APPENDIX 10G

INTERIM ABONDONMENT AND RECLAMATION PLAN

Baffinland Iron Mines Corporation
Mary River Project

Interim Abandonment and Reclamation Plan

2013-06-07	0	Approved for Use	A. Grzegorczyk	J. Binns	S. Perry	E. Madsen
Date	**Rev.**	**Status**	**Prepared By**	**Checked By**	**Approved By**	**Approved By**
			HATCH			**Client**

Table Of Contents

Tables

Figures

List of Appendix

Appendix Tables

1. Executive Summary

The Mary River Project (the Project) is an approved Project located on north Baffin Island, in the Qikiqtani Region of Nunavut. The Project is wholly owned by Canadian mining company Baffinland Iron Mines Corporation (Baffinland).

This Interim Abandonment and Reclamation (A&R) Plan has been updated from the Preliminary Mine Closure and Reclamation Plan presented in Volume3, Appendix 3B, Attachment 10 of the FEIS in accordance with applicable requirements of:

- Typical conditions applying to security and abandonment, closure and reclamation or temporary closure for a Type A Water Licence
- The Project Certificate No. 005 conditions
- The Qikiqtani Inuit Association (QIA) Abandonment and Reclamation Policy for Inuit Owned Lands
- Aboriginal Affairs and Northern Development Canada (AANDC) Mine Site Reclamation Guidelines for the Northwest Territories (2007)
- Commitments made by Baffinland during the FEIS and Type A Water Licence review processes.

Project related facilities were designed and constructed to minimize the footprint and where possible and practical, facilities were designed to be temporary in nature. These design and construction considerations have facilitated reclamation plans and minimized the engineering required to support the complete decommissioning and reclamation of the site.

Three abandonment scenarios have been described in this Interim Mine Closure and Reclamation Plan: short-term temporary mine closure, long-term temporary mine closure and final mine closure. Additionally, progressive reclamation measures have been proposed to facilitate temporary and final mine closures.

Temporary closure is the planned shutdown of a mine site for a period of less than one year. All facilities would be secured, an inventory of all hydrocarbon products, chemicals, hazardous wastes and explosives would be carried out and all effluents would be monitored. Hazardous waste and explosives would be removed from the site. Personnel necessary, including environmental personnel, to meet closure criteria would remain on site.

Long-Term Closure is the state of inactivity resulting from economic considerations or a reduction in ore reserves for a period greater than one year. During Long-Term Closure the Project sites will be maintained in a secure condition. Site personnel will conduct general inspections periodically. They will maintain a record of these inspections. Although protective measures will be in place the Project will no longer be monitored by on site personnel maintaining a full time presence on the Project.

Final closure and reclamation will occur when the ore deposit is exhausted and the mine ceases operations without the intent to resume mining activities in the future. Final closure and reclamation will include removing all infrastructure, equipment and materials either off-site or into an on-site landfill, the Mine Pit or quarries (for disposal of inert, non-hazardous, non-combustible materials), contouring of ground or granular surfaces if required to maintain stability and re-establish natural drainage patterns as reasonably possible. Arrangements will be made with a sealift contractor to collect materials and equipment at Milne Port and Steensby Port and to ship material destined for offsite transport. The airstrips will be abandoned, but left in good working order unless otherwise directed by regulatory agencies or the Land Owner to provide emergency/rescue landing spots for regional aircraft and access for post closure monitoring.

The final closure and reclamation activities are expected to last a period of three (3) years. Post closure monitoring will continue until closure objectives have been achieved as shown by monitoring results. These activities are periodic. Monitoring and follow-up inspections will be conducted to assess the physical and chemical stability of various components after closure and reclamation of the facilities. Environmental monitoring and follow-up inspections will assess the ongoing effectiveness of the reclamation.

The Mining RECLAIM spreadsheet provided by Aboriginal Affairs and Northern Development Canada (AANDC) (formerly Department of Indian Affairs and Northern Development) has been used as the basis for the interim estimate of the financial cost of final closure and reclamation measures. It addresses Project-related activity areas and infrastructure related to the Mary River Project including the Early Revenue Phase (ERP), mobilization and post-closure monitoring. The financial cost obtained is based on the information available at the time of publishing and will require updating as the Project progresses. The cost estimate also follows the QIA Abandonment and Reclamation policy guiding principles and stated assumptions.

2. Introduction

Abandonment and reclamation for the Mary River Project will be regulated under Baffinland's pending Type A Water Licence and the pending IOL Commercial Lease.

2.1 Conceptual Mine Closure and Reclamation Plan for the Project

The Interim Abandonment and Reclamation Plan contains and describes the studies and plans related to closure and reclamation of a mine site and its related mine facilities. The Interim A&R Plan addresses the physical stability, chemical stability and future land use of each component of the mine. Participation of local communities and other stakeholders in the consideration of alternative reclamation activities to safeguard community values is encouraged. Baffinland has committed to establish an advisory group focused on reclamation of the Project that will allow for local community input and involvement. Reclamation will be consistent with locally valued ecosystem components and regional planning objectives. All closure work will be carried out in accordance with permit requirements as stated in the Territorial Land Use Regulations.

The most recent AANDC guidelines envisage three primary stages in the development of an A&R Plan[1]:

- A Preliminary
- An Interim
- A Final Abandonment and Reclamation Plan.

After submission of the Final A&R Plan the subsequent post closure documents report reclamation activities undertaken and compares the planned objectives performance against that which has actually been achieved.

2.2 Preliminary Mine Closure and Reclamation Plan

A Preliminary Mine Closure and Reclamation Plan was prepared for Baffinland in support of the regulatory approval process, including the Final Environmental Impact Statement (FEIS) for the Project, and was based on available Project design information which was at a conceptual design level. This document assumes that the reader has access to and is familiar with the FEIS content.

The purpose of that document was to provide an initial Preliminary Mine Closure and Reclamation Plan for the Mary River Project, at a conceptual level, in accordance with the regulatory framework established by the Inuit, Federal and Territorial governments.

2.3 Interim Abandonment and Reclamation Plan

This Interim Abandonment and Reclamation Plan (A&R Plan) has been developed to increase the detail of the closure criteria presented in the Preliminary Mine Closure and Reclamation Plan. It addresses progressive rehabilitation undertaken to date and addresses temporary and long-term closure as well as final cessation of operations. Public health and safety is considered throughout all stages of progressive rehabilitation, closure and post-closure.

This Interim A&R Plan does not constitute a Final Closure Plan, and it will be updated throughout the life of the Project, as per the terms and conditions of the pending Type A Water Licence and pending IOL commercial lease. Updates will refine and elaborate on all specific targets and commitments.

The Mine Site Reclamation Guidelines For The Northwest Territories establishes that the following information should be addressed in the Interim closure plan:

- Renewed or updated statements of reclamation objectives
- Reclamation and progressive reclamation schedule
- Detailed descriptions of activities related to temporary or indefinite closure
- Detailed descriptions of contingency plans

[1] Mine Site Reclamation Guidelines for the Northwest Territories, AANDC Renewable Resources & Environment (January 2007).

- Renewed or updated descriptions of possible reclamation activities to a level of detail relevant to the information available (the level of detail should increase through the mine life due to new information)
- Updated reclamation research plan
- Increasingly convincing evidence that the reclamation objectives can be achieved by the described activities
- Updated photographs depicting the site during operations
- Detailed report on progressive reclamation activities
- Site specific closure criteria
- Updated post-closure monitoring requirements and responsibilities
- Renewed or updated descriptions of the likely post-reclamation risks to human and wildlife health and the environment relevant to the information available (Risk Assessments)
- Updated reclamation liability costs and financial security estimates to a level of detail relevant to the information available.

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 regulatory agencies and implicated communities.

Table 2-1 lists the relevant policies, guidelines and associated regulations that Baffinland will adhere to in the development of this and future revisions to the A&R Plan.

Table 2-1: Applicable Mine Closure Planning Policies, Guidelines, and Lease Requirements

Title	Source
Type A Water Licence 2AA-xxxxx (pending)	(NWB 2013)
Commercial Lease No.: QIOxxxx (pending)	(QIA 2013)
Guidelines for the Preparation of an Environmental Impact Statement for Baffinland Iron Mines Corporation's Mary River Project (NIRB File No. 08MN053)	(NIRB 2009)
Abandonment and Reclamation Policy for Inuit Owned Lands, Department of Lands and Resources	(QIA 2009)
Mine Site Reclamation Guidelines for the Northwest Territories	(AANDC 2007)
Mine Site Reclamation Policy for Nunavut	(AANDC 2002)
Mine Site Reclamation Policy for the Northwest Territories	(AANDC 2002a)
Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories	(NWTWB 1990)
NWT/Nunavut Mines Health and Safety Act and Regulations	2005

NIRB - Nunavut Impact Review Board
QIA - Qikiqtani Inuit Association
AANDC - Aboriginal Affairs and Northern Development Canada (formerly INAC - Indian and Northern Affairs Canada)
NWTWB - Northwest Territories Water Board

A Glossary of Terms, Acronyms and Abbreviations used throughout this document and the applicable guidelines and regulations can be found in Section 15.

2.4 Other relevant EHS changes to be incorporated prior to Mining Operations

Prior to commencement of mining operations and submission of this Interim Mine Abandonment and Reclamation Plan, the Environment, Health and Safety (EHS) systems documents, as presented in Volume 10 of the FEIS have been updated. These documents include:

- Environmental Design Guidelines used for the Mary River Project which enabled the design team to avoid major impacts on the identified Valued Ecosystem Components VECs and Valued Socio-Economic Components VSECs. Detailed environmental design criteria are presented in the FEIS.
- Environmental Protection Plan (EPP) has been updated and superseded by a Contractors Environmental Protection Plan (CEPP) which regroups detailed procedures and standards for the execution of field activities which will optimize environmental protection. many of the procedures and instruction developed at the exploration phase will be retained throughout the Life of the Project, as exploration is an on-going activity, and, the established procedures are relevant for all phases of the Project.
- An outline of the Company's Hazard Identification and Risk Assessment (Appendix 10A-2), based on OSHA 18001 principle. Emergency Response and Spill Contingency Plan. as per the other management plans, the Emergency Response and Spill Contingency Plan is a Life of Project Plan which is updated regularly to accommodate the level of activities on the Mary River Project sites.
- Purpose and content of the environment monitoring and mitigation plans (EMMPs). The EMMPs outline the specific mitigation measures applied to ensure minimal adverse impacts on the VECs. these EMMPs are "living documents" which are updated regularly in the context of the principle of "continuous improvement". They apply from the onset of exploration activities through to pre-development, construction, operation and the closure phase of the Project. As the Project advances in its "life cycle", the roles and responsibilities changes to reflect the degree of activities on the various sites. Monitoring activities (selection of indicators, targets and thresholds) as well as mitigation measures are also adjusted through adaptive management, if required, on the basis of monitoring information gathered and evaluation of effects.
- Outline of the health and safety management plan (developed on the basis of OSHA 18001 guidelines).
- Outline of the Project's stakeholder's engagement plan (developed in the context of ISO Standard 26000:2010 related to Guidance for Social Responsibility).

- Outline of the human resources management plan. the plan will be updated on the basis of the requirement of IIBA, once negotiations have concluded.
- Reporting and documentation requirements for all environmental management plans as outlined in Baffinland's EHS Framework (Appendix 10-A).
- Process of management review and adaptive changes, which is outlined in Appendix 10A-1, and is applicable to all management plans.
- Baffinland Health, Safety and Environment Policy updated March 2013.

In addition, the FEIS includes the documentation required for the application of a Type A Water Licence. All of the Project environmental management plans are subjected to audit and annual management reviews to ensure that the policies, procedures and mechanisms put in place lead to the achievement of stated performance goals and objectives. Several of these management plans will be updated to reflect the advancement in Project design as well as the construction activities. A summary of the various plans, the expected review date, or expected date of implementation will be presented in Volume 10 of the FEIS.

2.5 Interim A&R Plan Goals and Objectives

Over the life of the Project it is expected that techniques and methodology for mine site reclamation will continue to evolve with changes to our understanding of the Project site, stakeholder's views and technologies for cost effective and practical reclamation in northern conditions. Planning for the mine site reclamation will be risk based and remain dynamic in order to take into account results of on-going studies and identified best practices for the site specific conditions as this knowledge base is expanded over time.

The Project is being designed with closure and reclamation considerations in mind in compliance with the Baffinland Sustainable Development Policy.[2] The main objectives of this policy and the above guidelines and regulations are to:

- Apply the principles of pollution prevention and continuous improvement to minimize ecosystem impacts, and facilitate biodiversity conservation.
- Use energy resources, raw materials and natural resources efficiently and effectively.
- Engage with governments, employees, local communities and the public to create a shared understanding of closure and reclamation issues and take their views into consideration in making decisions.
- Return the Project affected and viable sites (Milne Port, Mine Site, Railway right of way, Quarries and Steensby Port) to "wherever practicable, self-sustaining ecosystems that are compatible with a healthy environment and human activities"[3].(NRCan, 1994).

[2] Baffinland Iron Mines Corporation, Sustainable Development Policy (September 2011).
[3] Natural Resources Canada. *The Whitehorse Mining Initiative Leadership Council Accord Final Report* (October 1994).

- Where practicable, undertake reclamation of affected areas as soon as practical in an on-going and progressive manner to reduce the environmental risk once the mine ceases operation (INAC, 2002. INAC, 2002a. Northwest Territories Water Board, 1990. and QIA, 2009).
- Provide for the reclamation of affected sites and areas to a stable and safe condition and restore altered water courses to near their original alignment and cross-section. Where practical, affected areas will be returned to a state compatible with the original undisturbed area (Territorial Land Use Regulations).
- Return altered water courses to their original alignment and cross-section (Territorial Land Use Regulations).
- Reduce the need for long-term monitoring and maintenance by designing for closure and instituting progressive reclamation, when possible.
- Provide for mine closure using the current available proven technologies in a manner consistent with sustainable development.

In accordance with the above objectives the main goals of the Interim Abandonment and Reclamation Plan are to:

- Establish a working group to consider reclamation options drawing from Inuit knowledge and arctic experiences of similar mining and use of decommissioned facilities for alternative uses.
- Provide for the long term physical and chemical stability of the Project areas so as to protect the public health and safety and ecosystem integrity.
- Promote and enhance natural re-vegetation and recovery of disturbed areas that is compatible with the surrounding natural environment and to allow for the future use by people and wildlife.
- Implement reclamation in a progressive on-going manner during the life of the Project and restore sites as soon as an area is no-longer required to limit the need for long term maintenance and monitoring.
- Reduce residual environmental effects once operations have ceased through final closure measures that are technically and economically feasible.

The list of major Project components in the MC&RP will be updated with current planning.

Specific criteria are listed for reclamation scenarios in Section 11 of this document. They are consistent with the AADNC 2007 Guidelines and will be revised and improved as the Project develops.

2.6 Technical Certificates

This update to the 2012 Preliminary Closure Plan document (now the Interim Mine Closure and Reclamation Plan) was prepared by professionals of Hatch Ltd and other members of the Baffinland Mary River Project team.

2.6.1 Certification

John Binns, M.Sc., P.Eng. – Environment Manager

Mr. Binns is a senior environmental engineer in Hatch's mining practice. He started his long career originally as an underground Mining Engineer with experience in gold and copper mines. He has broad experience in mineral exploration including mining geophysics, as well as extensive international experience in environmental management including mine closure, mine water management, Acid Rock Drainage, Environmental Management Systems (EMS), and EMS auditing.

Catalina González,* M.Env.Sc. *– Junior Engineer

Miss González is a junior environmental engineer in Hatch's Environmental Service Group With more than a year of experience, she has participated in several closure plans and closure cost estimates.

Adam Grzegorczyk, B.Sc (Env.) - Mine Closure and Reclamation Planning

Mr. Grzegorczyk is an environmental analyst in Hatch's mining practice. He has broad experience in Environmental Management Systems (EMS), Lifecycle Assessment, project planning and due diligence. He has worked closely with clients throughout his career to identify environmental impacts and mitigation strategies during the project planning and implementation phases for large scale mining, metal, infrastructure, and energy projects with a particular emphasis on project closure and reclamation.

3. Project Information

3.1 Proponent Name and Address

The proponent of this Interim Mine Closure and Reclamation Plan is:

Baffinland Iron Mines Corporation
120 Adelaide St. West, Suite 1016
Toronto, ON M5H 1T1
Tel: (416) 364-8820 Fax: (416) 364-0193

3.2 Project Description and Site Plans

A summary Project Description is provided below along with location drawings for each of the major Project sites identifying when components are planned to be reclaimed.

3.2.1 *Project Description*

The basis of the Mary River Project (the Project) is production and shipment of high grade iron ore from ore deposit, Deposit No.1 located on North Baffin Island in the Qikiqtani Region of Nunavut. There are three main project locations consisting of the Mine Site, Milne Port located north of the Mine Site, and, Steensby Port located south of the Mine Site. Milne Port is connected to the Mine Site by a 115 km Tote Road while a railway, 149 km in length, will eventually be constructed to connect Steensby Port to the Mine Site. The Mine Site is located approximately 160 km south of Pond Inlet (Mittimatalik) and approximately 1,000 km northwest of Iqaluit. The Project sites are shown on Figure 3-1. The Major Project Components are listed in Table 3-1.The Early Revenue Phase (ERP) includes development of a nominal 3.5 million tonnes per annum (Mt/a) road haulage operation from the Mine Site to Milne Port for shipping of iron ore during the open water season. The ERP introduces the following additional infrastructures that were not part of the Approved Project:

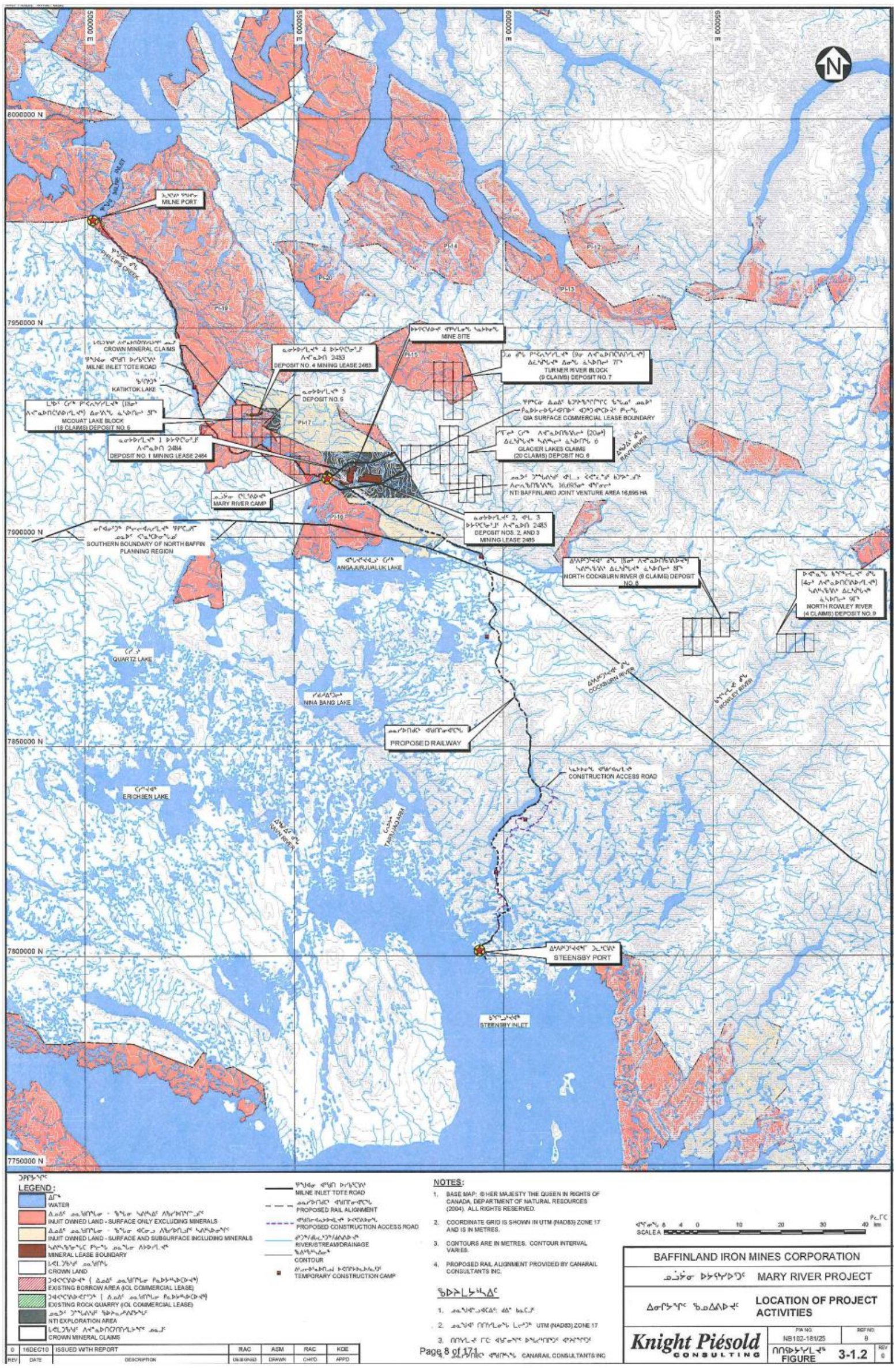
1. Milne Port:
    i) Ore stockpiling and loading equipment.
    ii) Ore dock.
2. Mine Site
    i) Truck fleet and associated extended maintenance facilities.

Construction of the ERP facilities will be completed by end Q1 2015 except for final commissioning of the ship loader which cannot occur until mid-July when ore shipping begins in the open water season of 2015. Approximately 2 Mt iron ore will be shipped in 2015 with 3.5 Mtpa shipped thereafter.

It is assumed that financing for the Approved Project Railway Phase (Project Certificate No. 005) will become available to begin engineering in 2014 and full scale mobilization at all Project sites in 2015. The Project Description for operating phase of the Approved Project Railway Execution Phase is described in Volume 3 of the FEIS. The Project plan calls for a railway to be constructed that will connect the Mine Site at Mary River to a newly constructed Port in Steensby Inlet on the south-western coast of Baffin Island. For the construction period, material, equipment and supplies required for the installation of needed facilities at the Mine Site and the northern portion of the railway will be received via Milne Port. Goods received at Milne Port will be transported to the work sites via the existing Tote Road which requires limited upgrading. Likewise, construction materials for the new port in Steensby Inlet and the southern portion of the railway will be received at the Steensby Port location.

During the construction phase of the Project, the majority of the construction material and supplies, fuel and mining equipment will be received at Milne Port and Steensby Port during the open-water season August to October. A floating dock will be located at Milne Port to facilitate the off-loading of construction materials, equipment and supplies. During the ERP 3,5 Mt/a of iron ore will be transported to Milne along the Tote Road by ore truck and shipped out of the Milne Port during the open water season.

Once the Railway is operational and the ERP has come to an end, Milne Port will only be used occasionally for the delivery of oversized equipment to the Mine Site. It is expected that the Steensby Port facilities and the Railway will take four years to construct. Upon Railway operation, 18 Mt/a of iron ore will be transported by rail and transferred to ore carrier vessels from Steensby Port for shipment to international markets. Shipping of ore from Steensby Port will occur year round and will require vessels with icebreaking capabilities. It is anticipated that the ERP will produce for five years on its own, after which time production from the Approved Project (18 MT/a) will commence and augment ERP production.



