MARY RIVER PROJECT

FINAL ENVIRONMENTAL IMPACT STATEMENT

VOLUME 10

ENVIRONMENTAL,HEALTH AND SAFETY MANAGEMENT

DOCUMENT STRUCTURE

Volume 1
Main Document

Volume 2
Consultation, Regulatory, Methods
- Consultation
- Regulatory Framework
- Impact Assessment Methodology

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- Project Description
- Workforce and Human Resources
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Volume 4
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- Population Demographics
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- Economic Development and Self Reliance
- Human Health and Well Being
- Community Infrastructure and Public Service
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Volume 6
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Volume 8
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- Sea Ice
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- Accidents and Malfunctions
- Transboundary Effects Assessment
- Navigable Water Assessment

Volume 10
Environmental, Health and Safety
- Management System
- Individual Management Plans

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PROJECT FACT SHEET

Location	• Located at Mary River, North Baffin Island. 1000 km north of Iqaluit, 160km south of Pond Inlet
Reserves	• Comprised of nine known iron ore deposits around Mary River. The current project is focused on Deposit No.1 with known reserves of 365 million tonnes estimated at >64 % iron
Construction Phase	• Construction of the project could commence as early as 2013 • Milne Port will support construction activities, receiving materials during the open water season and moving them to the Mine Site along the existing Tote Road • Construction materials will also be received at Steensby Port • 4 years to complete construction
Operational Phase **Open Pit Mine** **Processing**	• Operations will involve mining, ore crushing and screening, rail transport and marine shipping to European markets • Projected production of 18 million tonnes per year for 21 years • No secondary processing required; no tailings produced due to the high grade of ore
Rail Transport and Shipping	• A rail system will be built for year round transfer (~150 km) of ore to Steensby Inlet • A loading port constructed at Steensby Inlet will accommodate cape sized vessels • These specially designed ships will transport to the European market year round • Milne Port will be used to receive construction materials in the open water season and then very rarely to ship, during the open water season, oversized materials
Environment	• Baseline studies have been conducted by Baffinland since 2005 • Inuit Qaujimajatuqangit (traditional knowledge) information collected since 2006 • These baseline studies form the foundation for the environmental impact statement and provide information for the development of mitigation and management plans • Studies cover terrestrial environment, marine environment, freshwater environment, air quality, and resource utilization • Extensive ongoing consultation with communities and agencies • Monitoring during project activities will be important in validating predictions and mitigating potential affects
Social and Economic Benefits	• Mineral royalties will flow to NTI • Taxes will flow to governments of Nunavut and Canada • Baffinland finalizing negotiations with the Qikiqtani Inuit Association (QIA) for an Inuit Impact Benefits Agreement (IIBA) • During the four year construction period employment will peak at 2,700 people • Through the 21 years of operations about 950 people on the payroll each year
Closure and Post-Closure Phase	• Conceptual mine closure planning has been completed • Closure will ensure that the former operational footprint is both physically and chemically stable in the long term for protection of people and the natural environment • Post closure environmental monitoring will continue as long as needed to verify that reclamation has successfully met closure and reclamation objectives

EIS Document Structure

- **Executive Summary (Volume 1) –** The Executive Summary presents a concise non-technical overview of the Project and its effect on the current social and environmental conditions, and presents the significant findings, recommendations and actions contained in each of the other volumes.

- **Consultation, Regulatory Framework and Assessment Methodology (Volume 2)** – This volume presents the framework under which the EIS has been prepared. The first section presents the consultation Baffinland has undertaken with local communities, community groups, Inuit organizations, and local, territorial and federal governments. The second section describes the regulatory processes that are applicable to the review of the Project and the subsequent operation of the mine. The final section describes the approach to carrying out the impact assessment, including how valued components were identified, what criteria were used on the assessment, and how the significance of environmental impacts were determined.

- **Project Description (Volume 3)** – This volume describes the undertaking by project phase, including construction of the mine, operation, and a Closure and Reclamation Phase.

- **Human Environment Impact Assessment (Volume 4) –** This volume describes the current socio-economic conditions of the potentially affected communities in the North Baffin Region, as well as Iqaluit, located in South Baffin, which is a regional hub The potential impacts on local communities (both positive and negative) are described. Mitigation or actions to be undertaken to enhance positive effects and limit negative effects are presented. An evaluation focuses on the significance of residual impacts that may exist after mitigation plans have been implemented.

- **Atmospheric Environment Impact Assessment (Volume 5) –** This volume describes the climatic conditions in the region and measured at project development areas, air quality and noise baseline conditions, expected air and noise emissions that will result during different phases of the Project and an assessment of the potential impacts to local land users and wildlife. It describes the mitigation or actions that will limit negative air and noise effects, and evaluates the significance of residual impacts that may exist after the implantation of mitigation plans.

- **Terrestrial Environment Impact Assessment (Volume 6) –** This volume provides the impact assessment for the terrestrial (non-aquatic) environment, including geology, geochemistry and soils; vegetation; wildlife and wildlife habitat. It identifies the key environmental issues and wildlife species (valued ecosystem components, or VECs) focused on in the assessment, and summarizes current conditions, potential environmental impacts to the identified VECs that may result during all phases of the Project. It describes the mitigation or actions that will limit negative impacts to the VECs, and evaluates the significance of residual impacts that may exist after mitigation plans have been implemented.

- **Freshwater Aquatic Environment Impact Assessment (Volume 7) –** This volume provides the impact assessment for the freshwater aquatic environment, including hydrology, water quality, sediment, fish and fish habitat. It identifies the key environmental issues and species (VECs),

summarizes baseline conditions, explores the potential environmental impacts to the identified VECs, and describes mitigation or actions that will limit negative impacts to the VECs. It evaluates the significance of residual impacts that may exist after mitigation plans have been implemented.

- **Marine Environment Impact Assessment (Volume 8) –** This volume provides the impact assessment for the marine environment, including oceanography, sea ice, water quality and sediment, fish and fish habitat. It identifies the key environmental issues and species (VECs) focused on in the assessment, summarizes baseline conditions, explores potential environmental impacts to the identified VECs, and describes mitigation or actions that will limit negative impacts to the VECs. It evaluates the significance of residual impacts that may exist after mitigation plans have been implemented.

- **Sustainability Assessments (Volume 9) –** This volume describes the assessment of potential accidents and malfunctions, cumulative effects, effects on biodiversity, project sustainability, and the potential for transboundary effects.

- **Environmental Management (Volume 10) –** Volume 10 outlines Baffinland's Environmental, Health and Safety Management System, which defines the sequence of policy, planning, implementation and operation, checking and corrective actions, and management review processes that must be established to ensure that the Mary River Project is executed in an environmentally acceptable manner and in a spirit of continuous improvement. Volume 10 outlines the management, mitigation, monitoring, and institutional measures that are needed to mitigate, offset or reduce the environmental and social impacts of the Project to acceptable levels. It defines the actions that must be undertaken and identifies responsibilities for implementing the mitigation measures that are required, based on the Impact Assessments presented in Volumes 4 through 8.

FOREWORD

Volume 10 outlines Baffinland's Environmental Health and Safety (EHS) System, which is a framework that describes the requirements to develop and to maintain the elements of a management system in a manner relevant to:

- The Principle of Sustainability;
- ISO 26000:2010, *Guidance for Social Responsibility;*
- The practical application of the Precautionary Principle in the decision making process;
- The legal and regulatory requirements;
- The health and safety risks associated with the Mary River Project;
- The Project's environmental impacts; and
- On-going Stakeholder engagement.

Baffinland's Board of Directors is committed to EHS management. The Board of Directors has an active EHS Committee and EHS Charter. Baffinland has a governance policy with a Code of Business Conduct and Ethics which emphasises compliance with all regulatory aspects of Environmental, Health and Safety. The Governance Policy and the EHS Charter are posted on Baffinland's website.

Baffinland's EHS Management System is consistent with the world class *Occupational Health and Safety Management System (OHSAS) 18001*, dated 2007; the International Standards Organization *ISO 14001:2004 (Environmental) Management System Standards* and, the emerging *ISO Standard 26000:2010 related to Guidance for Social Responsibility*.

The EHS system defines the sequence of policy, planning, implementation and operation, checking and corrective actions, and, management review process that must be in place to ensure that the Mary River Project is executed in an environmentally and socially acceptable manner and in a spirit of continuous improvement.

In the context of this EHS system, Volume 10 introduces:

- The 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;
- The Environmental Protection Plan (EPP) which regroups detailed procedures and standards for the execution of field activities which will optimize environmental protection;
- The outline of Baffinland hazard identification, risk assessment, emergency response and spill contingency management plan;
- The purpose and content of the environment monitoring and mitigation plans which outline the specific mitigation measures applied to ensure minimal adverse impacts on the VECs;
- The outline of the health and safety management plan;
- The outline of the project stakeholders engagement plan;
- The outline of the human resources management plan;

- The reporting and documentation requirements for all environmental management plans; and
- The process of management review and adaptive changes.

In the Guidelines for the preparation of an Environmental Impact Statement (NIRB File No. 08MN053), November 16, 2009, NIRB requested that: "*The Proponent shall provide a risk assessment of those economic (e.g., the global economy and international markets), or other conditions (e.g., ownership transfer) that might also impair the implementation or effectiveness of proposed mitigation measures or management" (Section 9.1, page 61).* In response to this comment, Baffinland reiterates its commitment to carry out the Project in an environmentally and socially acceptable manner. The commitments made by Baffinland will be complied with independent of the commodity price cycle and will need to be honored in the event of an ownership transfer.

VOLUME 10

ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT

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Volume 10 - APPENDICES

Each appendix to Volume 10 is a stand-alone ESH Standard or Management Plan that is part of Baffinland's overall Environmental Management System. Some of these management plans are required for support of the Type A Water License Application (Appendix 3B of the FEIS). As the NWB requested that the Type A Water License Application be a "stand alone document", for presentation purposes, the management plans required for support of the Type A Water License Application are included as Attachments to the Type A Water License Application, in Appendix 3B of the FEIS. As a result, these documents are not duplicated as Appendices to Volume 10. For each reference to the DEIS, the numbering of Volume 10 Appendices has been retained in the FEIS. The following Table presents a cross reference for where each Management Plan is located within the FEIS and Type A Water License Submissions (Appendix 3B of FEIS Volume 3).

Table 1: EHS Management Plan Schedule Reviews and Updates				
Standard, Plan and Identification Number	FEIS Volume 10 Appendix	Type A Water License Application (FEIS Appendix 3B)	Next Review / Revision Date	Expected Implementation
EHS Framework Standard	10A-1		December 2012	In Effect
Hazard Identification and Risk Assessment Procedure	10A-2		December 2012	In Effect
Construction Risk Management Report	10A-3		During Detailed Design	
Environmental Protection Plan	10B	Attachment 5	As required	In Effect
Emergency Response and Spill Contingency Plan	10C-1	Attachment 5	April 2012	May 2012
Oil Pollution Emergencies Plan – Milne Port	10C-2	Attachment 5	April 2012	May 2011
Oil Pollution Emergencies Plan – Steensby Port	10C-3	Attachment 5	April 2012	May 2012
Explosives Management Plan	10C-4	Attachment 8	April 2012	May 2012
Hazardous Material and Hazardous Waste Management Plan	10C-5	Attachment 5	April 2012	May 2012
Air Quality and Noise Abatement Management Plan	10D-1		December 2011	September 2016
Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan	10D-2	Attachment 5	April 2012	May 2011
Waste Water Management Plan	10D-3	Attachment 5	April 2012	In Effect
Waste Management Plan	10D-4	Attachment 5	April 2012	In Effect

• Landfarm Manuals	10D-4	Attachment 5	April 2012	
• Landfill Manuals	10D-4	Attachment 5	April 2012	
• Incinerator Manuals	10D-4	Attachment 5	April 2012	
Waste Rock Management Plan	10D-5	Attachment 5	September 2015	2015
• ARD/ML Program	10D-5	Attachment 5	September 2015	2015
Borrow Pits and Quarry Management Plan	10D-6	Attachment 6	April 2012	EPP-2.17 In Effect
Fish Habitat Compensation	10D-7		January 2012	2012 to 2015
Roads Management Plan	10D-8		April 2012	
Railway Maintenance Management Plan	10D-9.1		December 2016	2017
Railway Emergency Response Plan	10D-9.2		December 2016	2017
Shipping and Marine Wildlife Management Plan	10D-10		May 2012	2012
Terrestrial Environmental Management and Monitoring Plan	10D-11		December 2011	Several EPP procedures in Effect
Environmental Monitoring Plan	10D-12	Attachment 5	December 2011	2017
Environmental Effects Monitoring Framework	10D-13		December 2011	2017
MMER Environmental Effects Monitoring Study Design Framework	10D-14		December 2011	2017
Health and Safety Management Plan	10E	Attachment 5	December 2011	In Effect

Stakeholders Engagement Plan	10F-1		December 2011	In Effect
Cultural and Heritage Resource Protection Plan	10F-2		December 2011	In Effect
Human Resources Management Plan	10F-3		December 2011	April 2012
Preliminary Closure and Reclamation Plan	10G	Attachment 10	December 2011	2035

List of Abbreviations and Acronyms

AANDC	Aboriginal Affairs and Northern Development Canada
Baffinland	Baffinland Iron Mines Corporation
COI	Community of Interest
CTA	Canadian Transportation Agency
DFO	Department of Fisheries and Oceans
ESIA	Environmental Social Impact Assessment
EIS	Environmental Impact Statement
EMS	Environmental (Health and Safety) Management System
EPP	Environmental Protection Plan
EMMP	Environmental Monitoring and Mitigation Plan
EPCM	Engineering, Procurement, Construction, and Management
ERP	Emergency Response Plan
EHS	Environment, Health and Safety
NBRLUP	North Baffin Regional Land Use Plan
NGO	Non-Governmental Organization
NIRB	Nunavut Impact Review Board
NRCan	Natural Resources Canada
NWB	Nunavut Water Board
OPEP	Oil Pollution Emergencies Plan
QIA	Qikiqtani Inuit Association
SEP	Stakeholder Engagement Plan
VEC	Valued Ecosystem Components
VSEC	Valued Socio-Economic Components
km	kilometre
m	metre

mm	millimetre
Mt/a	million tonne per annum
MW	megawatt
QA/QC	quality assurance / quality control
VEC	valued ecosystem component
VSEC	valued socio-economic component
BOD_5	Biological Oxygen Demand
FCC	Fecal Coliform Count
O&G	Oil and Grease
TSS	Total Suspended Solids

SECTION 1.0 - ENVIRONMENTAL, HEALTH AND SAFETY MANAGEMENT FRAMEWORK

Baffinland is committed to the principles of Sustainability, to the protection of the health and safety of employees, to the protection of the environment and its biodiversity, and, on-going community involvement and participation in the Mary River Project. The Company embraces the principle of Social Responsibility as outlined by the emerging voluntary International Standard, ISO 26000:2010, *Guidance for social responsibility.*

Baffinland believes that providing sound environmental management and a proactive community involvement embodies these principles and will protect the communities near our Project. Baffinland also believes that providing a healthy and safe workplace improves the morale and attentive behavior of its employees.

Baffinland's Environmental, Health, and Safety (EHS) Management System provides a framework for the practical implementation of the above principles. This EHS Management System describes the specific requirements that will enable the Company to develop and to maintain the elements of a socially responsible management system in a manner relevant to:

- The Principle of Sustainability;
- The practical application of the Precautionary Principle in the decision making process;
- The legal and regulatory requirements;
- The health and safety risks associated with the Mary River Project;
- The Project's environmental impacts;
- On-going stakeholder engagement; and
- Socially responsible community involvement and human resources practices.

Baffinland's EHS Management Framework Standard defines the sequence of policy, planning, implementation and operation, checking and corrective actions, and management review processes that must be established to ensure that the Mary River Project is executed in an environmentally acceptable manner and in a spirit of continuous improvement. This Standard and describes the 18 key elements of an effective EHS Management System (Table 10-1.1). The relationships between these 18 elements are listed below and illustrated in Figure 10-1.1.

Baffinland' s EHS Management System is consistent with the *Occupational Health and Safety Management System* (OHSAS) 18001, dated 2007; and, the ISO 14001:2004 *(Environmental) Management System Standards* as well as the emerging ISO 26000:2010 voluntary standard for *Guidance for Social Responsibility*. This EHS Management System facilitates the integration of occupational health and safety, environmental management systems and the application of the Precautionary Principle throughout the life of the Project.

Table 10-1.1 Core Principles of Continuous Improvement and the 18 Elements of an Effective EHS Management System

Core Principle	Element of the EHS Management System
Policy	1.0 Sustainable Development Policy
Planning	2.0 Methodology for Hazard Identification and Risk Assessment Methodology
	3.0 Environmental Aspects
	4.0 Legal and Other Requirements
	5.0 EHS Objectives and Targets
	6.0 EHS Management Plans
Implementation and Operation	7.0 Structure and Responsibility
	8.0 Training and Awareness
	9.0 Communication and Consultations
	10.0 Documentation of the Baffinland EHS Management System
	11.0 Document and Data Control
	12.0 Operational Control
	13.0 Emergency Preparedness and Response
Checking and Corrective Action	14.0 Performance Measurement and Monitoring
	15.0 Accidents, Incidents, Non-Conformances and Corrective and Preventive Actions
	16.0 Records and Records Management
	17.0 Audits and Assurance
Review	18.0 Management Review

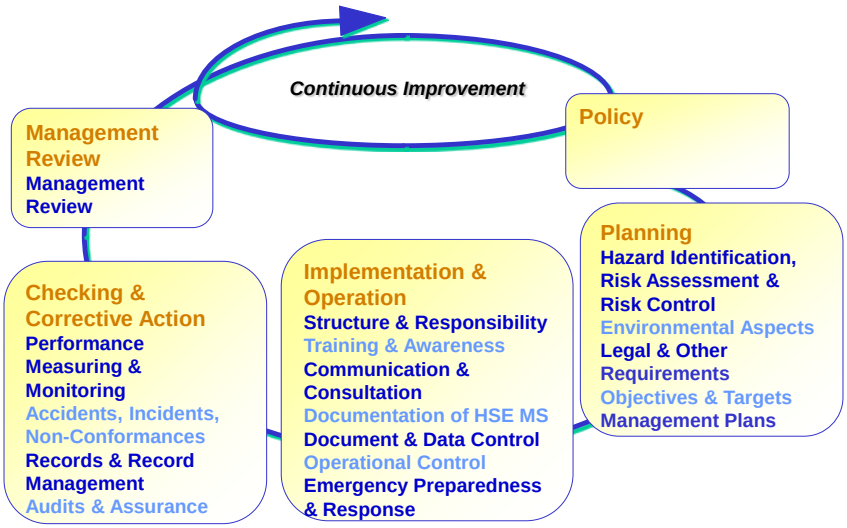


Figure 10-1.1 Relationships between the core principles and the 18 elements of an effective EHS Management System

1.1 SUSTAINABLE DEVELOPMENT POLICY

Baffinland concurs with NIRB's interpretation of achieving progress towards sustainable development.

- *Preservation of ecosystem integrity, including the capability of natural systems (local and regional) to maintain their structure and functions and to support biological diversity;*
- *Respect for intergenerational equity. That is, the right of future generations to the sustainable use of renewable and non-renewable resources depends on our commitment to those resources today; and*
- *The attainment of durable social and economic benefits.*

(Source: NIRB EIS Guidelines- Nov. 2009)

Baffinland' Sustainable Development Policy is presented in below.

