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Baffinland Iron Mines Corporation

Eqe Bay Exploration Program Closure and Reclamation Plan

BAF-PH1-400-P16-0003

Rev 0

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1 PLAIN LANGUAGE SUMMARY

The Eqe Bay Exploration Program (the Exploration Program) is located on northern Baffin Island, in the Qikiqtani Region of Nunavut. The Exploration Program is wholly owned by Baffinland Iron Mines Corporation (Baffinland). The Eqe Bay Exploration Area is located along the west coast of Baffin Island, approximately 190 km east from both the communities of Hall Beach and Igloolik (Figures 2-1 and 2-2). Relative to the Mary River Project, the Eqe Bay Exploration Area is located approximately 200 km from the Mine Site at Mary River, and approximately 90 km from the proposed Steensby Port.

Baffinland Iron Mines Corporation (Baffinland) has conducted reconnaissance level mineral exploration at the Eqe Bay Prospect periodically since 2013. Baffinland holds an Exploration Agreement with NTI, and a subarea of that agreement is located on Inuit Owned Land (IOL) Parcel IG-03. Baffinland also holds adjacent mining claims on Crown Land (Figure 2-2).

The Eqe Bay Exploration Program will include the following activities:

- Land-based and on-ice drilling, geological mapping and sampling, backpack drilling, till sampling and geophysical surveys
- Camp construction and operation
- Fuel storage and handling (drummed and double-walled tank storage)
- Quarrying
- Access road and airstrip construction
- Equipment, personnel and supply transport

The initial drill program will be supported by an approximate 50-person trailer camp and other outbuildings. The camp will be equipped with an incinerator, a potable water treatment plant, and a sewage treatment plant. Helicopters will be used to move drills and to transport workers between the drill and camp. Diesel and Jet fuel will be stored in drums within lined secondary containment areas. Workers and supplies will be delivered to the camp from either Mary River, Hall Beach or Igloolik using Twin Otter or similar aircraft. The aircraft will land at the Eqe Bay exploration area either on floats on a small lake within the exploration area, or on the tundra if equipped with tundra tires.

Based on the results of the initial drill program in 2019, Baffinland may seek to expand the scale of its exploration program at Eqe Bay. Over the subsequent five (5) years, the exploration program may be expanded as follows:

- Operate up to nine (9) drills;
- Expand the initial camp to 100-persons;

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- Implement bulk fuel storage using double-walled tanks;
- Source construction materials from one or two quarries;
- Construct access trails to connect the camp to exploration areas to reduce helicopter use; and
- Construct a small airstrip to improve air access to the site

Exploration activities are temporary in nature. Camps are mobile and focused on areas of high prospectively. Camps may be moved during or after the drilling the program to minimize mobilization and travel distances for more advanced exploration activities, primarily exploration drilling.

Final closure and reclamation will involve removing the exploration camp and its associated infrastructure (sewage treatment, incinerator, fuel cache) and site materials (drums, barrels, buildings and contents, docks, water pumps and lines, material and other equipment). Disturbed surfaces will be prepared by ripping, grading, or scarifying the surface to conform to the natural topography. All material will be shipped off-site.

As progressive reclamation is being conducted throughout the life of the Eqe Bay Exploration Program, final closure and reclamation activities are expected to last a period of no more than one year.

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2 INTRODUCTION

2.1 PURPOSE AND SCOPE OF THE CLOSURE AND RECLAMATION PLAN

This Closure and Reclamation Plan (CRP) outlines the closure goal, principles, objectives, criteria and activities associated with the final closure and reclamation of the Exploration Program as approved under Screening Decision No. 17EN026 issued by the Nunavut Impact Review Board (NIRB) on August 17, 2018.

Mine closure and reclamation for the Exploration Program will be regulated under Baffinland’s Land Lease No. XXXXXXX and the Type ‘B’ Water Licence 2BW-EQEXXX. In cases where the term ‘Abandonment and Reclamation (A&R)’ is used in authorizations, regulations and other forms of communication, Mine Closure and Reclamation (MCR) is synonymous for the purpose of the Exploration Program.

The CRP considers the complete development of the Eqe Bay Exploration Program (the Exploration Program) and describes expected closure activities at the end of the Exploration Program life.

2.2 RECLAMATION GOALS AND OBJECTIVES

Baffinland will conduct its exploration activities in a manner that minimizes disturbance to the natural environment and progressively reclaiming areas such as drillhole locations shortly following completion of drilling. This will minimize reclamation requirements at closure.


The main goals/objectives of the CRP are to:

- Drainage pathways for surface runoff are physically stable to limit risk to humans and receiving environment;
- Camp and Exploration areas are physically stable for use by humans and receiving environment;
- Surface water runoff that is safe for humans and the receiving environment;
- Remaining area will be safe for humans and the receiving environment;
- Area facilitates the desired wildlife movement;
- Natural revegetation is promoted; and
- Aesthetic conditions of the Exploration Program areas are similar to surrounding natural conditions

2.3 CLOSURE AND RECLAMATION PLANNING TEAM

The Eqe Bay CRP contains and describes the plans related to closure and reclamation of the Exploration Program. The CRP addresses the activities expected to be required to ensure the Project closure goal, principles, objectives, and criteria are met. Participation of local communities and other stakeholders in the consideration of alternative reclamation activities to safeguard community values is encouraged as the Exploration Program proceeds. Currently, closure planning is the responsibility of the Sustainable

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Development Department at Baffinland with support consultants Knight Piesold Consulting Ltd. (KP) authoring this revision of the CRP.

2.4 ENGAGEMENT

There are a number of resources available to Inuit in the area including caribou; marine mammals (walrus haulouts are located on nearby islands); birds and eggs along the coast and islands; and clam digging along the coast. The Exploration site is not a high use area, but was an important area for Inuit historically (Baffinland, 2014a; Knight Piésold, 2010a). This was confirmed through recent consultation with Igloolik and Hall Beach.


One of the rivers entering the adjacent Grant-Suttie Bay was identified as an area of high abundance of Arctic char in the fall or early winter in the Nunavut Coastal Resource Inventory (Government of Nunavut, 2008). The shoreline of Eqe Bay facing the proposed camp was identified as an area for clam digging by one elder participating in the Nunavut Coastal Resource Inventory. The adjacent Grant-Suttie Bay was identified more prominently by multiple elders as a location for clam digging, mussels, and an area of concentration of birds. Due to the proximity of Eqe Bay from Igloolik and Hall Beach, contemporary use of the area is relatively limited. Baffinland (2014a) recorded that the Eqe Bay shoreline is a blueberry picking area, as is a large area to the north and west of Eqe Bay. With respect to wildlife presence, caribou movements have been recorded in the vicinity of the area. A walrus haul-out exists on a small island in the adjacent Grant-Suttie Bay and on offshore islands (Bray Island and Rowley Island), while further out on toward Foxe Basin larger marine mammals such as narwhal are present.

During meetings with community representatives on the Eqe Bay Exploration Program in early April 2018, the following topics were most discussed:

- **Archaeology and traditional land use** – Baffinland was informed of the traditional use by Igloolik and Hall Beach community members of the area, noting that camping occurred there as well as the presence of burial sites in the general area. Baffinland’s project archaeologist will conduct archaeological surveys of the area this summer. Baffinland offered to involve one or two elders familiar with the area in the archaeological surveys.
- **Inuit employment** – A number of meeting attendees expressed approval of the upcoming exploration provided Baffinland prioritized hiring from Igloolik and Hall Beach.
- **Potential benefits** - Questions regarding potential benefits were also raised. Baffinland indicated that the exploration is at a very early phase and that there are a number of steps required to determine if there are minerals that are economic for development.
- **Closure and reclamation** – Meeting attendees raised concerns about historical exploration in the area that left fuel barrels and waste behind. Baffinland reassured participants that mining and exploration requirements have changed since then, and Baffinland is required to post financial assurance to cover the reclamation of the site and is required to bring the site back to its natural environment following their activities.

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Closure and reclamation was a key point of discussion; community representatives recalled equipment and materials having been left behind from earlier explorations by others.

2.5 REGULATORY INSTRUMENTS FOR CLOSURE AND RECLAMATION

Baffinland is committed to, and will be responsible for, carrying out the closure and rehabilitation measures in a phased, on-going (progressive) manner as reviewed and agreed with the Landlord, regulatory agencies and impacted communities.

The Closure and Reclamation Plan (CRP) has been developed in accordance with the following applicable requirements:

- *Abandonment and Reclamation Policy for Inuit Owned Lands – Version 3.0* (Qikiqtani Inuit Association [QIA], n.d.)
- *Mine Site Reclamation Policy for Nunavut* (Indian and Northern Affairs Canada, 2002).
- *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories* (Mackenzie Valley Land and Water Board and Aboriginal Affairs and Northern Development Canada, 2013).

Closure and reclamation for the Eqe Bay Exploration Program will also be regulated under Baffinland’s Type B Water Licence (2BE-EQEXXXX) and Baffinland’s Inuit Land Lease (XXXXXXX).

Relevant policies, guidelines, and associated regulations that Baffinland will adhere to in the development of this and future revisions of the CRP are outlined in Table 2.1, below.

TABLE 2.1 APPLICABLE MINE CLOSURE PLANNING POLICIES, GUIDELINES, AND LEASE REQUIREMENTS

Title/Year/Agency
Type B Water Licence 2BE-EQEXXXX, NWB
Lease No.: XXXXXXXXX, QIA
Screening Decision No. 18EN026, 2018, NIRB
Abandonment and Reclamation Policy for Inuit Owned Lands, Qikiqtani Inuit Association, Version 3.0. 2013, QIA
Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories, 2013, MVWLB/AANDC
Mine Site Reclamation Policy for Nunavut, 2002, AANDC
Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories, 1990, Northwest Territories Water Board
NWT/Nunavut Mines Health and Safety Act and Regulations, 2005, Government of Nunavut

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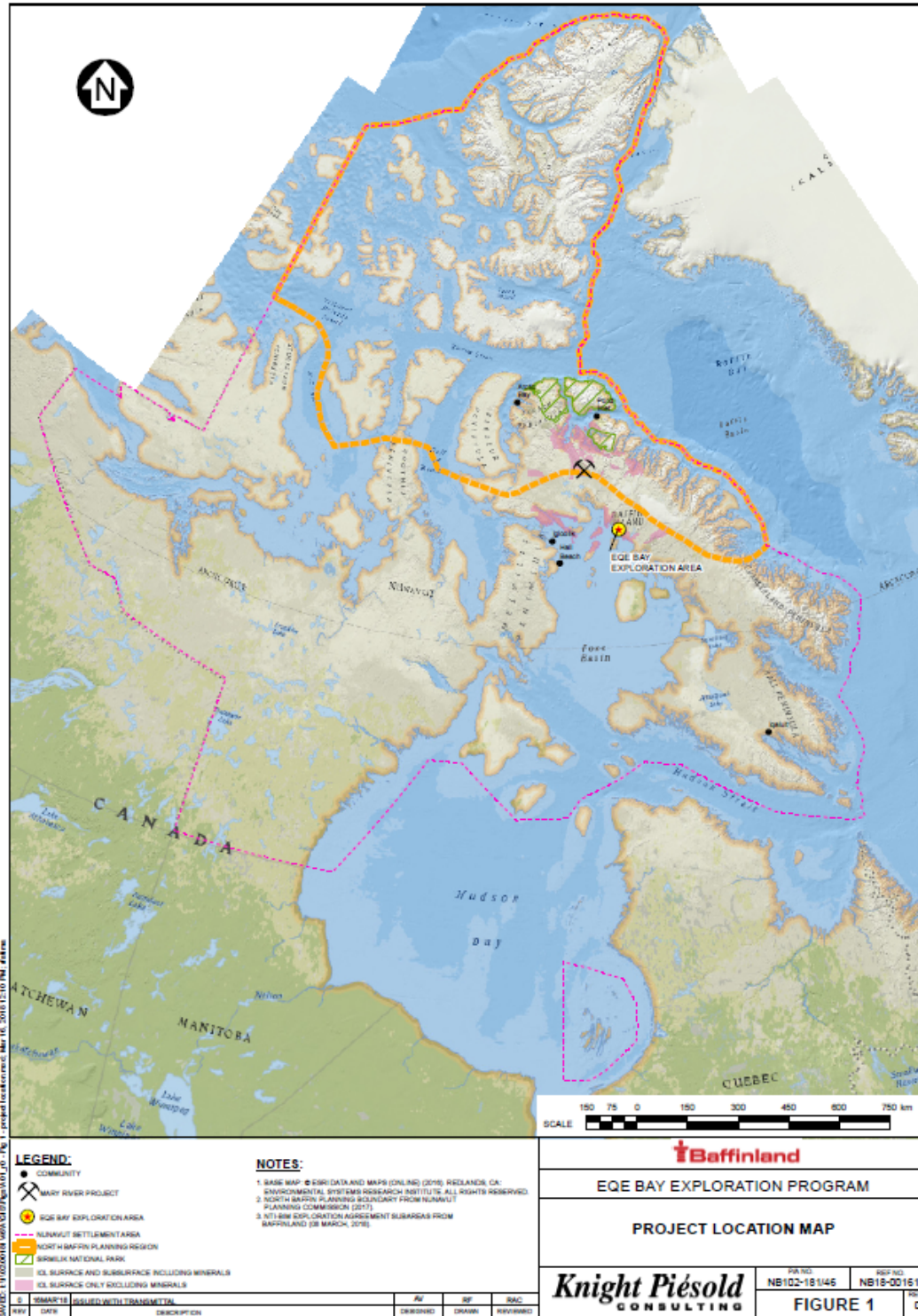


