Appendix A.4

Baffinland Iron Mines Corporation
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www.baffinland.com

Baffinland
Iron Mines Corporation

September 15, 2011

Aboriginal Affairs and Northern Development Canada
Manager, Land Administration
Nunavut Regional Office
Building 918
P.O. Box 100
Iqaluit, NU
X0A 0H0

Attention: Mr. Jeff Mercer
Manager, Land Administration

Re: Mary River Project
Quarry Lease – Steensby Site

Baffinland Iron Mines Corporation (Baffinland) has submitted an application to NIRB for review and approval of Pre-Development Work (PDW) for its Mary River Project. A significant portion of this PDW will occur at the Steensby site. The execution of the PDW will require an estimated 300,000 m^3 of aggregate. Baffinland wishes to exploit a quarry at the Steensby site.

Attached is the application form for the Quarry Lease at the Steensby Site. A drawing provides the coordinates of the quarry while the attached Quarry management Plan provides the additional information required for the exploitation of the quarry.

A cheque for $150.00 is attached for the application processing fee.

Yours truly,

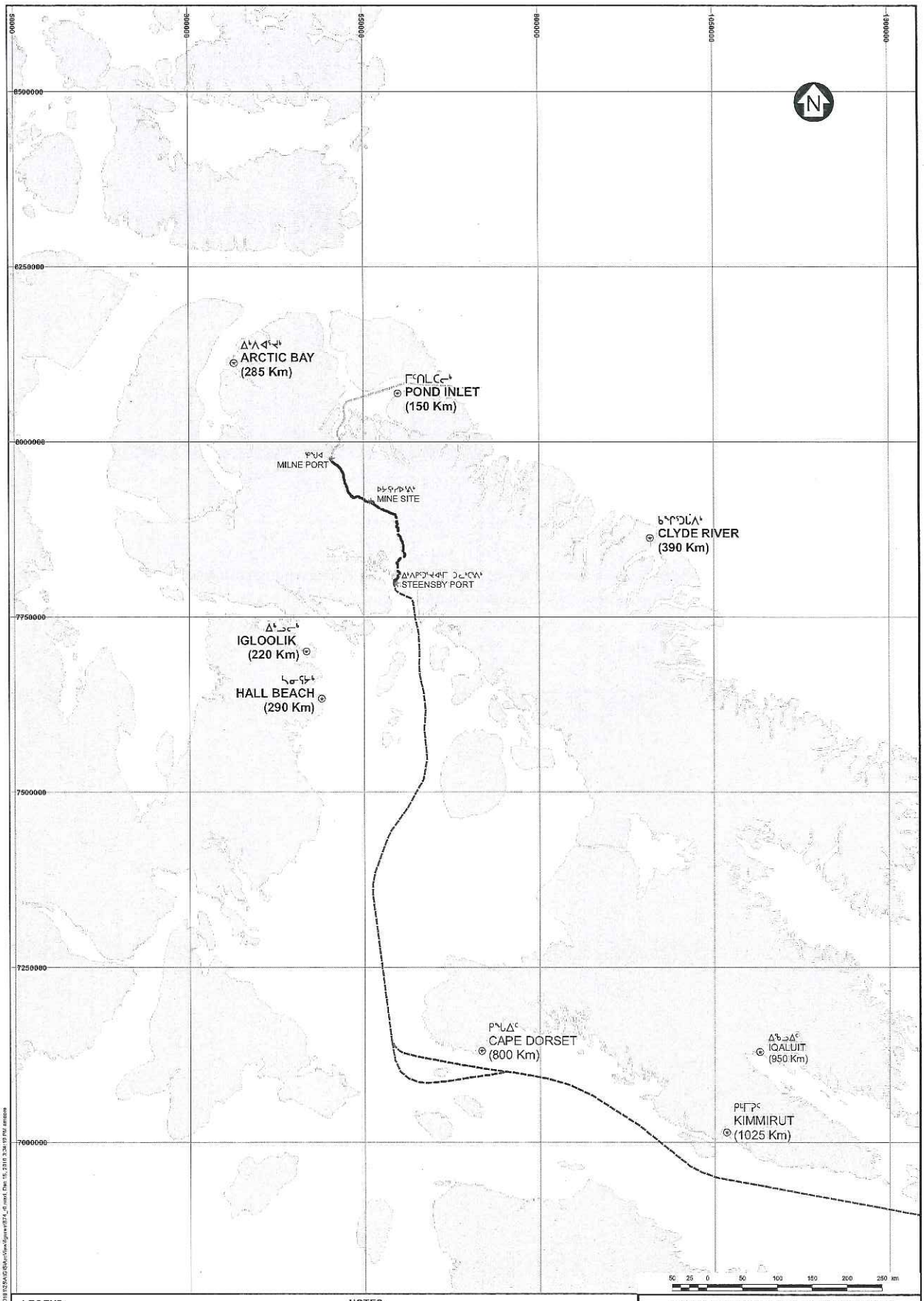
Erik Madsen
Vice-President Sustainable Development, Health, Safety & Environment

Attachment:

1. Figure 2-1.1 – Communities in the Vicinity of the Mary River Project
2. Figure 3-1.2 – Location of Project Activities
3. Figure 4.0 – Steensby Inlet Layout of PDW Facilities
4. Drawing H337697-7000-10-014-1112 Steensby Inlet Quarry QS2
5. Quarrying Permit Application
6. Certificate of Status – Baffinland Iron Mines Corporation
7. Baffinland Iron Mines Corporation – Mary River Project Quarry Management Plan

References:

1. Baffinland Iron Mines Corporation, Draft Environmental Impact Statement, January 2011
2. Baffinland Iron Mines Corporation, Addendum to the DEIS, July 4, 2011
3. Baffinland Iron Mines Corporation, Application for Approval of Pre-Development Work, September 15, 2011



LEGEND:

- ᑲᒪᒋᔭᐅᓂᖅ COMMUNITY
- ᐅᓴᖅᑭᑦᓯ MINE SITE
- ᐅᓪᓗᑎᑦ PORT SITE
- ᐊᒥᓱᓕᕆᓂᖅ ᓄᓇᕗᒻᒥᒃ - ᓯᓚᑖᓂᖓᓄᑦ NOMINAL SHIPPING ROUTE - ICE BREAKERS
- ᐊᒥᓱᓕᕆᓂᖅ ᓄᓇᕗᒻᒥᒃ - ᐅᑭᐅᖅᑕᖅ NOMINAL SHIPPING ROUTE - OPEN WATER SHIPPING ONLY
- ᒪᓕᓐ ᐃᓕᓐᑐ ᑐᓵᑎᓴ MILNE INLET TOTE ROAD
- ᐊᓯᐅᓚᐅᑎᓪᓗᒍ ᐊᑐᐊᓂᓕᕆᓂᖅ PROPOSED RAILWAY ALIGNMENT

NOTES:

1. ᐅᖃᐅᓯᕐᓂᐊᕐᓂᖅ ᓄᓇᕗᒻᒥᒃ 2009
1. BASE MAP: COPYRIGHT © 2009 ESRI. ALL RIGHTS RESERVED.

2. ᓄᓇᕗᑦ ᑎᑎᕋᓂᖅ ᒪᓕᓐ ᐅᓴᖅᑭᑦᓯ ᒪᓕᓐ ᓯᓚᑖᓂᖓᓄᑦ ᓴᓇᔨᓄᑦ
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) AND IS IN METRES.

