage Treatment & Domestic Waste Handling – The average sanitary wastewater flow rate is expected to be approximately 100,000 L/d. At the current stage of Project planning, it has been assumed that a package treatment plant will be required with a discharge to the selected surface water receiver (likely the Keewatin River south of the MacLellan site). Effluent will be treated to meet applicable federal and provincial regulatory requirements prior to discharge to the environment. All domestic waste disposal will follow a Waste Management Plan for the Project, which will be developed in accordance with applicable regulations and best practices. Where feasible, paper and cardboard will be recycled, waste steel will be sold as scrap, and wood and plastic will be salvaged and recycled. Non-hazardous domestic solid waste will be deposited at the landfill in Lynn Lake. Waste oils, fuels, and hazardous wastes (if any) will be safely handled and transported in compliance with applicable federal, provincial, or municipal regulations.

Utilities and Infrastructure - A potable water treatment plant with a capacity of 100,000 L/d is required to produce water for both the Gordon and MacLellan sites. The source of fresh water will be the Keewatin River, located to the west of MacLellan site. This system will also provide potable water for personnel working at the Project site. Raw water will be used for non-potable use such as fire water.

The MacLellan site will be accessed via the existing, all-weather PR 391. PR 391 will be used by personnel, material deliveries, and haulage trucks transporting material to the ore milling and processing plant. The potential need for upgrades to PR 391 and/or weight exception requirements to support the Project is currently being discussed with the highway authority (i.e., Manitoba Infrastructure). Project-related truck traffic between the Gordon and MacLellan sites is included in the scope of the Project to be assessed.

The existing 4.6-km MacLellan site access road will be retained for service and construction vehicle access. A new 2.6-km site access road is proposed to be constructed from PR 391 to the MacLellan

ore milling and processing plant and exit PR 391 east of the existing access road. The new access road is included in the scope of the Project to be assessed. Alamos will own and maintain internal site roads at the MacLellan site, which will allow movement of Project personnel, equipment, and materials on the site.

Power for the MacLellan site will be supplied by Manitoba Hydro and is proposed to follow the proposed new access road. Required upgrades to the power distribution system are expected to be assessed, built, owned, and operated by Manitoba Hydro. The upgraded system will also be entirely under the care and control of Manitoba Hydro and is therefore excluded from the scope of the Project to be assessed.

Diesel and gasoline fuels will be delivered by tanker trucks on an as-needed basis for use by heavy equipment and Project vehicles. Propane will be considered for space heating. Fuels will be stored in approved above-ground storage tanks equipped with secondary containment. Fuel storage and distribution infrastructure will be constructed in accordance with applicable legislation requirements. Stationary and distant mine equipment will be fueled with a fuel-dispensing truck.

Pipelines will be needed on-site to transport and dispose of contact water between various facilities, including the open pit, ore milling and processing plant, and TMF. A 10-inch high-density underground pipeline will also be constructed to provide fresh water from the Keewatin River for potable and process water (make-up) requirements. The locations and dimensions of these pipelines will be confirmed as Project engineering is advanced.

Buildings and yards proposed for the site include parking areas, security buildings, administration offices, truck shop, laboratory, plant control room, workshop, warehouse, and laydown areas. Building structures will be amalgamated where possible.

Explosives storage requirements for emulsion explosives with non-electric detonators to be used and stored at the MacLellan site during mine operations will be determined in consultation with the selected explosives supplier and will be established in accordance with a National Standard and the facility will be licensed under the *Explosives Act*.

A temporary construction camp may be required for approximately 300 workers during the construction phase. If a temporary construction camp is required, it will be included in the scope of the Project to be assessed and its location and other details will be determined as the Project plan is further developed.

Water Development and Control - There is an operational need for a small pond ('East Pond') located between the proposed open pit and the ore milling and processing plant at the MacLellan site to be dewatered and infilled (see **Map 5, Appendix A**). The pond will be backfilled with material that is not mine waste (e.g., borrow sourced material that has been tested). This pond is shallow, freezes to the bottom in winter, and does not host any CRA fish species. Based on the current mine plan, no amendment(s) to of the MMER is anticipated to be required for the

Project and no habitat used by any CRA fish species will be physically affected by construction of the Project. Assuming there will be no significant effects to stream flows or lake levels, no authorization(s) are likely to be required under section 35(2) of *the Fisheries Act*.

It is expected that approximately 60-70 m^3/day of fresh water will be withdrawn from the Keewatin River for use as potable water and 30 m^3/hour of fresh water will be withdrawn from the Keewatin River for use as process (make-up) water. Construction and operation of the water withdrawal pipeline is not anticipated to result in substantial changes to water level, flow, or pH. There may be a temporary increase in turbidity during pipeline construction; this will be mitigated through development and implementation of a Project-specific Erosion and Sediment Control Plan that includes consideration of in-water and shoreline activities associated with pipeline construction. The pipe will be constructed in accordance with the DFO *Freshwater Intake End of Pipe Fish Screen Guideline* (1995).

Project Phases

Construction will begin after associated permitting processes have been completed. The timeframe to complete the required site preparation and surface infrastructure to start open pit activities is approximately nine months. Construction of the ore milling and processing plant is expected to take two years. Ore will be stored in stockpiles until the facility is operational.

Construction will begin with clearing the areas for the Project components. Cleared merchantable timber will be sold, and any remaining cleared vegetation will be stockpiled/stored on-site for future use in reclamation activities. Dust suppression and water containment will be used during the earthworks program.

If sufficient off-site accommodations are not available for Project construction personnel, development of the temporary construction camp would be done early, as part of the site preparation activities at the MacLellan site.

Access roads connecting the sites to PR 391 (i.e., upgrades to the existing 15-km access road at the Gordon site and construction of the proposed new 2.6-km access road at the MacLellan site) are proposed to be developed in conjunction with site preparation activities. Any watercourse re-alignment works that may be required (Gordon site) will be initiated early. Grading and site preparations for the ore milling and processing plant area will include the backfilling of the small pond (East Pond) at the MacLellan site with clean material (not of mine waste origin) during the early (winter) stages of construction.

Starter dams for the TMF embankments at the MacLellan site will be constructed, and the embankments will be raised as storage requirements increase over the mine life. The ore stockpile and mine rock storage pads will be grubbed and graded and foundations will be prepared.

An aggregate crusher and a concrete batch ready mix plant will be required on-site during construction. The portable crusher and concrete batch plant used during construction may remain on-site or be contracted out on a periodic basis. Raw materials used for crushing will be NAG mine rock from the open pit, if suitable, and/or materials from nearby approved pits or borrow areas.

Services, including the power supply, waste handling and fresh water supply systems, will be installed. The power supply will be provided into the MacLellan site by Manitoba Hydro.

Footings and foundations for buildings and structures associated with the ore milling and processing plant will be poured in place. Pre-packaged and field-erected ancillary facilities, including the buildings, fueling, tanks and processing equipment, will be delivered to the site and installed. Other equipment will be set up in their appropriate locations, and electrical and mechanical connections will be completed.

Removal of overburden for the open pit areas will occur in preparation for mining activities. The overburden, where suitable, will be used on-site during construction with excess stored on-site for future use in reclamation activities.

The mechanical and electrical systems associated with the Project will be commissioned as construction is completed. Commissioning activities for the Project will include commissioning of the power distribution system and control, contact water collection systems, open pit dewatering system, tailings management water reclaim system, the ore milling and processing plant, and on-site fueling system. Following commissioning, the Project will start commercial operation.

The operating life of the Project is estimated to be 11 years (excluding the pre-production period estimated at one to two years). As operations continue, the open pits will become progressively deeper, and related overburden, ore stockpiles, mine rock storage areas, and the TMF, will increase in size. Solid and liquid wastes will be managed to comply with applicable federal and provincial regulatory requirements. Ore from the Gordon site will be transported via highway trucks to the ore milling and processing plant at the MacLellan site for the first five years of operation. Based on an assumed haulage rate of 7,000 t/d (which is more than is planned), the Project is estimated to require 13 truckloads per hour between the Gordon and MacLellan sites during this period.

At the end of operations of the Project, the main features will include the open pits, mill processing facilities, offices, storage areas, TMF, and mine rock storage areas. A Closure Plan will be developed and implemented, in accordance with the *Mine Closure Regulation* under *The Mines and Minerals Act* of Manitoba and associated *General Closure Plan Guidelines* (MGET n.d.), to remove unneeded facilities and restore the Gordon and MacLellan sites following the completion of mining activities. The primary objective of reclamation and closure activities will be to establish self-sustaining physical, chemical, and biological stability of the sites, and to meet desired end land functions and uses. The Closure Plan will be updated as necessary to reflect the

environmental requirements in place at the time of closure. Progressive reclamation activities will be carried out where possible throughout the mine life; however, most decommissioning and reclamation work will take place once mining has been completed.

Project Schedule

Construction of the Project is anticipated to start in Q1 2019 with commissioning anticipated in Q4 2020. The tentative Project schedule and approximate duration of the key Project phases are as follows:

- Construction (i.e., site preparation, physical construction/equipment installation, pre-production, and commissioning) is expected to start in 2019 and take approximately 2 years to complete. Project construction activities will be carried out concurrently at both mine sites.
- Operation (i.e., ore and mine rock extraction, processing, and waste management) is expected to start in 2021 and take approximately 11 years to complete.
  - Mining operations are expected to commence at both sites in year 1 (i.e., 2021). Mining at the Gordon site will be undertaken for six years while mining at the MacLellan site will be undertaken for the entire life of the Project (i.e., all 11 years).
  - The ore stockpiled during mine operations (both sites) will provide additional feedstock to the ore milling and processing plant during the Project.
- Active reclamation/closure is scheduled to begin in 2028 (year 7) at the Gordon site and in 2032 (year 11) at the MacLellan site, and is expected to take approximately 5-6 years to complete at each site. It will be followed by 10 years of post-closure monitoring and approximately 50+ years of pit flooding.

Emissions, Discharges and Wastes

Air Contaminant Emissions - Air contaminant emissions during construction will consist mainly of emissions from heavy equipment on-site and the heavy-duty trucks used to deliver equipment to the Project site, which will release particulates, sulphur dioxide, nitrogen oxides, and other criteria air contaminants from the combustion of fuel, as well as particulate matter and dust emissions from earthworks and on-site activities. Dust suppression using water sprays will be used during construction to mitigate the potential environmental effects of dust on surrounding properties.

Emissions will also be released from crushing and processing activities at the mill. Mill air emissions will include bullion furnace ventilation (typically once a week), and carbon kiln ventilations from the carbon circuit. Environmental effects of the Project on air quality will be considered and mitigated, where appropriate. Greenhouse gas (GHG) emissions will be associated with the combustion of fuel in mobile construction equipment and releases from blasting activities. During construction GHGs will also be released from stationary heaters, power generators and land-use changes (e.g., land clearing during construction).

The total annual GHG emissions associated with the Project are estimated to be approximately 100,000 tonnes of carbon dioxide equivalent (CO_2e) per year during construction and less than approximately 50,000 tonnes CO_2e during operation. Compared with available 2014 provincial and national GHG totals, it is estimated that the proposed construction and operation activities will increase these totals by 0.2-0.5% and 0.006-0.01%, respectively. The magnitude of this change from existing conditions is considered low.

Noise Emissions - Noise will be generated during construction, and will be typical of noise associated with construction projects involving the movement of heavy equipment. Mining and surface crushing activities, including blasting of rock, and movement of material, including trucking, will be a source of noise throughout operations. The diesel generators will also generate noise and will be primarily used during construction at both sites and during operation at the Gordon site. Noise source modelling will be carried out. Noise-related environmental effects will be considered and mitigated, where appropriate.

Liquid Discharges & Management - Multiple sources of liquid discharges during the construction and operation will be managed, including: site runoff arising from precipitation; dewatering for foundation preparation; and dewatering of the existing open pits and underground workings. Liquid discharges at the site can be classified as being either 'contact' or 'non-contact' water. Contact water is any water, surface water or groundwater, that contacts mine workings or interacts with any mine rock material. Non-contact water is water that does not contact mine workings and/or interact with mine rock material. Both sites have been designed, as much as practical, to minimize the generation of contact water.

Collection ditches will be constructed around all Project infrastructure to manage contact water. Water collected in the sumps and/or small ponds and during open pit dewatering will be pumped to water management ponds located at each site and discharged to the environment if it meets applicable federal and provincial regulatory requirements. If it does not meet federal and provincial regulatory requirements, the water will be treated prior to discharge. Where practical, collection ditches may be constructed to divert non-contact water around Project facilities to natural drainages.