FIGURE 2-1 PROJECT LOCATION MAP

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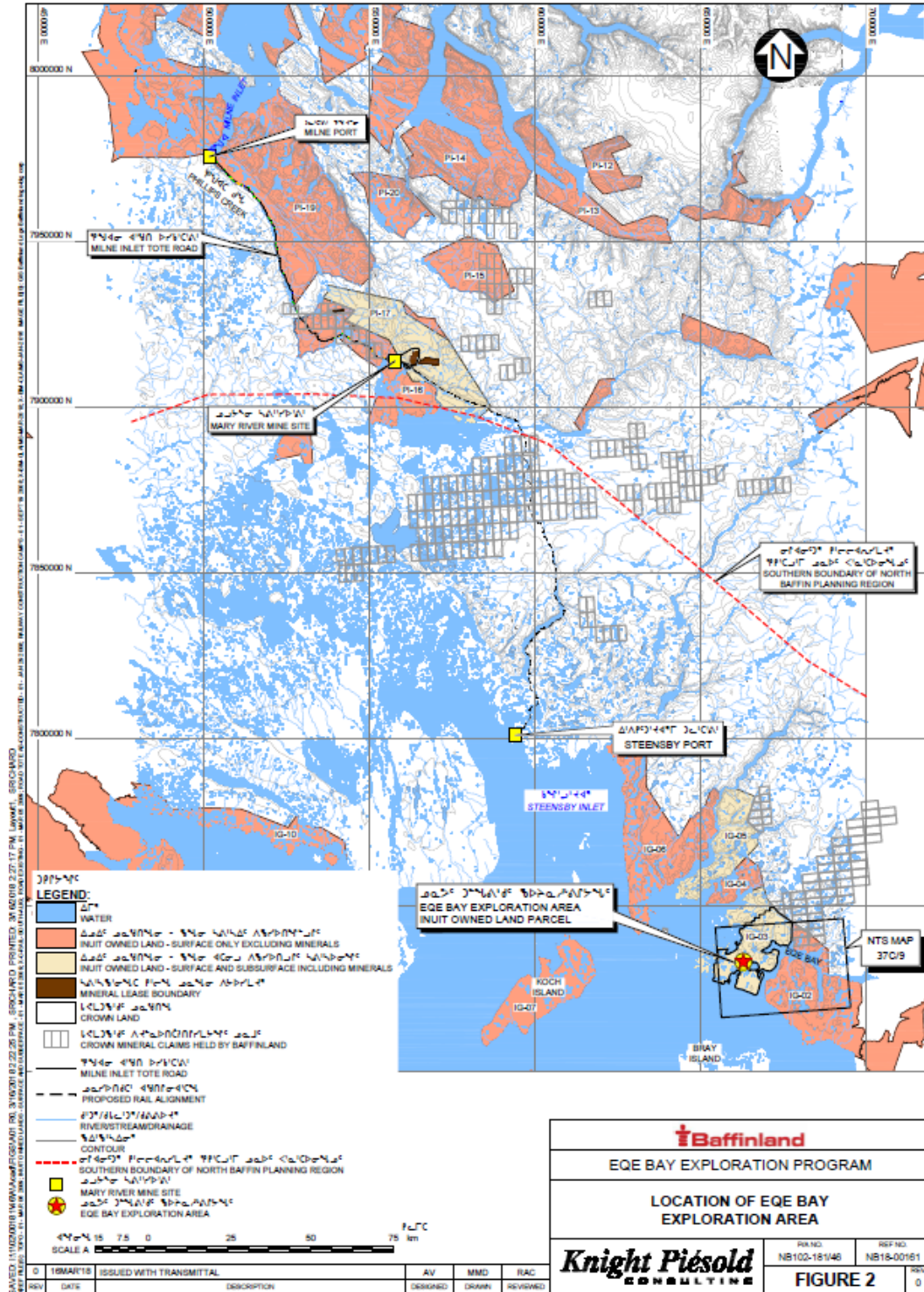



FIGURE 2-2 EQE BAY EXPLORATION AREA

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3 ENVIRONMENTAL SETTING

3.1 ATMOSPHERIC ENVIRONMENT

3.1.1 CLIMATIC CONDITIONS AND TRENDS

Northern Baffin Island has a semi-arid climate with relatively little precipitation. The region experiences near 24-hour darkness with less than two hours of twilight from approximately November 12 to January 29. Conversely, continuous sunshine is experienced from approximately May 5 to August 7. During September to November, temperature and the number of daylight hours start to decrease, and by mid-October the mean daily temperature is well below 0°C. The highest amount of snowfall typically occurs during this period.

Monthly mean temperatures at the long-term Environment Canada stations range from about -34°C in February at Pond Inlet to about 7°C in July at Igloolik (RWDI AIR Inc., 2010). Over the period of 2006 to 2015, monthly mean temperatures at Mary River ranged from -34.7°C in February to 11.1°C in July (Knight Piesold, 2016a). Annual mean temperatures generally increased over the measurement period at all locations, although there is considerable year-to-year variability. RWDI AIR Inc. (2010) noted that the annual mean temperature at Pond Inlet had increased by about 2.1°C between 1975 and 2009.

The mean annual precipitation at Pond Inlet is 190.8 mm, with 144.5 cm of snowfall (equivalent to 105.4 mm of rain) and 85.4 mm falling as rain (RWDI AIR Inc., 2010).

3.2 PHYSICAL (TERRESTRIAL) ENVIRONMENT

3.2.1 TOPOGRAPHY

The Eqe Bay Exploration Area consists of undulating bedrock outcrops with waterbodies filling local topographic lows. Glacio-fluvial or marine deposits are also present in the area.

3.2.2 SITE GEOLOGY


The North Baffin Region lies within the Committee Belt, a granite-greenstone terrain mixed with sedimentary and volcanic rock. Occasional outcrops of granitic and sedimentary rock formations occur.

Near surface bedrock is dominant in the Eqe Bay Exploration Area. Limited overburden is in the form of marine sediments and localized deposits of till. The majority of the overburden is located in depressions between the numerous bedrock outcrops and is typically overlain by a layer of vegetation and boulders.

3.2.3 SEISMICITY

Regional bedrock structures include a northwest-trending fault set system and the Central Borden Fault, a crustal-scale structure which extends more than 200 km northwest from Angajurjualak Lake to Milne Inlet. This forms the southern boundary of the Mary River iron deposits. These fault systems typically show very large displacements both vertically and horizontally. The majority of recorded earthquakes in

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the Baffin Island region are concentrated along the east and northeast coastline and within the northwestern area of Baffin Bay. Most of these events are small earthquakes with magnitudes of less than 5.0, though some moderate to large earthquakes have been recorded in the region, the largest being a magnitude 7.3 earthquake in 1933, located over 150 km off shore in Baffin Bay. This is the largest earthquake to be recorded north of the Arctic Circle.

A seismic review was performed in support of the south railway embankment design (Knight Piésold, 2008) using information from the seismic hazard database of Natural Resources Canada. Information obtained included determination of seismic coefficients and horizontal Peak Ground Acceleration (PGA) value. Based on the findings of the seismicity assessment, an appropriate design earthquake for foundations and structures at Mary River is the 1 in 2,500-year earthquake, with an estimated PGA of approximately 0.25g. At Steensby Port, the estimated PGA for the design earthquake is approximately 0.12g. The peak ground acceleration for the Steensby Port is significantly lower due to a rapid decrease in the apparent seismic hazard along the western side of Baffin Island.

3.2.4 PERMAFROST CONDITIONS


The Ege Bay Exploration Area is located within the zone of continuous permafrost with low ground ice content and mean annual ground temperatures between -10°C and -15°C (Natural Resources Canada, 1995). The active layer in the region typically ranges from approximately 1 to 2 m, but may be greater in areas where there is loose, sandy soil at the edges of lakes or ponds and less in areas with a substantial surface layer of wet organics. Unfrozen taliks can exist within areas of continuous permafrost below lakes, under large rivers or near the coast.

Permafrost thickness in and around the region is considered to be deep, typically in the 400–700 m depth range (Knight Piésold, 2010b). In 2007, a 400 m thermistor installed into Deposit No. 1 showed that the depth to permafrost is predicted to extend to 610 m at this location. This is consistent with regional measurements at the former Nanisivik Mine, where permafrost was measured at depths greater than 430 m (Gartner Lee, 2003), and at drillholes located 450 km west and 450 km south of Pond Inlet, with measured permafrost depths of 500 m and 400 m, respectively (Geological Survey of Canada, 2006).

3.2.5 HYDROLOGIC CHARACTERISTICS

Streamflow in the North Baffin Region typically commences in early to mid-June as temperatures climb above 0°C, and ends in late September to late October, depending upon watershed characteristics (Knight Piésold, 2012). The annual hydrograph is dominated by a nival (snowmelt) freshet, which occurs between late June and the end of July, followed by a period of low baseflows driven by permafrost melt and shallow subsurface flow. Baseflows are punctuated by precipitation events through July to early September. Precipitation runoff events are usually quite large and flows increase rapidly as interception, infiltration, and evapotranspiration are minimal due to shallow permafrost, cool temperatures and lack of vegetative cover.

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The timing and magnitude of runoff was first estimated from regional analyses and then reassessed with the addition of onsite measurements. Regional data indicated that mean annual unit runoff (MAUR) in the vicinity of Mary River should be slightly less than 10 L/s/km². Mean annual peak daily unit runoff values range from less than 100 L/s/km² for watersheds with significant lake volumes, to over 400 L/s/km² for smaller watersheds without lakes.

3.2.6 SURFACE WATER REGIME AND DRAINAGE AREA

There are two unnamed lakes in the vicinity of the Eqe Bay Exploration Area, referred to herein as Lakes EB-1 and EB-2. These lakes and their respective catchment areas are shown on Figure 4-1. Smaller ponds also exist within the Eqe Bay Exploration Area; these ponds may be used as a source of drilling water during the open water period only. Each of these waterbodies are sufficiently separated from the ocean and are therefore expected to be freshwater, however, water quality sampling has not been conducted in the Eqe Bay Exploration Area as yet. Bathymetric surveys have not been conducted at these waterbodies. Break-up and freeze-up periods are unknown but are not expected to vary significantly from lakes in the vicinity of the Mary River Project, which experience break-up in the first half of July and freeze-up in the month of October.

3.3 BIOLOGICAL SETTING

3.3.1 VEGETATION

Plant life is relatively sparse in much of the Project area and is generally consistent with the plants that usually occur in arctic regions. Vegetation surveys have not been conducted in the Eqe Bay Exploration Area; however, no plant species considered to be “rare” in Canada were found to occur during baseline surveys for the Mary River Project (Baffinland, 2012).


3.3.2 TERRESTRIAL MAMMALS

Terrestrial mammals in the region include barren-ground caribou of the North Baffin herd, wolf, arctic and red fox, ermine, arctic hare, and lemmings. Marine mammals are found in abundance in the region, including polar bears, narwhals, beluga whales, bowhead whales, several species of seals, and walrus. Killer whales and northern bottlenose whales were found in small numbers. North Baffin caribou are currently present at low densities and their numbers seem to vary in accordance with a 60- to 70-year cycle. The last period of caribou abundance in the area was 1980 to 2000, and the previous period of low abundance was in the 1940s. Caribou are expected to remain at low numbers for the next couple of decades. However, there is evidence that caribou do occur throughout the entire region. While some populations of caribou migrate between preferred habitats in summer and winter, North Baffin caribou appear to be non-migratory and are likely to be found relatively equally in many locations throughout the Project area.

3.3.3 MIGRATORY BIRDS

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Migratory bird species observed in the Mary River area include snow geese, ducks, eiders, loons, and mergansers. Raptors found include rough-legged hawks, peregrine falcons, gyrfalcons, and snowy owls. Relatively low densities of songbirds and shorebirds were recorded throughout the region. There are also numerous sea birds in the area, including Thick-billed Murres and many types of gulls. According to the Nunavut Coastal Resource Inventory (Government of Nunavut, 2008), a number of waterfowl species harvested by Inuit occur within the adjacent Grant-Suttie Bay as well as the offshore islands nearby (Bray, Rowley and Prince Charles).