Page 8 of 171

Figure 3-1: Location Map

Table 3-1: Major Project Components

Milne Port	
Temporary Facilities	**Permanent Facilities**
• Bulk fuel storage facilities (fuel bladders. to be decommissioned by end of 2013) • Mobile Gensets • Temporary Floating dock for sealift unloading • Temporary 120 person tent camp	• Beach laydown area for sea-lift unloading • Multiple Laydown areas • Airstrip (existing and upgraded) • Waste management facilities (hazardous, solid waste and tires) • Quarries and borrow sources (existing) • Camp facilities (existing) for a peak capacity of 150 people) • Wastewater treatment systems (sewage and oily water treatment) • Domestic water supply from Phillips Creek during the summer months and unnamed lake along the Milne Inlet Tote Road at km 32 during winter season • Mobile Gensets • Bulk fuel tank farm – new steel tanks, barrels – installed within lined containment • Explosives storage • Communication systems • Contaminated snow treatment pond and contaminated soil/landfarm • Truck maintenance facilities • Ore Dock • Floating Dock
Milne Inlet Tote Road	
Temporary Facilities	**Permanent Facilities**
• Stand-alone generators as required • Quarries and borrow sources • Explosives magazines	• Milne Inlet Tote Road • Quarries and borrow sources • Communication towers • Emergency shelters

Mine Site	
Temporary Facilities	**Permanent Facilities**
• Construction camp • Contractor offices • Quarries and borrow sites • Temporary fuel storage (double wall iso-containers and manufactured tanks) • Aggregate crusher and stockpiles • Concrete batching plants (post 2013) • Temporary power generators • Portable lighting plants • Construction workshops and maintenance shops • Warehouses/stores	• Ore crushing, screening and conveyer systems (post 2013) • Ore stockpiling facilities with associated runoff water polishing ponds (post 2013) • Contaminated snow holding pond (post 2013) • Landfarm for treatment of contaminated soil (post 2013) • Railway loading and unloading facilities (post 2013) • Truck loading and unloading facilities • Equipment maintenance facilities • Permanent worker accommodations • Communication systems • Site roads • Laydown areas • Airstrip (existing and upgraded) and facilities • Helicopter landing pad and hanger • Bulk fuel storage and distribution facilities • Explosives manufacturing and storage • Water supply for adjacent Camp Lake • Power generation for the camps • Waste management facilities • Non-hazardous landfill • Hazardous waste, recyclable waste, used tires and other miscellaneous waste storage areas • Explosives plant • Heavy equipment parking and maintenance facilities • Waste water treatment facilities discharging to either storage ponds or Mary River • Waste water treatment facilities for old exploration/bulk sample camp facilities discharging to storage ponds/Sheardown Lake.
Railway*	
Temporary Facilities	**Permanent Facilities**
• Construction access roads • Quarries and borrow sources • Construction camps and airstrips • Refuelling depots at camps • Explosives magazines	• Railway embankment • Train loading and unloading facilities • Communication systems • Tunnels, bridges • Rail sidings • Quarry for ongoing railway ballast during operations (also used in construction)

Steensby Port*	
Temporary Facilities	**Permanent Facilities**
• Construction docks • Quarry and borrow sites and related access roads • Concrete batch plant(s) • Construction workshops and maintenance shops • Warehouses/stores • Temporary power generators • Portable lighting plants • Laydown areas/freight storage • Parking areas for construction fleet • Temporary fuel storage (iso-containers) • Construction Equipment maintenance facilities • Explosives plant and magazines	• Steensby Island Causeway • Ore stockpiling facilities • Ore and freight docks • Ore crushing and screening • Ship loading and unloading facilities • Cargo (container) handling facilities • Permanent worker accommodations • Rail shops and maintenance infrastructure • Maintenance facilities • Buildings and offices • Communication systems • Site roads • Laydown areas/freight storage • Airstrip and related access road • Bulk fuel storage and distribution facilities • Water supply facilities • Waste management facilities • Power plant • Navigational aids (shipping lane and port)

* Railway and Steensby Port major project components are only applicable under currently approved Mary River Project.

3.2.2 Site Plans

The proposed Mine Site, Milne Port and Steensby Port, connecting infrastructure and principal camp locations site plans are shown on the series of drawings in Appendix A Project components that are planned to be reclaimed following the construction phase are quantified separately as are components that are contained on Inuit Owned Land. These drawings should be consulted when reviewing the remaining sections of this report.

There has been no change to the closure strategy for the Railway portion of the Project (as approved under the Project Certificate No. 005). The updates that have been done are the progressive reclamation plans for the proposed ERP at both Milne Inlet and the Mine Site. As such all the drawings shown in the table below are relevant for this Interim MC&RP.

Table 3-2: Drawings for Mine Closure and Reclamation

Drawing Number	Drawing Title
E349000-2000-07-014-00001	Areas of Reclamation – Milne Port Layout
H337697-4210-07-012-0001	Preliminary Mine Closure and Reclamation Plan – Mine Site Construction Phase
H337697-4210-07-012-0002	Preliminary Mine Closure and Reclamation Plan – Mine Site Final Closure Phase
H337697-0000-07-126-0014	Preliminary Mine Closure and Reclamation Plan – Tote Road
H337697-2000-07-012-0001	Preliminary Mine Closure and Reclamation Plan – Railway Alignment
H337697-7000-07-012-0002	Preliminary Mine Closure and Reclamation Plan – Ravn River Rail Camp
H337697-7000-07-012-0003	Preliminary Mine Closure and Reclamation Plan – North Cockburn Camp – Tunnels
H337697-7000-07-012-0004	Preliminary Mine Closure and Reclamation Plan – South Cockburn Lake Rail Camp
H337697-4510-07-012-0001	Preliminary Mine Closure and Reclamation Plan – Steensby Port Construction Phase
H337697-4510-07-012-0002	Preliminary Mine Closure and Reclamation Plan – Steensby Port Final Closure Phase

3.3 Inuit Owned Lands

The IOL surrounding the Project area are shown on the reference drawings for the Mine Site, Milne Port and Railway alignment. The surface lease to the Project is held by Baffinland and is leased from the Qikiqtani Inuit Association (QIA). In accordance with this and future surface leases held with the QIA, this Interim Abandonment and Reclamation Plan incorporates the guidelines developed for the Qikiqtani lands entitled the Abandonment and Reclamation Policy for Inuit Owned Lands (Version 2.0, QIA 2010). The guiding principles of the Abandonment and Reclamation Policy require that all disturbed IOL be returned to a safe and stable condition capable of supporting human and wildlife needs consistent to social and cultural needs of the Inuit for the undisturbed lands within that area. The QIA guidelines used for this Interim Abandonment and Reclamation Plan are summarized in Appendix C.

Milne Port and the Mine Site are entirely located on Inuit Owned Land. The first 25 km of the railway and access roads are located on Inuit Owned Land. The remaining sections are located on Crown land.

4. Current Project Site Conditions

Since the discovery of the ore deposit in 1962, there have been a number of exploration campaigns as described in Volume 3, Section 1.2 of the FEIS. A 2013 Work Plan was submitted to the Nunavut Water Board and others on February 13, 2013. All works and activities proposed have been screened by the NIRB and have been considered in the Project Certificate No. 005 issued by the NIRB on December 28, 2012. The general scope for the 2013 Work Plan includes:

- The development and construction of infrastructure required for site capture at Milne Port and the Mine Site for the launching of the 18 MT Mary River Project.
- Ongoing environmental baseline data collection and geotechnical drilling in order to support the development of the 18 MT Project. These activities will resume at the Milne Port site, along the Tote Road, at the Mine Site, at numerous quarry sites and at other Project development areas.

The current Type B Water License (2BB-MRY1114) authorizes Baffinland to operate the existing sewage treatment plants, incinerators, landfill, wastewater treatment and other facilities and camp infrastructure regulated by the Nunavut Water Board. A new Type B license (8BC-MRY1314) was granted on May 25, 2013 to allow for site preparation (prior to the receipt of the pending Type A Water License).The work completed by the end of 2013 includes:

- additional 5 ML fuel tank within the existing secondary containment at Milne Port
- the construction of an additional fuel containment berm at Milne Port
- the construction of a second Polishing Waste Stabilization Pond (PWSP) at Milne Port
- the construction of laydown and camp pad areas at Milne Port and the Mary River Mine Site
- the development of quarries and borrows to provide aggregate for the above projects.

It is anticipated that the future Type A license for the Project will be issued in July 2013. At that time, most activities authorized under existing Type B licenses will migrate to the new Type A. Since 2007, Baffinland has provided annual reports to the Nunavut Impact Review Board (NIRB) summarizing the site work completed, and the work planned for the following year for the activities previously screened and approved by NIRB. These reports also provide a synopsis of compliance performance with explorations licences, permits, approvals and commitments, and include the results of monitoring activities. An update on the existing environmental conditions and progressive reclamation activities are also contained in these reports. The reports are publicly available through NIRB (http://www.nirb.ca/). Appendix D provides Site Photographs of current conditions onsite.

5. Progressive Rehabilitation

Phase:	Construction – ERP		Operation – ERP						Operation - Rail Phase			
Year:	**1**	**2**	**1**	**2**	**3***	**4***	**5***	**6***	**1**	**2**	**3**	**4....**
Milne Port												
Stockpile												
Camp Pad												
PWSP (current)												
Bladder Farm												
Quarry (Q1)												
Mary River												
Bladder Farm												
Quarry (QMR2)												
Laydown Areas												
Borrow Pits												
Rail												
Rail access road												

Figure 5-1 Summary Progressive Rehabilitation Schedule

*Rail Phase construction begins

In accordance with the objectives and guidelines presented in Section 2.5, progressive rehabilitation will be implemented to reduce the risk to the environment. In addition to progressive closure activities, observations during operations to identify best practices for promoting natural re-vegetation of disturbed areas will occur and may be incorporated into updates of the Interim A&R Plan. The experience from closure of the Nanisivik and Polaris mine sites, which are in a similar climate zone, will be used as references.

5.1 Proposed Progressive Rehabilitation

This section describes the proposed rehabilitation measures that will be progressively completed during the construction and/or operation phases of the mine.

The overall intent of the Interim Abandonment and Reclamation Plan is to achieve Baffinland's desire of restoring the existing conditions of the Mine Site, Milne Port and Steensby Port during operation as practicable and on closure, so that areas affected by the proposed Project activities and to a lesser extent the historic exploration, bulk sampling programs, are returned to a state that is compatible with the original undisturbed areas upon completion of mining activities. The progressive rehabilitation measures proposed as part of the Interim Abandonment and Reclamation Plan are technically and economically feasible and reflect the objectives of this Plan, found in Section 2.5.

Most of the Project areas will be actively used during the construction and operation phases. Where practical, the inactive areas will be progressively reclaimed during construction and operations.

5.1.1 Progressive Reclamation of the Mine Site

A study will be undertaken to identify if a best practice for promoting natural re-vegetation of disturbed areas can potentially be used for reclamation. This will likely include an examination of colonizing species to previously disturbed areas. It must be noted that in much of the Project Area, vegetation is naturally sparse or nonexistent (e.g., waste rock pile footprint). Therefore, natural growth of vegetation for those areas is expected to be minimal and the reclamation goal for those areas will be long term landform stability.

It should also be noted participation of local communities via QIA representatives and other applicable regulatory agencies in the consideration of alternative reclamation activities to safeguard community values is encouraged. To that end, Baffinland has committed to establish an advisory group focused on reclamation of the Project that will allow for local community input and involvement in future revisions to this document.

The following areas will be progressively reclaimed during the construction and/or operation phases at the Mine Site:

- Laydown areas – un-used areas or areas no longer needed during operations will be re-graded and scarified.
- Quarries and Borrow Pits – once exhausted or no longer required, sites will be graded to maintain safe side slopes and re-establish the natural drainage of the area. Closure and reclamation of these sites will be carried out in accordance the site specific permits as outlined in the individual Borrow Pit or Quarry Operating Plan.
- Landfill – the landfill will be progressively covered with cover consisting of overburden to allow the contents of the landfill to remain permanently frozen.

- Camps – following the construction phase, construction camps will be removed and/or downsized to accommodate the reduced personnel onsite during operations. Associated structures and infrastructure not required for on-going operation will be removed from the site. The affected area will be re-graded, and selectively scarified and contoured to facilitate natural drainage.
- Waste rock stockpile – will be monitored during operations. Based on current investigations it is anticipated that most of the waste rock will not be prone to metal leaching or acid drainage. However, if ongoing work characterization studies show that the minor portion waste rock that is potentially acid generating (PAG) could cause unacceptable impact to runoff and seepage, the waste rock stockpile construction strategy will be modified accordingly.
- Landfarms – hydrocarbon-contaminated soils will be excavated and treated in the landfarms throughout the life of the Project.
- Facilities not in use during the operations phase will be demolished, removed, and disposed of in approved site landfills, the Mine pit, quarries or off-site disposal facilities.
- Roads – roads no longer required during operations, such as the railway construction access road, will be decommissioned. Stream crossings will be removed, and drainage channels that are stable in the long-term will be re-established.

5.1.2 Progressive Reclamation of Milne Port

Following the construction phase the camp facilities will be downsized to accommodate the reduced personnel remaining onsite during the proposed ERP operations and temporarily de-commissioned once the Railway Phase has been commissioned. Once the Railway Phase is commissioned, the Milne Port will not be permanently decommissioned and reclaimed due to occasional use to receive large loads in open water periods.

The following additional activities will be undertaken to progressively reclaim Milne Port:

- Removal of fuel bladder.
- Un-used laydown areas will be re-graded and scarified.
- Camps and associated structures and infrastructures not required for the on-going operation will be downsized and/or removed from the site, and the area will be re-graded and contoured to facilitate natural drainage.
- Quarries and borrow areas not used for disposal during final reclamation, will be re-contoured to maintain safe side slopes and re-establish natural drainage.

5.1.3 *Progressive Reclamation of Steensby Port*

Following the construction phase, the construction docks will be decommissioned. The ballast and caissons will be removed and either reused at either the Mine Site or Milne Port or disposed of at an approved facility. The following additional activities will be undertaken to progressively reclaim Steensby Port:

- The Steensby Port landfill will be progressively reclaimed using a cover to allow the waste materials to remain permanently frozen and isolated.
- Quarries and borrow areas not used for disposal during final reclamation, will be re-contoured to maintain safe side slopes and re-establish natural drainage.
- The construction camp will be downsized to accommodate the reduced personnel remaining onsite during operations.

5.1.4 *Progressive Reclamation Associated with the Railway*

Following completion of the railway, the following progressive reclamation activities will be undertaken:

- The railway construction camps will be decommissioned and include the following reclamation activities:
  - Dismantling of the water treatment and sewage treatment systems as per the manufacturer's specifications. All remaining infrastructure will either be sea lifted to an approved facility for disposal or disposed of at the Mine Site landfill, Steensby Port landfill, or other approved repositories.
  - Where practical, buildings, equipment and machinery will be reused. Alternatively, buildings, equipment and machinery will be demolished and sent for sealift to an approved facility for salvage/disposal or disposed of at the Mine Site landfill, Steensby Port landfill, or other approved repositories.
  - All fuel storage containers will be drained and removed from the camp sites for disposal at an approved facility. Secondary containment structures such as liners, will also be removed, tested for hydrocarbon content and sent to an approved facility at the Mine Site or Steensby Port for disposal.
  - Soils suspected of hydrocarbon contamination will be tested. It is expected contaminated soils will be bioremediated within landfarms located at either the Mine Site or Steensby Port or alternatively, sent via sealift to an approved facility for disposal.
  - All non recyclable, inert materials (i.e. material having insignificant leachability and pollution content) will be disposed of at the Mine Site landfill, Steensby Port landfill, or other approved repositories. At closure, the onsite landfills located at the Mine Site and Steensby Port will be reclaimed by capping the landfill with overburden or equivalent material. The landfill sites will be allowed to naturally re-vegetate.

- All disturbed areas will be re-graded to restore the natural drainage of the area and will be scarified.

- The construction access road along the rail alignment with arteries to the camps and quarries will be decommissioned. All water crossings will be removed and the natural drainage of the area will be restored.
- All quarries and borrow areas will be graded to maintain safe side slopes and natural drainage will be restored unless they are an approved disposal location to be used during reclamation.
- All disturbed areas will be will be scarified to encourage natural re-vegetation.
- Areas experiencing thermal disruptions (ponding, settlement and/or subsidence) will be drained of excess water, re-graded and/or insulated with a layer of overburden to restore the natural drainage of the area and maintain an active layer above the permafrost of 1 to 2 m (pers. Comm. Wiseman). The affected areas will be scarified to encourage natural re-vegetation.
- Phase I Environmental Site Assessments (ESA) will be carried out on the rail embankment. Further assessment will follow the ESA protocols.
- Progressive reclamation associated with the railroad will be revised at a later stage in the Project and include measures relative assessing and remediating, if warranted, to:
  - Railroad maintenance facilities that have generated wastes and the potential for spillage of solvents and heavy metals.
  - Railroad fuelling facilities: diesel spillage, diesel recovery, water treatment, soil remediation. Storage of gasoline at fuelling facilities.
  - Ballast geochemistry, potential ML/ARD.
  - Other materials to be hauled on the line such as diesel which have the potential to contaminate ballast and soils.
  - Ore dust from moving trains.
  - Ore spillage into the ballast from movement of trains.
  - Ballast cleaning and disposal of recovered fines.
  - Tie replacement and disposal of used ties.

6. Temporary Mine Closure Care and Maintenance

The Mine Site Reclamation Policy for Nunavut (2002) and the Mine Site Reclamation Policy for the Northwest Territories (2002) require that contingency measures be established in the Interim Abandonment and Reclamation Plan for Temporary Closure of a mine site. Under the Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories (NWTWB, 1990) temporary closure is defined as the planned shutdown of a mine site for a period of less than one year. This section of the report presents the conceptual plans for Temporary Closure of duration of less than one year. The section that follows this one (Section 7) deals with Long-Term Temporary Closure beyond one year.

In the event of temporary closure, the Project sites will be maintained through the implementation of a "care and maintenance plan" executed by operational maintenance staff and other support personnel on site. Access to the Project sites, buildings and structures will be restricted to authorized persons only, as during operations. Buildings where potential hazards exist will be locked or otherwise secured.

Specific end goals and major targets for reclamation and closure will be developed for each Project component as the Project progresses and within specific regulatory time frames. They include:

- Habitat protection and restoration.
- Reclamation of disturbed areas and natural re-vegetation, where appropriate.
- Erosion control.
- Management and control of slope stability.
- Land use restoration.
- Demolition and removal of all structures not part of a long term plan.
- Control of all discharges and effluents to acceptable regulatory limits.
- Control of solid and hazardous waste and their impacts on the environment.
- Management of the site on the long term during the closure and post closure period.
- Adequate incident response and emergency response commitments.

6.1 Health and Safety of Workers and the Public during Temporary Closure

Health and Safety of Workers and the Public will be ensured during Temporary Closure. Infrastructures will be kept secure by routine maintenance and inspections to eliminate any hazard to the public health and safety or material erosion to the terrestrial or aquatic receiving environment at concentrations that are harmful. Access to buildings and infrastructures will be restricted to authorized personnel only (see Section 6.2).

Employees on site will have been trained for site-specific health and safety. Baffinland commits to abide by all applicable NWT/Nunavut Mines Safety Act and Regulations, and the Explosives Use Act.

It will be ensured that emergency procedures will be applicable and that all equipment necessary for these procedures will be accessible and kept in good working condition.

6.2 Restriction of Access and Site Security

During Temporary Closure the Mine Site, Milne Port and Steensby Port will be maintained in a secure condition through the provision of continuous site security. Mine dewatering and water treatment where required will be on-going. As a result a number of operational maintenance staff, environmental personnel and other support personnel will be onsite at the Mine Site, Milne Port and Steensby Port. Access to buildings and structures will be restricted to authorized persons, as during operations. Buildings where potential hazards exist will be locked or otherwise secured.

Security personnel will carry out routine inspections of security, safety and environmental measures and maintain a record of these inspections. Contact information will be provided to pertinent government and Inuit agencies to facilitate their communication and potential access to the Mine Site, Milne Port and/or Steensby Port, if and when necessary.

The explosives contractor will manage explosives in accordance with applicable regulatory requirements as per NRCan Permit. On commencement of Temporary Closure, explosives will be either removed from the Project or/and detonated in a controlled and safe fashion by experienced and licensed personnel at appropriate locations away from sensitive receptors.

During Temporary Closure, reclamation activities such as re-grading and re-vegetation will continue as per the progressive reclamation plan (see Section 5). Erosion and discharge streams will be controlled as part of regular maintenance activities. Additionally, care will be taken that lines and pipes do not freeze and break.

6.3 Security of Mine Openings

The entrance ramp to the open pit will be fenced using boulders or other means to prevent inadvertent access. Signage indicating an “Open Hole” will already be in place around the open pit perimeter during operations as per NWT/Nunavut Mines Safety Act Regulations.

6.4 Security of Mechanical, Hydraulic Systems and Electrical Systems

During Temporary Closure, equipment required for the security and safety, including environmental aspects and safety will be maintained in working condition.

Buildings will be locked or otherwise secured to prevent inadvertent access once the Mine Site, Milne Port and Steensby Port are evacuated by the majority of the personnel, except as required by the onsite staff for site maintenance and security. Non-essential mechanical and hydraulic systems will be left in a no-load condition. Live electrical systems will be fenced, locked, or otherwise secured against inadvertent entry or contact, and appropriate signs will be placed to warn of potential hazards.

6.5 Waste Management Sites

During or prior to the Temporary Closure an inventory of all hydrocarbon products, chemicals, explosives and hazardous wastes (e.g. used oils, ammonium nitrate and greases) will be updated and all hazardous materials and wastes will be shipped south to the appropriate hazardous waste disposal facility via sealift.

All storage facilities that contained any such materials will be secured and monitored. Inert waste will be disposed of in the landfill sites or other approved repositories at the Mine Site or Steensby Port.

During Temporary Closure the non-hazardous waste management facilities at the Project will continue as in normal operations on an as-required basis. If waste management facilities are no longer required, landfills will be covered with 1.5 m of over burden.

6.6 Security of Chemicals

All hazardous materials and wastes will be removed from Project sites via sealift and disposed of at a licensed hazardous waste disposal facility in Southern Canada via sealift. Any remaining explosives (e.g. ammonium nitrate) will be removed from the site or detonated in a controlled and safe fashion by qualified and licensed personnel at appropriate locations away from sensitive receptors.

During Temporary Closure activities, remaining chemicals and petroleum products will be identified and their quantities will be recorded. Offsite disposal locations will be identified for the products remaining onsite and they will be disposed at approved facilities once no longer required.

6.7 Control of Effluents

Mine Site, Milne Port and Steensby Port water management will be required during Temporary Closure, including:

- Domestic sewage treatment.
- Surface/discharge waters, as per applicable regulatory requirements.

Surface water will be collected in settlement ponds and tested for Mining Metal Effluent Requirements (MMER). The waste rock stockpile will be monitored during operations. Based on current investigations it is anticipated that most of the waste rock will not be prone to metal leaching or acid drainage. However, if ongoing work characterization studies show that the minor portion waste rock that is potentially acid generating (PAG) could cause unacceptable impact to runoff and seepage, the waste rock stockpile construction strategy will be modified accordingly. If treatment is required, water will be batch treated with lime dosing for Acid Rock Drainage (ARD) affected water or a treatment plant such as a High Density Sludge (HDS) treatment plant may be required.

The Waste Rock Management Plan (Appendix 3B of the FEIS) provides treatment options in the event that waste rock run-off requires treatment. The Wastewater Management Plan provides the design criteria and operations and maintenance requirements for the collection and treatment of the site's wastewater.

6.8 Stabilization of Stockpiles

Ore and waste rock stockpiles will be visually assessed for stability at the start of Temporary Closure and stabilized if required. The stockpiles will be periodically inspected during the Temporary Closure.

6.9 Site Inspection Program

The general site areas at the Mine Site, Milne Port and Steensby Port will be periodically inspected by onsite security personnel. Visual inspections of the Mine Site, Milne Port and Steensby Port will be carried out to verify the physical stability of waste rock stockpiles and pit walls. Chemical analyses of surface water will be conducted monthly by site security personnel at the Mine Site, Milne Port and Steensby Port. If seepage or drainage locations are identified during the visual site inspections of the open pit, waste rock stockpile and ore stockpiles sampling will be conducted by site security personnel.

6.10 Schedule of Rehabilitation Measures – Temporary Closure

Reclamation work will be completed within approximately two months following the initiation of Temporary Closure status.

Employees, local communities, and the public will be notified in advance of any scheduled short term temporary closure activities.

7. Long-Term Temporary Mine Closure Care and Maintenance

The Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories (NWTWB, 1990) define Long-Term Closure as the state of inactivity resulting from economic considerations or a reduction in ore reserves for a period greater than one year. During Long-Term Closure the Project sites will be maintained in a secure condition. Site personnel will conduct general inspections periodically and may decrease that frequency if the site inspections indicate that the site infrastructure is stable. A record of these inspections will be maintained. The names of contact persons will be provided to the pertinent regulators and government agencies such as Aboriginal Affairs and Northern Development Canada (AANDC) and QIA for their information and to facilitate their access to the site if and when necessary. The Project could reopen when the circumstances requiring the closure change (e.g., when economic or other conditions that caused the temporary cessation of operations is no longer of concern).

Baffinland commits to mobilizing qualified environmental support personnel to complete tasks related to environmental management and monitoring.

7.1 Health and Safety of Workers and the Public during Long-Term Temporary Closure

Health and Safety of Workers and the Public will be ensured during Long-Term Temporary Closure. Infrastructures will be kept secure by routine maintenance and inspections to eliminate any hazard to the public health and safety or material erosion to the terrestrial or aquatic receiving environment at concentrations that are harmful.

Access to buildings and infrastructures will be restricted to authorized personnel only (see Section 7.2). Safety will be reinforced by an inspection program (see Section 7.9).