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**

- 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. **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.
- We continuously seek to use energy, raw materials and natural resources more efficiently and effectively. We strive to develop pioneering new processes and more sustainable practices.
- We understand the importance of closure planning. We ensure that an effective closure strategy is in place at all stages of project development and that progressive reclamation is undertaken as early as possible to reduce potential long-term environmental and community impacts.

3. **INVESTING IN OUR COMMUNITIES AND PEOPLE**

- We respect human rights and the dignity of others. We honour and respect the unique culture, values and traditions of the Inuit people.
- We contribute to the social, cultural and economic development of sustainable communities adjacent to our operations.
- We honour our commitments by being sensitive to local needs and priorities through engagement with local communities, governments, employees and the public. We work in active partnership to create a shared understanding of relevant social, economic and environmental issues, and take their views into consideration when making decisions.

4. **TRANSPARENT GOVERNANCE**

- We will take steps to understand, evaluate and manage risks on a continuing basis, including those that impact the environment, employees, contractors, local communities, customers and shareholders.
- We ensure that adequate resources are available and that systems are in place to implement risk-based management systems, including defined standards and objectives for continuous improvement.
- We measure and review performance with respect to our environmental, safety, health, socio-economic commitments and set annual targets and objectives.
- We conduct all activities in compliance with the highest applicable legal requirements and internal standards
- We strive to employ our shareholder's capital effectively and efficiently. We demonstrate honesty and integrity by applying the highest standards of ethical conduct.

Tom Paddon
President and Chief Executive Officer
September 2011

1.2 PRECAUTIONARY APPROACH

Principle 15 of the Rio Declaration on the Environment and Development (1992) states:

"Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."

The Precautionary Principle recognizes that lack of certainty regarding threats of environmental harm should not be used as an excuse for not taking action to avert that threat. It also recognizes that delaying action until there is compelling evidence of harm will often mean that it is then too costly or impossible to avert the threat.

The use of the Precautionary Principle promotes action to avert risks of serious or irreversible harm to the environment. Baffinland integrates the application of the Precautionary Principle in its EHS management practices. The Company's approach consists of:

- Incorporating the Precautionary Principle within the Framework of its EHS Management System:
  - Incorporate the Precautionary Principle explicitly into appropriate legal, institutional and policy frameworks for environmental protection;
  - Integrate the application of the Precautionary Principle with the application of and support for other relevant principles;
  - Develop clear and context specific obligations and operational measures with respect to environmental protection and environmental management;
  - Include relevant stakeholders in a transparent process of assessment, decision-making and implementation; and
  - Base precautionary decision-making on the best available information, including that relating to human drivers of threats, and traditional knowledge.
- Defining the issues/concerns, options and consequences:
  - Characterize the *issues/concerns*, assess the uncertainties surrounding ecological, social and economic drivers of changes;
  - Identify the available actions to address *issues/concerns*, and assess the likely consequences of these various courses of action and inaction; and
  - Allocate roles and responsibilities for providing information and evidence of *issues/concerns* and/or safety according to who is proposing a potentially harmful activity, who benefits from it, and who has access to information and resources.
- Devising the appropriate precautionary measures:
  - Specify that precautionary measures are being taken and be explicit about the uncertainty to which the precautionary measures are responding;

- In applying the Precautionary Principle adopt measures that are proportionate to the potential *issues/concerns*; and
- Consider social and economic costs and benefits when applying the Precautionary Principle and where decisions would have negative impacts on the community explore ways to avoid or mitigate these negative impacts.

- Implementing effectively:
  - Use adaptive management approach which includes the following core elements:
    - Monitoring of impacts of management or decisions based on agreed indicators;
    - Promoting research, to reduce uncertainty;
    - Ensuring periodic evaluation of the outcomes of implementation, drawing of lessons and review and adjustment, as necessary, of the measures or decisions adopted; and
    - Establishing an efficient and effective compliance system.

1.3 INUIT PARTICIPATION

Baffinland appreciates the time and effort committed by QIA to the review of the DEIS and the Company reiterates that underlying the economic provisions of the IIBA is the principle of mutual benefit for Inuit and for the Company from the Project.

Article 26, "Inuit Impacts and Benefits Agreement of the Nunavut Land Claims Agreement", requires a Major Development Project to finalize an Inuit Impact Benefits Agreement (IIBA) with the Designated Inuit Organization prior to the start-up date of the Project. The QIA and Bafflinland have been discussing the terms of the IIBA. Some of the benefits under discussion for Inuit include financial participation, a comprehensive training strategy, and target levels of Inuit employment, capacity building, business opportunities, and Inuit content considerations in contracting.

The Parties are considering the creation of a senior Executive Committee composed of Baffinland and QIA executive's to oversee the implementation of economic, social/cultural and environmental provisions of the IIBA. In addition a joint Management Committee consisting will be formed to monitor the Project on a continuous basis and review progress of the Project as it relates to the goals and objectives established.

The Management Committee will report to the Executive Committee. As part of the proposals Baffinland has agreed to fund the operation of these two committees as well as to fund a position for QIA representatives as IIBA Coordinator and Inuit Employment and Training Coordinator.

1.4 TRADITIONAL KNOWLEDGE

Baffinland recognizes the importance of Traditional Knowledge (TK) and that it is an *"indispensable element both as baseline information and as an Inuit lens through which impact analyses can be better understood and can also result in a more active and meaningful community engagement" (NIRB EIS Guideline – Nov. 2009)*. Baffinland will continue to consult with the QIA, and will use the IQ data as part of the base data phase and incorporate this data into the environmental mitigation and management plans (EMMP). As an example, the continuation of a harvest study is in the planning stages, and may be carried out in conjunction with the Qikiqtani Inuit Association. This harvest study will monitor caribou and marine mammal harvests in relation to the Project.

Baffinland will continue, once construction begins, the practice of retaining an "Elder-in-residence" or ombudsman on-site to advise and counsel on TK issues. This person will also be involved in the Management Reviews of the various plans (refer to Section 10).

The Company's Stakeholder Engagement Plan and Human Resources Plan outline other strategies by which the objective of integrating TK in EHS management practices will be achieved.

1.5 STAKEHOLDERS ENGAGEMENT

The Project will affect primarily the five closest North Baffin communities of Arctic Bay, Clyde River, Hall Beach, Igloolik and Pond Inlet; Iqaluit, the territorial capital of Nunavut and the commercial gateway to Baffin Island, will experience increased activity. These communities comprise the Project's social zone of influence and were selected based on existing and historical socio-economic and/or ecosystemic ties to the Project area and, in some cases, their geographic proximity to the Project.

Stakeholder Engagement is a necessary component of the application of sustainability and the emerging ISO 26000:2010 voluntary standard on Guidance for Social Responsibility. It relies on extensive consultation with local communities and draws on the local knowledge of the environment. Baffinland has undertaken significant consultation and engagement practices with these local communities and focuses on maintaining and improving existing stakeholder relationships. Engagement will be of particular importance during the construction Phase of the Project, as relationships are developed and solidified.

1.6 ENVIRONMENTAL RISK MANAGEMENT

Baffinland identifies Environmental, Health and Safety Risks on a regular basis. Baffinland prepares, maintains and updates operational controls of its activities, products or services that it can control, and over which it can be expected to have an influence. The Company Standard for carrying out risk assessments is listed as in Appendix 10A-2.

The protection of biodiversity is embedded in those operational controls. Baffinland can then determine those aspects that have or can have significant impacts on the environment. The Company needs to ensure that the aspects related to these significant impacts are considered in setting environmental objectives and targets.

1.6.1 Environmental and Social Impact Assessment (ESIA)

Environmental and Social Impact Assessment is an important tool for ensuring that environmental protection is integrated into project planning and decision-making and that relevant environmental and social interfaces are considered. The ESIA process provides a structured approach to considering the environmental, economic and social consequences of options and alternatives. The ESIA is applied to all stages of the Mary River Project life cycle and takes into consideration the principles of:

- Sustainability,
- Precautionary Principle,
- Stakeholders Involvement,
- Incorporation of Traditional Knowledge,
- Biodiversity , and
- Climate Change.

The impact assessments within Volumes 4 through 8 of the Environmental Impact Statement (EIS) predict and assess the magnitude of potential Project-related impacts of the Project and identify the specific mitigation measures that are required to reduce those impacts to insignificant levels. Volume 9 incorporates assessments on sustainability, biodiversity, trans-boundary and cumulative effects.

1.6.2 Environmental Design Guidelines

The establishment of Environmental Design Guidelines at an early stage in the Project life cycle enabled Baffinland to avoid many potentially adverse impacts on the VECs and VSECs identified and discussed in Volumes 4 through 8 of the EIS.

The Environmental Design Guidelines presented in Section 3 are central to environmental protection practices such as siting of the facilities, the establishment of setbacks from ecologically sensitive areas, design guidelines adapted to the climatic extremes of the area, and energy efficiency. Energy use is linked to climate change due to green house gas emissions (GHG).

1.6.3 Environmental Protection Plan (EPP)

The EPP provides activity specific, plainly written, environmental protection procedures to help ensure a high level of environmental protection throughout the life of the Project. The EPP summarizes the routine mitigation actions and monitoring specified in the various Environmental Monitoring and Mitigation Plans (Section 1.5.4). It is the objective of Baffinland to apply appropriate and effective management practices to advance environmental management to all facets of its operations. Officers, management, employees and contractors are all responsible for incorporating environmental protection measures into their work responsibilities. This is largely accomplished by means of appropriate distribution and communication of the EPP at the Project Site.

1.6.4 Environmental Monitoring and Mitigation Plan

The Environmental Monitoring and Mitigation Plans (EMMP) take over where the Impact Assessment and the Environmental Design Guidelines leave off. The EMMPs:

- Define the processes by which the mitigation measures will be implemented;
- Define the monitoring systems that will be put into place in order to assess and document the adequacy of each mitigating action in reducing impacts to insignificant levels;
- Define the roles and responsibilities of individuals responsible for implementation and follow up;
- Define the reporting and documentation requirements; and
- Establishes the management review requirements and the process for continuous improvement.

1.6.5 Environmental Effects Monitoring Framework

The Metal Mining Effluent Regulations (MMER), which were promulgated in 2002 under the *Fisheries Act*, require metal mines to undertake environmental effects monitoring (EEM) to ensure the adequate protection of all receiving aquatic environments. The regulations stipulate that the owner or operator of an operating mine conduct effects monitoring studies of the potential effects of effluent on the fish population, on fish tissue and on the benthic community at the final discharge points.

1.6.6 Audits, Management Reviews and Assurance

It is important that senior management regularly review the EHS Management System to determine its continued suitability, adequacy and effectiveness. Baffinland conducts audits to determine the degree of implementation of the Baffinland EHS Management System, and to verify the performance of the EHS Management System. The results of audit(s) and management review(s) can form the basis for the annual written statement of assurance by management on the effectiveness of the EHS Management System.

1.6.7 Continuous Improvement and Adaptive Management

Baffinland's EHS system defines the sequence of "***Policy – Planning – Implementation and Operation – Checking and Corrective Actions – Management Review Process***" that must be in place to ensure that the Mary River Project is executed in an environmentally and socially acceptable manner and in a spirit of **continuous improvement** and employs adaptive management principles.

The EHS system and its associated management plans are ***Life Of Project*** Management Plans. They apply from the onset of the exploration Phase, through pre-development activities, construction, Operations and Closure Phases of the Project. The application of the continuous improvement principle and adaptive management (***Policy – Planning - Checking and Corrective Actions – Management Review Process)*** ensures that the environmental management plans are appropriate for the level of activities on site at all times. Adaptive management is the application of mitigation measures when review processes identify potential adverse effects. The application of adaptive management measures could require the approval of a regulatory authority. Such practices will be discussed with the Communities and QIA as part of our ongoing external communication efforts.

1.7 RESOURCES

Baffinland provides adequate resources to implement and maintain the EHS Management System including the necessary human, material and financial resources.

1.8 RESPONSIBILITIES

- The Chief Operating Officer of Baffinland is responsible for obtaining an annual written statement of assurance regarding the degree of implementation and effectiveness of the Baffinland EHS Management System from each key operating department.
- Management is responsible for the EHS performance, the implementation of the EHS Management System, the maintenance of the EHS Management System, and for providing an annual statement of assurance to the Chief Operating Officer.
- Personnel with health and safety, and environmental responsibility are responsible for advising and assisting management in meeting their EHS Management System responsibilities.
- The Manager, Sustainable Development or designate is responsible for reviewing and updating the Baffinland EHS Management System document and providing functional oversight and advice regarding the implementation of the EHS Management System.
- Employees will comply with all regulations, wear protective equipment, promptly report and Health, Safety and Environmental incidents. Employees will follow all Operational Controls.
- The public will provide input on EHS management plans through public meetings. Citizens will be able to access the Baffinland Policy on Sustainability.

SECTION 2.0 - IMPACTS AND MITIGATION MEASURES BY PROJECT PHASE

The EIS contains a description of the Project (Volume 3) and presents an analysis of the predicted social and environmental effects that its development, operation, and reclamation will have on valued ecosystem components (VECs) and valued socioeconomic components (VSECs) (Volumes 4 through 8). It also assesses the significance of those impacts on each resource media.

In compliance with Baffinland EHS Standard (Appendix 10A), the hierarchy for the Project adverse impact avoidance is presented in Figure 10-2.1.

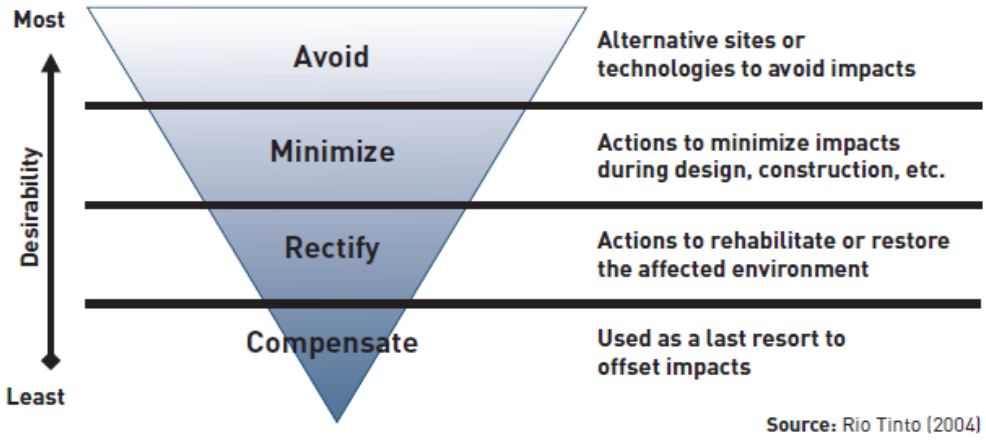


Figure 10-2.1 Hierarchy for Project Adverse Impact Avoidance

In this context, comprehensive Environmental Design Guidelines were established at the on-set of the design phase (refer to Section 4). These guidelines focused on avoidance of impact on the VECs and VSECs identified for the Project. The Environmental design guidelines focused on:

- Decisions regarding the siting of the facilities, roads and railway alignment and routing, avoidance of ecologically or culturally sensitive areas in order to avoid adverse impacts;
- The selection and use of the most appropriate technologies for the extreme climatic conditions encountered on Baffin Island; and
- Emissions and water quality standards.

Where impacts on the VECs and VSECs are unavoidable, mitigation measures are introduced in order to minimize impacts during the construction, Operations and Closure Phases of the Project. Mitigation measures may consist of:

- Physical structures, temporary or permanent, such as silt barrier, diversion ditches, retention ponds, fences, etc., (incorporated during the construction Phase or Operations Phase - such mitigation measures are the subject of the Environmental Monitoring and Mitigation Plans); or
- Operating procedures (activity based) that are designed to reduce the undesirable impacts by the various activities of the Project (activity based instructions outlined in the EPP and the Environmental Monitoring and Mitigation Plans).

Where residual impacts are identified or expected, actions are taken to rehabilitate or restore the affected site once construction is completed and at closure.

Compensating for the residual impacts by replacing or providing substitute resources or environment is used as a last resort to offset the Project impact.

While the EHS Management System looks at all potential impacts, the Environmental Monitoring and Mitigation Plans (EMMP) focus only on those mitigation measures that require specific action items for their implementation. It presents the actions, plans, and/or compensatory measures that are required to implement those mitigation measures to reduce potentially significant adverse environmental impacts to insignificant levels.

Table 10-2.1 presents an overview of how Baffinland has addressed the issues/concerns for each identified VEC and VSEC either with the Environmental Design Guidelines, the EPP or a specific EMMP.

Table 10-2.1 Environmental Monitoring and Mitigation Plans to Reduce Impacts on VECs and VSECs

VECs	Issues/Concerns	Environmental Monitoring and Mitigation Plan
Landforms	- Glacial features (ground ice) - Unique landform	Environmental Design Guidelines Surface Water Management Plan
	- Permafrost and Soils	Environmental Design Guidelines Surface Water Management Plan
Archaeological sites	Disturbance of archaeological sites	Environmental Design Guidelines, Cultural and Heritage Resource Protection Plan
	Removal of artifacts	Environmental Protection Plan, Cultural and Heritage Resource Protection Plan
Paleontological sites	Disturbance of paleontological sites	Environmental Design Guidelines, Cultural and Heritage Resource Protection Plan
	Removal of fossils	Environmental Protection Plan, ,Cultural and Heritage Resource Protection Plan
Air quality	Fugitive dust from: - land disturbance and roads - quarries and borrow pits - mining operation and waste rock stockpile - material handling (crushing plant, conveyors, stackers, stockpiles and ship loading)	- Environmental Design Guidelines - Environmental Protection Plan - Air Quality and Noise Abatement Management Plan

Table 10-2.1 Environmental Monitoring and Mitigation Plans to Reduce Impacts on VECs and VSECs (Cont'd)

VECs	Issues/Concerns	Environmental Monitoring and Mitigation Plan
Air quality	Emissions from: - mobile equipment - power plant (SO_X, NO_X, PM_{10}) - waste incinerator - ship	- Environmental Design Guidelines - Environmental Protection Plan - Air Quality and Noise Abatement Management Plan
	Carbon balance and greenhouse gas emissions	Environmental Design Guidelines
Noise & Vibrations	Blasting (construction: port construction, Cockburn lake, railway construction, etc.) Blasting from open pit mine Blasting from quarries	- Environmental Design Guidelines - Environmental Protection Plan - Air Quality and Noise Abatement Management Plan
	General construction activities	
	Crushing operation – ore and quarries	
	Rail traffic	
	Road traffic	
	Ship traffic	
	Aircraft – arrivals/departures	
Water Quality	Site runoff from: - site preparation (blasting, construction) - ore stockpiles - waste rock stockpile - crushing plant, maintenance area and other facilities - roads and laydown areas - port facilities - maintenance yards	- Environmental Design Guidelines - Environmental Protection Plan - Wastewater Management Plan - Surface Water, Aquatic Ecosystems, Fish & Fish Habitat Management Plan - Waste Management Plan - Waste Rock Management Plan - Explosives Management Plan
	Mine pit water (ammonia, nitrates, TSS from blasting)	- Surface Water, Aquatic Ecosystems, Fish & Fish Habitat Management Plan - Waste Rock Management Plan

Table 10-2.1 Environmental Monitoring and Mitigation Plans to Reduce Impacts on VECs and VSECs (Cont'd)