For the MacLellan site, seepage water associated with the TMF will be collected and pumped back to the TMF. Reclaim water from the TMF, underground/open pit dewatering water, and/or contact water from the water management facility will be used to meet ore milling and processing demand requirements. Tailings and excess water from the ore milling and processing plant will be piped to the TMF. Current modelling and engineering feasibility studies show that no discharge from the TMF will be required during operations. If discharge is required, it will be treated to meet applicable regulatory requirements prior to discharge to the environment.

At each site's water management pond, water quality will be monitored. If necessary, the water will be treated to meet applicable regulatory requirements prior to discharge to the environment,

including the authorized limits specified in Schedule 4 of the MMER. Identification of the discharge locations for each site will be determined during the EA.

Operational open pit dewatering will be carried out with in-pit pumps and/or using perimeter dewatering wells to intercept groundwater before it enters the pit.

Domestic sewage at the MacLellan site will be treated at the sewage treatment facility. Any effluent discharged from the facility will be treated to meet regulatory requirements. Details regarding the treatment of domestic sewage at the Gordon site will be developed during detailed engineering and addressed in the EA.

At closure, the water management related infrastructure will be sustained or re-configured to meet the requirements of the approved Closure Plan. Net runoff and drainage from the Project site will return to approximately its pre-Project conditions.

Solid wastes include domestic waste and waste oils, fuels, and hazardous wastes. All waste disposal will follow a Waste Management Plan for the Project, which will be developed in accordance with applicable regulations and best practices. Non-hazardous domestic solid waste will be deposited at the landfill in Lynn Lake. Waste oils, fuels, and hazardous wastes (if any) will be safely handled and transported in compliance with applicable federal, provincial, or municipal regulations.

Consultation and Engagement

Regulatory Consultation

The regulatory authorities that are expected to have an interest in the Project are identified in **Table 3.1**.

Table 3.1 Relevant Regulatory Authorities and Jurisdictions

Federal Government	Provincial Government	Municipal Government
• The Canadian Environmental Assessment Agency (the Agency) • Environment and Climate Change Canada (ECCC) • Fisheries and Oceans Canada (DFO) • Natural Resources Canada (NRCan) • Transport Canada	• Manitoba Growth, Enterprise, and Trade (MGET) • Manitoba Infrastructure (MI) • Manitoba Sport, Culture, and Heritage (MSCH) • Manitoba Sustainable Development (MSD)	• Town of Lynn Lake

Regulatory consultation activities undertaken to date by Alamos have included meetings,

teleconferences, and other discussions. Key issues identified and discussed during the regulatory consultation activities undertaken to date have pertained to:

- The provincial requirement to obtain separate licences under *The Environment Act* for the Gordon and MacLellan sites.
- The importance of redesigning the TMF to avoid interactions with waters frequented by fish.
- The importance of proactively engaging the local First Nation community (i.e., MCFN whose traditional territory the Project falls within) and other potentially affected Indigenous groups.
- The importance of local economic benefits.

Regulatory consultation with all three levels of government will continue throughout the EA process and will remain ongoing (on an as-needed basis) for the duration of the Project. It is understood that there will also be several government-led engagement opportunities during the federal and provincial EA processes (e.g., public review and comment periods for EA-related documents).

As a responsible corporate citizen, Alamos is also committed to providing Project and corporate updates to interested government officials, as appropriate.

Stakeholder and Community Consultation

The following is a preliminary list of the types of non-regulatory and non-Indigenous stakeholders that have been identified as potentially having an interest in the Project:

- Business/economic stakeholders (e.g., local businesses, business associations, and industry groups).
- Development corporations.
- Local community members (e.g., residents and property owners).
- Local services (e.g., fire and police departments, hospitals).
- Non-governmental organizations.
- Research/academic organizations.

Alamos has conducted various stakeholder and community consultation and engagement activities with the groups identified above, including meetings, telephone interviews and presentations at career fairs. Additional stakeholders are expected to be identified as the project progresses.

Four Open House public meetings have been held to date: three in Lynn Lake for members of the local community including Marcel Colomb First Nation (MCFN), and one in Winnipeg, Manitoba for MCFN members residing in the city. The Open Houses were advertised using posters, mail-outs, word of mouth, and social media. The first two events were informal drop-in style Open Houses

held on March 25, 2015 in Lynn Lake and on March 26, 2015 in Winnipeg; they were attended by 42 individuals. The third and fourth Open Houses occurred on April 26, 2016 and May 1, 2017, respectively, in Lynn Lake. A total of 70 people were recorded as attendees at the third Open House and there were a total of 53 recorded attendees at the fourth Open House. The Proponent and Proponent Team distributed handouts and delivered a formal presentation to share Project information and solicit feedback/input during the third and fourth Open Houses. At all four Open Houses, attendees were invited to fill out questionnaires to provide feedback as well as any inquiries or issues that they wanted to raise.

In general, the questions, comments and concerns identified on the questionnaires completed at the Open Houses pertained to:

- Opportunities for employment and economic development in local communities.
- Opportunities for education/training, employment, and engagement specifically for members of MCFN.
- Opportunities for improved housing or other benefits specifically for local First Nations communities.
- Project infrastructure.
- The status and results of environmental baseline studies.
- Potential Project-related effects on water quantity and quality, soil quality, fish and fish habitat, wildlife, traplines, vegetation, human health, the local economy, local housing, community services and infrastructure, the MCFN/Black Sturgeon Falls Reserve, and the current use of lands and resources for traditional purposes by Indigenous peoples.
- Tailings containment.
- Site remediation.
- Potential accidental events.
- The importance of ongoing consultation and engagement.

The following topics were rated 'very important' in the opinions of more than 60% of the questionnaire respondents:

- Tailings and mine rock management.
- Wildlife and fish habitat.
- Employment.
- Groundwater and surface water.
- Plants.
- Air quality.

- Contracts and business opportunities.
- Training and job skills.
- Community health.

When asked to list various environmental aspects in order of importance (in the 2017 questionnaire only), the highest percentage (33%) of respondents identified surface water and groundwater as the most important environmental aspect, followed closely by wildlife and fish habitat (27%). The environmental aspect identified as second most important by the highest percentage of respondents was wildlife and fish habitat (31%). The environmental aspect identified as third most important by the highest percentage of respondents was evenly split between community health, contracts and business opportunities, training and job skills, and increased traffic (each 13%).

Proponent-led stakeholder and community consultation will continue throughout the EA process and will remain ongoing (on an as-needed basis) for the duration of the Project. It is understood that there will also be several additional government-led engagement opportunities during the federal and provincial EA processes (e.g., public review and comment periods for EA-related documents).

Additional Engagement with Indigenous Peoples

Based on 2011 census data (the latest census data available at the time this document was prepared), Indigenous people account for approximately 16.7% of the total population of Manitoba, which includes approximately 195,900 First Nations, Métis, and Inuit people (Statistics Canada 2013).

Based on current understanding of traditional lands located in proximity to, and/or downstream or downwind from, proposed Project activities and components, the Project could, to highly varying degrees,

- Potentially affect areas of importance for three Indigenous communities (i.e., Marcel Colomb First Nation [MCFN], Mathias Colomb Cree Nation [MCCN], and Manitoba Métis Federation [MMF]).
- Potentially affect or be of interest to up to four Indigenous communities (i.e., Barren Lands First Nation [BLFN], Nisichawayasihk Cree Nation [NCN], O-Pipon-Na-Piwin Cree Nation [OPCN], and Peter Ballantyne Cree Nation [PBCN]).
- Potentially be of interest to one additional Indigenous community (i.e., Métis Nation-Saskatchewan [MN-S]).

The Project site is wholly within the defined traditional territory of MCFN; therefore, Alamos engagement efforts have primarily focused on MCFN. In addition to the attendance of MCFN community members and other Indigenous peoples at the Open Houses held for the Project in 2015, 2016, and 2017, representatives of MCFN have been engaged by Alamos since 2014 through

several meetings at which various topics related to the Project have been discussed. Alamos has been supported at these meetings by members of the Proponent Team, where appropriate. Other Proponent-led efforts to engage MCFN in support of the Project have included hiring a local Community Liaison Coordinator, hiring local field support personnel, and, through 2015, establishing an Environment Committee comprised of members selected by the MCFN Chief.

MCFN also participated in some meetings with Alamos and the provincial government. The main comments and concerns that have been raised by MCFN and documented during the engagement activities undertaken to date have pertained to the:

- Importance of ongoing Indigenous engagement and partnership.
- Importance of education and training for MCFN members, particularly youth.
- Importance of building capacity and preparing for mining industry employment.
- Lack of previous engagement from mining and hydroelectric companies.
- Current general lack of training for MCFN members.
- Current general lack of opportunities and amenities for MCFN causing social problems.
- Current general lack of MCFN capacity to benefit from mine development.
- Potential Project-related effects on water quality and terrestrial habitat, and potential implications for hunting and fishing in the area.
- Importance of water quality monitoring.
- Compensation for effects on traditional activities.
- Post-mining legacy long-term effects of mining (i.e., 50-100 years after mining ceases).
- Importance of keeping Winnipeg-based MCFN members informed of future potential employment opportunities.
- Ability of the Environment Committee to interpret and understand environmental studies and analyses being completed in support of the Project, as well as environmental permitting process.

Alamos has a local office/presence in Lynn Lake that facilitates ongoing communications with members of MCFN.

A Project-specific Traditional Knowledge/Traditional Land and Resource Use study is currently being completed in support of the EA, with participation from Indigenous peoples in the Manitoba communities of Lynn Lake, Pukatawagan, and Winnipeg, as well as Regina, Saskatchewan.

Proponent-led Indigenous engagement will continue throughout the EA process and will remain ongoing (on an as-needed basis) for the duration of the Project. It is understood that there will also be several additional government-led engagement opportunities during the federal and provincial EA processes (e.g., public review and comment periods for EA-related documents), in addition to government-led Indigenous consultation.

Environmental Setting

This section describes the environmental setting with reference to a "General Project Area", which does not have strictly defined spatial boundaries but generally includes the area indicated on **Map 1** in **Appendix A**; this area is considered to be generally representative of the local environmental context for the Project.

Several environmental baseline studies have been or are being carried out in support of the Project, with corresponding technical data reports focused on aspects of the atmospheric environment (i.e., climate and meteorology, air quality, ambient sound, and ambient light), water resources (i.e., hydrology, hydrogeology, and geochemistry), the aquatic environment (i.e., water quality, fish and fish habitat, and sediment quality), the terrestrial environment (i.e., soils and terrain, vegetation and wetlands, birds, mammals, and amphibians), human health and ecological risk, and the human and socio-economic environment (i.e., labour and economy, community services and infrastructure, land and resource use, and heritage resources). Some high-level information obtained during these studies has been incorporated into the description of the environmental setting below. Other Project-specific studies that have been or are being undertaken include a Traditional Knowledge/Traditional Land and Resource Use study, a Transportation Assessment, and physical modelling (e.g., atmospheric dispersion, surface, and groundwater flows). The EIS will provide further details regarding the methods and results of studies completed in support of the Project.

The Project is located within a remote, rugged region of the Boreal Shield Ecozone. The General Project Area (see **Map 1, Appendix A**) supports peat-covered glacial deposits underlain by Precambrian bedrock. The terrain consists of mostly hilly, till-covered bedrock, with low areas of terrain ranging from level to moderately sloping (0-15%). Topography slopes from a high of 450 m above mean sea level (AMSL) in the west and northwest to a low of 260 m AMSL in the southeast. Within the vicinity of the Gordon site, the ground surface elevation ranges from about 320 m to 350 m AMSL. Near the MacLellan site, the ground surface elevation ranges from 325 m to 375 m AMSL with an overall slope to the southeast.

Steep rocky ridges protrude 30 m to 60 m above lakes and peat-filled depressions. Surface water features and peat generally occupy the low areas. Soils in the region are thin, poorly drained, and acidic, with organic soils typical in bogs and peat plateaus, and discontinuous permafrost is widespread.

Contiguous tracts of boreal forest span the area with jack pine common in well-drained areas, and black spruce and tamarack species abundant in wetter areas. The area is home to diverse wildlife such as beaver, moose, black bear, American marten, and a variety of migratory birds such as ring-necked duck, bald eagle, and Tennessee warbler. Numerous wetlands, lakes, rivers, and streams are found throughout the General Project Area. These waterbodies are a part of the Churchill River Watershed that drains into Hudson Bay to the east. Fish in the General Project Area include northern pike, walleye, yellow perch, and brook stickleback.