REV	DATE	DESCRIPTION				
C	SEDEC'18	ISSUED WITH REPORT	RAC DESIGN	ASM DRAWN	RAC CHKD	KDB APPD

BAFFINLAND IRON MINES CORPORATION

ᑲᓇᑕᓂᕐᒧᑦ ᐅᖃᐅᓯᕐᓂᐊᕐᓂᑦ MARY RIVER PRJECT

ᓄᓇᕗᑦ ᑲᒪᒋᔭᐅᓂᖅ ᖃᐅᔨᓴᓂᖓᓄᑦ
COMMUNITIES IN THE VICINITY OF THE MARY RIVER PROJECT

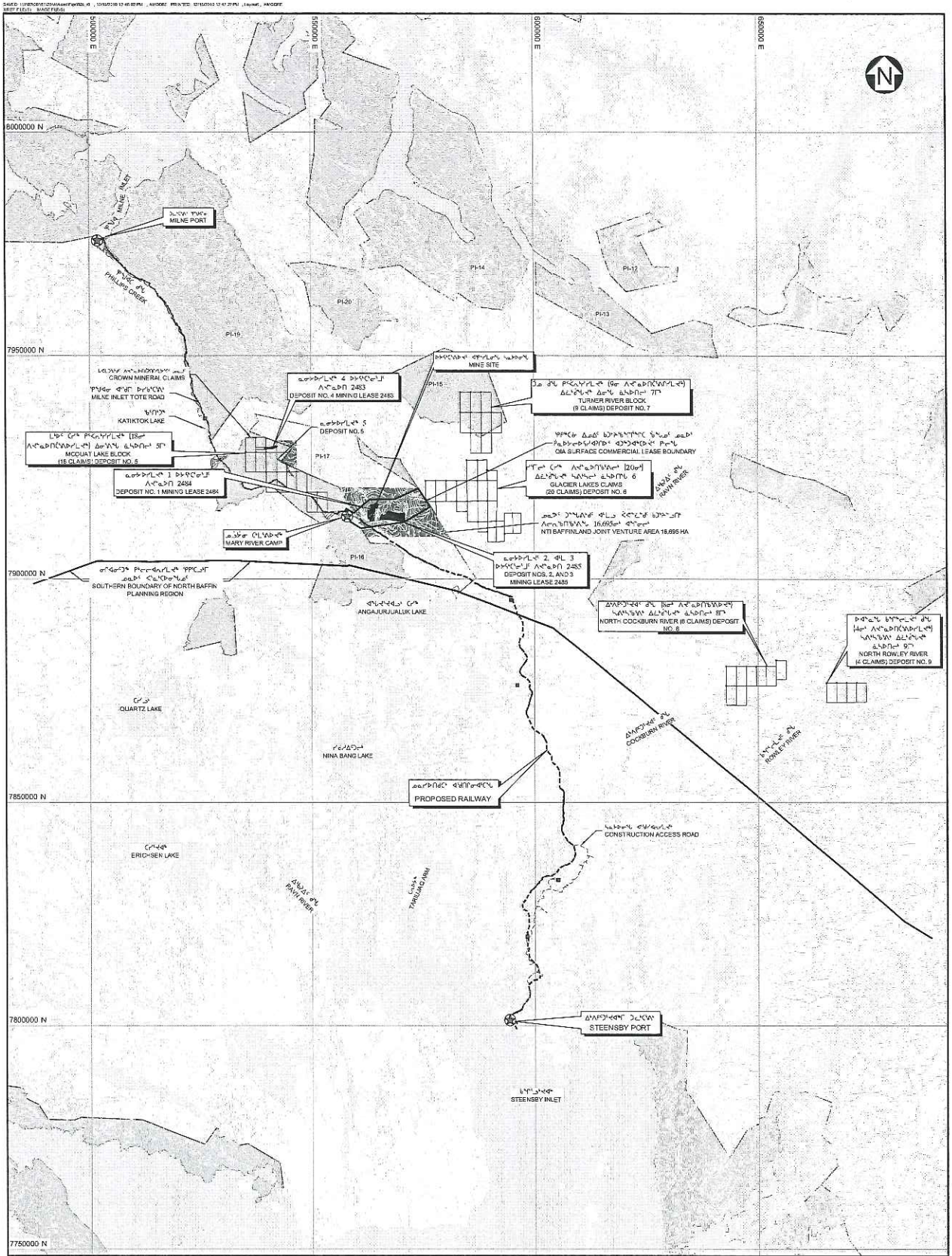
Knight Piésold CONSULTING

P/A NO. NB102-181/25

REF NO. 7

FIGURE 2-1.1

REV 0



LEGEND:

- WATER
- INUIT OWNED LAND - SURFACE ONLY EXCLUDING MINERALS
- INUIT OWNED LAND - SURFACE AND SUBSURFACE INCLUDING MINERALS
- MINERAL LEASE BOUNDARY
- CROWN LAND
- EXISTING BORROW AREA (IOL COMMERCIAL LEASE)
- EXISTING ROCK QUARRY (IOL COMMERCIAL LEASE)
- NTI EXPLORATION AREA
- CROWN MINERAL CLAIMS
- MILNE INLET TOTE ROAD
- PROPOSED RAIL ALIGNMENT
- PROPOSED CONSTRUCTION ACCESS ROAD
- RIVER/STREAM/DRAINAGE
- CONTOUR
- TEMPORARY CONSTRUCTION CAMP

NOTES:

1. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA, DEPARTMENT OF NATURAL RESOURCES (2004). ALL RIGHTS RESERVED.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METRES.
3. CONTOURS ARE IN METRES. CONTOUR INTERVAL VARIES.
4. PROPOSED RAIL ALIGNMENT PROVIDED BY CANARAIL CONSULTANTS INC.

