BACK RIVER PROJECT
Interim Closure and Reclamation Plan

Type B Development Works Water Licence

August 2017

Executive Summary

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 km southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet, and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed (Nunavut Water Regulations, Schedule 4).

The Project is comprised of two main areas with interconnecting winter ice roads (WIR): Goose Property (Section 3, base Figure 2) and the Marine Laydown Area (MLA) (Section 3, base Figure 3) situated along the western shore of southern Bathurst Inlet. The majority of annual resupply will be completed using the MLA, and an approximately 160 km long WIR will interconnect these sites.

The Feasibility Study for the Project, completed in June 2015, identified the positive economic viability and potential of the Project. The mine plan reflects an estimated 10 year operating mine life based on currently identified ore reserves, with a total ore feed of 19.8 million tonnes to a single process plant at the Goose Property. The life of the Project, from Mobilization and Construction to Operations and Closure, and Post-Closure, is expected to be 27 years.

Mobilization and Construction activities could begin in Q1 of 2018 with the staging of materials at the MLA, followed by three years of construction of the Goose Property infrastructure. For the purpose of this application, the first year of production is termed "Year 1". Production (Operations Phase) will carry on for 10 years followed by Closure activities (up to eight years). It should be noted that the Operations Phase may be extended beyond 10 years should additional mineral deposits become economical to be developed. Sabina will continue Post-Closure monitoring until closure objectives have been achieved.

The Project is subject to the regulatory requirements of the Nunavut Agreement and the N*unavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA or Act), and as such is required to obtain a project certificate from the Nunavut Impact Review Board (NIRB) and a Type A Water Licence (Application) from the Nunavut Water Board (NWB) to allow for mine development and mining of the Project. Sabina recently completed public hearings related to the environmental review and assessment of the Project and the NIRB recommendation has been forwarded to the Minister. The Ministerial decision is pending.

The regulatory framework provided in the Nunavut Agreement, *Nunavut Project and Planning Assessment Act* (NuPPA) and NWNSRTA allows for interim, short-term approvals for water uses related to exploration or development work for a proposal under development impact review. The NWB is not restricted from issuing an interim, short-term period water license for development work related to the Project. Provided the scope of works being considered for development works are being considered by the NIRB as part of the review of the Project.

Sabina is submitting this Type B Water Licence application and supporting documents (Application) for proposed development works, as well as supporting ongoing exploration and baseline data collection related to the Project. Sabina believes the scope of activities proposed for this Application are consistent with scope identified in the Project Proposal submitted to the NIRB for review. Sabina understands the Application can be processed as an interim, short-term approval consistent with Article 13.5.5 of the Agreement.

Construction scheduling and implementation for the Project is dependent upon, and restricted by, the seasonal sealift to support mobilization of supplies and equipment. By implementing a development permitting approach, Sabina and the Project could yield substantial scheduling gains. The securing of a Type B Water Licence would allow for development, construction, site preparation, and mobilization

work to begin potentially in Q1 of 2018, following issuance of the Project Certificate and while awaiting the Type A Water Licence. The alternative, which would involve Sabina waiting up to a year to receive a Type A Water Licence before starting any construction would have a significant impact on the overall project schedule and the economic feasibility of the Project.

Sabina has identified specific development activities that would be beneficial in achieving the overall project schedule. The proposed new development works requested for consideration include the following:

GOOSE PROPERTY
Goose Exploration Camp Operation
Ice Airstrip Construction and Operation
Mobilize Fuel, Equipment, and Supplies
Winter Ice Road Construction and Operation
Operate Airstrip Quarry
Operate Umwelt Quarry
Locate Temporary Fuel Storage
Construct All-weather Service Roads and Water Crossings
Construct Goose Plant Site and Fuel Storage Area Pad
MARINE LAYDOWN AREA
Ice Airstrip Construction and Operation
Mobilize Fuel, Equipment, and Supplies (Air)
Upgrade Temporary Exploration Camp
Operate MLA Quarry
Construct All-weather Service Roads, Laydown Areas, and Fuel Storage Area
Mobilize Additional Fuel, Equipment, and Supplies (Vessels)
Install One Steel Bulk Fuel Tank

The overall goal of closure is to return the proposed mine site and affected areas to viable and, wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and with human activities. The overall closure goal is supported by the four closure principles of: physical stability, chemical stability, no long-term active care requirements, and compatibility with future land uses for each component of the Project.

In accordance with NWNSRTA, Sabina is required to furnish and maintain security with the Minister, in a form determined by the Regulations or satisfactory to the Minister. For the NWB to be able to issue a licence, Sabina must satisfy the Board that the company has the financial ability to adequately implement mitigation measures and apply any costs associated with closing or abandonment of the undertaking.

This document provides the closure and reclamation approach proposed by Sabina and an estimate of financial liability for the site as it pertains to the facilities and infrastructure related to Type B development activities of the Project to be carried out in advance of receipt of a Type A Water Licence.

BACK RIVER PROJECT
INTERIM CLOSURE AND RECLAMATION PLAN

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1. Introduction

The Back River Project (the Project) is a proposed gold project owned by Sabina Gold & Silver Corp. (Sabina) within the West Kitikmeot region of southwestern Nunavut. It is situated approximately 400 km southwest of Cambridge Bay, 95 km southeast of the southern end of Bathurst Inlet, and 520 km northeast of Yellowknife, Northwest Territories. The Project is located predominantly within the Queen Maud Gulf Watershed (Nunavut Water Regulations, Schedule 4).

The Project is comprised of two main areas with interconnecting winter ice roads (WIR): Goose Property (Section 3, base Figure 2) and the Marine Laydown Area (MLA) (Section 3, base Figure 3) situated along the western shore of southern Bathurst Inlet. The majority of annual resupply will be completed using the MLA, and an approximately 160 km long WIR will interconnect these sites.

The MLA is located on Inuit Owned Land (IOL). The Goose Property is predominately located on IOL, except for the southern portion, which is located on Crown Land. A northern portion and a southern portion of the WIR connecting the MLA and the Goose Property are located on Crown Land.

The Project is 100 % owned by Sabina. All rights, title, interests, liabilities, and obligations for the Project rest with Sabina. In 2009, Sabina acquired the Project from Dundee Precious Metals for a total acquisition cost in the order of $29.3 million.

The Feasibility Study for the Project, completed in June 2015, identified the positive economic viability and potential of the Project. The mine plan reflects an estimated 10 year operating mine life based on currently identified ore reserves, with a total ore feed of 19.8 million tonnes (Mt) to a single Process Plant at the Goose Property. The milling rate will be approximately 6,000 tonnes per day. The life of the Project, from Mobilization and Construction to Operations and Closure, and Post-Closure, is expected to be 27 years.

Mobilization and Construction activities could begin in Q1 of 2018 with the staging of materials at the MLA, followed by three years of construction of the Goose Property infrastructure. For the purpose of this application, the first year of production is termed “Year 1”. Production (Operations Phase) will carry on for 10 years followed by Closure activities (up to eight years). It should be noted that the Operations Phase may be extended beyond 10 years should additional mineral deposits become economical to be developed. Sabina will continue Post-Closure monitoring until closure objectives have been achieved.

The Project includes several mineral deposits at the Goose Property: Umwelt, Llama, Echo, and Goose Main. Ore will be mined using conventional open pit and underground methods and trucked to the Process Plant. Waste rock will be stored in several designated waste rock storage areas (WRSAs) on the surface or backfilled in mined out workings. Tailings from the Process Plant will first be stored in a Tailings Storage Facility (TSF) located near the Process Plant and then backfilled in mined out open pits.

Fifty-nine (59) Mt of mining waste rock and 5.3 Mt of overburden are expected to be produced during the life of mine, for a total of 64.3 Mt of waste. Approximately 19.8 Mt of tailings will be produced.

The Project is subject to the regulatory requirements of the Nunavut Agreement and the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* (NWNSRTA or Act). As such, the Project is required to obtain a project certificate from the Nunavut Impact Review Board (NIRB) and a Type A Water Licence (Application) from the Nunavut Water Board (NWB) to allow for mine development and mining of the Project. Sabina recently completed public hearings related to the environmental review and assessment

of the Project and the NIRB recommendation has been forwarded to the Minister. The Ministerial decision is pending.

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Sabina is submitting this Type B Water Licence application and supporting documents (Application) for proposed development works, as well as supporting ongoing exploration and baseline data collection related to the Project. Sabina believes the scope of activities proposed for this Application are consistent with scope identified in the Project Proposal submitted to the NIRB for review. Sabina understands the Application can be processed as an interim, short-term approval consistent with Article 13.5.5 of the Agreement.

Construction scheduling and implementation for the Project is dependent upon, and restricted by, the seasonal sealift to support mobilization of supplies and equipment. By implementing a development permitting approach, Sabina and the Project could yield substantial scheduling gains. The securing of a Type B Water Licence would allow for development, construction, site preparation, and mobilization work to potentially begin in Q1 of 2018, following of issuance of the Project Certificate and while awaiting the Type A Water Licence. The alternative, which would involve Sabina waiting up to a year to receive a Type A Water Licence before starting any construction would have a significant impact on the overall project schedule and the economic feasibility of the Project.

Sabina has identified specific development activities that would be beneficial in accelerating the overall project schedule. These facilities are listed in Section 3 and the closure and reclamation of these facilities along with an estimate of financial liability are provided in this document.

2. Regulatory Context

A detailed overview of the legislative and regulatory requirements are provided in Section 2 of the Main Application Supporting Document.