The General Project Area supports two communities: the Town of Lynn Lake and MCFN Black Sturgeon Falls Reserve. These communities are connected by PR 391 which runs southeast from Lynn Lake to Thompson, Manitoba.

The EA Study Team is not aware of any relevant regional environmental study that is being or has been conducted in the General Project Area. The EA Study Team is also not aware of any applicable plans regarding water use (including groundwater), resource management, or conservation. It is understood that the Town of Lynn Lake has a Town Plan from 1952, a zoning bylaw from 1980, and a Development Plan from 2009. The applicability of these land use planning documents to the Project will be investigated.

Atmospheric Environment

The Project is in a region characterized by short, cool summers and long, cold winters. Long-term climate data indicates that the mean annual air temperature is -3.2°C, ranging from an extreme maximum of 35°C to an extreme minimum of -47 °C. There is an annual average of 98 frost-free days. On average, there are 141 days with precipitation per year with an average annual precipitation of 478 mm (318 mm as rain and 160 mm as snow).

Existing air quality reflects the remote location of the Project and the current lack of industrial activities in the area. Existing dust levels are low and attributed to traffic on unpaved roads and other human activities such as the use of wood stoves and open fires.

Sound levels (L_{eq}) range from approximately 20 dBA to 49.5 dBA as measured across representative remote, unpopulated, sparsely populated and rural areas. Existing examples of noise include residents' activities, local traffic, watersport and recreational activities, occasional aircraft flyovers, vegetation rustling, dog barking, wildlife (birds) and insects.

Light levels are typical of those in remote towns and villages at higher latitudes. Dark sky is available within a few kilometers of Lynn Lake and the MCFN Black Sturgeon Falls Reserve. The light that affects these communities is the light that is generated within them, not by the overlap of other sources, such as industry, outside of the urban areas.

Water Resources

The General Project Area lies within four subwatersheds of the Granville Lake River Watershed: Hughes River, Lower Keewatin River, Lower Lynn River, and Cockeram Lake.

Surface water around the Gordon site drains southward into the Hughes River, via Swede and Ellystan lakes, which in turn discharge into Barrington River and Southern Indian Lake on the Churchill River. Around the MacLellan site, water flows south into the Keewatin River and southeast through Cockeram Lake and Sickle Lake before discharging into Granville Lake on the Churchill River, upstream of Southern Indian Lake.

Gordon Lake is located at the top end of the watershed and west of the historical mine area that formerly drained eastward to Farley Lake via Gordon Creek. As part of historical mining activities, a diversion channel was constructed between Gordon Lake and Farley Lake, north of the historical East and Wendy pits. East and Wendy Pits are flooded and are not directly connected to the diversion channel or Gordon or Farley lakes. The water level in Gordon and Farley lakes is maintained at pre-development levels due to the construction of control structures at the outlets as part of closure activities that occurred between 2007 and 2012.

The Keewatin River, Lynn River, Goldsand Lake, and Cockeram Lake are some of the largest waterbodies in the Lower Keewatin River, Lower Lynn River, and Cockeram Lake subwatersheds. The subwatershed on the west side of the MacLellan site flows towards the Keewatin River which ultimately converges with the Lynn River before entering Cockeram Lake.

Five lakes surround the proposed TMF at the MacLellan site, including Payne Lake (which drains into the Keewatin River) and Lobster, Minton, and two unnamed lakes (which drain into an unnamed river that ultimately discharges to Cockeram Lake in the south). The Keewatin River flows southeast from Cockeram Lake, through Sickle Lake before discharging into Granville Lake on the Churchill River, upstream of Southern Indian Lake.

Evidence of beaver activity was noted throughout the General Project Area, particularly in streams and at lake outlets. In these areas, beaver dams have reduced flow and increased water levels upstream.

Groundwater flow in the General Project Area is strongly influenced by topography, which results in flow originating from high areas to low areas. Measured groundwater levels vary from 314-326 m AMSL. Recharge is associated with the high areas and discharges to surface water features within the low areas.

Overall groundwater quality in the General Project Area meets the *Manitoba Provincial Water Quality Guidelines* (MPWQG) for drinking water and the *Canadian Drinking Water Quality Guidelines* (CDWQG) except for iron and manganese. These parameters are typically elevated in groundwater within northern areas. With respect to drinking water guidelines, there is no clear difference in groundwater quality between areas associated with historical mine operations and background areas.

Background groundwater quality also meets the more stringent provincial and federal guidelines for the protection of freshwater aquatic life for all parameters except fluoride, iron, copper, aluminum, and arsenic. Within the historical mine operational areas, groundwater quality exceeds these guidelines for fluoride, free cyanide, uranium, selenium, zinc, copper, and iron.

Aquatic Environment

Most of the lakes near the Gordon and MacLellan sites are shallow (less than 4 m deep) and do not stratify during the summer. Background surface water quality generally reflects geochemistry of the Precambrian Shield. Lakes and streams are typically low in dissolved ions, soft, and neutral to slightly acidic in pH. Some parameters (e.g., dissolved oxygen, pH, total phosphorus, aluminum, chromium, and iron) are naturally elevated and occasionally do not meet water quality guidelines.

At the outlet of Gordon Lake, there were no notable changes in water quality from background conditions. Water quality data indicate elevated levels of some metals and other ions in the existing open pits and in Farley Lake compared to background concentrations in the Gordon site area; however, concentrations of these parameters were similar to background levels downstream from Farley Lake. In general, the Hughes River subwatershed, within which the Gordon site is located, demonstrates concentrations of total and dissolved organic carbon, total phosphorus, iron, and aluminum that are above water quality guidelines. These exceedances are likely the result of the lithology and the proliferation of beaver dams, muskeg bogs, and low relief.

The inactive MacLellan site does not appear to affect water quality in the Keewatin River, as there were no identifiable increased concentrations of water quality parameters between the sites upstream and downstream of the site (upstream of the Lynn River confluence). Elevated, and in some cases, above water-quality guideline concentrations, for sulphate, chloride, and some metals in some nearby waterbodies are generally attributable to past mining activity near Lynn Lake. Other guideline exceedances in the MacLellan site area, including total phosphorus, iron, and aluminum, reflect background conditions.

A total of 17 fish species are known to occur in the lakes and streams near the Project mine sites. Small-bodied fish species are most prevalent in streams and small, shallow lakes including: brook stickleback, ninespine stickleback, log perch, trout perch, emerald shiner, spottail shiner, longnose dace, lake chub, and slimy sculpin. Large-bodied fish species are more prevalent in larger, deeper lake and include: northern pike, walleye, yellow perch, lake whitefish, burbot, cisco, white sucker, and longnose sucker. Larger lakes, such as Cockeram Lake, typically support a greater diversity of fish and fish habitat than smaller lakes in the General Project Area. Northern pike are the most widespread large-bodied species in the lakes of the General Project Area, while brook stickleback are the most widespread small-bodied species in the lakes and streams.

Metals concentrations in northern pike tissues from the Gordon and MacLellan sites are generally below guidelines for protection of aquatic life and human consumption. This includes total mercury. Concentrations of selenium in northern pike tissues were lower than the guideline used in British Columbia (BCMoE 2014).

Elevated concentrations of chromium, copper, arsenic, and zinc that exceed federal and/or Manitoba sediment guidelines have been measured in sediment where the Keewatin River flows

into Cockeram Lake. This location is downstream of the MacLellan site, downstream of other historical mining activities, and downstream of other human influences from the Town of Lynn Lake. These data suggest past contamination of sediments in north Cockeram Lake. Other metals, for which no guidelines currently exist, such as aluminum and iron, were also elevated at several locations, including Goldsand Lake located upstream of the MacLellan site. This suggests some natural enrichment from the surrounding geology.

Arsenic and chromium concentrations exceed federal or Manitoba sediment quality guidelines in Farley and Gordon lakes, respectively. Iron and aluminum concentrations were also elevated in Gordon and Farley lakes compared to upstream reference sites. Sediment metal concentrations were otherwise below guideline values at the Gordon site.

Terrestrial Environment

At the MacLellan site, the dominant soils are imperfectly drained, coarse-textured Gleyed Eluviated Dystric Brunisols of the Hat Lake soil series and very poorly drained, Terric Fibric Organic Cryosols of the Wuskwatim soil series. At the Gordon site, the dominant soils are well drained, coarse-textured Eluviated Dystric Brunisols of the Fay Lake soil series and very poorly drained Terric Fibric Organic Cryosols of the Wuskwatim soil series. The Project is in a zone where permafrost is typically found in 10% to 50% of the land area (Heginbottom *et al.* 1995).

Field surveys documented 200 plant species within the General Project Area. Eleven wetland types have been recorded within the General Project Area. The Project is in the High Boreal wetland region. which is characterized by permafrost and non-permafrost wooded bogs and patterned fens (Halsey *et al.* 1997). An estimated 37% of the High Boreal wetland region is covered in wetlands.

Boreal chorus frog, wood frog and northern leopard frog have the potential to breed within the General Project Area. Baseline field surveys confirmed the presence of breeding habitat for boreal chorus and wood frogs; both are widely dispersed throughout the General Project Area.

One hundred and ninety-eight bird species have the potential to breed in the General Project Area (MB BBA 2016): 62 waterbirds, four upland gamebirds, 18 raptors, and 114 songbirds. Common birds observed during baseline studies were mallard, ring-necked duck, Canada goose, common loon, swamp sparrow, ruby-crowned kinglet, Tennessee warbler, dark-eyed junco, and yellow-rumped warbler.

Baseline data indicates the General Project Area is home to American marten, American red squirrel, beaver, black bear, Canadian lynx, fisher, grey wolf, mink, moose, red fox, river otter, snowshoe hare, weasel, wolverine, eastern red bat, hoary bat, little brown myotis, various small rodents (e.g., voles). Moose and black bear are some of the important game species harvested by local resource users.

Species of conservation concern (SOCC) are those species listed as *special concern*, *threatened*, or *endangered* under SARA (Government of Canada 2016), recommended for listing under SARA by COSEWIC (2016), listed as *threatened* or *endangered* under MB ESEA (Government of Manitoba 2016), or ranked as S1-S3 by the MB CDC (2015). The General Project Area is located within the known range of 38 terrestrial SOCC: 23 plant, one amphibian, nine bird, and five mammal species.

None of the 23 plant SOCC are listed under SARA, nor are any of Manitoba's SARA-listed plant SOCC expected to occur based on the habitat types found in the General Project Area.

The historical range of northern leopard frog (SOCC) includes the General Project Area; however, there are no recent records of their presence and none were observed during baseline studies.

Of the nine bird SOCC, three are confirmed breeders in the area: common nighthawk, olive-sided flycatcher, and barn swallow. Trumpeter swan, horned grebe, and rusty blackbird may occur based on the availability of suitable breeding habitat.

Two of the five mammal SOCC (i.e., little brown myotis and wolverine) have been documented in the General Project Area. Additionally, Northern myotis has the potential to occur in the General Project Area due to the availability of suitable bat roosting and foraging habitat; however, was not detected during bat baseline surveys. The barren-ground caribou (listed as a *threatened* by COSEWIC) range extends to approximately 45 km north of the General Project Area (BQCMB n.d.). Discussions with local resource users and MSD, and results of previous studies (MinGold Resources Inc. 1989 and Tetra Tech 2013) indicate that they are uncommon. MSD and local resource users indicated that it is unlikely that boreal woodland or barren-ground caribou would occur in the General Project Area (pers. comm. 2015a; pers. comm. 2015b; pers. comm. 2015c). Subsequent conversations with the Regional Director for MSD and the Beverly and Qamanirjuaq Caribou Management Board (BQCMB) Senior Biologist confirmed that the current caribou range does not extend near the Project area.

Human and Socio-Economic Environment

There are two population centres in the General Project Area: the Town of Lynn Lake and Black Sturgeon Falls Reserve. The Town of Lynn Lake has approximately 650 residents (Lynn Lake Mayor and Council 2014; pers. comm. 2015d). The population of the Black Sturgeon Falls Reserve is 38, all of whom are among the 430 registered members of MCFN (INAC 2017). The Town of Lynn Lake was built in the mid-20th century, primarily to serve the mining industry. Since the closure of the Blackhawk mine, the region has sought to develop its tourism industry, which is based largely around fishing and hunting.

The Town of Lynn Lake is accessible by PRs 391, 394, 396, 397 and 399. PR 391 connects the Town of Lynn Lake and Black Sturgeon Falls Reserve with the Town of Leaf Rapids and City of Thompson.

There is currently no rail service to the Town of Lynn Lake. The Lynn Lake Airport is used by fishing charters, RCMP, health services, and for mining-related activities (pers. comm. 2015e).