SCALE A: 0 4 0 10 20 30 40 km

REV	DATE	DESCRIPTION	RAC DESIGNED	ASM DRAWN	RAC CHKD	KDE APPD
0	16DEC10	ISSUED WITH REPORT				

BAFFINLAND IRON MINES CORPORATION

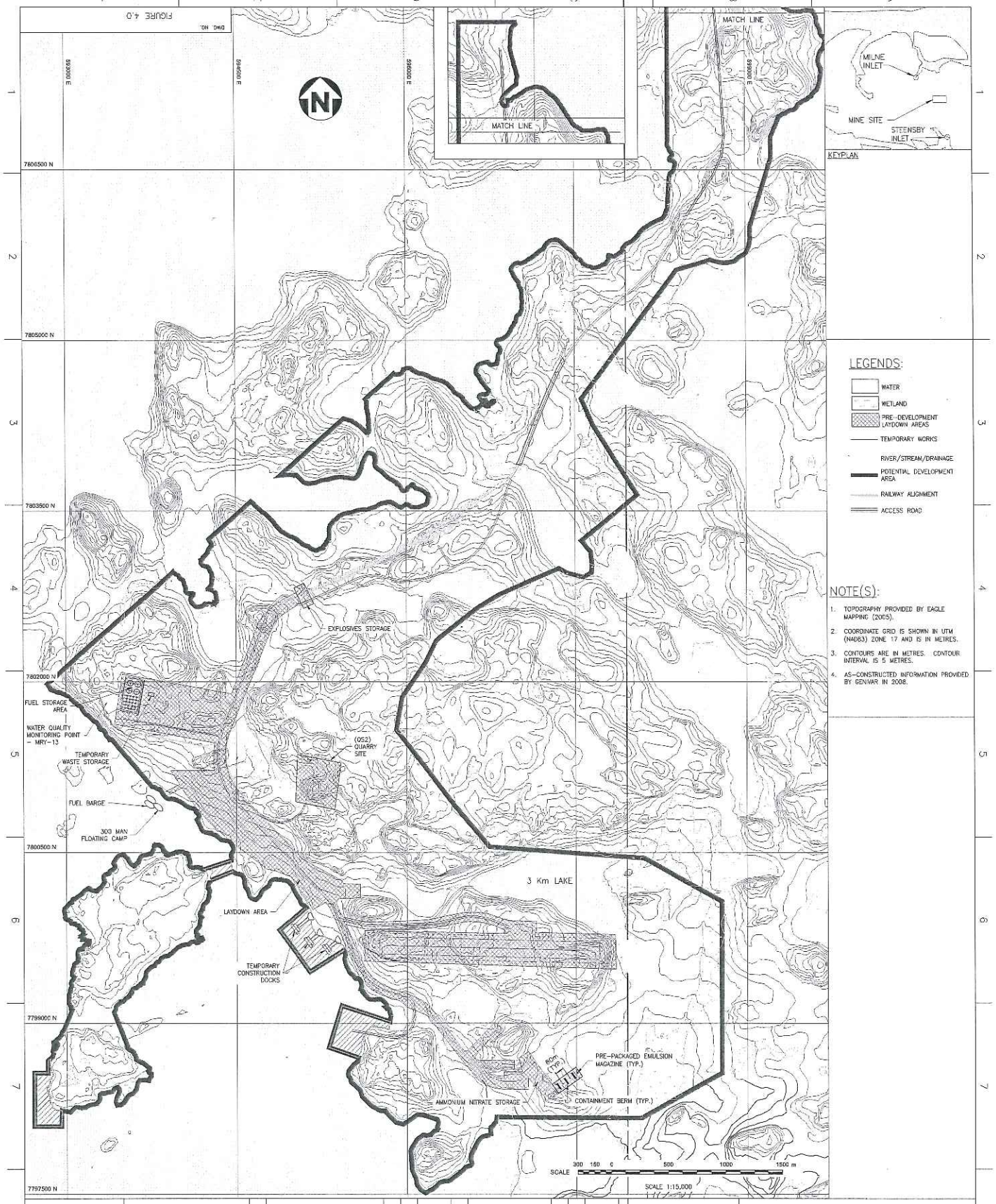
MARY RIVER PROJECT

LOCATION OF PROJECT ACTIVITIES

Knight Piésold CONSULTING

PIA NO. NB102-181/25 | REF NO. 6

FIGURE 3-1.2 | REV 0



DRAWING NO.	DRAWING TITLE	DESCRIPTION	ICHK'D	APP'D	DATE	REV.	ISSUE FOR	AUTH. BY	DATE
						A	INTERIM REVISION		

REFERENCE DRAWINGS | REVISIONS | ISSUE AUTHORIZATION

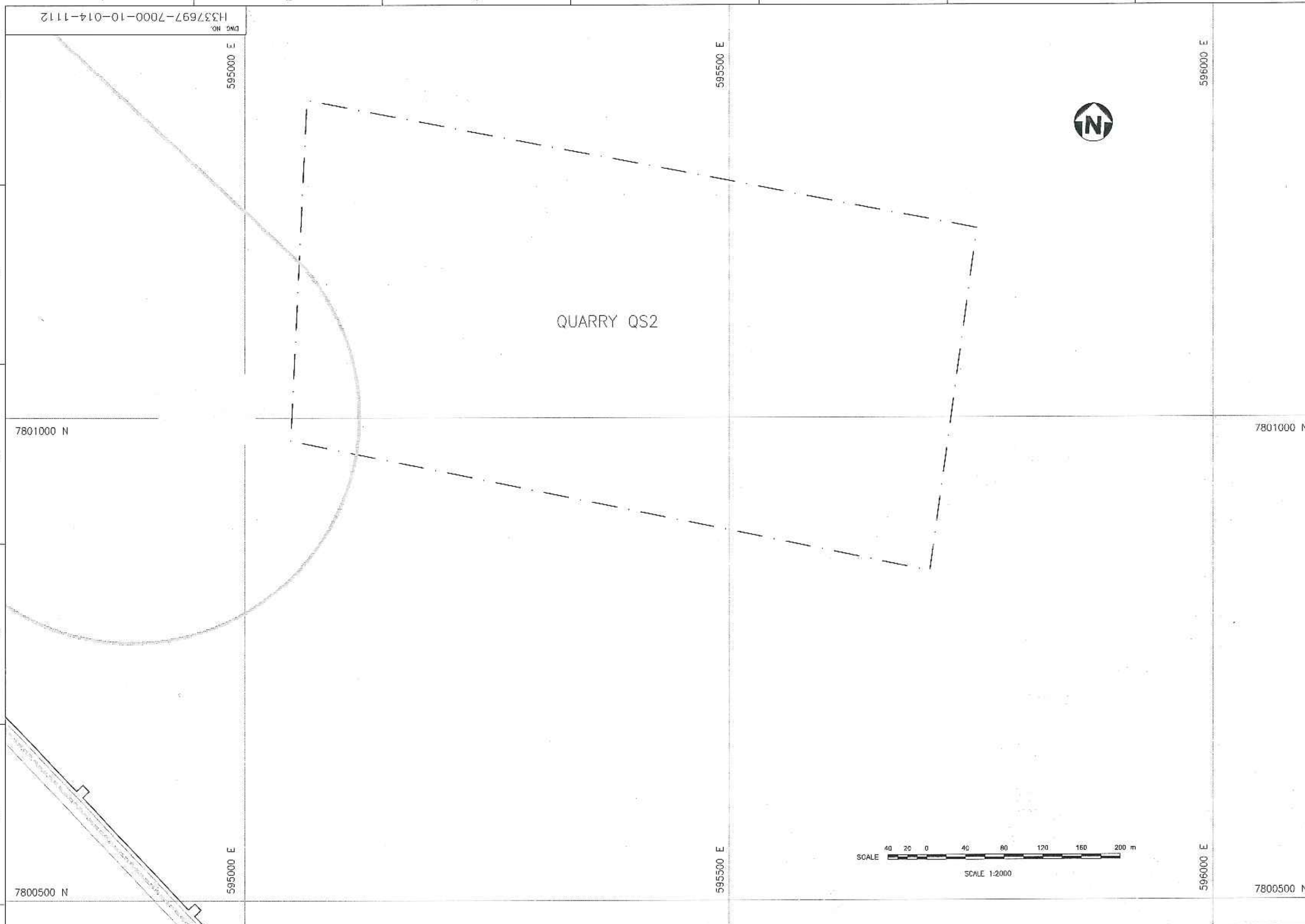
DESIGNED BY	DRAWN BY J. R
DATE	DATE 2011/09/09
CHECKED BY T. H.	DISCIP. ENGR.
DATE 2011/09/09	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	
DATE	

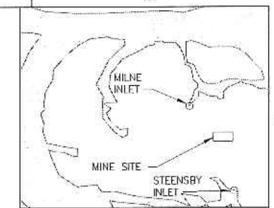
Baffinland

MARY RIVER PROJECT

STEENSBY INLET
LAYOUT OF PDW FACILITIES (2012)
SITE LAYOUT

SCALE: DR. AS NOTED | DWG. NO.: FIGURE 4.0 | REV.: A





KEYPLAN

LEGEND:

- WATER
- EXISTING BORROW AREA
- TEMPORARY LAYDOWN AREA
- RIVER/STREAM/DRAINAGE
- — · — QUARRY BOUNDARY

NOTES:

1. TOPOGRAPHY PROVIDED BY TERRAPOINT CANADA INC.
2. COORDINATE GRID IS SHOWN IN UTM (NAD83) ZONE 17 AND IS IN METERS.
3. CONTOURS ARE IN METERS. CONTOUR INTERVAL IS 5 METERS.

DRAWING NO.	DRAWING TITLE

REFERENCE DRAWINGS

NO.	DESCRIPTION	BY	CHK'D	APPR.	DATE
D	ISSUED FOR PERMITTING – PRE-DEVELOPMENT WORKS	DF	AS	TH	11/09/13

REVISIONS

REV.	ISSUE FOR	AUTH. BY	DATE

ISSUE AUTHORIZATION

HATCH™

DESIGNED BY	DRAWN BY J.R.
DATE	DATE
CHECKED BY A.S.	DISCIP. ENGR.
DATE	DATE
PROJ. DES. COORD.	PROJ. ENGR.
DATE	DATE
PROJ. MGR.	
DATE	

Baffinland Iron Mines Corporation

MARY RIVER PROJECT

STEENSBY INLET
QUARRY QS2
SITE LAYOUT

SCALE	DWG. NO.	REV.
OR AS NOTED	H337697-7000-10-014-1112	0

QUARRYING PERMIT APPLICATION

***Privacy Act* Statement**

The information you provide in this document is collected under the authority of the *Territorial Quarrying Regulations* for the purpose of applying for a quarrying permit. Information on individuals is used Indian and Northern Affairs Canada Mineral and Petroleum Resources Branch employees who need to know the information in order to respond to the program requirements. We do not share the personal information with other government departments. The personal information will be retained for 5 years after the last administrative use and then transferred to Library and Archives Canada. Individuals have the right to the protection of and access to their personal information under the *Privacy Act* http://lois.justice.gc.ca/en/P-21/index.html.

Applicant Name	Company Name
Erik Madsen, Vice-President Sustainable Development	Baffinland Iron Mines Corporation

Address

Suite 1016, 120 Adelaide Street West, Toronto, Ontario M5H 1T1

Telephone Number	Facsimile Number	Cellular Number
416-814-3980		416-996-5523

Sub-Contractor or Pit Operator ☑ Same as above	Name/Company

Address

Telephone Number	Facsimile Number	Cellular Number

I hereby apply for a Quarrying Permit for the purpose of taking:

Amount of Cubic Metres	Sand	Gravel	Stone	Loam	Other (please specify)
300,000 ▶	○	○	●	○	○
▶	○	○	○	○	○
▶	○	○	○	○	○

Location of Pit	NTS Map Sheet No.	Co-Ordinates
Steensby Inlet, Baffin Island, Nunavut	• 37 F/6 Edition 1 ASE Series	• 595394E 7801092N Zone 18

Land Use Permit

● Existing	Land Use Permit No.	Expiry Date	○ New Application	Application Date
	N2007F0004	2012-06-04		(YYYY/MM/DD)

Quarry Site

○ Existing ● New | Application made to: ○ MVLWB ○ WLWB ○ SLWB ○ GLWB

1. A Quarry Operations Plan is required with this application and must be approved by a Land Use Inspector prior to approval and issuance of the quarry permit if:

   (A) The volume being applied for is greater than 1,000 m3 and/or
   (B) The quarry site is being operated by multiple users

   The Quarry Operations Plan includes the following mandatory information:
   - -North Arrow
   - -Map Scale at 1:5000
   - -NTS Map Sheet or acceptable alternate at 1:50,000
   - -Coordinates of quarry site - 4 corners (NE, NW, SE, SW)
   - -Total area of the identified quarry resource
   - -Area of existing clearing
   - -Area of proposed quarrying
   - -Topsoil/overburden storage area
   - -Access roads/trails
   - -Camp locations identifying all infrastructure to be established on the site
   - -When applicable, blast pattern details must be indicated
   - -Closure and Reclamation Plan including:
     - -Camp reclamation, if applicable
     - -Abandonment of active quarry face
     - -Waste disposal
     - -Stockpile removal
     - -Road closure
     - -Soil remediation for contaminated soils

Failure to submit an acceptable Quarry Operations plan (when required) will result in rejection of the Quarry Permit Application. Complete 2 - 7 below only if a Quarry Operations Plan is not required.