VECs		Issues/Concerns	Environmental Monitoring and Mitigation Plan
Water Quality		Sewage Treatment Plants water discharge quality	- Wastewater Management Plan
		Rail ballast and cut/fill contributions to watercourses along rail route and roads	- Environmental Design Guidelines - Environmental Protection Plan
		Runoff plume from Steensby Island ore stockpile	- Surface Water, Aquatic Ecosystems, Fish & Fish Habitat Management Plan
		Ballast water discharge	- Shipping Management Plan
Water Quantity		Lake drawdown effects - camps and drilling	- Environmental Design Guidelines - Environmental Protection Plan - Surface Water, Aquatic Ecosystems, Fish & Fish Habitat Management Plan - Road Management Plan
		Channel and ecosystem stability post water diversions	
		Ice damming	
		Volume reduction (drawdown, ice damming, incidental water takes during construction)	
Fish Habitat		Habitat loss or alteration for: - site facilities - road creek/stream/river crossings - railway creek/river crossings	- Environmental Design Guidelines - Environmental Protection Plan - Surface Water, Aquatic Ecosystems, Fish & Fish Habitat Management Plan - Road Management Plan - Fish Habitat Fish Habitat Compensation
Fish	Arctic char	Change to fish health, habitat and population	- Environmental Design Guidelines - Environmental Protection Plan - Surface Water, Aquatic Ecosystems, Fish & Fish Habitat Management Plan - Road Management Plan - Fish Habitat Compensation
		Water quality changes	
		Discharge and intake structures	
		Blasting	
		Metal accumulation and taste (consumptive	
		Increased fishing pressure	- Environmental Protection Plan
Vegetation	- Berries - Plants important for wildlife	Destruction of rare species and species at risk	- Environmental Design Guidelines - Environmental Protection Plan - Terrestrial Environment Management Plan
		Surface disturbance (temporary or permanent loss of vegetation)	

Table 10-2.1 Environmental Monitoring and Mitigation Plans to Reduce Impacts on VECs and VSECs (Cont'd)

VECs		Issues/Concerns	Environmental Monitoring and Mitigation Plan
Vegetation	Berries - Plants important for wildlife	Airborne dust effects to abundance and diversity Metal uptake and resultant effects to other VECs Alien invasive species	
Birds	-Loons (Red-throated) -Common Eider - Songbird -Snowy Owl	Destruction of nests during construction Disturbance of nesting and habitat (mining activities, flights) Disturbance of nests and habitat in transportation corridors and Sheardown Lake Interruption of food chain (songbirds) Aircraft collisions at Steensby Port	- Environmental Design Guidelines - Environmental Protection Plan - Terrestrial Environment Management Plan
	-Peregrine Falcon	Destruction of nests during construction (Gyrfalcon nest along Cockburn Lake rail cut) Disturbance of nesting and habitat (mining activities, over flights, etc.) Interruption of food chain (songbirds)	- Environmental Design Guidelines - Environmental Protection Plan - Terrestrial Environment Management Plan
	- Sea birds	Ross' Gull (species at risk) - potential wake effect from ships Ross' Gull (species at risk) - disturbance to feeding due to open water ship traffic	- Environmental Design Guidelines - Environmental Protection Plan - Terrestrial Environment Management Plan
	-Snow Geese	Disruption of moulting and staging habitat (different locations and timing) - when birds are vulnerable due to nutritional stress Aircraft collisions at Steensby Port	- Environmental Design Guidelines - Environmental Protection Plan - Terrestrial Environment Management Plan
Terrestrial Wildlife	Caribou	Disturbance and destruction of habitat Interruption of migratory process and routes by railway, road, ship track, camps Unsafe passage across/through Project infrastructure (i.e., rail cuts, rail embankments and snow banks, open pit)	- Environmental Design Guidelines - Environmental Protection Plan - Road Management Plan - Railway Management Plan

Table 10-2.1 Environmental Monitoring and Mitigation Plans to Reduce Impacts on VECs and VSECs (Cont'd)

VECs		Issues/Concerns	Environmental Monitoring and Mitigation Plan
Terrestrial Wildlife	Caribou	Change in abundance/distribution in RSA	
		Interruption of hunting / increased hunting due to increased familiarity/knowledge of the area	- Environmental Design Guidelines - Environmental Protection Plan
		Integrating/obtaining TK knowledge	
		Overhead flights disturbance	
	Carnivores	Disturbance of den habitat	- Environmental Design Guidelines - Environmental Protection Plan
		Habituation and feeding	
Marine Mammals	All mammals	Ice breaking through the sea ice along route (Noise effects, potential habitat changes and potentially new access for wildlife - even pack ice can be pretty solid)	- Shipping Management Plan
		Collisions with ships 1. Open water 2. Pack ice where congregations of beluga are trapped	
		Habitat loss due to Project facilities footprint (docks, blasting/dredging)	- Environmental Design Guidelines - Environmental Protection Plan - Emergency Response Plan & Spill Contingency Plan - Shipping Management Plan - Wastewater Management Plan - Surface Water, Aquatic Ecosystems, Fish & Fish Habitat Management Plan
		Habitat alteration within the water column or in the seabed (ballast water, dust plume from stockpiles, sewage effluent discharge, prop wash)	
		Oil spill impacts	
	Polar Bear	Human - bear interactions	-Environmental Design Guidelines - Environmental Protection Plan
	Beluga Whale	Ability to acclimatize to disturbance	- Shipping and Marine Wildlife Management Plan
	Narwhal Whale	Disturbance to important summering habitat in Milne Port	
	Bowhead Whale	Ability to acclimatize to disturbance	
	Walrus	Ability to acclimatize to disturbance	

Table 10-2.1 Environmental Monitoring and Mitigation Plans to Reduce Impacts on VECs and VSECs (Cont'd)

VECs		Issues/Concerns	Environmental Monitoring and Mitigation Plan
Marine Mammals	Bearded Seal	Ability to acclimatize to disturbance	
	Ringed Seal	Increase in seal pup mortality	
Details and justification of mitigation measures incorporated in the Project are provided in EIS Volumes 4 through 8 as well as Appendix 10D			

2.1 CONSTRUCTION PHASE

The construction Phase of the Project is expected to be carried out over approximately a three-year period, the key elements of which are described in Volume 3 of this EIS. Baffinland has appointed an Engineer, Procure, Construct, Manage (EPCM) contractor to manage and implement the Construction Phase of the Project on its behalf. While Baffinland remains responsible for implementing the commitments of this EHS System, it has obliged its EPCM contractor to conform to all aspects of the EHS Management Framework as the construction and development activities move forward.

2.2 OPERATIONS PHASE

The operating life of the Project is expected to be about 21 years, although additional successful exploration results could either extend the operational life, increase the annual ore production volume, or both. During this phase, the elements of which are defined in Volume 3 of this EIS, Baffinland will assume direct management responsibility of the Project and the EMP.

2.3 CLOSURE AND RECLAMATION PHASE

The Closure and Reclamation Phase is expected to last three years, followed by a minimum of five years of post-closure environmental monitoring to verify that the reclamation has successfully met closure and reclamation objectives. Management systems established during the operation Phase will carry over into decommissioning and closure. Specific issues that must be considered at closure (e.g., land rehabilitation, facility transfer, and staff retrenchment) warrant additional planning when the time for closure is approaching.

During the Operations Phase of the Project, Baffinland will strive to develop partnerships with communities and appropriate businesses, government, and non-government organizations (NGOs) that foster sustainable development initiatives in the nearby communities through its Inuit Impact and Benefit Agreement (IIBA) commitments so that the adverse impacts of Project may be offset. Closure planning will be in accordance with Baffinland's policies. Detailed descriptions of the Closure and Reclamation Phase are described in Volume 3 of this EIS. The Preliminary Closure Plan is presented in Attachment 10 of Appendix 3B (Type A Water License Application).

SECTION 3.0 - ENVIRONMENTAL DESIGN GUIDELINES

The hierarchy of Environmental and Social adverse impacts avoidance is presented in Figure 10-2.1. The establishment of Environmental Design Guidelines at an early stage in the Project life cycle enabled Baffinland to avoid many potentially adverse impacts on the VECs and VSECs identified and discussed in Volumes 4 through 8 of the EIS. An overview of these Environmental Design Guidelines and how they enabled Baffinland to avoid adverse impacts related to the VECs/VSECs is presented in this section. The detailed environmental design criteria for the Project are presented in Attachment 4 of Appendix 3B (Type A Water License Application).

3.1 SITE SELECTION, ROADS AND RAILWAY ROUTING

A number of changes in Project design, operational safeguards, and contingency plans have been incorporated to mitigate potential impacts. Highlights of the mitigation measures incorporated in the Project include:

- Minimize Project footprint, thus minimizing the loss of habitat and reduction of habitat effectiveness.
- To the extent possible, avoid known archaeological sites and prioritize avoidance of important (unique and/or old) sites.
- Maintain a 31 m buffer from streams and waterways.
- Maintain a 500 m buffer zone from important bird nesting areas.
- Maximize sourcing of aggregate and borrow materials from road and railway right-of-ways.
- Select water sources in which Project water withdrawals will minimize the potential for drawdown and affects to fish habitat and the aquatic environment.

Construction activities will utilize the existing Project infrastructure and footprint to the greatest extent practical so as to minimize land disturbance and improve the overall efficiency of construction activities. Where possible, permanent support infrastructure will be built at the onset of construction, to be used during both Construction and Operations Phases of the Project. In many instances, temporary infrastructure will be constructed or positioned at Project sites for the duration of the Construction Phase only. This temporary infrastructure will be removed at the completion of the Construction Phase.

Planning to avoid sensitive landforms and soils sensitive to thawing is satisfied through the development of detailed design criteria for each Project facility as well as extensive geotechnical investigation that support the detailed design of these facilities. The design criteria are presented in Attachment 4 of Appendix 3B. Section 2.0 of Volume 9, Effects of the Environment on the Project, also addresses this commitment.

3.2 AIR EMISSIONS

Potential sources of Project related effects to air quality include exhaust emissions from vehicles, aircraft, generators and other equipment, emissions from camp incinerators, and fugitive dust emissions from road traffic during the snow-free periods. The applicable regulations for air emissions are summarized below.

Source	Regulation
Mobile Equipment / Mining Equipment	The *On-Road Vehicle and Engine Emission Regulations* introduce more stringent national emission standards for on-road vehicles and engines and a new regulatory framework under the Canadian Environmental Protection Act, 1999 (CEPA, 1999). These Regulations for controlling emissions from on-road vehicles and engines came into effect on January 1, 2004.
Diesel Generators/Compressors	The *Off-Road Compression-Ignition Engine Emission Regulations* introduce emission standards for diesel engines used in off-road applications such as those typically found in construction, mining, farming and forestry machines. The Regulations, under section 160 of the *Canadian Environmental Protection Act, 1999* (CEPA 1999), apply to engines of the 2006 and later model year.
Incinerator	Camp incinerators are installed at each of the camps associated with the Mary River Project, namely Milne Port, Mine Site, Mid-Rail and Steensby. Each of these incinerators utilizes dual chamber, variable air flow design technology and is specifically designed for remote camp operations. These incinerators comply with emission standards established by the Canadian Council of Ministers of the Environment (CCME), Canada Wide Standards (CWS) for Mercury Emissions and the CCME CWS for Dioxins and Furans.

3.2.1 Fugitive Dust Emission from Material Handling Equipment

The crushers and screens will be installed inside buildings. Material handling equipment, including reclaimers, stackers and conveyors will be installed outdoors. Conveyors will be equipped with wind hoods to reduce wind exposure and potential for ore fines to be blown off the conveyors. Dust collectors will be installed at transfer points and other required areas to limit fugitive dust emissions.

3.3 NOISE

There are no regulations or guidelines in Nunavut that address environmental noise levels. However, noise has been addressed in recent Environmental Impact Statements developed for other mining projects in Nunavut (i.e., Meadowbank Gold Project, Doris North Gold Project, High Lake Project). These projects and other projects in the Northwest Territory have adopted the Alberta Energy Resource Conservation Board (ERC) Directive 038 Guidelines (ERCB 2007) as indicative of what is generally considered acceptable with respect to noise levels from industrial activities in remote areas. D038 guidelines have been adopted for the Project.

Baffinland and its contractors will also adhere to the DFO Guidelines for blasting in or near water courses during the construction period. The principal areas of concern are the construction of the railway tunnels and the blasting requirement at Steensby Inlet. Detailed EPP procedures will be developed by the contractors for this work.

3.4 WASTEWATER DISCHARGES AND RUNOFF WATER QUALITY

Water quality standards for wastewater treatment plants (WWTF) were based on criteria that are stipulated in the predevelopment and exploration water licence. Sewage will be discharged to a Waste Water Treatment Facility (WWTF) at Mine Site, Milne Port and Steensby Port unless otherwise approved. Treated effluent discharged to fresh water from the Mine Site WWTF (and other temporary camps during construction) will not exceed the following quality standards:

Parameter	Maximum Average Concentration
BOD_5	30 mg/L
Total Suspended Solids	35 mg/L
Fecal Coliform	1000 CFU/100 mL
Oil and Grease	No visible sheen
pH	between 6.0 - 9.5

Nutrient loadings in WWTF effluent discharges will not cause eutrophication of the fresh water receiver.

Treated effluent discharged from the WWTF at Milne Port and Steensby Port to marine receivers will not exceed the following quality standards:

Parameter	Maximum Average Concentration
BOD_5	100 mg/L
Total Suspended Solids	120 mg/L
Fecal Coliform	10,000 CFU/100 ml
Oil and Grease	No visible sheen
pH	between 6.0 - 9.5

Non-compliant discharges from the WWTFs will be directed to a Polishing/Waste Stabilization Pond (PWSP). Discharges will be released in a manner that minimizes surface erosion. PWSP's will be bermed to ensure there is no seepage.

Greywater not directed to the WWTF will be contained in sumps located at least 30 m from the ordinary high water mark of any water body, at a site where direct flow into the water is not possible and additional impacts are not created, unless otherwise approved.

Latrines will be located at least 31 m from the ordinary high water mark of any water body. In most cases lantrine wastes at small remote camps will be collected and either incinerated or transported to a WWTF for treatment.

Effluent discharged from all the Bulk Fuel Storage Facilities will not exceed the following quality standards:

Parameter	Maximum Average Concentration (µg/L)
Benzene	370
Toluene	2
Ethyl benzene	90
Lead	1
Oil and Grease	15,000 and no visible sheen

Water quality standard for runoff from mine and stockpile areas - All discharge from the open pit mine, ore stockpile and waste rock stockpile areas will not exceed the following limits:

Parameter	Maximum Average Concentration (mg/L)	Maximum Concentration of Any Grab Sample (mg/L)
Total Arsenic	0.5	1.00
Total Copper	0.30	0.60
Total Lead	0.20	0.40
Total Nickel	0.50	1.00
Total Zinc	0.5	1.00
Total Suspended Solids	15.0	50.0
Oil and Grease	No visible sheen	N/A
Waste discharged will have a pH between 6.0 - 9.5		

Effluent discharges to freshwater or marine receivers from WWTFs, PWSPs, bulk fuel storage facilities, and mine/stockpile areas will be acutely non-toxic.

3.5 CREEK / STREAM / RIVER CROSSINGS – FISHERIES AND AQUATIC RESOURCES

Baffinland will continue to operate a hydrological monitoring program throughout the LSA in order to develop a long term record of hydrological information suitable for the design of future infrastructures.

Stream banks will not be cut and material will not be removed from below the ordinary high water mark of any water body unless authorized.

Stream crossings will be located so as to minimize approach grades. Approaches will be stabilized during construction and upon completion in order to control runoff, erosion and subsequent siltation to any water body.

As creek crossings and construction activities will likely result in a Harmful Alteration, Disruption or Destruction (HADD) of fish habitat as defined under the *Fisheries Act*, a Fish Habitat Compensation Plan

(Appendix 10D-7) has been developed to mitigate impacts to the associated fish habitat (requirement under the terms of the Section 35(2) Fisheries Authorization issued by DFO for these installations).

3.6 FUEL STORAGE FACILITIES

Bulk fuel storage facilities (Jet-A fuel and diesel) are or will be installed according to the following guidance.

- The fuel tank farms will be designed to have bermed spill containment with capacity equal to the volume of the largest tank plus 10% of the volume of the remaining tanks OR 110 % volume of the largest tank, whichever is greater. In calculating the volume, the footprint of the smaller tanks is subtracted. The above basis is consistent with the document entitled "Design Rationale for Fuel storage and distribution facilities" published by the Department of Public Works of the North West Territories (refer to section 4.6 of these guidelines).
- The lining within the bermed area is an impervious HDPE liner membrane. There are industry standards for installation, jointing, etc., the membrane to ensure its integrity.
- Refuelling stations are equipped with a lined and bermed area to contain minor spills or leaks during refuelling. The liner (e.g., 40 mm hypolon liner or equivalent) is protected by sand bedding. Vehicles and mobile equipment drive onto this bedding for refuelling. All fuel transfer is done by pumps.
- All fuel storage areas are equipped with spill kits for emergency response, and a current Spill Contingency Plan that identifies spill kit locations and response plans will be maintained. The spill kit contains the appropriate type, size and quantity of equipment for the volume/type of product present in the storage location as well as the environment likely to be affected by a spill (ground, river, lake or ocean).

3.7 WASTE MANAGEMENT FACILITIES

Hazardous waste will be classified, then stored securely on site and shipped off site for final treatment or disposal. Chemicals and potentially hazardous materials associated with Project operations include:

- Petroleum oils and lubricants for mining and heavy equipment;
- Drilling additives;
- Calcium chloride flakes for drill water;
- Lead acid batteries;
- Cleaning supplies at camp sites;
- Waste oil from equipment and generators, and
- Spent ethylene glycol coolant.

Lubricants, oils, spent coolant and batteries are stored in suitable containers at the workshop and at other work areas. Waste oils are stored in drums in lined containment, and may be used to fuel the camp incinerator. All other hazardous chemicals and wastes will be stored in suitable containers for ease of transport by sealift and truck and ship to southern disposal or recycling facilities.

Centralized waste management facilities at the Mine Site and at Steensby Port will be used as central transfer and processing locations for waste materials that are to be recycled on site or shipped south via sea lift during the Construction and Operations Phases of the Project..

Lined treatment facilities will also be constructed to receive any snow and ice, soil or water that may become contaminated from fuel spills. The final location and sizing of these facilities has not been determined, but the intent will be to have these facilities at both the Mine Site and Steensby Port.

Combustible waste will be incinerated in incinerator units.

All inert solid waste will be disposed of in the landfill sites located at the Mine Site and Steensby Port. Permits for the Mine Site landfill facility have been obtained and construction and commissioning was completed in July 2010.

3.8 EXPLOSIVES STORAGE FACILITIES

Explosives are stored in explosives magazines positioned in accordance with the *Nunavut Mine Health and Safety Act* and Regulations. Detonators and explosives are stored in separate magazines, and inventory is strictly controlled with supervisory control. The explosives magazines are located at a minimum distance of 600 m away from other infrastructure (building or work area) in accordance with the requirements of the *Explosives Use Act*, warning signs are prominently posted and the magazines are regularly inspected.

Prefabricated magazines will be positioned and appropriately bermed to store explosives as they are unloaded from the ship before being transported to areas of use along the tote road, at the Mine Site, and the northern portion of the Railway and rock quarry sites..

Once the bulk mixing plant has been commissioned at the Mine Site, ammonia nitrate (AN) will be delivered in bulk to Milne Port and Steensby Port, and transported by truck to the permanent storage facility at Steensby Port and at the Mine Site. During operations, AN will be delivered to Steensby Port and will be transported by rail to the permanent storage facility at the Mine Site.