The Town of Lynn Lake provides solid waste services for residents and businesses. Waste from the town and Black Sturgeon Falls Reserve is disposed at the Lynn Lake Landfill. Water for the town comes from West Lynn Lake. MCFN operates its own water treatment plant and sewage lagoon on the Black Sturgeon Falls Reserve.

Education services within the General Project Area are provided through Frontier School Division, Area 1. West Lynn Heights School serves the Town of Lynn Lake and Black Sturgeon Falls Reserve.

The General Project Area is in the service delivery area for the Northern Health Region. The Lynn Lake Hospital is in the Town of Lynn Lake. The hospital shares health care resources with the Leaf Rapids Health Centre. For medical emergencies and specialist appointments, residents are transported by medivac to Thompson or Winnipeg.

The Town of Lynn Lake has 24-hour emergency medical services with one ambulance capable of providing patient transport to the Thompson General Hospital. Lynn Lake, Leaf Rapids, Thompson, South Indian Lake, Nelson House, and Cross Lake have volunteer search and rescue teams. The Lynn Lake Fire Department is a volunteer-run service that serves both the Town of Lynn Lake and Black Sturgeon Falls Reserve (the MCFN has a fire truck but lacks trained operators).

The Gordon and MacLellan sites are in a remote area approximately 37 km and 7 km northeast of the Town of Lynn Lake, respectively. The Black Sturgeon Falls Reserve is located approximately 12 km southwest of the Gordon site. The nearest known permanent, seasonal, or temporary residences to the Project are a:

- Trapper cabin located approximately 3.5 km southeast of the Gordon site, on the north shore of Swede Lake.
- Remote cottage located approximately 4.5 km southwest of the Gordon site, on the north shore of Simpson Lake.

The land use site in closest proximity to the MacLellan site is a landfill located approximately 3 km to the southwest.

The Town of Lynn Lake is the self-proclaimed 'Sportfishing Capital of Manitoba'. Outdoor recreation activities are popular with both residents and visitors to the region and include sportfishing, hunting, boating, swimming, camping, cross-country skiing, and snowmobiling (Lynn Lake Mayor and Council 2014). There are two provincial parks within 20 km of the Town of Lynn Lake: Burge Lake and Zed Lake. Sand Lakes Provincial Park is approximately 40 km north of the Gordon site.

There are several municipal recreation facilities in the Town of Lynn Lake, including an arena, an unsupervised beach, a public library, and a mining museum. The former Royal Canadian Legion

Hall in the Town of Lynn Lake is privately owned and used as a gathering place (pers. comm. 2015d). There are no recreation facilities on the Black Sturgeon Falls Reserve (pers. comm. 2015f).

The following municipal development plan and zoning by-law apply to the Town of Lynn Lake:

- The Town of Lynn Lake Development Plan No. 1329-2009, which identifies the MacLellan mine site as being designated a "Limited Development" area. Mineral exploration and development is encouraged in the Limited Development land use area under the Town of Lynn Lake Development Plan. There is no applicable development designation under a development plan for the Gordon mine site as it is located outside of municipal jurisdiction on unorganized Crown land.
- The Local Government District (LGD) of Lynn Lake By-law No. 675, which zones most of the land outside the built-up settlement area (townsite) of Lynn Lake but still in the municipal boundary as "LD – Limited Development District", including the MacLellan mine site. Mining and quarrying are permitted uses in the Limited Development land use district under the By-law. There is no applicable zoning under a zoning by-law for the Gordon mine site as it is located outside of municipal jurisdiction on unorganized Crown land.

Provincial Land Use Policies (PLUPs) under the Provincial Planning Regulation No. 81/2011 reflect the provincial government's interest in land and resource use and sustainable development. The PLUPS apply to all lands subject to *The Planning Act* of Manitoba in the absence of adopted development plans. PLUPs are also given full consideration when undertaking planning activities and land use decision-making on Crown lands. Schedule 3 of the PLUPs include Policy Area 8: Mineral Resources, which expresses the provincial interest in mineral resources development.

Heritage resource potential was reviewed (including field assessments), identifying no heritage resources associated with the Gordon site. Development within the MacLellan site is primarily located in areas that would have limited human activity given the nature of the terrain and general lack of navigable and potable water. The one exception is the upland area where exposed quartz veins may have been quarried for stone tool manufacture. One such site was identified north of the proposed TMF and consisted of quartz flakes shallowly buried beneath the organic overburden. It is possible that additional sites are present at this and other upland locations. However, based on the site extent defined by shovel tests, these sites do not encompass a large area.

A Traditional Knowledge/Traditional Land and Resource Use (TK/TLRU) Study is currently underway (interview phase complete) in collaboration with MCFN. While there is current use of lands and resources for traditional purposes by Indigenous peoples in the General Project Area, details of the TK/TLRU Study are confidential until released by MCFN. MCFN is considered likely to be affected by the Project due to the proximity of its Reserve to the Project, identified traditional activity areas, and in consideration of the water flow directions and predominant wind direction as shown on **Map 1** in **Appendix A**.

Desktop research was conducted regarding the current use of lands and resources for traditional purposes by the six other Indigenous communities that have potential to be affected by or be

interested in the Project to varying degrees. Further investigation will be required to confirm some of the assumptions below.

MCCN is considered likely to be affected by the Project based on its connection to MCFN and associated common identified traditional activity areas. Elders from MCCN have been interviewed as part of the TK/TLRU Study currently underway with MCFN.

The MMF is considered likely to be affected by the Project due to its local presence in Lynn Lake and Leaf Rapids. Given the proximity of these communities, members of the MMF are considered likely to carry out traditional activities near the Project.

BLFN has potential to be affected by or be interested in the Project based on their recent participation in the Northwest Co-operative Fisheries Limited (NWCFL), which is a commercial fishing co-op that serves the BLFN Brochet Reserve as well as the following other First Nation communities in Northwest Manitoba (Government of Canada 2006):

- MCFN Black Sturgeon Falls Reserve in Manitoba.
- MCCN Pukatawagan Reserve in Manitoba.
- NCN Nelson House Reserve in Manitoba.
- OPCN South Indian Lake Reserve in Manitoba.
- PBCN Kinoosao-Thomas Clarke (Kinoosao) Reserve in Saskatchewan.

The co-op's 143 members fish in over 48 lakes across the region. The last indication of activity in this co-op is 2007 (Government of Canada 2006).

BLFN is an isolated community and there is a reliance on country foods (Northern Manitoba Food, Culture, and Community Fund 2014). A winter road connects the community to Lynn Lake and is the only ground link, which suggests that it may provide access to winter hunting and trapping opportunities in the General Project Area as well.

The Treaty Land Entitlement (TLE) lands associated with BLFN are located in a separate upgradient watershed from the Project (see **Map 1**, **Appendix A**), thereby reducing opportunities for potential interactions with the Project.

NCN has potential to be affected by or be interested in the Project based on their recent participation in NWCFL and the proximity of their Nelson House Resource Management Area (RMA) to the General Project Area (see **Map 1**, **Appendix A**). However, NCN community members may not travel to the General Project Area often because it is likely that their main service centres are Leaf Rapids and Thompson.

OPCN has potential to be affected by or be interested in the Project due to their recent participation in NWCFL and the location of their TLE lands immediately upstream/upwind and approximately 40 to 50 km downstream/downwind of the Gordon site (see **Map 1**, **Appendix A**).

The OPCN Reserves are on lakes identified by MCFN as traditional land use areas. MCFN is considered likely to be affected by the Project, and it is probable that the OPCN community members who live on these lakes would feel as affected in their traditional territory as do other Indigenous peoples who practice traditional harvesting on these lakes. Road connections suggest that Leaf Rapids is the likely service centre for OPCN's main residential community. From Leaf Rapids, there is ground access to the General Project Area via PR 391, which provides access to potential traditional harvesting areas for hunting, fishing, and plant gathering.

PBCN has potential to be affected by or interested in the Project based on their traditional territory (see **Map 1**, **Appendix A**), which extends along the Churchill River and Reindeer River (PBCN 2016), and their recent participation in the NWCFL.

The only all-season road that accesses the PBCN Kinoosao Reserve is PR 391. It is possible that traditional land use activities such as hunting, fishing, and plant gathering may occur in the General Project Area as a normal part of travel by PBCN community members for commercial and supply purposes.

The nearest MN-S Métis local to the General Project Area is Sandy Bay #90 on the Churchill River in MN-S Eastern Region 1. The nearest local in MN-S Northern Region 1 is La Ronge #19. As Métis Harvesting Zone 1 borders with Manitoba, there is a potential for Métis traditional harvesting activities to occur up to the Saskatchewan border within the Granville Lake watershed.

Potential Environmental Interactions and Scoping Considerations

Table 5-1 provides an overview of potential Project-related changes to environmental components that are directly linked or necessarily incidental to regulatory (federal and provincial) decisions that enable the Project to proceed, and associated effects on health and socio-economic conditions, physical and cultural heritage, and resources of historical, archaeological, paleontological, or architectural significance. The scope of the environmental assessment will focus on the potential adverse environmental effects of the Project on the Valued Components (VCs) identified in the last column of **Table 5-1**. VCs are environmental attributes associated with the Project of special value or interest to Indigenous peoples, regulatory agencies, the Proponent, resource managers, scientists, key stakeholders, and/or the general public.

Environmental Component(s) of Concern	Potential Environmental Interactions (Without Mitigation or Management)	How Potential Environmental Interactions will be Addressed in the EIS
Fish, Fish Habitat, and Aquatic Species	The Gordon and MacLellan sites contain several fish-bearing watercourses and waterbodies. Routine Project activities could result in changes to fish and fish habitat due to the following potential interactions: • The Project has potential to adversely affect fish if Project-related hydrological and/or hydrogeological changes affect the quality or quantity of fish habitat. • Liquid discharges from the Project have potential to adversely affect fish habitat and fish health if they cause a reduction in water quality in receiving waters frequented by fish. Discharge or seepage of mining effluents has potential to cause changes to surface water and sediment quality that could potentially lead to indirect or direct effects on fish (i.e., toxicity, bioaccumulation, avoidance of area, alteration of planktonic and benthic communities). The exposure and weathering of some mine materials may also cause degradation of fish habitat due to acid generation and/or leaching of contaminants into waters frequented by fish. • Construction, excavation, and dewatering and/or infilling of waterbodies have potential to cause injury or mortality to fish. • Alterations to stream channels have potential to cause injury or mortality to fish, as well as to affect fish mobility and fish habitat. • If any blasting occurs near fish-bearing waters, shock waves from the detonation of explosives have potential to cause injury or mortality to fish. An accidental spill or release to the environment originating from a Project activity or component would have potential to result in changes to fish and fish habitat, including: • Injury, mortality, and/or reduced health for fish. • Reduced availability and quality of fish habitat (including water quality). Section 2(1) of SARA defines 'aquatic species' as comprising fish and marine plants as defined under sections 2(1) and 47 of the *Fisheries Act*, respectively. The Project is not expected to result in any changes to aquatic species as defined under SARA other than fish (i.e., the Project will not result in any changes to marine plants) due to the lack of any anticipated potential interaction between the Project and the marine environment. However, the potential Project-related changes to fish habitat identified above include potential changes to freshwater aquatic plants as components of fish habitat.	• Potential Project-related environmental effects on fish and fish habitat will be assessed primarily in the context of the Fish and Fish Habitat VC, but will also be indirectly considered in the context of the Surface Water VC. • The assessment will include the identification of standard and VC-specific mitigation measures to reduce or eliminate Project-related environmental effects; characterization of residual Project-related environmental effects; and determination of the significance of residual Project-related environmental effects. • The EIS will also consider accidental events and assess the potential effects of an accidental spill or release to the environment on the Fish and Fish Habitat VC and Surface Water VC. • The assessment will be based on desktop information, the professional judgement of the EA Study Team, and the results of relevant environmental baseline studies carried out in support of the EIS, including associated baseline field data (e.g., Fish and Fish Habitat, Distribution, and Tissue Analysis; Benthos and Sediment; Water Quality; Hydrology; Hydrogeology; and Geochemistry technical data reports).