2. Is any part of the land occupied? And if so, by whom and for what purpose?

3. The only buildings or other improvements on the said lands are as follows:

Nature of Improvements

Value of Improvements

Owner of Improvements

4. The land is/is not wooded. If yes, describe species of trees and approximate size:

○ No ○ Yes ▶

5. Please describe the proposed methods of brush and or timber disposal to be used on the site (if required).

6. If a camp is to be utilized please describe the proposed methods for:

Combustible Garbage	Non-combustible Garbage
Food Wastes	Grey Water
Black Water	Potable Water Supply

7. Please describe the proposed reclamation techniques that will be applied to the quarry site upon or prior to termination of the Quarry Permit:

I enclose the required fees as indicated below:	Total $
Quarrying Permit Fee: ($150.00)	150.00
Royalties on sand, gravel, loam per cubic metre: ($1.50)	
Royalties on other building materials per cubic metre: ($1.25)	
Total Fees ▶	**150.00**

Canada

1. The attached plan is a sketch plan of the land as required by the Territorial Quarrying Regulations (Sketch should include an indication of the area to be worked).

☑ See Quarry Management Plan

2. Sketch Plan:

Use Additional sheets if required.

3. Co-ordinates of Site (Latitude and Longitude):

NW Point	NE Point	SW Point	SE Point
• 595064E 7801331N	• 595761E 7801197N	• 595706E 7800842N	• 595051E 7800980N

Signature of Applicant

Date 2011/09/14

Note to Client: Alteration to base form will not be accepted.

For Internal Use Only

Reviewing Officer (Print Name)		Signature
Date Application Deemed Complete (YYYYMMDD)	Date Application Faxed (YYYYMMDD)	Sent to: ○ Yellowknife ○ Inuvik ○ Nunavut

Canada

BAFFINLAND IRON MINES CORPORATION

4508

Vendor ID	Name	Payment Number	Cheque Date	Document Number
REC001	Receiver General For Canada	PP-0000000015287	9/12/11	004508

Invoice Number	Date	Amount	Amount Paid	Discount	Net Amount Paid
2011QUARRYLSEAPP	9/12/11	$ 150.00	$ 150.00	$ 0.00	$ 150.00
		$ 150.00	$ 150.00	$ 0.00	$ 150.00

BAFFINLAND IRON MINES CORPORATION

4508

Vendor ID	Name	Payment Number	Cheque Date	Document Number
REC001	Receiver General For Canada	PP-0000000015287	9/12/11	004508

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2011QUARRYLSEAPP	9/12/11	$ 150.00	$ 150.00	$ 0.00	$ 150.00
		$ 150.00	$ 150.00	$ 0.00	$ 150.00

THIS DOCUMENT CONTAINS SECURITY FEATURES INCLUDING FLUORESCENT FIBRES AND A TRUE WATERMARK

CHEQUE NO. 4508

Baffinland Iron Mines Corporation

Suite 1016, 120 Adelaide Street West, Toronto, ON M5H 1T1

The Bank of Nova Scotia 47696
www.scotiabank.com/businessservice
1-888-855-1234

DATE 09 12 2011
M M D D Y Y Y Y

PAY One Hundred Fifty Dollars And 00 Cents

$ 150.00

TO THE ORDER OF Receiver General For Canada

BAFFINLAND IRON MINES CORPORATION

PER

PER

⑈004508⑈ ⑆80002⑈00 2⑆ 11263⑈18⑈

Request ID: 008568840
Demande n° :
Transaction ID: 30599851
Transaction n° :
Category ID: CT
Catégorie :

Province of Ontario
Province de l'Ontario
Ministry of Consumer and Business Services
Ministère des Services aux consommateurs et aux entreprises
Companies and Personal Property Security Branch
Direction des compagnies et des sûretés mobilières

Date Report Produced: 2006/10/25
Document produit le :
Time Report Produced: 08:41:01
Imprimé à :

CERTIFICATE OF STATUS
ATTESTATION DU STATUT JURIDIQUE

This is to certify that according to the records of the Companies and Personal Property Security Branch

D'après les dossiers de la Direction des compagnies et des sûretés mobilières, nous attestons que la société

BAFFINLAND IRON MINES CORPORATION

Ontario Corporation Number

Numéro matricule de la société (Ontario)

000658456

is a corporation incorporated, amalgamated or continued under the laws of the Province of Ontario.

est une société constituée, prorogée ou née d'une fusion aux termes des lois de la Province de l'Ontario.

The corporation came into existence on

La société a été fondée le

MARCH 10 MARS, 1986

and has not been dissolved.

et n'est pas dissoute.

Dated

Fait le

OCTOBER 25 OCTOBRE, 2006

Director
Directrice

The issuance of this certificate in electronic form is authorized by the Director of Companies and Personal Property Security Branch.
La délivrance du présent certificat sous forme électronique est autorisée par la Directrice de la Direction des compagnies et des sûretés mobilières.

APPENDIX B.7

MARY RIVER PROJECT
PRE-DEVELOPMENT WORKS

BORROW PIT AND QUARRY
MANAGEMENT PLAN

ENVIRONMENTAL MANAGEMENT

Appendix B.7 – BORROW PIT AND QUARRY MANAGEMENT PLAN

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ATTACHMENTS

Attachment 1: Milne Quarry Description and Operations Plan
Attachment 2: Mary River Quarry QMR2 Description and Operations Plan
Attachment 3: Steensby Inlet Quarry QS2 Description and Operations Plan

SECTION 1.0 - INTRODUCTION

1.1 PURPOSE

This management plan is prepared within the context of the Baffinland Mary River Draft Environmental Impact Statement (DEIS), but applies only to quarries and borrow pits that are required as part of pre-development activities. A more complete project description of all components is found in Volume 3: Project Description, and further management plan descriptions in Appendix 10-D of the Draft Environmental Impact Statement. The purpose of the Borrow Pit and Quarry Management Plan is to set out objectives and measures to maintain and enhance environmental performance of the quarries while avoiding to the extent practical, remedying, and mitigating any potential adverse environmental effects associated with quarrying. The goal of the Management Plan for the pre-development work is to also obtain the quantities and quality of material necessary to construct facilities while at the same time ensuring that a no-go decision will allow for a return to pre-development conditions.

1.2 REGULATORY REQUIRMENTS

Borrow pit or quarry development requires a quarry permit under the Territorial Quarrying Regulations, and if activities include the use of equipment that exceeds the thresholds of the applicable land-use regulations, a land-use permit is required. Both permits include terms and conditions specifying how operations must be conducted. A quarry lease may be applied for instead of a quarry permit if longer-term tenure is desired.

Quarry operations that require blasting might require regulatory approval from the Worker's Safety and Compensation Commission.

1.3 BAFFINLAND'S COMMITMENTS

Baffinland provides adequate resources to implement and maintain the Environmental, Health, and Safety (EHS) Management System including the necessary human, material and financial resources. For Baffinland's Sustainable Development Policy, see Figure B.7-1.

1.4 APPLICATION OF THIS MANAGEMENT PLAN

Aggregate requirements for the pre-development works described elsewhere in this document will be supplied by the quarry and borrow sites located at Milne Inlet, Mary River and Steensby Inlet. Operations plans are included as Attachments 1 through 3 of this document, and brief outlines for each quarry are discussed below. Sources and requirements are discussed further in this document in Section 2.1, Section 4.2 and Section 5.3. Section 2.1.6 of the DEIS describes the overall strategy for sourcing aggregate, the following summarizes the sources and applications.

Aggregate for pre-development activities at Milne Port will be obtained from existing Borrow Sources and from blast rock generated to establish the pad for the laydown area; Quantities available from the blast rock quarry are expected to be approximately 200,000 m^3. The existing borrow pits do not have the type of aggregate available in the quantities needed for pre-development works. The proposed blast rock

quarry is currently permitted, but has not yet been activated. Attachment 1 outlines the Site Description and Operations Plan for this quarry.

Aggregate will be used during pre-development work at the Mine Site as both general fill and structural fill for activities such as site grading for the airstrip, backfill, foundations for fuel storage, camp expansion and administration and maintenance facilities, and heavy equipment storage. The aggregate will be obtained from borrow sources located within the PDA (See DWG # 1102, Appendix C) and pit overburden and rock quarries at the Mine Site (See Drawing # 1101, Appendix C). A new blast rock quarry with a capacity of 500,000 m^3 will be opened to provide the additional quantities needed during the pre-development phase. The total estimated volumes of aggregate required for pre-development work at the Mary River site are presented in Section 4.2 of this report. Crushed rock will be obtained from an existing rock quarry at the Mine Site, supplemented with the proposed quarrying of a granitic (non-ore) outcrop (QMR2). Attachment 2 outlines the Site Description and Operations Plan for this quarry.

Pre-development Facilities at Steensby Port will be located on the mainland as well as nearby Steensby Island in Steensby Inlet (See Drawing # 1107, Appendix C). Development of the initial quarry (QS2) will, allow for the establishment of access roads and laydown areas to receive the very large volume of equipment, materials and fuel that will be delivered by sealift in the open water season of Year 1 of construction, and for access to additional quarries to construct the airstrip. Quarry QS2 is a granitic outcrop blast rock operation, with an estimated volume of 300,000 m^3. Attachment 3 outlines the Site Description and Operations Plan for this quarry.