3.3.4 FRESHWATER BIOTA

There are two fish species in the freshwater environment: Arctic char and ninespine stickleback. Many inland waters on northern Baffin Island contain a landlocked variety of Arctic char. Lakes connected to the marine environment that do not have natural barriers to fish contain anadromous or sea-run variety of char. Fish in the marine waters include Arctic char, sculpins, and Atlantic lumpfish at Steensby Inlet (Baffinland, 2012).

Lake EB-1 (to be used for the camp water supply) is situated just above sea level and very likely supports Arctic char and ninespine stickleback and possibly sculpins. The accessible portions of the lake inlet tributaries would be used by juvenile Arctic char in the summer months as rearing habitat. This lake will be used as the water source for the exploration camp. A culvert will be installed in an unnamed stream at the east side of Lake EB-1; the stream likely supports juvenile Arctic char. Detailed habitat mapping has not been conducted to describe the streambed and streambank material, streambank vegetation and meander characteristics.


Lake EB-2 (to be used to supply water to drills) will be the main water source for initial exploration drilling. The lake discharges to a stream with several ponds that ultimately reports to Harbour Bay (the marine environment). Lake EB-2 is at elevation 50 metres above sea level and its outlet is approximately 3 km by stream distance from tidewater. It is unlikely that Lake EB-2 is accessible by sea-run Arctic char due to insufficient flows and habitat connectivity to support upstream and downstream fish passage. Lake EB-2 may support land-locked Arctic char and ninespine stickleback. The second proposed stream crossing is on the same stream that discharges directly to Harbour Bay in the marine environment. The upper portion of this stream may support juvenile rearing by land-locked Arctic char during the open water period although fish use is expected to be low at the proposed crossing since it is 2.5 km by stream distance upstream from tidewater and 0.5 km below the Lake EB-2 outlet. It is unlikely that the proposed crossing is accessible by sea-run Arctic char due to insufficient flows and habitat connectivity to support fish passage.

Both culvert crossings are assumed to be fish-bearing, although each has fish habitat limitations due to the relatively small catchment areas and low flows in mid to late summer.

3.3.5 MARINE ENVIRONMENT

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The Eqe Bay Exploration Area is bordered on the east by Eqe Bay, a long finger-like inlet; Grant-Suttie Bay to the west; and Harbour Bay / Foxe Basin to the south. Marine mammals are found in abundance in the region, including polar bears, narwhals, beluga whales, bowhead whales, several species of seals, and walrus. Killer whales and northern bottlenose whales were found in small numbers. Fish in the marine waters include arctic char, sculpin, and Atlantic lumpfish at Steensby Inlet, and Arctic char, sculpin and Greenland cod at Milne Inlet.

3.4 SOCIO-ECONOMIC SETTING


The Baffin Region of Nunavut has a rich and visible archaeological heritage dating many thousands of years. Within the North Baffin Region broadly, there are many archeological sites both small and more significant, particularly along the coast but also inland. Though an archaeological survey of the Eqe Bay Exploration Area will be conducted only in 2018, the coastal location as well as the sheltered nature of Eqe Bay means that there is likely to be a comparatively high density of archaeological sites in the area.

The Inuit of the North Baffin region have experienced tremendous social and cultural change over the course of a few decades. In particular, initiatives such as residential schools, have affected family integrity and by implication, social cohesion. Elders are becoming increasingly engaged in community life and in promoting the learning of traditional culture for the younger generation. At the same time, a shift toward western middle-class expectations appears to be taking place among Inuit youth. These communities have experienced dramatic population growth over the last 20 years. Over 70% of the population is under the age of 25. Underemployment and lack of opportunities are contributing to social stress. Demand amongst residents for wage employment is very high. Community Elders recognize that the communities need to position themselves to enter the wage economy.

The five communities of northern Baffin Island, listed by proximity to Eqe Bay, include Hall Beach (190 km), Igloolik (190 km), Clyde River (325 km), Pond Inlet (345 km) and Arctic Bay (480 km). Based on the results of the Mary River Inuit Knowledge Study (Baffinland, 2014a), Igloolik and Hall Beach and to a lesser extent Pond Inlet and Clyde River have ties to the Eqe Bay area.

For many of these North Baffin households, harvest of country food provides an important contribution to their overall well-being, both physical and cultural. In all five communities, caribou, ringed seal, and arctic char are of major importance. In addition, walrus is a significant species in Hall Beach and Igloolik, while narwhal is a key component of the harvest among households in Arctic Bay, Pond Inlet, and to a lesser degree, Clyde River. The land-based economy is a major part of the livelihoods of many residents of the North Baffin. Harvesting from the land and sea is estimated to produce food worth between \$12 million and \$20 million per year in this region (Baffinland, 2012). The amount of work to harvest this food is estimated to be 350 full-time jobs.

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Residents of the region earn money through sales of arts and crafts, through employment, and from various government social programs such as income support. The Mary River Project has provided employment to these same communities since exploration was resumed in 2004, and particularly since construction of that project began in 2013. The Mary River Project provided approximately 155 full-time equivalents of employment in 2017 (Jason Prno Consulting Services Ltd., 2018). Approximately \$387.2 million was spent on procurement with Inuit-owned businesses and joint ventures in 2017.

3.4.1 HISTORICAL AND TRADITIONAL USES OF THE PROJECT AREA

Human habitation of the region extends back at least 4,000 years. The historic period of a region is defined as that point where human activities are documented in written record.

The historic period of the North Baffin region begins in the late 16th century with the first European whaling and exploration in areas adjacent to Baffin Bay. Two ships that over-wintered in the Igloolik in 1822 and 1823 provide the first record of Euro-Canadian exploration in the Foxe Basin area. The Hudson Bay Company, the Royal Canadian Mounted Police, and the church established themselves at different times in the vicinity of each of the existing communities, as early as 1921). The establishment of these institutions, as with the whalers before, influenced land use and settlement patterns through the mid-twentieth century. The establishment of DEW-line sites in Foxe Basin also influenced land use patterns, with Inuit settling near the DEW-line sites seeking part time employment and for trade. Traditional land use patterns changed substantially with the movement of the Inuit into permanent settlements as a result of federal policy and housing initiatives in the 1950s Contemporary Inuit land use was determined through consideration of the Nunavut Wildlife Harvest Study interviews and discussions with local communities, and the results of the MRIKS. Connection with the land continues to be an important aspect of Inuit life and is evident in current land use patterns. Although Inuit now live in permanent settlements, travel and camping continue to be important aspects of Inuit life. Travel routes have been identified linking all the communities of north Baffin Island (Clyde River, Pond Inlet, Arctic Bay, Igloolik, and Hall Beach). Travel is an important land use practice of the Inuit as it enables the development of connections to the land, enables individuals to meet with family and friends from other communities, and enables hunting and gathering.

Historic land use information collected for the Mary River Project suggest that Inuit occupied traditional settlements in the general area (Crowe, 1969 in Knight Piésold, 2010a), and this was confirmed during consultation with Igloolik and Hall Beach (Section 2.4).


Baffinland undertook an extensive traditional knowledge study in the five North Baffin communities referenced above in support of the Mary River Project (Baffinland, 2014a). Although the focus of the study was the Mary River Project, the study included all of northern Baffin Island including the Eqe Bay Exploration Area. A number of historic camping areas were identified by elders who participated in the study. These camping locations have been recorded along the cost of Foxe Basin, and along the shores of

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Eqe Bay. It is likely that Lake EB-2 was used as a water source for a camp and for drilling by previous mineral exploration activities.

One of the rivers entering the adjacent Grant-Suttie Bay was identified as an area of high abundance of Arctic char in the fall or early winter in the Nunavut Coastal Resource Inventory (Government of Nunavut, 2008). The shoreline of Eqe Bay facing the proposed camp was identified as an area for clam digging by one elder participating in the Nunavut Coastal Resource Inventory. The adjacent Grant-Suttie Bay was identified more prominently by multiple elders as a location for clam digging, mussels, and an area of concentration of birds. Due to the proximity of Eqe Bay from Igloolik and Hall Beach, contemporary use of the area is relatively limited. Baffinland (2014) recorded that the Eqe Bay shoreline is a blueberry picking area, as is a large area to the north and west of Eqe Bay. With respect to wildlife presence, caribou movements have been recorded in the vicinity of the area. A walrus haul-out exists on a small island in the adjacent Grant-Suttie Bay and on offshore islands (Bray Island and Rowley Island), while further out on toward Foxe Basin larger marine mammals such as narwhal are present.

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4 PROJECT DESCRIPTION

4.1 LOCATION AND SITE ACCESS

The Eqe Bay Exploration Area is located along the west coast of Baffin Island, approximately 190 km east from both the communities of Hall Beach and Igloolik. Relative to the Mary River Project, the Eqe Bay Exploration Area is located approximately 200 km from the Mine Site at Mary River, and approximately 90 km from the proposed Steensby Port.

Eqe Bay will be initially accessed by air using twin otter or similar aircraft equipped with tundra tires or floats. A helicopter will be used to move drills and drilling personnel within the Project site. An airstrip may be constructed at the approximate location shown on Figure 4-1. It will be necessary to quarry aggregate to construct the airstrip.

Equipment and materials will be delivered to the Eqe Bay Exploration Area each year or every second year by sealift. To facilitate offloading from barges, Baffinland may construct a barge ramp similar to what has been constructed at Milne Port for the Mary River Project.

Following the initial exploration program, Baffinland will prepare a 4 km access road connecting the camp to the exploration area to the north (Figure 4-1). The access road may further finger out to specific drill sites. The construction of the travel way will reduce the need for helicopter use to transport personnel, thereby reducing fuel consumption and noise generated by the helicopter. The access road will be constructed by placing a sub-base and/or surfacing layer as required using aggregate from the proposed quarries. Cuts in overburden will be avoided.

Culverts will need to be installed to cross potentially fish-bearing streams at two locations along the access road, shown on Figure 4-1. Additional culverts may be installed to maintain proper drainage along the length of the access road.

It is possible that Baffinland may establish a winter trail along the access road alignment prior to constructing the access road.


4.1.1 PROPONENT NAME AND ADDRESS

The proponent of this CRP is:

Baffinland Iron Mines Corporation
2275 Upper Middle Road East, Suite 300
Oakville, ON, Canada L6H 0C3
Tel: (416) 364-8820 Fax: (416) 364-0193

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4.2 SITE HISTORY

The Eqe Bay exploration area was first explored for iron ore in 1969 by Patino Mining Corp. Ltd., who established mining claims, a camp with a winter airstrip. A limited drilling program was carried out at that time. Nanisivik Mines Ltd. conducted additional exploration in 1991.

The area was selected as Inuit Owned Land with surface and subsurface mineral rights by the community of Igloolik (IOL Parcel IG-03) during the land selection process leading up to the Nunavut Agreement (Indian and Northern Affairs Canada and Nunavut Tunngavik Inc., 2010).

From review of historical records that describe Inuit occupancy and use of northern Foxe Basin, it is clear that the area was a traditional settlement area for Inuit, referred to as the Piling Bay settlement area (Crowe, 1969 in Knight Piésold, 2010a). In consultation with Igloolik and Hall Beach on the Eqe Bay Exploration Program, participants indicated that there are cultural heritage resources in the area, including two participants who indicated that their parents or grandparents historically occupied the area.

4.3 SITE GEOLOGY

The North Baffin Region and Eqe Bay area lies within the Committee Belt, a granite-greenstone terrain mixed with sedimentary and volcanic rock. The belt lies within the Churchill Province, extending from Baker Lake to Greenland, and is divided into five main assemblages: the Archean, the Mary River Group, the Piling Group, the Bylot Supergroup, and the Turner Cliffs-Ship Formation. Occasional outcrops of granitic and sedimentary rock formations occur.

Near surface bedrock is dominant in the Eqe Bay Exploration Area. Limited overburden is in the form of marine sediments and localized deposits of till. The majority of the overburden is located in depressions between the numerous bedrock outcrops and is typically overlain by a layer of vegetation and boulders.

4.4 PROJECT DESCRIPTION

4.4.1 EXPLORATION CAMP

The exploration camp will initially consist of 11 trailer units capable of accommodating up to 50 people. The trailers will include single and double occupancy rooms, a kitchen, dining area, storage and limited recreation facilities. The proposed camp will be located at the approximate location shown on Figure 4-1. Provided initial exploration drilling is promising, the camp will likely be expanded with an additional 11 trailer units, for accommodation for up to 100 people total. The camp will be capable of being operated year-round.

4.4.2 WATER SUPPLY

Water will be pumped from unnamed lake EB-1 to the water treatment facility through a temporary intake which will need to be adjusted between open water and ice over. During ice cover, the intake will be

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positioned from the ice surface and during open water, the intake will be positioned from shore. A containerized water treatment facility consisting of ultrafiltration treatment facility with a chemical dosing system will be commissioned to supply the camp with potable water. Water from the water treatment facility will be either trucked or piped to the camp.

4.4.3 EQUIPMENT

The equipment list for the 50-person exploration camp and drilling program is presented in Table 4-1.