This Type B Water Licence Application has been prepared in accordance with specific legislative requirements outlined in the Nunavut Agreement, the NWNSRTA, the Nunavut Water Regulations, and where applicable the NuPPA. For a full listing of regulatory permits, authorization, or licenses for the Project development refer to Appendix F of the Main Application Supporting Document.

3. Scope of Development Works

Development works associated with the Sabina's Goose Property and the MLA are summarized below. Sabina believes the development work exceptions are appropriate as the activities:

- Facilitate scientific research and ongoing baseline data collection within the defined project area to support where possible commitments made for the Project under Review;
- Will allow for continued in depth exploration and additional sampling; and
- Facilitate the limited transport and storage of equipment and materials related to the project, in recognition of the seasonal constraints imposed by the arctic conditions. This includes: the transport of fuel, construction of winter roads/trails and temporary airstrips and temporary onshore offloading facilities, the short-term storage of fuel, equipment and materials, the establishment of storage facilities and the related use of existing or new quarry and borrow sources.

The scope of development works is provided in Section 3 of the Main Application Supporting Document. In summary, the following development works are proposed (base Figures 2 and 3):

3.1 GOOSE PROPERTY DEVELOPMENT WORKS

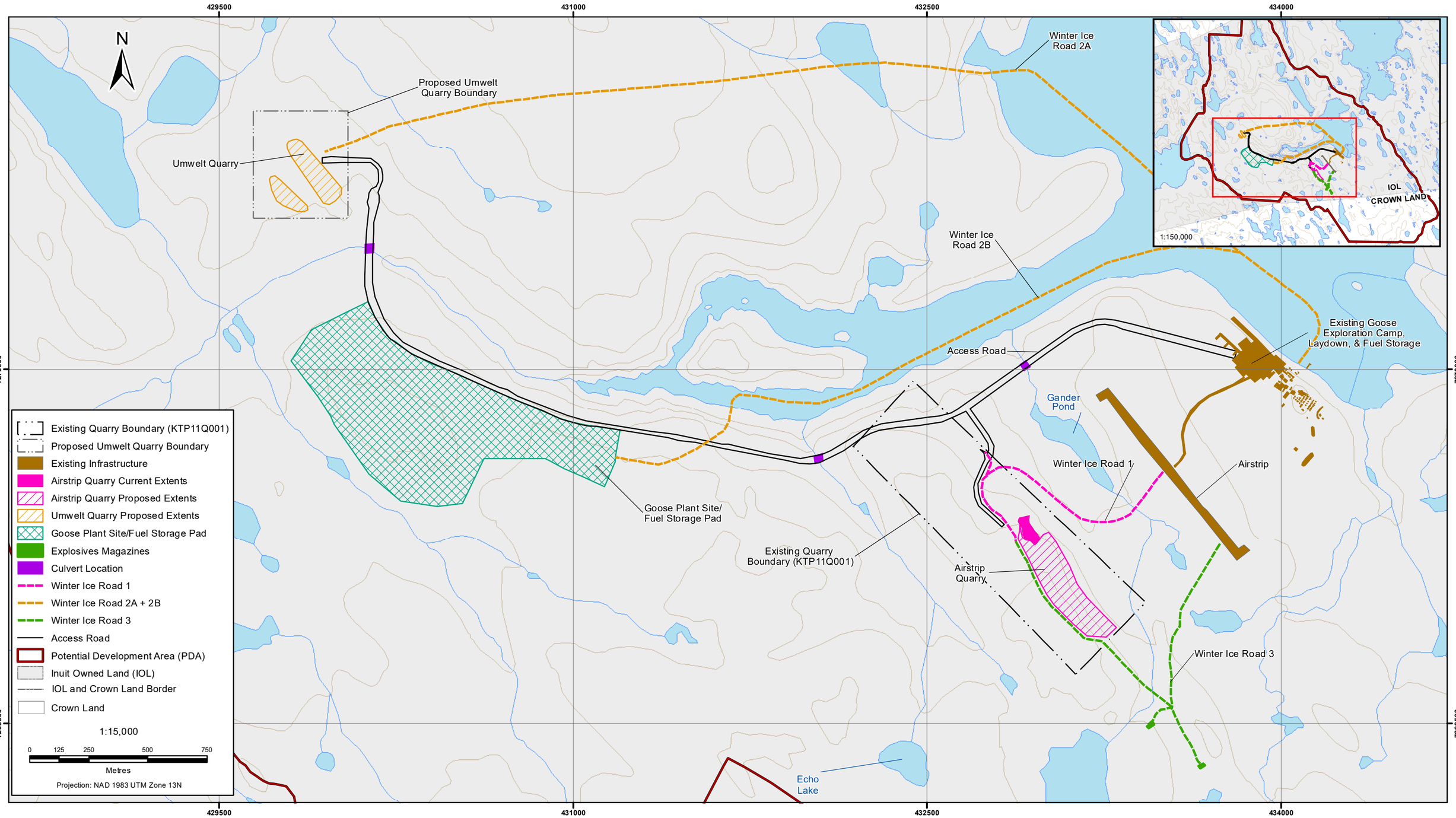
Activities and works already scoped and approved under the existing NWB Type B Water Licence 2BE-GOO1520 include:

- Goose Exploration Camp and infrastructure operation;
- Ice airstrip construction and operation;
- Equipment, fuel, and supplies mobilization;
- Winter ice road construction and operation;
  - Goose Exploration Camp to Airstrip Quarry Winter Ice Road;
- Airstrip Quarry operation; and
- Temporary fuel cache storage.

These approved activities have been included within this application document to provide clarity on overall proposed activities; however, do not require additional authorization. For existing permits, authorizations, and approvals refer to Section 2.3.1 of the Main Application Supporting Document.

Proposed new development works being requested for consideration in this Application include:

- Winter ice road construction and operation;
  - Goose Exploration Camp to Umwelt Quarry Winter Ice Road;
  - Goose Exploration Camp to Explosives Storage Winter Ice Road;
- Umwelt Quarry operation and expansion of the Airstrip Quarry;
- All-weather service road construction and operation, including associated water crossings; and
- Goose Plant Site and Fuel Storage Area Pad initial construction.



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Goose Property Area
Potential Development Area and Layout
Type B Water Licence

base Figure 2

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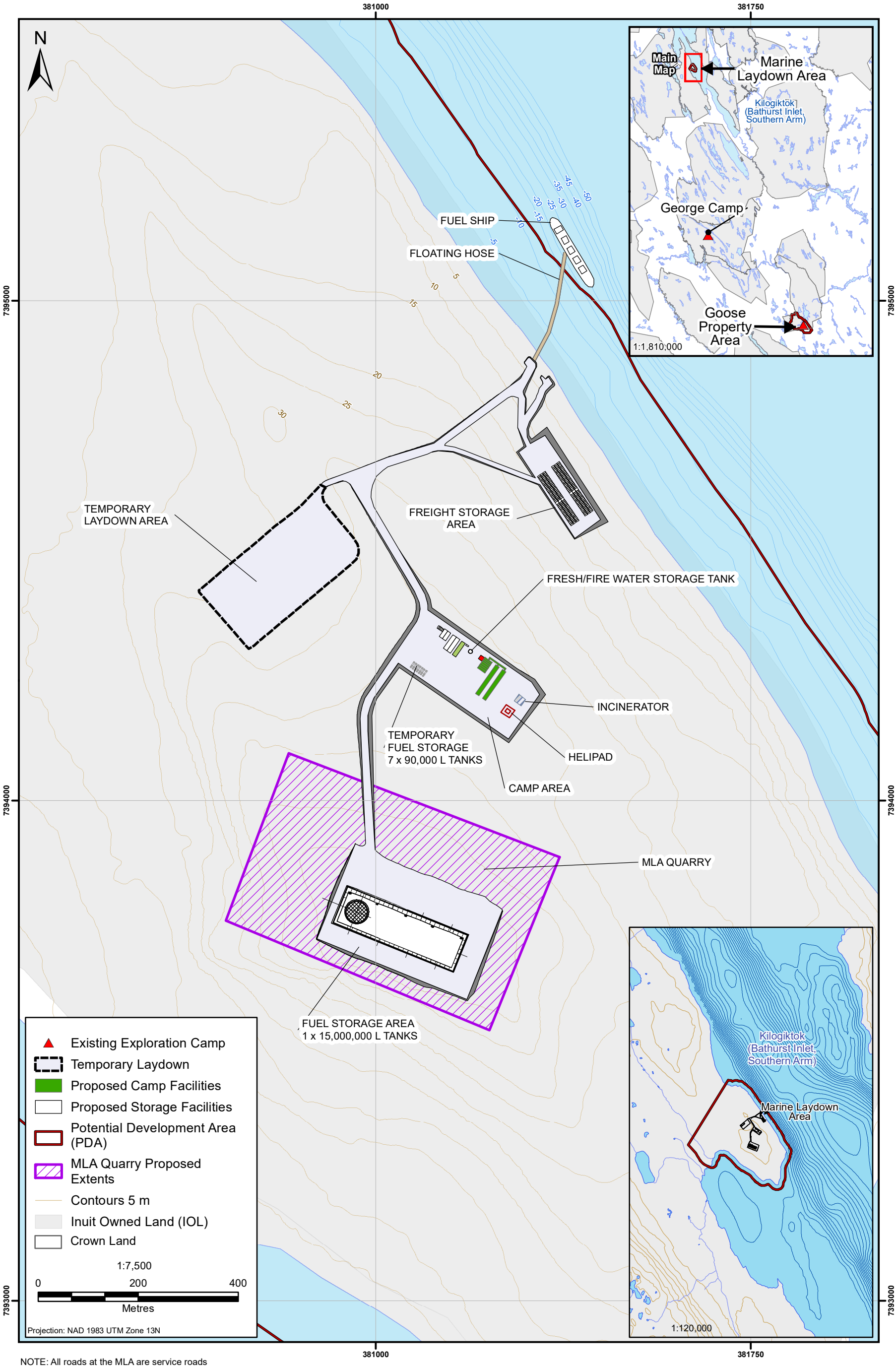