3.9 CLIMATE CHANGE

Green house gas emissions (GHG) contribute to climate change. In order to minimize GHG emissions, Baffinland is committed to the use of low sulphur fuel. The Company also made major Project decisions that will have a positive impact on energy consumption. They are:

- Construction of a railway for the transportation of most of the iron ore, will reduce fuel transportation requirements; and
- Baffinland conducted a pre-feasibility study on alternative energy options to supply power to either or both of the Mine Site and Steensby port site.

A potential hydro-electric station and distribution power line has been identified at Separation Lake, located approximately 58 km east of the Steensby Port. While hydro-electric power does not form part of the Project, Baffinland continues to evaluate this energy option for potential longer-term implementation.

If it is determined that sufficient hydro power is available, a power line could be extended along the rail line to service the Steensby Port site and possibly the Mine Site. Baffinland intends to further evaluate the feasibility of hydro-electric power generation over the next several years. Separate approvals will be sought if the hydro-electric site provides viable.

SECTION 4.0 - ENVIRONMENTAL PROTECTION PLAN (EPP)

Baffinland is committed to conducting its work in a manner that minimizes potential impacts to the natural environment and contributes to positive social and economic effects, particularly as they relate to communities in the North Baffin region. Baffinland seeks to ensure that its procedures and construction methods meet these commitments and regulatory requirements, and that, the commitments and requirements are understood, implemented and maintained by personnel at all levels involved throughout the life cycle of the Project which include:

- Exploration and Pre-Development Phase,
- Construction Phase,
- Operations Phase, and
- Closure.

From the onset of the Exploration and Pre-Development Phase, Baffinland developed the *Environmental Protection Plan* to help ensure a high level of environmental protection. It is the objective of Baffinland to apply appropriate and effective management practices to advance environmental management to all facets of its operations related to the Project. Officers, management, employees and contractors are all responsible for the incorporation of environmental protection measures into their work responsibilities.

The EPP is a "living document" and will be updated as the Project advances through its life cycle of Construction, Operation and Closure. The know-how acquired during the early stages of the Project will thus be retained and passed on through the successive phases of the Project. Many additional procedures will be developed and added to the EPP at the onset of early construction activities in 2012.

The current EPP is presented in Attachment 5 of Appendix 3B (support documentation for the Type A Water License Application) as well as a list of additional EPP procedures that are soon to be developed.

4.1 PURPOSE OF THE EPP

The EPP provides a practical way to facilitate field implementation of environmental regulations, practices, and procedures required to eliminate or reduce potential environmental effects. It is a working document for use in the workplace by Project personnel and contractors, as well as at the corporate level for ensuring commitments made in policy statements are implemented and monitored. The content of the EPP is developed in recognition of applicable permits, authorizations, approvals and Inuit Knowledge.

The specific purposes of the EPP are as follows:

- Provide a plainly written reference document to ensure that commitments to minimize environmental effects will be met;
- Document environmental concerns and ensure appropriate protection measures are implemented;
- Provide concise (short and clear) instructions to Project personnel regarding procedures for protecting the environment and minimizing environmental effects;
- Provide a reference document for personnel when planning and/or conducting specific routine activities and working in specific areas;
- Provide for a training aid during implementation efforts;
- Communicate changes in the program through the revision process; and
- Provide a reference to applicable legislative requirements and guidelines.

4.2 ORGANIZATION OF THE EPP

The format of the EPP is intended to enhance its use by Project personnel in the workplace and to provide an important plainly written support document. The EPP summarizes the overall approach to environmental protection planning and the specific requirements in various permits, approvals and authorizations issued for specific Project components and activities.

As mentioned above, the EPP is a living document and is subject to on-going updates. The content will vary (expand or contract) depending on the phase of the development of the Project. Many of the specific EPP will be developed by contractors as they begin construction on site. The structure and content of the EPP is presented in Table 10-4.1.

Table 10-4.1 Structure and Content of the Environmental Protection Plan

Section 0	Introduction	Contents List and Revision Control, serving as the Table of Contents listing the latest revisions for each Operational Standard
Section 1	Purpose of the Plan	Outlines the purpose and organization of the EPP, Baffinland's environmental commitment, corporate resources and regulatory requirements
Section 2	Activity based Operational Standards	Provides Operational Standards for a variety of specific activities anticipated to occur in relation to the Project. Each Operational Standard provides an overview, environmental concerns and general environmental protection procedures associated with that activity, to meet regulatory requirements, corporate commitments and/or best practices. Within the Operational Standards further reference will be provided, if warranted, to relevant operating procedures and work instructions that have been developed to address identified risks.
Section 3	Documentation	Provides the inspection and record keeping forms that will be used by Project personnel to verify adherence or audit compliance to the Operational Standards
Section 4	Revisions	Includes a Request for Revision, which allows for users to recommend changes or additional Operational Standards, to facilitate continuous improvement
Attachments	Maps Drawings Supporting documents	Reference the specific functional management plans presented in Draft EIS Volume 10, Section 6. Drawings

4.2.1 Construction Phase

Prior to the commencement of the Construction Phase, the content of the EPP will expand rapidly to ensure that appropriate and adequate environmental protection are in place for all construction activities at all construction sites. The Construction Phase EPP will build on the existing Pre-Development Phase EPP (Appendix 3B, Attachment 5) and add site specific procedures, work instructions, and standards as required taking into account the increased level of activities, personnel and contractors at each construction location.

4.2.2 Operations and Closure Phases

As the focus will shift toward daily operation of the facilities, many of the detailed operating standards established for the construction period may no longer be relevant. The EPP will be updated in a timely manner to reflect the needs of the Operations Phase.

4.3 CURRENT EPP STANDARDS AND PROCEDURES

The EPP outlines activity based operating procedures and standards for the implementation of mitigation measures that will reduce the severity of the residual impact of the Project. The content of the current EPP is presented in the Table below. The detailed EPP procedures are presented in Attachment 5 of Appendix 3B.

SECTION	OPERATIONAL STANDARD	REVISION #	REVISION DATE
0	Contents and Revision Control	H	January 6, 2012
	SECTION 1		
1.1	Purpose of the Environmental Protection Plan	B	August 8, 2007
1.2	Organization of the Environmental Protection Plan	D	January 6, 2012
1.3	Environmental Commitment	C	January 6, 2012
1.4	Environmental Approvals	E	January 6, 2012
1.5	Responsibilities	C	June 4, 2008
	SECTION 2		
2.1	Archaeological Resources	E	June 4, 2008
2.2	Avoiding Disturbance to Local Land Users	D	January 6, 2012
2.3	Ground Disturbance	C	January 6, 2012
2.4	Water Use	D	January 6, 2012
2.5	Geotechnical Drilling Operations	D	January 6, 2012
2.6	Equipment Operations & Mobilization	C	January 6, 2012
2.7	Fuel Storage and Handling	D	January 6, 2012
2.8	Aircraft Flights	D	January 6, 2012
2.9	Sediment and Erosion Control	C	June 4, 2008
2.10	Polar Bear Encounters	C	June 4, 2008
2.11	Fox and Wolf Encounters	C	June 4, 2008
2.12	Caribou Protection Measures	C	August 14, 2007
2.13	Bird Protection Measures	D	January 6, 2012
2.14	Solid Waste Management	E	January 6, 2012
2.15	Sewage Treatment	E	January 6, 2012

SECTION	OPERATIONAL STANDARD	REVISION #	REVISION DATE
2.16	Hazardous Material & Hazardous Waste Management	E	January 6, 2012
2.17	Road Construction and Borrow Development	D	January 6, 2012
2.18	Tote Road Watercourse Crossing Installation	E	January 6, 2012
2.19	Road Traffic Management	E	January 6, 2012
2.20	Drilling, Blasting and Crushing	D	January 6, 2012
2.21	Exploration Drilling Operations	C	January 6, 2012
2.22	Water Sampling for On-Ice Drilling	C	January 6, 2012
2.23	Wildlife Log Instructions	A	June 4, 2008
2.24	Blasting in Water	A	January 6, 2012
2.25	Quarry and Barrow Pit Operation	A	January 6, 2012
2.26	Concrete Production	A	January 6, 2012
2.27	Equipment Mobilization	A	January 6, 2012
2.28	Excavation and Foundations	A	January 6, 2012
EPP Procedures to be added on the onset of Early Construction			
2.29	Dredging		
2.30	Dredge Material Handling		
2.31	Docking Procedures		
2.32	Small Craft Operations		
2.33	Ore Carrier Inland Waters Procedure		
2.34	Marine Mammal Protection		
2.35	Freight Dock Operation		
2.36	Ore Dock Operation		
2.37	Floating Construction Dock Operation		
2.38	Local Vessel Interaction Procedure		
2.39	Railway Embankment Construction		
2.40	Railway Tunnel Construction		
2.41	Railway Vehicle Noise Control		
2.42	Railway Tie and Rail Construction		
2.43	Railway Alignment Clearing		
2.44	Railway Wildlife Crossing		
2.45	Railway Maintenance Materials Handling Procedure		
2.46	Railway Rail Camp Waste Handling		

SECTION	OPERATIONAL STANDARD	REVISION #	REVISION DATE
2.47	Railway Rail Camp Sewage Handling		
2.48	Railway Access Road Vehicle Traffic Procedure		
2.49	Railway Access Road Wildlife Encounter Procedure		
2.50	Railway Usage Notification Procedure		
2.51	Mine Pit Traffic Coordination Procedure		
2.52	Mine Pit Dust Suppression Procedure		
2.53	Mine Pit Heavy Precipitation Event Procedure		
2.54	Waste Rock Stockpile Construction Procedure		
2.55	Waste Rock Stockpile Bird Nesting Procedure		
2.56	Ore Stockpile Stacking Procedure		
2.57	Ore Stockpile Heavy Precipitation Event Procedure		
2.58	Tanker Truck Refueling Procedure		
2.59	Day Tank Re-Supply		
2.60	Field Equipment Refueling		
2.61	Fuel System Inspection Procedure		
3.0	Documentation Logs	C	June 4, 2008
3.1	Human Use Log	A	August 8, 2007
3.2	Voluntary Self-Registration of Land Use	B	August 14, 2007
3.3	Wildlife Log	B	June 4, 2008
3.4	Drill Inspection Forms: Pre-Drilling, Daily, and Post Drilling	B	June 19, 2009
3.5	Fuel Storage Facility Inspection Form	B	June 4, 2008
3.6	Off-Site Waste Disposal Log	B	June 4, 2008
3.7	Caribou Decision Tree	A	June 4, 2008
3.8	Watercourse Crossing Data Monitoring Form	A	June 4, 2008
3.9	Turbidity Monitoring Data Form	A	June 4, 2008
3.10	Compliance Monitoring Form	A	June 4, 2008
3.11	Compliance Inspection Form	A	June 4, 2008
3.12	Landfill Inspection Form	A	June 4, 2008
3.13	Fuel Reconciliation Form	A	January 6, 2012
3.14	Water Use Log Form	A	January 6, 2012
3.15	Sewage Effluent Disposal Log Form	A	January 6, 2012
3.16	Waste Disposal Log Form	A	January 6, 2012

SECTION	OPERATIONAL STANDARD	REVISION #	REVISION DATE
3.17	Water Treatment Facilities Inspection Form	A	January 6, 2012
4.0	Request for Revision to an Operational Standard	B	August 8, 2007

The above Table presents the list of existing EPP procedures. Several new EPP procedures will be developed by contractors at the onset of early Construction Phase and will be added to this list (see Table above).

4.3.1 Blasting

During the construction period, blasting will be undertaken during site preparations, construction and port construction. Limiting underwater blasting will be required at Steensby Inlet to remove obstacles to ship navigation.

The handling, transportation, storage and use of explosives and all other hazardous material will be conducted in compliance with all applicable laws and regulations, Department of Mines and the *Transportation of Dangerous Goods Act.* Baffinland's Explosives Management Plan is presented in Appendix 3B, Attachment 8.

For blasting activities, on land, near or under water, Baffinland's contractors will be required to develop their own specific environmental protection procedures. The operational requirements, standard procedures and environmental protection measures listed below will be implemented, as required, to prevent or minimize environmental impacts related to the use of explosives and blasting on land and near watercourses.

Blasting on Land

- All blasting will be performed in compliance with the appropriate permits and approvals and DFO Guideline for the Use of Explosives in or Near Canadian Fisheries Waters (see http://www.dfo-mpo.gc.ca/habitat/role/141/1415/14155/explosives-explosifs/index-eng.asp);
- Warning of imminent blasting will be given by means of an audible signal;
- Blasting activities located within 50 m of a watercourse will follow the Guidelines for the Use of Explosives in or near Canadian Fisheries Water;
- There will be separate magazines for explosives and dynamite blasting caps;
- All temporary magazines will have a Temporary Magazine License from the Department of Energy, Mines and Resources;
- A blasting procedure will be developed, followed, and enforced by the contractors;
- Use of explosives will be restricted to authorized personnel trained in the use of explosives;
- The immediate area of the site will be surveyed prior to a blast to determine if there are any sensitive terrestrial animals in the area. Blasting operations will be delayed if such animals are observed within 500 m. Animals will be allowed to leave the area on their own accord. The use of controlled hazing as

a method for removing wildlife from the area will be used only as a last resort and, if used, will be conducted in a manner that does not harass the wildlife;

- Explosives will be used in a manner that will minimize damage to landscape features;
- Blasting pattern and procedures will minimize shock or instantaneous peak noise levels. Time delay blasting cycles will be used, if necessary, to control the scatter of blasted material;
- Blasting will not occur in the vicinity of fuel storage tanks or storage areas for other hazardous materials;
- All vehicle and equipment operators will be required to have the appropriate training and certification for the vehicles and equipment that they will be operating;
- Where feasible, rock resulting from blasting will be used on site; and
- Prior to the start of the blasting program, the Environment Monitoring officer will be notified. Blast schedules will be posted and updated daily.

Blasting in or Near Water

Prior to the use of explosives in and/or near fish habitat the necessary approval will be obtained from DFO. Explosives will only be used when other, less detrimental methods are not feasible. If blasting in water is required, the following information will be provided to DFO in order to facilitate the assessment of potential impacts and provide recommendations for appropriate mitigative measures:

- Total quantity and type of explosives;
- Cross-section detail of blast hole;
- Individual weight of charge(s);
- Magnitude of charge weight to be detonated instantaneously;
- Any decking of charges (e.g., several charges within a hole);
- Amount of millisecond delay between charges;
- Information on the type of material requiring blasting (e.g., rock and saturated soil);
- Proposed blasting methodology;
- Location of blasting;
- Proposed time of year for Project blasting;
- Freshwater or marine environment; and
- Fish habitat and fishery resources present.

In addition to the specific mitigative measures identified for blasting on land (above), the specific guidelines for blasting activities in or near freshwater or marine environment are listed below:

- Approval will be obtained from DFO (Section 32 of the *Fisheries Act*);
- Blasting plans will be developed such that the weight of the charge (kg) to be detonated at any precise moment is small;
- For multiple charges, time-delay (e.g., blasting caps) will be used to reduce the overall detonation to a series of single explosions separated by a minimum of a 25 millisecond delay between charge detonations;

- No detonation of explosives will occur that are likely to produce an instantaneous pressure change greater than 100 kPa in the swim bladder of a fish. Please refer to the 1998 Guidelines for the Use of Explosives in or Near Canadian Fisheries Waters;
- For unconfined explosives, contact Department of Fisheries and Oceans authorities for further guidance;
- If blasts on land are required to be near a watercourse, then additional mitigative measures will be initiated which may include some of the following:
    - installation of bubble/air curtains to disrupt the shock wave (when a bubble curtain is used, it should surround the blast site and be started up only after fish have been moved outside of the surrounded area);
    - blasting during less sensitive fishery periods;
    - isolation of the work area from fish movement;
    - detonation of small scaring charges set off one minute prior to the main charge to scare fish away from the site; and
    - use of noise generators to move fish out of the area.
- Blast holes should be back filled (stemmed) with sand or gravel to grade or to the streambed/water interface to confine the blast;
- All blasting and other associated equipment/products (e.g., shock tube and detonation wire) will be removed from onshore blast areas, including any debris that may have entered the freshwater or marine water bodies;
- DFO will be notified regarding proposed blasting programs prior to their initiation;
- Exclusion of fish from the blasting area, where practical, using appropriate methods (installation of nets on either side of the work area and removal of fish from between the nets) will be conducted; and
- Non-propagating explosives will be used where practical.

4.3.2 EPP 2.12 – Caribou Protection Measures

EPP 2.12 will be updated prior to commencement of construction activities. The measures to be undertaken for the protection of wildlife are described in the Road Management Plan (Appendix 10D-8, section 3) and the Terrestrial Environment Management Plan (Appendix 10D-11, section 3).

4.3.3 Explosives Handling Procedures in the mine pit

Based on the experience acquired at other northern mines, Baffinland will implement best management practices when handling explosives. This will ensure that losses as well as nitrates entrained with runoff are minimized. Baffinland has initiated contact and discussions with the Diavik and Ekati operations and will draw on experience acquired at the Diavik and Ekati mines with the management of explosives in the mine

pit. Key findings from an explosive investigation at Diavik in 2006 concluded that ammonium nitrate losses can be reduces with the implementation of the following actions:

- Ensure that all production blastholes are primed according to the explosives manufacturers specifications and to a Standard Operating Procedure for loading explosives in blastholes;
- Increase the training and put more emphasis on the correct explosives loading procedure as well as increase supervision of the loading process;
- Reduce the ANFO content of the emulsion blend when used in the wet holes so there is less of the solid AN exposed to water; and
- Produce a more viscous form of the emulsion which would increase the water resistance; Reduce the time that explosives are in the ground in wet areas prior to detonation. This would reduce the time that explosives are in contact with water. The initial limit should be four days and evaluated over a period of about one year. If ANY losses are still significant, then this should be reduced to three days for blasts that have large flows of water through the rock.

Baffinland will incorporate these findings in the development of its own Standard Operating Procedures (SOP) for explosives handling in the mine pit and at the quarries. These SOP will be developed prior to mine development in 2014.

4.4 ENVIRONMENTAL APPROVALS

For all phases of the Project, the requirements of permits and approvals will form an integral part of the EPP. Project personnel are directed to the applicable approvals. Official copies of the approvals are maintained on-site by the Environmental Superintendent.

4.5 DOCUMENTATION

A key aspect of the Environmental Protection Plan is effective record-keeping. The record keeping practices satisfy the requirements of the EHS Framework Standard (Appendix 10A-1).

4.6 UPDATES AND REVISIONS

The Environmental Protection Plan is a living document, and its users are encouraged to suggest changes to the content or wording of EPP standards to make the document more useful, appropriate to the work being conducted, and user-friendly. The process and procedures for reviews, updates and revisions of the EPP are outlined in Appendix 10A-1.

SECTION 5.0 - ROLES AND RESPOSIBILITIES

The roles and responsibilities for the implementation of the EHS Management System will evolve with the advancement of the Project. Throughout the Project lifecycle, the roles and responsibilities of Baffinland personnel will be as follows:

Vice-President of Sustainable Development and Manager, Sustainable Development

- Provide corporate resources and overall direction to the implementation of the EPP; and
- Review and approve revision requests.

Superintendent of EHS

- Review requests for revision;
- Conduct a review of the EPP on an as needed basis;
- Ensure revisions are distributed to managers and supervisors;
- Perform document controls;
- Ensure that managers, supervisors and their staff are familiar with the EPP and its procedures;
- Supervise issuance of revisions; and
- Obtain approvals from management.

Operations and Site Managers

- Implement the EPP in daily operations;
- Maintain a current copy of each Operational Standard and the Content List (Section 0);
- Provide training and support to ensure successful implementation of the EPP; and
- Initiate changes to improve and update the plan.