Results of geochemical testing for acid rock drainage and metal leaching indicate that quarry materials have low potential for acid generation (ARD) and metals leaching (See DEIS Appendix 6B-2). Geotechnical drilling samples have been obtained for all three sites to be utilized for pre-development works, and no ARD issues have been noted.

This Pit and Quarry Management Plan will be updated to reflect situations related to incident investigations, regulatory changes, or other Project-related changes. Start of the pre-development phase will be a major milestone for the Project.

Figure B.7-1 Sustainable Development Policy

Baffinland
Iron Mines Corporation

SECTION 2.0 - SUSTAINABLE DEVELOPMENT POLICY

At Baffinland Iron Mines Corporation, we are committed to conducting all aspects of our business in accordance with the principles of sustainable corporate responsibility and always with the needs of future generations in mind. Everything we do is underpinned by our responsibility to protect the environment, to operate safely and fiscally responsibly and to create authentic relationships. We expect each and every employee, contractor, and visitor to demonstrate a personal commitment to this policy through their actions. We will communicate the Sustainable Corporate Policy to the public, all employees and contractors and it will be reviewed and revised as necessary on an annual basis.
These four pillars form the foundation of our corporate responsibility strategy:

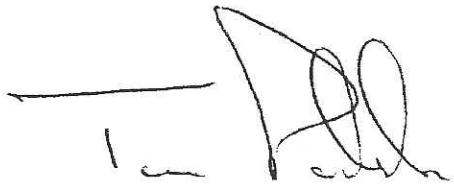
1. Health and Safety
2. Environment
3. Investing in our Communities and People
4. Transparent Governance

1.0 HEALTH AND SAFETY

- We strive to achieve the safest workplace for our employees and contractors; free from occupational injury and illness from the very earliest of planning stages. Why? Because our people are our greatest asset. Nothing is as important as their health and safety.
- We report, manage and learn from injuries, illnesses and high potential incidents to foster a workplace culture focused on safety and the prevention of incidents.
- We foster and maintain a positive culture of shared responsibility based on participation, behaviour and awareness. We allow our workers and contractors the right to stop any work if and when they see something that is not safe.

2.0 ENVIRONMENT

- We employ a balance of the best scientific and traditional Inuit knowledge to safeguard the environment.
- We apply the principles of pollution prevention and continuous improvement to minimize ecosystem impacts, and facilitate biodiversity conservation.



Tom Paddon
President and Chief Executive Officer

September 2011

2.1 RELATIONSHIP TO OTHER MANAGEMENT PLANS

This plan should be viewed in concert with the following additional plans prepared for the pre-development works:

- Emergency and Spill Contingency Plan (Appendix B.1)
- Surface Water and Aquatic Ecosystems Management Plan (Appendix B.4)
- Wastewater Management Plan (Appendix B.5)
- Terrestrial Environnent Management (Appendix B.8)
- Explosives Management Plan (Appendix B.10)
- Abandonment and Reclamation Plan (Appendix B.12)

In addition, completed management plans as described in the DEIS should be consulted if other details are required.

SECTION 3.0 - TARGETED VECS

Valued Ecosystem Components (VECs) were established in the studies and evaluations related to the DEIS. For the pre-development work, targeted VECs for the Pit and Quarry Management Plan are:

- health and safety (compliance with Baffinland's Health and Safety Management Plan)
- surface water quality
- air quality, noise and vibration
- terrestrial wildlife

SECTION 4.0 - MITIGATION MEASURES

4.1 PLANNING AND DESIGN

Potential borrow pit and quarry sites have been identified for each area of the pre-development works for the Project. These sites are located in the footprint of Project facilities.

At Milne Inlet the borrow areas and quarries are on Inuit-Owned Land and will be subject to a Commercial Lease with the QIA. There are three very large borrow areas and two quarries currently permitted under Baffinland's existing land lease. One of the three borrow areas along the Milne Inlet Tote Road is covered under the current Indian and Northern Affairs Canada (INAC) land use permit.

Appendix 10-H of the DEIS Provides further location information and includes quarry boundaries, distances from creeks and streams (30-m setback), presence of bird-nesting areas, and potential tonnage.

The requirement for a 30-m setback from creeks or streams will ensure minimal adverse impacts of the pit/quarry operation on surface water quality. A similar setback is required from known bird-nesting locations.

An important aspect of pre-development planning is to assess suitability of quarry material. Baffinland will avoid using quarry material that has the potential for generating ARD. Geotechnical investigations have been carried out at the proposed sites, and ARD sources are being avoided.

4.2 ENVIRONMENTAL CONCERNS AND MITIGATION TECHNIQUES

Environmental concerns for all pre-development work, including the quarries and borrow areas, are presented in Sections 11 through 21 of the Application for Review and Approval for PDW. Table 4-1 below presents a summary of environmental concerns and mitigation techniques associated with development of borrow pits and quarries.

Table 4-1 Pit and Quarry Environmental Concerns and Mitigation Techniques

Development Phase	Activities	Potential Environmental Effects	Mitigation Techniques
Site layout/ Site preparation	• Timber clearing • Vegetation removal • Soil and overburden removal	• Soil erosion • Habitat loss	• Retain vegetation to maintain slope stability • Maintain natural drainage patterns • Maintain vegetation buffer zones to protect water bodies • Construct ditches to direct runoff away from site • Locate the development in a well-drained area • Salvage and properly store organics, topsoil, and overburden for use in reclamation
Operations/ Monitoring	• Blasting • Stockpiling • Crushing • Access road maintenance	• Soil erosion and sediment deposition	• Limit sediment movement using silt fences or straw bales • Use rip-rap to reinforce drainage channel corners and water discharge points • Revegetate where required to stabilize slopes
		• Water quality impacts: o Silt o Fuel o Blasting residue	• Limit sediment movement or use settling ponds before discharging • Use proper fuel containment and handling techniques, and have spill kits accessible • Use proper explosives handling techniques to minimize wastage
		• Water Ponding: o Permafrost degradation	• Minimize sources of in-pit water by diverting surface water away from the development area • Place ice-rich material to thaw in a location where melt water will not re-enter pit • Limit pit or quarry depth
		• Dust generation	• Spray water and use dust skirts on conveyors to minimize dust

Source: Northern Land Use Guidelines, Pits and Quarries, INAC 2008

4.3 DEVELOPMENT PLANS OF BORROW PIT AND QUARRY

Attachments 1 through 3 of this report lay out the site description and operating details for the pre-development quarries. A detailed development plan will be prepared by the selected contractor before the start of extraction of material from each borrow pit or quarry. Site development plans will augment this operations plan with specific details. These development plans will include:

- Site layout and boundaries with the following provisions:
  - minimum setback of 30 m from environmentally sensitive areas;
  - adequate room for all activities

- estimates of the resources to be extracted
- refuelling station with appropriate containment (if required)
- stockpiling location
- dust and noise consideration
- waste management
- water management structures

- Sequence of operation
  - contractor involved in the operation
  - site operating procedures
  - spill response procedures

- Monitoring
  - pit wall stability (for quarry)
  - extent of permafrost or ground-ice
  - wildlife interactions or sightings
  - contingencies if changes to the original development scenario are required

- Reclamation
  - overburden replacement for site grading and re-contouring
  - reclamation of natural drainage
  - slope reconstruction
  - removal of all garbage and debris
  - removal of all temporary storages/structures/equipment
  - reclamation of access road and block access (if required)
  - replacement of all salvaged topsoil (if required)

4.4 WATER MANAGEMENT

Site development must ensure positive drainage to prevent water pooling or flooding of the pit. The following measures will be implemented to enhance re-establishment of equilibrium and minimization of erosion and water ponding:

- Where possible, excavations will be minimized by utilizing above grade sources for material (hills and swales) , which will minimize water collection and drainage disruption
- Cut and fill areas will be stabilized by constructing gentle slopes less prone to erosion.
- Cut and fill areas are expected to be relatively small in horizontal and vertical extent. The side slopes of the borrow pits will be 1H:1V to 2H:1V, slightly gentler than natural slopes to reduce erosion.
- In low-lying areas where roadbed fill is in the order of 1 m and permafrost can be expected to rise to a meaningful degree, swales or culverts will be installed as part of road maintenance to prevent water ponding.

- At closure, swales will be left in place, or alternatively, the road bed will be breached to allow drainage.
- Borrow activities will be concentrated in few areas to limit the area of disturbance.
- Thawed layers will be removed sequentially.
- Areas of unexpected settlement will be filled to re-establish natural contours and eliminate water ponding.
- Borrow locations will be regularly inspected and unstable slopes re-graded to eliminate depressions and re-establish natural drainage patterns.

4.5 RESOURCE EXTRACTION

Extraction methods will depend on the nature of the material, equipment used, and extent and nature of the permafrost.