NOTE: All roads at the MLA are service roads

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Marine Laydown Area
Potential Development Area and Layout
Type B Water Licence

base Figure 3

3.1.1 Winter Ice Roads

Winter ice roads, totaling approximately 9 km in length, will be required to connect and access the proposed quarries at the Goose Property. These WIRs will allow development works to commence in the winter season, reducing potential environmental effects by avoiding any potential overland rutting or gouging. For additional information related to environmental baseline and effects refer to Section 5 of the Main Application Supporting Document. Efforts will be made to limit distances developed by utilizing one WIR to access multiple locations, or by utilizing other infrastructure (i.e., the permanent airstrip) to shorten distances. The WIRs would be used to temporarily connect three key areas (base Figure 2):

1. Goose Exploration Camp to Airstrip Quarry (Winter Ice Road 1): This WIR will provide continued access to the existing quarry and source material needed for development works. Construction and operation of this WIR is currently a permitted activity under water licence 2BE-GOO1520, and all planned activities will be consistent with activities undertaken in previous years. No additional water usage is currently anticipated.
2. Goose Exploration Camp to Umwelt Quarry/Goose Plant Site (Winter Ice Road 2a/2b): This WIR will provide new access to Umwelt Quarry/Goose Plant Site and source material needed for development works.
3. Goose Exploration Camp (or other WIR) to Explosives Storage (Winter Ice Road 3).

Consistent with WIR construction under 2BE-GOO1520, all ice roads will be constructed using the Government of Northwest Territories (GNWT) published Northern Land Use Guidelines (GNWT 2015).

3.1.2 Quarries/Borrow Sources and Overburden

Two quarries have been identified for use at the Goose Property: the existing quarry next to the airstrip (Airstrip Quarry) incorporated within 2BE-GOO1520, and a new quarry located within the footprint of the future Umwelt open pit (base Figure 2). Up to 550,000 m^3 of rock will be required to support development works and this material will be extracted from one or both of these quarries. Sabina does not anticipate the total volume of rock extracted from one or both quarries however, to exceed 550,000 m^3.

Sabina currently holds a Quarry Permit Agreement (KTP11Q001) with the landowner, the KIA, for the existing Airstrip Quarry at the Goose Property. The coordinates of the existing and proposed quarries are presented in Table 3.1-1. An amendment will be sought from the KIA for the Goose Property's Airstrip Quarry Permit Agreement and a new agreement will be sought to develop a rock quarry at the Umwelt deposit.

Table 3.1-1. Summary of Existing and Proposed Quarries

Aggregate Source	Permit	Material	Approved Volume (m^3)	Maximum Requested Volume (m^3)[(a)]	Permit Area Boundaries
Airstrip Quarry (Existing Quarry)	KTP11Q001/ Type B Water Licence 2BE-GOO1520	Rock	125,000	550,000	See QMP
Umwelt Quarry	In application	Rock	0	550,000	See QMP

(a) Combined maximum volume from Airstrip Quarry and Umwelt Quarry not to exceed total volume of 550,000 m^3

Detailed geochemical characterization studies to assess the metal leaching/acid rock generation (ML/ARD) potential of quarry rock associated with the Goose Property was carried out; results can be found in the Geochemical Characterization Report (FEIS Volume 2, Appendix V2-7D). The testing program included acid-base accounting (ABA) and trace element analyses on 40 samples from the Airstrip Quarry, and 16 samples from the Umwelt Quarry.

The Airstrip Quarry is mainly comprised of turbiditic meta-sedimentary rocks (greywacke and mudstone) with minor amounts of banded iron formation, large intrusive gabbro dykes, and smaller felsic to intermediate dykes. Results indicate that rock from the Airstrip Quarry has a variable potential for ARD. Based on these results, Sabina has committed to complete further testing within the existing quarry footprint to further delineate potentially acid generating (PAG) materials in advance of, or concurrent with, sourcing additional material from this quarry. Only non-potentially acid generating (NPAG) quarry rock will be used for construction. For additional information, refer to the Quarry Management Plan provided as a supplement document to the Application.

The Umwelt Quarry locations were selected to be entirely within the upper greywacke unit. The majority of these unit samples are classified as NPAG or low sulfide (S) material with a limited potential for ARD. Therefore, no special management measures are required at this location.

The existing Airstrip Quarry has minimal overburden and the same condition is expected in the expansion area. Any overburden generated and not used by the Project will be placed in stable stockpiles either above the highwall or along the toe of the quarry. To develop the Umwelt Quarry, it will be necessary to strip and stockpile the overburden. Though the ground is relatively flat across the top of the Umwelt Quarry, the stockpile will be positioned on the up gradient side of the quarry so that the finished quarry can serve to collect runoff from the stockpile. Since the overburden may be frozen, it may become necessary to blast it to facilitate its removal. Some slumping of the overburden pile may be expected as it thaws and as water is released from the soil. The overburden stockpile will likely be constructed in a windrow fashion to an approximate maximum height of 6 m and sloping outward. This configuration could be modified based on observations in the field.

3.1.3 All-weather Service Road and Associated Water Crossings

Sabina proposes to construct all-weather service roads for the development works. This road alignment, totaling approximately 6 km in length, is required to connect the existing Airstrip Quarry, the new Umwelt Quarry, the Goose Plant Site pad, and the existing Goose Exploration Camp.

The service roads will be constructed with run-of-quarry rock placed directly onto the tundra to preserve the permafrost. A layer of graded surfacing material will be placed to provide a protective trafficking layer. Construction materials will consist of geochemically and geotechnically suitable rock sourced from the existing quarry and/or Umwelt Quarry.

Stream flow across the service roads will be conveyed using appropriately sized culverts. The service roads will have a maximum grade: 10% for short lengths, 6% normal and travelling surface up to 8 m for development works. The major culverts will be designed to convey flows for 1-in-100-year event.

3.1.4 Goose Plant Site and Fuel Storage Area Pad Initial Construction

Once service roads to the Goose Plant Site area are established, construction material will be sourced by cutting bedrock material to create a suitable area for the Goose Plant Site pad and Fuel Storage Area pad; it is estimated that up to 300,000 m^3 of rock fill material will be required.

Ground conditions for design and engineering of MLA Site infrastructure has been informed by four geotechnical investigations from 2010 to 2015 including test pits, drill holes, thermistor installations, and a variety of laboratory and in-situ testing. Geotechnical design is also supported by ERM Rescan's 2014 Cumulative Permafrost Baseline Data Report which includes observations on active layer freeze-thaw cycle and active layer depth from 2007 to 2014. Refer to the Site-Wide Geotechnical Properties Report (FEIS Volume 2, Appendix V2-7C) for more detail.

It will be necessary to strip and stockpile the overburden to create the pad areas. The overburden material is expected to be used by the Project closure efforts. Overburden materials at the Goose Property generally consist of poorly sorted till material (glacial sediments) that appear highly weathered and contain mostly refractory minerals. Though the ground is relatively flat across the deposit, the stockpile will be positioned on the up gradient side of the pad so that the finished pad can serve to collect runoff from the stockpile. Since the overburden may be frozen and therefore blasted during removal, some slumping is expected as water is released from the soil. The overburden stockpile will likely be constructed in a windrow fashion to an approximate maximum height of 6 m and sloping outward. This configuration could be modified based on observations in the field.

3.2 MLA DEVELOPMENT WORKS

Activities and works at the MLA already scoped and approved under the existing NWB Type B Water Licence 2BE-GEO1520 include:

- Temporary Exploration Camp and infrastructure operation;
- Equipment, fuel, and supplies mobilization via cat-train; and
- Temporary fuel cache storage.

These approved activities have been included within this application document to provide clarity on overall proposed activities; however, they do not require additional authorization. For existing permits, authorizations, and approvals refer to Section 2.3.1 of the Main Application Supporting Document.

Proposed new development works at the MLA being requested for consideration in this Application include:

- Ice airstrip construction and operation;
- Equipment, fuel, and supplies mobilization (air);
- Upgrade Temporary Exploration Camp;
- Operate MLA Quarry;
- All-weather service road, laydown area, and bulk fuel storage area construction and operation;
- Additional equipment, fuel, and supplies mobilization (vessels); and
- Install one steel bulk fuel tank (not fill).

3.2.1 Ice Airstrip

The construction and operation of an ice airstrip on southern Bathurst Inlet will be required to supply the development works at the MLA. The MLA ice airstrip will be located as close to the MLA as possible, but the final location will depend on ice conditions and possible seal pup lairs. Consistent with ongoing ice airstrip construction and operation experience at Sabina's Goose and George Properties, it is anticipated that minimal water will be needed for ice airstrip construction at the MLA.

Although it is Sabina's understanding that the marine environment is outside the jurisdiction of the NWB, Sabina intends to utilize equivalent environmental protection measures which are in place for all on ice works at the Goose and George Properties. Water intakes, if required, will be equipped with screens to prevent the entrainment or impingement of fish in accordance with DFO Measures to Avoid Causing Harm to Fish and Fish Habitat (DFO 2013). If the construction commences in the seal pupping season, the

procedures described within the Wildlife Mitigation and Management Plan will be adhered to (Section 14.2 of the WMMP; Version 7, submitted with FEIS Addendum February 2017).