Employees on site will have been trained for site-specific health and safety. Baffinland commits to abide by the NWT/Nunavut Mines Safety Act and Regulations, and the Explosives Use Act.

It will be ensured that emergency procedures will be applicable and that all equipment necessary for these procedures will be accessible and kept in good working condition.

7.2 Restriction of Access and Site Security

During Long-Term Closure the Mine Site, Milne Port and Steensby Port will be maintained in a secure condition. Access to the buildings and structures will be locked and/or fenced/gated. Potentially unsafe areas will be posted with appropriate signage. Unused machinery and equipment will be removed, where practical.

The explosives contractor will manage explosives in accordance with applicable regulatory requirements by NRCan. On commencement of Long-Term Closure, explosives will be either removed from the Project or/and detonated in a controlled and safe fashion by experienced and licensed personnel at appropriate locations away from sensitive receptors.

Site personnel will conduct general site inspections on a periodic basis. Initial site inspections are proposed to be conducted periodically and may decrease in frequency if the site inspections indicate that the site infrastructure is stable. The site personnel will maintain a record of these inspections. The names of contact persons will be provided to the pertinent associations such as AANDC and QIA for their information and to facilitate their access to the site if and when necessary.

During Long-term Closure, reclamation activities such as re-grading and re-vegetation will continue as per the progressive reclamation plan (see Section 5). Erosion and discharge streams will be controlled as part of regular maintenance activities. Additionally, care will be taken that lines and pipes do not freeze and break.

7.3 Security of Open Pit

Following notice of Long-Term Closure the pit walls of the open pit will be inspected by a qualified professional to assess the physical stability. Pit water will be monitored during the course of the operation for any indication of contamination at levels that exceed MMER or may adversely affect the receiving environment. During Long-Term Closure dewatering of the open pit will cease and the open pit be allowed to naturally flood.

It is anticipated that the final configuration of the open pit will take an estimated 85 to 150 years to passively fill with water from natural sources such as direct precipitation and surface runoff (KP 2008). Therefore, it is anticipated that the open pit will not completely flood during Long-Term Closure and drainage from the open pit is not considered to be an issue.

Other Long-Term Closure activities to close out the open pit include:

- Barricading access ramps into the open pit.
- Placing of fencing and “Danger”/”Open Hole” signage as necessary.

7.4 Security of Mechanical, Hydraulic, and Electrical Systems

All buildings will be locked and/or otherwise secured to prevent inadvertent access once the Project is evacuated by the majority of the personnel, except as required by the onsite staff for site maintenance and security. All non-essential mechanical and hydraulic systems will be left in a no-load condition. Live electrical systems will be fenced, locked, or otherwise secured against inadvertent entry or contact, and appropriate signs will be placed to warn of potential hazards.

7.5 Waste Management Sites

Inert waste will first be disposed of in the landfill sites or other approved repositories at the Mine Site or Steensby Port. During operations the landfills will be covered with an interim soil cover layer to ensure wastes are encapsulated within permafrost. As such, contaminated runoff or seepage from the landfill sites are not anticipated during Long-Term Temporary Closure.

During or prior to the Long-Term Temporary Closure an inventory of all hydrocarbon products, chemicals, explosives and hazardous wastes (e.g. used oils, ammonium nitrate and greases) will be updated and all hazardous materials and wastes will be shipped south to the appropriate hazardous waste disposal facility via sealift. All storage facilities that contained any such materials will be secured and monitored. Inert waste will be disposed of in the landfill sites or other approved repositories at the Mine Site or Steensby Port.

7.6 Security of Chemicals

All hazardous materials and wastes will be removed from Project sites via sealift and disposed of at a licensed hazardous waste disposal facility in Southern Canada. Any remaining explosives (e.g. ammonium nitrate) will be removed from the site or detonated in a controlled and safe fashion by qualified and licensed personnel.

During Long-Term Closure activities, remaining chemicals and petroleum products will be identified and their quantities will be recorded. Offsite disposal locations will be identified for the products remaining onsite and they will be disposed at approved facilities once no longer required.

7.7 Stabilization of Stockpiles

At the onset of Long-Term Closure the waste rock stockpile may undergo minor re-contouring and the physical and chemical stability of the waste rock stockpile will be assessed. Following this investigation and according to the stockpile geometry at the time of long-term closure, aspects related to erosion, runoff control, slopes, benches, and discharges will be addressed.

All ore stockpiles will be depleted and removed prior to Long-Term Closure. In the event the ore stockpiles remain during Long-Term Closure, they will be monitored.

7.8 Control of Effluents

Mine Site, Milne Port and Steensby Port water management will be required during Long-Term Closure, including:

- Domestic sewage treatment.
- Surface/discharge waters, as per applicable regulatory requirements.

Surface water will be collected in settlement ponds and those for the ore stockpiles and waste rock stockpile will be tested for Mining Metal Effluent Requirements (MMER). The waste rock stockpile will be monitored during operations. Based on current investigations it is anticipated that most of the waste rock will not be prone to metal leaching or acid drainage. However, if ongoing work characterization studies show that the minor portion waste rock that is potentially acid generating (PAG) could cause unacceptable impact to runoff and seepage, the waste rock stockpile construction strategy will be modified accordingly. If treatment is required, water will be batch treated with lime dosing for Acid Rock Drainage (ARD) affected water or a treatment plant such as a High Density Sludge (HDS) treatment plant may be required.

The Waste Rock Management Plan provides treatment options in the event that waste rock run-off requires treatment. The Wastewater Management Plan also provides the design criteria and operations and maintenance requirements for the collection and treatment of the site's wastewater. The Waste Rock Management Plan can be found in Volume 3, Appendix 3B, and Volume 5 of the FEIS for more information. This Plan will be updated 60 days prior to mining operation on site.

7.9 Site Inspection Program

The general site areas at the Mine Site, Milne Port and Steensby Port will be periodically inspected by onsite security personnel. Annual Reports are produced by Baffinland and provided to the Nunavut Impact Review Board (NIRB) summarizing the site work completed, and the work planned for the following year for the activities previously screened and approved by NIRB. These reports also provide a synopsis of compliance performance with explorations licences, permits, approvals and commitments, and include the results of monitoring activities. An update on the existing environmental conditions and progressive reclamation activities are also contained in these reports. These reports will continue to be produced annually based on any ongoing site inspection and monitoring during long-term Temporary Closure.

The reports are publicly available through NIRB (http://www.nirb.ca/). Visual inspections of the Mine Site, Milne Port and Steensby Port will be carried out to verify physical stability of the site, waste rock stockpiles and pit walls. Chemical analyses of surface water will be conducted monthly by site security personnel at the Mine Site, Milne Port and Steensby Port. If seepage or drainage locations are identified during the visual site inspections of the open pit, waste rock stockpile and ore stockpiles, sampling will be conducted by site security personnel.

7.10 Schedule of Rehabilitation Measures – Long-Term Temporary Closure

The following activities will be carried out within approximately six months of the initiation of Long-Term Closure:

- All buildings and storage compounds will be fenced and gated, to prevent inadvertent access.
- All unnecessary machinery and equipment will be removed or placed in a no load condition.
- All unused pipelines will be drained.
- All unnecessary equipment will be removed from the Mine Site, Milne Port and Steensby Port or secured in a no load condition onsite.
- A contact person will be designated for authorized site access.
- A schedule will be established for monitoring purposes.
- Fences and/or barriers with signs will be constructed to restrict access as required.
- All explosives, fuel tanks, chemicals and hazardous wastes will be inventoried and secured in a protective environment and/or removed from the site to an approved facility.
- Within one year of the decision to place the Project in Long-Term Closure the following additional activities will be completed, if not already done:
  - All remaining fuels, chemicals, oil, grease and any used oil will be removed for reuse or disposal at an approved facility.
  - All employees, local communities, and the public will be notified in advance of any scheduled long-term closure activities.

8. Final Mine Closure and Reclamation Measures

Mining activities are anticipated to be completed when the ore deposit is exhausted and the mine ceases operations without the intent to resume mining activities in the future. Within 60 days of completion of closing out the site a Final Mine Closure and Reclamation Plan will be issued to the Land Use Engineer of AANDC (Territorial Land Use Regulations. Sections 33 and 35), to the Lands Director at QIA and to the Nunavut Water Board.

For Final Mine Closure, materials and equipment will either be removed from site or disposed of in on-site landfills, and all hazardous materials and wastes will be removed from site to licensed disposal facilities. The open pit and waste rock stockpiles will be inspected for physical and chemical stability. Roads (with the exception of the public Milne Inlet Tote Road), airstrips and development areas will be re-contoured as required to provide long-term stability and reduce the potential for erosion. The closure phase is expected to be three (3) years, followed by a minimum of five (5) years of post-closure safety and environmental monitoring and treatment, as and if required.

This section describes the measures that will be undertaken for final closure of the Project, based on the current design. As the Project advances through the detailed design phase, changes to the Project may occur that will alter the Interim Mine Closure and Reclamation Plan. Though changes may occur, at this time, it is anticipated that the major components of the Project will remain the same.

Prior to closing out the Mary River Project Baffinland will consult with the QIA and surrounding communities regarding transfer of ownership of structures that may be utilized by the surrounding communities during harvests, camping and other recreational uses or relocated to local hamlets.

8.1 Health and Safety of Workers and the Public

Health and Safety of Workers and the Public will be ensured during Final Mine Closure. Until final reclamation of infrastructure, all infrastructures will be kept secure by routine maintenance and inspections to eliminate any hazard to the public health and safety or material erosion to the terrestrial or aquatic receiving environment at concentrations that are harmful. Access to buildings and infrastructure will be restricted to authorized personnel only (see Section 8.2). Safety will be reinforced by an inspection program (see Section 7.9).

Employees on site will have been trained for site-specific health and safety. Baffinland commits to abide by all applicable Northwest Territories & Nunavut Health and Safety Regulations, including the Mine Health and Safety Act and the Explosives Use Act.

Emergency procedures will be revised to ensure they will be applicable during final closure.

8.2 Open Pit

Conceptual modelling of the pit water quality is presented in the FEIS. Predictions of pit water quality will be updated throughout the life of the Project as more information comes available on the geochemistry of the waste rock and the pit wall.

The Final Abandonment and Reclamation Plan will present a time frame for the potential development of ARD conditions and discuss the impact of ARD release on final closure identifying the need for ongoing monitoring, treatment, and potential mitigations.

Following completion of operations the pit walls of the open pit will be inspected by a qualified engineering professional to assess the physical stability and for any indicators of Acid Rock Drainage and/or Metal Leaching (ARD/ML).

If ARD and/or ML are identified during the inspection, the impacts that ARD would have on closure plan, monitoring, long-term maintenance and bonding will be addressed. ARD and ML will be periodically reassessed as a potential issue in the in the future Interim and Final A&R Plans as exploration and development continues. Inspections will also address the stability of the pit walls and pit lake.

Backfilling of open pits at closure is rarely conducted due to the high cost even when sufficient materials are present on the property. At some Projects where multiple pits are present, backfilling may occur sequentially during operation, such that mineral waste can be deposited directly into another pit without double handling of material. For these reasons, it is proposed that the open pit be allowed to naturally flood to form a “pit lake”. At closure inert wastes (i.e. material having insignificant leachability and pollution content) may be disposed of in the open pit. It is anticipated that the open pit will take an estimated 85 to 150 years to passively fill with water from natural sources such as seepage into the pit, direct precipitation and surface runoff (KP 2008). There are a number of different potential scenarios for accelerating the pit filling which are presented below. These will be further assessed prior to final closure.

Once the open pit fills to the point of overflow, pit drainage will enter the natural environment through the spillway and natural drainage from the southeast corner of the open pit (KP 2008). It is currently anticipated that the discharge from the open pit will not require treatment (AMEC 2010).

However, if treatment is required several effective technologies are currently available to manage ARD. If ARD/ML drainage were to develop, batch treatments will be carried out to adjust the pH and/or metal concentrations of the water in the pit so that it meets discharge requirements before overflow into the environment. The overflow location at the southeast area of the pit will provide emergency access to and from the open pit/pit lake.

Other activities to close out the open pit will include:

- Barricading access ramps into the open pit.
- Removal of any dewatering infrastructure (i.e., pumps, surge box and pipelines).
- Clean up of any soil contamination (i.e., hydrocarbon).
- Placing of boulder fencing or equivalent and hazard signage as necessary.
- At closure inert wastes may be disposed of in the open pit.

8.2.1 Accelerated Pit Filling

The mining plan and the ongoing waste characterization plan will inform the prediction modeling of the mine pit water quality at the end of mine life. Should the modeling indicate potential exceedance of water quality objectives, alternative pit closure scenarios will be considered, including accelerated pit filling.

The filling of the pit can be accelerated via pumping water from a nearby water source – thereby complementing the accumulation of natural precipitation and ground water accumulation. The pit has a "fill volume" of 43,400,000 m^3 until the overflow lip is reached, at which point the pit will drain into Mary River.

Assisted pit filling is governed by two parameters – pumping costs and water source drawdown limits. Water source drawdown limits are designed to ensure that the volume of water extracted from a given source does not significantly lower the water table and has minimal impact on the aquatic ecosystem. Key factors to consider when calculating maximum acceptable drawdown of a lake include: potential spawning habitat as well as the residency time of the water body. According to current best management practices and per The Canadian Department of Fisheries and Oceans (DFO) – Protocol for Winter Water Withdrawal from Ice-covered water bodies in the Northwest Territories and Nunavut, 2010 - the water source from which the pit is filled should have a draw rate of approximately 10% of the water bodies' total volume per annum. In addition to this the water body chosen should be as close to the pit and over as level terrain as is reasonably practical in order to reduce pumping costs.

The Project pit has four potential water sources that can be used for filling the pit – Sheardown Lake, Camp Lake, Mary Lake and Mary River. This information is summarized in Table 8-1.

Table 8-1: Potential Water Source Pit Fill Data

Water Source	Pumping Distance	Total Volume/ Annual Flow (m3)	Permissible Annual Water Take (m3)	Number of Years to Fill Pit
Sheardown Lake (NW Basin)	2 km	8,175,410	820,000	53
Camp Lake	4.7 km	29,690,200	3,000,000	15
Mary Lake (Main Basin)	12 km	112,000,000	11,200,000	4
Mary River (at MR-12, east pond discharge location)	< 1 km	78,185,678 (mean) 53,166,261 (10-year dry)	25,000,000 (difference between mean and low flow)	2

Sheardown Lake and Camp Lake are significantly closer to the proposed final pit at a distance of 2 km and 4.7 km respectively, as opposed to Mary Lake which sits at a distance of 12 km from the pit. This results in Sheardown and Camp Lakes having significantly lower pumping costs than Mary Lake. Unfortunately Sheardown and Camp Lakes have total volumes of 8,175,410 m^3 and 29,690,200 m^3, allowing us to draw a maximum volumes of only 820,000 m^3 and 3,000,000 m^3 per annum, thus resulting in a total pit fill times of 53 and 15 years respectively. In addition to this Sheardown and Camp Lakes have a very long "residence" time for the water in the lake to completely recycle itself. As a result it may be necessary to draw even less than 10% of the total lake volume in order to ensure no significant impact to the Sheardown or Camp Lake ecosystem.

The main basin of Mary Lake has a volume of 112,000,000 m^3 providing us with a total draw volume of 11,200,000 m^3 per annum. Assuming the maximum available volume of water is drawn this will result in a pit fill time of approximately 4 years. In addition to this Mary Lake has a very high recharge rate completely "recycling" approximately every 1.5 years – resulting in minimal impact to the lakes ecosystem. Unfortunately Mary Lake is located 12 km from the pit, which would result in substantial pumping costs – which are not expected to be economically feasible.

The Mary River offers the fourth pit filling alternative. It has been calculated that the Mary River can run at the "10-year-dry" conditions, which runs approximately 67% less than the mean flow, with no loss of habitat or damage to the aquatic ecosystem. The difference between the mean flow and the 10-year-dry flow provides us with a volume of 25,000,000 m^3 (please refer to Table 8-1). Drawing a volume of 25,000,000 m^3 of water from the Mary River over a four month period each year would enable the pit to be filled in 2 years. Although there will be substantial pumping costs to draw this volume of water over a four month period – given the reduced length of pipe line, the shortened fill pit time and the limited effect on habitat – drawing from the Mary River is considered the preferred option for pit filling at this time.

8.2.1.1 Periodic Pumping

Periodic pumping involves pumping from the Mary River during the summer months only, when ice cover is not an issue. This period, June to September provides us with a maximum four month pumping window. Pumping during this time is essential as Mary River is expected to freeze solid during the winter months. Warm weather pumping also reduces the cost of constructing and maintaining a pipe line.

Assuming pumping continues 24 hours a day for the entire period this would require a pumping rate of 8700 m^3/hour, over approximately a 1 km distance. During the winter months the pump and pipeline would be drained and locked out to ensure that the equipment is not damaged by the winter conditions.

8.2.1.2 Continuous Pumping

Continuous pumping assumes that water will be pumped to the Mine Site pit 24 hours a day all year long. Mary River is not an option for this scenario as it freezes during the winter, leaving Mary Lake the only practical choice for continuous pumping.

Assuming pumping continues 24 hours a day with no delays or malfunctions for the entire year this would require a pumping rate of 1,300 m^3/hour, over a 12 km distance.

In addition to pumping costs there are numerous other factors that must be accounted for during winter pumping including: the heating of pipe lines, snow removal, ice removal from discharge and intake points, extreme weather conditions, increased maintenance costs and risk to personnel. Given these conditions it is expected that continuous pumping would not be an economically feasible option.

8.3 Removal of Buildings and Infrastructure

Specific criteria for the buildings and infrastructure include:

- Ensure buildings do not become a source of contamination or a safety hazard to wildlife and humans.
- Ensure infrastructure does not become a source of contamination.
- Return area to its natural state or to a state compatible with the desired end use.
- Restore natural drainage patterns where surface infrastructure has been removed.
- Restore the natural use by wildlife.
- Buildings and infrastructure located at the Mine Site, Milne Port and Steensby Port will be removed and either:
  - Transported to Milne Port or Steensby Port for shipment to the mainland for either disposal or salvage.
  - Disposed of in the open pit.
  - Disposed of in the onsite landfills or other approved repository.
  - Donated to local communities.

The water supply system at the Mine Site, Milne Port and Steensby Port will be demolished, removed and either:

- Sealifted to the mainland for disposal or salvage.
- Disposed of in the onsite landfills or other approved repository.

The sewage treatment plants located at the Mine Site, Milne Port and Steensby Port will be decommissioned as per the manufacturer's specifications. The remaining sewage treatment plant components will be either transported for sealift to the mainland for disposal or salvaged or disposed of in the onsite landfill.

The Mine Site utilidor/corridor will be dismantled and disposed of in either the Mine Site landfill or transported offsite to the mainland via sealift for disposal at an approved facility.

8.4 Removal of Machinery, Equipment, and Storage Tanks

Salvageable machinery, equipment and other materials (incinerator, crusher, screen, stacker etc.) will be dismantled and taken offsite for sale or reuse if economically feasible. If not, they will be cleaned of oil and grease, where appropriate, and deposited within onsite landfills or the open pit. Gearboxes or other equipment containing hydrocarbons that cannot readily be cleaned will be removed and sent to either Milne Port or Steensby Port for sea-lift to an approved disposal facility.

Empty fuel storage tanks, drums and other fuel storage containers will be drained and removed from the Mine Site, Milne Port and Steensby Port for disposal at an approved facility. Secondary containment structures such as liners will also be removed, tested for hydrocarbon content and sent to an approved offsite facility for disposal, as required.

8.5 Transportation Corridors

Bridges, culverts and other water crossings along the Milne Inlet Tote Road will remain in place until all the closure activities requiring Milne Port access at the Mine site are completed. This road is part of the Inuit-Owned Lands referenced in the Nunavut Land Claims Agreement. It is designated for public use and the road will be left intact with the road crossings removed. Final decision on the water crossings will remain with the Land Owner, but the removal cost has been included for closure planning.

The lighting associated with the airstrips will be removed. The airstrips will be abandoned, but left in good working order unless otherwise directed by regulatory agencies or the Land Owner, to provide emergency/rescue landing spots for regional aircraft, when no other options are available.

The bridges, culverts and other water crossings associated with the Steensby Port rail alignment will be decommissioned and the natural drainage and water flows will be restored. Tunnel portals will be backfilled and plugged with rock or equivalent material as available and the openings at each end sealed with concrete.

The steel rails and rail ties will be removed from the railway and transported to Steensby Port for sealift and offsite salvage. The embankment will remain.

The reclamation measures for the rail alignment will be carried out on the entire length of the rail and on a width of 10 m. Reclamation for these transportation corridors will take place on both Inuit Owned Land and Crown Land.

The railroad embankment is to be left in place upon closure. However, the rail ballast will be tested to determine if it can be left in place at closure. If found unacceptable (from an environmental point of view), the ballast will be cleaned. The resultant fines material will be hauled away for more controlled disposal.

Locomotives and cars will be sea lifted offsite for resale, salvage or disposal at an approved facility.

As more information becomes available, the discussion of railroad closure will be expanded to include the following:

- Railroad maintenance facilities – wastes and releases. Solvents are often an issue at maintenance facilities, as are heavy metals.
- Railroad fuelling facilities – diesel spillage, diesel recovery, water treatment, soil remediation. Storage of gasoline at fuelling facilities.
- Bioremediation of diesel contaminated soils in the Arctic.

- Quarries and their reclamation: 27,000,000 tonnes of rock will be quarried for railroad use from 63 quarries.
- Phase I Environmental Site Assessment (ESA) will be carried out on the rail embankment. Further assessment will follow the ESA protocols.
- Other materials to be hauled on the line such as diesel which may ultimately contaminate ballast and soils.

The shelters and communication towers along the rail alignment will be dismantled and disposed of in either the Mine Site or Steensby Port landfills or transported offsite via sealift for disposal at an approved facility.

8.6 Docks and Airstrip

The docks at Steensby Port will be left in place. The rock causeway connecting Steensby Port and Steensby Island will be left in place.

The docks and infrastructure at Milne Port will be removed and either recycled or shipped offsite to an appropriate facility for disposal.

The lighting at the airstrips located at the Mine Site, Milne Port and Steensby Port will be removed. The airstrips will be abandoned, but left in good working order unless otherwise directed by regulatory agencies, to provide emergency/rescue landing spots for regional aircraft.

8.7 Concrete Structures

Concrete foundations will be demolished and exposed rebar will be cut to ground level to prevent safety hazards. Concrete and rebar will be disposed of in the open pit, waste rock stockpile or landfill, and the concrete foundation areas covered with non acid-generating mine rock or overburden. The area will be re-graded to restore the natural drainage. Any remaining concrete piles will be cut to grade and covered with overburden.

8.8 Removal of Chemicals

At final closure, Baffinland will undertake a comprehensive site Phase 1 Environmental Site Assessment (ESA) to determine extent of contaminated areas and appropriate techniques and methods to deal with such sites.

The stock of explosives will be depleted towards the end of the operations phase and any remaining explosives will be securely contained and shipped from the site by a licensed contractor to an approved facility for disposal or reuse or detonated in a controlled and safe fashion by experienced and licensed personnel at appropriate locations away from sensitive receptors.

Oil, grease, ammonium nitrate and chemicals will be transported offsite 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.

8.9 Waste Management Sites

Combustible non-hazardous wastes will be incinerated at the Project incinerators. Once the incinerators are no longer required, they will be managed as described in Section 8.4. Sewage treatment facilities disposal is also addressed in Section 8.4.

Liners will be removed from polishing ponds and Sewage Water Management (SWM) ponds, and berms will be re-graded and levelled.

The onsite landfills located at the Mine Site and Steensby Port will be reclaimed by capping the landfill with 1.5 m of overburden or equivalent material to freeze the core of the landfill. The landfill sites will be scarified to encourage natural re-vegetation.

8.10 Soils Testing

A site investigation will be conducted at the onset of closure to identify soils that may be contaminated with hydrocarbons or chemicals. Soil materials found to exceed the appropriate cleanup criteria for hydrocarbons will be remediated onsite in the landfarm units or removed offsite to a licensed waste management facility.

If there is reason to suspect an area of soil has been contaminated by chemicals other than hydrocarbons (such as explosives), samples will be collected and the soil will be tested. If the applicable regulatory requirements are exceeded, an appropriate method of disposal will be sought in consultation with the appropriate authorities.

8.11 Waste Rock Stockpiles

8.11.1 Waste Rock Characterization Program

At the onset, the waste rock pile design will consider final closure considerations. A detailed sampling and testing program for the characterization of the waste rock for the period of 2012-2014 is in progress and involves:

- Devising a representative sampling program for the waste rock based on the configuration of the ore body and the mining plan.
- Analysis of the lithology, morphology and mineralogy of the waste rock.
- Additional testing (both static and humidity cell).