Site Personnel

- Familiarize themselves with the EPP; and
- Have knowledge of reporting procedures.

Environmental Consultants

- Provide technical support to EPP development and on-going revisions; and
- Provide audits of EPP implementation, as requested by the VP Sustainable Development.

Stakeholders

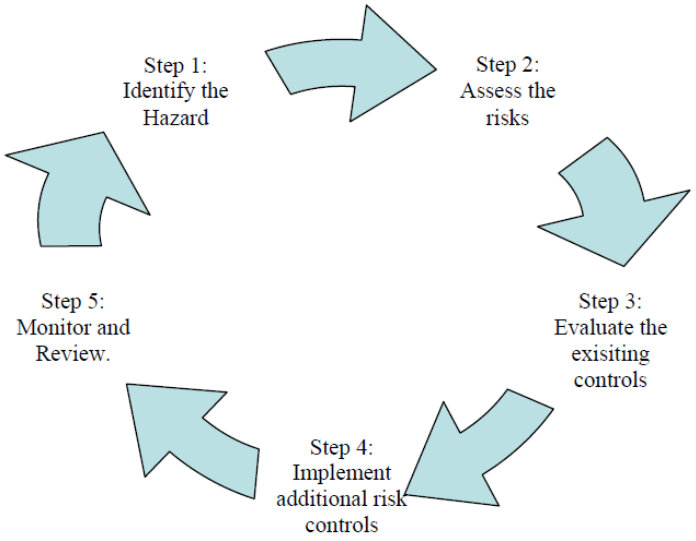
- Monitor Baffinland operations; and
- Provide input and comment as required.

5.1 CONSTRUCTION PHASE

The Construction Phase of the Project is expected to be carried out over approximately a four-year period, the key elements of which are described in Volume 3 of this EIS. Baffinland has retained an EPCM contractor to manage the design and construction of the Project. During the construction period, a number of activities will take place concurrently at various Project locations. The EPCM contractor will assume responsibility for all aspects of the construction activities, including environmental management, for this period. The roles and responsibilities of individuals responsible for the implementation and monitoring of the EHS system will be defined once the EPCM Project team is in place. The EPCM contractor will appoint EHS managers as required, who will report to the Superintendent of EHS, who will in turn report to the Manager, Sustainable Development and VP Sustainability on all EHS matters.

SECTION 6.0 - RISK MANAGEMENT AND EMERGENCY RESPONSE

Knowledge of hazards and the evaluation of associated risks are necessary requirements for establishing health, safety and environmental objectives and targets, and for setting priorities to control the identified risks to employees and others on an ongoing basis. Baffinland's Risk Assessment methodology is an integral part of the EHS Management Framework (Appendix 10A). The Hazard Identification and Risk Assessment procedure can best be illustrated as a cycle:



Baffinland has knowledge of potential hazard through sources such as:

- Regulatory requirements;
- Company Sustainable Development Policy and supporting policies;
- Records of incidents, accidents and non-conformances;
- Company EHS audits and Environmental Management System audits;
- Communications from employees and others;
- Information from health and safety consultations;
- Information on best practices, typical hazards for the industry, and incidents and accidents having occurred in other organizations;
- Details of changes in occupations, facilities and activities;
- Inventory of hazardous materials and the toxicology of the hazardous materials;
- Monitoring data;
- Existing administrative, engineering and personal protective equipment controls;
- Workplace knowledge and other data;
- Professional judgment; and
- Process Hazard Analysis.

For routine and non-routine events associated with activities, occupations and facilities, Baffinland documents the identification of hazards and classification of risks. This documentation is used to establish priorities for risk control and action.

6.1 RISK CONTROL AND ACTION

The results of hazard identification and risk assessment are the basis for establishing and documenting:

- Environmental, health and safety objectives;
- Environmental, health and safety performance targets; and
- Actions to achieve the established objectives and targets.

Each hazard classified as representing a priority risk requires an action plan with recommendations to control the risk. Recommendations include consideration for:

- Operational controls;
- Training and awareness; and
- Performance measurement and monitoring.

The action plan and recommendations are forwarded to the area management responsible for the follow-up. In all cases, the action plan and recommendations are communicated to the interested and affected employees (and others as required). Typically, the recommendations are implemented in consultation with interested and affected employees (and others as required).

6.1.1 Project Risk Assessment Update

In compliance with Baffinland's EHS Framework, and as part of the Feasibility Study, the engineering contractor carried out a risk assessment for the Construction Phase of the Project. This Project Report is presented for information in Appendix 10A-3.

6.2 HAZARDOUS MATERIALS MANAGEMENT

A variety of petroleum products and other hazardous materials are used as part of ongoing site activities. Large quantities of petroleum products (Arctic diesel, marine diesel and Jet A aviation fuel) are stored on site at various designated locations. Explosives are also stored on site. Other hazardous materials are also used, but in smaller quantities. Nonetheless, all these products are considered as potential environmental and safety hazards. Transportation, handling and storage methods and procedures are subjected to the Hazard/Aspect Identification and Risk Assessment. Baffinland prepared a Hazardous Material Management Plan on the basis of MSDS instruction for each substance. This management plan is presented in Attachment 5 of Appendix 3B (supporting document for the Type A Water License Application).

The material safety data sheets (MSDS) of all hazardous products are attached to the Emergency and Spill Response Plan presented in Attachment 5 of Appendix 3B (supporting document for the Type A Water License Application). The MSDS provide detail instructions on recommended handling, storage, transportation procedures, and exposure hazards and first aid treatment required from exposure to these hazardous materials.

Regular monitoring and inspection of fuel and hazardous material storage areas and the use thereof is undertaken in accordance with the Baffinland's environmental management system and procedures.

In terms of hazardous waste, quantities and storage locations of hazardous waste are identified in the Waste Management Plan presented in Appendix 3B, Attachment 5.

6.3 EMERGENCY AND SPILL RESPONSE PLAN

Baffinland will be self sufficient for Search and Rescue operations (SAR) and response to environmental emergencies as it relates to Mary River Project activities, but will share relevant information with the RCMP and GN Department of Justice.

Emergencies that could result in an accident or incident causing injuries, illnesses or environmental impacts, or that could cause health and safety risks or environmental impacts need to be considered within the EHS Management System.

Baffinland maintains operational controls to identify the potential for and responses to accidents, incidents and emergency situations, and to prevent and mitigate the likely injury, illness and adverse environmental impacts that may be associated with such accidents or incidents.

Due to the remoteness of the Project site and the lack of infrastructure, Baffinland has committed to be self-sufficient in terms of emergency response capabilities.

As part of the Emergency and Spill Response Plan, Baffinland is responsible for implementing the following:

- Train site personnel in spill response procedures and the proper use of response equipment and materials;
- In the event of a spill, mobilize required site personnel, equipment and tools;
- Implement the required health and safety procedures at the site of the spill;
- Eliminate the fire hazards and potential ignition sources near the spill area;
- Control the source of the spill (i.e., reduce or stop product discharge);
- Contain the spilled product using the most appropriate methods and equipment (i.e., dykes, ditches, sorbent materials, containment booms, and other barriers);
- Evaluate the possibilities of recovering spilled materials;
- Obtain, if required, assistance from government agencies such as Environment Canada, the Canadian Coast Guard and/or Fisheries and Oceans Canada.
- Obtain, if required, additional assistance by hiring local rangers or residents from the nearest communities and/or firms specialized in spill response operations;
- Comply with applicable guidelines and regulations;
- Conduct a preliminary assessment of environmental impacts to marine, freshwater and terrestrial ecosystems and natural resources; and
- Report the spill to the Government of Nunavut Spill Report Line, to QIA, and to the water license inspector within 24 hours of the event, and submit a written spill report using the appropriate form (see below for the list of information required in the report).

Spill procedures and response functions are implemented by Baffinland's Emergency Response Management Team. An On-site Coordinator is designated to lead the Emergency Response Team. Once a spill event is reported, the On-Site Co-Coordinator establishes a specific strategy for containing and controlling the spill and to initiate the clean-up activities. Other site personnel such as the Fire Chief, the EHS Superintendent, and the Operations Manager may act as technical advisers prior to and during the intervention. The trained Emergency Response Team conducts all emergency spill response operations under the leadership of the On-Site Co-Coordinator. During the cleanup phase other site personnel (heavy equipment operators, labourers, etc.) may be involved in the intervention.

6.3.1 Roles and Responsibilities

6.3.1.1 On-Site Coordinator

As part of the spill response plan, the On-Site Co-Coordinator, acting as incident commander, is responsible for implementing the following procedures:

- Assume authority over the spill scene and personnel involved;
- Activate the Spill Response Plan;
- Evaluate the initial situation and assesses the magnitude of the spill;
- Develop an overall plan of action;
- Collect photographic records of the spill event and clean up efforts;
- Prepare a root cause analysis and an incident investigation for major spills; and
- Report to the Operations Manager and provide recommendations on resource requirements (additional manpower, equipment, material, etc.) to complete the cleanup effort. The responsibility of the co-ordinator is to mobilise personnel and equipment to implement the cleanup.

The On-Site Coordinator is accessible to the Canadian Coast Guard during the entire transfer operation.

6.3.1.2 EHS Superintendent

The responsibilities of the EHS Department include the following:

- Report the spill to NWT 24-hour Spill Report Line at (867) 920-8130, to Qikiqtani Inuit Association Lands Administrator at (867) 975-8422, and AANDC Water License Inspector at (867) 975-4288;
- Provide liaison with Management to keep them informed of cleanup activities;
- Collect photographic records of the spill event and clean up efforts;
- Obtain additional required resources not available on-site for spill response and cleanup;
- Act as the spokesperson with government agencies as appropriate;
- Document the cause of the spill and effectiveness of the cleanup effort, and recommend the appropriate measures to prevent a recurrence of the spill;

- Prepare and submit follow-up documentation required by appropriate regulators; and
- Ensure that the spill is cleaned up and all follow-up communication and reports are filed with the AANDC Water License Inspector, and QIA Land Administrator. Ensure that the spill reports submitted to QIA include photographic records and an updated map showing UTM coordinates, date, amount and the nature of spill.

6.3.1.3 Corporate Contact

The responsibilities of the Corporate Contact include the following:

- Work with the EHS Department on regulatory follow-up as necessary;
- Act as the spokesperson with government agencies as well as the public and the media on any significant spill events.

6.3.1.4 Other Site Personnel - Responders

All responders are trained under the Emergency Response Plan. The number of responders and their specific tasks is estimated in accordance with the spill scenarios and as outlined in the Emergency and Spill Response Plan and the Oil Pollution Emergency Plans for both Milne Port and Steensby Port.

6.3.1.5 On-Site Medical / Rescue Team

Depending on the scale of the spills/emergency scenario, the fire response and medical emergency procedures will be initiated.

6.3.2 Shipping Companies

When shipping hazardous materials to and from the site transport companies are required to carry out their operations in accordance with federal and international Transport of Dangerous Goods Regulations (i.e., TDGR - Clear Language, IMDG, IATA).

In the event of a spill of hazardous materials (exceeding the quantities listed in Part 8.1 (1) of the TDGR) during transport, the shipping company will immediately report the incident to the local police and the Nunavut Emergency Services at 1-800-693-1666 (as stated in Part 8.1 (5), TDGR). The immediate report must include as much of the information, listed in Part 8.2, TDGR, as is known at the time of the report. A follow-up report must be made, in writing, to the Director General within 30 days after the accidental release, the "dangerous goods accident" or the "dangerous goods incident". The follow-up report must include the information listed in Part 8.3, TDGR.

If a spill occurs on water during transport or during the transfer of hazardous materials from ship to land, the shipping company is responsible to implement the appropriate spill response measures in accordance to their spill response plan. If needed, the Baffinland Emergency Response Team can be available to assist the shipping company in their emergency response operations.

6.3.3 Coordination with Coast Guards and Government Agencies

Although Baffinland intends to be self sufficient in terms of emergency response, the Company has reporting obligations to regulatory authorities. Baffinland will maintain close communication with Transport Canada, the Canadian Coast Guard and the Government of Nunavut, who all share responsibilities for environmental protection and adequacy of emergency response in the eastern

Canadian Arctic. Baffinland will work with Transport Canada and the Canadian Coast Guard to develop emergency and spill response plans.

6.3.3.1 Canadian Coast Guard

The response to spill at the Milne Port or the Steensby Port is managed in coordination with the Canadian Coast Guard who is the lead response agency north of 60º.

The Central and Arctic Regional Response Plan (2006) and the Baffin Region, Nunavut Area Plan outline the Canadian Coast Guard's response capability for the Baffin region. The plans are components of the Canadian Coast Guard National Response Plan, which is the responsibility of the Director of Safety and Environmental Response Systems, Ottawa. It establishes the framework and the procedures by which Central and Arctic Region will prepare for, assess, respond to and document actions to be taken in response to pollution incidents in the Region. This capability and the information contained in the Coast Guard plans are considered a valuable resource in the planning and response to spills at both Milne Inlet and Steensby Inlet.

6.3.3.2 Regional Environmental Emergencies Team (REET)

The Environment Canada, Regional Environmental Emergencies Team (REET) is a multi-agency, multi-disciplinary group specializing in environmental emergencies. REET is designed to provide consolidated and coordinated environmental advice, information and assistance in the event of an environmental emergency. REET members represent several federal, provincial and municipal government departments, aboriginal communities, private sector agencies, and local individuals.

During emergency response situations a REET operates as a flexible and expandable multi-disciplinary and multi-agency team brought together to obtain and provide comprehensive and coordinated environmental advice, information and assistance to the On-Scene Commander or Lead Agency.

6.3.4 Emergency Response Team

An appropriate number of site personnel are selected and appropriately trained to form the Emergency Response Team. Crew members are trained in emergency spill response procedures and operations. Training includes knowledge of:

- Properties of hazardous materials used on site;
- Common causes of spills;
- Environmental effects of spills;
- Worker health and safety during emergency interventions;
- Personal protective equipment and clothing;
- Spill response procedures and techniques on land, water, snow and ice, and during all four seasons; and
- Spill response equipment and materials.

Baffinland makes the following commitments:

- Maintain necessary equipment and trained personnel at the Steensby Port at all times to enable the Company to respond effectively to SAR or sea borne environmental emergencies; and
- Provide adequate resources to implement and maintain the Emergency Response and Spill Contingency Plan, including the necessary human, material, and financial resources.

6.3.5 Emergency Response Training

The Operations Manager is responsible for coordinating emergency response training on site. The Emergency Response Team participates in training and emergency response exercises to ensure that all members are trained in equipment use and emergency response methods. The Emergency Response Team members are trained in emergency identification and currently accepted response action techniques. Training is related to specific emergency response roles, and includes:

- Emergency chain-of-command;
- Communication methods and signals;
- Emergency equipment and use;
- Emergency evacuation;
- Offsite support and use;
- Marine spill response; and
- Marine shoreline recovery operations.

Emergency personnel receive training in first aid and Cardiopulmonary Response (CPR) and practice hands-on rescue techniques. Employees undergo formal safety and emergency response training, which identifies site-specific hazards and other hazards associated with the Project in general. The training also reviews standard operating procedures, use of personal protective equipment, signalling an emergency, evacuation routes and muster locations, reporting and notification protocol, and other general safety procedures.

As part of site orientation and ongoing awareness training, all personnel are informed that any spill of fuel or other hazardous liquids or solids, whatever the extent, has to be reported to their immediate supervisor.

Training also includes analysis of potential spill events that are more likely to occur during the Mary River Project operations. Fuel spills are more likely to be caused by:

- Human error during fuel transfer operations (tank farm to tanker-trucks, drums to helicopters, etc.);
- Rupture of tanks, supply lines, or valves from accidental damage, deterioration or equipment failure; or
- Road accidents involving tanker-trucks.

Training includes spill response field drills and classroom training. Hands-on training includes:

- Review of inventory of spill equipment;
- Hands-on instruction – boom connections, tow bridles, rope handling, basic knots and attachment and deployment accessories;
- Simulated deployment of booms and related gear on water using appropriate vessels; and
- Debriefing and lessons learned.

Baffinland will implement annual training programs (classroom and hands-on deployment field exercises) for emergency responders to ensure that emergency response and spills contingency procedures are effective and up to date.

6.3.6 Emergency Response Exercises

Baffinland will invite external organization (Transport Canada, CCG, community representatives) to participate in the training exercises.

Following the annual delivery of training as outlined above, a comprehensive spill exercise is undertaken to test the readiness of management and responders, and to practice and validate the logistics of the deployment of spill gear. The exercise content is different from year to year so that it can best validate the various elements of the Emergency and Spill Response Plan and the OPEPs, and, the appropriateness of the response. Some of the factors that are evaluated include:

- Activation of the ERP / OPEP;
- Effectiveness of management response;
- Site safety;
- Communications;
- Equipment deployment for specific scenarios;
- Reporting and coordination with external agencies;
- Exercise coordination with Canadian Coast Guard; and
- Exercise coordination with ship.

Baffinland will invite external organizations to participate in its Emergency Response Exercises.

6.3.7 Communication

The types of communication for which members of the team participate include the following:

- Formal written correspondence and meetings with stakeholders;
- Site visits by community representatives;
- Design, construction and planning meetings;
- Field inspections and monitoring reports disseminated by the EHS Superintendent;
- Electronic communications;
- Tailgate/toolbox meetings;
- Formal written correspondence and meetings with government regulatory bodies; and
- Formal environmental awareness training.

Communications are appropriately recorded and filed for future reference. Where appropriate, copies will be forwarded to the Operations Manager(s), and Vice President Sustainability.

6.3.8 External Communications

Baffinland will distribute its Emergency Response and Spill Contingency Plan to all relevant stakeholders.

Effective forms of communication include the proactive notification to external stakeholders of Project activity. Project activity updates are provided to the communities of North Baffin through various means including regular meetings, public notices and radio announcements as appropriate. Baffinland will endeavour to maintain Community Liaison Offices to assist in this regard.

6.3.9 Updates

Baffinland will maintain an Emergency Response and Spill Contingency Plan that is current and adapted to the level of activities at the Mary River Project.

The Emergency and Spill Response Plan is revised and updated on a regular basis. The Plan will be updated prior to the commencement of construction and mobilization of the EPCM contractor. The revised plan will take into account the multiple construction sites, the large influx of construction personnel, and the drastic increase in volumes of hazardous materials transported/stored/handled throughout the construction period.

The updated Emergency Response and Spill Contingency Plan will include a section that outlines the measures Baffinland will initiate to protect wildlife in the event of a spill. The plan will include the following:

- Contact information (name location, phone number) for Agencies and people with expertise in bird hazing and bird exclusion, expertise in oiled bird rehabilitation, and, permits needed to haze, salvage, hold and clean, or euthanize birds;
- Procedures for deployment of bird hazing and bird exclusion techniques; and
- Procedures for destroying oiled/contaminated oiled birds.

Baffinland's Emergency and Spill Response Plan which is used during the pre-development and exploration Phase of the Project is attached in Appendix 3B, Attachment 5.

6.4 MILNE PORT OIL POLLUTION EMERGENCY PLAN

The Milne Port Fuel Storage Facility, Oil Pollution Emergency Plan (OPEP), was developed to specifically assist in implementing measures to protect the marine environment and minimize impacts from potential fuel spill events. This OPEP outlines potential spill scenarios and provides specific procedures for responding to spills while minimizing potential health and safety hazards, environmental damage and clean-up costs. The OPEP provides instructions to guide all personnel in emergency spill responses, defines the roles and responsibilities of management and responders and outlines the measures taken to prevent spills, the related exercise and evaluation program, and the mechanism for regular updates to the Plan. The OPEP complements the Emergency and Spill Response Plan by providing site specific consideration to Milne Port and instructions.