TABLE 4-1 EQUIPMENT LIST

Activity	QTY	Comments
Power Generation		
200 kW - New	1	QAS 250 MD T4F MVT w/ QC4003
48 kW	2	Assumed Service Required - 1x 20ft container
Waste Water Disposal		
CWT50 Containerized WWTP	1	50 Person Capacity - 1x 42ft Container
Water Purification		
Containerized Plant	1	5,000 GPD UF System - 1x 20ft container
Incinerator		
Containerized Plant	1	500lb per batch @ 2 batch per day - 1x 20ft container
Vehicles & Equipment		
PowerTraxx 18-H or Similar	2	Cargo Carrier ideally for drill/drill supplies transport
Kubota RTV	2	RTV-X1100C 25HP DSL 2-HST 4WD CAB
Compact Loader	1	279D or similar - General use
Telehandler	1	TL943D or similar - Site Set-up
Grader	1	12H or similar - Pad and road construction
Backhoe/Loader	1	3CX-14 JCB or similar - Construction and Site Set-up
Lighting		
Atlas Copco - V5+ LED	2	Purchased for Main Camp
Pumps		
2" Dewatering Pump	3	CD75MA5 Dri-Prime Pump - 82,800L/hr Capacity
Drills		
Diamond Core Drill	2	A5 or YH 1000 Drill - Stored in 1x 20ft Container each
Geotech Drill	1	Pioneer II or similar drill - geotech investigations

4.4.4 FUEL AND HAZARDOUS MATERIALS STORAGE

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Initially, fuel will be delivered to site by sealift. During the initial drilling program, up to 512,500 L of fuel (diesel and Jet A fuel) may be stored in fuel barrels within a containment area boarded by a fuel berm made up of vinyl sling bag liners. Drums will be slung to drill sites by helicopter. Empty fuel barrels will be backhauled to the south by sealift for final disposal.

Upon expansion to the 100-person camp fuel will be stored in approximately 63 – 24,000L capacity double-walled ISO containers. The total amount of fuel stored will be in the order of 1,500,000 L.

Engine oil, antifreeze and calcium chloride will also be stored at the exploration site. Engine oil and antifreeze will be stored in 205 L drums within line containment areas. Calcium chloride powder will be stored in 50 large totes and will be used to generate brine for drilling the deepest holes. Most drillholes will be sufficiently shallow as to not require brine.

4.4.5 WASTE MANAGEMENT FACILITIES


Camp sewage will be treated using a package sewage treatment plant prior to effluent being discharged to land for runoff into Eqe Bay. The package sewage treatment plant consists of a four-part treatment process. The first stage includes two settling tanks, the second stage includes a reactor unit for extended aeration and a clarifier, the third stage includes a reactor with fixed film media and clarification, and the final fourth stage include a pump chamber to discharge the treated effluent. Raw wastewater will be pumped from a collection tank into the first and second settling tanks. Wastewater is then hydrologically displaced into the first reactor unit for further setting and aeration, after which gravity transports the waste water to the second reactor unit for processing using the fixed film growth media. A sludge return air lift will circulate activated sludge from the bottom of the reactor chamber to the fixed media. Wastewater will then flow through a quiescent zone at the outlet of the reactor into the pump chamber. In the pump chamber the effluent will pass through two sets of UV lights before final discharge. The effluent will be discharged to land at a location where the effluent will run off into the ocean (Figure 4-1).

Greywater will be either treated by the sewage treatment plant, or alternatively will be directed to an excavated sump located more than 31 m from the high water mark of Eqe Bay.

Non-hazardous combustible waste will be burned in an onsite incinerator. The incinerator will use a two stage process. The primary burner burns waste and produces an inert ash and combustible gases, the secondary chamber combusts off-gases to eliminate smoke and minimize contaminants. Non-hazardous waste that is non-combustible, such as scrap metal, will be stored and then backhauled to a southern disposal or recycling facility.

Hazardous waste (mainly waste oil and waste antifreeze) will be generated annually, along with lead-acid batteries and a small volume of oily rags. Liquid hazardous waste will be stored in a lined containment facility and backhauled by sealift to a southern disposal or recycling facility.

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4.4.6 QUARRIES

Baffinland intends to develop one or two rock quarries to aid in the development of the camp and laydown areas, access road between the camp and the exploration area, and a small airstrip. Pre-packaged explosives will be used. Preliminary locations of potential quarries are shown on Figure 4-1. It is expected that the quarries will only be developed if the exploration activities expand as described in this Project Proposal.

The rock in the quarries will be assessed for acid rock drainage (ARD) and metal leaching (ML) potential prior to being exploited, in accordance with the Protocol for the Assessment for the Potential for Acid Rock Drainage located in Appendix B of the Borrow Pits and Quarry Management Plan (Baffinland, 2014b). Once the potential quarries have been assessed for acid rock drainage (ARD) and metal leaching (ML) potential, Baffinland will develop and file a quarry-specific management plan with the Nunavut Water Board (NWB) and the QIA.

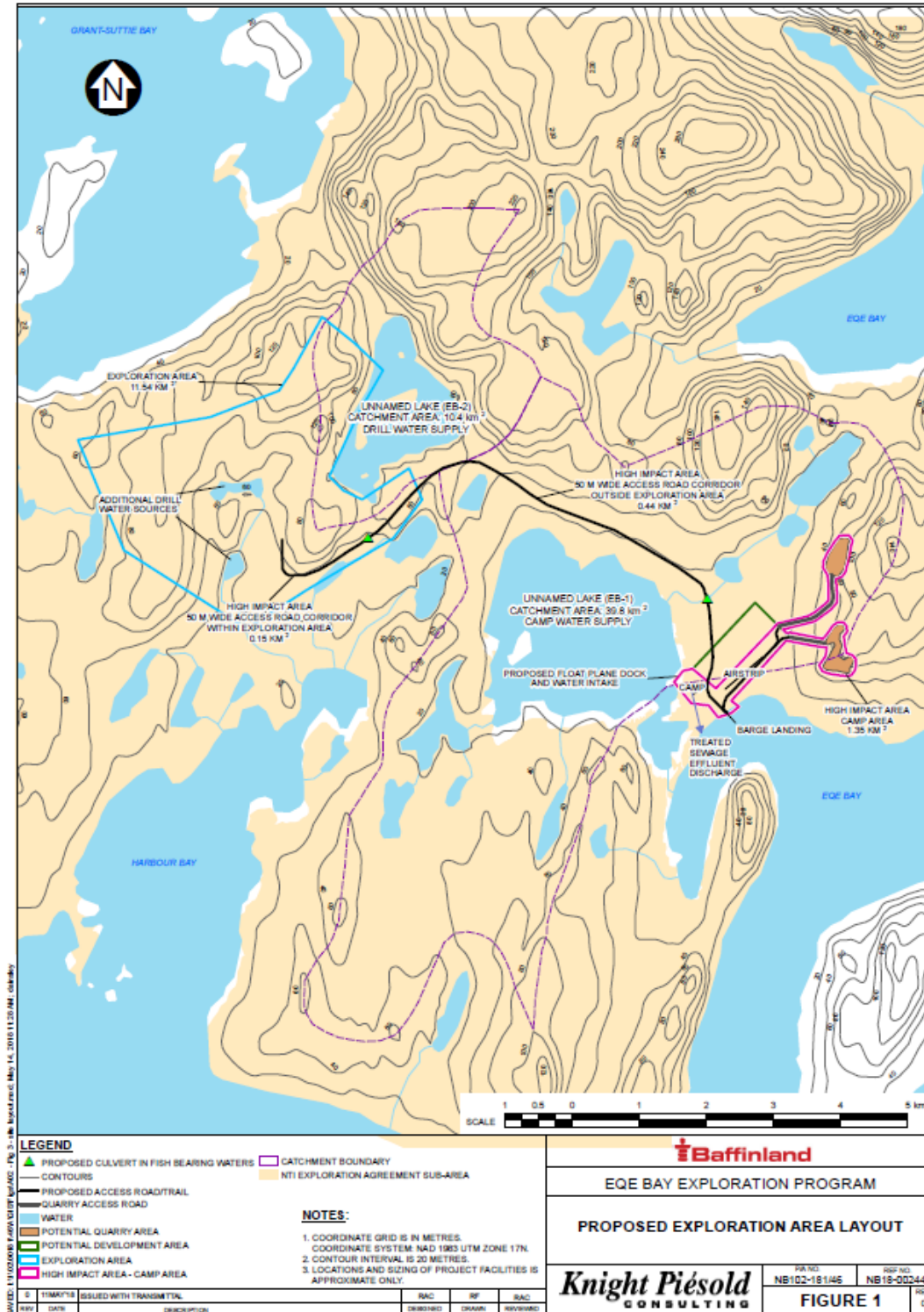


FIGURE 4-1 PROPOSED EXPLORATION AREA LAYOUT

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5 PERMANENT CLOSURE

Permanent closure is defined in the MVLWB Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories (MVLWB/AANDC 2013) as follows:

“Permanent closure is the final closure of a mine site with no foreseeable intent by the existing proponent to return to either active exploration or mining.”

Reclamation is defined in the MVLWB Guidelines as follows:

“The process of returning a disturbed site to its natural state or which prepares it for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.”

Baffinland acknowledges that due to various economic drivers (commodity prices, escalation of construction and production costs, extended maintenance shutdown, others), Baffinland may be forced into a temporary or permanent closure scenario.

Consideration of future land use is an important closure principle in f this CRP. Future land use has been considered in numerous aspects of the Exploration Program planning, such as:


- Adopting environmental management best practices during exploration to reduce impacts where possible;
- Various planned reclamation activities which are not required to establish physical and chemical stability, such as:
 - Scarification to promote natural revegetation
 - Removal of above-grade buildings
 - Re-establishing pre-existing drainage pathways where practical
- Clean up of pre-existing waste (e.g. non-hazardous debris) at Eqe Bay

Moving forward Baffinland will seek further input from communities on potential closure options that promote the desired post-closure land use. Feedback via engagement activities will be compiled and considered and incorporated into future revisions of the CRP. Baffinland has committed to several closure objectives focusing on land use, which are presented in Table 5.1. In keeping with the closure principles, the objectives and criteria presented below avoid introducing designs which would require long term active care.

Planned closure activities will involve dismantling of camps and the transport of equipment, materials and wastes to a final destination by sealift. The final destination may include another exploration property, or for disposal at a licensed waste disposal facility, as appropriate. Materials or equipment may also be donated to local communities as appropriate.

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The following summarizes the final closure activities with respect to the various components:

5.1 CLOSURE OBJECTIVES AND CRITERIA

A description of the closure criteria and applicable monitoring or assessment programs that are proposed to be implemented to confirm that the objectives were met for each Exploration Program component is summarized in

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Table 5-1 for permanent and temporary closure. In addition to the specific criteria listed below to measure reclamation success, QIA’s approval is also required to achieve mine closure.

As the Exploration Program is in the very early years of exploration, closure planning is expected to be refined over time using findings from engagement efforts, site-specific operational knowledge, environmental monitoring programs, and progressive reclamation. Furthermore, if the Exploration Program yields results that indicate a full scale Project is viable, the CRP would be updated accordingly through the approvals process.

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TABLE 5-1 CLOSURE OBJECTIVES, CRITERIA & ACTIONS FOR THE EQE BAY EXPLORATION PROGRAM

Project Component	Closure Objectives	Closure Criteria	Actions/Measurements
Site Wide	Drainage pathways for surface runoff are physically stable to limit risk to humans and receiving environment ¹ .	<p>Drainage pathways will be designed by a professional engineer for long-term stability to mitigate against erosion.</p> <p>No significant signs of deformation, degradation and/or erosion and sedimentation which could contribute to physically unstable conditions as visually observed during geotechnical inspections by a qualified professional engineer.</p> <p>Inspection criteria and schedule will be refined based on the final engineering designs for site grading and specific engineered drainage controls.</p>	<p>Geotechnical assessment, analysis and/or monitoring of the drainage pathways will occur as part of the Geotechnical/Engineering Monitoring Program.</p> <p>Surface water quality monitoring will be completed post-closure at applicable drainage pathways to ensure all relevant closure objectives and criteria have been met.</p>
	Camp and Exploration areas are physically stable for use by humans and receiving environment ¹ .	<p>No significant signs of deformation or degradation at remaining engineered structures and/or other disturbed areas which could contribute to physically unstable conditions. This will be confirmed by visual monitoring as part of site geotechnical inspections.</p> <p>Inspection criteria and will be refined based on the post closure stability assessment for remaining structures and Final Grading Plan.</p>	<p>Geotechnical assessment, analysis and/or monitoring will occur as part of the Geotechnical/Engineering Monitoring Program.</p> <p>Monitoring scope and duration will be informed by operational performance results where possible, and detailed in the final grading and engineering designs for remaining structures.</p>

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Project Component	Closure Objectives	Closure Criteria	Actions/Measurements
	Surface water runoff that is safe for humans and the receiving environment ¹ .	Closure water quality meets Type B Water Licence effluent criteria, territorial/federal guidelines, and/or site-specific risk-based criteria, as relevant to the specific areas and components. Criteria will be refined based on water quality monitoring results during operations.	Specific testing parameters, frequencies, locations and program durations will be refined over time based on findings of operational monitoring programs.
	Remaining area will be safe for humans and the receiving environment ¹ .	No buildings or equipment remain above surface grade following final closure. This criteria is supplemented by several other closure criteria focusing on additional aspects of closure (e.g. chemical and physical stability) Areas with risk to humans, terrestrial wildlife and/or aquatic biota will be managed to reduce hazards to an acceptable level. This criteria will be refined over time and as the Exploration Program evolves.	Geotechnical assessment, analysis and/or monitoring of the mine areas will occur as part of the Geotechnical/Engineering Monitoring Program. Final inspection by a qualified professional ² and representative of Designated Inuit Organization.
	Area facilitates the desired wildlife movement	To the extent possible, disturbed areas to be scarified to promote natural revegetation. Use of the site by wildlife (i.e. birds, mammals). Detailed metrics will be developed as monitoring programs inform the level of impact by the Exploration Program.	Geotechnical assessment, analysis and/or monitoring of the mine areas will occur as part of the Geotechnical/Engineering Monitoring Program. Final inspection by a qualified professional ² and representative of Designated Inuit Organization.