This program has been reviewed with guidance by independent experts. The objective of this program is too inform prediction of expected runoff quality over time. Contingencies will be put into place if there are acid rock drainage issues and treatment if necessary. The characterisation program will be ongoing for the Life of the Project and will guide the development of adaptive management strategies for waste rock management (should this be required over the life of the Project). Regular updates on waste rock characterization and prediction of runoff water quality will be provided in future updates of the Waste Rock Management Plan and the Interim A & R Plan.

8.11.2 *Closure of the Waste Rock Stockpile*

The waste rock stockpile at final closure is expected to have a total volume of about 640 Mt with average side slopes of 2H:1V. At closure the waste rock stockpile may undergo minor re-contouring. The physical and chemical stability of the waste rock stockpile will be investigated at the onset of closure. This investigation will take into account the final geometry of the stockpile, including the aerial extent, height, cross-sections and the volume in place. A preliminary assessment of this geometry and its impact on erosion, runoff control, slopes, benches, and discharges will be done, and be included in future Interim and Final Closure plans. Following re-contouring and stabilization investigations, the waste rock stockpiles will be considered closed. Runoff will be discharged from two runoff ponds that will be left in place and monitored. Based on the current state of the Mine Site prior to mining activities, the Mine Site is characterized by a rugged rocky terrain with minimal vegetation. Therefore, an uncovered waste rock stockpile is considered environmentally compatible with the current undisturbed surrounding areas.

Following closure, generation of ARD/ML is not anticipated. During operations drainage from the waste rock stockpile will be monitored and should ARD/ML be identified the waste rock will be segregated based on acid generating potential. If treatment is required following closure a variety of ARD/ML treatment technologies are available. If treatment is required the waste rock stockpile drainage will be treated with batch lime doses. During operations total suspended solids (TSS) may be identified as being a potential problem. If TSS is identified as a concern following operations the surface water from the waste rock stockpiles will be directed to additional settlement ponds for treatment prior to discharge to the surrounding environment. Please refer to the Mary River Waste Rock Management for further discussion on potential treatment methods.

Each quarry permit application presents a quarry development plan, drainage information as well as a closure plan. All borrow areas and quarries will be progressively reclaimed maintaining stable side slopes in accordance with the individual site permit. At the onset of closure the borrow areas and 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.

The ore stockpiles will be depleted upon closure. Soils below the ore stockpiles will be sent for testing and treatment, if required, as discussed in Section 8.10. The ore stockpile bases will be re-contoured as necessary scarified and allowed to naturally re-vegetate.

8.12 Watercourses and Drainage Ways

Disturbances to the surrounding areas of the Project may cause thermal disruptions to the permafrost zone resulting in ponding, settlement and/or subsidence due to changes in the active zone (the upper 1 to 2 m of soil). During closure these areas will be drained of excess water, filled with clean material to re-establish the active layer and graded, restoring the natural drainage of the area as necessary.

Water crossings (bridges and culverts) will be decommissioned and the drainage channels restored to natural drainage conditions.

8.13 Re-vegetation

It is anticipated that re-vegetation will be difficult to re-establish due to the arctic environment. The present re-vegetation strategy is to encourage disturbed areas to naturally re-vegetate. Natural re-vegetation for the Project will include:

- Re-grading and scarifying disturbed and compacted areas.
- Allowing the established surrounding vegetation to encroach and ultimately take over the area.
- As noted in Section 5.1.1, a study will be undertaken to determine which plant species, if any, are better suited to colonizing disturbed and graded areas. Results of this study will inform any potential efforts for re-vegetation.

8.14 Schedule of Rehabilitation Measures – Final Closure

Once the decision has been made to permanently close the mine, it is anticipated that the major closure activities, as described in the above sections, will be completed within a period three (3) years. Closure works will be carried out between March and October every year for three (3) years, if not already completed progressively.

The ongoing monitoring and management of ARD/ML (if any) is expected to be required until such time as it can be demonstrated that site drainage no longer poses a negative impact to downstream receiving waters.

Monitoring of various site aspects such as water quality, natural re-vegetation and landform stability are expected to continue over an extended period of time until such time that monitoring is no longer required. It is estimated that this period will last five (5) years.

All employees, local communities, and the public will be notified in advance of any scheduled final closure activities.

9. Post Mine Closure Monitoring

The Post Mine Closure Monitoring Plan will be developed and submitted as part of the Final Mine Closure and Reclamation Plan six months prior to final closure. The monitoring section of the Final Abandonment and Reclamation Plan will be based upon the knowledge gained through studies during the design, construction and operational phases of the Project. Achieved performance will be assessed against the detailed specific objectives and criteria for major Project components that will be established.

A post-closure monitoring program compliant with the applicable guidelines and regulations will be implemented to ensure the reclamation measures remain effective and continue to provide a high level of protection for the public and the environment. This monitoring program

will assess the effectiveness of the restoration and will be undertaken between Baffinland, AANDC, QIA and any applicable regulators or government agencies.

The monitoring presented in the subsequent sections is conceptual and focuses on the post-closure monitoring objectives. The program will be revisited following the completion of the detailed design phase of the Project at which time a more specific monitoring program will be developed.

Monitoring and follow-up inspections will be conducted to assess the physical and chemical stability of various components after closure and reclamation of the facilities.

Biological monitoring and follow-up inspections will assess the effectiveness of the reclamation.

Ongoing monitoring and management of ARD and ML (if necessary) is required until such time as it can be demonstrated that site drainage does not pose a threat to downstream receiving waters. This includes an assessment of long-term water quality of the pit lake.

Monitoring of site aspects such as water quality is expected to continue until such time that the monitoring is no longer required.

Further updates will redefine what mitigation measures will be implemented, how these measures will be monitored to confirm their performance, the data gaps and uncertainties identified in the FEIS and how these will be addressed through monitoring or mitigation.

Post closure monitoring is expected to last five years, which will be revised if necessary as the Project progresses.

9.1 Physical Stability

The post-closure physical stability monitoring objective will be to demonstrate the physical safety of the Mine Site, Milne Port and Steensby Port and to ensure that all lands and structures remaining on the Mine Site, Milne Port and Steensby Port are left in a long term stable condition. The physical stability monitoring will also be utilized to identify any physical instability issues and to take appropriate corrective measures. The physical stability of the following items will be monitored on annual bases for the first five years following final closure:

- Exposed pit slopes.
- Any remaining stockpiles.
- Remaining road easements.
- Remaining rail alignment.

The stability of the pit walls with regard to the presence of the pit lake and its impact on stability will also be investigated during post-closure.

9.2 Chemical Stability

Once mining operations have been completed chemical monitoring programs will be initiated to monitor the surface and groundwater quality (in the active layer). Groundwater in the Project area is shallow seepage through the active layer and maybe monitored as surface water. The chemical stability programs will be utilized to monitor the effectiveness of the reclamation undertaken at the Mine Site, Milne Port and Steensby Port. Sample stations recommended at this time will be re-evaluated as the Project continues to develop and are therefore, subject to change in location, quantity and/or frequency of monitoring. In addition, any seeps which develop downstream of the open pit or waste rock stockpile will be monitored.

Monitoring programs will continue until it has been shown that the objectives of the Final Closure Plan have been achieved and a monitoring program is no longer required. The proposed parameters to be monitored are summarized in Table 9-1. The parameters represented in Table 9-1 may change as the Project develops through detailed design, construction and operations. Discharges from the Mine Site, Milne Port and Steensby Port stockpiles, open pit and waste rock stockpile are expected to be consistent with the Mining Metal Effluent Regulations (MMER).

9.2.1 Milne Port

The following sample stations present the approximate post-closure monitoring to be conducted at Milne Port. As the Project continues to develop the post-closure sample locations will be re-evaluated and a more detailed monitoring program will be developed. The post-closure monitoring will include the following sample stations:

- One marine sample located by the ore dock.
- One background marine sample location.
- One to two surface water or seepage locations within the Milne Port area (one monitoring location is to be located down gradient from the ore stockpiles). and one background surface water sample location.

9.2.2 Mine Site

Surface water monitoring at the Mine Site will include a minimum of the following samples:

- One surface water background sample location.
- One to two surface water samples located in the upstream of Sheardown Lake, the primary receiver for the Mine Site.
- One to two surface water samples located in the secondary receiver (Camp Lake tributaries) for the Mine Site
- One surface water location to monitor the waste rock stockpile and open pit.

- One seepage location from the toe of the waste rock stockpile to monitor.
- One to two samples to monitor seepage in the active layer down gradient from the waste rock stockpile.

9.2.3 Steensby Port

The following sample stations present the approximate post-closure monitoring to be conducted at Steensby Port. As the Project continues to develop the post-closure sample locations will be re-evaluated and a more detailed monitoring program will be developed. The post-closure monitoring at will include the following sample stations:

- One marine sample located by the freight dock.
- One marine sample located by the ore dock.
- One background marine sample location.
- One to two surface water or seepage locations within the Steensby Port area (one monitoring location is to be located down gradient from the ore stockpiles). and one background surface water sample location.

9.3 Biological Monitoring

A biological monitoring program was conducted as part of environmental baseline studies. Biological monitoring will be conducted during the operation and closure phase at the Mine Site, Milne Port and Steensby Port to assess the effectiveness of the reclamation and potential impact to the biological environment, in accordance with the MMER Technical Guidance Document on Aquatic Environmental Effects Monitoring and as otherwise required.

The monitoring section of the Final Mine Closure and Reclamation Plan will be based upon the knowledge gained through studies during the design, construction and operational phases of the Project. Achieved performance will be assessed against an agreed set of specific biological objectives and criteria for areas to be returned for wildlife use.

The list of parameters to be monitored will be revisited as construction and operation activities continue, based on what is used and disposed of on site. Petroleum hydrocarbons, diesel range organics, additional metals and nitrates are examples of parameters that will be considered for future monitoring. Similarly, after investigation of the materials that have been disposed in the landfills, a list of parameters will be established and monitoring activities will be planned accordingly.

Table 9-1: Proposed Post-Closure Monitoring Parameters

General Parameters	Metals
pH	Arsenic
Total Suspended Solids	Aluminum
Total Ammonia	Cadmium
Total Dissolved Solids	Calcium
Sulphate	Molybdenum
Conductivity	Copper
Alkalinity	Iron
Acidity	Lead
Hardness	Nickel
Ammonium	Zinc

10. Expected Site Conditions Following Final Closure

10.1 Land Use

The overall intent of the final closure is to restore the Project to a productive land use, that is self-sustaining and to mitigate impacts from mining activities. In such a condition, the site areas will provide wildlife and aquatic habitat.

Creeks and rivers will be returned to natural drainage by removing bridges and culverts located on the railway alignment and its access roads, and by removing culverts from Tote Road. A new lake will be created from the water inflow into the open pit.

10.2 Site Topography

10.2.1 Mine Site

Relative to predevelopment site conditions, the principal topographic changes to the site will include the following:

- The waste rock stockpile will remain at closure with a maximum elevation of 810 masl.
- The open pit will naturally flood at closure ultimately forming a pit lake.
- Remnants of other infrastructure at the Mine Site, including the crusher and buildings will be demolished and laydown areas re-graded and scarified to enhance natural re-vegetation at closure.
- The airstrip at the Mine Site will be abandoned, but not otherwise scarified or actively reclaimed unless otherwise directed by regulatory agencies or Land Owner, because abandoned airstrips can provide emergency landing locations for regional aircraft, when no other options are available. The airstrips will also be required to conduct ongoing Long-Term monitoring.

10.2.2 Milne Port and Milne Inlet Tote Road

Relative to predevelopment conditions at Milne Port the remnants of infrastructure including buildings will be removed and laydown areas re-graded and scarified to allow for natural re-vegetation at closure. The airstrip at Milne Port will be abandoned but otherwise left intact to provide an emergency landing spot for aircraft. The water crossings along the Milne Inlet Tote Road will be removed. Otherwise the Milne Inlet Tote Road will remain intact.

10.2.3 Steensby Port and Rail Alignment

Relative to predevelopment conditions at Steensby Port, the remnants of infrastructure including buildings will be demolished and laydown areas re-graded and scarified to enhance natural re-vegetation at closure. The airstrip at Steensby Port will be abandoned but otherwise left intact to provide an emergency landing location for aircraft. All dock structures will be left intact at Steensby Port but infrastructure will be removed.

Steel rails and ties will be removed from the railway. All water crossings will be removed. The railway embankment will remain intact.

Tunnels will be sealed. The portals will be backfilled and plugged with rock and sealed with concrete.

10.3 Local Surface Water

Disturbances to the surrounding areas of the Project may cause thermal disruptions to the permafrost zone resulting in ponding, settlement and/or subsidence due to changes in the active layer (approximately the upper 1 to 2 m of soil). During closure these areas will be drained of excess water, filled with clean material to insulate and re-establish the active layer and graded, restoring the natural drainage of the area as necessary.

The natural drainage of water courses will be re-established for long term stability.

11. Closure Criteria

Specific criteria for the Final Closure of Project components include:

Project Component	Closure Criteria
Open Pit	• Minimize access to protect human and wildlife safety. • Allow emergency access and escape routes from flooded pits. • Implement water management strategies to minimize and control migration and discharge of contaminated drainage, and if required, collect and treat contaminated water. • Meet water quality objectives for any discharge from pit. • Stabilize slopes to minimize erosion and slumping. • Meet end land use target for resulting surface expression. • Establish original or desired new surface drainage patterns. • Ensure physical stability of residual earth structures for environmental, human, and wildlife safety. • Physical stability of remaining earth structures is compatible with, and will not be compromised by, the post-closure land use.

Project Component	Closure Criteria
Removal of Buildings and Infrastructure	• Ensure buildings do not become a source of contamination or a safety hazard to wildlife and humans. • Ensure infrastructure does not become a source of contamination. • Return area to a state compatible with the desired end use. • Restore natural drainage patterns where surface infrastructure has been removed. • Restore the natural use by wildlife.
Removal of Machinery, Equipment and Storage Tanks	• Ensure equipment do not become a source of contamination or a safety hazard to wildlife and humans.
Transportation Corridors	• Return area to a state compatible with the desired end use. • Restore natural drainage patterns where surface infrastructure has been removed. • Restore the natural use by wildlife. • Remediate any sources of contamination that may have been created during the development and operation of the mine site in order to protect humans, wildlife, and environmental health.
Waste Management Sites	• Dismantle and remove/dispose of as much of the system as possible. • Stabilize and protect from erosion and failure for the long term. • Achieve approved water quality limits, and in the case of existing mines, implement long term treatment (if required).
Stabilization of Stockpiles	• Minimize erosion, thaw settlement, slope failure, collapse or the release of contaminants or sediments. • Build to blend in with current topography, be compatible with wildlife use, and/or meet future land use targets. • Develop and implement preventive and control strategies to effectively minimize the potential for ARD and ML to occur. • Where ARD and ML are occurring as a result of mine activities, mitigate and minimize impacts to the environment. • Assist with providing physical stability of mine components. • Ensure physical stability of residual earth structures for environmental, human, and wildlife safety. • Physical stability of remaining earth structures is compatible with, and will not be compromised by, the post-closure land use.
Watercourses and Drainage Ways	• Dismantle and remove/dispose of as much of the system as possible and restore natural drainage patterns. • Stabilize and protect from erosion and failure for the long term. • Achieve approved water quality limits.
Re-vegetation	• Re-establish the pre-mining ground cover, which may involve encouraging self-sustainable indigenous vegetation growth (natural re-vegetation). • Provide wildlife habitat where appropriate and feasible. • Assist with providing physical stability of mine components.

12. Estimated Closure and Reclamation Costs

The financial cost of the Mary River Project closure and reclamation has been estimated using The Mining RECLAIM spreadsheet provided by Aboriginal Affairs and Northern Development Canada (AANDC) (formerly Department of Indian Affairs and Northern Development). This model identifies several reclamation components:

- Open pit.
- Waste Rock pile.
- Buildings and Equipment.
- Chemicals.
- Water.
- Mobilization.
- Post Closure
- Ongoing water monitoring.

Several reclamation strategies ("Objectives") are listed for each component, and broken down into lists of actions that can be priced separately. A unit cost spreadsheet provides a range of prices for most actions it has been completed where possible with the most accurate available or Project-specific costs. To best estimate the total reclamation cost, some actions were modified or adapted to the strategies defined in the Interim Abandonment and Reclamation Plan.

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 D. The spreadsheet will require to be updated annually as the Project progresses. To make up for uncertainties, the highest prices of the range provided by the MINING RECLAIM unit costs spreadsheet were systematically chosen.

12.1 Final Mine Closure Cost

MINING RECLAIM calculates the grand total capital costs required for the Project closure and reclamation. The cost is split into land and water liability. Additionally, the cost associated to Inuit Owned Land (IOL) and Federal Owned (FOL) has been differentiated from North to South, Milne Port, Tote Road, Mine Site, and the first 25 km of the railway are located on Inuit land. The remaining section of the railway and Steensby Port are located on federally owned land. Costs relating to the infrastructure, equipments and remediation actions on these sites were attributed to the corresponding category. Less tangible components, such as chemicals and soil management, water management and post-closure monitoring and maintenance were attributed on a basis of two thirds (2/3) to IOL and one third (1/3) to FOL. This was based on two of the main sites (Milne Port, Mine Site) being in IOL and one site (Steensby Port) located in FOL.

The Ultimate Project closure and reclamation is estimated to cost $518,711,208. The break down between land and water liability and IOL/FOL is summed up in Table 12-1.

Table 12-1: Total Cost and Breakdown for Mary River Project Closure and Reclamation

	Total Cost	Percentage	Land Liability	Water Liability
Inuit Owned Land	$411,234,800	79.2	$405,430,454	$6,106,421
Federal Owned Land	$107,476,408	20.7	$105,391,574	$2,160,637
Total	$518,711,208	100	$510,822,029	$8,267,058

12.2 Interim Mine Closure Cost

The conditions of the pending Type A Water Licence and Qikiqtani Inuit Associations Commercial Lease will be for Baffinland to provide annual updates on closure costs until the Project is fully developed. These annual updates, and the accordingly increased security bonding, will occur until the full closure bonding requirements are met.

13. Relationship to other Management Plans

During the implementation of this Interim Mine Closure and Reclamation Plan and future revisions of this plan, all environmental management, monitoring and mitigation plans will be applicable until the mine closure is complete. The following management's plans will apply:

- Health, Safety and Environmental Management Framework, FEIS, Appendix 3B.
- Environmental Design Basis (FEIS, Appendix 3B, Attachment 3).
- Construction Environmental Protection Plan.
- Construction Environmental Monitoring Requirements.
- Comprehensive Environmental Monitoring Plan – updated March 2013.
- Emergency Response and Spill Contingency Plan – updated March 2013.
- Milne Port and Steensby Port Oil Pollution Emergency Plan – Milne Port OPEP to be updated prior to 2013 Shipping Season.
- Explosives Management Plan – to be updated after Type A Water License is issued.
- Waste Rock Management Plan (FEIS, Appendix 3B, and Attachment 5, to be updated prior to commencement of mining operations).
- Borrow Pits and Quarry Management Plan (updated March 2013).
- Surface Water and Aquatic Ecosystem Management Plan (updated March 2013).
- Freshwater Supply, Sewage and Wastewater Management Plan (updated March 2013).
- Terrestrial Environmental Management and Monitoring Plan.
- Waste Management Plan (updated April 2013).

- Hazardous Waste Management Plan (updated April 2013).
- Waste Rock Management Plan (FEIS, Appendix 3B, and Attachment 5, to be updated prior to commencement of mining operations).
- Shipping and Marine Mammals Management Plan (FEIS, Appendix 3B, Attachment 5, to be updated prior to commencement of mining operations).
- Air Quality and Noise Abatement Management Plan (FEIS, Appendix 3B, and Attachment 5, to be updated prior to commencement of mining operations).
- Explosive Management Plan (FEIS, Appendix 3B, Attachment 5, to be updated prior to commencement of mining operations).
- Blasting Management Plan submitted to QIA March 2013.

14. Concordance Table

Table 14-1 has been prepared to characterize the content of the Interim Abandonment and Reclamation Plan (Abandonment and Reclamation). And updated with reference to this Interim MC&RP. The concordance table is consistent with the principles of the Qikiqtani Inuit Association (QIA) Abandonment and Reclamation Policy for Inuit Owned Lands ('the Policy') and structured in accordance with Appendix C of the QIA Security Policy (2010).

Table 14-1: QIA Abandonment and Reclamation Policy for Inuit Owned Lands Concordance Table

Item	QIA Abandonment and Reclamation Policy for Inuit Owned Lands (2010)	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 rational 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 *Guiding Principles on Reclamation* and provide rationale on how these principles have been satisfied?	Yes
5	Has Inuit Qaujimajatuqangit and consultation with Community Land and Resources Committee(s) been applied?	Not at this stage, commitment to do so in the future
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

Item	QIA Abandonment and Reclamation Policy for Inuit Owned Lands (2010)	Baffinland Response
9	Have Tables 1, 2, 3 and 4 of the Security Policy (Appendix C) been used in completing the financial security estimate?	Yes
10	Has evidence been provided to support the Policy assumptions for all reports and plans?	Yes

Table 14-2 has been prepared to show all the Project Certificate No. 0005 commitments outlined in that apply to this Interim A&R Plan. Where the Project Certificate Conditions have requirements for Construction, Operations, Temporary Closure/Care and Maintenance, Closure and Post Closure Monitoring the requirements are dealt with by a current Management Plan that will be updated regularly throughout the life of the Project. These Management Plans will still be applicable during Closure and, as necessary, Post Closure Monitoring.

Table 14-2 NIRB Project Certificate Conditions - Appendix A

Commitment Number	NIRB Project Certificate - Appendix A	Interim MC&RP Plan Section
38	Baffinland is committed to undertaking a phased approached to any abandonment and restoration, as well as final abandonment and restoration, of the Mary River Project site(s) and relevant monitoring activities in a manner that is consistent with applicable guidelines and regulations.	5
39	Baffinland is committed to investigating and exploring the potential for native species of flora to be used for re-vegetating areas disturbed within the project area.	8.13
40	Baffinland is committed to undertaking environmental effects monitoring during the mine life mine as well as after closure.	9
42	Baffinland is committed to establishing a working/ advisory group consisting of stakeholders of the Mary River Project to identify and address issues surrounding abandonment and restoration activities associated with the Mary River Project. The terms of reference, as well as information on all issues identified to be resolved by the working group, will be made available to the NIRB and interested persons for information and/or review purposes.	2.3 and 2.5

15. Glossary of Terms, Acronyms, or Abbreviations

15.1 Glossary of Terms

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.
Acid-Base Accounting (ABA)	Acid-Base Accounting (ABA) is a screening procedure whereby the acid-neutralizing potential and acid-generating potential of rock samples are determined.

Term	Meaning
Acid generating (AG)	Production of acidity irrespective of its effect on the adjacent pore water or whether the material is net acid producing or neutralizing.
Acid rock drainage (ARD)	Acidic drainage stemming from open pit, underground mining operations, waste-rock or tailings facilities that contains free sulphuric acid and dissolved metals sulphate salts, resulting from the oxidation of contained sulphide minerals or additives to the process. The acid dissolves minerals in the rocks, further changing the quality of the drainage water.
Acid Potential (AP)	Maximum potential acid generation from a sample. The calculation of AP (or MPA) is an integral part of acid/base accounting.
Acidity	Measure of the capacity of a solution to neutralize a strong base.
Active layer	The layer of ground above the permafrost which thaws and freezes annually.
Alkalinity	Measure of the capacity of a solution to neutralize a strong acid.
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: • 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.
Background	An area near the site under evaluation not influenced by chemicals released from the site, or other impacts created by onsite activity.
Baseline	A surveyed condition and reference used for future surveys.
Benign	Having little or no detrimental effect.
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.
Biodiversity	The variety of plants and animals that live in a specific area.
Bioremediation	The use of microorganisms or vegetation to reduce contaminant levels in soil or water.
Borrow Pit	A source of fill or embanking material.
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.
Comminution	Size reduction of an ore by crushing and/or grinding to such a particle size that the product is a mixture of relatively clean particles of mineral and gangue. In order to produce a relatively pure concentrate, it is necessary to grind the ore fine enough to liberate the desired minerals.