Equipment required for the construction of the ice airstrip will likely be mobilized to the MLA via cat train from Goose Property. Cat train operations are currently permitted under KIA LUP KTL304F049 and INAC LUPs N2010F0017 and N2011F0029, and all planned activities will be consistent with activities undertaken in previous years. Equipment may also be initially mobilized to the MLA by air equipped to land with skids on the unprepared marine ice.

3.2.2 Fuel, Equipment, and Supplies Mobilization

To commence development work at the MLA, fuel, equipment, and supplies will be brought to the MLA via the ice airstrip and by shipping using up to five vessels.

The equipment, materials, and fuel will be offloaded and initially stored at a temporary laydown area at the MLA prior to construction of the all-weather laydown area (base Figure 3). The Fuel will be initially mobilized to the MLA in nine approximately 70,000 L double walled fuel tanks. These tanks will be installed within tertiary Arctic-grade Insta-berms, and may be refilled throughout the development works. This temporary storage of fuel is required as permanent storage tanks are under construction. As built drawings will be provided within 90 days following installation.

A crusher, as well as supporting equipment, will be mobilized to allow for the initial development of all-weather service roads, laydown areas, and bulk fuel storage areas prior to the first sealift. A more detailed list of material and equipment can be found in a Table 3.2-1.

Table 3.2-1: Air Mobilization Inventory

Equipment / Material	Quantity
40 Person Soft Walled Camp	1
Camp Genset – 125kw	2
70,000 Fuel Tanks	9
Fuel Berms (80,000 L capacity)	9
Diesel Fuel	800,000 L
Incinerator	1
Mobile Crusher	1
Soft Walled Shop/Warehouse	1
Explosive Magazine – 20ft	3
Excavator	1
Haul Truck	2
Dozer – Cat D6T	1
Grader – Cat 140H	1
Air Track Drill	1
Compactor	1
Geomembrane Liner for Bulk Fuel Containment	1
Swamp Mats (if Required)	75

During the open water season, up to five vessels will be utilized to bring additional supplies, equipment, and fuel to the MLA for development work. Sabina will limit their shipping period to the open water season and not ship within the Nunavut Settlement Area after October 15 (except under unforeseen and exceptional events including consideration for vessel safety). All vessels utilized will be appropriate as defined by Transport Canada's Zone/Date System. Each vessel will be appropriately sized and will utilize lightering barges to bring the material from the vessel to the barge landing location.

An initial sealift will mobilize additional fuel to be stored in the already positioned nine 70,000 L fuel tanks mobilized via air, as well as steel for one 15 ML fuel tank. Additional supplies and equipment required for development works (i.e., MLA camp maintenance and quarry operations) will also be mobilized. Except for large equipment and fuel, materials arriving at the MLA will generally be housed in sea containers. If the all-weather service road to the MLA barge landing area is not constructed prior to vessel arrival, the MLA will be accessed using swamp mats provisionally placed directly onto the tundra to preserve the permafrost and protect the tundra from rutting and gouging. Once the equipment is stored on the all-weather laydown area, the swamp mats along the access corridor will be removed and stored for future use, or transported offsite with the outgoing barges.

After the initial sealift, additional vessels (up to 5 total) will arrive at the MLA between late August and early October carrying fuel and materials required for ongoing development work. Limited equipment and supplies required for future Project activities, such as the first WIR construction and construction of the Goose Property, will additionally be mobilized. The mobilization of this equipment and supplies is included in this Type B Water Licence Application; however, Sabina intends for the activities associated with this equipment to be completed under the future Type A Water Licence.

A more detailed list of materials to be mobilized to the MLA via the open water sealift can be found in Table 3.2-2.

Table 3.2-2: Additional Sealift Vessel Inventory

Equipment / Material	Quantity
Diesel Fuel	2,520,000 L
Camp Modules	15
Steel for 15 ML Steel Tank	1
Dozer – Cat D6T	1
Grader – Cat 140H	1
Air Track Drill	1
Compactor	1
Articulated Hauler	1
Excavator	1
Caterpillar Loader 966	1
Packer	1
Crew cab truck	1
Desalination Plant	1
Swamp Mats (8'x14')	550

3.2.3 Upgrade Temporary Exploration Camp

Sabina is currently authorized and operates a temporary exploration camp at the MLA, in accordance with NWB Water Licence 2BE-GEO1520. One of the first priorities of development works at the MLA will be to upgrade this existing temporary camp and its associated services and utilities. An approximate 40-person soft walled camp will be established. The MLA camp will continue to employ Pacto or incinerating toilets, and Pacto-waste, as well as acceptable food waste, paper waste and untreated wood products will continue to be disposed of in an incinerator. All greywater will continue to be discharged at a distance of at least 31 m above the ordinary high water mark of any waterbody, at a location where direct flow into a waterbody is not possible. These measures for management of waste are consistent with those authorized under Sabina's current water licence 2BE-GEO1520. No additional water usage or waste management is requested for camp services under 2BE-GEO1520 (Part C, Item 1).

3.2.4 Quarries/Borrow Sources and Overburden

Quarry operations (cut and fill) at the MLA will be completed by cutting bedrock material in the same area as the MLA Bulk Fuel Storage Area. It is estimated that up to 400,000 m^3 of aggregate sourced from the cut/fill balance will be required for development work, which is referred to as the MLA Quarry (base Figure 3). The extracted material will be used to build the all-weather service roads, laydown areas, and bulk fuel storage area.

Cut and fill operations will use explosives and the design, shape, and size of the blasts will be planned with safety and potential environmental effects being the most important consideration. Prior to the blast, all personnel and equipment will be moved to a safe distance and a check for wildlife will be completed. The blast will not be initiated until all setback requirements are met. For additional information refer to the Quarry Management Plan provided as a supplement document to the Application.

Preliminary geochemical characterization has been completed on surface outcrop samples and sandy gravel representing quarry material that will be excavated during initial development of the MLA Quarry. These samples were described as weathered quartzite conglomerate, quartz arenite/quartzite (sandstone) and sandy gravel. The test results showed that the materials have a negligible potential for ML/ARD. Sabina intends to complete additional sampling and testing in advance of, or concurrent with, development to characterize materials from greater depths. Only geochemically appropriate material will be used as construction material.

To develop the MLA Quarry, it will be necessary to strip and stockpile the overburden for potential use by the Project closure efforts. Though the ground is relatively flat across the top of the MLA Quarry, the stockpile will be positioned on the up gradient side of the quarry or beside the quarry so that the finished quarry can serve to collect runoff from the stockpile. Since the overburden may be frozen, and therefore blasted during removal, some slumping is expected as water is released from the soil. The overburden stockpile will likely be constructed in a windrow fashion to an approximate maximum height of 6 m and sloping outward. This configuration could be modified based on observations in the field.

3.2.5 All-weather Service Roads, Laydown Areas, and Bulk Fuel Containment Area

The development works require the construction of approximately 1km of various all-weather service roads, laydown areas, as well as the construction of at least one of the bulk fuel containment areas (Base Figure 3). Sabina intends to utilize, wherever possible, the same footprint for the development works as the full-scale MLA site layout as presented in the FEIS. Pending the outcome of a planned 2017 geotechnical program at the MLA (which is occurring post Type B application submission) and completion of Basic Engineering work, the MLA layout may be further enhanced. Although the layout may alter due to construction limitations or efficiencies, the activities at the MLA as presented will not change. Should

significant alterations be required to the proposed MLA layout, Sabina will provide the portions of the revised layout and any other relevant enhancements, to the NWB 60 days prior to construction.

The service roads will be constructed with run-of-quarry rock placed directly onto the tundra to preserve the permafrost. A layer of graded surfacing material will be placed to provide a protective trafficking layer. The service roads will have a maximum grade: 10% for short lengths, 6% normal and travelling surface up to 8 m for site preparation.

There are no streamflow interactions and therefore no proposed water crossings at the MLA. Sabina will require construction of an all-weather service road within 31 m of the ordinary high water mark of Bathurst Inlet to facilitate access to the barge landing area. Sediment and erosion control measures shall be implemented prior to and maintained during the construction and operation where necessary to prevent entry of sediment into marine water.

One 15 ML field erected fuel tank will be constructed at the MLA. Construction of the fuel tank and the fuel storage area and transfer facilities is proposed to occur under this Application; however, Sabina does not intend to mobilize fuel into this tank as part of this Type B Water Licence. The MLA Fuel Storage Area will be constructed in conformance with the Canadian Council of Ministers of the Environment (CCME) Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products (CCME 2003), and the *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (2008). Project fuel storage facilities will be designed to have bermed spill containment with capacity equal to the volume of the largest tank plus 10% of the volume of the remaining tanks, or 110% volume of the largest tank, whichever is greater. The fuel tank storage areas embankments (or bund) will be lined with HDPE for spill containment. The fuel storage areas will be provided with standard instrumentation and controls to monitor and safely manage the inventory in the tanks. For additional information related to the design of the fuel storage facilities, please see the Fuel Management Plan. Sabina is committed to provide detailed designs for construction of the 15 ML fuel storage and fuel transfer facilities at the MLA to the NWB at least 60 days prior to construction.

4. Closure and Reclamation Approach

Sabina estimates that development work could be initiated as early Q1 2018 subject to NWB approval of the Type B Application for development works and issuance of the Project Certificate.

Sabina acknowledges that the NWB may require the company to furnish and maintain security with the Minister, in a form determined by the Regulations or satisfactory to the Minister. As such, Sabina has provided this Closure and Reclamation Approach and Security Estimate (the Plan). The Plan includes an estimate of financial liability for development works and site preparation (see Section 7); however, Sabina would propose that the NWB defer full consideration of security of project liability to the Type A Water Licence, projected to be submitted to the NWB in September 2017.