The Milne Port OPEP presented in Attachment 5 of Appendix 3B, has been prepared to meet the requirements of the Canada Shipping Act and the associated Oil Handling Facility Regulations in the context of the planned operations for the 2011 shipping season.

The Oil Handling Facility Regulations stipulate that an operator of an Oil Handling Facility must notify the Minister of all substantive changes to its response plan immediately after they are made and will, at least annually, update its response plan. To this end, the current Milne Port OPEP will be updated at the beginning of 2012 to reflect the changes proposed to the bulk fuel storage depot during pre-construction.

As this plan has been produced in anticipation of submission to Transport Canada for regulatory approval as written, reference to only the 2011 infrastructures and activities have been included in this document.

The planned bulk fuel transfer for the 2011 season will be carried out in a similar manner to the operation that was undertaken at Milne Inlet in 2008.

6.5 STEENSBY PORT OIL POLLUTION EMERGENCY PLAN

The Project's main fuel depot will be located at Steensby Port. The Steensby Port OPEP presented in Appendix 10C-3, has been prepared to meet the requirements of the Canada Shipping Act and the associated Oil Handling Facility Regulations in the context of the planned operations for the shipping season of the second year of construction (expected to be in 2013). The intent, structure and content of the Steensby Port OPEP are identical in nature to that of the Milne Port OPEP. Differences relate mainly to the nature and the size of the fuel tank farm.

6.6 EXPLOSIVES MANAGEMENT PLAN

Baffinland will require a supply of ammonium nitrate to manufacture ANFO and emulsion explosives for blasting during the Construction Phase and at the open pit mine during the operation Phase. This plan discusses explosives management, and in particular ammonium nitrate, pursuant to directives from the Nunavut Impact Review Board and Nunavut Water Board. For construction and operations, explosives will be contracted to a licensed contractor who will have a detailed operations manual for transportation, storage and handling of explosives. Therefore, the Explosives Management Plan is conceptual at this stage, since Baffinland's facilities have not been constructed and an explosives contractor has not been retained. However, the Plan does reflect the Baffinland's requirements from its Explosives Contractor.

Due to the potentially severe consequences of inappropriate management or use of explosives, the regulations and guidelines provide extensive detail of all aspects of managing and using explosives. Baffinland and its contractors will adhere to all applicable regulations and guidelines and will develop detailed standard operating procedures to include all potential scenarios that could occur during the life of the Project. The Explosives Management Plan is presented in Attachment 8 of Appendix 3B.

SECTION 7.0 - ENVIRONMENTAL MONITORING AND MITIGATION PLANS

The Environmental Mitigation and Monitoring Plans (EMMP) define specific procedures, actions, and monitoring needed to accomplish certain tasks required by the Project. Each EMMP enables assessment of the effectiveness of the mitigation measures implemented. These monitoring requirements ensure that:

- The Project is conducted as proposed;
- The predicted adverse environmental effects are promptly mitigated in a timely fashion; and
- The conditions set at the time of the Project's authorization and the requirements pertaining to the relevant laws and regulations are met.

Each plan outlines how monitoring results are used to refine or modify the design and implementation of mitigation measures and management activities (operating procedures). These plans also make it possible to ensure the proper operation of works, equipment, and facilities connected to the Project. If necessary, the plans help reorient the work and make improvements at the time of construction and implementation of the various elements of the Project. Each EMMP:

- Specifies criteria or thresholds to trigger corrective action based on its monitoring results;
- Identifies specific personnel responsible for the implementation of the corrective action; and
- Presents the system of accountability and the phase and component of the Project to which the mitigation measure would be applied.

The implementation of mitigation and monitoring measures will continue throughout all phases of the Project. The general organization and content of the EMMPs is presented in Table 10-7.1.

Table 10-7.1 Organization and Content of the Environmental Mitigation and Monitoring Plans

Section 1	Introduction	• States the purpose of the plan • Presents the legal and other requirements • Presents Baffinland's commitments • Presents the relationship to other EMMPs
Section 2	Targeted VECs	• List the VECs targeted
Section 3	Mitigation Measures	• Reiterates mitigation measures implemented in each Biophysical Environment Functional Management Plan • Reiterates justification for mitigation measures • Outlines expected residual effects with mitigation in place • Discuss possible effects of mitigation failure
Section 4	Activities / Components	• Description of activities and Project components impacting on VECs from the Construction Phase through to the Closure Phase

Table 10-7.1 Organization and Content of the Environmental Mitigation and Monitoring Plans (Cont'd)

Section 5	Roles & Responsibilities	• Identifies personnel responsible for implementing mitigation measures. • Identifies personnel responsible for conducting the monitoring, collecting, analyzing and interpreting data
Section 6	Performance Indicators & Thresholds	• Lists the selection criteria/threshold for compliance with regulatory requirements and performance target levels. • Identifies thresholds that will trigger corrective action or response • Evaluates the performance of the mitigation measures in place
Section 7	Monitoring and Reporting Requirements	• Lists parameters and indicators to be monitored • Establishes the reporting requirements (internal and external agencies) • Established reporting frequencies, format • Establishes the communication requirements for the monitoring results
Section 8	Audit and Adaptive Strategies	• Defines the review process • Defines procedures for making changes (integrating the results of the monitoring plan) to existing Biophysical Environment Functional Management Plan • Prescribe actions to be taken for observed non-compliance with laws, regulations, permits, performance targets
Section 9	References	• References as required.
Section 10	Attachment	• Supporting documents • Maps/drawings • Useful references

EMMPs vary in detail, reflecting the significance and complexity of the issues and the information available relative to the current stage of Project development. Proposed mitigation may include additional baseline work, further research, and plan development. The purpose of these plans is to provide an applicable framework and in some instances spell out the specific steps for implementing the mitigation actions. They reflect the current understanding of the local and regional environmental, social, and economic conditions. Each plan will be updated as the Project progresses to provide timely actions and responses to the issues they address, and task-specific procedures will be developed to define and detail each relevant job procedure.

7.1 LIST OF EMMPS

The list of EMMPs developed pursuant to this EIS is presented in Table 10-7.2. This Table presents an overview of some of the mitigations, indicators and thresholds used for monitoring of the VECs. Additional plans may be developed in the future, if appropriate, to further mitigate impacts and enhance benefits as the Project moves forward.

The Hazard Identification Procedure (Appendix 10A-2), the Emergency Response and Spill Contingency Plan, the OPEPs, the Explosives Management Plan and the Hazardous Material Management Plan address risk management and emergency response. These management plans are presented in Appendix 3B.

With respect to the Ship Oil Pollution Emergency Procedure (SOPEP), Baffinland points out that these are proprietary documents and are required by the Canada Shipping Act for each vessel navigating in Canadian waters. As Baffinland does not own the ships that will be servicing the Project, the Company cannot provide these SOPEP. For information purposes, the Table of Contents of a typical SOPEP is presented in Appendix 10D-10A.

The incineration management plan is an integral part of the waste management plan (refer to Appendix 3B, Attachment 5).

The air quality and noise abatement management plans are combined in a single management plan (Appendix 10D-1).

All EMMPs have been updated for the FEIS.

Table 10-7.2 Environment Monitoring and Mitigation Plans and Targeted VECs

(refer to relevant Appendix for comprehensive list of mitigation measures, relevant indicators and thresholds)				
Environmental Monitoring and Mitigation Plan	**Targeted VECs**	**Typical Mitigation Measures**	**Indicator**	**Threshold**
Air Quality and Noise Abatement (Appendix 10D-1)	Terrestrial Wildlife Birds Marine Mammals	- Procurement specification for emissions from equipment, incinerator and power plant - Use of dust suppressant where required - Use of ventilation hood and equipment on crushers and conveyors and stackers - Use of low sulfur fuels - Blasting techniques - Activity scheduling - Limit speed on roads - Waste segregation for incinerator operation	Air quality at sampling locations SO_2 NO_x PM_{10} Noise level at established distance from the equipment	Air quality SO_2 > NO_x > PM_{10} > CCME guidelines for dioxins and furans Noise level not to exceed 40 dB

Table 10-7.2 Environment Monitoring and Mitigation Plans and Targeted VECs (Cont'd)

Environmental Monitoring and Mitigation Plan	Targeted VECs	Typical Mitigation Measures	Indicator	Threshold
Surface Water, Aquatic Ecosystems, Fish and Fish Habitat (Attachment 5 of Appendix 3B)	Water quantity Water quality Vegetation Terrestrial Wildlife Fish Fish Habitat	- Siting/design of water intake - Water metering and conservation measures - Engineered lined containment (fuel and hazardous material) - Containment berms - Diversion/collection channels - Armouring - In-ground or portable sumps - Polishing ponds - Silt and erosion control structures - Polymer blocs - Freshet mitigation - Fish migration structures at creek crossing	Visual inspection of water quality at point of discharge or creek crossing Receiving water quality Visual inspection of creek crossing for erosion/damage to fish migration structures Fish count (CCME guidelines)	Surface runoff CCME guidelines for aquatic and marine receivers, Type 'A' water license criteria and MMERs for surface discharge criteria
Water Supply and Wastewater (Attachment 5 of Appendix 3B)	Water quality Fish Fish Habitat	- Effluent Treatment Plant (WWTF) - Oily Water Treatment Plant - Explosives effluent treatment - Contaminated snow/soil containment pond - Maintenance of the waste water treatment facilities - Operating procedures - Operator training	WWTF discharge water quality Oily Water treatment discharge effluent quality Effluent Toxicity	Exceedance of Type A water license thresholds

Table 10-7.2 Environment Monitoring and Mitigation Plans and Targeted VECs (Cont'd)

Environmental Monitoring and Mitigation Plan	Targeted VECs	Typical Mitigation Measures	Indicator	Threshold
Waste (Attachment 5 of Appendix 3B) - Landfill, Landfarm, Incineration	Land use Water quality Fish Fish Habitat Air quality Birds	- Strict adherence to operating procedures for waste storage, handling and disposal - Design of landfill & temporary waste storage facilities	Reports of non-compliance and/or incidents	Runoff from Storage areas O&G – no visible sheen
Waste Rock (Attachment 5 of Appendix 3B)	Landform Water quality Fish Fish Habitat Vegetation	- Siting of dump facility - Drainage patterns and drainage control structures - Operating procedures such as segregation/placement of waste rock - Seepage/runoff monitoring	On-going sampling/testing for potential acid generation material (ABA accounting) Seepage monitoring and acute toxicity testing	Exceedance of MMER thresholds for water quality and toxicity
Borrow Pits and Quarry (Attachment 6 of Appendix 3B)	Noise Air quality Water quality Fish Fish Habitat Vegetation Terrestrial Wildlife	- Archaeological survey - Siting of borrow pits and quarries - Detailed operating procedures as outlined in EPP - Drainage works - Closure procedures	- elevated TSS in stream - visible erosion - visible permafrost degradation	Exceedance of Type A water license thresholds
Fish Habitat Compensation (Appendix 10D-7)	Water quality Fish Fish Habitat			
Roads (Appendix 10D-8)	Cultural Heritage Water quality Fish Fish Habitat Terrestrial Wildlife	- Archaeological survey - Design/construction of creek crossings - Maintenance of roads - Operating procedures - Signage/awareness	- road condition - wildlife-vehicles interaction - silt entrainment in water bodies - accident/incident	- Visible erosion - No road kill

Table 10-7.2 Environment Monitoring and Mitigation Plans and Targeted VECs (Cont'd)

Environmental Monitoring and Mitigation Plan	Targeted VECs	Typical Mitigation Measures	Indicator	Threshold
Railway Maintenance Management Plan (Appendix 10C-9)	Water quality Fish Fish Habitat Terrestrial Wildlife	- Design/construction along lake & creek crossings - Railway maintenance - Operating procedures - Signage/awareness program - Locomotive speed	- Ice blockage of stream crossing - accident/incident - Wildlife kill	No accidental wildlife kill
Shipping and Marine Wildlife Management Plan (Appendix 10D-10)	Marine Wildlife	- Shipping route selection - Scheduling of ships - Operating procedures (ballast water and waste management)	- Marine mammal kill - Observable changes in behavioral or geographic distribution of mammal	Significant changes in behavioral patterns of marine mammals along shipping route
Terrestrial Environment Management Plan (Appendix 10D-11)	Vegetation Birds Terrestrial Wildlife	- Environmental awareness program for all site personnel - Avoidance of habitat - Responsible waste management - Effective traffic management - On-going wildlife monitoring - Nest management plans - Maintain distance from nesting ground	Caribou Peregrine falcons, Snow geese, Common and king eiders, Red-throated loons	Noticeable change in wildlife behavior patterns around facilities No accidental wildlife kill

7.2 SPECIFIC COMMITMENTS RELATED TO THE EMMPS

7.2.1 Air Quality and Noise

The Air Quality, Noise and Vibration Management Plan (Appendix 10D-1) outlines the mitigation measures implemented to avoid, reduce or minimize adverse effects to air quality, baseline noise and vibration.

Dust suppression

Brine or calcium chloride is used for drilling. Specific EPP procedures have been developed for the use and disposal of brine as it relates to exploration and geotechnical drilling (EPP 2.5 and 2.21). As these activities are often isolated, those procedures are adequate.

Consideration has also been given to the use of calcium chloride as dust suppressant during summer. Although this is an acceptable practice, Baffinland will aim to avoid this practice on the site, except in extreme conditions where no alternatives can readily be used. Specific commitments were made at the Pre-Hearing Conference with respect to the use and disposal of brine or calcium chloride for dust suppression.

As described in the Air Quality Management Plan, the main approach to dust reduction will be the use of coarse granular fill for road bed material, and, enforcement of strict vehicle speed limits throughout the site. An alternative dust suppressant will be used on the airstrips.

A complete emission inventory is presented as an appendix to Volume 5 of the FEIS.

In terms of the crushing and ore conveying equipment, as stated in the Project design criteria, crushing equipment will be enclosed and ventilated, and conveyor transfer points will also be ventilated. The dust collected from these areas will be disposed of at the landfill site.

Noise

As part of the H&S Management Plan, ambient noise measurement will be taken periodically. The baseline noise conditions (pre-Project) have already been recorded. More noise information will be recorded during the Construction and Operation Phases. As noise is not a major concern (refer to Volume 5, Section Appendix 5D-1, Noise Assessment), there is no need to undertake regular noise surveys; they will be undertaken on an as-needed basis.

Blasting near or under water has been identified as a concern. As stated in Section 4.3, a specific EPP procedure will be developed at the onset of construction to address environmental concerns associated with blasting in water.

7.2.2 Waste Rock Management Plan

Baffinland's approach to management of potential ARD/ML from the waste rock pile is four fold:

1. On-going program for characterisation of the waste rock and PAG/non PAG fractions;
2. Design of a waste rock pile that will prevent ARD/ML;
3. Should there be ARD, capture and containment of runoff from this stockpile and diversion to a sedimentation pond where the runoff quality can be monitored prior to discharge to the receiving environment; and
4. Treatment of runoff, if runoff quality does not meet discharge criteria established by the MMER regulation.

7.2.2.1 Characterization of the waste rock

Static testing and humidity cell results obtained to date indicate that in the very long term, there is some potential for acid runoff. Characterization of the waste rock will be on-going throughout the life of the Project. Additional static test and humidity cell were carried out in 2011 and these results will be presented in the FEIS. A detailed sampling and testing program is current being developed for the period of 2012 to 2014. This program 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); and
- Review and guidance of this program by independent experts.

The details of this ongoing characterization program are presented in the Waste Rock Management Plan (Appendix 3B, Attachment 5).

7.2.2.2 Waste Rock Stockpile Configuration

Since little can be done to change the lithology of the waste rock, Baffinland is concentrating its efforts on the design of a stock pile that will prevent conditions favourable to ARD/ML. The proposed design for the Waste Rock Pile (WRP) will utilize permafrost encapsulation and rely on the short- and long-term maintenance of frozen conditions within and beneath Potentially Acid Generating (PAG) waste rock piles to contain contaminants originating from the waste rock.

7.2.2.3 Containment of Waste Rock Stockpile Runoff

As a second line of defense against ARD/ML, the location of the stockpile is entirely within one watershed; this will divert all runoff to a single discharge point. Permafrost ensures that no groundwater seepage will occur and that all runoff can be contained.

As recommended by NRCan, as part of detailed design, thermal modeling has been conducted to determine whether the proposed berm design would maintain a permafrost barrier and prevent shallow subsurface seepage to the surrounding environment.

7.2.2.4 Discharge of Waste Rock Stockpile Runoff

Baffinland has stated that the discharge from the waste rock pile sedimentation pond will be in compliance with the discharge criteria established by the MMER. This regulation imposes an obligation for ongoing acute lethal toxicity testing of the discharge as well as Environmental Effects Monitoring Studies in accordance with Schedule 5 of the *Metal Mining Effluent Regulations* (MMER). As a last resort, treatment will be provided if the quality of the runoff exceeds discharge criteria imposed by the MMER regulation.

Based on the results obtained from the static ARD/ML test work and humidity test cell completed to date, Baffinland does not expect that runoff will exceed these discharge criteria, nor will this runoff have adverse effects on aquatic ecosystems.

Questions were raise about the duration of post closure monitoring. It should be stated that test work with humidity cell and static testing will continue for some time to come and that prior to closure, Baffinland will

have a much better understanding of ARD/ML potential from the waste rock. As explained in the Preliminary Closure Plan, post closure monitoring will continue until the closure objectives are achieved (refer to Preliminary Closure Plan, Appendix 3B, Attachment 10).

7.2.3 Quarry Management Plan

In terms of the quarry, Baffinland will avoid the use of quarry material that has ARD/ML potential. Testing of cuts and tunnel section are in progress for the railway line. To date, there is no indication that ARD/ML is problematic along the railway alignment.

A protocol for ARD/ML for quarry sites is presented as an attachment to the Quarry Management Plan presented as Attachment 6 of Appendix 3B.

As requested by commitment #110, Baffinland confirms that its site wide Emergency Response and Spill Contingency Plan also applies for the borrow pits and quarries.

7.2.4 Fish Habitat Compensation

Discussion with DFO on HADD quantification has been ongoing throughout 2011. Now that the HADD has been quantified for freshwater and marine fish habitat, discussions are under way for compensation. The Fish Habitat Compensation presented in Appendix 10D-7 presents the advancement on the discussion with DFO.

7.2.5 Railway Management Plan

The preliminary railway management plan presented in the DEIS has been enhanced to describe maintenance requirements as well as a draft “Railway Emergency Response Plan. These plans build on the lesson learned at Arcelor Mittal’s QCM facilities in Labrador.

7.2.6 Invasive Species

A discussion on the introduction of invasive species (both marine based and terrestrial) is included in Volume 9, section 3.5.5 and 3.5.6.

Ballast Water

To reduce or eliminate the risk of invasive aquatic species and pathogens being introduced into Canadian waters, all ships will exchange ballast water in accordance with the *Ballast Water Control and Management Regulations* (SOR 2006/129), which prescribe exchange of ballast water at sea in deep waters away from coastal zones. Ballast water will be exchanged in the mid-north Atlantic Ocean, which is part of the same ocean regime as Steensby Port. Upon arrival at the port, the ships will exchange ballast water for ore. During winter, full ballast is required to assist in icebreaking and so the entire amount of ballast water will be discharged at the dock. During summer, ships may discharge ballast water along the shipping route and only a partial load of ballast, in the order of 70,000 m^3, will be discharged at the ore dock.