Term	Meaning
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.
Cumulative Effects	The combined environmental impacts that accumulate over time and space as a result of a series of similar or related actions or activities.
Crushing	Comminution process that reduces the particle size of run-of-mine ore to such a level that grinding can be carried out. This is accomplished by compression of ore against rigid surfaces, or by impact against surfaces in rigidly constrained motion path.
Cryoconcentration	Concentration of solutes due to exclusion by ice.
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 sludges.
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.
Drainage Chemistry	Concentrations of dissolved components in drainage, including element concentrations, chemical species and other aqueous chemical parameters.
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.
Frost Heave	Annual ground displacements and differential ground pressures due to the freezing of water within soils.
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).

Term	Meaning
Ground Thermal Regime	Temperature conditions below the ground surface. A condition of heat losses and gains from geothermal sources and the atmosphere.
Groundwater	All subsurface water that occurs beneath the water table in rocks and geologic formations that are fully saturated. Distinct from surface water.
Humidity Cell Test	Kinetic test procedure used primarily to measure rates of acid generation and neutralization in sulphide-bearing rock.
Hydrogeology	Science of the groundwater circuit (interrelationship of geologic materials and processes with water).
Hydrology	The science that deals with water, its properties, distribution and circulation over the Earth's surface.
Inert Waste	Material having insignificant leachability and pollution content which will not require laboratory analysis.
Infiltration	Entry of water into a porous substance.
Inukshuk	A stone representation of a person, used as a milestone or directional marker by the Inuit of the Canadian Arctic.
In Situ Treatment	A method of managing or treating contaminated soils, sludges 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.
Leachate	Solution obtained by leaching. e.g. water that has percolated through soil containing soluble substances and that contains certain amounts of these substances in solution.
Leaching	Passage of a solvent through porous or crushed material in order to extract components from the liquid phase. For example, gold can be extracted by heap leaching of a porous ore, or pulverized tailings. Other methods are tank leaching of ore, concentrates or tailings and in-situ leaching.
Lithology	Composition of rocks, including physical and chemical characteristics such as colour, mineralogical composition, hardness and grain size.
Migration	The movement of chemicals, bacteria, and gases in flowing water or vapour.
Mineral Resource	Concentration or occurrence of natural, solid, inorganic or fossilized organic material in or on the Earth's crust in such form and quantity and of such a grade or quality that it has reasonable prospects for economic extraction. The location, quantity, grade, geological characteristics and continuity of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge.
Mining	Methods and techniques to extract ore from the ground, including support facilities (e.g. stockpiles, workshops, transport, ventilation) and supporting activities in the mine itself or in the vicinity.
Mining Operation	Any extraction of ore from which mineral substances are taken, where the corporate intent is to make an operating profit or build continuously toward a profitable enterprise.
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.

Term	Meaning
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 42 ypersthenes and covering with overburden as required and allowing the surrounding natural vegetation to encroach and be re-established on the disturbed area.
Neutralization	Raising the pH of acidic solutions or lowering the pH of alkaline solutions to near-neutral pH (about pH 7) values through a reaction in which the hydrogen ion of an acid and the hydroxyl ion of a base combine to form water.
Neutralization Potential (NP)	General term for a sample's or a material's capacity to neutralize acidity.
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.
Operator	Any natural or legal person that is responsible for the control, operation, and maintenance of the mine, mineral processing plant, tailings dam and/or related facilities including the after-closure phases.
Ore	Mineral or variety of accumulated minerals of sufficient value as to quality and quantity that it/they may be mined at a profit. Most ores are mixtures of extractable minerals and extraneous rocky material.
Orebody (mineral deposit)	Naturally occurring geological structure consisting of an accumulation of a desired mineral and waste-rock, from which the mineral can be extracted, at a profit, or with a reasonable expectation thereof.
Overburden	Layer of natural grown soil or massive rock on top of an orebody. In case of open pit mining operations it has to be removed prior to extraction of the ore
P	Phosphate
Passive Treatment	Treatment technologies that can function with little or no maintenance over long periods of time.
Permafrost	Ground that remains at or below zero degrees Celsius for a minimum of two consecutive years.
Permafrost Aggradation	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.

Term	Meaning
Potentially Acid Generating (PAG)	Rock or overburden material that has the potential to produce acidity irrespective of its effect on the adjacent pore water or whether the material is net acid producing or neutralizing.
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.
Primary Crushing	Process of reducing ore into smaller fragments to prepare it for further processing and/or so that it can be transported to the processing plant. In underground mines, the primary crusher is often located underground, or at the entrance to the processing plant.
Quarry	Whole area under the control of an operator carrying out any activity involved in the prospecting, extraction, treatment and storage of minerals, including common related infrastructures and waste management activities, being not a mine. It is distinguished from a mine because it is usually open at the top and front, and used for the extraction of building stone, such as slate, limestone, gravel and sand.
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.
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.
Risk Assessment	Reviewing risk analysis and options for a given site, component or condition. Risk assessments consider factors such as risk acceptability, public perception of risk, socio-economic impacts, benefits, and technical feasibility. It forms the basis for risk management.
Run-of-mine (ROM)	Run of mine. Unprocessed conveyed material (ore) from the mining operation.
Runoff	Part of precipitation and snowmelt that does not infiltrate but moves as overland flow and drains off the land into bodies of water.
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.
Seismic	Relating to an earthquake or to other tremors of the Earth, such as those caused by large explosions.

Term	Meaning
Solubility	Quantity of solute that dissolves in a given volume and type of solvent, at given temperature and pressure, to form a saturated solution. The degree to which compounds are soluble depends on their ability, and that of the other dissolved species, to form ions and aqueous complexes in a particular drainage chemistry.
Sump	An underground catch basin in a mine where water accumulates before being pumped to the surface.
Supernatant	The clear liquid that floats about the sediment or precipitate.
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.
Tailings	Material rejected from a mill after most of the recoverable valuable minerals have been extracted.
Taliks	Unfrozen zones that can exist within, below, or above permafrost layers. They are usually located below deep water bodies.
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.
Thermokarst	A landscape characterized by shallow pits and depressions caused by selective thawing of ground ice, or permafrost.
Topsoil	Natural huminous layer on top of the orebody, which has to be stripped prior to start-up of ore extraction.
Traditional Knowledge	A cumulative, collective body of knowledge, experience, and values built up by a group of people through generations of living in close contact with nature. It builds upon the historic experiences of a people and adapts to social, economic, environmental, spiritual and political change.
Ultramafic	Igneous rock composed chiefly of mafic minerals, e.g. monomineralic rocks composed of 44 ypersthenes, augite, or olivine.
Waste-rock, Discard, or Spoil Material	All rock materials, except ore and tailings that are produced as a result of mining operations.
Watershed	A region or area bordered by ridges of higher ground that drains into a particular watercourse or body of water.
Water Table	The level below where the ground is saturated with water.
Weathering	Processes by which particles, rocks and minerals are altered on exposure to surface temperature and pressure, and atmospheric agents such as air, water and biological activity.

15.2 Acronyms and Abbreviations

The following are acronyms or abbreviations that may be used in this document.

Abbreviation	Description
General	
A&R	Abandonment and Reclamation
ARD	Acid Rock Drainage
Baffinland	Baffinland Iron Mines Corporation
CCME	Canadian Council of Ministers of the Environment
DEIS	Draft Environmental Impact Statement

Abbreviation	Description
EA	Environmental Assessment
EHS	Environmental Health and Safety
EIS	Environmental Impact Statement
EMMP	Environmental Mitigation and Monitoring Plans
ERP	Proposed Early Revenue Phase
ESA	Environmental Site Assessment
FEIS	Final Environmental Impact Statement
FOL	Federal Owned Lands
HADD	Harmful Alteration, Disruption, or Destruction
HTA/HTO	Hamlets, Hunters, and Trappers Association/Organization
HTO	Hunters and Trappers Organization
IIBA	Inuit Impact and Benefits Agreement
IOL	Inuit Owned Lands
IQ	Inuit Qaujimajatuqangit (Inuit knowledge, or traditional knowledge)
KI	Key Indicator
LAC	Land Advisory Committee
LSA	Local Study Area
MASL	Metres above Sea Level
Mary River	Nuluujaak
MC&RP	Mine Closure and Reclamation Plan
MDAG	Mineral Development Advisory Group
MERA	Mineral and Energy Resource Assessment
ML	Metal Leaching
MOU	Memorandum of Understanding
Mt/a	Million Tonne-Per-Annum
NLCA	Nunavut Land Claims Agreement
NSA	Nunavut Settlement Area
NWT	North West Territories
PAG	Potential Acid Generating
PDA	Potential Development Area
PDW	Pre-Development Works
PLA	Production Lease Area
PPR	Personal Property Registry
RA(s)	Responsible Authority(ies)
RMO	Resource Management Officer
RSA	Regional Study Area
TC-NWPP	Transport Canada Navigable Waters Protection Program
the Project	Mary River Project
TK	Traditional Knowledge
VC	Valued Component
VEC	Valued Ecosystem Component
VSEC	Valued Socio-Economic Component
Federal And Territorial Acts	
AWPPA	Arctic Waters Pollution Prevention Act
BCANU	Business Corporations Act (Nunavut)
CEAA	Canadian Environmental Assessment Act
CEPA	Canadian Environmental Protection Act, 1999
CLA	Commissioner's Land Act

Abbreviation	Description
CNPA	Canada National Parks Act
CWA	Canada Wildlife Act
EG&GANU	Engineers, Geologists and Geophysicists Act (Nunavut)
EMAANU	Emergency Medical Aid Act (Nunavut)
EPANU	Environmental Protection Act (Nunavut)
EUANU	Explosives Use Act (Nunavut)
EXA	Explosives Act
FA	Fisheries Act
FPANU	Fire Prevention Act (Nunavut)
LSANU	Labour Standards Act (Nunavut)
MBCA	Migratory Birds Convention Act, 1994
MH&SANU	Mine Health and Safety Act (Nunavut)
NW&NSRTA	Nunavut Waters and Nunavut Surface Rights Tribunal Act
PHANU	Public Health Act (Nunavut)
TDGA	Transportation of Dangerous Goods Act, 1992
TDGANU	Transportation of Dangerous Goods Act (Nunavut)
TLA	Territorial Lands Act
TPANU	Territorial Parks Act (Nunavut)
WANU	Wildlife Act (Nunavut)
WCANU	Workers' Compensation Act (Nunavut)
Federal And Territorial Regulations	
AWPPR	Arctic Waters Pollution Prevention Regulations
CFAEAP&R	Regulations Respecting the Coordination by Federal Authorities of Environmental Assessment Procedures and Requirements
CLR	Commissioner's Land Regulations
CMR	Canada Mining Regulations
CRFR	AECB Cost Recovery Fees Regulations, 1996
CSLR	Comprehensive Study List Regulations
CSLRNU	Comprehensive Study List Regulations (Nunavut)
CSRNU	Camp Sanitation Regulations (Nunavut)
ELR	Exclusion List Regulations
EURNU	Explosives Use Regulations (Nunavut)
EXR	Explosives Regulations
FPRNU	Fire Prevention Regulations (Nunavut)
ILR	Inclusion List Regulations
LLR	Law List Regulations
MBSR	Migratory Bird Sanctuary Regulations
MH&SRNU	Mine Health and Safety Regulations (Nunavut)
MMER	Metal Mining Effluent Regulations
NA&PSR	Nunavut Archaeological and Palaeontological Sites Regulations
NBRLUP	North Baffin Regional Land Use Plan
NPWR	National Parks Wildlife Regulations
NWTFR	Northwest Territories Fishery Regulations
NWTWR	Northwest Territories Waters Regulations
PCSRNU	Propane Cylinder Storage Regulations (Nunavut)
SCP&RRNU	Spill Contingency Planning and Reporting Regulations (Nunavut)
TDGR	Transportation of Dangerous Goods Regulations
TDGRNU	Transportation of Dangerous Goods Regulations (Nunavut)

Abbreviation	Description
TDR	Territorial Dredging Regulations
TLR	Territorial Lands Regulations
TLUR	Territorial Land Use Regulations
TPRNU	Territorial Parks Regulations (Nunavut)
TQR	Territorial Quarrying Regulations
WAR	Wildlife Area Regulations
WCRNU	Workers' Compensation Regulations (Nunavut)
WSRNU	Wildlife Sanctuaries Regulations (Nunavut)
Federal Government Departments And Agencies	
AANDC	Aboriginal Affairs and Northern Development Canada
CTA	Canadian Transportation Agency
DFO	Fisheries and Oceans Canada
DOJ	Department of Justice Canada
EC	Environment Canada
INAC	Indian and Northern Affairs Canada (recently renamed Aboriginal Affairs and Northern Development Canada)
NRCan	Natural Resources Canada
PCH	Parks Canada Agency (Canadian Heritage)
TC	Transport Canada
Territorial Government Departments And Agencies	
CGSNU	Department of Community and Government Services
CLEYNU	Department of Culture, Language, Elders and Youth
DOJNU	Department of Justice
DOENU	Department of Environment
ED&TNU	Economic Development & Transportation
GN	Government of Nunavut
H&SSNU	Department of Health and Social Services
WCBNU	Workers' Compensation Board of the Northwest Territories and Nunavut
Institutions Of Public Government	
CLARC	Community Land and Resource Committee
CLO	Community Liaison Officer
IPGs	Institutions of Public Government
NIRB	Nunavut Impact Review Board
NPC	Nunavut Planning Commission
NSRT	Nunavut Surface Rights Tribunal
NWB	Nunavut Water Board
NWMB	Nunavut Wildlife Management Board
Inuit Organizations	
DIO	Designated Inuit Organizations
MHTO	Mittimatalik Hunters and Trappers Organization
NTI	Nunavut Tunngavik Incorporated
QIA	Qikiqtani Inuit Association
RIA	Regional Inuit Association
RWO	Regional Wildlife Organization

16. References

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Appendix A

Preliminary Mine Closure and Reclamation Plan Drawings

Appendix B

Mining RECLAIM Assumptions and Spreadsheet Extracts as present in FEIS

B.1 Open Pit

B.1.1 Objective: Control Access

The access of the Mary River open pit will be controlled by a berm at the crest and signage. The pit will have an estimated final perimeter of 4300 m, along which a berm will be installed. Signage will be installed every 500 m at a minimum.

B.1.2 Objective: Cover/Contour Slopes (chosen for the price of placing inert materials in the pit)

Scrap materials will be produced by the demolition of buildings. Although these materials may or may not be dumped in the open pit, the price of loading and dumping has been included in the open pit spreadsheet. The price will be similar to that of loading and dumping at the alternate locations, the onsite landfills. It is assumed that 90% of the materials from the building will be disposed of at approved repositories on-site and 10% will be shipped from Milne Port or Steensby Port off-site for disposal. A yield of 50 m3 per 1000 m2 of building footprint has been assumed. Additionally, the cost of placing 1.5 m of overburden over that material was taken into account. The total surface of Project buildings is: 82,763.5 m2.

B.1.3 Objective: Spillway

The pit will be allowed to flood naturally, a process that may take 85 to 150 years to complete. Once the open pit fills to the point of overflow, pit drainage will enter the natural environment from the southeast corner of the open pit. A channel is thus necessary to guide the overflow to Mary River. It is assumed the channel will be 0.5 km long, 1 m wide and 0.75 m deep.

B.1.4 Objective: Reclaim Quarries

A majority of the quarries will be reclaimed after construction. It is assumed that four of the 63 quarries will be reclaimed at closure. Excess rock will be placed back in the quarries. An estimated 5% of the total surface of the quarries will be covered by excess rock, at a minimum of 1 m. The borrow pit slopes will be contoured. It has been assumed that 20% of the total area of the borrow pit will undergo re-contouring.

At this point, no treatment for ARG/ML is anticipated (AMEC, 2010). If future investigations prove to the contrary, batch treatments will be added to the open pit cost.

B.2 Rock Pile

Objective: Cover Dump (chosen for the price of scarification)

In order to stimulate re-vegetation, the flat areas of the rock pile will be scarified. The area has been calculated from the final drawing of the pile and is assumed to be: 1,762,884.5 m2 or 176.2 ha.

It is assumed all ore piles will be shipped off site prior to reclamation due to their monetary value.

B.3 Buildings and Equipment

Three objectives correspond to each building:"removal of contaminated buildings", "removal of non contaminated buildings" and "break basement slab".

As a general assumption, the buildings have been sorted into the following categories in the RECLAIM spreadsheet:

- Buildings that may require decontamination (maintenance shop, power plant, bulk fuel storage and ANFO plant): 200$/m2.
- Buildings that may not require decontamination (crushing plant, water treatment plant offices, warehouse and accommodations and miscellaneous): 100 $/m2.

These prices were extracted from former mine reclamation estimates and doubled to account for the additional costs inherent to arctic conditions.

As well as:

- Buildings with concrete foundations (crushing plants): 53.46 $/m2.
- Buildings with pile foundations: 26.73 $/m2.

In the Tables Table B-2, Table B-5, and Table B-7, P stands for Piles and S for Shallow Foundations.

The list of buildings was extracted from document H337697-0000-00-144-0001: Mary River Project Master Building Matrix.

An update of this section will be necessary as this document is revised.

B.3.1 Objective: Dispose Mobile Equipment

It has been assumed that all the mobile equipment will be disposed of offsite. The total cost of sealift is included in the mobilization estimate. The return on salvaged scrap material from the demolition of buildings and equipment was not taken into account in this estimate.

PLEASE NOTE: Options for any remaining infrastructure at final closure to be donated to local communities will be examined and encouraged, however the cost of demolition and disposal of all buildings was the cost captured in this estimate.

B.3.2 Milne Port

B.3.2.1 Objective: Remove Buildings

Table B-1 summarizes the buildings at Milne Port.

Table B-1: Buildings at Milne Port

Buildings/Areas	Area (m^2)
Exist. Polishing/waste stabilization pond	
Exist. Fuel storage drums	
Temporary empty fuel drums on ground	
Exist. Bladder fuel farm	
Lined storage area	
Exist. Fuel storage area	
Total	42,270 m^2

Existing camps account for 1,250 m2.

It is assumed that strictly the footprints of the aboveground fuel tanks would be reclaimed and not the entire fuel storage site. Therefore it is estimated that this is 75% of the fuel storage site area will need to be reclaimed.

Additionally, the airstrip lightning will be removed at the cost estimated in the 2011 Exploration Phase A&R Plan.

B.3.3 Tote Road

B.3.3.1 Objective: Reclaim Roads

Tote road is left as a public road. As per the 2011 A&R plan, all culverts on Tote Road will be removed, including ten major culverts (box and round culverts). Water breaks will be installed. This will allow for the natural restoration of drainage patterns.

B.3.4 Mary River Mine Site

B.3.4.1 Objective: Reclaim Airstrip

The airstrip lightning will be removed at the cost estimated in the 2011 Exploration Phase A&R Plan.

B.3.4.2 Objective: Landfill for Demolition Waste

It is assumed a 1.5 m cover will be placed over the Mary River mine landfill of area 76,300 m2.

B.3.4.3 Objective: Reclaim Roads

It is assumed that the deposit #1 road ditches will be filled with cobble over 600 m. It has been assumed that 20% of the access roads (totalling 1,000,000 m2 according to the Mary River Iron Ore Trucking Feasibility Study – Technical Decision Record, Appendix A will be graded and contoured.

The buildings, vehicles and airstrip equipment at Mary River Mine Site are listed in tables Table B-2, Table B-3 and Table B-4 respectively.

Table B-2: Buildings at Mary River

		Footprint m2	Foundation
Pit Office & Lunch Room (MR)	Offices/warehouse/accom	532.8	
Emulsion Plant Building (MR)	ANFO plant	372.10	
MMU Building (MR)	ANFO plant	558.2	
Primary Crusher Building (MR)	Crushing plant	720.0	P
Secondary Crusher Building (MR)	Crushing plant	630.0	S
Conveyor Tunnel Exit Building (MR)	Crushing plant	240.0	
Maintenance of Way Building (MR)	Maintenance shop	1600	P
Accommodation Building (MR)	Offices/warehouse/accom	4207.0	P
Services Building (MR)	Offices/warehouse/accom	6739.0	P
Unheated Storage Building (MR)	Offices/warehouse/accom	2550.0	P
Truck Warming Building (MR)	Offices/warehouse/accom		
Administration Building (MR)	Offices/warehouse/accom	1483.0	P
Airstrip Shelter (MR)	Other	300.0	S
De-Icing Equipment Storage (MR)	Other	300.00	P
Maintenance & Cargo Building (MR)	Other	300.0	P
Field Electrical Centre (MR)	Other	40.0	S
Lake Pump House (MR)	Water treatment plant	72.0	S
Potable water Treatment Building (MR)	Water treatment plant	178.2	P
Fire Pump House (MR)	Other	450	P
Sewage Treatment Building (MR)	Water treatment plant	1680.0	P
Emergency Boiler Building (MR)	Other	180.0	P
Solid waste disposal & incinerator system building (MR)	Consolidate & dump boneyard debris	1200.00	P
Telecommunications & Signalling Shelter & Tower (MR)	Other		
Power plant Building (MR)	Power plant	3600.0	P
E-house for 1000-BLD-1210.100 (MR)	Power plant	216.0	P
E-house for 1000-BLD-1230.100 (MR)	Power plant	540.0	S
E-House for 4000-BLD-4220-101 (MR)	Power plant	216.0	P
E-House for 4000-BLD-4290.102 (MR)	Power plant	72.0	P
E-House for 4000-BLD-4310.100 (MR)	Power plant	144.0	P
E-House for 4000-BLD-4320.100 (MR)	Power plant	144.0	P
E-House for 4000-BLD-4330.101 (MR)	Power plant	72.0	P
E-House or Fuel Unloading Station (MR)	Power plant	144.0	P
E-House for 4000-BLD-4330.102 (MR)	Power plant	144.0	P
E-House for 4000-BLD-4340.100 (MR)	Power plant	144.0	P
E-House for 4000-BLD-4350.100 (MR)	Power plant	72.0	P
E-House for 5000-BLD-5130-103 (MR)	Power plant	540.0	P
E-House for 5000-BLD-5180.100 (MR)	Power plant	216.0	P
Utilidors (MR)	Other	2761.7	P
Transfer Tower 5130-TT-001 (MR)	Conveyors & transfer towers	297.0	P
Transfer Tower 5130-TT-002 (MR)	Conveyors & transfer towers	252.0	P
Transfer Tower 5130-TT-003 (MR)	Conveyors & transfer towers	140.0	P
Transfer Tower 5130-TT-004 (MR)	Conveyors & transfer towers	180.0	P
Rail Car Loading Station Building (MR)	Other	408.3	P

NOTE: Fuel Storage areas were not included in the building list. This area represents 13,130 m2. It is assumed 75% of this area will need to be reclaimed and this cost was captured in this estimate.

Table B-3: Vehicles at Mary River Mine Site

Vehicles			
Haul Trucks			
CAT D300 (Haul Truck 30 ton)	2	**Material Handling & Lifts**	
CAT 777 Tow Haul	1	12000lb Tele-Handler Zoom Boom	2
		85ft Man Lift	1
Loaders			
CAT 966 Loader	1	**Pick-Ups, Trucks & Trailers**	
CAT 988 Loader	2	Pick-ups	13
CAT IT62 Loader	2	20 ton Picker Truck	4
Skid Steer Loader	4	Pintle Trailer for the above	2
Backhoe	2	Roll-off Trucks	3
		4000 Gal Fuel Truck	1
Dozers		B Train Fuel Truck	1
CAT D6 Dozer	1	Sewage collection truck	2
		4000 Gal Water Truck	1
Graders		Busses	2
CAT 16H Grader	1	Tractor Trailer & Low Boy	2
		Winch Tractor	1
Crushers		Winch Tractor	3
Nordberg NW7150 Crusher	1	Winch Tractor	1
Nordberg NWSeries Jaw Crusher to suit above	1	Tow Haul Trailer	1
Nordberg NW Series Screen Plant (3 decks)	1	Crew Bus	2
Nordberg CM Series Mobile Conveyor	4		
		Safety Equipment	
Pit / Blast Hole Drill		Fire Truck	1
Polaris Ranger 80C Utility Vehicle	1	Ambulance	1
		Tracked Recovery Vehicle	1
Packers		Emergency Response Vehicle	1
10 ton Drive On Packer	1		
		Miscellaneous	
Cranes		320000BTU Frost Fighter	10
Grove 40 ton Rough Terrain	1	8kW Ingersol Rand Light Towers	10
Grove RT89E, Rough Terrain	1	Tyre handler	3
		20kW Whisper Watt Gen Set	5
Container Handling		Fork Lift	1
100000lb Sea Can Handler	1	Fork Lift	3
100000lb Hyster Fork Lift	1	Pallet Truck	10
		Rock Breaker	1
		Total	118

Table B-4: Aircraft Equipment at Mary River

Maintenance and Cargo Building Electric Baggage Tow Tractor	1
Maintenance and Cargo Building Bobcat	1
Maintenance and Cargo Building Potable Water Truck	1
Maintenance and Cargo Building Aircraft Passenger Stairs	1
Maintenance and Cargo Building Aircraft Tow Tug	1
Maintenance and Cargo Building Aircraft Tow Bars - Set	1
Maintenance and Cargo Building E-Sprayer	1
Maintenance and Cargo Building Lavatory Service Truck	1
Maintenance and Cargo Building Baggage Belt Loader Vehicle	1
Maintenance and Cargo Building Pallet Dolley	2
Maintenance and Cargo Building Wheeled Fire Extinguisher (125 lbs)	1
Maintenance and Cargo Building Combi Back-Hoe with Front Blade Attachment	1
Maintenance and Cargo Building Service Pick Up Truck	2
Maintenance and Cargo Building Fork Lift	2
Maintenance and Cargo Building Maintenance Service Ladder and Platform	1
Maintenance and Cargo Building Mobile Air Compressor	
Deicing Equipment and Fire Rescue Building De-Icing Truck	2
Deicing Equipment and Fire Rescue Building Fire Rescue Truck	1
Total	21

Objective: Specialized Items

At Mary River, the train load-out, stackers and conveyors will all be broken down prior to disposal. This specific equipment will require particular care during reclamation. The price of reclamation is estimated to be 25% the cost of installation, except for the conveyor. This is assumed based on the concept that the specialized items will simply be broken down into transportable pieces and then disposed of. Estimated cost of installation is as follows:

- Stacker: $9,669,727.
- Train load-out: $3,226,600.
- Conveyor: $48,146,024.