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Project Component	Closure Objectives	Closure Criteria	Actions/Measurements
	Natural revegetation is promoted	<p>Grading and scarification completed where required, excluding the transportation route and the airstrip.</p> <p>Baffinland has committed to completing reclamation activities that will promote natural revegetation over long timelines, but specific criteria or goals for vegetation growth post-closure are not planned.</p>	Final inspection by a qualified professional ² and representative of Designated Inuit Organization.
	Aesthetic conditions of the Exploration Program areas are similar to surrounding natural conditions	<p>No visible buildings, equipment, or non-local materials. This excludes structures remaining at, and below grade (i.e. concrete foundations).</p> <p>Final grading reflects surrounding topography where possible (i.e. limit steep slopes) and re-establish pre-existing drainage pathways.</p> <p>Activities to promote natural revegetation to the extent possible.</p>	Final inspection by a qualified professional ² and representative of Designated Inuit Organization.


Notes:

¹Receiving Environment – includes aquatic (freshwater and marine) biota and terrestrial biota.

²Qualified Professional assumes a minimum of 3 years experience in the relevant field.

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5.2 PERMANENT CLOSURE AND RECLAMATION REQUIREMENTS

The closure and reclamation approach for the Project was developed on the basis of:

- MVLWB/AANDC Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the NWT (MVLWB/AANDC, 2013); and
- QIA Abandonment and Reclamation Policy for Inuit Owned Lands (2013).

It adheres to generally-accepted rehabilitation criteria and focuses on both physical and chemical stabilization of the site. Land disturbances not needed to support active operations will be concurrently reclaimed.

The main work items for final mine closure and reclamation include:

- Dismantling and removal of all tents and camp infrastructure, exploration equipment
- Demobilization of fuel, either for resale, use at other exploration sites, or provided to other users in the region
- Removal of all hazardous materials and wastes from the site to licenced disposal facilities;
- Roads, airstrips, and development areas will be re-contoured as required to provide long-term stability and reduce the potential for erosion.
- Removal of water crossings and regrading of disturbed project areas to restore natural drainage patterns.
- Scarification of disturbed areas of former mine infrastructure to encourage natural revegetation.
- Monitoring during closure and post closure up until the post-closure site assessment shows that the closure works been successful in meeting the closure criteria.

These following sub-sections describe each of the Exploration Program components, how they are to be rehabilitated and what options were considered, what uncertainties there are with respect to the closure and management, monitoring of the component following closure.


Exploration Project components will be considered closed and reclaimed when closure criteria outlined in Section 5.1.1 are met. As the Exploration Program advances, changes may occur that will alter the Closure and Reclamation Plan. Though changes may occur, at this time it is anticipated that the major components of the Exploration Program will remain the same.

5.2.1 BUILDINGS AND EQUIPMENT

5.2.1.1 PROJECT COMPONENT DESCRIPTION

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The exploration camp will initially consist of 11 trailer units capable of accommodating up to 50 people. The trailers will include single and double occupancy rooms, a kitchen, dining area, storage and limited recreation facilities. Provided initial exploration drilling is promising, the camp will likely be expanded with an additional 11 trailer units, for accommodation for up to 100 people total. The camp will be capable of being operated year-round. To the extent possible, buildings are proposed to be consolidated to hold accommodation, administration, maintenance and laboratory complexes to reduce outside travel of in-building workers. See Section 5.2.5 for mining infrastructure, including associated buildings.

Equipment proposed for the Site include heavy equipment (generator, containerized water treatment system, containerized incinerator), heavy mobile equipment (drills), medium mobile equipment (loader, telehandler, grader), and light mobile equipment (light stands, pumps, generators).

5.2.1.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS

The pre-disturbance site conditions are summarized in Section 3. Appendix D provides a photolog showing the current mining operations.

Upon Final Mine Closure, buildings and infrastructure will be decommissioned and no longer be features on site. Associated pads and laydown areas will be re-graded to restore natural drainage patterns where possible, and scarified to allow for natural re-vegetation at closure.

5.2.1.3 CLOSURE OBJECTIVES AND CRITERIA

The closure objectives are presented in Section 5.1.1 and closure criteria are presented in Table 5.1.

5.2.1.4 CONSIDERATION OF CLOSURE OPTIONS AND SELECTION OF CLOSURE ACTIVITIES

Detailed alternative analysis of other closure options have not been completed by Baffinland due to the early stage of the Exploration Program. As data are collected and analysis is conducted, the CRP will be updated as required.

5.2.1.5 ENGINEERING WORK ASSOCIATED WITH CLOSURE ACTIVITY

To permit the reclamation of the land area they cover, improve aesthetics, remove the physical hazard they pose to humans and the environment, and address any chemical concerns they may pose, buildings at the Exploration Program will be removed.


Mechanical equipment will be considered closed and reclaimed when they no longer pose a risk of contamination to the environment, will not be a safety hazard to humans and wildlife, and no longer need long term care.

Removal of the buildings and equipment will involve the following works:

- Decontaminate buildings and equipment as necessary to permit safe working conditions and mitigate the potential for uncontrolled releases;

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- Demolish buildings and haul away the refuse;
- The foundations of buildings and infrastructure will be demolished:
 - Concrete foundations will be demolished to grade and exposed rebar will be cut to grade to prevent safety hazards; and,
 - Concrete foundation areas will be drilled to allow for water infiltration.
- Wood structures like the dining hall, outhouse, dry, tent wood floors, bunk beds and table will be dismantled and wherever possible the wood will be salvaged for re-use; otherwise it will be incinerated or open burned on-site if suitable. In the event that wood cannot be salvage or burned on-site, it will be shipped off-site.
- Relocate all equipment to the mainland for resale or disposal, or donate to the local community;
- Cleanup of any soil contamination (i.e. hydrocarbons, etc.);
- Re-grade the area to restore the natural drainage patterns;
- Scarify the ground surface around the buildings to support natural revegetation; and,
- Refuse from the demolished buildings and equipment will be removed and shipped for either disposal or salvage.

5.2.1.6 UNCERTAINTIES

Uncertainties related to buildings and equipment are limited to whether or not any such facilities will be left in place, and whether or not any associated contaminated soils may be present upon closure (Section 9.5). There may be uncertainty in revegetation success.

5.2.1.7 POST CLOSURE MONITORING, MAINTENANCE AND REPORTING


The nature and scale of the exploration program is such that post-reclamation monitoring is expected to be limited. It is possible nonetheless that this becomes a regulatory requirement by the Landowner and/or the NWB. For this reason, a follow up site visit is proposed the subsequent summer. This will include a visual inspection documented with photos, and the collection and testing of water quality samples down gradient the quarry(s), if such runoff exists.

5.2.1.8 CONTINGENCIES

The need for contingencies for the reclamation of buildings and equipment has not been identified by Baffinland at this time.

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5.2.2 WASTE AND FUEL

5.2.2.1 PROJECT COMPONENT DESCRIPTION

Fuel will be stored at the site in 205L drums or 24,000L double walled ISO containers, and with the exception of minor fuel drum caches at drill sites will be stored within designated lined containment areas. Waste oils, lubricants and off-specification fuel will be stored in drums and labelled as waste materials for disposal off Site.

Domestic wastes, including wastes that cannot feasibly be re-used or recycled, will be incinerated at the Eqe Bay Exploration Area camp. Combustible non-hazardous wastes (i.e., food scraps, oily rags, paper and small plastics, etc.) is incinerated to minimize the negative impacts of attraction vectors to wildlife. Incinerator ash generated is analyzed and placed in containment for off-site disposal. Waste oil and waste fuel may be burned when possible in the incinerator as a secondary source of fuel. Any solid waste that cannot be combusted will be removed from site for disposal at a receiving facility.

Hazardous materials (other than fuels) used throughout the lifecycle of the Eqe Bay Exploration include; oils, greases, antifreeze, calcium chloride salt, ammonium nitrate, lead acid batteries, cleaners and other chemicals. Hazardous materials and hazardous waste will be stored within designated lined and contained areas or within shipping containers at the laydown area. Transportation and packaging of hazardous waste for disposal off-site shall be coordinated and supervised by fully-trained and qualified Project personnel or an appropriately licenced Contractor.

5.2.2.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS

The pre-disturbance site conditions are summarized in Section 3. Appendix D provides a photolog showing the current mining operations.

The fuels and fuel storage area, assuming they are not to be maintained, will be decommissioned and removed during closure. Soils will be tested for contamination. The area will be regraded to restore natural drainage patterns where possible, and scarified to allow for natural re-vegetation.


Solid waste management infrastructure includes the incinerator and the hazardous waste containment areas. The incinerator will be decommissioned and removed from the site and affected footprint regraded to restore natural drainage patterns where possible and scarified to allow for natural re-vegetation. The hazardous waste containment areas will be evaluated for any remaining hazardous material/soils and addressed as per the Environmental Protection Plan. The area will be re-graded and scarified to allow for natural re-vegetation at closure.

5.2.2.3 CLOSURE OBJECTIVES AND CRITERIA

The closure objectives are presented in Section 5.1.1 and closure criteria are presented in Table 5.1.

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5.2.2.4 CONSIDERATION OF CLOSURE OPTIONS AND SELECTION OF CLOSURE ACTIVITIES

Detailed alternative analysis of other closure options have not been completed by Baffinland due to the early stage of the Exploration Program.

No major closure options are being considered for this component. The closure activities discussed below is expected to be relevant for all existing and any future changes to Exploration Program infrastructure within this component (e.g. additional non-hazardous landfills).

5.2.2.5 ENGINEERING WORK ASSOCIATED WITH CLOSURE ACTIVITY

Closure activities for waste and fuel will involve the following works:

- Oil, grease and chemicals will be transported off-site for disposal at an approved facility or where applicable for reuse. All batteries and hazardous waste will be removed and disposed of or recycled at an approved facility offsite.
- Drums of fuel will be consolidated, inspected and securely sealed.
- Any open drums of diesel, off-specification fuel as well as waste oil will be used in the camp incinerator or will be consolidated and transported off-site.
- Sealed fuel containers (drums, double-walled tanks) will be sold, relocated to another exploration site, or provided to other users in the region, such as Hall Beach or Igloolik.
- Empty fuel drums, tanks and cylinders will be transported by sealift and returned to the vendor or disposed of at licensed disposal facilities.
- Combustible non-hazardous wastes will be incinerated at the Exploration Program incinerators. Once the incinerators are no longer required, they will be shipped to the mainland to be disposed of off-site.
- All other site waste will be collected and placed in appropriate containers for removal. Pre and post waste removal inspections will be made to ensure the thoroughness of the program. Waste will include metallic waste, construction material waste and domestic waste.

5.2.2.6 UNCERTAINTIES


Uncertainties related to the fuel storage and waste disposal areas is whether or not the remaining land contains contaminated soils. There may also be uncertainty in revegetation success.

5.2.2.7 POST CLOSURE MONITORING, MAINTENANCE AND REPORTING

The nature and scale of the exploration program is such that post-reclamation monitoring is expected to be limited. It is possible nonetheless that this becomes a regulatory requirement by the Landowner and/or the NWB. For this reason, a follow up site visit is proposed the subsequent summer. This will include a visual inspection documented with photos, and the collection and testing of water quality samples down gradient the quarry(s), if such runoff exists.

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5.2.2.8 CONTINGENCIES

The need for contingencies for the reclamation of waste and fuel storage areas has not been identified by Baffinland at this time.

5.2.3 QUARRIES

5.2.3.1 PROJECT COMPONENT DESCRIPTION

The preliminary plans for the Exploration Program include the potential for quarrying activities at the site to produce aggregate for camp infrastructure and transportation routes. The location of these quarries have not been finalized and will be dependant on a number of factors including geochemical and geotechnical suitability.