Environmental Component(s) of Concern	Potential Environmental Interactions (Without Mitigation or Management)	How Potential Environmental Interactions will be Addressed in the EIS
Migratory Birds	The Gordon and MacLellan sites may provide habitat for various species of migratory birds. Routine Project activities could result in changes to migratory birds as defined in section 2(1) of MBCA due to the following potential interactions with the environment: • If conducted during the breeding bird season, site preparation activities (e.g., clearing and grubbing) have potential to cause injury or mortality to migratory birds, their nestlings, and their eggs, as well as to damage or destroy their nests. Project construction also has potential to result in alteration or loss of habitat for migratory birds. • Noise, vibration, and air emissions (e.g., dust) during Project construction and operation have potential to adversely affect habitat quality for migratory birds and could cause behavioural effects (e.g., avoidance/displacement). • Artificial night lighting during Project operation has potential to attract and/or disorient nocturnally migrating birds, and could cause an increased risk of injury or mortality from exhaustion and/or collisions with Project infrastructure. Any migratory birds attracted to the Project site by artificial night lighting could also be exposed to other threats such as predation or interactions with Project vehicles and equipment. An accidental spill or release to the environment originating from a Project activity or component would have potential to result in changes to migratory birds, including: • Injury, mortality, and/or reduced health for migratory bird species. • Reduced availability and quality of migratory bird habitat. The potential environmental effects described above for migratory birds could affect secure species as well as species at risk protected under SARA.	• Potential Project-related environmental effects on migratory birds will be assessed primarily in the context of the Wildlife and Wildlife Habitat VC. • The assessment will include the identification of standard and VC-specific mitigation measures to reduce or eliminate Project-related environmental effects; characterization of residual Project-related environmental effects; and determination of the significance of residual Project-related environmental effects. • The EIS will also consider accidental events and will assess the potential effects of an accidental spill or release to the environment on the Wildlife and Wildlife Habitat VC. • The assessment will be based on desktop information, the professional judgement of the EA Study Team, and the results of environmental baseline studies carried out in support of the EIS, including associated baseline field data (e.g., Birds, Acoustics, and Ambient Lighting technical data reports).

Environmental Component(s) of Concern	Potential Environmental Interactions (Without Mitigation or Management)	How Potential Environmental Interactions will be Addressed in the EIS
Environmental Effects Occurring on Federal Lands Transboundary Environmental Effects	The Project, located within the Province of Manitoba, will be situated on lands that are comprised of mining claims and provincially-issued leases held by and registered in the name of Carlisle Goldfields Limited, a wholly-owned subsidiary of Alamos. The Saskatchewan provincial border is located approximately 63 km west of the MacLellan site. This is the shortest distance between the Project and any transboundary lands. As shown on **Map 1** in **Appendix A**, the direction of surface water flow in and around the General Project Area is away from the Saskatchewan border, thereby reducing the potential for transboundary environmental effects on water. Hourly wind direction data from 2013 to 2014 were analyzed at ECCC station 5061645 (Lynn Lake). The prevailing wind direction primarily comes from the northwest and secondarily from the west (**Map 1**, **Appendix A**). However, some exceptions occur during May and June when the prevailing winds arise from the east, as well as in September when the winds predominately come from the south. Atmospheric emissions associated with the Project are therefore considered generally unlikely to be transported into Saskatchewan to a measurable degree. With the exception of potential transboundary environmental effects on the atmospheric environment associated with Project-related emissions of criteria air contaminants and greenhouse gases, the Project is not expected to result in any changes to the environment that would occur on federal lands, in another province, or outside of Canada. An accidental spill or release to the environment originating from a Project activity or component would similarly not be expected to result in any environmental effects occurring on federal or transboundary lands.	• Potential Project-related transboundary environmental effects on the atmospheric environment will be assessed primarily in the context of the Atmospheric Environment VC. The EIS will not assess any other environmental effects occurring on federal or transboundary lands due to the lack of anticipated interaction between the Project and any other aspect of the environment on federal lands or outside of the Province of Manitoba. • The assessment will include the identification of standard and VC-specific mitigation measures to reduce or eliminate Project-related environmental effects; characterization of residual Project-related environmental effects; and determination of the significance of residual Project-related environmental effects. • The EIS will also consider accidental events and assess the potential effects of an accidental spill or release to the environment on the Atmospheric Environment VC. • The assessment will be based on desktop information, the professional judgement of the EA Study Team, and the results of relevant environmental baseline studies carried out in support of the EIS, including associated baseline field data (i.e., Air Quality technical data report). Air quality modelling to be conducted in support of the EIS will not include the modelling of acid deposition or speciated volatile organic compounds, as these are not considered to be pathways for Project-related environmental effects.

Environmental Component(s) of Concern	Potential Environmental Interactions (Without Mitigation or Management)	How Potential Environmental Interactions will be Addressed in the EIS
Health and Socio-Economic Conditions for Indigenous and Non-Indigenous Peoples	The Gordon and MacLellan sites have potential to be used by various Indigenous and non-Indigenous land and resource users. Routine Project activities could result in the following changes to the environment that have potential to affect health and socio-economic conditions for Indigenous and non-Indigenous peoples: • Project activities and components have potential to affect the availability of lands and resources for commercial or recreational fishing and hunting/trapping activities and/or other recreational uses currently carried out by Indigenous and non-Indigenous peoples. • Project-related requirements and the influx of Project personnel could increase the demand for local services and infrastructure, thereby potentially affecting the quality or availability of these amenities for Indigenous and non-Indigenous residents of the Town of Lynn Lake and other surrounding communities. • The Project has potential to adversely affect human health if liquid discharges from the Project degrade the quality of drinking water resources or if Project-related hydrological and/or hydrogeological changes affect the quality or quantity of drinking water resources. A Boil Water Advisory has been in effect for the Town of Lynn Lake since 2012 (MSD 2017). Water for the town comes from West Lynn Lake, which is located approximately 38 km southwest of the Gordon site and approximately 7 km southwest of the MacLellan site. Drinking water for MCFN's Black Sturgeon Falls Reserve and the City of Thompson is sourced from Hughes Lake (located approximately 7 km southwest of the Gordon site and approximately 25 km southeast of the MacLellan site) and Burntwood River (located ≥150 km from the Project mine sites), respectively. • Air, noise, and light emissions from the Project have potential to disturb nearby human receptors and pose a nuisance. • Emission and dispersion of chemicals from Project activities have the potential to affect air quality, as well as soil and surface water quality (through deposition), which could potentially affect human health (e.g., through contamination of drinking water resources or species of fish, wildlife, or plants that are consumed by Indigenous or non-Indigenous peoples). • The Project is also expected to have economic benefits, including training, employment, and contracting opportunities, for Indigenous and non-Indigenous peoples.	• Potential Project-related environmental effects on health and socio-economic conditions for Indigenous and non-Indigenous peoples will be assessed in the context of the following VCs: Labour and Economy, Community Services and Infrastructure, Land and Resource Use, Traditional Land and Resource Use, and Human Health. • The assessment will include the identification of standard and VC-specific mitigation measures to reduce or eliminate Project-related environmental effects; characterization of residual Project-related environmental effects; and determination of the significance of residual Project-related environmental effects. • The EIS will also consider accidental events and will assess the potential effects of an accidental spill or release to the environment on these VCs. • A Human Health and Ecological Risk Assessment (HHERA) will be completed using standard risk assessment protocols. Calculations consistent with regulatory expectations and requirements will be completed and, where local receptor assumptions (e.g., land-use patterns, country food consumption rates, etc.) are unavailable, parameters recommended by Health Canada and ECCC will be used to characterize human and ecological receptor interactions with the local environment. • The assessment will be based on desktop information; the professional judgement of the EA Study Team; the results of the HHERA; the results of a Project-specific Transportation

Environmental Component(s) of Concern	Potential Environmental Interactions (Without Mitigation or Management)	How Potential Environmental Interactions will be Addressed in the EIS
	• The expenditures and employment associated with Project activities will affect local, regional, and provincial economic conditions through all phases of the Project. In addition to having positive economic effects, the Project could adversely affect labour and economy, for example by contributing to local or regional labour shortages or interacting negatively with the economic activities of other sectors, such as tourism or forestry.	Impact Study; and the results of environmental baseline studies carried out in support of the EIS, including associated informant interviews and baseline field data (e.g., Socio-Economics, Acoustics, Air Quality, and Ambient Lighting technical data reports).
Physical and Cultural Heritage, and Resources of Historical, Archaeological, Paleontological, or Architectural Significance for Indigenous and Non-Indigenous Peoples	Archaeological and heritage resources have potential to occur on the Gordon and MacLellan sites. Routine Project activities could result in the following changes to the environment that have potential to affect the physical and cultural heritage of Indigenous or non-Indigenous peoples, and/or to affect any structure, site, or thing of historical, archaeological, paleontological, or architectural significance to Indigenous or non-Indigenous peoples: • Although the Project will be designed to avoid ground disturbance at sites where resources of cultural, historical, archaeological, paleontological, or architectural significance are known to be located, there is potential for Project-related ground disturbance (including excavation and blasting) to occur where previously unrecorded resources may be present. Such resources, if present, could be disturbed, damaged or destroyed by the Project. An accidental spill or release to the environment originating from a Project activity or component could result in changes to the environment that could affect physical and cultural heritage, or resources of historical, archaeological, paleontological, or architectural significance for Indigenous and non-Indigenous peoples.	• Potential Project-related environmental effects on physical and cultural heritage, and resources of historical, archaeological, paleontological, or architectural significance for Indigenous and non-Indigenous peoples will be assessed in the context of the Heritage Resources VC. • The assessment will include the identification of standard and VC-specific mitigation measures to reduce or eliminate Project-related environmental effects; characterization of residual Project-related environmental effects; and determination of the significance of residual Project-related environmental effects. • The EIS will also consider accidental events and, will assess the potential effects of an accidental spill or release to the environment on the Heritage Resources VC. • A Heritage Resources Impact Assessment (HRIA) was completed for the Project in 2012, and a Heritage Resources environmental baseline study, including a field program, was completed in 2015 in support of the EIS. • The assessment will be based on desktop information, the professional judgement of the EA Study Team, the results of the HRIA, and the results of the Heritage Resources technical data report, including associated baseline field data.

Environmental Component(s) of Concern	Potential Environmental Interactions (Without Mitigation or Management)	How Potential Environmental Interactions will be Addressed in the EIS
Current Use of Lands and Resources for Traditional Purposes by Indigenous Peoples	The Gordon and MacLellan sites have potential to be used for traditional purposes by Indigenous land and resource users. The Project may therefore require access to, use or occupation of, or the exploration, development and production of lands and resources currently used for traditional purposes by Indigenous peoples. Routine Project activities could result in the following changes to the environment that have potential to affect the current use of lands and resources for traditional purposes by Indigenous peoples: • Project activities and components have potential to affect the availability of lands (including travel routes) and resources currently used by Indigenous peoples for traditional purposes such as fishing, hunting/trapping, and gathering. • The influx of Project personnel could increase the recreational demand for lands and resources that are currently used by Indigenous peoples for traditional purposes, thereby potentially affecting the quality or availability of these lands and resources for Indigenous peoples. • The Project has potential to adversely affect the quality or availability of fish species of traditional importance to Indigenous peoples (including species that are currently fished by Indigenous harvesters for traditional purposes) if liquid discharges from the Project degrade the quality of fish habitat. • Air, noise, and light emissions from the Project have potential to disturb wildlife species of traditional importance to Indigenous peoples and affect their movement, thereby potentially affecting their availability for current use by Indigenous peoples (e.g., hunting/trapping). • Emission and dispersion of chemicals from Project activities have the potential to affect air quality, as well as soil and surface water quality (through deposition). Thus, the Project has potential to adversely affect the quality or availability of fish, wildlife, and plant species of traditional importance to Indigenous peoples (including species that are currently fished, hunted/trapped, and gathered by Indigenous peoples for traditional purposes) if the Project results in the degradation of their habitats or the contamination of these resources. An accidental spill or release to the environment originating from a Project activity or component would have potential to result in changes to the environment that could affect the current use of lands and resources for traditional purposes by Indigenous peoples.	• Potential Project-related environmental effects on the current use of lands and resources for traditional purposes by Indigenous peoples will be assessed in the context of the Traditional Land and Resource Use VC. • The assessment will include the identification of standard and VC-specific mitigation measures to reduce or eliminate Project-related environmental effects; characterization of residual Project-related environmental effects; and determination of the significance of residual Project-related environmental effects. • The EIS will also consider accidental events and, in particular, will assess the potential effects of an accidental spill or release to the environment on the Traditional Land and Resource Use VC. • A Project-specific TK/TLRU Study is currently being completed in support of the EIS, with participation from Indigenous peoples in Lynn Lake, Pukatawagan, Winnipeg, and Regina. • The assessment will be based on desktop information, the professional judgement of the EA Study Team, the results of the TK/TLRU Study, and the results of the Socio-Economics and Heritage Resources technical data reports, including associated interviews and baseline field data.