For the conveyor, a ratio of 0.125 has been applied, since the pile foundations will require much less work for reclamation than for installation.

Please Note: This price includes the conveyors located in Steensby Port as well.

B.3.5 Railway and Access Roads

B.3.5.1 Objective: Reclaim railway

200 culverts and 31 bridges will be removed. It has been assumed that the cost of removing each bridge is $50,000. The rails will be dismantled and disposed of. Tunnels will be plugged by rock and sealed with concrete. An estimated 20 cm of concrete will be poured on the surface area of tunnel opening. It is assumed all tunnel openings will be a standard 4.8 * 8 m2, the approximate cross section of each tunnel. In addition, an estimated three meters of rock will be placed at each entrance.

Buildings and equipment along the railway are listed in table Table B-5 and Table B-6

Table B-5: **Buildings along the Railway**

	Footprint m2	Foundation
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 1	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 2	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 3	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 4	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 5	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 6	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 7	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 8	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 9	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 10	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 11	29	
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER NO. 12	29	

Table B-6: **Equipment along the Railway**

Equipment	Total Units
Locomotives	11
Cars	433
Total	444

The price of removing tracks and ties from the railway has been estimated based on contractor's installation cost. Estimated cost of installation is as follows:

- Material transportation to Steensby Port: $1,953,724.
- Tracks removal: $17,534,764.
- Yards and sidings removal: $4,019,321.
- Turnout's removal: $1,324,116.
- Remove miscellaneous appurtenances: $540,410.

The price of reclamation of the rail and ties is estimated to be 50% the cost of installation. This is assumed based on the concept that the rail and ties items will simply be broken down into transportable sections and disposed of.

The access road along the railway will have been reclaimed after construction and is indeed not included in the final reclaim cost estimate.

The grand total cost for tracks and ties removal amounts to: $25,372,335.

B.3.6 Steensby Port

Buildings, vehicles and airstrip equipment at Steensby Port are respectively listed in tables Table B-7, Table B-8, and Table B-9.

Table B-7: **Buildings at Steensby Port**

		Footprint m2	Foundation
SCREENING BUILDING (SP)	other	1728.0	S
TERTIARY CRUSHER BUILDING (SP)	crushing plant	1728.0	S
RAIL INSPECTION BUILDING (SP)	other	3500.0	
ORE DOCK OPERATIONS FACILITY (SP)	other	216	S
FREIGHT DOCK OPERATIONS FACILITY (SP)	other	216	S
ACCOMMODATION BUILDING (SP)	offices/warehouse/accom	4976.0	P, S
ADMINISTRATION BUILDING (SP)	offices/warehouse/accom	1598.4	P
RAIL & LIGHT VEHICLE MAINTENANCE BUILDING (SP)	maintenance shop	9091.3	S
UNHEATED STORAGE BUILDING (SP)	maintenance shop	2550.0	
AIRSTRIP SHELTER (SP)	other	300.0	S
DE-ICING EQUIPMENT STORAGE (SP)	other	300.0	P
MAINTENANCE & CARGO BUILDING (SP)	other	300.0	P
FIELD ELECTRICAL CENTRE (SP)	other	40.0	S
LAKE WATER PUMPHOUSE (SP)	water treatment plant	72.0	S
POTABLE WATER TREATMENT BUILDING (SP)	water treatment plant	165.0	P
FIRE WATER PUMP HOUSE (SP)	other	450.0	P
OILY WATER TREATMENT BUILDING (SP)	water treatment plant	126.0	
SEWAGE TREATMENT BUILDING (SP)	water treatment plant	1152.0	S
FUEL DISTRIBUTION PUMPHOUSE (SP)	bulk fuel storage	600.0	
EMERGENCY BOILER BUILDING (SP)	other	180.0	S
SOLID WASTE DISPOSAL & INCINERATOR SYSTEM BUILDING (SP)	consolidate & dump boneyard debris	1200.0	S
TELECOMMUNICATIONS & SIGNALLING SHELTER & TOWER (SP)	offices/warehouse/accom	29	
POWER PLANT BUILDING (SP)	power plant	3600.0	S
E-HOUSE FOR 4000-BLD-1260.100 (SP)	power plant	216.0	S

E-HOUSE FOR 4000-BLD-1270.100 (SP)	power plant	540.0	S
E-HOUSE FOR 4000-BLD-4520.101 (SP)	power plant	216.0	S
E-HOUSE FOR 4000-BLD-4590.102 (SP)	power plant	72.0	S
E-HOUSE FOR 4000-BLD-4610.100 (SP)	power plant	144.0	P
E-HOUSE FOR 4000-BLD-4620.100 (SP)	power plant	144.0	S
E-HOUSE FOR 4000-BLD-4630.101 (SP)	power plant	72.0	S
E-HOUSE FOR 4000-BLD-4630.102 (SP)	power plant	144.0	S
E-HOUSE FOR 4000-BLD-4640.100 (SP)	power plant	144.0	S
E-HOUSE FOR 4000-BLD-4650.100 (SP)	power plant	144.0	S
E-HOUSE FOR 4000-BLD-4660.100 (SP)	power plant	72.0	S
E-HOUSE FOR 5000-BLD-5210.100 (SP)	power plant	216.0	S
E-HOUSE FOR 5000-BLD-5210.101 (SP)	power plant	540.0	P
E-HOUSE FOR 5000-BLD-5370.100 (SP)	power plant	540.0	S
E-HOUSE FOR 5000-BLD-5370.101 (SP)	power plant	540.0	S
E-HOUSE FOR 3000-BLD-3280.102 (SP)	power plant	144.0	S
E-HOUSE FOR 4000-BLD-4560.101 (SP)	power plant	216.0	S
UTILIDORS (SP)	other	2833	S
RAIL CAR UNLOADING STATION BUILDING (SP)	other	1650.0	S
TRANSFER TOWER 5210-TT-001 (SP)	other	240.0	P
CONVEYOR TUNNEL EXIT BUILDING (SP)	other	240.0	
TRANSFER TOWER 5350-TT-001 (SP)	conveyors & transfer towers	360.0	S
DRIVE HOUSE (SP)	conveyors & transfer towers	0.0	S
DRIVE HOUSE (SP)	conveyors & transfer towers	0.0	S
PORT SURGE BIN BUILDING (SP)	conveyors & transfer towers	486.0	S
TRANSFER TOWER 5370-TT-001 (SP)	conveyors & transfer towers	627.0	S
DRIVE HOUSE (SP)	conveyors & transfer towers	0.0	

Table B-8: Vehicles at Steensby Port

Vehicles			
Haul Trucks			
CAT D300 (Haul Truck 30 ton)	2	**Material Handling & Lifts**	
		12000lb Tele-Handler Zoom Boom	3
Loaders		85ft Man Lift	1
CAT 966 Loader	1		
CAT 988 Loader	2	**Pick-Ups, Trucks & Trailers**	
CAT IT62 Loader	2	Pick-ups	14
Skid Steer Loader	3	20 ton Picker Truck	3
Backhoe	1	Pintle Trailer for the above	2
		Roll-off Trucks	3
Dozers		4000 Gal Fuel Truck	1
CAT D6 Dozer	1	Sewage collection truck	2
		4000 Gal Water Truck	1
Graders		Potable Water Truck	1
CAT 16H Grader	1	Lavatory Service Truck	1
		Busses	2
Crushers		Tractor Trailer & Low Boy	2
Nordberg NW7150 Crusher	1	Winch Tractor	1
Nordberg NWSeries Jaw Crusher to suit above	1	Winch Tractor	3
Nordberg NW Series Screen Plant (3 decks)	1	Winch Tractor	1
Nordberg CM Series Mobile Conveyor	4	Crew Bus	2
Pit / Blast Hole Drill		**Safety Equipment**	
Polaris Ranger 80C Utility Vehicle	1	Rescue boat	1
		Fire Truck	1
Packers		Ambulance	1
10 ton Drive On Packer	1	Tracked Recovery Vehicle	1
		Emergency Response Vehicle	1
Cranes			
Grove 40 ton Rough Terrain	1	**Miscellaneous**	
Grove RT9130E, Rough Terrain	1	320000BTU Frost Fighter	10
Grove RT89E, Rough Terrain	1	8kW Ingersol Rand Light Towers	18
		Tyre handler	2
Container Handling		20kW Whisper Watt Gen Set	5
100000lb Sea Can Handler	2	Fork Lift	1
100000lb Hyster Fork Lift	2	Fork Lift	3
		Pallet Truck	10
		Rock Breaker	1
Total			127

Table B-9: Aircraft equipment at Steensby Port

Maintenance and Cargo Building Electric Baggage Tow Tractor	1
Maintenance and Cargo Building Bobcat	1
Maintenance and Cargo Building Potable Water Truck	1
Maintenance and Cargo Building Aircraft Passenger Stairs	1
Maintenance and Cargo Building Aircraft Tow Tug	1
Maintenance and Cargo Building Aircraft Tow Bars - Set	1
Maintenance and Cargo Building E-Sprayer	1
Maintenance and Cargo Building Lavatory Service Truck	1
Maintenance and Cargo Building Baggage Belt Loader Vehicle	1
Maintenance and Cargo Building Wheeled Fire Extinguisher (125 lbs)	1
Maintenance and Cargo Building Combi Back-Hoe with Front Blade Attachment	1
Maintenance and Cargo Building Service Pick Up Truck	2
Maintenance and Cargo Building Fork Lift	1
Maintenance and Cargo Building Maintenance Service Ladder and Platform	1
Maintenance and Cargo Building Mobile Air Compressor	1
Deicing Equipment and Fire Rescue Building De-Icing Truck	2
Deicing Equipment and Fire Rescue Building Fire Rescue Truck	1
Total	19

B.3.7 Objective: Specialized items

At Steensby Port, the stacker, ship loaders and car dumpers will all be dismantled before being disposed. This specific equipment will require particular care during reclamation. The price of reclamation is estimated to be 25% of the estimated installation cost. This is assumed based on the concept that the specialized items will simply be broken down into transportable pieces and disposed. Estimated cost of installation is as follows:

- Stacker: $9,669,727.
- Ship loaders: $3,888,010.
- Car dumper: $720,175.

The price of reclaiming the conveyors at Steensby port is included in the Mary River Mine site section.

B.4 Chemicals

B.4.1 Objective: Hazardous materials audit

A Phase I Environmental Site Assessment will first be carried out. A daily cost of $1,200 has been assumed. The assessment is estimated to require a month at Mary River and the railway, 12 days at Steensby Port as well as 20 days for Milne Port and Tote Road

(combined). The need for a Phase II ESA will be assessed during Phase I. A global cost estimate of $100,000 has been added shall a Phase II be required.

B.4.2 Objective: Hazardous Materials to be Consolidated for Removal

The cost of reclamation of hazardous materials is captured in the annual operating budget as hazardous materials are shipped offsite annually. The cost of personnel needed for this activity is included in the mobilization costs.

In addition, an estimated 20% of the total fuel storage will be left in the containers at closure. These containers will be drained and shipped back. The total storage of fuel (249,080,000 L) has been estimated from drawing H337697-0000-60-013-0001.

B.4.3 Objective: Contaminated Soil Removal

A technical as well as a drilling and sampling investigation for contaminated soils will be carried out. The cost is based on the site overview cost from the 2011 Exploration Phase A&R Plan.

B.4.4 Objective: Contaminated Soil Removal

The removal takes into account the soils and the water/ice/snow contaminated with hydrocarbons, with an assumed total volume of 33,600 m3.

B.4.5 Objective: Other

Similarly to the fuel, an estimated 20% of the explosives will need to be reclaimed at closure. The total storage on site is assumed to be 15,013,250 kg.

B.5 Water

Objective: Remove Pipelines

All pipes will be removed. The total length of pipes is 44,402.3 m according to MRP estimating scope review R9.

Sewage and sludge will be incinerated whenever possible. If incineration is not available it will be sent to the waste storage pond for decantation. Solids will be left to dry and sent to the landfills.

B.6 Mobilization

B.6.1 Objective: Mobilize Heavy Equipment

At the end of reclamation, all heavy equipments at Mary River mine will be transported to Milne Port for shipment. It is thus estimated that each piece of equipment will travel once the length of Tote Road.

B.6.2 Objective: Mobilize Camps

Existing camps will be used and dismantled at the end of reclamation. The price associated with camp operations is taken into account in the objective: Worker Accommodation.

B.6.3 *Objective: Mobilize Workers*

Labour cost is included in the unit cost for each action required. For reference, the labour rates for the Mary River Project are listed in table Table B-10

Table B-10: Labour Rates for Mary River Project

Description	Total	Trade Rate
Labour Rate Rate Site Development	100%	$ 112.39
Labour Rate Rate Concrete	100%	$ 99.64
Labour Rate Rate Earthworks	100%	$ 106.00
Labour Rate Rate Architectural	100%	$ 104.45
Labour Rate for Port and Marine Works	100%	$ 104.80
Labour Rate Rate Instrumentation	100%	$ 107.93
Labour Rate Rate Electrical	100%	$ 109.16
Labour Rate Rate Linemen	100%	$ 107.34
Labour Rate Rate Mechanical	100%	$ 114.03
Labour Rate Rate Mechanical Platework	100%	$ 109.72
Labour Rate Rate Piping	100%	$ 109.07
Labour Rate Rate Structures	100%	$ 112.13
Labour Rate Rate Wire & Cable	100%	$ 108.74
Labour Rate Virtual Subcontrac	0%	$ -
Construction Distributables	100%	$ 106.70

In addition, 210 flights will be required. The number of flights required each year is aligned with the number of workers on site (see Objective: Worker Accommodation below). 82 flights are indeed estimated for the first two years, and 46 flights the third year. The price of flight is based on the 2011 rate of a round trip from Ottawa to Iqaluit, going to Mary River, then Iqaluit and back to Ottawa. En-route fees, terminal fees and handling fees are accounted for. Each flight can carry 112 passengers and the total cost is $88,875.52 (supplier estimate: Canadian North Airlines).

B.6.4 *Objective: Mobilize Misc. Supplies*

Fuel will be required during the three years of mine closure. The estimate is based on the amount of fuel required for construction: 273,846,688 L for equipment and 167,788,800 L for power generation at an estimated landed cost of $0.95 per litre. These are total costs for the construction phase which is planned to last four years. The amount of fuel required for the equipment has been factored by the number of men and years during reclamation, compared to construction. For construction, 9252 workers will be required over four years, while 2000 workers will be required for reclamation over three years. A ratio of 0.08 has indeed been applied for the fuel related to the equipment. Similarly, it is estimated that only two engines

will run over three years of reclamation, as opposed to five over four years during construction. The ratio is 0.2. Total fuel quantity for closure amounts to 47,076,055 L.

A total price for sealifts has been estimated based on the PDW Mine Closure Cost estimate (McKeil Budget Pricing, 2011). The PDW costs are:

- Mobilization and deck demobilization deck barge 1, 2 and dock barge W/SPU: $2,930,000/year.
- Barge costs for two (2) years, including insurance: $2,910,000.
- Tug costs on site for two (2) years: $5,115,000.
- Stevedoring costs on site for two (2) years: $2,160,000.

Additionally, the freight off-load manpower costs $47,845,200 per year (Table B-11).

There will be two sealifts during the reclamation period: one sealift will take place during the first two years, and the second sealift will take place at the end of open water season of the third year. Manpower will be required each of the three years to prepare material for shipment and this cost is captured in this estimate. The total cost associated with sealift is: $121,377,400.

Table B-11: Freight off-load manpower cost per season

Freight Off- Load Manpower	Location							
Title	Mary River	Milne	Steensby	Total # Persons	Hrs/day	# Days	avg $ cost/hr	Cost/Season
Logistics Manager	1			1	10	84	300	252,000
Safety Cordinator	2	2	2	6	60	84	110	554,000
Logistics Cordinator	2	2	2	6	60	84	110	554,000
Freight Handler	2	2	2	6	60	84	110	554,000
Loaders	3	3	3	9	180	84	150	2268000
Loader Operators	6	6	6	18	180	84	100	2268000
Sea-Can Manipulator	1	1	1	3	60	84	200	1008000
Sea-Can Manipulator Operator	2	2	2	6	60	84	100	504000
HEAVY Lift Fork Lift	1	1	1	3	60	84	200	1008000
Heavy Lift Fork Lift Operator	2	2	2	6	60	84	100	504000
Cranes	2	4	4	10	200	84	300	5040000
Crane Operator	4	8	8	20	200	84	200	3360000
Riggers	8	16	16	40	400	84	110	3696000
Tractor Trailers	6	4	4	14	280	84	150	2352000
Truck Drivers	12	8	8	28	280	84	100	2352000
Labourers (Lashing Guys)	12	8	8	28	280	84	100	2352000
Lightering Lead(Tug and Barge Crew Lead)		2	2	4	40	84	200	672000
	66	71	71	208				**29,298,000**
Tug	0	3	3	6	120	84	300	3024000
Barge	0	6	6	12	240	84	150	3024000
Tug Captain	0	6	6	12	240	84	300	6048000
Load Master		3	3	6	120	84	200	2016000
Barge labour		24	24	48	480	84	110	4,435,200
							Total	**$47,845,200**

Table B 12: Budgetary Rates for Marine Equipment

BUDGETARY RATES FOR MARINE EQUIPMENT OPTION 2:

MOBILIZATION & DEMOBILIZATION COSTS:

YEAR 1	
MOBILIZATION & DEMOBILIZATION DECK BARGE 1	$990,000.00
MOBILIZATION & DEMOBILIZATION DECK BARGE 2	$990,000.00
MOBILIZATION & DEMOBILIZATION DOCK BARGE W/SPU	$950,000.00
TOTAL COSTS	$2,930,000.00

YEAR 2	
MOBILIZATION & DEMOBILIZATION DECK BARGE 1	$990,000.00
MOBILIZATION & DEMOBILIZATION DECK BARGE 2	$990,000.00
MOBILIZATION & DEMOBILIZATION DOCK BARGE W/SPU	$950,000.00
TOTAL COSTS	$2,930,000.00

Note: The mobilization and demobilizations costs are based on today's fuel cost of CD$ 0.93 cents per litre any increase will trigger a fuel surcharge.

TUG COSTS ON SITE:

YEAR 1 & 2 based on 75 days of operations per year		
1 fully crewed & operational tug	$465,000.00 x 5 months	$2,325,000.00
Fuel usage per day (average) 8,000 litres $ 1.30 per litre using Arctic rates	$312,000.00 x 5 months	$1,248,000.00
1 stand-by & back-up tug	$180,000.00 x 5 months	$900,000.00
Fuel usage per day on stand-by (average) 600 litres $ 1.30 per litre using Arctic rates	$23,400.00 x 5 months	$117,000.00
TUG COSTS		$4,590,000.00

NOTE:
IN ORDER TO AVOID CHARGING HATCH & ARCELOR MITTAL FOR A LIGHT TUG DEMOBILIZATION FEE
WE WOULD SUGGEST THAT WE KEEK THE 3RD TUG ON SITE. WE WOULD BE WILLING TO LEAVE THE
TUG ON SITE FOR A MONTHLY FEE OF $ 105,000.00, BASED ON A 5-MONTH OPERATION OVER TWO-YEARS
THE COST TO KEEP THE BARGE ON SITE WOULD BE:

1 stand-by tug	$105,000.00 x 5 months	$525,000.00
TOTAL TUG COSTS		$5,115,000.00

BARGE COSTS BASED ON 2.5-MONTHS PER SEASON (BRINGING BARGES BACK):

YEAR 1 & 2		
2 deck barges 400' x 76' (30,000 sq ft deck space)	$350,000.00 x 5 months	$1,750,000.00
Insurance costs for 2 deck barges	$16,000.00 x 5 months	$80,000.00
1 Dock Barge w/ spuds & ramp	$120,000.00 x 5 months	$600,000.00
Insurance on Dock Barge	$6,000.00 x 5 months	$30,000.00
Dock Barge Operator $ 1,500.00 per day based on 12 hrs / $ 3,000.00 per day based on 24 hrs we are basing our rates on 24 hrs per day 75-days	$90,000.00 x 5 months	$450,000.00
TOTAL BARGE CHARTER & INSURANCE COSTS		$2,910,000.00

NOTE: Other cargo barges can be added to the 2 cargo barges we are offering, this may be necessary depending on the schedule of the ships arriving on site. If too many ships will be in port at the same time, 2 cargo barges may not be enough to handle all the volume.

STEVEDORING COSTS ON SITE:

YEAR 1 & 2 based on 75 days of operations per year		
12-men gang available to work 24 hrs per day 2 - crews of 6-men each	$432,000.00 x 5 months	$2,160,000.00
TOTAL STEVEDORING COSTS		$2,160,000.00

Notes:

1) Hatch to supply all the fuel & lubes for the tugs when operating in Milne Inlet as well as, the food required to feed the c
2) Hatch to provide the flights required for our crew rotation
3) Hatch to provide early access to the mine site in Milne Inlet so our marine superintendent can survey the proposed lanc
4) Hatch to provide the required room & board for the stevedoring
5) Hatch to provide the required unloading equipment, i.e. forklifts, container handler, cranes, slings, etc...

B.6.5 Objective: Worker Accommodation

The price associated with the camp operation is based on the estimate of $60/person/day (John Brooks Logistics). The total price is calculated with 180 working days per year, a crew an 800 for the first two years and 400 the third year.

B.6.6 Objective: Interim Care and Maintenance

The 2011 A&R plan provided an additional estimated cost of $20,000 for the general site cleanup. Labour costs associated with maintenance are taken into account in the objective: Mobilize Workers.

B.7 POST CLOSURE

B.7.1 Objective: Monitoring and Inspections

Costs of monitoring and inspections were extracted from the 2011 Exploration Phase A&R Plan. It is estimated that three survey inspections will take place: one general site inspection, one stability survey for the open pit and one stability survey for the rock pile. Reporting costs are added as well as transportation to and from site.

B.7.2 Objective: Cover Maintenance

According to the PDW closure plan, maintenance costs are estimated at $100,000 per year.

B.7.3 Objective: Spillway Maintenance

An annual cost of $5,702 has been applied for clearing the spillway during post closure, although the spillway is only expected to be used after a minimum of 85 years.

B.7.4 Objective: Post-closure Water Treatment

Post-closure water treatment accounts for $106,276 as per the on-going water spreadsheet (see Section B.8).

At the end of post-closure, a sealift will be needed to ship back the remaining equipments. The price is calculated similarly to the one estimated for mobilization.

B.8 ON-GOING WATER

Water costs during post closure will only be related to the survey visits. Prices were extracted from the 2011 Exploration Phase A&R Plan:

- Sampling equipment: $4,200.
- Equipment maintenance and parts: $5,000.
- Water analysis: $6,400.
- Annual labour cost: $1,800 (three men per day, one day per year at hourly rate $75, 00).
- Annual site access cost: $88,875.52 (2011 Charter quote for a round trip Ottawa – Iqaluit – Mary River).

Necessary equipment will be left on site: at least one Weatherhaven building and an ATV at Mary River and Steensby Port.

B.9 INDIRECT COSTS

This section aims at clarifying how indirect costs are taken into account. Indirect costs include all the costs that are not directly linked to the decommissioning, demolition, dismantling, clean-up, etc. They consist of labour wages, management costs, workers accommodation and food.