Ballast Water Management Plans are specific to individual ships. The Shipping and Marine Wildlife Management Plan (Appendix 10D-10) outlines the major elements and requirements of a plan acceptable to Baffinland. In light of the ballast water management in place, the introduction of invasive species is unlikely and the risk is considered low.

Given the precaution taken, the introduction of invasive marine species is an unlikely event and the risk is considered low.

7.2.7 Introduction of Terrestrial Invasive Species

The delivery of material, equipment and freight to Steensby and Milne also introduces the potential for introduction of invasive terrestrial species (rodents) into the Arctic environment. Although climatic conditions at both ports are expected to be the major barrier to the survival of introduced species, Baffinland will undertake routine inspection of storage sites (*Wildlife Act, SNu 2003, 91(2)*). If a foreign species is detected, Baffinland will consult with Canada Customs and the Government of Nunavut DoE and take appropriate actions to remove/limit the spread of the species to Northern Baffin Island. The action taken will be species dependent.

7.3 ENVIRONMENTAL EFFECTS MONITORING PLAN (MMER REQUIREMENT)

The MMER stipulates a number of conditions under which a mine may release effluent into the environment. These conditions include:

- Monitoring of effluent for pH and deleterious substances;
- Acute lethality testing;
- Daphnia magna monitoring tests; and
- Environmental effects monitoring (EEM) studies.

The EEM studies are specified in Schedule 5 of the MMER Regulations and are designed to monitor the potential effects of effluent on the receiving environment, i.e., on fish populations, on fish tissue and on the benthic invertebrates community.

Baffinland's MMER Environmental Effects Monitoring Study Design Framework is presented in Appendix 10D-14. .

7.4 ENVIRONMENTAL MANAGEMENT PLAN

Each of the EMMP contains monitoring requirements. The purpose of the Environmental Monitoring Plan is to regroup the monitoring requirements of each EMMP and of the EEM plan into a comprehensive document. The EMP outlines the monitoring and reporting aspects of the atmospheric, terrestrial, freshwater and marine environments adopted by Baffinland for the Mary River Project.

Baffinland will continue to engage Environment Canada on the subject of water quality monitoring with a focus on compliance monitoring of discharges and aquatic effects monitoring.

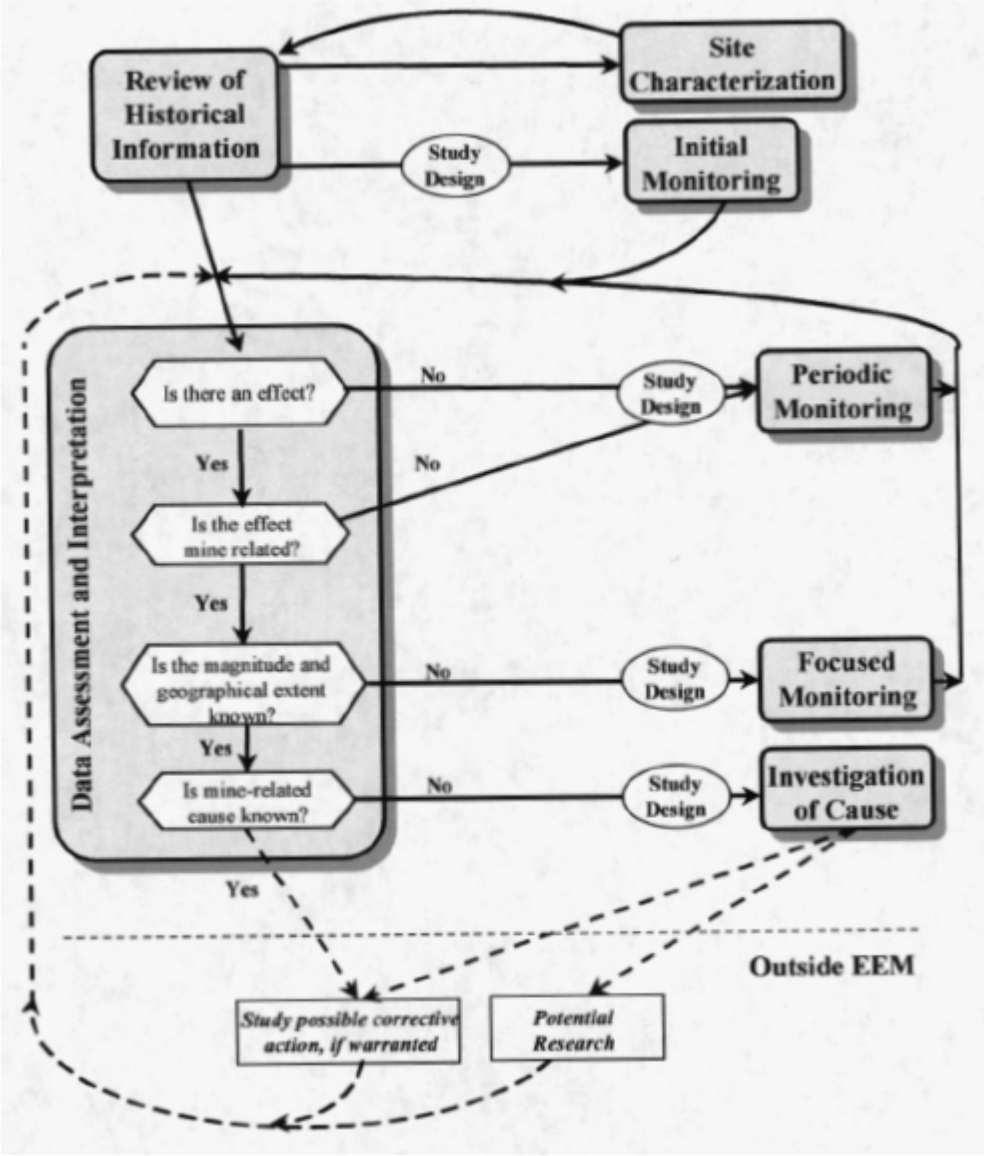
The EMP is presented in Appendix 10D-12.

SECTION 8.0 - BIOPHYSICAL ENVIRONMENTAL EFFECTS MONITORING FRAMEWORK (BEEMF)

The BEEMF (Appendix 10D-13) is a component of the Baffinland's EHS Management System. Baffinland's approach to environmental management is to seek continuous improvement in performance with documentation comprising a series of Environmental Mitigation and Environmental Monitoring Plans (EMMPs) focused on valued ecosystem components (VEC).

Figure 10-8.1 demonstrates the tiered nature of an effective BEEMF. As stated in the guidance document for the development of an effective environmental effects monitoring program:

> *"One of the most important aspects of the metal mining EEM program is that it is a tiered program, with the design of monitoring for a site being determined, in part, by the results of previous monitoring at that site. If EEM identifies effects at a site, then subsequent EEM studies will be more intensive, to determine the magnitude and extent of the effect, and ultimately identify the cause of the effect. On the other hand, if EEM studies consistently indicate that there are no effects, then the frequency of some monitoring activities may be reduced. The tiered nature of the EEM program is illustrated in Fig. 10-8.1."*



Source: CHARLES DUMARESQ, KATHLEEN HEDLEY AND ROBERT MICHELUTTI, Overview of the Metal Mining Environmental Effects Monitoring Program, *Water Qual. Res. J. Canada, 2002, Volume 37, No. 1, 213–218.*

Figure 10-8.1 EEM Program Activities

In line with the above illustration, the Mary River Project is now in the assessment process stage. At this stage, the site historical information, site characterization and initial monitoring information have been reviewed. This review process has resulted in the development of the Environmental Mitigation and Monitoring Plans (EMMPs) and the Biophysical Environmental Effects Monitoring Framework (BEEMF).

Under the section Data Assessment and Interpretation, a number of factors are taken into account:

- whether there is an effect,
- if the effect is caused by the operation,
- if the magnitude and extent known, and
- if the mine related cause is known.

At each stage a study design will be developed if there is no effect or no required action. Based on the study design either periodic or focused monitoring is undertaken. An investigation of cause is undertaken when there is the need to determine if a mine-related cause needs to be quantified. Then, either research or corrective actions are taken.

8.1 BIOPHYSICAL ENVIRONMENTAL EFFECTS MONITORING FRAMEWORK GOALS AND OBJECTIVES

A good BEEMF design addresses public concerns, regulatory requirements and scientific issues. The goals and objectives of the respective monitoring programs will be clearly stated to ensure the results are scientifically defensible and relevant. The goals relate to the specific purpose of the respective monitoring components of the BEEMF and the objectives will address the need to confirm predictions and to confirm the effectiveness of mitigation measures. Most important, the role of the various monitoring programs as early warning indicators will help to identify exceedances or unanticipated effects and will trigger additional monitoring studies or the implementation of mitigation measures.

8.2 BAFFINLAND APPROACH TO ENVIRONMENTAL EFFECTS MONITORING

It is the intention of Baffinland to establish cooperative environmental arrangements between the company, the QIA (Qikiktani Inuit Association) and the Inuit of Northern Baffin Island to protect the environment and the traditional relationship of the Inuit peoples with the natural environment. Review agencies will also be consulted (Environment Canada, Government of Nunavut DoE, DFO, others as required). The objectives of these arrangements are to:

- Develop a comprehensive and integrated environmental monitoring program, that may include a follow-up program as required under CEAA;
- Incorporate an ecosystem-based approach for monitoring and management of Project-related environmental effects;
- Include the meaningful participation Inuit in all aspects of the environmental monitoring program in all phases of the development, including the decommissioning and reclamation;
- Integrate traditional knowledge into the development and implementation of the environmental monitoring programs;
- Coordinate all aspects of the environmental monitoring program; and
- Report in an effective and timely manner on the environmental monitoring program and its results in ways that are meaningful to Inuit people.

8.3 PURPOSE OF BIOPHYSICAL ENVIRONMENTAL EFFECTS MONITORING FRAMEWORK

There are specific purposes for conducting a BEEM program. These are:

- To assist in the identification of target indicators, threshold, and, linkages for monitoring;
- To provide baseline data so that Project activities can be scheduled or planned to avoid or reduce Project adverse effects interactions;
- To evaluate the effectiveness of mitigation;
- To identify unforeseen environmental effects;
- To provide an early warning of undesirable change in the environment;
- To improve the understanding of cause-and-effect relationships; and
- To verify/validate effects predictions.

Three categories of study flow from these purposes:

1. **Research** – Background studies intended to establish need for, or parameters of, a BEEMF program. Research studies could address issues such as natural variability of a measured parameter or monitoring target, or examine the nature, extent or duration of a potential Project – Valued Ecosystem Component (VEC) interaction. Research studies address Purpose #1 for BEEMF.
2. **Surveillance** – Programs to produce information about the pattern of occurrence of target indicators/monitoring targets. Studies, for example to establish travel patterns of migratory animals through the Project area would address Purpose # 2 for BEEMF.
3. **Monitoring –** Programs to address and quantify cause and effect linkages between Project activities and components of the receiving environment. The full rigor of design criteria would apply to this type of monitoring program, which would address one or more of Purposes #3 through #7.

Research monitoring is conducted primarily to determine the need for further monitoring and if a program is deemed necessary, to identify target indicators and linkages. Research is usually only done once (at the beginning). Upon the determination that a BEEMF program is necessary, either a surveillance program or a BEEMF program is initiated.

The surveillance program is usually short term and is typically designed to identify potential mitigation measures to avoid adverse Project interactions. A surveillance program can also serve to identify a change in conditions which could trigger a biophysical environmental effects monitoring plan. A full scale BEEMF program is typically long term and is usually multifaceted.

In developing the BEEMF program, Baffinland has sought to ensure that relevant issues have been addressed, while avoiding the tendency to carry out a broad spectrum of poorly focused efforts. In order to accomplish this, emphasis has been focused on the issue of Project-induced change and addressing the challenge of establishing cause-and-effect relationships between the Project and the identified monitoring target.

Monitoring which simply records change is not Effects Monitoring. BEEMF must be relevant to the Project and to its possible effects on the environment; BEEMF must be capable of establishing a relationship

between any observed change in the environment and some feature of the Project. The criteria to be applied in considering candidate monitoring studies include:

- A credible Cause and Effect relationship can be postulated/established;
- The identified Effect has the potential to be negative;
- The effect is considered Significant;
- The likelihood is High or Moderate;
- The timing of interaction between the Project and the VEC will be sustained
- A credible, Unplanned Event could result in a significant negative effect; and
- The level of Confidence in the predicted Effect is low.

For the design of the BEEMF program, Baffinland's approach is to draw on the understanding of ecosystem interconnections and pathways in developing individual monitoring studies. The result is a pattern of individual monitoring programs, each of which satisfies the selection criteria and the design requirements for BEEMF program, and which, in total provide a comprehensive monitoring network. Through examination of the measured changes in the selected indicators, conclusions will be drawn with respect to impacts on the ecosystem as a whole.

In BEEMF program it will be necessary to establish protocols for evaluating data to determine if there is a need to modify monitoring plans or develop and implement corrective action as per the procedure illustrated in Figure 10-8.1. Thus, thresholds will need to be established for each monitoring program in one of a number of possible ways:

- Exceedance of background or baseline data by a prescribed percentage;
- Exceedance of an established "no observable effects concentration";
- Exceedance of "meaningful change" threshold criteria;
- Exceedance by an amount which is "statistically significant"; and
- Observance of levels which are known to cause an environmental effect.

For each monitoring program, appropriate thresholds will be established for the parameters and environmental effects being monitored. When thresholds are exceeded, the appropriate staff and management will be notified. The appropriate regulatory agencies and Monitoring Partnerships will be notified and consulted. The cause of the exceedance and its nature will be investigated. An action plan will be developed, and appropriate mitigation measures will be implemented. As per Baffinland's EHS Management System requirement, the BEEMF program may result in the addition or revisions of the already established Environmental Mitigation and Monitoring Plans (EMMPs described in section 8.0).

8.4 FRAMEWORK OF THE ENVIRONMENTAL EFFECTS MONITORING PROGRAM

The design structure for the respective EEM Programs includes:

- Project Interaction
    - Phenomena of concern
    - Environmental effect / issue
- Hypothesis Formulation
- Monitoring Target
- Design Type (Radial gradient, before-after comparison, control-exposure)
- Parameters and Endpoints
- Testable Hypothesis

- Sample Size Requirements
- Sampling
    - Frequency
    - Location
    - Timing
- Data Collection Methods
- QA/QC Sampling and Requirements
- Sample Handling and Analysis
- Data Interpretation and Reporting
- Triggering Levels (Threshold)

8.5 RELATIONSHIP BETWEEN THE BIOPHYSICAL ENVIRONMENTAL EFFECTS MONITORING FRAMEWORK, EMMPS AND THE ENVIRONMENTAL MONITORING PLAN

It is acknowledged that a number of monitoring and reporting requirements may be required of mining activities located in Nunavut, Canada. Of note are the requirements for Environmental Effects Monitoring under the Fisheries Act (Metal Mining Effluent Regulations). These regulations lay out a comprehensive monitoring program focused on waterborne discharges from the mining operation. In addition, the EMMPs presented in Section 8.0 build on the requirements of the NIRB EIS Guidelines for the Mary River Project.

Figure 10-8.2 illustrates the relationship between the Biophysical Environmental Effects Monitoring Framework (BEEMF – Appendix 10D-13), the Environmental Mitigation and Monitoring Plans (EMMPs), and, the overall Environmental Monitoring Plan (EMP – Appendix 10D-12).

This BEEMF is applicable only to environmental effects monitoring programs associated with mining activities under the authority of Baffinland's Mary River Project, located in Nunavut.

As mentioned in the BEEMF presented in Appendix 10D-13, a number of candidate program have already been identified.

8.6 UPDATE OF THE ENVIRONMENTAL EFFECTS MONITORING PLAN

Baffinland's BEEMF, outlined in Appendix 10D-13, will be regularly updated based the process established in Figure 2 of the BEEMF, management reviews, incident investigations, regulatory changes, or other Project-related changes.

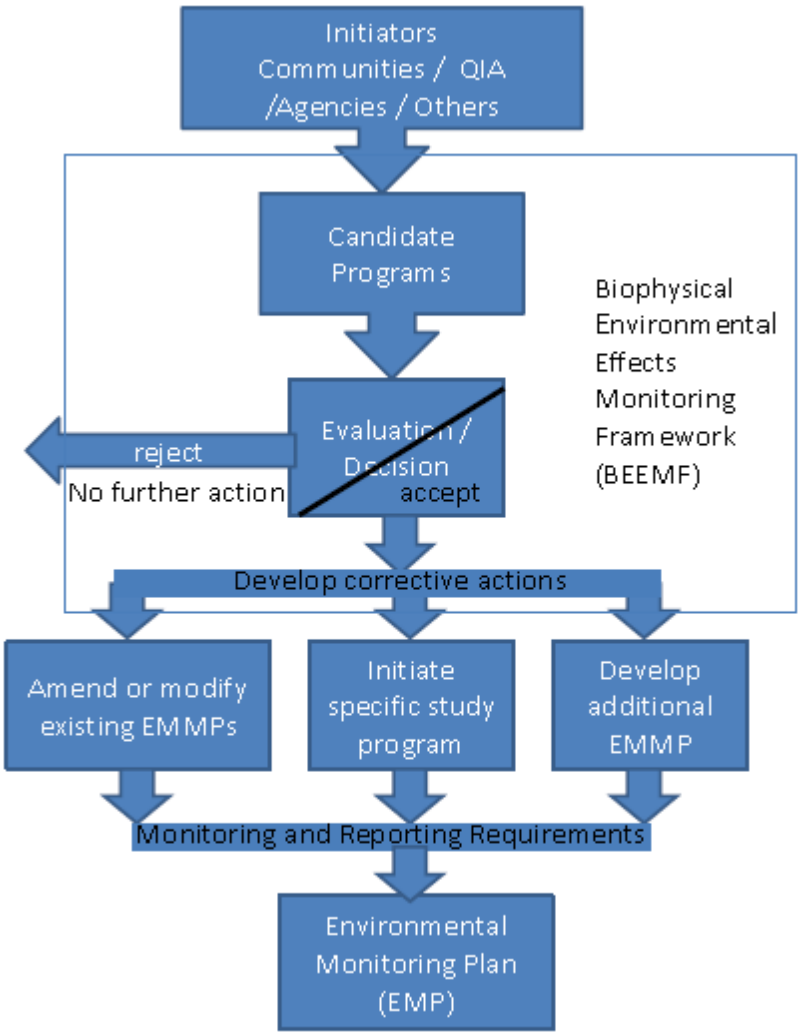


Figure 10-8.2 Relationship between BEEMF, EMMPs and EMP

SECTION 9.0 - SOCIO-ECONOMIC ENVIRONMENT MANAGEMENT PLANS

9.1 OCCUPATIONAL HEALTH & SAFETY MANAGEMENT PLAN

Baffinland is committed to protecting the health and safety of employees. The Company believes that providing a healthy and safe workplace leads to employees with better morale and more attentive behavior, resulting in improved productivity and product quality. Baffinland's Health and Safety Management Plan is based on the continuous improvement principle and is consistent with the *Occupational Health and Safety Management System* (OHSAS) 18001, dated 2007.

Baffinland's Health and Safety Management Plan is in place to control health and safety risks of its activities. The Company is committed to leadership and continuous improvement in Environmental, Health and Safety practices for the benefits of its employees, contractors and communities. This will be accomplished by:

- Providing a safe and healthy workplace;
- Integrating environmentally sound practices into processes;
- Complying with applicable laws, regulations, policies and standards;
- Conserving natural resources and energy;
- Providing necessary resources for the support of Environment, Health and Safety goals and objectives; and
- Aligning Environmental, Health and Safety goals and objectives with our overall business strategy.