Pits and quarries will not be excavated below the water table. If excavated material contains ground-ice, the material will be stored at a location in the pit where it can thaw and drain. Melt water from such stockpiles must be treated for sediment control (see Appendix B.4, Surface Water and Aquatic Ecosystems Management Plan).

Machinery and equipment used on the site will be serviced on a routine maintenance schedule to ensure proper operation and thus minimize emissions and noise.

If fuel storage is required, fuel tanks must be double-walled and placed within a containment berm. A well-stocked spill response kit must be placed in the refuelling area. Vehicles must be equipped with spill response kits and drip trays. Used oil and fuel must not be stored at the pit/quarry sites.

A spill contingency plan must be in place for each quarry site. This plan outlines the logical order of how operators should respond to spills, resources available onsite for spill response, and notification procedures.

4.6 CLOSURE

The abandonment of the predevelopment works (PDW) and site reclamation for the quarries and borrow pits will be undertaken if the Project is not developed. If the Project's EIS application is approved the works will integrated into the overall Project Abandonment and Reclamation Plan (Appendix B.12, although separate closure plans for each quarry and borrow pit will be required. Abandonment of PDW will involve removing PDW materials, equipment and infrastructure and reclaiming the site to self sustaining productive ecosystem near its original condition.

In addition to the measures described in Section 3.1 to 3.5 above, the general abandonment and reclamation plans include the following:

- Dismantle and transport all fuel/chemical storage and handling infrastructure to an approved facility or for reuse where applicable
- Dismantle and remove all buildings and related infrastructure. Any remaining concrete piles will be cut to below grade and covered with overburden
- Dismantle water and sewage treatment plants for reuse or disposal at an approved facility
- Remove all hazardous waste and explosives
- Re-grade as necessary to establish safe slopes and restore the natural drainage to the area
- Test soils and granular materials for hydrocarbon content; contaminated soils will be remediated

SECTION 5.0 - ROLES AND RESPONSIBILITIES

The quarries and borrow pits described in this document are being exploited for pre-development activities only. Although there is the potential for the quarries to continue operating as part of the overall project development if approval is granted, there is no current commitment past the pre-development stage being sought.

5.1 BAFFINLAND PERSONNEL

The Manager for Sustainability is responsible for implementing Baffinland's EHS policies and environmental management plans, and for ensuring that the EPCM contractor and subcontractor have the organization, policies, and operating practices in place to ensure ongoing compliance with Baffinland's EHS requirements.

5.2 EPCM CONTRACTOR

The EPCM contractor is responsible for:

- preparing necessary documentation for permitting of quarries and borrow pits
- selecting the subcontractors who will undertake development of borrow pits and quarries
- ensuring that subcontractors comply with Baffinland's health and safety policies
- daily supervision and monitoring of subcontractors to ensure compliance with regulatory requirements
- reporting to Baffinland as required

Before material extraction from a borrow pit or quarry sites, the EPCM contractor will submit a detailed pit/quarry development plan to Baffinland (see Section 3.3).

SECTION 6.0 - PERFORMANCE INDICATORS AND THRESHOLDS

The performance indicators for the pit/quarry are visual and depend on regular inspection and maintenance of the pit/quarry site. These indicators are:

- site safety and security
- general site condition and "housekeeping"
- positive drainage and absence of water pooling/ponding on the pit/quarry site
- ground/slope stability

SECTION 7.0 - MONITORING AND REPORTING REQUIREMENTS

Operation of the borrow pits and quarries must be monitored to ensure they are proceeding according to the Borrow Pit and Quarry Management Plan and remain in compliance with regulations and land-use permits. Monitoring focuses on:

- regular inspection of site-preparation measures:
  - site safety and security
  - site maintenance and general housekeeping conditions
- regular inspection of drainage and water management structures and assessment of their effectiveness
- determining if the granular resource material is still suitable for end-use
- establishing how much ground-ice is present in the material and behaviour and volume loss of the material as thawing occurs
- inspecting records of wildlife interactions and sightings
- reporting quantities of material extracted

Site monitoring is required for several years after closure to assess whether reclamation objectives have been met. Post-closure monitoring requirements will be specified in the land-use permits.

SECTION 8.0 - ADAPTIVE STRATEGIES

Baffinland is committed to continuous improvement in its work activities with the aim of reducing risks to the environment and improving operational effectiveness. Pre-development work will be especially subject to this approach, and will focus on the outcome of the overall Project application. Pre-development works will need to fit seamlessly into the overall Project plans should the development proceed to the next stage. The strategy at Baffinland is regular monitoring supported by operational change and adoption of other mitigation measures if warranted.

As per the requirements of Baffinland's EHS Management Framework, the company will conduct and document regular management reviews of its Borrow Pit and Quarry Management Plan. Such reviews will ensure monitoring results for the Borrow Pit and Quarry Management Plan are integrated with other aspects of the Project and that necessary adjustments are implemented as required. These reviews also provide a formal mechanism to assess effectiveness of management in achieving company objectives and maintaining ongoing compliance with Project permits and authorizations.

SECTION 9.0 - REFERENCES

1. Northern Land Use Guidelines, Pits and Quarries, INAC 2008
2. Drawing # H337697-7000-10-014-1107
3. Drawing H337697-7000-10-014-1102

SECTION 10.0 - ATTACHMENT

10.1 STEENSBY INLET QUARRY DESCRIPTION AND OPERATION

10.2 QUARRYING PERMIT APPLICATION

Steensby Quarry

Quarry Description and Operations Plan

Attachment 1: Steensby Inlet
Quarry Description and Operations Plan

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1.0 Introduction

The Mary River Iron Ore project requires a number of separate infrastructure components to be completed as part of the Pre-Development Works (PDW) in anticipation of the eventual Project Approval. The need for aggregate resources for PDW necessitates the opening of a quarry at Steensby. This document outlines the Site Description and Operations for the quarry for the PDW phase of the project only.

1.1 Need for an Operations Plan

The guidelines provided by the Nunavut Impact Review Board (NIRB) and Aboriginal Affairs and Northern Development Canada (AANDC) with regards to a Quarrying Permit Application state:

> *1. A Quarry Operations Plan is required with (this) application and must be approved by a Land Use Inspector prior to approval and issuance of the quarry permit **if**:*
> *(A) The volume being applied for is greater than 1,000 m3 and/or*
> *(B) The quarry site is being operated by multiple users*

The proposed quarry at Steensby will exceed the volume threshold of 1000 m^3, and a plan is required. This plan should be used in conjunction with the Pre-Development Borrow Pit and Quarries Management Plan, and other plans referred to in the document.

1.2 Site Description

The following physical description and environmental setting are summaries from the Mary River Draft Environmental Impact Statement (DEIS). For a more complete description, refer to Section 15 and 16 of the PDW Application, and Baffinland Iron Mines Corporation, Draft Environmental Impact Statement, January 2011, Volumes 6, 7 and 8.