Environmental Component(s) of Concern	Potential Environmental Interactions (Without Mitigation or Management)	How Potential Environmental Interactions will be Addressed in the EIS
Other Changes to the Environment Directly Related or Necessarily Incidental to a Federal Authority's Exercise of a Power or Performance of a Duty or Function in Support of the Project	Various federal authorities may need to exercise a power or perform a duty or function to allow the Project to proceed. Routine Project activities could result in the following other changes to the environment directly related or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function in support of the Project: • If a licence, certificate, or permit from NRCan is required under the *Explosives Act*, the potential changes to the environment that would be directly related or necessarily incidental to this regulatory approval would be limited to the potential effects summarized above that could result from Project-related blasting. • If authorization from DFO is required under section 35(2) of the *Fisheries Act* for serious harm to fish that are part of a CRA fishery or that support a CRA fishery, the potential changes to the environment that would be directly related or necessarily incidental to this regulatory approval are limited to the potential effects summarized above with respect to fish and fish habitat, socio-economic conditions (i.e., potential Project-related effects on the abundance or distribution of commercially or recreationally important fish species), and Indigenous traditional use (i.e., potential Project-related effects on the abundance or distribution of traditionally important fish species). • If a permit from ECCC is required under section 19 of the MBCA for the collection of migratory birds, their nests, or their eggs, the potential changes to the environment that would be directly related or necessarily incidental to this regulatory approval would be limited to disturbance of migratory birds, their nests, or their eggs; potential injury or mortality of collected migratory birds; and potential damage or destruction of collected nests and eggs. • If a permit from ECCC or DFO is required under section 73(1) of SARA for engaging in activities affecting a SARA-listed aquatic and/or migratory bird species and/or their residences (e.g., nests), the potential changes to the environment that would be directly related or necessarily incidental to this regulatory approval would be limited to the potential effects summarized above with respect to fish, fish habitat, and migratory birds.	• Other potential changes to the environment directly related or necessarily incidental to a federal authority's exercise of a power or performance of a duty or function in support of the Project will be assessed in the context of the Fish and Fish Habitat and Wildlife and Wildlife Habitat VCs. • The assessment will include the identification of standard and VC-specific mitigation measures to reduce or eliminate Project-related environmental effects; characterization of residual Project-related environmental effects; and determination of the significance of residual Project-related environmental effects. • The EIS will also consider accidental events and, will assess the potential effects of an accidental spill or release to the environment on the Fish and Fish Habitat and Wildlife and Wildlife Habitat VCs. • The assessment will be based on desktop information, the professional judgement of the EA Study Team, and the results of relevant environmental baseline studies, including associated baseline field data (e.g., Fish Habitat, Distribution, and Tissue Analysis; Mammals; Birds; and Amphibians technical data reports).

Environmental Component(s) of Concern	Potential Environmental Interactions (Without Mitigation or Management)	How Potential Environmental Interactions will be Addressed in the EIS
Environmental and Human Health Effects Under Provincial Jurisdiction	In addition to the potential environmental and human health effects discussed above with respect to fish and fish habitat, migratory birds, health and socio-economic conditions, archaeological and heritage resources, and Indigenous traditional use (many of which fall under both federal and provincial jurisdiction), routine Project activities also have potential to result in the following other environmental effects under provincial jurisdiction: • Site preparation activities (e.g., clearing and grubbing) have potential to cause injury or mortality to provincially regulated non-migratory birds, their nestlings, and their eggs, as well as to damage or destroy their nests. Provincially regulated small mammals and amphibians may also be susceptible to potential injury or mortality during site preparation activities. Project construction also has potential to result in alteration or loss of habitat for provincially regulated non-migratory birds and other provincially regulated wildlife in general. • Site preparation activities (e.g., clearing and grubbing) will cause mortality to provincially regulated plants and have potential to cause alteration or loss of wetland habitat. • Noise, vibration, and air emissions (e.g., dust) during Project construction and operation have potential to adversely affect habitat quality for provincially regulated non-migratory birds and other provincially regulated wildlife, and could cause behavioural effects (e.g., avoidance/displacement). • The Project has potential to cause an increased risk of injury or mortality for provincially regulated non-migratory birds and other provincially regulated wildlife due to collisions with Project vehicles. • Artificial night lighting during Project operation has potential to attract and/or disorient nocturnally active provincially regulated non-migratory birds, and could cause an increased risk of injury or mortality from exhaustion and/or collisions with Project infrastructure. Non-migratory birds attracted to the Project site by artificial night lighting, if any, could also be exposed to other threats such as predation or interactions with Project vehicles and equipment. Other provincially regulated nocturnal wildlife (e.g., bats) may also be susceptible to potential effects from artificial night lighting. • Project-related solid and liquid wastes have potential to attract provincially regulated non-migratory birds and other provincially regulated wildlife, where	• Potential Project-related environmental and human health effects under provincial jurisdiction will be assessed in the context of the following VCs: Atmospheric Environment, Groundwater, Surface Water, Fish and Fish Habitat, Vegetation and Wetlands, Wildlife and Wildlife Habitat, Labour and Economy, Community Services and Infrastructure, Land and Resources Use, Heritage Resources, Traditional Land and Resource Use, and Human Health. • The assessment will include the identification of standard and VC-specific mitigation measures to reduce or eliminate Project-related environmental effects; characterization of residual Project-related environmental effects; and determination of the significance of residual Project-related environmental effects. • The EIS will also consider accidental events and will assess the potential effects of an accidental spill or release to the environment on these VCs. • The assessment will be based on desktop information; the professional judgement of the EA Study Team; the results of the HHERA, HRIA, and TK/TLRU Study; and the results of the various environmental baseline studies identified above for each environmental component of concern in this table, including associated interviews and/or baseline field data. The assessment will also consider the results of additional relevant environmental baseline studies, including associated baseline field data not identified above (i.e.,

Environmental Component(s) of Concern	Potential Environmental Interactions (Without Mitigation or Management)	How Potential Environmental Interactions will be Addressed in the EIS
	they may be exposed to threats such as predation or interactions with Project vehicles and equipment. • Open pit mining during the operational phase of the Project has potential to affect groundwater quantity (i.e., groundwater discharge levels and discharge to surface water features), flow, and quality. The exposure and weathering of some mine materials may result in acid generation and/or leaching of contaminants causing degradation of surface water runoff and groundwater quality. • Deposition of chemicals of potential concern from dust onto soil from Project activities has the potential to affect soil quality and surface water quality. This change in soil quality can directly affect ecological receptors that interact either directly or indirectly with this soil. The change in chemical concentrations in soil may alter their concentrations in vegetation, and prey species. These changes in media concentrations disseminate through the food web, and can potentially produce effects in organisms that ingest these media. • Discharges and runoff from Project operations may release chemicals of potential concern into groundwater and surface water. A change in surface water quality may affect ecological receptors that use surface water from the local assessment area as a source of drinking water. An accidental spill or release to the environment originating from a Project activity or component could result in environmental effects under provincial jurisdiction, including many of those discussed above with respect to fish and fish habitat, migratory birds, health and socio-economic conditions, archaeological and heritage resources, and Indigenous traditional use, as well as: • Injury, mortality, and/or reduced health for provincially regulated non-migratory birds and other provincially regulated wildlife. • Reduced availability and quality of habitat for provincially regulated non-migratory birds and other provincially regulated wildlife. The potential environmental effects described above for birds and other wildlife, fish, and vegetation could affect secure species as well as SOCC protected under provincial legislation.	Vegetation and Wetlands and Soil and Terrain technical data reports).

The VCs proposed in **Table 5-2** have been selected in consideration of:

- The interactions discussed in **Table 5-1**.
- Regulatory guidance and requirements.
- Issues raised by regulatory agencies, Indigenous groups, key stakeholders, and the public.
- Technical aspects of the Project (i.e., the nature and extent of Project components and activities).
- Existing environmental conditions in the study area and interconnections between the biophysical and socio-economic environment.
- Experience and lessons learned from similar mining projects.
- The professional judgment of the EA Study Team.

Table 5-2 Rationale for Selection of Proposed Valued Components

Proposed Valued Component	Rationale for Selection
Atmospheric Environment	Potential Project-related effects on atmospheric environment for the purposes of this assessment include changes to air quality and greenhouse gases. The atmospheric environment has been selected as a VC in consideration of regulatory requirements, the potential sensitivity of human health to air quality, potential effects on enjoyment of property (e.g., nuisance effects resulting from effects on air quality), and the potential deposition of air contaminants in soil, vegetation, and water as pathways to humans and wildlife. Project-related acoustic and light emissions will be addressed as factors potentially affecting the Wildlife and Wildlife Habitat, Land and Resource Use, and Traditional Land and Resource Use VCs.
Surface Water	Surface water and groundwater, have been selected as VCs because they are critical in the hydrologic cycle and the life function of human and non-human biota. Surface water supports industrial, commercial, and recreational uses, has cultural value and is subject to regulated discharge limits (water quality criteria). Groundwater is important to maintaining ecological habitats by supporting streamflow and wetlands. Surface water and groundwater may be assessed as separate VCs in the EIS.
Groundwater	
Wildlife and Wildlife Habitat	Wildlife and wildlife habitat have been selected as a VC because of their potential to interact with Project activities and because they are considered by the proponent, the public, Indigenous communities, the scientific community, and government agencies to have ecological, aesthetic, recreational, economic, and cultural importance. For the purposes of this assessment the term 'wildlife' refers to birds, mammals, and amphibians, and includes SOCC.

Table 5-2 Rationale for Selection of Proposed Valued Components

Proposed Valued Component	Rationale for Selection
Fish and Fish Habitat	Fish and fish habitat have been selected as a VC for assessment because fish and their habitats are key indicators of fisheries sustainability and productivity. This VC includes fish that are part of a CRA fishery and fish that support a CRA fishery (e.g. prey species including invertebrates), as defined in the *Fisheries Act*. Fish habitat means waters on which fish depend directly or indirectly to carry out their life processes. These include spawning, nursery, rearing, migration and feeding areas. These habitats are described in terms of their physical, chemical, and biological attributes including water quality, sediment quality, substrate composition, aquatic plant communities and benthic invertebrate communities.
Vegetation and Wetlands	Vegetation and wetland communities encompass the vegetated state of the natural environment. These communities are classified as ecosite community types, where assessment of classification includes dominant vascular plants, soil type(s), climatic, and hydrological conditions that support them. Vegetation and wetlands have been selected as a VC for assessment because of their critical role in supporting biodiversity and traditional use by Indigenous communities, as well as their contributions to ecosystem services at a local and regional landscape.
Labour and Economy	Labour and economy includes local and regional economy, employment, and business. Labour and economy have been included as a VC for assessment because employment and business support the economic livelihoods of local and Indigenous residents, and provide associated social benefits related to employment and income.
Community Services and Infrastructure	Community services and infrastructure includes housing and temporary accommodations, health and emergency services, recreation and entertainment services and infrastructure, and provincial and municipal services and infrastructure. Community services and infrastructure have been selected as a VC for assessment because the in-migration of Project workers and their families, Project-related business growth, and Project activities will increase demands for community services and infrastructure during the construction and operation phases, which has the potential to exceed present capacities.
Land and Resource Use	Land and resource use has been included as a VC for assessment because of its contribution to the quality of life and the livelihoods of local stakeholders.
Heritage Resources	Heritage resources are human and natural resources created by activities from the past that remain to inform present and future societies of that past. Heritage resources include archaeological, architectural and historical, and paleontological resources. Heritage resources have been selected as a VC to meet regulatory requirements and in recognition of the interest of provincial and federal agencies who are responsible for the effective management of these resources and potentially affected Indigenous communities and stakeholders that have an interest in the preservation and management of heritage resources related to their history and culture.

Table 5-2 Rationale for Selection of Proposed Valued Components

Proposed Valued Component	Rationale for Selection
Traditional Land and Resource Use	Traditional land and resource use has been selected as a VC because of the potential for the Project to affect traditional activities, sites and resources identified by Indigenous communities.
Human Health	Human health has been selected as a VC because of the inherent importance to the wellbeing of humans and the natural environment, and regulatory requirements.

Potential Mitigation and Environmental Management Measures

Potential mitigation and environmental management measures have been developed for all VCs based on preliminary Project planning and design. These mitigation measures will be considered and refined as Project design and engineering progress, and will be informed by the outcomes of the EA process (including the results of EA-related modelling, as well as the results of public and Indigenous engagement carried out in support of the EA).