In accordance with the Nunavut Mine Site Reclamation Policy, Sabina's financial security cost estimate for the development works requested in the Application for a Type B Water Licence has been developed assuming third party contractor rates, on the presumption that Sabina would be somehow unable to fulfill its closure and reclamation obligations, and that the government would be required to take over reclamation of the works.

The decision to implement the Type B closure and reclamation approach does not mean Sabina would abandon its current work program for which it holds valid authorizations, licenses, and permits. Therefore, Sabina proposes to defer security of the development components to the Type A Water Licence.

Should the development activities require the implementation of the reclamation and closure plans as outlined in Section 5 in advance of receipt of a Type A Water Licence, then the development works remediation and closure would be undertaken at the same time as current approvals for the Goose Property and MLA (refer to Section 2.3 of the Main Application Supporting Document for the Type B Application).

The closure and reclamation activities associated with the proposed Type B Water Licence development work will follow applicable KIA and federal/territorial guidelines and policies.

5. Closure and Reclamation Activities

Closure and reclamation of proposed development works described in Section 3 will include:

- All surface structures, machinery, and equipment will be disposed at an off-site landfill when they are no longer needed and after any hazardous material has been removed.
- Most of the mobile equipment will be disposed once the closure stage is complete. A small subset of equipment will be retained on-site for the Post-Closure Phase.
- Sabina will consider transferring the surface structures, machinery, and equipment to a third party, should there be such interest.
- Fluid hydrocarbons drained from equipment will be burned in the camps' incinerators where approved or shipped off-site to be disposed at a licensed facility.
- Any unused petroleum products will be burned in the camps' incinerators where approved. Unused chemicals will be sold, returned to suppliers or disposed by a licensed handler.
- All hazardous wastes will be removed from the site and transported to a licenced facility for disposal. Hazardous waste at Goose will be hauled to the MLA and then backhauled by sealift during the open water season to authorized waste disposal areas in southern Canada (as per Sabina's Hazardous Waste Management Plan). All waste material will be handled, stored, and transported in accordance with the Canadian and Territorial waste regulations.
- Fuel not required during the closure and reclamation activities will be sold, returned to suppliers, or incinerated in the camps' incinerators.
- Fuel tanks will be steam cleaned, cut-up, and disposed at an off-site landfill. The rinse water will be treated before disposal.
- An assessment will be carried out to identify areas where soils may be contaminated by hydrocarbons; contaminated soils will be excavated and placed in containers to be shipped off-site for remediation and disposal.
- All developed areas at each of the Project sites will be re-graded and contoured to remove uneven ground for public and wildlife safety, to reduce the potential for erosion, and to blend with the surrounding landscape. Cover materials may be required for erosion and dust control. It is anticipated that a succession of native plant species will naturally re-vegetate the surface over time.
- Air access to the MLA during Post-Closure monitoring will use float planes during summer or ice airstrip during winter.
- Air access to Goose Camp during Post-Closure monitoring will use will use the existing airstrip while it is available. After that, access will be by planes landing on Goose Lake (using floats during summer or skis or ice airstrip during winter).
- All-weather service roads:
  - Once the all-weather service roads are no longer required for Closure and Post-Closure activities, the culverts will be removed and the natural drainage will be restored.
  - The remaining all-weather service road sections (with no culverts) will be scarified, but will otherwise remain intact to ensure preservation of permafrost.

  - It is anticipated that a succession of native plant species will naturally revegetate the surface over time.
- Quarries/Borrow Sources and Overburden
  - All mobile and stationary equipment will be removed.
  - The overall reclamation objective for the quarry/borrow areas is to return the site to a condition that blends in with the existing topography and surrounding landscape. It is anticipated that a succession of native plant species will naturally revegetate the surface over time.
  - In the case of the Airstrip Quarry and MLA Quarry, no extraction will occur below water level and the area will be contoured to drain positively, so there will be no residual pond after the quarries are closed. The water quality of the runoff will be monitored.
  - Operation of the Umwelt Quarry will result in the formation of two closed depressions that will accumulate water over time. A wall of boulders will be constructed around the quarry to prevent inadvertent access to the flooded voids and warning signs will be posted. One small spillway will be excavated for each of the depressions to control the location and elevation of water discharge. The discharge water quality will be monitored.

Development of monitoring and maintenance programs is an iterative process in consultation with communities and regulators as the Project advances. Monitoring and maintenance of the reclaimed facilities will be carried out during development, Operations, and into Closure. Periodic inspections will be performed to visually assess the reclaimed areas.

Groundwater will be only sampled if site-specific conditions dictate during the Closure Phase. Surface water quality monitoring will be undertaken on the drainage from the MLA Quarry and the Goose Airstrip Quarry and Umwelt Quarry. This monitoring will be discontinued after three years if the results are satisfactory.

6. Schedule of Closure and Reclamation Activities

Sabina requests a term of at least one year to allow for construction of some basic infrastructure site preparation during the mobilization and development phase of the Project. Sabina is requesting the term of licence expiry be set "upon issuance of the Type A". Sabina is requesting that should a Type A Water Licence be issued for the Project in the future, that the Board incorporate the scope of this Type B Application/Licence into the Type A Water Licence.

Similar to the Term of Licence, Sabina also requests that, should a Type A Water Licence be issued for the Project in the future, that the Board incorporate the security required under the Development Type B Licence into the Type A Water Licence such that a "double bonding" for project activities of the same scope does not occur.

Sabina estimates that, if the Type A Licence was not issued, it would require one summer season to complete the site work noted in this plan. The equipment and material from Goose Camp would then have to be de-mobilized over the winter ice road to the MLA during the following winter for shipment at the start of the following summer shipping season. Sabina anticipates the Type A Water Licence will be issued, so this plan would not need to be implemented.

7. Estimate of Proposed Development Works Financial Liability

A permanent closure and reclamation financial security cost estimate for the proposed development works described in this plan has been prepared to a conceptual level using RECLAIM Version 7.0, March 2014 (Attachment A).

A summary of the financial security cost estimate for the pre-development works is provided in Table 7.1.

Table 7.1. Summary of the Financial Security Cost Estimate

SUMMARY OF COSTS				
CAPITAL COSTS	**COMPONENT NAME**	**COST**	**LAND LIABILITY**	**WATER LIABILITY**
QUARRY	Airstrip Quarry Expansion	$3,800	$0	$3,800
QUARRY	Umwelt Quarry	$18,763	$0	$18,763
QUARRY	MLA Quarry	$9,500	$0	$9,500
UNDERGROUND MINE		$0	$0	$0
TAILINGS FACILITY		$0	$0	$0
ROCK PILE		$0	$0	$0
BUILDINGS AND EQUIPMENT		$509,528	$0	$509,528
CHEMICALS AND CONTAMINATED SOIL MANAGEMENT		$222,750	$0	$222,750
SURFACE AND GROUNDWATER MANAGEMENT		$0	-	$0
INTERIM CARE AND MAINTENANCE		$0	-	$0
	SUBTOTAL: Capital Costs	**$764,341**	**$0**	**$764,341**
	PERCENT OF SUBTOTAL		**0%**	**100%**
INDIRECT COSTS		**COST**	**LAND LIABILITY**	**WATER LIABILITY**
MOBILIZATION/DEMOBILIZATION		$167,729	$0	$167,729
POST-CLOSURE MONITORING AND MAINTENANCE		$56,572	$0	$56,572
ENGINEERING	5%	$38,217	$0	$38,217
PROJECT MANAGEMENT	5%	$38,217	$0	$38,217
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	$7,643	$0	$7,643
BONDING/INSURANCE	1%	$7,643	$0	$7,643
CONTINGENCY	10%	$76,434	$0	$76,434
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	$0	$0
	SUBTOTAL: Indirect Costs	**$392,456**	**$0**	**$392,456**
TOTAL COSTS		**$1,156,797**	**$0**	**$1,156,797**

8. References

CCME (Canadian Council of Ministers of the Environment) 2003. Environmental Code of Practice for Aboveground and Underground Storage Tank Systems Containing Petroleum and Allied Petroleum Products

DFO (Fisheries and Oceans Canada) 2013. Measures to Avoid Causing Harm to Fish and Fish Habitat, http://www.dfo-mpo.gc.ca/pnw-ppe/measures-mesures/index-eng.html

Government of Northwest Territories (GNWT) 2015. Northern Land Use Guidelines

Attachment A: Security Estimate - Reclaim Model v.7.0 – Back River Project Type B Water Licence for Development Works

SUMMARY OF COSTS

CAPITAL COSTS	COMPONENT NAME	COST	LAND LIABILITY	WATER LIABILITY
QUARRY	Airstrip Quarry Expansior	$3,800	$0	$3,800
QUARRY	Umwelt Quarry	$18,763	$0	$18,763
QUARRY	MLA Quarry	$9,500	$0	$9,500
UNDERGROUND MINE		$0	$0	$0
TAILINGS FACILITY		$0	$0	$0
ROCK PILE		$0	$0	$0
BUILDINGS AND EQUIPMENT		$509,528	$0	$509,528
CHEMICALS AND CONTAMINATED SOIL MANAGEMENT		$222,750	$0	$222,750
SURFACE AND GROUNDWATER MANAGEMENT		$0	-	$0
INTERIM CARE AND MAINTENANCE		$0	-	$0
	SUBTOTAL: Capital Costs	**$764,341**	**$0**	**$764,341**
	PERCENT OF SUBTOTAL		**0%**	**100%**