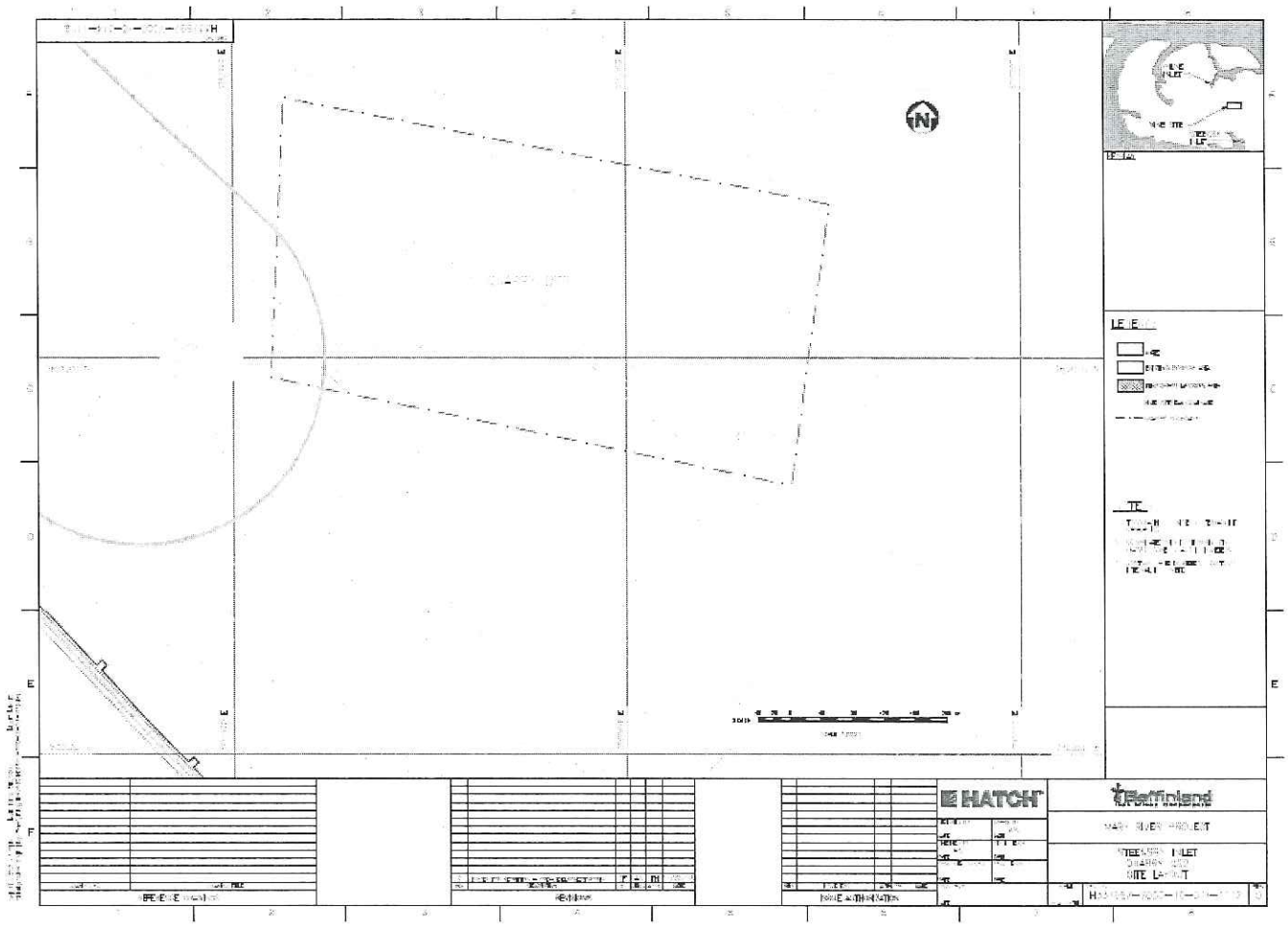
1.2.1 Physical Description

The layout for the proposed Steensby Quarry is shown in Figure 1. The basic quarry specifics are shown in Table 1 below:

Table 1: Steensby Quarry Description

Requirement	Description
NTS Map Sheet (1:50,000)	• 37 F/6 Edition 1 ASE Series A 713
Quarry Coordinates (UTM Zone 18)	• 595394E 7801092N (centre point) • 595064E 7801331N (NW extent) • 595761E 7801197N (NE extent) • 595706E 7800842N (SE extent) • 595051E 7800980N (SW extent)
Total Area of Quarry	• 242,800 m^2; 24.28 ha
Estimated Quarry Volume	• 300,000 m^3
Area of Existing Clearing	• No clearing is required as site is primarily exposed rock
Area of Proposed Quarrying	• Figure 1 shows the quarry extents. All operations will take place within these boundaries along the existing rock outcroppings.
Topsoil/Overburden Storage Area	• None is required as site is primarily exposed rock
Access Roads/Trails	• No roads currently exist to the site. As part of the PDW temporary access roads will be constructed to the quarry.
Camp Locations	• No camp will be built specifically for the quarry operation. Personnel will be housed at the expanded Steensby Inlet camp

Figure 1: Quarry Area



(refer to drawing H337697-7000-10-014-1112_0-1)

Topography varies considerably across the Project area. The land south of Cockburn Lake to Steensby Inlet becomes flatter with mainly undulating bedrock and boulder landforms. The proposed quarry site consists of large rock outcrops (Figure 2a and 2b).

Near surface bedrock is dominant in the Steensby Port area. Limited overburden is in the form of marine sediments and localized deposits of till. The majority of the overburden is located in depressions between the numerous bedrock outcrops and is typically overlain by a layer of vegetation and boulders. This is evident along the base of the rock outcrops at the quarry site.

The Project is located in a zone of continuous permafrost. The active layer through the Project area typically ranges from approximately 1 to 2 m but may be greater in areas where there is loose, sandy soil at the edges of lakes or ponds and less in areas with a substantial surface layer of wet organics. The proposed quarry site has limited areas where permafrost would be encountered.

1.2.2 Environmental Setting

In general, the proposed quarry area at Steensby was found to be primarily either exposed bedrock hills or bedrock very close to surface (see Figure 2a and Figure 2b). Lower depressions between the hills generally have a moderate layer of wet organics at surface and drainage is poor. These lower areas have a range of materials present from colluvial/alluvial type deposits to till with significant fines present. In areas where overburden was present, this generally comprised of a thin layer of organics, underlain by moist gravely sand with some silt. Within the Steensby area there is potential for thermokarst development in ice-rich organic soils along road alignment and potential for saline permafrost (i.e. high salt content pore ice). These do not appear to be present at the proposed quarry site. Fragile landscapes associated with frost/thaw sensitive till blankets and the presence of massive ground ice within glaciofluvial deposits are not present in the vicinity of the quarry site.

Only one surface water body exists within 200 m of the proposed quarry extents (see Figure 1). This is a small (<2 ha) lake at the south west corner, approximately 40 m from the quarry boundary. This lake drains via an ephemeral stream to the northwest. This lake is labeled as ST31 in the DEIS and is described as not containing arctic char.

Vegetation within the Mary River Project area is described in the Vegetation Baseline Study Report in Volume 6 of the DEIS (Appendix 6C). A total of 155 vascular plant species were recorded through the total project area, a vegetation classification system was developed and a species list was compiled. No plant species considered to be "rare" in Canada were found to occur in the survey locations. Vegetation is extremely limited in the area of the proposed quarry, and exists in small patches where small organic deposits occur around the base of the rock outcroppings.

Several species of songbirds and shorebirds migrate to this area annually to breed, and were predominately found in the various types of lowland habitats (river deltas, coastal plains, tundra, and near wetlands) that offer an abundant source of insects and vegetation for foraging and nesting habitat. This type of habitat is absent within and near the proposed quarry site. It should be noted that the Peregrine Falcon is known in the Steensby Inlet area and is rated as follows:

- COSEWIC Special Concern;
- SARA: Special Concern;
- CESCC: Secure

Although not located directly at the proposed quarry site, there is potential for interaction through operations.

Terrestrial wildlife on north Baffin Island is described in the terrestrial wildlife baseline report (Volume 6: Terrestrial, Appendix 6F). Terrestrial wildlife includes caribou, wolves, foxes, arctic hares, ermine, and small mammals. Occurrence of most wildlife species on north Baffin Island is relatively sparse, and this is expected to be especially true at the quarry site given the type of terrain.

.Marine mammals present in the area include polar bear, ringed seal, bearded seal, walrus, beluga whale and narwhal. With the exception of the polar bear, the quarry site is displaced from shoreline habitat sufficiently to avoid being regarded as suitable habitat.

No settlements or known hunting camps or areas are located in proximity to the proposed quarry site. There are currently no roads, buildings or structures at the site.

Figure 2a: Rock outcropping at Steensby Quarry Site

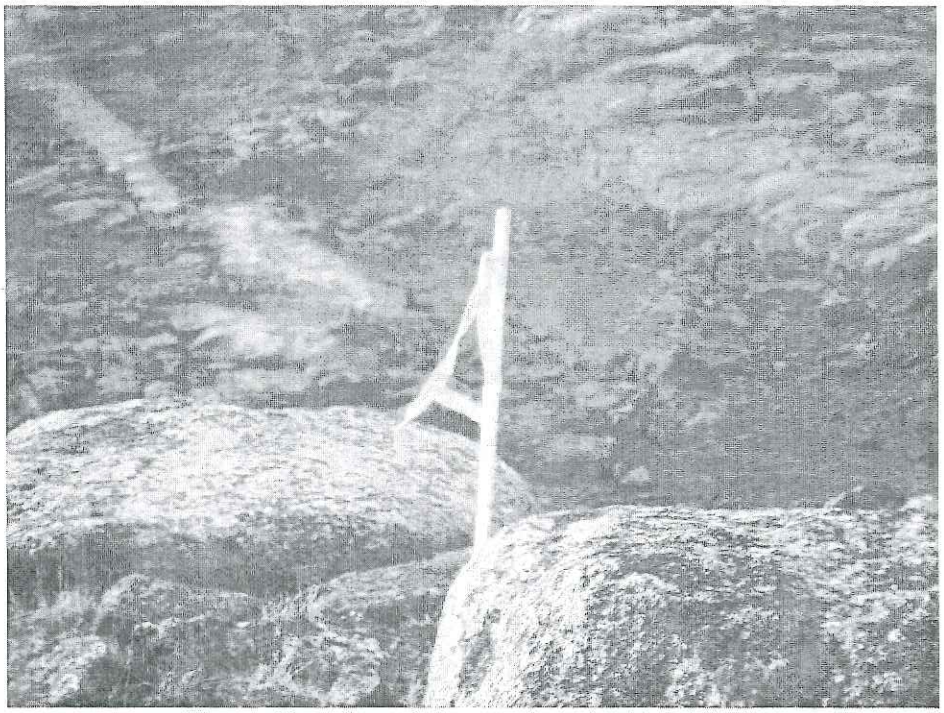


Figure 2b: View of Quarry Area looking West

2.0 Operation

The following outlines the operational activities for the proposed quarry at Steensby Inlet.