Opportunities for the reduction of potential adverse environmental effects are being and will continue to be considered in the design and engineering of Project components and the planning, scheduling, and carrying out of activities during all phases of the Project. Currently proposed mitigation measures are anticipated to result in compliance with applicable environmental legislation and regulatory requirements, including the *Fisheries Act* and MBCA.

Preliminary plans for mitigation and environmental management include development and implementation of the following Project-specific environmental management and monitoring plans, and consultation with applicable federal and provincial regulators and engagement with potentially affected Indigenous communities regarding these plans:

- Air Quality Management Plan and GHG Management Plan.
- Beaver Dam and Beaver Activity Management Plan.
- Bird Nest Mitigation Plan (if activities that could result in incidental take cannot be avoided).
- Closure Plan.
- Emergency Response and Spill Prevention and Contingency Plans.
- Erosion and Sediment Control Plan.
- Explosives Management Plan.
- Fish Habitat Offsetting Plan (if serious harm to fish that are part of or support a CRA fishery cannot be avoided).
- Groundwater Monitoring Plan.

- Surface Water Monitoring and Management Plan.
- Vegetation Management Plan and Weed Management Plan.
- Waste Management Plan.
- Wildlife Monitoring and Management Plan.

Alamos will plan for communication of Project activities, locations and timing throughout construction, operation, and closure to affected Indigenous communities, land and resource users, interest groups, the provincial government, and local authorities leading up to construction and throughout the life of the Project.

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2015b. MCFN member and local resource user. Conversation with Environmental Biologist, Stantec Consulting Ltd., Winnipeg, Manitoba, April 14, 2015.

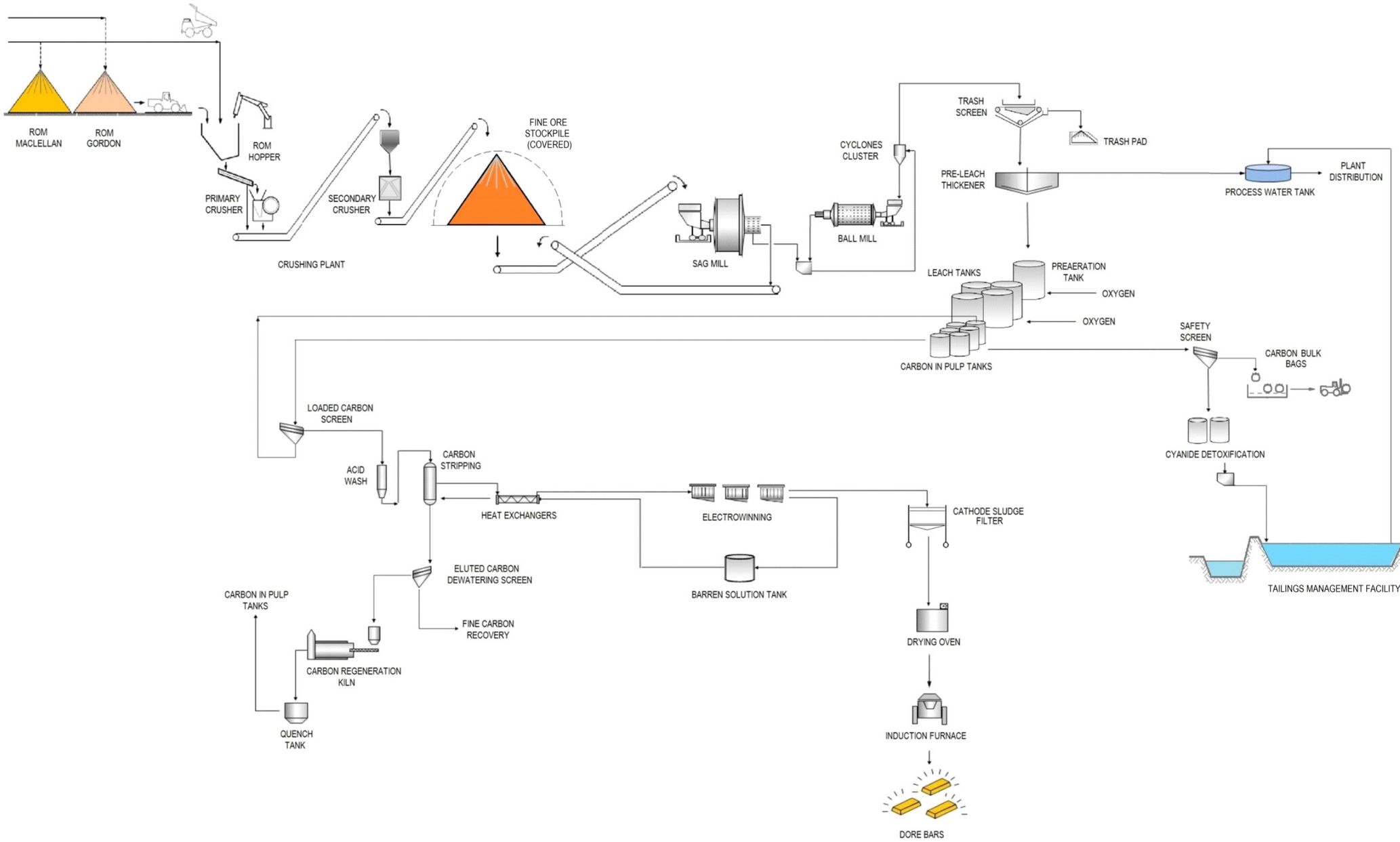
2015c. Local resource user and outfitter. Conversation with Environmental Biologist, Stantec Consulting Ltd., Winnipeg, Manitoba, April 13, 2015.

2015d. Chief Administrative Officer, Town of Lynn Lake, Manitoba. Email to Socio-economic Analyst, Stantec Consulting Ltd., Montreal, Québec, August 18, 2015.

2015e. Manager, Lynn Lake Hospital and Leaf Rapids Health Center, Manitoba. Telephone call with Socio-economic Analyst, Stantec Consulting Ltd., Montreal, Québec, August 19, 2015.

2015f. Chief, Marcel Colomb First Nation, Manitoba. Telephone call with Socio-economic Analyst, Stantec Consulting Ltd., Montreal, Québec, September 8, 2015.

Appendix A FIGURE AND MAPS



ALAMOS GOLD INC.

Ausenco

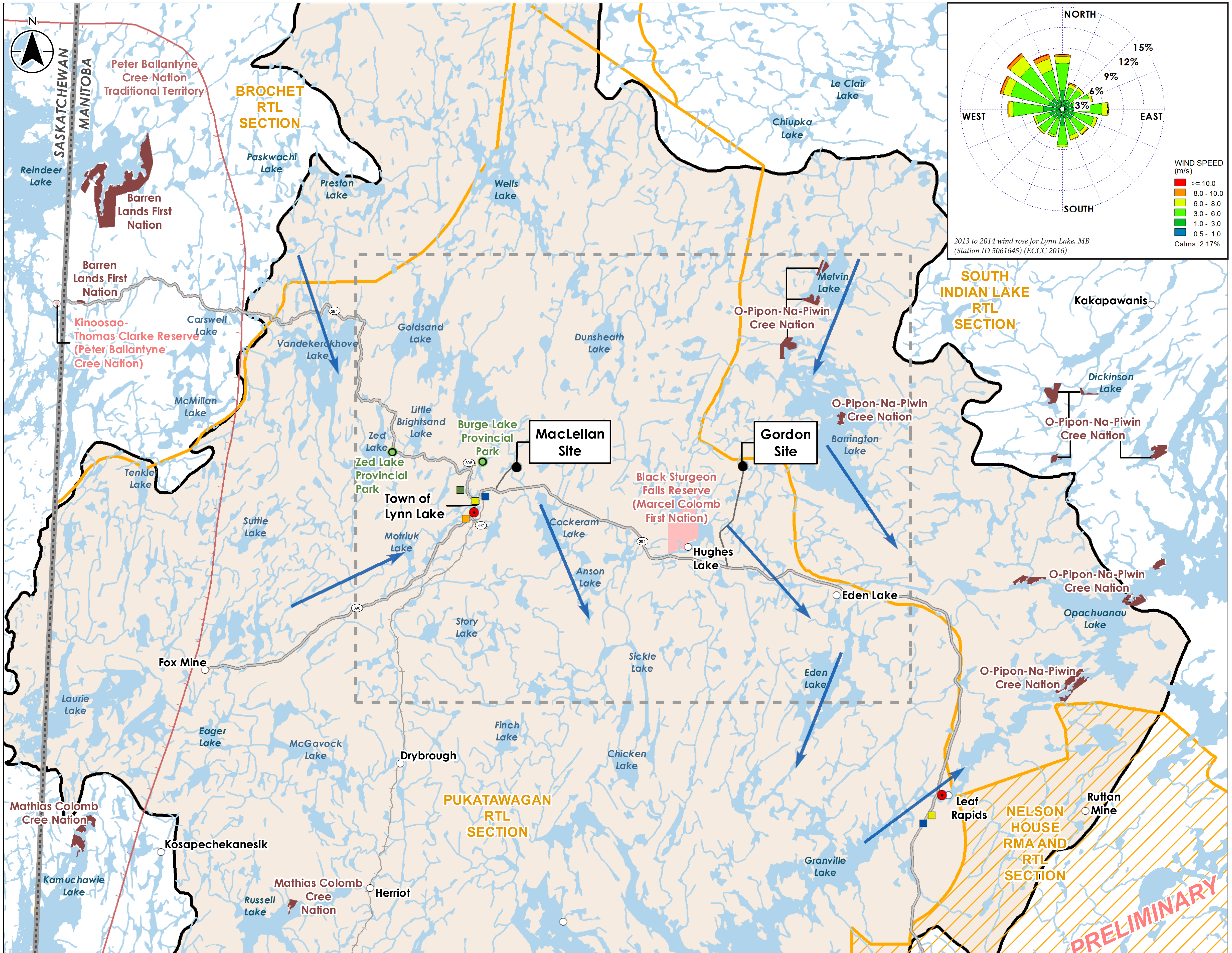
PROJECT

LYNN LAKE GOLD PROJECT

TITLE

CONCEPTUAL PROCESS FLOW DIAGRAM

Figure 1: Conceptual Process Flow Diagram for Ore Mining and Processing Plant



Stantec

Landbase

- Project Mine Site
- General Project Area
- First Nation Reserve
- Treaty Land Entitlement (TLE) Site
- Peter Ballantyne Cree Nation Traditional Territory
- Access Road
- Provincial Road
- Community/Locality
- Provincial Park
- Manitoba Métis Federation (MMF) - Métis Local
- Surface Water Flow Direction
- Granville Lake Watershed
- Registered Trapline (RTL) Section
- Nelson House Resource Management Area (RMA)

Federal Land

- Environment Canada
- RCMP
- Canada Post
- Lynn Lake Airport

0 10 20 Kilometres

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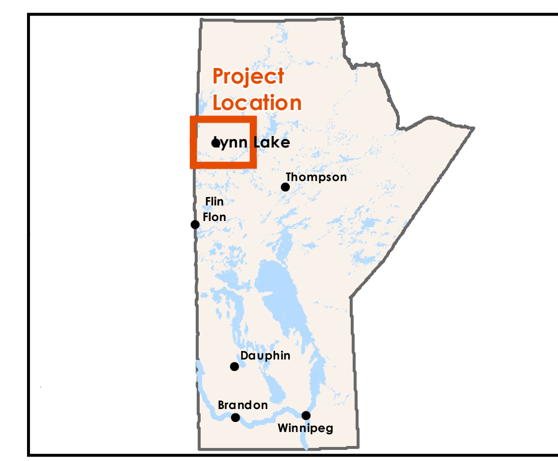
Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base features provided by Government of MB & Government of CND.



Project Location 111473000
MacLellan and Gordon
Lynn Lake, Manitoba

Prepared by AC on 2017-06-20
Technical Review by KM on 2017-06-20

Client/Project

LYNN LAKE GOLD PROJECT
PROJECT DESCRIPTION

Map No.
1

Title
Overview Map

Stantec

Historical Mine Infrastructure

Existing Access Road

Existing Infrastructure Associated with Historical Mine

0 0.5 1 Kilometres

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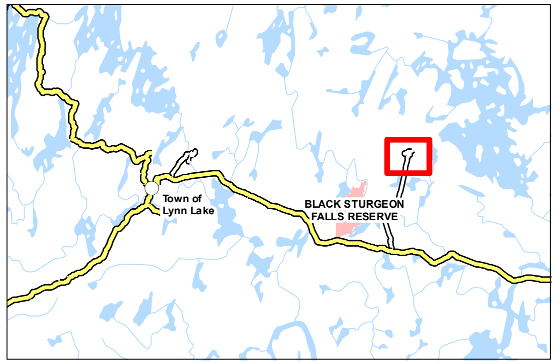
Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base features provided by the Government of Manitoba and the Government of Canada.
3. Imagery: SPOT-7 imagery, BlackBridge Gemoatics Corp. July 2015.