5.2.3.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS

The pre-disturbance site conditions are summarized in Section 3. Appendix D provides a photolog showing the current site conditions.

Each quarry management plan presents a quarry development plan, drainage information as well as a closure plan. All quarries will be progressively reclaimed maintaining stable side slopes in accordance with the individual management plan. At the onset of closure the quarries will be investigated to assess for potential thermal damage and instability due to thaw impacts. At closure, re-contouring and filling with overburden may be required to ensure slope stability and restore the natural drainage due to thermal disruptions.

Aggregate stockpiles will be depleted upon closure, and the bases will be re-contoured as necessary, scarified, and allowed to naturally re-vegetate. If aggregate stockpiles remain at closure, they will be graded and re-contoured for long-term physical stability.

5.2.3.3 CLOSURE OBJECTIVES AND CRITERIA


The closure objectives are presented in Section 5.1.1 and closure criteria are presented in Table 5.1.

5.2.3.4 CONSIDERATION OF CLOSURE OPTIONS AND SELECTION OF CLOSURE ACTIVITIES

Detailed alternative analysis of other closure options have not been completed by Baffinland due to the early stage of the Exploration Program. Closure options will be assessed in the development of the quarry management plan(s) for the Exploration Program. As any monitoring data are collected and analysis is conducted, the CRP will be updated as required.

Relevant closure options to consider in the future will likely include grading and drainage options assessed as part of the Final Grading Plan.

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5.2.3.5 ENGINEERING WORK ASSOCIATED WITH CLOSURE ACTIVITY

Quarries will no longer be needed at closure. Closure of active quarry faces will involve removing all materials, equipment and infrastructure. Active quarry walls will be terraced during operation to closely manage issues related to drainage and will not be altered for closure. The quarry development will reduce the creation of pits and depressions to the degree practicable to reduce the potential for standing water. The quarry pit floor will be left as free draining. Any stockpile areas will be recontoured to match the surrounding terrain (where possible), and scarified to promote natural revegetation and allow vegetation to re-establish through natural processes.

Quarrying activities will be closely managed to avoid the accumulation of unnecessary stockpiles of aggregate. Any stockpiles that do remain will be dealt with as follows:

- Large rock will be spread out on the landscape or used as rip-rap for erosion control
- Medium sized rock will be used to re-contour affected areas to re-establish a more natural appearance to the area
- Small crushed rock will be used to assist in drainage restoration, and spread on the landscape to re-establish more natural contours
- Any collected soils will be spread to allow for the re-establishment of vegetation. No vegetation planting or seeding operations will take be undertaken and natural re-vegetation will be allowed to take place

Quarry access roads will typically be relatively short aggregate structures. The entire road bed will be removed to re-establish desired drainage.

A pre-closure inspection for potentially impacted soils will be completed at the entire site. Any contaminated soils, snow or ice packs, or overburden will be flagged. The extent of the contamination will be assessed, and the material containerized for shipment to a licenced off-site facility.

Reclamation of uncovered permafrost and ground/ice will involve removing any ponding water and backfilling the impacted permafrost and/or ground ice with available material.


5.2.3.6 UNCERTAINTIES

Uncertainties related to the closure of quarries include whether or not the remaining exposed aggregate is PAG, which is addressed in the individual quarry management plans.

5.2.3.7 POST CLOSURE MONITORING, MAINTENANCE AND REPORTING

The nature and scale of the exploration program is such that post-reclamation monitoring is expected to be limited. It is possible nonetheless that this becomes a regulatory requirement by the Landowner and/or the NWB. For this reason, a follow up site visit is proposed the subsequent summer. This will include a

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visual inspection documented with photos, and the collection and testing of water quality samples down gradient the quarry(s), if such runoff exists.

5.2.3.8 CONTINGENCIES

Contingencies related to the revegetation efforts have not been completed by Baffinland due to the early stage of the Exploration Program. As data are collected and analysis is conducted, the CRP will be updated as required.

5.2.4 TRANSPORTATION ROUTES

5.2.4.1 PROJECT COMPONENT DESCRIPTION

Transportation routes on site include the barge ramp for sealift freight delivery, future airstrip and future access road from the camp area to exploration area.

5.2.4.2 PRE-DISTURBANCE, EXISTING, AND FINAL SITE CONDITIONS

The pre-disturbance site conditions are summarized in Section 3. Appendix D provides a photolog showing the current mining operations.

Culverts the access road will need to be installed at select water crossings, and will remain in place until all the closure activities requiring access to the exploration area are complete. The road will remain in place at closure, as will the airstrip.

The barge ramp will remain in place as the excavation of materials used to construct the ramp would result in unnecessary disturbance.

5.2.4.3 CLOSURE OBJECTIVES AND CRITERIA

The closure objectives are presented in Section 5.1.1 and closure criteria are presented in Table 5.1.

5.2.4.4 CONSIDERATION OF CLOSURE OPTIONS AND SELECTION OF CLOSURE ACTIVITIES


Detailed alternative analysis of other closure options have not been completed by Baffinland due to the early stage of the Exploration Program.

5.2.4.5 ENGINEERING WORK ASSOCIATED WITH CLOSURE ACTIVITY

Closure of transportation infrastructure will involve the following works:

- Water crossings along the access road will be removed and the surrounding area graded to restore the natural drainage pattern of the area and ensure stability.
- The barge ramp will remain in place with any surface infrastructure removed.

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- Relocate excavated material from the water crossing location and place in areas located more than 31 metres from any water body. This material could be used at nearby grading in borrow areas and quarries.
- Streambed and banks will be restored and stabilized. This may require communication with DFO prior to commencing work.
- Removed culverts will be flattened and disposed of off-Site. Ditching will be subject to grading as necessary to establish post-closure drainage pathways.
- The abandoned access road and airstrip are expected to be transferred 'as is'. If any additional closure activities are desired by the parties receiving responsibility for the structures, this will be confirmed via ongoing engagement with the applicable communities and QIA.
- Cleanup of any soil contamination (i.e. hydrocarbons, etc.).

5.2.4.6 UNCERTAINTIES

Uncertainties related to the transportation routes may include which infrastructure may be left in place and whether or not any associated contaminated soils may be present upon closure. There may also be uncertainty in revegetation success.

5.2.4.7 POST CLOSURE MONITORING, MAINTENANCE AND REPORTING

The nature and scale of the exploration program is such that post-reclamation monitoring is expected to be limited. It is possible nonetheless that this becomes a regulatory requirement by the Landowner and/or the NWB. For this reason, a follow up site visit is proposed the subsequent summer. This will include a visual inspection documented with photos, and the collection and testing of water quality samples down gradient the quarry(s), if such runoff exists.


5.2.4.8 CONTINGENCIES

The need for contingencies for the reclamation of mine infrastructure has not been identified by Baffinland at this time. As the Exploration Program progresses, the need for adaptive management and contingency alternatives may arise.

5.3 RECLAMATION RESEARCH

Given the temporary and small scale nature of the exploration program as well as the lack of a revenue source from the program, research on reclamation is deemed beyond the scope of this Closure and Reclamation Plan.

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6 PROGRESSIVE RECLAMATION

In accordance with the objectives and guidelines presented in Section 2.3, progressive rehabilitation will be implemented to reduce the risk to the environment and land users. The following areas will be progressively reclaimed during the Eqe Bay Exploration Program:

- Laydown areas – un-used areas or areas no longer needed during exploration will be re-graded and scarified.
- Sumps – All sumps will be backfilled to the pre-existing natural contours of the land.
- Drillholes - All drillholes will be restored to natural conditions immediately upon completion of drilling including the removal of any drill casing materials and, if having encountered artesian flow, the capping of holes with a permanent seal.

NOTE: all drill cores produced will be stored in an appropriate manner and location at least 31 m above the ordinary High Water Mark of any adjacent waterbody, where any direct flow into a waterbody is not possible and no additional impacts are created.

- Camps – The exploration camp will be decommissioned and removed once deemed no longer required to support the Eqe Bay Exploration Program. See section 5 for more information on what final decommissioning of camps would include.
- Other disturbed areas – will be will be scarified to encourage natural re-vegetation.

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7 TEMPORARY CLOSURE

Temporary closure as defined by the *Guidelines for the Closure and Reclamation of Advanced Mineral Exploration and Mine Sites in the Northwest Territories*, states temporary closure occurs when a project ceases with the intent of resuming activities in the near future. Monitoring and reporting continues during temporary closure and a care and maintenance crew are in most instances present to care for the site.

With respect to the Eqe Bay Exploration Program, Baffinland may operate the exploration program seasonally or year-round. In late 2018 and early 2019, the camp will be unattended following sealift delivery of equipment and supplies and camp setup. In subsequent years, it is expected that a small care and maintenance crew will remain at the camp during periods when exploration activities are not underway.

Temporary closure care and maintenance activities are described below.

7.1 STRUCTURES

- All tents and camp facilities (i.e., kitchens, showers, eating areas, etc.) will be thoroughly cleaned and all wastes and open food will be incinerated (if available) or taken off-site. All remaining foodstuffs will be contained in sealed in secure containers to ensure wildlife attractants are not left over winter.
- Any overflow tents (prospector or dome-style) will be taken down and packed up.
- Oil stoves and propane systems will be shut off, and supply oil drums and propane cylinders closed.
- All doors and window will be secured shut to prevent animals and snow from entering the structures.

7.2 WATER SUPPLY


- The water supply system (tank and lines) will be drained.
- The water pump, intake and water lines will be stored away.

7.3 FUEL AND HAZARDOUS MATERIALS

- Drums of fuel will be left within the engineered containment structures.
- All drums and cylinders will be inspected and securely sealed.
- Empty fuel drums and cylinders will be removed from site by the next sealift.
- Any calcium chloride at the drill sites will be returned to the calcium chloride storage area.
- All other chemicals, such as lubricants and cleaning supplies, will be stored in sealed buildings or shipping containers.

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7.4 GENERATOR/MECHANICAL EQUIPMENT

- The diesel camp generator and other mechanical equipment will be shut-down and winterized according to manufacturer’s procedures.
- All fuel hoses will be drained and stored away, and storage tanks will be sealed and inspected for leaks.

7.5 WASTES

- Suitable wood will be disposed of by open burning, wood that can be reused will be stored onsite. All other remaining wastes are transported off-site to an approved disposal facility.
- Kitchen and shower water holding tanks will be drained.

No additional closure and reclamation activities are required for other disturbed areas or drillholes as these are restored to natural conditions immediately upon completion of drilling.

8 SCHEDULE OF ACTIVITIES


As progressive reclamation is being conducted throughout the life of the Eqe Bay Exploration Program, final closure and reclamation activities are expected to last a period of one year. All development areas will be subjected to a closure inspection by a company representative or contractor, and final conditions photographed. A brief closure report or site visit by community or land owner representatives can be arranged if desired. A one-time follow-up inspection will be carried out the year following final closure, to ensure that conditions have not changed and remain stable. The schedule of activities is outlined in Table 8-1, and the scope is further discussed in Section 9.

TABLE 8-1 SCHEDULE OF CLOSURE ASSESSMENTS

	Interim Care and Maintenance	Closure	
	Year 0	Year 1	Year 2
Short Term Temporary Care and Maintenance Program	Yes		
Water Quality Sampling	Yes	Yes	
Geotechnical Inspection		Yes	
Environmental Site Assessment		Yes	
Final Site Inspection			Yes

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9 POST-RECLAMATION SITE ASSESSMENT

A reclamation report documenting the final site conditions following reclamation and identifying any outstanding issues or monitoring requirements will be submitted to the Landowner. Ideally, the Landowner will visit the site to conduct a joint site inspection with Baffinland at the conclusion of reclamation activities.

The nature and scale of the exploration program is such that post-reclamation monitoring is expected to be limited. It is possible nonetheless that this becomes a regulatory requirement by the Landowner and/or the NWB. For this reason, a follow up site visit is proposed the subsequent summer. This will include a visual inspection documented with photos, inspection by a Qualified Person and/or Geotechnical Engineer, and the collection and testing of water quality samples down gradient the quarry(s), if such runoff exists.

Post-closure site assessment/geotechnical engineering monitoring will consist of an engineering analysis of disturbed areas (where no permanent structure or significant landform structure will remain). On Final Closure, Baffinland will commission an inspection of the site and review of the design or as-built information (where available) for each of the permanent site features to confirm the scope of post-closure geotechnical assessments (analyses and monitoring). The scope and duration of monitoring and assessments required will be developed and confirmed based on operational performance results and available construction records. If features are no longer needed during the Exploration Program, this assessment may be completed earlier in the Program's lifespan. Complete studies will be submitted to QIA for review, where available, with planned CRP updates.

An Environmental Site Assessment will be conducted at the onset of closure for areas that are expected to be contaminated with hydrocarbons or chemicals. Soil materials found to exceed the appropriate cleanup criteria for hydrocarbons (based on CCME contaminated sites guidelines or site-specific risk-based criteria) will be removed offsite to a licensed waste management facility, or the risk will be managed using site controls (e.g. covers).