B.9.1 Labour Wages

Unit costs in MINING RECLAIM take into account the price associated with labour. However, due to the location of the Project, labour conditions are different from regular Projects and therefore indirect cost associated with labour are also included.

B.9.2 Management Costs

Similarly to labour wages, management costs are already included in MINING RECLAIM. The “summary” spreadsheet allocates the management cost as well as the engineer costs as a percentage of the total reclamation costs, mobilization excluded. Both management and engineering costs are assumed to be 5%. This percentage may be adapted if necessary.

B.9.3 Workers Accommodation and Food

Workers accommodation and food is included in the “mobilization” spreadsheet under the Objective: Workers accommodation.

Table B-13: Mine Closure and Reclamation Cost Summary

CAPITAL COSTS	**0**	$0.00	$0.00	$0.00
COMPONENT TYPE	**COMPONENT NAME**	**TOTAL COST**	**LAND LIABILITY**	**WATER LIABILITY**
OPEN PIT	Mary River Mine Pit	$1,455,765	$1,449,650	$6,116
UNDERGROUND MINE	-	$0	$0	$0
TAILINGS	-	$0	$0	$0
ROCK PILE	Mary River Stockpile	$192,957	$16,667	$176,290
BUILDINGS AND EQUIPMENT	Milne Site	$7,311,986	$7,311,986	$0
	Tote Road	$1,092,211	$0	$1,092,211
	Mary River Mine	$23,488,970	$23,244,356	$244,614
	Railway	$14,345,812	$12,756,932	$1,588,880
	Steensby Port	$10,506,669	$10,289,403	$217,266
CHEMICALS AND SOIL MANAGEMENT	0	$144,940,175	$145,126,575	$0
WATER MANAGEMENT	0	$239,772	$0	$239,772
POST-CLOSUREMONITORING AND MAINTENANCE	0	$52,295,597	$51,782,771	$512,826
	0	$0	$0	$0
	SUBTOTAL	**$255,869,914**	**$251,978,339**	**$4,077,975**
	0	**PERCENTAGES**	**98%**	**2%**
MOBILIZATION/DEMOBILIZATION	0	$206,549,913	203,408,455	3,291,928
	0	$0	$0	0.00
PROJECT MANAGEMENT	5%	$12,793,496	$12,598,917	$203,899
Bonding	1%	$2,558,699	$2,519,783	$40,780
Taxes (GST on supplies) - est.	allowance	$0	$0	$0
Insurance	1%	$2,558,699	$2,519,783	$40,780
ENGINEERING	5%	$12,793,496	$12,598,917	$203,899
	0	$0	$0	$0
CONTINGENCY	10%	$25,586,991	$25,197,834	$407,798
	0	$0	$0	$0
Market Price Factor Adjustment	0%	$0	$0	$0
GRAND TOTAL - CAPITAL COSTS	**0**	**$518,711,208**	**$510,822,029**	**$8,267,058**
Inuit Owned Land Cost		$411,234,800	$405,430,454	$6,106,421
Federal Owned Land Cost		$107,476,408	$105,391,574	$2,160,637
Total		$518,711,208	$510,822,029	$8,267,058

Table B-14: Mine Closure and Reclamation Cost – Open pit

Open Pit Name: ***Mary River Mine Pit*** **Pit #** ***1***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: CONTROL ACCESS								
Fence	m		#N/A	0.00	$0	100%	$0	$0
Signs	each	9	SH	35.64	$321	100%	$321	$0
Berm at crest	m	4300	RBS	29.53	$126,969	100%	$126,969	$0
Block roads	m3		#N/A	0.00	$0		$0	$0
Other			#N/A		$0		$0	$0
OBJECTIVE: STABILIZE SLOPES								
Off-load crest, soil A	m3		#N/A	0	$0		$0	$0
Off-load crest, soil B	m3		#N/A	0	$0		$0	$0
Doze/trimoverburden at crest	m3		#N/A	0	$0		$0	$0
Drill & blast pit crest	m3		#N/A	0	$0		$0	$0
buttress slope	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: COVER/CONTOUR SLOPES								
Dump demolition materials (pit or landfill or qı	m3	3724.3566	SC1H	8.262	$30,771	100%	$30,771	$0
Place overburden over demolition material	m3	124145.22	RB1L	10.098	$1,253,618	100%	$1,253,618	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Vegetate slopes	ha		#N/A	0	$0		$0	$0
Vegetate pit floor	ha		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: SPILLWAY								
Excavate channel, soil A	m3	375	RC2H	16.308	$6,116		$0	$6,116
Excavate channel, soil B	m3		#N/A	0	$0		$0	$0
Concrete	m3		#N/A	0	$0		$0	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Other	each		#N/A	0	$0		$0	$0
OBJECTIVE: FLOOD PIT								
remove stationary equipment (sump pump)	each		#N/A	0	$0		$0	$0
remove power lines	each		#N/A	0	$0		$0	$0
Embankment/dam - Soil A	m3		#N/A	0	$0		$0	$0
Embankment/dam - Soil B	m3		#N/A	0	$0		$0	$0
supply/install pump & piping system	each		#N/A	0	$0		$0	$0
operate pumps to flood pit	each		#N/A	0	$0		$0	$0
LIme addition, _____ kg/m3 of water	tonne		#N/A	0	$0		$0	$0
Lime, purchase and shipping	tonne		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
RECLAIM QUARRIES								
Contour slopes	m3	3238.09524	DSH	3.3588	$10,876	100%	$10,876	$0
Berm at crest	m3		#N/A	0	$0		$0	$0
Place overburder	m3	809.52381	SBCL	3	$2,429	100%	$2,429	$0
Vegetate	m3		#N/A	0	$0		$0	$0
OTHER ITEMS								
Stability inspection		1	sis	16667	$16,667	100%	$16,667	$0
Reclaim road to primary crusher (scarification)		8	scs	1000	$8,000	100%	$8,000	$0

	Subtotal	$1,455,765	100%	$1,449,650	$6,116
			Pct Land	Total Land	Total Water

Table B-15: Mine Closure and Reclamation Cost – Rock Pile

Rock Pile Name: *Mary River Stockpile* **Rock Pile #: *1***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: STABILIZE SLOPES								
Flatten slopes with dozer	m3		#N/A	0	$0		$0	$0
Flatten "bubble dump" areas	m3		#N/A		$0		$0	$0
Divert runon, ditch mat'l A	m3		#N/A	0	$0		$0	$0
, ditch mat'l B	m3		#N/A	0	$0		$0	$0
Toe buttress, drain mat'l	m3		#N/A	0	$0		$0	$0
, fill mat'l A	m3		#N/A	0	$0		$0	$0
, fill mat'l B	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: COVER DUMP								
Mat'l A	m3		#N/A		$0		$0	$0
Mat'l B	m3		#N/A	0	$0		$0	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Other (scarify)	m2	176.29	SCS	1000	$176,290		$0	$176,290
VERY LOW PERMEABILITY COVER								
supply geomembrame, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
upper and lower bedding layers	m3		#N/A	0	$0		$0	$0
install geomembrane, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
erosion protection layer	m3		#N/A	0	$0		$0	$0
vegetate	ha		#N/A	0	$0		$0	$0
install infiltration/seepage instrumentation	allow		#N/A	0	$0		$0	$0
OBJECTIVE: RELOCATE DUMPS								
Load, haul, dump or doze	m3		#N/A	0	$0		$0	$0
Add lime	tonne		#N/A	0	$0		$0	$0
Contour reclaimed area	ha		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
SPECIALIZED ITEMS								
Stability inspection		1	sis	16667	$16,667	100%	$16,667	$0
install permanent instrumentation, drilling			#N/A		$0		$0	$0
Subtotal					$192,957	9%	$16,667	$176,290

% Land	Total Land	Total Water

Table B-16: Mine Closure and Reclamation Cost – Milne Port

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

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other (sealift for equipmt)	each		#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0		$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0		$0	$0
Decontaminate thickeners	each		#N/A	0	$0		$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0		$0	$0
Decontaminate maintenance shop	each		#N/A	0	$0		$0	$0
Decontaminate power plant	each		#N/A	0	$0		$0	$0
Decontaminate bulk fuel storage	each	31702.5	BRCDS	200	$6,340,500	100%	$6,340,500	$0
Decontaminate ANFO plant	each		#N/A	0	$0		$0	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0		$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0		$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	1250	BRS	100	$125,000	100%	$125,000	$0
consolidate & dump boneyard debris	m3		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2	3170.25	BRCS	26.73	$84,741	100%	$84,741	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	1250	BRCS	26.73	$33,413	100%	$33,413	$0
Other	m2		#N/A	0	$0		$0	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2	74100	SB4H	9.666	$716,251	100%	$716,251	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	1250	SB4H	9.666	$12,083	100%	$12,083	$0
other	m2		#N/A	0	$0		$0	$0
OBJECTIVE: RECLAIM ROADS								
Remove culverts	each		#N/A	0	$0		$0	$0
Remove bridges	each		#N/A	0	$0		$0	$0
Scarify and install water breaks	ha		#N/A	0	$0		$0	$0
remove/doze down berms	m3		#N/A	0	$0		$0	$0
create wildlife passage ramps	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
SPECIALIZED ITEMS								
Dispose of misc. debris and laydown area refuse	each		#N/A	0	$0		$0	$0
				Subtotal	$7,311,986	100%	$7,311,986	$0
						Pct Land	Total Land	Total Water

Table B-17: Mine Closure and Reclamation Cost – Tote Road

Building / Equip Name: *Tote Road* **Bldg / Equip #:** 2

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other	each		#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0	100%	$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0	100%	$0	$0
Decontaminate thickeners	each		#N/A	0	$0	100%	$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0	100%	$0	$0
Decontaminate maintenance shop	each		#N/A	0	$0	100%	$0	$0
Decontaminate power plant	each		#N/A	0	$0	100%	$0	$0
Decontaminate bulk fuel storage	each		#N/A	0	$0	100%	$0	$0
Decontaminate ANFO plant	each		#N/A	0	$0	100%	$0	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0	100%	$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0	100%	$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0	100%	$0	$0
Other			#N/A	0	$0	100%	$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2		#N/A	0	$0	100%	$0	$0
conveyors & transfer towers	m2		#N/A	0	$0	100%	$0	$0
tanks & plumbing	m2		#N/A	0	$0	100%	$0	$0
thickeners	m2		#N/A	0	$0	100%	$0	$0
water treatment plant	m2		#N/A	0	$0	100%	$0	$0
maintenance shop	m2		#N/A	0	$0	100%	$0	$0
power plant	m2		#N/A	0	$0	100%	$0	$0
bulk fuel storage	m2		#N/A	0	$0	100%	$0	$0
ANFO plant	m2		#N/A	0	$0	100%	$0	$0
offices/warehouse/accom	m2		#N/A	0	$0	100%	$0	$0
consolidate & dump boneyard debris	m3		#N/A	0	$0	100%	$0	$0
other	m2		#N/A	0	$0	100%	$0	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2		#N/A	0	$0	100%	$0	$0
conveyors & transfer towers	m2		#N/A	0	$0	100%	$0	$0
tanks & plumbing	m2		#N/A	0	$0	100%	$0	$0
thickeners	m2		#N/A	0	$0	100%	$0	$0
water treatment plant	m2		#N/A	0	$0	100%	$0	$0
maintenance shop	m2		#N/A	0	$0	100%	$0	$0
power plant	m2		#N/A	0	$0	100%	$0	$0
bulk fuel storage	m2		#N/A	0	$0	100%	$0	$0
ANFO plant	m2		#N/A	0	$0	100%	$0	$0
offices/warehouse/accom	m2		#N/A	0	$0	100%	$0	$0
Other	m2		#N/A	0	$0	100%	$0	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
other	m2		#N/A	0	$0		$0	$0
OBJECTIVE: RECLAIM ROADS								
Remove box culverts & stabilize slopes	each	1	RBCS	285794	$285,794		$0	$285,794
Remove round culverts & stabilize slopes	each	1	RRCS	754618	$754,618		$0	$754,618
Install water breaks	ha	1	IWBS	18211	$18,211		$0	$18,211
remove/doze down berms	m3	10000	DSH	3.3588	$33,588		$0	$33,588
create wildilfe passage ramps	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
SPECIALIZED ITEMS								
Dispose of misc. debris and laydown area refuse	m3		#N/A	0	$0		$0	$0
				Subtotal	$1,092,211		$0	$1,092,211
						Pct Land	Total Land	Total Water

Table B-18: Mine Closure and Reclamation Cost – Mary River Mine

Building / Equip Name: *Mary River Mine* **Bldg / Equip #: *3***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0	100%	$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other (remove airstrip lightning)	each	1	RALS	10099	$10,099	100%	$10,099	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0	100%	$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0		$0	$0
Decontaminate thickeners	each		#N/A	0	$0		$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0		$0	$0
Decontaminate maintenance shop	each	1900	BRCdS	200	$380,000	100%	$380,000	$0
Decontaminate power plant	each	6804	BRCdS	200	$1,360,800	100%	$1,360,800	$0
Decontaminate bulk fuel storage	each	9847.5	BRCdS	200	$1,969,500	100%	$1,969,500	$0
Decontaminate ANFO plant	each	930.25	BRCdS	200	$186,050	100%	$186,050	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0		$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0		$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2	1350	BRS	100	$135,000	100%	$135,000	$0
conveyors & transfer towers	m2	869	BRS	100	$86,900	100%	$86,900	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1930.2	BRS	100	$193,020		$0	$193,020
maintenance shop	m2		#N/A	0	$0	100%	$0	$0
power plant	m2		#N/A	0	$0	100%	$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0	100%	$0	$0
offices/warehouse/accom	m2	18061.76	BRS	100	$1,806,176	100%	$1,806,176	$0
consolidate & dump boneyard debris	m3	1200	BRS	100	$120,000	100%	$120,000	$0
other	m2	4439.94	BRS	100	$443,994	100%	$443,994	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2	1350.0	BRCH	53.46	$72,171	100%	$72,171	$0
conveyors & transfer towers	m2	869	BRCS	26.73	$23,228	100%	$23,228	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1930.2	BRCS	26.73	$51,594		$0	$51,594
maintenance shop	m2	1900	BRCS	26.73	$50,787	100%	$50,787	$0
power plant	m2	6804	BRCS	26.73	$181,871	100%	$181,871	$0
bulk fuel storage	m2	13130	BRCS	26.73	$350,965	100%	$350,965	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	14979.0	BRCS	26.73	$400,388	100%	$400,388	$0
Other	m2	4439.9	BRCS	26.73	$118,680	100%	$118,680	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3	114450	SBTH	3.27	$374,252	100%	$374,252	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2	1350.0	SB4H	9.666	$13,049	100%	$13,049	$0
conveyors & transfer towers	m2	869	SB4H	9.666	$8,400	100%	$8,400	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1930.2	SB4H	9.666	$18,657	100%	$18,657	$0
maintenance shop	m2	1900	SB4H	9.666	$18,365	100%	$18,365	$0
power plant	m2	6804	SB4H	9.666	$65,767	100%	$65,767	$0
bulk fuel storage	m2	13130	SB4H	9.666	$126,915	100%	$126,915	$0
ANFO plant	m2	930.25	SB4H	9.666	$8,992	100%	$8,992	$0
offices/warehouse/accom	m2	14979.0	SB4H	9.666	$144,787	100%	$144,787	$0
other	m2	4439.9	SB4H	9.666	$42,916	100%	$42,916	$0
OBJECTIVE: RECLAIM ROADS								
Remove culverts	each		#N/A	0	$0		$0	$0
Remove bridges	each		#N/A	0	$0		$0	$0
Scarify and install water breaks	ha		#N/A	0	$0		$0	$0
Grade and contour road and ditch	m2	200000	DSH	3.3588	$671,760	100%	$671,760	$0
create wildlife passage ramps	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
other	m3	600	DSH	3.3588	$2,015	100%	$2,015	$0
SPECIALIZED ITEMS								
Conveyors		1	cons	12036506	$12,036,506	100%	$12,036,506	
Stacker reclaimers	each	0.5	sts	2417431.8	$1,208,716	100%	$1,208,716	$0
Rail load out		1	tlos	806650	$806,650	100%	$806,650	
				Subtotal	$23,488,970		$23,244,356	$244,614
						Pct Land	Total Land	Total Water

Table B-19: Mine Closure and Reclamation Cost – Railway

Building / Equip Name: *Railway* **Bldg / Equip #: *4***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other	each		#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0		$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0		$0	$0
Decontaminate thickeners	each		#N/A	0	$0		$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0		$0	$0
Decontaminate maintenance shop	each		#N/A	0	$0		$0	$0
Decontaminate power plant	each		#N/A	0	$0		$0	$0
Decontaminate bulk fuel storage	each		#N/A	0	$0		$0	$0
Decontaminate ANFO plant	each		#N/A	0	$0		$0	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0		$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0		$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
consolidate & dump boneyard debris	m3		#N/A	0	$0		$0	$0
other	m2	351	BRS	100	$35,100	100%	$35,100	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
Other	m2		#N/A	0	$0		$0	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2		#N/A	0	$0		$0	$0
conveyors & transfer towers	m2		#N/A	0	$0		$0	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2		#N/A	0	$0		$0	$0
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2		#N/A	0	$0		$0	$0
other	m2	351	SB4H	9.666	$3,393	100%	$3,393	$0
OBJECTIVE: RECLAIM RAILWAY								
Remove culverts	each	200	PPLH	194.4	$38,880		$0	$38,880
Remove bridges	each	31	RBRIS	50000	$1,550,000		$0	$1,550,000
Remove tracks and ties	eallow	1	TTRS	1.3E+07	$12,686,168	100%	$12,686,168	$0
recontour/doze access road	m3		#N/A	0	$0		$0	$0
create wildilfe passage ramps	m3		#N/A	0	$0		$0	$0
other (plug tunnels)		37.12	CSH	642.6	$23,853	100%	$23,853	$0
other (plug tunnels)		556.8	RB1H	15.12	$8,419	100%	$8,419	$0
SPECIALIZED ITEMS								
Dispose of misc. debris and laydown area refuse	m3		#N/A	0	$0		$0	$0
				Subtotal	$14,345,812		$12,756,932	$1,588,880
						Pct Land	Total Land	Total Water

Table B-20: Mine Closure and Reclamation Cost – Steensby Port

Building / Equip Name: *Steensby Port* **Bldg / Equip #: *5***

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: DISPOSE MOBILE EQUIPMENT								
Decontaminate and ship off-site	each		#N/A	0	$0		$0	$0
Decontaminate, dispose on-site	each		#N/A	0	$0		$0	$0
Other (remove airstrip lightning)	each	1	RALS	10099	$10,099	100%	$10,099	$0
OBJECTIVE: REMOVE CONTAMINATED BUILDINGS								
Decontaminate crushing plant	each		#N/A	0	$0		$0	$0
Decontaminate tanks & plumbing	each		#N/A	0	$0		$0	$0
Decontaminate thickeners	each		#N/A	0	$0		$0	$0
Decontaminate water treatment plant	each		#N/A	0	$0		$0	$0
Decontaminate maintenance shop	each	11641.3	BRCdS	200	$2,328,260	100%	$2,328,260	$0
Decontaminate power plant	each	7704	BRCdS	200	$1,540,800	100%	$1,540,800	$0
Decontaminate bulk fuel storage	each	600	BRCdS	200	$120,000	100%	$120,000	$0
Decontaminate ANFO plant	each		#N/A	0	$0		$0	$0
Deontaminate offices/warehouse/accom	each		#N/A	0	$0		$0	$0
Removal of asbestos siding on buildings	each		#N/A	0	$0		$0	$0
Removal of friable asbestos on equipment	each		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE NON-CONTAMINATED BUILDINGS								
crushing plant	m2	1728	BRS	100	$172,800	100%	$172,800	$0
conveyors & transfer towers	m2	1473	BRS	100	$147,300	100%	$147,300	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1641	BRS	100	$164,100		$0	$164,100
maintenance shop	m2		#N/A	0	$0		$0	$0
power plant	m2		#N/A	0	$0		$0	$0
bulk fuel storage	m2		#N/A	0	$0		$0	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	6603.65	BRS	100	$660,365	100%	$660,365	$0
consolidate & dump boneyard debris	m3	1200	BRS	100	$120,000	100%	$120,000	$0
other	m2	12193.12	BRS	100	$1,219,312	100%	$1,219,312	$0
OBJECTIVE: BREAK BASEMENT SLABS								
crushing plant	m2	1728	BRCH	53.46	$92,379	100%	$92,379	$0
conveyors & transfer towers	m2	1473	BRCS	26.73	$39,373	100%	$39,373	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1389	BRCS	26.73	$37,128		$0	$37,128
maintenance shop	m2	9091.3	BRCS	26.73	$243,010	100%	$243,010	$0
power plant	m2	7704	BRCS	26.73	$205,928	100%	$205,928	$0
bulk fuel storage	m2	600	BRCS	26.73	$16,038		$0	$16,038
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	12447.8	BRCS	26.73	$332,730	100%	$332,730	$0
Other	m2	8453.1	BRCS	26.73	$225,951	100%	$225,951	$0
OBJECTIVE: LANDFILL FOR DEMOLITION WASTE								
Place soil cover	m3	15000	SBTH	3.27	$49,050	100%	$49,050	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Landfill disposal fee	tonne		#N/A	0	$0		$0	$0
OBJECTIVE: GRADE AND CONTOUR MILL & PLANT SITE								
crushing plant	m2	1728	SB4H	9.666	$16,703	100%	$16,703	$0
conveyors & transfer towers	m2	1473	SB4H	9.666	$14,238	100%	$14,238	$0
tanks & plumbing	m2		#N/A	0	$0		$0	$0
thickeners	m2		#N/A	0	$0		$0	$0
water treatment plant	m2	1641	SB4H	9.666	$15,862	100%	$15,862	$0
maintenance shop	m2	11641.3	SB4H	9.666	$112,525	100%	$112,525	$0
power plant	m2	7704	SB4H	9.666	$74,467	100%	$74,467	$0
bulk fuel storage	m2	600	SB4H	9.666	$5,800	100%	$5,800	$0
ANFO plant	m2		#N/A	0	$0		$0	$0
offices/warehouse/accom	m2	6603.65	SB4H	9.666	$63,831	100%	$63,831	$0
other	m2	12193.12	SB4H	9.666	$117,859	100%	$117,859	$0
OBJECTIVE: RECLAIM ROADS								
Remove culverts	each		#N/A	0	$0		$0	$0
Remove bridges	each		#N/A	0	$0		$0	$0
Scarify and install water breaks	ha		#N/A	0	$0		$0	$0
remove/doze down berms	m3		#N/A	0	$0		$0	$0
create wildilfe passage ramps	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
SPECIALIZED ITEMS								
Car dumper		1	cds	180044	$180,044	100%	$180,044	
Stacker reclaimers	each	0.5	sts	2417432	$1,208,716	100%	$1,208,716	$0
Ship loaders		1	slos	972003	$972,003	100%	$972,003	
				Subtotal	$10,506,669		$10,289,403	$217,266
						Pct Land	Total Land	Total Water

Table B-21: Mine Closure and Reclamation Cost – Chemicals

Chemicals and Soil Contamination:

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
Note: The procedures, equipment and packaging for clean up and removal of chemicals or contaminated soils are highly dependent on the nature of the chemicals and their existing state of containment. Government guidelines should be consulted on an individual chemical basis. Any estimate made here should be considered very rough unless specific evaluations have been conducted.								
HAZARDOUS MATERIALS AUDIT								
Phase 1 audit	each	72	P1AS	1200	$86,400	100%	$86,400	$0
Phase 2 audit	each	1	#N/A	100000	$100,000	100%	$100,000	$0
HAZARDOUS MATERIALS TO BE CONSOLIDATED FOR REMOVAL								
Waste oils	litre	34816000	PCRH	2.214	$77,082,624	100%	$77,082,624	$0
Fuel - Type 1, eg diesel dregs	litre	49816000	FRH	1.1016	$54,877,306	100%	$54,877,306	$0
Fuel - Type 1, eg gasoline dregs	litre	1800000	FRH	1.1016	$1,982,880	100%	$1,982,880	$0
waste batteries	kg	3418000	PCRH	2.214	$7,567,452	100%	$7,567,452	$0
assay & environmental lab reagents	litre		#N/A	0	$0	100%	$0	$0
machine shop, paints, solvents etc	litre		#N/A	0	$0	100%	$0	$0
contaminated soils - hydrocarbon	m3		#N/A	0	$0	100%	$0	$0
metal contam. soil at conc. load-out	m3		#N/A	0	$0	100%	$0	$0
HAZARDOUS MATERIALS								
Transportation to disposal facility	T		#N/A	0	$0		$0	$0
Disposal fees	allow		#N/A		$0		$0	$0
other			#N/A	0	$0		$0	$0
CONTAMINATED SOILS								
Contam. soil investigation - technical	each	1	#N/A	34957	$34,957	100%	$34,957	$0
Contam. soil investigation - drilling & sampling	each	1	#N/A	34957	$34,957	100%	$34,957	$0
CONTAMINATED SOIL REMOVAL	m3				$0		$0	$0
contaminated soils - hydrocarbon	m3	33600	remss	100	$3,360,000	100%	$3,360,000	$0
metal contam. soil at conc. load-out	m3		#N/A	0	$0		$0	$0
Load, haul, dump or doze	m3		#N/A	0	$0		$0	$0
Reagents/stabilizing agent	m2		#N/A	0	$0		$0	$0
Contour reclaimed area	m3		#N/A	0	$0		$0	$0
other	m2		#N/A	0	$0		$0	$0
CONTAMIANTED SOIL VERY LOW PERMEABILITY COVER								
supply geomembrame, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
upper and lower bedding layers	m3		#N/A	0	$0		$0	$0
install geomembrane, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
erosion protection layer	m3		#N/A	0	$0		$0	$0
vegetate	m2		#N/A	0	$0		$0	$0
install infiltration/seepage instrumentation	allow		#N/A	0	$0		$0	$0
other			#N/A	0	$0		$0	$0
OTHER								
Explosives	kg	3002650	#N/A	0	$0		$0	$0
			Subtotal		$144,940,175	100%	$145,126,575	$0
						Pct Land	Total Land	Total Water

Table B-22: Mine Closure and Reclamation Cost – Water Management

Water Management :

ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
OBJECTIVE: WATER SUPPLY EMBANKMENT								
Toe buttress, drain mat'l	m3		#N/A	0	$0		$0	$0
, fill mat'l A	m3		#N/A	0	$0		$0	$0
, fill mat'l B	m3		#N/A	0	$0		$0	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Vegetate	ha		#N/A	0	$0		$0	$0
Breach dam	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: UPGRADE SPILLWAY								
Excavate channel, mat'l A	m3		#N/A	0	$0		$0	$0
, mat'l B	m3		#N/A	0	$0		$0	$0
Concrete	m3		#N/A	0	$0		$0	$0
Rip rap	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
OBJECTIVE: STABILIZE &/OR UPGRADE DIVERSION DITCHES								
Excavate channel	m3		#N/A	0	$0		$0	$0
doze & spread excavated material	m3		#N/A	0	$0		$0	$0
Vegetate, spread material	ha		#N/A	0	$0		$0	$0
Rip rap in channel base	each		#N/A		$0		$0	$0
OBJECTIVE: BREACH DITCHES								
Excavate breaches	m3		#N/A	0	$0		$0	$0
install rip rap	m3		#N/A	0	$0		$0	$0
install flow dissipation	m3		#N/A	0	$0		$0	$0
vegetate remainder of ditch	m2		#N/A	0	$0		$0	$0
OBJECTIVE: REMOVE PIPELINES								
Remove pipes	m	44402.3	PPSH	5.4	$239,772		$0	$239,772
Concrete plug deep pipes	m3		#N/A	0	$0		$0	$0
Other			#N/A	0	$0		$0	$0
Groundwater Collection - Long-term Collection System								
excavate/install sumps	m2		#N/A	0	$0		$0	$0
install pumping wells	m3		#N/A	0	$0		$0	$0
install pumps/pipelines/power supply			#N/A	0	$0		$0	$0
OBJECTIVE: COLLECT DRAINAGE FOR TREATMENT								
Excavate channel	m3		#N/A	0	$0		$0	$0
doze & spread excavated material	m3		#N/A	0	$0		$0	$0
Vegetate, spread material	ha		#N/A	0	$0		$0	$0
Rip rap in channel base	each		#N/A	0	$0		$0	$0
Construct contaminated water storage pond								
Excavation	m3		#N/A	0	$0		$0	$0
supply geomembrame, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
upper and lower bedding layers	m3		#N/A	0	$0		$0	$0
install geomembrane, HDPE, ES3, GCL	m2		#N/A	0	$0		$0	$0
erosion protection layer	m3		#N/A	0	$0		$0	$0
OBJECTIVE: TREAT DRAINAGE (see "ONGOING TREATMENT" for operating costs)								
Build treatment plant	LS		#N/A	0	$0		$0	$0
build sludge containment facility	LS		#N/A	0	$0		$0	$0
				Subtotal	$239,772	0%	$0	$239,772
						Pct Land	Total Land	Total Water

Table B-23: Mine Closure and Reclamation Cost – Mobilization

Mobilization:

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	MOBILIZE HEAVY EQUIPMENT								
	Equipment to regional centre								
.	Excavators	km	100	MHERH	9.0936	$909	100%	$909	$0
.	Dump trucks	km	300	MHERH	9.0936	$2,728	100%	$2,728	$0
	Dozers	km	100	MHERH	9.0936	$909	100%	$909	$0
	Demolition shears	km	700	MHERH	9.0936	$6,366	100%	$6,366	$0
	Crane	km	200	MHERH	9.0936	$1,819	100%	$1,819	$0
	Light duty vehicles	km	3900	MHERH	9.0936	$35,465	100%	$35,465	$0
.	Other (loaders)	km	1100	MHERH	9.0936	$10,003	100%	$10,003	$0
.	Other	km	7500	MHERH	9.0936	$68,202	100%	$68,202	$0
	Equipment, regional centre to site								
.	Excavators	km		#N/A	0	$0		$0	$0
.	Dump trucks	km		#N/A	0	$0		$0	$0
	Dozers	km		#N/A	0	$0		$0	$0
	Demolition shears	km		#N/A	0	$0		$0	$0
	Crane	km		#N/A	0	$0		$0	$0
	Light duty vehicles	km		#N/A	0	$0		$0	$0
.	Other	km		#N/A	0	$0		$0	$0
.	Other	km		#N/A	0	$0		$0	$0
B	MOBILIZE CAMP								
.		allow		#N/A		$0		$0	$0
C	MOBILIZE WORKERS								
	crew travel time	manday		#N/A	0	$0	100%	$0	$0
.	crew transportation	each	210	flightS	88876	$18,663,859	100%	$18,663,859	$0
D	MOBILIZE MISC. SUPPLIES								
.	Fuel	litre	47,076,055	fss	0.95	$44,722,252	100%	$44,722,252	$0
.	Sealift per season	allow	2	sls	8E+06	$16,045,000	100%	$16,045,000	$0
.	Sealift manpower per season	allow	2	plss	5E+07	$95,690,400	100%	$95,690,400	$0
	Manpower for the season w/o sealift		1	slnss	1E+07	$9,642,000	100%	$9,642,000	$0
E	WORKER ACCOMODATIONS								
.		$	2000	cos	10800	$21,600,000	100%	$21,600,000	$0
F	WINTER ROAD							$0	$0
.	Full winter use	km		#N/A	0	$0		$0	$0
.	Limited winter use	km		#N/A	0	$0		$0	$0
.	other			#N/A	0	$0		$0	$0
G	INTERIM CARE & MAINTENANCE								
	on-site caretaker	annual		#N/A	0	$0			
	fuel and misc. supplies	annual		#N/A	0	$0			
	electrician	days		#N/A	0	$0			
	mechnaic	days		#N/A	0	$0			
	pick-up truck	yr		#N/A	0	$0			
	small dozer	allow		#N/A	0	$0			
	small excavator	allow		#N/A	0	$0			
	snow machine	allow		#N/A	0	$0			
	communications	allow		#N/A	0	$0			
	Water licence sampling & reporting	each		#N/A	0	$0			
	Geotechnical assessment	each		#N/A	0	$0			
	Other	each	1	#N/A	20000	$20,000			
				sub-total annual C&M cost		$20,000			
	Total C&M cost	years	3	#N/A	20000	$60,000	100%	$60,000	$0
					Subtotal	$206,549,913	100%	$206,549,913	$0
							Pct Land	Total Land	Total Water

Table B-24: Mine Closure and Reclamation Cost – Post-Closure

Post-Closure Monitoring & Maintenance:

	ACTIVITY/MATERIAL	Units	Quantity	Cost Code	Unit Cost	Cost	% Land	Land Cost	Water Cost
A	OBJECTIVE: MONITORING & INSPECTIONS								
	Annual geotechnical insp.	each		#N/A	$0	$0		$0	$0
.	Survey inspection	each	1	SIS	$16,667	$16,667	100%	$16,667	$0
.	Surface water sampling	each	0	WSS	$200	$0		$0	$0
	Groundwater Sampling	each	0	WSS	$200	$0		$0	$0
	Receiving/downstream water sampling	each	0	WSS	$200	$0		$0	$0
	Reporting	each	1	RPTH	$11,880	$11,880	100%	$11,880	$0
.	on-site transportation	each		#N/A	$0	$0		$0	$0
	transporation to site	each	1	#N/A	$4,918	$4,918	100%	$4,918	$0
.	Other (sea lift at the end of post closure)		1	slpcs	$11,173,540	$11,173,540	100%	$11,173,540	$0
B	OBJECTIVE: COVER MAINTENANCE								
.	Repair erosion - infill gullies	allow		#N/A	$0	$0		$0	$0
.	Repair erosion - upgrade diversion ditches	allow		#N/A	$0	$0		$0	$0
.	Remove problem vegetation	allow		#N/A	$0	$0		$0	$0
.	Repair animal damage	allow		#N/A	$0	$0		$0	$0
.	Repair/upgrade access controls	allow		#N/A	$0	$0		$0	$0
	Other		1	#N/A	$100,000	$100,000	100%	$100,000	$0
C	SPILLWAY MAINTENANCE								
	Repair erosion	m3		#N/A	$0	$0		$0	$0
	Clear spillway	each	1	CSWH	$5,702	$5,702		$0	$5,702
	Other			#N/A	$0	$0		$0	$0
D	POST-CLOSURE WATER TREATMENT								
	Annual water treatment cost, from Ongoing water		1	#N/A	$106,276	$106,276		$0	$106,276
	Subtotal, Annual post-closure costs					$11,418,983		$11,307,005	$111,978
	Discount rate for calculation of net present value of post-closure		3.00%						
	Number of years of post-closure activity		5	years					
	Present Value of payment stream					$52,295,597	$1 Pct Land	$51,782,771 Total Land	$512,826 Total Water

Table B-25: Mine Closure and Reclamation Cost – On-going Water

WATER TREATMENT COSTS

ANNUAL VOLUME OF WATER (m3)

Reagent addition rates

Reagent	kg reagent/m3 water		cost in $/kg, FOB site	Annual reagent cost
H2O2		kg/m3		$0
lime		kg/m3		$0
ferric sulphate		kg/m3		$0
ferrous sulphate		kg/m3		$0
flocculents		kg/m3		$0
			TOTAL	$0

Supplies and Labour

power, kW-hr	0	rate, $/kW-hr	$0
misc. supplies, hoses, tools			$0
sampling equip.			$4,200
equip. maintenance and parts			$5,000
water analysis			$6,400
reporting			$0
truck rental			$0
annual mileage			$0
road maintenace & snow plowing			$0
electrician/mechanic for treatment plant & power supply			$0
		Annual cost	$15,600
labor, hourly rate	$75.00		
men per day for water treatment work			3
on site, days per year			1
spring/fall maintenance, extra work			0
hours worked per year			24
annual labor cost			$1,800
		Total, labour and supplies	$17,400
TOTAL ANNUAL COSTS, reagents + labour + supplies + site access			$106,276
Average treatment cost, $/m3			$0.00

Water analyses	
samples per month	0
analysis cost/sample	0
shipping	0
Total Water Sampling	0

Site Access	
road	$0
air	$88,876
winter road	$0
annual site access cost	$88,876

Appendix C

Mine Closure and Reclamation Planning Guidelines, Regulations and Lease Requirements

The following tables provide cross-referencing to where responses to key Mine Closure and Reclamation Planning guidelines, regulations or lease requirements can be found in this document. The referenced section of this Interim MC&RP report provides an outline, at a conceptual level, of how the proponent plans to address the particular requirement.

Table C-1: Qikiqtani Inuit Association, Commercial Lease No.: QIOC3001 (2010)

COMMERCIAL LEASE FOR INUIT OWNED LANDS BETWEEN QIKIQTANI INUIT ASSOCIATION AND BAFFINLAND IRON MINES CORPORATION November 2010	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan (Section)**
Environmental Action Plans that shall include the activities to be undertaken in that year, the details of the environmental monitoring and reporting plans for the upcoming year, a report of the estimated costs to be incurred to implement the Environmental Action Plans for the year and the balance of the Term, and any other planned activities for the balance of the Term, and which shall also include, but shall not be limited to, the proposed methods and procedures for the progressive:	
Removal of all structures, equipment, and other manmade debris.	8.3, 8.4, 8.5, 8.6, 8.7, 8.8 & 8.9
Rehabilitation of the area.	8
Replacement of overburden and soil.	8
Grading of the area back to its natural contours. and	8.12
Re-establishment, to the extent possible, of flora required or necessary arising out of the Tenant's activities or presence on the Property.	8.13

Table C-2 : Qikiqtani Inuit Association

Abandonment and Reclamation Policy for Inuit Owned Lands, Qikiqtani Inuit Association - Department of Lands and Resources (2010)	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan (Section)**
Abandonment and Reclamation Plan (Preliminary Closure Plan) is to be a standalone document with supporting rationale and detail.	All
All referenced documents must be properly cited including document name, author, and section and page number.	16
Rationale on how the Preliminary Closure Plan understands and satisfies the QIA's *Guiding Principle's on Reclamation:*	1
Inuit Owned Land (IOL) to be returned to a safe and stable condition capable of maintaining the ecosystem integrity consistent with Inuit societal and cultural needs and aspirations.	3.3
Ensure the physical, chemical and biological stability of the mine site for closure.	8
Reclamation should be aesthetically and environmentally compatible with the surrounding area.	5.1
Reclamation should be consistent with locally valued ecosystem components and regional planning objectives.	11
Integrate Inuit Qaujimatajatuqangit (Inuit knowledge) and consultation with Community Land and Resources Committee(s).	2. and 2.5
Meet applicable federal and territorial public health and safety requirements.	Appendix C

Abandonment and Reclamation Policy for Inuit Owned Lands, Qikiqtani Inuit Association - Department of Lands and Resources (2010)	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan (Section)**
Minimize human health risks.	6.1, 7.1 and 8.1
Utilize progressive reclamation where possible.	5
Undertake research for the site as necessary.	2.2 and 2.3
Post closure monitoring, if required.	9
Financial security estimate for each mine component - results should be methodical and self explanatory. A comprehensive summary of closure cost estimate should be included.	12 and Appendix B
Contingency costs are to be included in the closure cost estimate.	Appendix B
Cost estimate to assume worst case scenario.	12 and Appendix B
Cost estimate for an independent third-party contractor to close out the site (including mobilization and equipment).	12 and Appendix B
Progressive reclamation credits may be applied to closure cost estimate.	Included in Appendix B
Provide a list of mine components that are considered in the Preliminary Closure Plan.	Table 3-1
Provide evidence to support the QIA policy assumptions for Preliminary Closure Plans.	1, Table E-2

Table C-3: Territorial Lands Act

Territorial Land Use Regulations (TLUR 2010)		
Key Mine Closure and Reclamation Plan Guidelines	**TLUR Section**	***Interim* A&R Plan (Section)**
All closure work shall be carried out in accordance with permit requirements as stated in the *Territorial Land Use Regulations.*	s. 8 through 10, 31	2.1
"Subject to the terms and conditions of his permit or the express written authority of an inspector, every permittee shall replace all materials removed by him in the course of excavating, other than rock trenching, and shall level and compact the area of excavation."	s. 12	8
"Restore the channel and bed of the stream to their original alignment and cross-section."	s. 13.(1 b)	8.12
"Subject to the terms and conditions of his permit, every permittee shall, after completion of a land use operation, restore the permit area as nearly as possible to the same condition as it was prior to commencement of the land use operation."	s. 18	5.1
Remove all buildings equipment, machinery, and storage equipment/containers and materials onsite.	s. 19.(1)	8.3 and 8.4
A final plan will be issued to the "engineer" within 60 days following completion of the land use operation or expiration of the permit.	s. 33	8
All plan drawings shall be: Drawn to scale that clearly illustrates all mine features. Shows the scale on the drawing. and Provide geographic co-ordinates.	s.35	Appendix A
"In order to ensure that a permittee compiles with the terms and conditions of his permit with these Regulations, the engineer may include in the permit a condition that the permittee deposit with the Minister a security deposit not exceeding $100,000."	s. 36	Included in Appendix B

Table C-4: Nunavut Impact Review Board

Guidelines for the Preparation of an Environmental Impact Statement for Baffinland Iron Mines Corporation's Mary River Project (2009)	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan (Section)**
"To ensure that issues associated with the effective closure and reclamation of all Project Components is considered at the earliest possible stage in the mine development process, thereby influencing mine design to take into account environmental issues related to mine closure and reclamation."	All
"To establish major targets for reclamation of lands potentially affected by the Project."	11
"Description of reclamation methods, time frames and schedules, including proposed notice periods to employees and public."	8
"Description of temporary closure measures and a discussion of at what point a temporary closure should be considered permanent for the purposes of requiring implementation."	6
"Discussion of research programs to address challenges to reclamation, given the local conditions."	2.2 and 2.3
"Considerations for the Projection of public health and safety."	6.1, 7.1 and 8.1
"Description of closure and post - closure monitoring of environmental components."	9
"Discussion of the need for long - term monitoring and maintenance by establishing physical and chemical stability."	9.1, 9.2
"Discussion on reduction or elimination of environmental effects once the mine ceases operation."	8, 10, and 11
"Discussion regarding re-establish conditions that permit the land to return to similar pre-mining land use."	5, 5.1 and 8
"Consideration for ARD/ML potential of rocks, in association with related waste rock management strategies."	8.11
"Any considerations for the restoration of the natural aesthetics of the Project."	11

Table C-5: AANDC (INAC) Guidelines

Mine Site Reclamation Guidelines for the Northwest Territories (2007)	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan Report Section**
Develop and implement preventive and control strategies to effectively minimize the potential for ARD and ML to occur.	8.11
Where ARD and ML are occurring as a result of mine activities, mitigate and minimize impacts to the environment.	8.11
Re-establish the pre-mining ground cover, which may involve encouraging self-sustainable indigenous vegetation growth.	5.1
Remediate any sources of contamination that may have been created during the development and operation of the mine site in order to protect humans, wildlife, and environmental health.	8.10
Ensure physical stability of residual earth structures for environmental, human, and wildlife safety.	9.1

Mine Site Reclamation Guidelines for the Northwest Territories (2007)	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan Report Section**
Open Pit: Minimize access to protect human and wildlife safety. Implement water management strategies to minimize and control migration and discharge of contaminated drainage, and if required, collect and treat contaminated water. and Stabilize slopes to minimize erosion and slumping.	8.2
Waste Rock: Minimize erosion, thaw settlement, slope failure, collapse or the release of contaminants or sediments.	8.11 and 8.13
Buildings and infrastructure, equipment: Return area to its original state or to a condition compatible with the end land-use targets.	8.3 and 8.4
Restore natural drainage patterns where surface infrastructure has been removed.	8.12 and 8.13
Landfills: • Control erosion and effects to the ground thermal regime.	8.9
Water Management Systems: Dismantle and remove/dispose of as much of the system as possible and restore natural or established new drainage patterns. Stabilize and protect from erosion and failure for the long term.	8.3, 8.4, 8.12 and 8.13

Table C-6: AANDC (INAC) Policies

Mine Site Reclamation Policy for Nunavut (2002) and Mine Site Reclamation Policy for the Northwest Territories (2002)	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan Report Section**
Areas should be returned to viable and self sustaining areas where practical.	5.1 and 8
Use best management principles such as progressive reclamation and reduce the environmental risk.	5.1
Communication and consultation shall be undertaken with all applicable parties.	2.2 and 2.3
Closure impacts for all mine components.	8
Closure costs estimates should be undertaken by a third party using a recognized methodology such as RECLAIM. Closure cost estimates should include contingency factors.	12 and Appendix B
Inclusion of a progressive reclamation plan.	5 and 5.1
Removal/stabilization of all structures.	8.3
Reclaim and stabilize waste rock stockpiles remaining on site.	8.11
Reclaim the disturbed surface areas to acceptable standards.	8
Water quality at closure shall meet or exceed the accepted standards.	9.2
Temporary Closure measures shall be included in the Preliminary Closure Plan and cost estimate.	6, 7
Inclusion of a post - closure monitoring program.	9

Mine Site Reclamation Policy for Nunavut (2002) and Mine Site Reclamation Policy for the Northwest Territories (2002)	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan Report Section**
Detailed closure and decommissioning of the following: Buildings and other structures. Roads. Airstrips. Waste rock stockpiles. Ore stockpiles Quarries. Open pit. Petroleum and chemical storage areas and facilities. Pipelines. Power corridors. Sewage and waste disposal areas. and Mine drainage.	8
Re-vegetation of the site where practical.	8.13
Meet or exceed applicable water standards.	9.2
Recycle materials where practical.	8
Closure cost estimate to be calculated for the total financial security for final closure.	12 and Appendix B
Utilization of a recognized methodology for calculating the closure costs (i.e. RECLAIM model).	12 and Appendix B
Establish financial security to be provided to the Minister of Aboriginal Affairs and Northern Development Canada (previously Indian Affairs and Northern Development).	To be included in Interim Closure Plan for submission

Table C-7: AANDC (INAC) Guideline

Mine Reclamation in the Northwest Territories and Yukon (1992)	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan Report Section**
Preliminary Closure Plan objectives are to: Protect the public health and safety. Prevent and/or reduce the environmental deterioration. and Return all disturbed areas to the original state or an accepted level of reclamation.	11
Ensure post-closure physical and chemical stability.	9.1 & 9.2
Development of a monitoring program to assess the effectiveness of the restoration to be undertaken between the Proponent and Indian and Northern Affairs Canada.	9
Reclaimed areas should be returned to previous land use and aesthetics, to the extent possible.	5.1, 8
Include temporary closure and indefinite (long term) Preliminary Closure Plans.	6 & 7
Mine features should be closed in accordance with the guidelines provided in Tables 5.2 through Table 5.8 (Robertson and Kirsten 1992).	8
Inclusion of a fully developed closure cost estimate.	12 and Appendix B
Re-vegetation where practical. Local arctic species and distributions should be considered.	8.13

Table C-8: Northwest Territories Water Board Guidelines

Guidelines for Abandonment and Restoration Planning for Mines in the Northwest Territories (1990)	
Key Mine Closure and Reclamation Plan Guidelines	***Interim* A&R Plan Report Section**
Evaluation of ARD/ML potential for open pit, waste rock stockpiles and disturbed areas.	8.11 (on-going process) and to be included in Interim Closure Plan for submission
Cover design for waste rock stockpiles, if required. Stockpiles should be designed and contoured to ensure stability.	8.11 and 9.1
Re-vegetation of disturbed areas, where practical.	8.13
Open pit closure preferably backfilling or flooding.	8.2
Stability of open pit should be investigated.	8.2
Quarries should be backfilled and contoured to match the surrounding topography.	8.11
Removal of fuel and chemical storage tanks and associated piping and plumbing if applicable.	8.3, 8.4 and 8.8
Fuel contaminated soils should be remediated.	8.10
Chemical storage facilities should be removed from site.	8.8
Soils surrounding chemical facilities should be tested for contamination and where present be removed from site.	8.10
Culverts should be removed from site.	8.12
Airstrips should be left intact, unless deemed unsafe.	8.6
Natural drainage should be restored to the site. Roads that do not impede the natural drainage may remain intact.	8.12
Solid wastes should be dealt with in responsible manner.	8.9
Hazardous wastes are to be disposed at an approved facility.	8.8 and 8.9
Buildings and structures should be removed from the site.	8.3
Concrete foundations may be left in a safe condition.	8.7
The Preliminary Closure Plan should include a planned shutdown/temporary closure scenario.	6 Incorporated into Interim Mine Closure
The Preliminary Closure Plan should include a long term shutdown/Long-Term Closure scenario.	7 Incorporated into Interim Mine Closure
The Preliminary Closure Plan should include a final abandonment/final closure scenario.	8 Incorporated into Interim Mine Closure
It is encouraged that site closure include phased plan development (progressive closure).	5
A monitoring program should be devised to measure the effectiveness of the site closure.	9
Financial security is required for the closure phase.	12

Appendix D

Site Photos of Current Site Conditions