Project Location 11440362

Gordon Site

Lynn Lake, Manitoba

Prepared by AC on 2017-06-16

Technical Review by AF on 2017-06-16

Client/Project

LYNN LAKE GOLD PROJECT

PROJECT DESCRIPTION

Map No.

2

Title

Historical Mine - Gordon Site

PRELIMINARY

DOT LAKE

ACCESS ROAD

PR391

KEEWATIN RIVER

Core Racks

Maintenance Building

Storage Building

Core Racks

Core Rack

Headframe/ MacLellan Shaft

Pump House

Office

Storage Building

Waste Rock Storage Area

Entrance Ramp

Overburden Rock Storage Area

Escapeway

Sewage Lagoon and Settling Pond

Polishing Pond

EAST POND

N

Stantec

Historical Mine Infrastructure

Existing Access Road

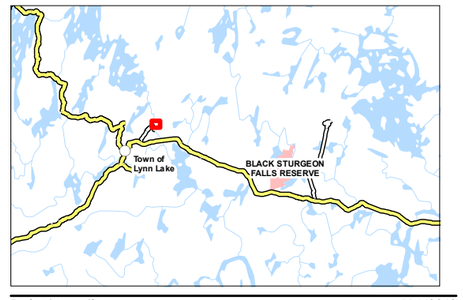
Existing Infrastructure Associated with Historical Mine

0 100 200 Metres

1:5,000 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base features provided by the Government of Manitoba and the Government of Canada.
3. Imagery: SPOT-7 imagery, BlackBridge Gemoatics Corp. July 2015.



Project Location
MacLellan Site
Lynn Lake, Manitoba

11440362

Prepared by AC on 2017-06-16
Technical Review by AF on 2017-06-16

Client/Project

LYNN LAKE GOLD PROJECT
PROJECT DESCRIPTION

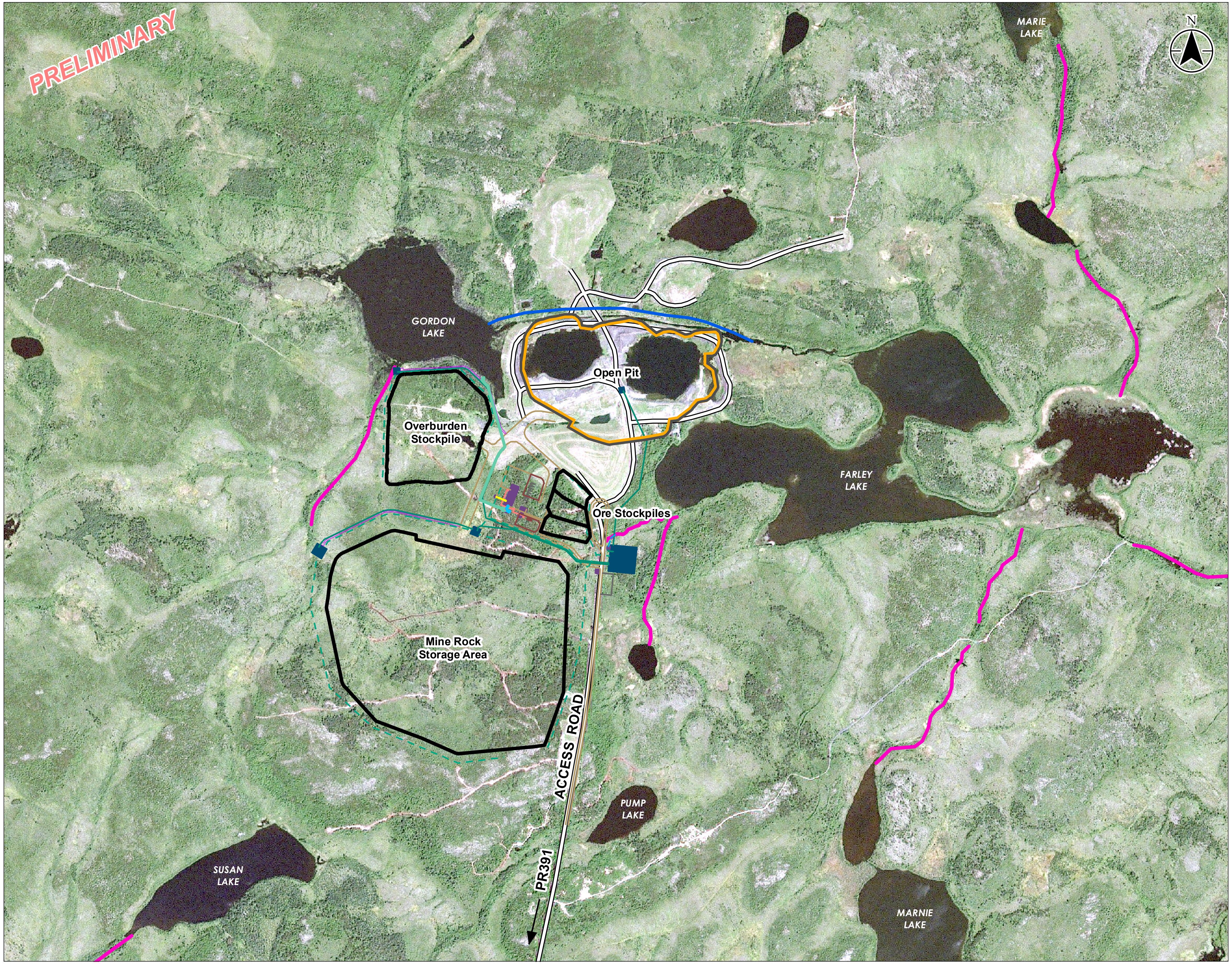
Map No.

3

Title

Historical Mine - MacLellan Site

G:\...\GIS Project Folder\11440293 ArcGIS Figures\Project Description\Proj Description Summary Maps\ Historical Mine Operations MacLellan 20170622.mxd - Revised: 2017-06-22 By: acampbell



Stantec

Project Components and Infrastructure

- Potential Open Pit
- Potential Infrastructure
- Building
- Collection Pond

Site Access

- Proposed Site Access Road
- Drainage Road

Other Infrastructure

- Construction Temporary Facility
- Parking
- Diversion Ditch
- Fresh Water Pipe
- Sewer
- Potable Water
- Drainage Ditch - Clean water
- Drainage Ditch - Potentially Contaminated
- Drainage Pipe
- Fire Water

Study Area

- Fish-bearing Channel

Landbase

- Existing Access Road

0 250 500 Metres

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Notes

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2. Base features provided by the Government of Manitoba and the Government of Canada.
3. Imagery: SPOT-7 imagery, BlackBridge Gemoatics Corp. July 2015.

Project Location 11440362

Gordon Site
Lynn Lake, Manitoba

Prepared by AC on 2017-06-20
Technical Review by KM on 2017-06-20

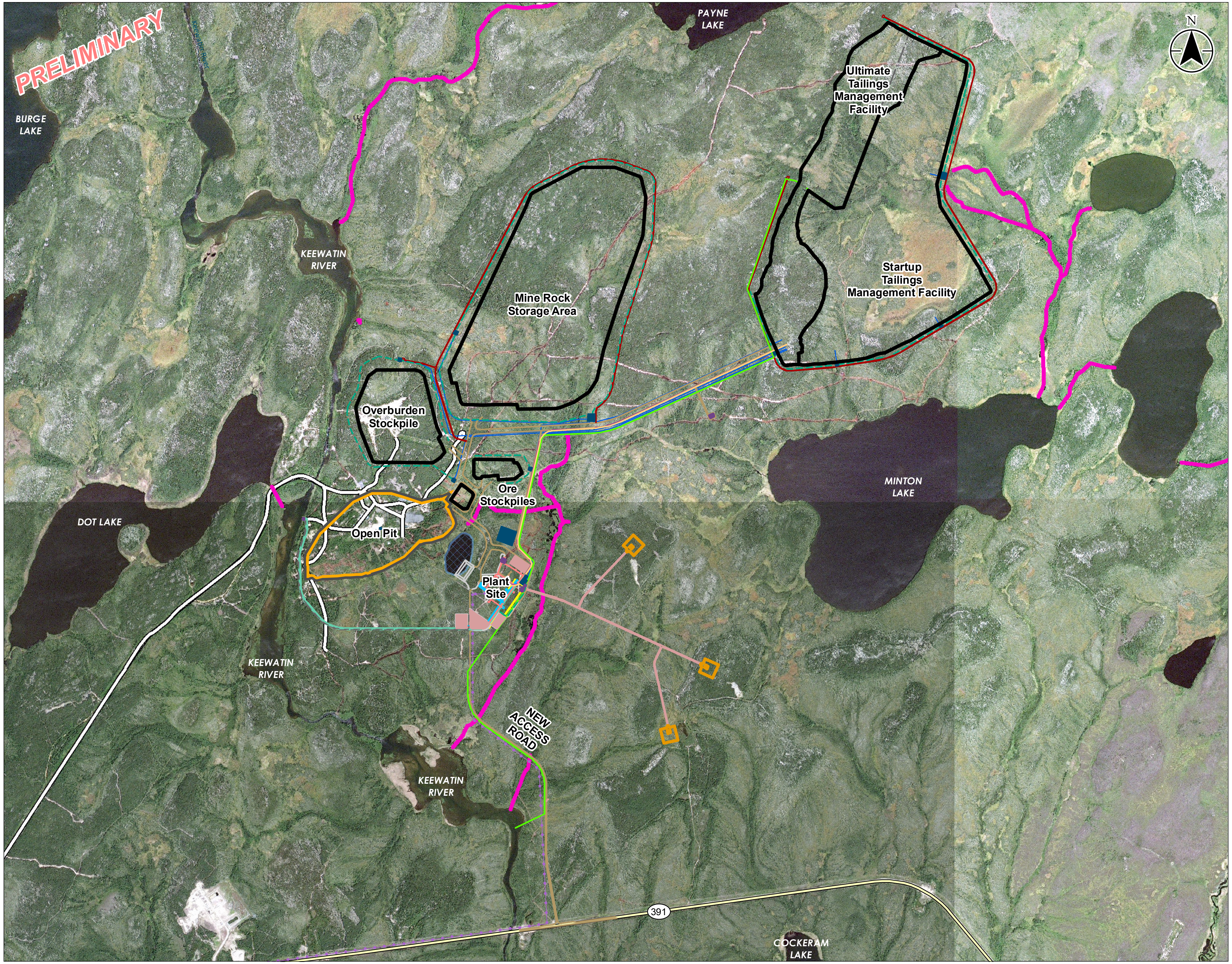
Client/Project

LYNN LAKE GOLD PROJECT
PROJECT DESCRIPTION

Map No.
4

Title

Preliminary General Arrangement of Project Infrastructure - Gordon Site



Stantec

Project Infrastructure

- Potential Open Pit
- Potential Infrastructure
- Construction Temporary Facility
- Collection Pond
- Building
- Infilled Waterbody

Site Access

- Potential Access Road
- Water Supply Road
- Drainage Sumps Access Road

Other Infrastructure

- TMF - Internal Dyke
- Construction Temporary Facility
- Potential Borrow Source
- Pad and Parking
- Drainage Ditch - Potentially Contaminated
- Drainage Pipe
- Fire Water
- Fresh water Pipe
- Pond
- Power Supply
- Reclaim Pipeline
- Sewer
- Tailings Pipeline
- Water Treatment Pipeline
- Potable Water

Study Area

- Fish-bearing Channel

Landbase

- Existing Access Road
- Provincial Road

0 0.5 1 Kilometres

1:27,500 (At original document size of 11x17)

Notes

1. Coordinate System: NAD 1983 UTM Zone 14N
2. Base features provided by the Government of Manitoba and the Government of Canada.
3. Imagery: SPOT-7 imagery, BlackBridge Geomatics Corp. July 2015.

Project Location 11440362
MacLellan Site
Lynn Lake, Manitoba

Prepared by AC on 2017-06-20
Technical Review by KM on 2017-06-20

Client/Project

LYNN LAKE GOLD PROJECT
PROJECT DESCRIPTION

Map No.
5

Title

Preliminary General Arrangement of Project Infrastructure - MacLellan Site