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10 ESTIMATED CLOSURE AND RECLAMATION COSTS

The financial cost of the Eqe Bay Exploration Program closure and reclamation has been estimated using the Hatch Estimate Breakdown Structure (EBS) Model developed for the Mary River Project. The Hatch EBS Model was utilized over CIRNAC's RECLAIM Model based on previous discussions with QIA and in keeping with the QIA's Abandonment and Reclamation Policy.

The financial cost obtained is based on the information available at the time of publishing. Several assumptions and estimations have been made and are described in Appendix B. The model may require to be updated as the Eqe Bay Exploration Program progresses to take into consideration additional activities that have not been considered that may have associated closure liability.

10.1 MARY RIVER EXPLORATION PROJECT CLOSURE COST

The Estimate is inclusive of all closure and reclamation costs estimated to be required for a 3rd Party Contractor to perform the work in a 'worst-case' scenario for all disturbed areas, Exploration Program components and Exploration Program activities proposed for the Eqe Bay Exploration Program site upon conclusion of the program.

The total reclamation estimate for the Exploration Program, based on the total of all direct and indirect costs is \$570,000. The breakdown of the liability by land owner and land/water liability is provided in Table B-5.

TABLE 10-1 EQE BAY EXPLORATION PROGRAM CLOSURE AND RECLAMATION SECURITY ESTIMATE¹

	A	B	C
	Authorization	Liability	Total Reclamation Security Estimate (\$)
1		IOL ²	570,000
2	Type B Water	Crown	-
3	Licence	Water	-
4		Land	570,000
5	Subtotal Type B		570,000

NOTES:

- 1) Totals rounded to nearest '000 in CAD
- 2) Security relating to IOL held by Qikiqtani Inuit Association (QIA) under land lease

11 CONCORDANCE TABLES


Table 11-1 describes the concordance of this CRP with the principles of the QIA's Abandonment and Reclamation Policy for Inuit Owned Lands (Version 3.0).

TABLE 11-1 CONCORDANCE WITH QIA'S ABANDONMENT AND RECLAMATION POLICY

Item	QIA Abandonment and Reclamation Policy	Baffinland Response
1	Have all reports and plans including addendums and responses been submitted?	Yes
2	Are the submitted reports and plans executable standalone documents with adequate rationale and detail?	Yes
3	Do all reports and plans contain appropriate referencing (document name, author, section, and page number) to all supporting information?	Yes
4	Do the reports and plans demonstrate a firm understanding, of QIA's <i>Guiding Principles on Reclamation</i> and provide rationale on how these principles have been satisfied?	Yes
5	Has Inuit Qaujimagatuqangit and consultation with Community Land and Resources Committee(s) been applied?	Yes (Section 2.4)
6	Are all the components that are considered in the abandonment and reclamation plan listed?	Yes
7	Does each component of the Project have an abandonment and reclamation objectives and criteria?	Yes
8	Has an A&R plan been provided with a financial security estimate?	Yes
9	Have Table 1, 2, 3 and 4 of Appendix B been used in completing the financial security estimate?	No. See Appendix B for description of methodology
10	Has evidence been provided to support the Policy assumptions for all reports and plans?	Yes
11	Has the Tenant contacted QIA if uncertainty existed in how the Tenant was to determine an acceptable estimate?	Yes. QIA confirmed preference for the Hatch EBS Model rather than RECLAIM.

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Appendix A

Glossary of Terms & Definitions

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Term	Meaning
Abandonment	The permanent dismantlement of a facility so it is permanently incapable of its intended use. This includes the removal of associated equipment and structures.
Backfill	Material excavated from a site and reused for filling the surface or underground void created by mining. Reinsertion of materials in extracted part(s) of the orebody. Materials used for backfilling can be waste-rock or overburden. In most cases backfill is used to refill mined-out areas in order to: <ul style="list-style-type: none"> • Assure ground stability. • Prevent or reduce underground and surface subsidence. • Provide roof support so that further parts of the orebody can be extracted and to increase safety. • Provide an alternative to surface disposal. and • Improve ventilation.
Berm	A mound or wall, usually of earth, used to retain substances or to prevent substances from entering an area.
Best Management Practices	Any program, technology, process, operating method, measure, or device that controls, prevents, removes, or reduces pollution and impact on the environment.
Bioremediation	The use of microorganisms or vegetation to reduce contaminant levels in soil or water.
Care and Maintenance	A term to describe the status of a mine when it undergoes a temporary closure.
Closure	When a mine ceases operations without the intent to resume mining activities in the future.
Closure Criteria	Detail to set precise measures of when the objective has been satisfied.
Contaminant	Any physical, chemical, biological or radiological substance in the air, soil or water that has an adverse effect. Any chemical substance with a concentration that exceeds background levels or which is not naturally occurring in the environment.
Contouring	The process of shaping the land surface to fit the form of the surrounding land.
Decommissioning	Process by which a mining operation is shut down i.e.: permanently closing a site, removing equipment, buildings and structures. Rehabilitation and plans for future maintenance of affected land and water are also included.
Dewatering	Process of removing water from an underground mine or open pit, or from the surrounding rock or non-lithified area. The term is also commonly used for the reduction of water content in concentrates, tailings and treatment sludge's.

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Term	Meaning
Disposal	The relocation, containment, treatment or processing of unwanted materials or materials that are not reusable. This may involve the removal of contaminants or their conversion to less harmful forms.
Drainage	Manner in which the waters of an area exist and move, including surface streams and groundwater pathways. A collective term for all concentrated and diffuse water flow.
Effluent	Treated or untreated liquid waste material that is discharged into the environment from a structure such as a settling pond or a treatment plant.
End Land Use	The allowable use of disturbed land following reclamation. Municipal zoning and/or approval may be required for specific land uses.
Environment	Interrelated physical, chemical, biological, social, spiritual and cultural components that affect the growth and development of living organisms.
Erosion	The wearing away of rock, soil or other surface material by water, rain, waves, wind or ice. The process may be accelerated by human activities.
Evaporation	Physical process by which a liquid is changed into a gas.
Existing Operation	An installation in operation or, in accordance with legislation existing before the date on which this Directive is brought into effect, an installation authorized or in the view of the competent authority the subject of a full request for authorization, provided that that installation is put into operation no later than one year after the date on which this Directive is brought into effect.
Geochemistry	Science of the chemistry of geological materials and the interaction between geological materials with the environment.
Geology	Study of the earth, its history and the changes that have occurred or are occurring, and the rocks and non-lithified materials of which it is composed and their mode of formation and transformation.
Grade	Dimensionless proportion of any constituent in an ore, expressed often as a percentage, grams per tonne (g/t) or parts per million (ppm).
Inert Waste	Material having insignificant leachability and pollution content which will not require laboratory analysis.
In Situ Treatment	A method of managing or treating contaminated soils, sludge's and waters "in place" in a manner that does not require the contaminated material to be physically removed or excavated from where it originated.
Landfill	An engineered waste management facility at which waste is disposed by placing it on or in land in a manner that minimizes adverse human health and environmental effects.

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Term	Meaning
Mitigation	The process of rectifying an impact by repairing, rehabilitating or restoring the affected environment, or the process of compensating for the impact by replacing or providing substitute resources or environments.
Monitoring	Observing the change in geophysical, hydrogeological or geochemical measurements over time. Process intended to assess or to determine the actual value and the variations of an emission or another parameter, based on procedures of systematic, periodic or spot surveillance, inspection, sampling and measurement or another assessment methods intended to provide information about emitted quantities and/or trends for emitted pollutants.
Naturally Re-vegetate or Natural Re-vegetation	For the purposes of the Mary River Project natural re-vegetation will include scarifying and covering with overburden as required and allowing the surrounding natural vegetation to encroach and be re-established on the disturbed area.
Objectives	Objectives describe what the reclamation activities are aiming to achieve. The goal of mine closure is to achieve the long-term objectives that are selected for the site.
Open Pit Mining	Mining operation takes place on the surface. Mining operation and environment are in contact over an extended area.
Permafrost	Ground that remains at or below zero degrees Celsius for a minimum of two consecutive years.
Permafrost Aggradations	A naturally or artificially caused increase in the thickness and/or area extent of permafrost.
Permeability	The ease with which gases, liquids, or plant roots penetrate or pass through soil or a layer of soil. The rate of permeability depends upon the composition of the soil.
Phreatic Surface	The term phreatic is used in Earth sciences to refer to matters relating to ground water below the water table (the word originates from the Greek phrear, phreat- meaning “well” or “spring”). The term ‘phreatic surface’ indicates the location where the pore water pressure is under atmospheric conditions (i.e. the pressure head is zero). This surface normally coincides with the water table.
Progressive Reclamation	Actions that can be taken during mining operations before permanent closure, to take advantage of cost and operating efficiencies by using the resources available from mine operations to reduce the overall reclamation costs incurred. It enhances environmental protection and shortens the timeframe for achieving the reclamation objectives and goals.
Reclamation	The process of returning a disturbed site to its natural state or one for other productive uses that prevents or minimizes any adverse effects on the environment or threats to human health and safety.
Rehabilitation	Activities to ensure that the land will be returned to a form and productivity in conformity with a prior land use plan, including a stable ecological state that does not contribute substantially to environmental deterioration and is consistent with surrounding aesthetic values.

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Term	Meaning
Remediation	The removal, reduction, or neutralization of substances, wastes or hazardous material from a site in order to prevent or minimize any adverse effects on the environment and public safety now or in the future.
Restoration	The renewing, repairing, cleaning-up, remediation or other management of soil, groundwater or sediment so that its functions and qualities are comparable to those of its original, unaltered state.
Re-vegetation	Replacing original ground cover following a disturbance to the land.
Scarification	Seedbed preparation to make a site more amenable to plant growth.
Screening	Separating material into size fractions.
Security Deposit	Funds held by the Crown or designated owner of the land that can be used in the case of abandonment of an undertaking to reclaim the site, or carry out any ongoing measures that may remain to be taken after the abandonment of the undertaking.
Sediment	Solid material, both mineral and organic, that has been moved by air, water, gravity, or ice and has come to rest on the earth's surface either above or below sea level.
Sump	An underground catch basin in a mine where water accumulates before being pumped to the surface.
Surface Water	Natural water bodies such as river, streams, brooks, ponds and lakes, as well as artificial watercourses, such as irrigation, industrial and navigational canals, in direct contact with the atmosphere.
Sustainable Development	Industrial development that does not detract from the potential of the natural environment to ensure benefits for future generations.
Temporary Closure	When a mine ceases operations with the intent to resume mining activities in the future. Temporary closures can last for a period of weeks, or for several years, based on economical, environmental, political, or social factors.
Topsoil	Natural huminous layer on top of the orebody, which has to be stripped prior to start-up of ore extraction.

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Appendix B

Cost Estimate Assumptions

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B.1 Introduction

The purpose of this Type B Closure Cost Estimate (the Estimate) is to provide a summary of the closure and reclamation security estimate to be required for the Eqe Bay Exploration Program to meet reclamation objectives outlined in the Closure and Reclamation Plan (CRP). The Estimate is intended to be inclusive of all closure and reclamation costs estimated to be required for a 3rd Party Contractor to perform the work in a ‘worst-case’ scenario for all disturbed areas, exploration program components and activities existing at the Eqe Bay Exploration Program.

B.2 Applied Unit Rates

The Estimate was developed by applying the direct cost unit rates established in the 2014 Complete Project Financial Security Assessment prepared by Hatch for the Mary River Project to quantities of functional units of each activity or project component proposed/changed under the 2019 Estimate Addendum, unless indicated otherwise. The 2014 Complete Project Financial Security Estimate outlined the ‘First Principles’ method for developing direct costs, based on the number of person-days, equipment hours and fuel consumption estimated to complete each activity. Where possible, actual cost data was utilized, including labour and equipment rates.

As a result of ongoing discussions with QIA regarding the High Uncertainty Items for the Mary River Project Financial Security Estimate, an evaluation and update of the unit rates was completed in 2018. These rates are based on an adjustment to the labour and equipment rates utilized to build the Unit Rates, based on actualized 3rd Party Contractor costs for 2018. The 2018 Unit Rates are provided in the below Table B-1 for reference.