INDIRECT COSTS		COST	LAND LIABILITY	WATER LIABILITY
MOBILIZATION/DEMOBILIZATION		$167,729	$0	$167,729
POST-CLOSURE MONITORING AND MAINTENANCE		$56,572	$0	$56,572
ENGINEERING	5%	$38,217	$0	$38,217
PROJECT MANAGEMENT	5%	$38,217	$0	$38,217
HEALTH AND SAFETY PLANS/MONITORING & QA/QC	1%	$7,643	$0	$7,643
BONDING/INSURANCE	1%	$7,643	$0	$7,643
CONTINGENCY	10%	$76,434	$0	$76,434
MARKET PRICE FACTOR ADJUSTMENT	0%	$0	$0	$0
	SUBTOTAL: Indirect Costs	**$392,456**	**$0**	**$392,456**

TOTAL COSTS	**$1,156,797**	**$0**	**$1,156,797**

3 **Quarry Name:** **Airstrip Quarry Expansion** **Pit # 1**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
CONTROL ACCESS								
Fence		m		#N/A	$0.00	$0	$0	$0
Signs		each		#N/A	$0.00	$0	$0	$0
Berm at crest		m3		#N/A	$0.00	$0	$0	$0
Block roads		m3		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
STABILITY STUDY								
Conduct stability and setback study		allow		#N/A	$0.00	$0	$0	$0
STABILIZE SLOPES								
Off-load crest, soil A		m3		#N/A	$0.00	$0	$0	$0
Off-load crest, soil B		m3		#N/A	$0.00	$0	$0	$0
Doze/trim overburden at crest		m3		#N/A	$0.00	$0	$0	$0
Drill & blast pit crest		m3		#N/A	$0.00	$0	$0	$0
Buttress slope		m3		#N/A	$0.00	$0	$0	$0
Other	Backhoe to pull down loose rock on bedrock backslope - assumed	hrs	20	exc-sL	$190.00	$3,800	$0	$3,800
COVER/CONTOUR SLOPES								
Place fill, soil A		m3		#N/A	$0.00	$0	$0	$0
Place fill, soil B		m3		#N/A	$0.00	$0	$0	$0
Rip rap		m3		#N/A	$0.00	$0	$0	$0
Vegetate slopes	Allow to revegetate naturally	ha		#N/A	$0.00	$0	$0	$0
Vegetate pit floor		ha		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
CONSTRUCT DIVERSION DITCHES								
Excavate ditches -soil		m3		#N/A	$0.00	$0	$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0	$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0	$0	$0
CONSTRUCT SPILLWAY								
Excavate channel		m3		#N/A	$0.00	$0	$0	$0
Concrete		m3		#N/A	$0.00	$0	$0	$0
Rip rap		m3		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
RECLAIM QUARRIES								
Contour slopes		m3		#N/A	$0.00	$0	$0	$0
Place overburden		m3		#N/A	$0.00	$0	$0	$0
Vegetate		m3		#N/A	$0.00	$0	$0	$0
FLOOD PIT-Capital	Quarry will not be flooded - development will occur below water level and the areas will be contoured to drain positively							
Remove stationary equipment (sump pumps)		each		#N/A	$0.00	$0	$0	$0
Remove dewatering pipeline		m		#N/A	$0.00	$0	$0	$0
Remove power lines		each		#N/A	$0.00	$0	$0	$0
Construct diversion ditches		m3		#N/A	$0.00	$0	$0	$0
-Ditch, mat'l A		m3		#N/A	$0.00	$0	$0	$0
-Ditch, mat'l B		m3		#N/A	$0.00	$0	$0	$0
Construct embankment/dam		m3		#N/A	$0.00	$0	$0	$0
Supply/install pump station		each		#N/A	$0.00	$0	$0	$0
Supply/install piping system		m		#N/A	$0.00	$0	$0	$0
Remove pump post-closure		each		#N/A	$0.00	$0	$0	$0
Remove pipeline post-closure		m		#N/A	$0.00	$0	$0	$0
FLOOD PIT-Annual Cost								
Operate pumps (power)		m3		#N/A	$0.00	$0	$0	$0
Maintain pump/pipeline		allow		#N/A	$0.00	$0	$0	$0
Labour:fuel management, commissioning/decom		$/h		#N/A	$0.00	$0	$0	$0
Chemical addition, _____ kg/m3 of water		tonne		#N/A	$0.00	$0	$0	$0
Chemicals, purchase and shipping		tonne		#N/A	$0.00	$0	$0	$0
Passive/biological additives		$/ha		#N/A	$0.00	$0	$0	$0
Passive additives purchase and shipping		tonne		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
					Annual pumping costs	$0		
Number of years of pump flooding		years						
					Total pumping costs	$0	$0	$0
					Total	$3,800	$0	$3,800
					% of Total		0%	100%

Quarry Name: **Umwelt Quarry** **Pit # 2**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	% Cost Land	Land Cost	Water Cost
CONTROL ACCESS								
Fence		m		#N/A	$0.00	$0	$0	$0
Signs	Assumed	each	4	Sabina	$75.00	$300	$0	$300
Berm at crest	Estimated for continuous berm with 1m diameter boulders, no spacing between boulders - 0.52 m3/m	m3	484	RB1H	$17.05	$8,245	$0	$8,245
Block roads	2 entrances, each block 5m base, 1 m crest width, 1 m high, 2H:1V slopes and 20 m long	m3	120	RB1L	$11.40	$1,368	$0	$1,368
Other				#N/A	$0.00	$0	$0	$0
STABILITY STUDY								
Conduct stability and setback study		allow		#N/A	$0.00	$0	$0	$0
STABILIZE SLOPES								
Off-load crest, soil A		m3		#N/A	$0.00	$0	$0	$0
Off-load crest, soil B		m3		#N/A	$0.00	$0	$0	$0
Doze/trim overburden at crest		m3		#N/A	$0.00	$0	$0	$0
Drill & blast pit crest		m3		#N/A	$0.00	$0	$0	$0
Buttress slope		m3		#N/A	$0.00	$0	$0	$0
Other	Backhoe to pull down loose rock on bedrock backslope - assumed	hrs	15	exc-sL	######	$2,850	$0	$2,850
COVER/CONTOUR SLOPES								
Place fill, soil A		m3		#N/A	$0.00	$0	$0	$0
Place fill, soil B		m3		#N/A	$0.00	$0	$0	$0
Rip rap		m3		#N/A	$0.00	$0	$0	$0
Vegetate slopes	Exposed Areas - allow to revegetate naturally	ha		#N/A	$0.00	$0	$0	$0
Vegetate pit floor		ha		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
CONSTRUCT DIVERSION DITCHES								
Excavate ditches -soil		m3		#N/A	$0.00	$0	$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0	$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0	$0	$0
CONSTRUCT SPILLWAY								
Excavate channel	Assumed - construction of two outflow systems (one at each location - t	allow	1	Sabina	######	$6,000	$0	$6,000
Concrete		m3		#N/A	$0.00	$0	$0	$0
Rip rap		m3		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
RECLAIM QUARRIES								
Contour slopes		m3		#N/A	$0.00	$0	$0	$0
Place overburden		m3		#N/A	$0.00	$0	$0	$0
Vegetate		m3		#N/A	$0.00	$0	$0	$0
FLOOD PIT-Capital	Quarries will be allowed to pond naturally							
Remove stationary equipment (sump pumps)		each		#N/A	$0.00	$0	$0	$0
Remove dewatering pipeline		m		#N/A	$0.00	$0	$0	$0
Remove power lines		each		#N/A	$0.00	$0	$0	$0
Construct diversion ditches		m3		#N/A	$0.00	$0	$0	$0
-Ditch, mat'l A		m3		#N/A	$0.00	$0	$0	$0
-Ditch, mat'l B		m3		#N/A	$0.00	$0	$0	$0
Construct embankment/dam		m3		#N/A	$0.00	$0	$0	$0
Supply/install pump station		each		#N/A	$0.00	$0	$0	$0
Supply/install piping system		m		#N/A	$0.00	$0	$0	$0
Remove pump post-closure		each		#N/A	$0.00	$0	$0	$0
Remove pipeline post-closure		m		#N/A	$0.00	$0	$0	$0
FLOOD PIT-Annual Cost								
Operate pumps (power)		m3		#N/A	$0.00	$0	$0	$0
Maintain pump/pipeline		allow		#N/A	$0.00	$0	$0	$0
Labour:fuel management, commissioning/decom		$/h		#N/A	$0.00	$0	$0	$0
Chemical addition, _____ kg/m3 of water		tonne		#N/A	$0.00	$0	$0	$0
Chemicals, purchase and shipping		tonne		#N/A	$0.00	$0	$0	$0
Passive/biological additives		$/ha		#N/A	$0.00	$0	$0	$0
Passive additives purchase and shipping		tonne		#N/A	$0.00	$0	$0	$0
Other				#N/A	$0.00	$0	$0	$0
				Annual pumping costs		$0		
Number of years of pump flooding		years						
				Total pumping costs		$0	$0	$0
					Total	$18,763	$0	$18,763
					% of Total		0%	100%