A detailed outline of Baffinland's H and S Management Plan is presented in Attachment 5 of Appendix 3B.

9.2 STAKEHOLDERS ENGAGEMENT PLAN

As a member of the Mining Association of Canada (MAC), Baffinland has committed to MAC's "Towards Sustainable Mining" Guiding Principles (http://www.mining.ca/site/index.php/en/), one of which is to be "proactively seeking, engaging and supporting dialogue regarding our operations." Baffinland also adheres to the principles of ISO 26000, Guidance for Social Responsibility. To that end, this Stakeholder Engagement Plan SEP represents a proactive approach to meaningful stakeholder engagement.

The Stakeholder Engagement Plan (SEP) establishes the approach, strategy and means by which Baffinland will communicate with stakeholders. It draws on the knowledge gained from past consultation and engagement practices, and focuses on maintaining and improving existing stakeholder relationships and management systems. Engagement will be of particular importance during the Construction Phase of the Project, as relationships are developed and solidified. As the Project advances, the SEP will be refined and updated to provide relevant guidance applicable to subsequent phases of the Project.

The Project will affect the five North Baffin communities of Arctic Bay, Clyde River, Hall Beach, Igloolik and Pond Inlet; Iqaluit, the territorial capital of Nunavut and the commercial gateway to Baffin Island will also be impacted. These communities comprise the Project's social zone of influence and were selected based on existing and historical socio-economic and/or ecosystemic ties to the Project area and, in some cases, their geographic proximity to the Project.

The SEP provides guidance on communicating more effectively with Inuit people and other stakeholders, and describes the types of materials that may be used to support that engagement. It defines the objectives and approach, and describes the types of engagement activities that may be employed during the

Construction Phase. It also describes who is responsible for implementing, monitoring and reporting on the engagement programs.

A complaints management process is also presented, detailing the process by which Baffinland intends to deal with stakeholder complaints about the Project. It defines the procedure for recording, screening, resolving, monitoring, reporting, record keeping and archiving activities associated with the complaints process.

Specific commitments for implementation are made in the SEP. These include commitments to organize and systematically implement the concepts presented in the SEP, commitments for consultation and engagement with a variety of stakeholders, and commitments to engage employees and others to assist with the SEP implementation.

Baffinland's Stakeholders Engagement Plan is presented in Appendix 10F-1.

9.3 CULTURAL AND HERITAGE RESOURCES PROTECTION PLAN

The North Baffin region and the Mary River Project Area have a very rich archaeological history. This Cultural and Heritage Protection Plan describes the processes by which ground disturbing activities of the Project can be carried out with appropriate assessments by Project archaeologists, and also lays out the procedures for addressing chance finds of archaeological resources during construction activities. The plan is conceptual at this stage and was developed to support the EIS. The plan is presented in Appendix 10F-2. As the Project moves forward, the plan will be updated and more details will be added as appropriate.

9.3.1 Mitigation Measures

Activities associated with the Construction Phase of the Project will be the primary source of direct impacts to archaeological resources. Facilities such as the mine, stockpiles, railway, borrow sites and port facilities have footprints that will result in localized ground disturbance.

Three basic mitigation measures can be applied to direct impacts on archaeological resources: avoidance, site protection, and systematic data recovery. Specific mitigation measures are selected based on site-specific requirements.

- **Avoidance:** Avoidance of archaeological resources is the preferred mitigation measure, and has been applied to the Mary River Project design wherever possible. The results of archaeological surveys were used in Project planning to avoid identified sites and high potential areas.
- **Site Protection:** Sites which will not be impacted directly, but which are located near Project activities, will be protected through flagging and archaeological constraints mapping.
- **Systematic Data Recovery:** Sites that cannot be avoided within the development footprint will undergo systematic data recovery: surface collection, detailed mapping, and subsurface testing to collect information about the site, and recovery of artifacts. This will be limited to sites that cannot be avoided and will be conducted prior to site disturbance.

Indirect impacts are associated with improved access to the region and increased Project and non-project related human presence in the area. Project related personnel may inadvertently pick up artifacts or disturb rock features, or drive ATVs or snowmobiles over sites close to the development areas. While the Mary River Project will not be open to the public, the construction of docks at Milne Port and Steensby Port, and

improvements to the Milne Inlet Tote Road, will result in improved access, and may increase the number of non-project related users in the area.

Mitigation measures for indirect impacts will include:

- Enforcement of environmental protection measures as described in Section 2.3;
- Training of supervisory personnel in protection procedures and reporting protocols;
- Employee and contractor training and site orientation; and
- Additional site specific protection measures will be developed as required.

9.3.2 General Protection Measures

The EPP identifies a list of general protection measures for archaeological site as well as measures for managing known archaeological sites, and sites discovered during Project related activities. These measures reflect the contents of current land use permits and licences, the Government of Nunavut's Human Remains Policy, and the applicable legislation governing archaeology in Nunavut.

9.3.3 Roles and Responsibilities

As is currently the practice, Baffinland will retain the services of a qualified project archaeologist to develop a mitigation plan that identifies which mitigation strategies will be employed and the mitigation required. The archaeologist will report to the Environmental Superintendent and work in close cooperation with the Government of Nunavut Department of Culture, Language, Elders and Youth (CLEY).

This plan will include a description of the sites and the mitigation methods to be applied, and will be submitted to CLEY for review. Because of the sensitivity of heritage resources, this plan will not be available to the public. While CLEY is ultimately responsible for the issuing of archaeological permits, wider consultation with other stakeholders is also required.

All mitigation requests must be approved by CLEY prior to any disturbance of cultural resources. CLEY will then issue a permit to the qualified archaeologist prior to any site disturbance or data recovery program implementation.

9.3.4 Annual reporting

The Environmental Superintendent, in coordination with qualified archaeologists as permit holders for mitigation actions, will prepare an annual report summarizing what work has been done under the existing permits. This report will address location details and significance of actions and will be submitted to CLEY for each year that heritage resource mitigating actions are carried out. General activities that are not location-specific relating to archaeology will be summarized in the NIRB Annual Report.

9.3.5 Incident Reporting

The Environmental Superintendent is responsible to complete an incident report if an archaeological site is discovered during Project related activities, or if a known site is disturbed. The Environmental Superintendent will contact a qualified archaeologist and/or CLEY as required. The RCMP and Chief Coroner will be contacted immediately in the case of a suspected discovery of human remains.

9.4 HUMAN RESOURCES PLAN

Baffinland's Human Resources Management Plan (HRMP) ensures that the needs of all Baffinland personnel are addressed throughout the life of the Project. The plan consists of the following elements:

- Human Resources Management Principles and Policies;
- Workplace preparedness for Inuit workers;
- Organizational planning:
  - Human resource information systems;
  - Employee communications.
- Recruitment programs and point of hire;
- Inuit human resources strategy;
- Inuit education, training and development;
- Occupational health and safety and medical program;
- Employee relations:
  - Compensation plans and gain sharing;
  - Benefit programs.
- Contracting and subcontracting policies;
- Support for communities; and
- Socio-economic monitoring and reporting.

Baffinland is committed to providing an employment climate that will attract, develop and retain qualified personnel. Maintaining effective, committed employees is vital to the achievement of Baffinland goals. Baffinland will respect the terms and conditions of the IIBA and is committed to use best efforts in its attempts to maximize Inuit participation throughout the life of the Project. Baffinland will use best efforts with respect to:

- Inuit employment opportunities;
- Inuit education and training;
- Equal access to job opportunities for women;
- Contracting and subcontracting to Inuit firms; and
- Support for communities.

The HRMP is presented in Appendix 10F-3. The HRMP places a strong emphasis on Inuit participation in the Project, both as employees or contractors. The Plan incorporates the relevant aspects of the terms and conditions of the "Inuit Impact and Benefits Agreement" (IIBA).

SECTION 10.0 - MINE CLOSURE AND RECLAMATION PLAN

The Preliminary Closure and Reclamation Plan (MC&RP) describes the conceptual plans for dismantling surface structures and physically reclaiming land disturbances to a suitable post-mining land use. An overview of the closure plan is presented in Volume 3, Project Description, Section 4.10. The Preliminary Closure Plan is also presented in support of the Type A Water License Application (Attachment 10 of Appendix 3B).

The Preliminary Closure Plan addresses concurrent reclamation programs that will be implemented during the Construction Phase and as a result of iron ore mining activities. The Plan was developed on the basis of AANDC 2007 Mine Closure Guidelines and QIA Mine Closure Guidelines. It adheres to generally accepted rehabilitation criteria and focuses on both physical and chemical stabilization of the site. Land disturbances not needed to support active operations will be concurrently reclaimed.

A number of commitments related to the content of the Preliminary Closure Plan were made by Baffinland at the Pre-Hearing Conference. These commitments are tracked in a cross-reference Table presented at the end of the document (refer to Attachment 10 of Appendix 3B).

SECTION 11.0 - FOLLOW-UP AND ADAPTIVE MANAGEMENT PLAN

Baffinland's EHS management system is designed to offset the likelihood of adverse impacts cause by non-effective mitigation measures and the potential severity of the consequences. Each management plan incorporates a process of continuous improvement through which the information related to the effectiveness of mitigation measures is analyzed, and associated adaptive measures are employed in the environmental management system. Trends are monitored and exceedances of pre-established thresholds are reported along with justification for corrective actions.

11.1 PERFORMANCE MEASUREMENT AND MONITORING

It is important to identify key parameters to measure and communicate performance both internally and externally. The key parameters to measure include:

- Compliance with relevant regulatory requirements and performance targets
- Incident trends; and
- Progress towards achieving objectives and targets.

Each EMMP identifies criteria or thresholds to trigger appropriate response based on its monitoring results. The EMMP also specifies the position of the person responsible for taking corrective action, the system of accountability and the phase and component of the Project to which the corrective action would be applied.

Baffinland monitors and measures the performance of its EMMPs on a regular basis and periodically communicates key findings. These actions enable Baffinland to verify the accuracy of the environmental impact predicted in the Environmental Assessment and permitting stages of the Project, and to determine the effectiveness of the mitigation measures in reducing potential or adverse environmental impacts. If this monitoring process identifies unusual and unforeseen adverse environmental effects, corrective action is initiated. The existing mitigation measures are then adjusted, or if necessary, an adaptive plan with new mitigation or compensation measures is developed.

11.2 ACCIDENTS, INCIDENTS, NON-CONFORMANCES AND CORRECTIVE AND PREVENTIVE ACTION

Root or basic cause analysis is important for evaluating and investigating accidents, incidents and non-conformances in establishing objectives and targets for a successful corrective action program. Through this process, the actions taken to address non-conformances can result in permanent and positive changes in the EHS Management System and continual improvement. It is important that employees with health, safety and environmental responsibility be part of this process to assist in identifying and assessing actual and potential health and safety risks, and adverse environmental impacts.

Baffinland has written operational controls for handling and investigating potential accidents, incidents and non-conformances that includes:

- Tracking, and recording of details of accidents, incidents, and other non-conformances;
- Root or basic cause analysis;
- Mitigating any health and safety risks and adverse environmental impacts that arise from accidents, incidents, or other non-conformances including corrective and preventive action;

- Where mitigation is necessary, conducting a health and safety risk assessment and/or significance evaluation of the environmental aspects of the proposed corrective and preventive action(s) to determine appropriateness and effectiveness; and
- Implementing, recording and communicating changes arising from the corrective and preventive action, e.g., changes in operational controls, etc.

The Hazard Identification Standard presented in Appendix 10A-2 is integral to the identification of risk and the development of control measures.

11.3 RECORDS AND RECORDS MANAGEMENT

Baffinland maintains and preserves internal and external records that are critical to the design and performance of the EHS Management System. These records include:

- Training records;
- Inspections reports;
- Management of Change checklists and outcomes;
- Consultation reports;
- Accident, incident and non-conformance reports and follow-up corrective and preventive action reports;
- Medical test reports;
- Health surveillance reports;
- Cases of occupational disease and compensation claims;
- Audits and assurances;
- Management reviews;
- Environmental aspect evaluations;
- Emissions measurements;
- Exposure measurement records;
- Hazard identification, risk assessment and risk control records; and
- Governmental reports.

Baffinland has a written operational control to identify, maintain and preserve records. This operational control includes documented retention times, proper disposition of records, and a regular review of the operational control. Records are legible, identifiable and traceable to the activity, product, or service involved.

11.4 AUDITING, REVIEW AND UPDATE

Baffinland conducts audits to determine the degree of implementation of its EHS Management System, and to verify the performance of its EHS Management System. Audits and management review are fundamental to the concept of continuous improvement and adaptive management.

Management and labor representatives may undertake audits. The results of audit(s) and management review(s) can form the basis for the annual written statement of assurance by management on the effectiveness of the EHS Management System. Baffinland has a written operational control for regular internal audits of the implementation of the Baffinland EHS Management System criteria and requirements, and the operation and effectiveness of the EHS Management System.

In addition, there are regular Company Environmental, Health and Safety audits to determine compliance with the Baffinland EHS Management System requirements, and the degree of implementation and effectiveness of the EHS Management System. These audits extend to all management plans.

On an annual basis, management submits to the Chief Operating Officer a written statement of assurance as to the effectiveness of the EHS Management System.

11.5 MANAGEMENT REVIEW

Baffinland senior management reviews the EHS Management System to determine its continued suitability, adequacy and effectiveness. Management and labor representatives may undertake the review. Typical outputs of a management review could include:

- Recommendations to revise the Baffinland Environmental, Health and Safety Policy and supporting policies;
- Revision to the established objectives and targets; and
- Specifications for corrective actions for individual management plans with target dates for completion.

Baffinland conducts and documents management reviews on a regular basis. These reviews consider:

- The suitability of the Company Sustainable Development Policy and supporting policies;
- Establishing or updating of objectives and targets for continual improvement;
- The adequacy of the environmental aspect evaluation;
- The adequacy of hazard identification, risk assessment and risk control methodology;
- The levels of risk and the effectiveness of existing risk control measures;
- The adequacy of resources (financial, personnel, material);
- The effectiveness of any inspection processes;
- The effectiveness of the hazard reporting process;
- The data relating to accidents, incidents and non-conformances that have occurred;
- The trends in the number of occupational disease cases and compensation claims;
- The recorded instances of operational controls not being effective;
- The results of EHS Management System audits and assurances carried out since the last review and their effectiveness;
- The state of emergency preparedness;
- The improvements to the EHS Management System;
- The results of any investigations into accidents and incidents; and
- The effects of emerging trends and foreseeable changes to legislation and/or technology.

SECTION 12.0 - MANAGEMENT PLAN UPDATES AND DEVELOPMENT SCHEDULE

All environmental management plans are subjected to audit and annual management reviews to ensure that the policies, procedures and mechanisms lead to the achievement of stated performance goals and objectives. Table 1 (page ix) presents a summary of the various plans, with the latest revision date, the expected review date, or expected date of implementation.

SECTION 13.0 - DEFINITIONS

Acceptable Risk: Risk that has been reduced to a level that can be tolerated by the Company having regard to its legal obligations and its own EHS Policy.

Accident: An undesired event resulting in ill health, injury, property damage or loss, adverse environmental impact, or business interruption.

Activity: Includes a process, an event or a task that is not necessarily associated with a specific occupation or that may interact with the environment.

Audit: A systematic and documented verification process of objectively obtaining and evaluating evidence to determine whether the EHS Management System conforms to the Baffinland Iron Mines EHS Management System requirements, and for communication of the results of this process to management.

Change: Includes all permanent and temporary expansions, contractions and modifications to equipment, operational controls and technology (process), and includes additions and deletions, but excludes "replacement in kind". Change in technology includes the introduction of new physical, chemical or biological agents, new formulations, and process/system or activity changes. Change may also include modifications to an organization including addition or reduction of staff and new job assignments that may affect accountability assignments and/or knowledge.

Continual Improvement: A recurring process of enhancing the EHS Management System in order to achieve improvements in overall EHS performance consistent with the Company's EHS Policy

Corrective Action: Action to eliminate the cause of a detected nonconformity

Documents: Includes written information that is critical, or could be critical, for day-to-day effective EHS management.

EHS Management System: Part of an organization's management system used to develop and implement its EHS Policy and manage its EHS risks.

EHS Policy: Overall intentions and direction of an organization related to its EHS performance as formally expressed by top management.

Employee: A person who works for Baffinland Iron Mines.

Employees and others: Used in this context, "others" are persons who are not Baffinland employees and who may or may not have access to the workplace: contractors, visitors, governmental officials and other stakeholders including people in nearby communities.

Environment: Surroundings in which Baffinland Iron Mines operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

Environmental Aspect: Elements of Baffinland activities, products, or services that can interact with the environment.

Environmental Impact: Any change to the environment, whether adverse or beneficial, wholly or partially resulting from Baffinland activities, products, or services.

Facility: Facilities may be regarded as physical objects, structures, or items of equipment, as opposed to people and their activities.

Hazard: A source or situation with a potential for harm in terms of human injury or ill health, damage to property, damage to the environment, or a combination of these.

Hazard Identification: *The* process of recognizing that a hazard exists and defining its characteristics.

Ill Health: Identifiable, adverse physical or mental condition arising from and/or made worse by a work activity and/or work-related situation.

Incident: An event that gave rise to an accident or has the potential to lead to an accident. The term "incident" includes "near misses".

Interested Party: Person or group, inside or outside the workplace, concerned with or affected by the EHS performance of the Company.

Job (Occupation): A "job" is a series of tasks.

Legal and Other Requirements: Legal requirements are governmental regulatory requirements; and, "other requirements" are those that the corporation have adopted and that apply. Both types of requirements have equal weight and must be complied with.

Non-Conformance: Any deviation from work standards, practices and operational controls, safe conditions, legal and other requirements, the EHS Management System, etc., that could either directly or indirectly lead to injury or illness, property damage or loss, damage to the environment, or a combination of these. This may also be non-fulfillment of a requirement.

Objective: A goal to be achieved in terms or EHS performance than the Company sets itself to achieve.

Occupation: A job.

Occupational Health and Safety (OH&S): Conditions and factors that affect, or could affect the health and safety of employees or other workers (including temporary workers and contractor personnel), visitors or any other person in the workplace

Operational controls: Includes administrative, engineering and personal protective equipment and other protective measures (machine guarding, railing, *etc*). Administrative controls include programs, procedures and instructions.

Organization: A company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration.

Prevention of Pollution: The use of processes, practices, materials, or products to avoid, reduce or control pollution, which may include recycling, treatment, process changes, control mechanisms, efficient use of resources and material substitution.

Preventative Action: Action to eliminate the cause of a potential nonconformity or other undesirable potential situation.

Procedure: Specified way to carry out an activity or process.

Product: The material results of the activities. These can include intermediate products, by-products, and final market products.

Record: Is a document that furnishes objective evidence of activities performed or results achieved. A record records the outcome or results of an activity or task.

Risk: The combination of the likelihood of an occurrence of a hazardous event or exposure and the severity of injury or ill health that can be caused by the event or exposure.

Risk Assessment: The process of evaluating the risk(s) arising from a hazard(s), taking into account the adequacy of any existing controls and deciding whether or not the risk(s) is acceptable.

Safety: The freedom from unacceptable risk of harm.

Services: A function auxiliary to production or distribution of products, which supports the production or distribution of products.

Targets: A series of intermediate endpoints, the accomplishment of which is necessary to achieve an objective.

Task: A sequence of separate steps or activities that together accomplishes a work goal.

Workplace: Any physical location in which work-related activities are performed under the control of the Company.