Table B-1 Unit Rates for Reclamation Security Estimation, Updated 2018

Description	Unit	2018 Unit Rate (\$/unit)
Fill Application	m2	38.83
Grade & Re-Contour	m2	1.49
Grade & Re-Contour Significant Disturbed Areas	m2	4.99
Culvert Removal	Ea	1,094.48
Liner Removal	m2	3.50
Open Pit Stabilization	m3	5.49
Light Mechanical Equipment	Ea	1,707.45
Medium Mechanical Equipment	Ea	3,714.64
Heavy Mechanical Equipment	Ea	35,507.45
Light Mobile Equipment	Ea	876.92
Medium Mobile Equipment	Ea	1,378.63
Heavy Mobile Equipment	Ea	2,310.87
Light Tanks	Ea	1,872.41
Medium Tanks	Ea	6,386.31
Light Diesel Tanks	Ea	3,193.16

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Description	Unit	2018 Unit Rate (\$/unit)
Medium Mobile Diesel Tanks	Ea	9,031.52
Medium Diesel Tanks	Ea	13,928.01
Large Diesel Tanks	Ea	91,285.24
Largest Diesel Tanks	Ea	147,297.85
Modular Building Not Contaminated	m ²	50.75
Modular Building Contaminated	m ²	123.02
Fold Away Building Not Contaminated	m ²	35.53
Fold Away Building Contaminated	m ²	122.25
Soft Walled Building (tent) Not Contaminated	m ²	40.60
Soft Walled Building (tent) Contaminated	m ²	127.32
ISO Container	m ²	25.38
Timber Cribbing	m ²	17.76
Precast Concrete Foundations	m ²	32.88
Slab on Grade	m ²	33.11
Bridge Removal	Lot	172,505.43
Incinerator	Ea	8,743.93
Potable Water	Ea	8,743.93
Sewage Treatment Plant	Ea	9,649.58
Ship Loader	Lot	3,271,220.53
Waste Rock Facility Water Treatment Plan	Lot	67,350.00
Reclaim Conveyor	Lot	1,136,232.91
Piping	m	56.60
Cabling	m	22.64
Miscellaneous Items (Minor)	ea	452.83
Removal of Airstrip Lighting	m	22.64

B.3 Summary of Activities


The purpose of this section of the document is to provide a summary of the financial security estimated to be required for the reclamation of the Eqe Bay Exploration Program. The Eqe Bay Exploration Program will include the following activities:

- Land-based and on-ice drilling, geological mapping and sampling, backpack drilling, till sampling and geophysical surveys
- Camp construction and operation
- Fuel storage and handling (drummed and double-walled tank storage)
- Quarrying
- Access road and airstrip construction
- Equipment, personnel and supply transport

The initial drill program will be supported by an approximate 50-person trailer camp and other outbuildings. The camp will be equipped with an incinerator, a potable water treatment plant, and a sewage treatment plant. Helicopters will be used to move drills and to transport workers between the

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drill and camp. Diesel and Jet fuel will be stored in drums within lined secondary containment areas. Workers and supplies will be delivered to the camp from either Mary River, Hall Beach or Igloolik using Twin Otter or similar aircraft. The aircraft will land at the Eqe Bay exploration area either on floats on a small lake within the exploration area, or on the tundra if equipped with tundra tires.

B.4 Reclamation Security Estimate Assumptions

The following sub-sections describe the assumptions used to establish the direct and indirect costs allocated for the Eqe Bay Exploration Program Estimate. Direct cost allocations were applied to quantities indicated in the respective sections, and consistent with the direct cost assumptions described in the 2014 Complete Project Financial Security Assessment completed for the Mary River Project.

B.4.1 Direct Cost - Equipment and Materials

The Estimate allocates \$43,000 in direct costs for mobile and mechanical equipment required for the Eqe Bay Exploration Program. A summary of the costs associated with mechanical or mobile equipment and associated unit rates is shown in Table B-2.

Table B-2 Summary of Mobile and Mechanical Equipment

Description	Quantity	Unit	Price Code Description	Unit Rate (\$)	Total Cost (\$)
Generator - 200kW	1	Ea	Heavy Mobile Equipment	2,075.0	2,075
Backhoe/Loader	1	Ea	Medium Mobile Equipment	1,162.5	1,163
Powertraxx 18-H or similar	2	Ea	Medium Mobile Equipment	1,162.5	2,325
Compact Loader	1	Ea	Medium Mobile Equipment	1,162.5	1,163
Grader	1	Ea	Medium Mobile Equipment	1,162.5	1,163
Telehandler	1	Ea	Medium Mobile Equipment	1,162.5	1,163
Diamond Core Drill (A5 or YH1000)	2	Ea	Medium Mobile Equipment	1,162.5	2,325
Geotech Drill	1	Ea	Medium Mobile Equipment	1,162.5	1,163
Generator 48 KW (Seacan)	1	Ea	Medium Mobile Equipment	1,162.5	1,163

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Description	Quantity	Unit	Price Code Description	Unit Rate (\$)	Total Cost (\$)
2" Dewatering Pump	3	Ea	Light Mobile Equipment	729.2	2,188
Kubota RTV-X1100c	2	Ea	Light Mobile Equipment	729.2	1,458
Light Plant Atlas V5+ or similar	2	Ea	Light Mobile Equipment	729.2	1,458
Incinerator	1	Ea	Incinerator	7,925.0	7,925
Water Treatment Plant	1	Ea	Potable Water	7,925.0	7,925
Waste Water Treatment Plant	1	Ea	Sewage Treatment Plant	8,775.0	8,775
Subtotal (\$ Rounded to nearest '000)					43,000

B.4.2 Direct Cost - Buildings and Structures

The Estimate allocates \$104,000 in direct costs for buildings and structures required for the Ege Bay Exploration Program. A summary of the costs associated with buildings and structures, and associated unit rates is shown in Table B-3.

Table B-3 Summary of Buildings and Structures

Description	Quantity	Unit	Price Code Description	Unit Rate (\$)	Total Cost (\$)
20 x ISO Shipping Container (20') including reefers for food storage	300	m2	ISO Container	23.8	7,145
11 Trailer Unit Drill Camp	1,210	m2	Modular Building Not Contaminated	47.6	57,639
Hard Wall Rapid Deployment Shop	300	m2	Modular Building Contaminated	114.9	34,466
Alaska Structure 16x24'	36	m2	Soft Walled Building (tent) Not Contaminated	38.1	1,372
Alaska Structure 16x16'	24	m2	Soft Walled Building (tent) Not Contaminated	38.1	915
Alaska Structure 16x50'	75	m2	Soft Walled Building (tent) Not Contaminated	38.1	2,858
Subtotal (\$ Rounded to nearest '000)					104,000

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B.4.3 Direct Cost - Disturbed Areas

The Estimate allocates \$54,000 in direct costs for disturbed areas required for the Ege Bay Exploration Program. A summary of the costs associated with the disturbed areas and associated unit rates is shown in Table B-3.

Table B-3 Summary of Disturbed Areas

Description	Quantity	Unit	Price Code Description	Unit Rate (\$)	Total Cost (\$)
Camp area (approx 600' x 600')	33,500	m2	Grade & Re-Contour	1.5	50,079
Fuel Storage Area - Fold Away Spill Containment	1,044	m2	Grade & Re-Contour with Liner	4.1	4,325
Subtotal (\$ Rounded to nearest '000)					54,000

B.4.4 Indirect Cost – Mobilization and Demobilization of Fuel


The Estimate allocates \$23,000 to account for the demobilization of fuel stored on site, and the mobilization of fuel required for the reclamation activities. Based on the proposed fuel storage of 1,800 drums (205L) equalling 369,000 L, it is assumed 50% of this fuel would need to be demobilized at closure. This is based both on the assumption that the fuel cache would be at full capacity at closure, and that 50% of fuel on site would be available for reclamation activities. The fuel demobilization rate is assumed to be \$0.10/L, and therefore the cost to demobilize fuel is \$18,450.

The allocation for fuel mobilization is based on the cost of mobilizing 50% of the fuel required for marginal reclamation and closure activities, including direct activities, power generation, and heat production. Reclamation for Exploration Program is estimated to require an additional 12,000 L of Type-1 fuel (see Appendix A). Camp operation during reclamation is estimated to require 127 person-days on-site. Each person-day on site is assumed to consume 116L of Type-1 fuel for heat and power generation. This totals 15,000 L of Type-1 fuel required to heat and power the camp. The fuel mobilization rate is assumed to be \$0.40/L, and therefore based on the total required fuel volume of 27,000 L, the mobilization of fuel is estimated to cost \$5,000.

B.4.5 Indirect Cost – Mobilization and Demobilization of Equipment and Materials

The Estimate allocates \$20,000 to account for mobilization and demobilization of equipment, materials and wastes. These are indirect costs for moving equipment and materials to and from the reclamation

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site. The amount is based the assumption that mobilization and demobilization cost are estimated as 10% of total direct costs.

B.4.6 Indirect Cost – Mobilization of Workers Required for Reclamation

The Estimate allocates \$11,000 for worker mobilization. Detailed assumptions for mobilization of workers required for marginal closure and reclamation activities are as follows.

Person-hours required to complete direct cost related on-site marginal reclamation activities is estimated to be 1,274 hrs or 127 person-days (based on 10hr/day productivity), and based on the following assumptions:

- Assume 70% of hires (90 person-days) are from southern communities and 30% (39 person-days) are from northern communities.
- Cost per person-day on site for worker mobilization from southern communities is \$85.45/person-day on-site.
- Cost per person-day on site for worker mobilization from northern communities is \$75.00/person-day on-site

B.4.7 Indirect Cost – Worker Accommodation & Camp Operation

The Estimate allocates \$29,000 for worker accommodation and camp operation costs during reclamation activities. Person-hours required to complete direct cost related on-site marginal reclamation activities is estimated to be 1,274 hrs or 127 person-days (based on 10hr/day productivity), and an estimated camp operation cost of \$225.50/person-day, which includes camp maintenance, catering, housekeeping and fuel costs.

B.4.8 Indirect Cost - Post Closure Monitoring

The nature and scale of the Exploration Program is such that post-reclamation monitoring is expected to be limited. It is possible none-the-less that this becomes a regulatory requirement by the Landowner and/or the NWB. Accordingly, a limited scope Post Closure Monitoring program is proposed for the Exploration Program as outlined in Section 9 of the CRP. The cost associated with the Post Closure Monitoring program total \$185,000, as outlined in the below Table B-4. These costs are inclusive of all field work, laboratory fees, data analysis and reporting, and are estimates based on the operational experience and known costs for the Mary River Project.

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Table B-4 Schedule and Costs Associated with Post Closure Monitoring

	Interim Care and Maintenance	Closure		Subtotal
	Year 0	Year 1	Year 2	
Short Term Temporary Care and Maintenance Program	50,000			50,000
Water Quality Sampling	30,000	30,000		60,000
Geotechnical Inspection		20,000		20,000
Environmental Site Assessment		50,000		50,000
Final Site Inspection			5,000	5,000
Subtotal	80,000	105,000	5,000	
			Total	185,000

B.4.9 Indirect Cost – Supervision, Project Management and Contract Administration

The Estimate includes a project supervision, management and contract administration indirect cost allowance of \$36,000 or 9.4% of total direct costs, care and maintenance costs, and closure monitoring/reporting costs. Project supervision, management and contract administration indirect costs include, but are not limited to:

- Contract strategy, administration and expediting;
- Construction logistics, planning, scheduling, supervision and manpower forecasts;
- Labour relations, safety;
- Field office management, temporary facilities;
- Materials receiving and warehousing;
- Progress monitoring, trending and reporting;
- Cost performance monitoring, trending and claims processing; and
- Quality assurance.

B.4.10 Indirect Cost – Engineering Fees

The Estimate includes an engineering, design and execution planning indirect cost allowance of \$8,000 or 3.9% of the total direct costs.

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B.4.11 Indirect Cost - Contingency

The Estimate includes a contingency of \$56,000 or 12.5% of the total of direct costs, mobilization and demobilization of equipment and materials costs, worker accommodation and camp operation costs, mobilization of workers costs, and post closure monitoring.

B.5 Reclamation Estimate Summary

The Estimate is inclusive of all closure and reclamation costs estimated to be required for a 3rd Party Contractor to perform the work in a 'worst-case' scenario for all disturbed areas, Exploration Program components and Exploration Program activities proposed for the Eqe Bay Exploration Program site upon conclusion of the program.

The total reclamation estimate for the Exploration Program, based on the total of all direct and indirect costs is \$570,000. The breakdown of the liability by land owner and land/water liability is provided in Table B-5. The complete estimate as compiled in the Estimate Breakdown Structure is provided in Appendix C.

Table B-5 Eqe Bay Exploration Program Closure and Reclamation Security Estimate¹

	A	B	C
	Authorization	Liability	Total Reclamation Security Estimate
			(\$)
1		IOL ²	570,000
2	Type B Water	Crown	-
3	Licence	Water	-
4		Land	570,000
5	Subtotal Type B		570,000

NOTES:

1) Totals rounded to nearest '000 in CAD

2) Security relating to IOL held by Qikiqtani Inuit Association (QIA) under land lease

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Appendix C

Estimate Breakdown Structure

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Appendix D

Photographs

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Figure C.1 – Aerial of Eqe Bay Region, Looking North



Figure C.2 – Aerial of Eqe Bay Region, Looking South


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Figure C.3 –Eqe Bay Region, Approximate Camp Location, Looking Northeast



Figure C.4 –Eqe Bay Region, Approximate Camp Location, Looking South