Quarry Name: **MLA Quarry** **Pit # 3**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
CONTROL ACCESS									
Fence		m		#N/A	$0.00	$0		$0	$0
Signs		each		#N/A	$0.00	$0		$0	$0
Berm at crest		m3		#N/A	$0.00	$0		$0	$0
Block roads		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
STABILITY STUDY									
Conduct stability and setback study		allow		#N/A	$0.00	$0		$0	$0
STABILIZE SLOPES									
Off-load crest, soil A		m3		#N/A	$0.00	$0		$0	$0
Off-load crest, soil B		m3		#N/A	$0.00	$0		$0	$0
Doze/trim overburden at crest		m3		#N/A	$0.00	$0		$0	$0
Drill & blast pit crest		m3		#N/A	$0.00	$0		$0	$0
Buttress slope		m3		#N/A	$0.00	$0		$0	$0
Other	Backhoe to pull down loose rock on bedrock backslope - assumed	hrs	50	exc-sL	######	$9,500		$0	$9,500
COVER/CONTOUR SLOPES									
Place fill, soil A		m3		#N/A	$0.00	$0		$0	$0
Place fill, soil B		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Vegetate slopes	Allow to revegetate naturally	ha		#N/A	$0.00	$0		$0	$0
Vegetate pit floor		ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
CONSTRUCT DIVERSION DITCHES									
Excavate ditches -soil		m3		#N/A	$0.00	$0		$0	$0
Excavate ditches -rock		m3		#N/A	$0.00	$0		$0	$0
Rip rap in channel base		m3		#N/A	$0.00	$0		$0	$0
CONSTRUCT SPILLWAY									
Excavate channel		m3		#N/A	$0.00	$0		$0	$0
Concrete		m3		#N/A	$0.00	$0		$0	$0
Rip rap		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
RECLAIM QUARRIES									
Contour slopes		m3		#N/A	$0.00	$0		$0	$0
Place overburden		m3		#N/A	$0.00	$0		$0	$0
Vegetate		m3		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Capital	Quarry will not be flooded - development will occur below water level and the areas will be contoured to drain positively								
Remove stationary equipment (sump pumps)		each		#N/A	$0.00	$0		$0	$0
Remove dewatering pipeline		m		#N/A	$0.00	$0		$0	$0
Remove power lines		each		#N/A	$0.00	$0		$0	$0
Construct diversion ditches		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l A		m3		#N/A	$0.00	$0		$0	$0
-Ditch, mat'l B		m3		#N/A	$0.00	$0		$0	$0
Construct embankment/dam		m3		#N/A	$0.00	$0		$0	$0
Supply/install pump station		each		#N/A	$0.00	$0		$0	$0
Supply/install piping system		m		#N/A	$0.00	$0		$0	$0
Remove pump post-closure		each		#N/A	$0.00	$0		$0	$0
Remove pipeline post-closure		m		#N/A	$0.00	$0		$0	$0
FLOOD PIT-Annual Cost									
Operate pumps (power)		m3		#N/A	$0.00	$0		$0	$0
Maintain pump/pipeline		allow		#N/A	$0.00	$0		$0	$0
Labour:fuel management, commissioning/decom		$/h		#N/A	$0.00	$0		$0	$0
Chemical addition, _____ kg/m3 of water		tonne		#N/A	$0.00	$0		$0	$0
Chemicals, purchase and shipping		tonne		#N/A	$0.00	$0		$0	$0
Passive/biological additives		$/ha		#N/A	$0.00	$0		$0	$0
Passive additives purchase and shipping		tonne		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
					Annual pumping costs	$0			
Number of years of pump flooding		years							
					Total pumping costs	$0		$0	$0
					Total	$9,500		$0	$9,500
					% of Total			0%	100%

1 **Building / Equip Name:** **Bldg / Equip #: 1**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
DISPOSE MOBILE EQUIPMENT									
Decontaminate prior to shipment off-site		allow	1	Sabina	$20,000.00	$20,000		$0	$20,000
Decontaminate and dispose on-site		allow		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
REMOVE BUILDINGS - see note below									
	Existing Goose camp configuration under existing Type B water license 2BE-GOO1520			BRS1L					
Accomodation Complex	Only MLA camp upgrade (25 person addition) included - existing camp configuration under existing Type water license 2BE-GEO1520	m2	2,200		$45.00	$99,000		$0	$99,000
Process Facilities		m2		#N/A	$0.00	$0		$0	$0
Offices, Repair, Lab, Warehouse		m2		#N/A	$0.00	$0		$0	$0
Storage Facilites		m2		#N/A	$0.00	$0		$0	$0
Water and Wastewater Treatment Facilities		m2		#N/A	$0.00	$0		$0	$0
U/G Heating Plant		m2		#N/A	$0.00	$0		$0	$0
Emulsion Plant		m2		#N/A	$0.00	$0		$0	$0
AN Storage Facility		m2		#N/A	$0.00	$0		$0	$0
Warehouse, Shops and Other		m2		#N/A	$0.00	$0		$0	$0
Storage Facility at Laydown/Airstrip		m2		#N/A	$0.00	$0		$0	$0
Temporary Fuel tanks - 9 x 70,000L in Insta-berms	Decommission MLA temporary fuel storage tanks and Insta-berms	allow	1	Sabina	$5,000.00	$5,000		$0	$5,000
REMOVE BULK FUEL STORAGE FACILITY	15 ML welded steel tank								
Empty and purge tank		manhour	32	lab-sH	$49.60	$1,587		$0	$1,587
Cut tank into 3m x 3m strips	Torch cutting 3 men crew @ 136 hours	manhour	408	lab-sH	$49.60	$20,237		$0	$20,237
Lower strips, haul and load on barge	Flatdeck truck with HIAB	hr	200	hiab	$155.00	$31,000		$0	$31,000
HC contaminated soils	Remove for offsite disposal	m3	0	CSR	47	$0.00		0%	$0
Remove liner for offsite disposal	Cut into 5 m strips x 50 m and roll	manhour	150	lab-sH	$49.60	$7,440		$0	$7,440
	Roll strips, haul to barge	hr	75	hiab	$155.00	$11,625		$0	$11,625
Decommission MLA fuel storage safety berms		m3	2580	DSL	$0.95	$2,451		$0	$2,451
Freshwater intake		m2		#N/A	$0.00	$0		$0	$0
Reclaim pumps		m2		#N/A	$0.00	$0		$0	$0
Outfall & Diffuser		m2		#N/A	$0.00	$0		$0	$0
Airstrip lighting, navigation, electrician		mandays		#N/A	$0.00	$0		$0	$0
Airstrip lighting, navigation, mechanical		mandays		#N/A	$0.00	$0		$0	$0
Break foundation slabs	total of all buildings	m2		#N/A	$0.00	$0		$0	$0
Consolidate & dump boneyard debris		m3		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
LANDFILL FOR DEMOLITION WASTE									
Place rock cover		m3		#N/A	$0.00	$0		$0	$0
Place soil cover		m3		#N/A	$0.00	$0		$0	$0
Vegetate		ha		#N/A	$0.00	$0		$0	$0
GRADE AND CONTOUR PADS									
	Existing Goose camp configuration under existing Type B water license 2BE-GOO1520		0.2	SCFYL					
Accomodation Complex	Only MLA camp upgrade included - existing camp configuration under existing Type water license 2BE-GEO1520	ha			$4,300.00	$946		$0	$946
Process Facilities	Scarify Goose plant site and Goose fuel storage pad initial construction	ha	54.3	SCFYL	$4,300.00	$233,490		$0	$233,490
Offices, Repair, Lab, Warehouse		ha		#N/A	$0.00	$0		$0	$0
Storage Facilites		ha		#N/A	$0.00	$0		$0	$0
Water and Wastewater Treatment Facilities		ha		#N/A	$0.00	$0		$0	$0
U/G Heating Plant		ha		#N/A	$0.00	$0		$0	$0
Emulsion Plant		ha		#N/A	$0.00	$0		$0	$0
Warehouse, Shops and Other		ha		#N/A	$0.00	$0		$0	$0
Place rock cover		m3		#N/A	$0.00	$0		$0	$0
Vegetate	Allow to revegetate naturally	ha		#N/A	$0.00	$0		$0	$0
Other	Scarify MLA temporary fuel storage pad - not required	ha		#N/A	$0.00	$0		$0	$0
Other	Scarify MLA storage pad (15 ML fuel tanks)	ha	2.08	SCFYL	$4,300.00	$8,944		$0	$8,944
PUNCTURE LINED SUMPS									
Puncture liner and place soil cover		m3		#N/A	$0.00	$0		$0	$0
RECLAIM ROADS									
Remove culverts	Goose - on site all-weather service roads; 3 culverts	allow	1	Sabina	$6,000.00	$6,000		$0	$6,000
Remove bridges		each		#N/A	$0.00	$0		$0	$0
Scarify roads	Goose - on site all-weather service roads - 8 m wide, 6 km	ha	4.8	SCFYH	$6,030.00	$28,944		$0	$28,944
Scarify roads	MLA - on site all-weather service roads - 8 m wide, 1 km	ha	0.8	SCFYH	$6,030.00	$4,824		$0	$4,824
Scarify and install water breaks		ha		#N/A	$0.00	$0		$0	$0
Scarify airstrip	Not applicable [MLA ice airstrip (on sea ice)]	ha		#N/A	$0.00	$0		$0	$0
Scarify laydown areas	MLA laydown area initial construction	ha	4.65	SCFYH	$6,030.00	$28,040		$0	$28,040
Vegetate	Allow to revegetate naturally	ha		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
SPECIALIZED ITEMS									
Dispose of misc. debris and laydown area refuse				#N/A	$0.00	$0		$0	$0
					Total	$509,528		$0	$509,528
					% of Total			0%	100%

Note: Unit costs are based on 3m high, single storey building. Scale larger building areas accordingly. E.g. 10m high building multiply area by 3.3 (10/3)