2.1 Organization and Reporting

Figure 3 shows the Pre-Development Work Site Organization Chart. The entire project will be under control of a Construction Director, with a Steensby Construction Manager directly reporting to him. An Area Coordinator Lead (AC) will report to the Steensby Construction Manager, and supervise AC#3, who will be directly responsible for quarry development and operations.

Common to all aspects of the Steensby construction will be a Project Administrator, a Safety Manager, and Engineering Site Lead, and an Environmental Coordinator.

All names and contact numbers for the above positions will be provided prior to the commencement of quarrying activities.

2.2 Quarry Set Up and Operation

The quarry will be accessed by a road from the main staging area road, and will be approximately 300m in length and constructed of granular material. Equipment transported to the quarry site will include:

- Crushing, screening and cleaning plants (delivered by sea lift in 2012)
- Drilling Equipment
- Rock hauling trucks
- Scrapers
- Excavators
- Blasting Gear

A small (<50 m^2) portable field office trailer will be placed at the quarry site. Equipment will be serviced at maintenance facilities located at the nearby laydown area.

2.3 Quarrying Activities

The following describes the general activities:

2.3.1Explosives Management and Blasting

Blasting operations will be carried out by Orica, an independent engineering firm specializing in blast monitoring and design. Orica will eventually be manufacturing and using an Ammonium Nitrate Emulsion (ANE). However, explosives for the development of the Steensby quarry will initially consist of pre-packaged explosives with up to 100,000 kg stored within the Steensby area. Pre-packaged explosives will gradually be replaced by ANFO mixtures once a temporary plant is erected and made operational. Transportation of explosives to and from the quarry site will occur from the temporary magazine storage area via road.

Drilling for the blasting will take place on a 5 foot grid pattern in an effort to minimize the rock size resulting from the blasting. Blasting management will be coordinated with the Area Coordinator responsible for quarries and borrow pits.

Blasting will take place on a day shift, seven days per week. An Explosives Management Plan for the project, and an ANE Bulk Temporary Plant document have been developed by Orica and are available for review (refer to Appendix B.10 of PDW Application).

2.3.2 Excavation and Crushing

The entire operation takes place in an area of permafrost, and groundwater is therefore not an issue. Drilling will be monitored to avoid creating run off and drainage issues. Washing of aggregate is not required, as the material will used for site preparation only. Quarrying will work along the exposed rock faces and will be terraced to minimize run off from the site. Efforts will be made during blasting operations to avoid creating depressions which might collect run off or melt waters

Drilling and extraction exercises may occur concurrently, depending on issues of safety and schedule.

Blast areas will be cleared by loader and/or scraper and put into rock trucks for transport to the crusher/screener facility. Loaders will feed rock to the crushing and screening operation.

Crushing and stockpiling areas will be located as near as practical to the southern extent of the quarry within easy access to the road location. Very little topsoil is present at the site, and would be considered as incidental material. As a result, no stockpiling area for topsoil will be required.

Crushing operations and screening operations will take place during the day shift, seven days per week. The operation will process all rock from the quarry, and may also process rock from other areas if required. Final material will be cleaned and stored by aggregate size in stockpiles for transport to the appropriate construction sites.

2.3.3 Site Security and Safety

Copies of all safety and management documents will be made available to on site personnel and mandatory training for operations at the Steensby quarry will take place. The Area Coordinator will ensure that operations are consistent with other management plans, terms and conditions of the issued permits, and safety procedures for the project.

Security signage will be posted at the entrance to the quarry. The remoteness of the quarry and the onsite presence of operations personnel will make perimeter fencing unnecessary. Audible warning systems will be employed for all blasting operations at posted intervals prior to any detonations.
Blasting and processing operations will be suspended if incursions into the quarry occur, or if observations of wildlife in the immediate quarry area are made. On site monitors for bear will provide warnings if approach by any animals is noted.

2.4 Site Management Measures

Best management practices for quarry operations will be followed for the Steensby Quarry. The following management activities will be incorporated into the site operations:

2.4.1 Drainage Management

The potential to alter drainage patterns and affect local water quality exists. Prior to quarry operation, the hydro-geological regime around the quarry site will need to be defined, and appropriate direction of flows from site managed to maintain the natural flow patterns as much as possible. The quarry is currently designed to avoid surface water courses and drainage channels by a minimum of 30 meters.

Sources of contamination from the operation that could affect water quality include dust from blasting and refueling for equipment. Blast residues from explosives will be managed by ensuring that all material is ignited during the blasting process. Vehicle fueling will be conducted at a centralized fueling facility off site that has proper containment and spill response capability. Fueling for non-moveable onsite equipment, such as generators, will take place in a secured area with approved spill containment.

2.4.2 Dust Management

The primary sources of dust at the Steensby Quarry are blasting, loading and crushing and screening of aggregates. Very little topsoil exists at the quarry site, and is not considered a primary source of dust. The management of dust will be accomplished by minimizing the creation of dust at source. Crushing activity will take place as far from surface water or dust sensitive areas as is practical at the site. If possible, protection from prevailing winds will be accomplished by situating the crushing operation to take advantage of the local topography for shelter. Transport of material will be subject to speed limit restrictions to help reduce dust.

Dust management activities will include monitoring surrounding snow for accumulations of quarry dust. If such deposits are noted, the snow layer will be removed prior to melting, and transported to the land farm.

2.4.3 Noise Management

Quarry activities will generate noise from equipment operation, blasting and crushing and screening operations. Noise receptors within the area are restricted to wildlife, as no dwellings or other land use that is sensitive to noise occur nearby.

During quarry operations, monitors will inform the quarry manager if significant wildlife activity, such as caribou movement or seal pull outs, is occurring. Depending on the concentrations and likely effect of the noise generating activity, the quarry manager may temporarily suspend operations

2.5 Monitoring

Operation of the Steensby quarry must be monitored to ensure compliance with the Borrow Pit and Quarry Management Plan and to meet the terms and conditions of the regulations and land-use permits granted for the project. Monitoring will focus on:

- regular inspection of site-preparation measures
- regular inspection of drainage from the quarry site
- quantification and quality estimates of the granular resource material
- monitoring for ground-ice presence
- monitoring for presence of avian, terrestrial and marine mammals in the area
- monitoring of water quality for changes
- monitoring of snow surrounding quarries for dust deposition
- reporting requirements as outlined in any permits

3.0 Supporting Management Plans

This plan should be viewed in concert with the following additional plans prepared for the pre-development works:

- Emergency and Spill Contingency Plan - Appendix B.1
- Surface Water and Aquatic Ecosystems Management Plan – Appendix B.4
- Wastewater Management Plan – Appendix B.5
- Terres trial Environnent Management - Appendix B.8
- Explosives Management Plan Appendix - B.10
- Abandonment and Reclamation Plan – Appendix B.12

4.0 Closure Activities

The abandonment of the predevelopment works (PDW) and site reclamation for the quarries and borrow pits will be undertaken if the Project is not developed or if approvals are not granted. If the Project's EIS application is approved the Steensby quarry will be integrated into the overall Project Close Out plan. However, separate closure plans for the Steensby quarry and borrow pit operations are required. Abandonment of the quarry will involve removing PDW materials, equipment and infrastructure and reclaiming the site to self sustaining productive ecosystem as near its original condition as is achievable and practical.

4.1 Abandonment of Active Quarry Face

The active quarry face will be terraced during operation to closely manage issues related to drainage and will not be altered for closure. The quarry development will preclude the creation of pits and depressions as much as possible.

4.2 Waste Disposal

All site waste will be collected and placed in appropriate containers for removal. Pre and post waste removal inspections will be made to ensure the thoroughness of the program. Waste will include metallic waste, construction material waste and domestic waste.

At the current time, no washroom facilities for personnel are expected at the quarry site. Any requirement for such facilities will be met by easily removable portable toilets. These will be operated in a manner consistent with regulations, and disposal will be in accordance to the waste management plans.

4.3 Stockpile Removal

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

- Large rock will be spread out on the landscape
- Medium sized rock will be used to re-contour affected areas to re-establish a more natural appearance to the area
- Small crushed rock will be used to assist in drainage restoration, and spread on the landscape to re-establish more natural contours

4.4 Road Closure

The Steensby quarry road is a relatively short (<300m) aggregate structure. The entire road bed will be removed, and the material utilized in re-establishing natural contours throughout the area.

4.5 Soil Remediation for Contaminated Soils

A pre-closure inspection of the entire quarry site will be made. Any contaminated soils, snow or ice packs, or overburden will be flagged. The extent of the contamination will be determined, and the material removed. Hydrocarbon contaminated soils or overburden will be transported to the land farm established on site. Other contamination, such as heavy metals or toxins, will require containerization for shipping off site to an appropriate facility (refer to Abandonment and Closure Plan, Appendix B.12).