1 **Chemicals/Soil Area Name:**

Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
HAZARDOUS MATERIALS AUDIT									
Hazardous materials audit		mandays		#N/A	$0.00	$0		$0	$0
Phase 1 audit	1 at Goose, 1 at MLA - half of cost under existing Type B	each	1.0	CS1L	$7,500.00	$7,500		$0	$7,500
Phase 2 audit	1 at Goose, 1 at MLA - half of cost under existing Type B	each	1.0	CS2L	$50,000.00	$50,000		$0	$50,000
BUILDING DECONTAMINATION & CONSOLIDATION OF HAZARDOUS MATERIALS									
Environmental technician/coordinator		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate: oil, fuel		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate maintenance shop		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate power plant		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate bulk fuel storage		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate ANFO plant		mandays		#N/A	$0.00	$0		$0	$0
Decontaminate offices/warehouse/accom		mandays		#N/A	$0.00	$0		$0	$0
Removal of asbestos siding on buildings		m2		#N/A	$0.00	$0		$0	$0
Removal of friable asbestos on equipment		m2		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
HAZARDOUS MATERIALS REMOVAL									
Waste oils	To be burned in the camp incinerators, cost includes transportation - quantity assumed	litre	5000	ORL	$0.43	$2,150		$0	$2,150
Waste fuel	To be burned in the MLA incinerator, cost includes transportation - assumed 50% of fuel tanks volume (9 tanks of 70,000 L)	litre	315000	ORL	$0.43	$135,450		$0	$135,450
Waste batteries	Assumed 20-kg batteries - to be disposed off-site, includes transportation and disposal fees	kg	20	PCRH	$2.50	$50		$0	$50
Assay & environmental lab reagents		kg		#N/A	$0.00	$0		$0	$0
Machine shop paints, solvents etc		litre		#N/A	$0.00	$0		$0	$0
Glycol		litre		#N/A	$0.00	$0		$0	$0
Process reagents		kg		#N/A	$0.00	$0		$0	$0
Fuel Tanks	Remove hazardous waste (equipment under building & equip. cost)	allow	1	Sabina	$2,000.00	$2,000		$0	$2,000
Nuclear sources		allow		#N/A	$0.00	$0		$0	$0
Other hazardous materials	Unused materials included in waste costs above	allow		#N/A	$0.00	$0		$0	$0
HAZARDOUS MATERIALS									
Transportation to disposal facility	off-site	allow	1	Sabina	$10,000.00	$10,000		$0	$10,000
Disposal fees	off-site	allow	1	Sabina	$1,000.00	$1,000		$0	$1,000
Other				#N/A	$0.00	$0		$0	$0
CONTAMINATED SOILS									
Contam. soil investigation - Phase 1		each		#N/A	$0.00	$0		$0	$0
Contam. soil investigation - Phase 2		each		#N/A	$0.00	$0		$0	$0
CONTAMINATED SOIL REMOVAL									
Excavate and transport to onsite facility		m3		#N/A	$0.00	$0		$0	$0
Manage hydrocarbon remediation at facility		m3		#N/A	$0.00	$0		$0	$0
Reagents/stabilizing agent		m2		#N/A	$0.00	$0		$0	$0
Excavate and transport to offsite facility	Includes excavation, shipment off site and remediation fees	m3	100	CSRH	$146.00	$14,600		$0	$14,600
Contour decontaminated area		m3		#N/A	$0.00	$0		$0	$0
CONTAMINATED SOIL VERY LOW PERMEABILITY COVER									
Supply geomembrane, HDPE, ES3, GCL		m2		#N/A	$0.00	$0		$0	$0
Upper and lower bedding layers		m3		#N/A	$0.00	$0		$0	$0
Install geomembrane, HDPE, ES3, GCL		m2		#N/A	$0.00	$0		$0	$0
Erosion protection layer		m3		#N/A	$0.00	$0		$0	$0
Vegetate		m2		#N/A	$0.00	$0		$0	$0
Install infiltration/seepage instrumentation		allow		#N/A	$0.00	$0		$0	$0
Other				#N/A	$0.00	$0		$0	$0
OTHER									
				#N/A	$0.00	$0		$0	$0
					Total	$222,750		$0	$222,750
					% of Total			0%	100%

1 **Mobilization/Demobilization:**

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MOBILIZE HEAVY EQUIPMENT	Assumed Sabina equipment left at site and available for contractor's use. Equipment will be de-mobilized from Goose to MLA, via 157 km ice winter road, once reclamation activities at Goose have been carried out.					
1 excavator	to be mobilized in CAT train - time in transit from Goose (1 equip) - hrs assumed	hrs	30	exc-sL	190	$5,700
1 dozer	to be mobilized in CAT train - time in transit from Goose (1 equip) - hrs assumed	hrs	30	dozersH	260	$7,800
2 light trucks	to be mobilized in CAT train - time in transit from Goose (2 trucks) - hrs assumed	hrs	60	Sabina	20	$1,200
1 CAT train	time in transit from Goose (1 equip) - hrs assumed	hrs	30	Sabina	500	$15,000
Personnel	3 staff - time in transit - hrs assumed	hrs	90	operH	65	$5,850
Dump trucks		each		#N/A	0	$0
Demolition shears		each		#N/A	0	$0
Crane		each		#N/A	0	$0
Loader		each		#N/A	0	$0
Compactor		each		#N/A	0	$0
MOBILIZE MISC. EQUIPMENT						
Pump shipping		each		#N/A	0	$0
Pipe shipping		m		#N/A	0	$0
Minor tools and equipment		allow		#N/A	0	$0
Truck tires		allow		#N/A	0	$0
Other				#N/A	0	$0
MOBILIZE CAMP						
Reclamation activities		allow		#N/A	0	$0
Long term reclamation activities (eg pump flooding)		allow		#N/A	0	$0
Food and Freight		kg	580	Sabina	12	$6,955
MOBILIZE WORKERS						
Reclamation activities - transport	Round trip to MLA	each	8	Sabina	572	$4,576
Reclamation activities - travel time	Round trip to MLA	mandays	16	Sabina	110	$1,760
Long term reclamation activities (eg pump flooding) - transport	Round trip to MLA	each	4	Sabina	572	$2,288
Long term reclamation activities (eg pump flooding) - travel time	Round trip to MLA	mandays	8	Sabina	110	$880
Monitoring Airfare		each		#N/A	0	$0
WORKER ACCOMMODATIONS						
Reclamation activities		mandays	168	Sabina	110	$18,480
Long term reclamation activities (eg pump flooding)		mandays	84	Sabina	110	$9,240
MOBILIZE FUEL						
Fuel freight - reclamation activities		litre		#N/A	0	$0
Fuel freight - long term reclamation activities		litre		#N/A	0	$0
Fuel freight accommodations		litre		#N/A	0	$0
WINTER ROAD						
Construction and operation	Assumes construction and maintenance of one time x 9 km winter ice roads at Goose. 157 km Ice Winter Road between MLA and Goose not included as it is covered by existing Type B licence	km	9	WRCL	2000	$18,000
Limited winter use		km		#N/A	0	$0
Winter road tariff		km		#N/A	0	$0
DEMOBILIZE HEAVY EQUIPMENT						
1 excavator, 1 dozer, 2 light trucks, CAT train	off - site : shipping allowance	allow	1	Sabina	10000	$10,000
Barge rental		allow	1	Sabina	60000	$60,000
Dump trucks		km		#N/A	0	$0
Demolition shears		km		#N/A	0	$0
Crane		km		#N/A	0	$0
Loader		km		#N/A	0	$0
Compactor		each		#N/A	0	$0
Other		km		#N/A	0	$0
DEMOBILIZE CAMP						
		allow		#N/A	0	$0
DEMOBILIZE WORKERS						
crew travel time	included under Mobilize Workers above (round trip)	mandays		#N/A	0	$0
crew transportation	included under Mobilize Workers above (round trip)	each		#N/A	0	$0
					Total	**$167,729**

1 Post-Closure Monitoring & Maintenance:

ACTIVITY/MATERIAL	Notes	Units	Quantity	Cost Code	Unit Cost	Cost
MONITORING & INSPECTIONS						
Annual geotechnical inspection	allowance - to be combined with existing Type B licences	each	0.5	RPTH	$20,000.00	$10,000
Surface water sampling	allowance	each	0.5	WSH	$10,000.00	$5,000
Ground water sampling	not applicable	each	0	WSH	$10,000.00	$0
Receiving/downstream water sampling	allowance	each	0.5	WSH	$10,000.00	$5,000
Survey inspection		each		#N/A	$0.00	$0
Regulatory costs*		each		#N/A	$0.00	$0
Site water monitoring (AEMP and SNP)		each		#N/A	$0.00	$0
- Active closure and flooding		each		#N/A	$0.00	$0
- Post pit flooding		each		#N/A	$0.00	$0
Air Quality Monitoring Program (AQMP)		each		#N/A	$0.00	$0
Wildlife Effects Monitoring Program (WEMP)		each		#N/A	$0.00	$0
Vegetation Monitoring		each		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
COVER MAINTENANCE						
Repair erosion - infill gullies		allow		#N/A	$0.00	$0
Repair erosion - upgrade diversion ditches		allow		#N/A	$0.00	$0
Remove problem vegetation		allow		#N/A	$0.00	$0
Repair animal damage		allow		#N/A	$0.00	$0
Repair/upgrade access controls		allow		#N/A	$0.00	$0
Other				#N/A	$0.00	$0
SPILLWAY MAINTENANCE						
Repair erosion		m3		#N/A	$0.00	$0
Clear spillway		each		#N/A	$0.00	$0
CWTS MAINTENANCE						
Maintain flow, restore vegetation		allow		#N/A	$0.00	$0
POST-CLOSURE WATER TREATMENT						
Annual water treatment cost, from "Water Treatment"						$0
Subtotal, Annual post-closure costs						$20,000
Discount rate for calculation of net present value of post-closure cost, %				3.00%		
Number of years of post-closure activity				3	years	
Present Value of payment stream						$56,572

*Regulatory costs - annual reporting, management plans, progress reports etc.