MARY RIVER PROJECT
ENVIRONMENTAL IMPACT STATEMENT

VOLUME 10
ENVIRONMENTAL, HEALTH, AND SAFETY (EHS) MANAGEMENT SYSTEM

APPENDIX 10D-8

ROADS MANAGEMENT PLAN

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Table of Contents

List of Figures

Abbreviations

Baffinland ..... Baffinland Iron Mines Corporation
EHS ..... Environmental, Health, and Safety
EHS Policy ..... Environmental, Health, and Safety Policy
EIS .....Environmental Impact Statement
EPCM ..... Engineering, Procurement, Construction, and Management
EPP ..... Environmental Protection Plan
ESIA ..... Environmental and Social Impact Assessment
HADD ..... Harmful Alteration, Disruption, or Destruction
INAC ..... Indian and Northern Affairs Canada
Mary River Project ..... the Project
NLCA ..... Nunavut Land Claims Agreement
NTI .....Nunavut Tunngavik Incorporated
OH&S ..... Occupational Health and Safety
OHSAS ..... Occupational Health and Safety Management System
QIA ..... Qikiqtani Inuit Association
VEC ..... Valued Ecosystem Component
VSEC..... Valued Socio-Economic Components

1. Introduction

1.1 Purpose

The Mary River Project road network consists of the following:

- Service roads around Milne Port facilities.
- Road between Milne Port and mine site.
- Service roads around the mine facilities, including the mine haul and waste rock haul roads.
- Railway construction road between the mine and Steensby Port.
- Service roads around Steensby Port facilities.

These roads will be constructed and maintained by Baffinland for the duration of the Project. The Road Management Plan establishes Baffinland policies and guidelines for road use in the Project Area.

1.2 Regulatory Framework

The remote location of the Project necessitates construction of new access roads to transport materials and supplies to support project activities. Minimizing the effects of road construction on water bodies, tributaries, wildlife interactions sensitive ecosystems and traditional lands is foremost. Minimization of these effects and the mitigation of unavoidable effects are necessary for the sustainable development at the Mary River Project.

The road design criteria have been determined using the Mine and Safety Act, Northwest Territories and Nunavut (GN 1994).

1.3 Baffinland Road Policy

For safety reasons, use of service roads in the Milne Port, mine site and Steensby Port facilities will be restricted to Baffinland's employees and contractors.

The Milne Port–mine site road is a public road.

The railway construction road is a temporary road. Baffinland acknowledges that this road might be used by local residents while it is in service. The road will be open for public use until it is decommissioned.

1.4 Baffinland's Commitments

Baffinland will provide the necessary human, material and financial resources to implement and maintain the Health, Safety and Environment Management System. For Baffinland's Sustainable Development Policy, see Figure 1.

1.5 Relationship to Other Management Plans

The construction, upgrade, and maintenance of roads can affect site water quality and fish habitat. Therefore, this plan must be viewed in concert with:

- Environmental Protection Plan (EPP) – Appendix 10B.
- Surface Water and Aquatic Ecosystems Management Plan – Appendix 10D-2.

- Borrow Pit and Quarry Management Plan – Appendix 10D-6.
- Preliminary Mine Closure and Reclamation Plan – Appendix 10G.

The following related plans should also be consulted:

- Emergency Response and Spill Contingency Plan – Appendix 10C-1.
- Air Quality and Noise Abatement Management Plan – Appendix 10D-1.
- Terrestrial Environmental Management and Monitoring Plan – Appendix 10D-11.

1.6 Update of This Management Plan

The Road Management Plan will be updated as required based on management reviews, incident investigations, regulatory changes, or other Project-related changes.

Start of the construction phase will be a major milestone for the Project. The Road Management Plan will be updated with input from the engineering, procurement, construction, and management (EPCM) contractor to reflect the complexities of the construction phase.

SUSTAINABLE DEVELOPMENT POLICY

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

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

1.0 HEALTH AND SAFETY

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

2.0 ENVIRONMENT

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

3.0 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.

4.0 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

Figure 1: Sustainable Development Policy

2. Targeted VECS

The targeted valued ecosystem components (VECs) and valued socio-economic components (VSECs) are:

- Water quality.
- Fish habitat.
- Terrestrial wildlife.
- Health and safety of employees.
- Cultural resources and heritage.

In addition to the VECs and VSECs, this plan considers occasional use of the roads by residents of the neighbouring communities (Pond Inlet and Igloolik/Hall Beach residents).

3. Mitigation Measures

3.1 Construction of Roads

Road design shall be based on current Best Engineering Practice, for example Design of Surface Mine Haulage Roads- a Manual (US Department of the Interior, Bureau of Mines, 2001) and shall comply with applicable Federal and Local Laws and Regulations. This includes the application of the Mine and Safety Act, Northwest Territories and Nunavut (GN 1994) which requires the minimum haul road width of three times the maximum width of the largest haul truck and safety berms of at least three-quarters the height of the haul truck tire are required if the embankment is over three meters high.

The wearing surface of the roads will be designed based on the loads from the specific design vehicle for the road and shall be profiled to drain water from the surface to appropriately designed ditches adjoin the road. At suitable intervals along the ditch, settlement ponds shall be placed to provide sediment capture prior to the water being channelled to existing water courses. Ditches and settlement ponds shall be designed to cope with the peak flow specified with the required return period event.

Roads are constructed for all-season use. Cut and fill locations along road alignments and excavation of sand and gravel from borrow areas exposes soil that is potentially prone to erosion. These activities can result in a change in the ground thermal regime, as a new active layer is introduced. Modification to the thermal regime can induce melting of ground ice present, resulting in thaw settlement and depressions and ultimately road hazards, and areas that are more prone to erosion and ponding of water. Roads will be designed to minimize the potential for ground ice melting, erosion, and ponding of water and to enable rapid discharge of water through the road embankment via existing drainages and creeks/streams (e.g., by appropriately designed and constructed culverts).

Whenever practicable, road construction will be scheduled to minimize impacts on the receiving environment.

3.1.1 Road Alignment

Before finalizing the alignment of a road, unique landform and archaeological resources will be surveyed. Whenever possible, the alignment of new roads will avoid unique landforms and archaeological sites.

3.1.2 Creek and River Crossings

For the mitigation measures related to protection of surface water quality and fish habitat, see the Surface Water and Aquatic Ecosystem Management Plan in Appendix 10D-2. Several operating procedures have been developed to mitigate the negative impacts on erosion and damage to creek crossing structures and fish habitat. These measures include:

- Clearing snow from roads where culverts/crossings are located.
- Excavating downstream and upstream of crossing before onset of freshet monitoring culverts for clearance of snow and ice.
- Where snow and ice blockage occurs, ensuring that blockage is removed to re-establish adequate flow.
- Regular monitoring of crossing conditions to ensure acceptable conditions for fish migration.
- Performing repairs/modification to crossing structures as required based on results of monitoring and risk assessment Fish Habitat Protection.
- For locations where there is a problem with culvert outlet scour and erosion, construction of rocky ramps downstream of the crossings will be considered. Occasionally, reinstalling culverts is required, or installation of additional overflow culverts will be required.
- During construction of docks, for all works requiring the use of explosives (blasting) in or near water bodies, DFO Guidelines for Use of Explosives in or Near Canadian Waters.
- For dock construction (dredging, piling, backfilling), a silt curtain will be used to prevent dispersion of sediment in marine waters.
- Mitigation measures, such as bubble curtains, will be used to attenuate noise in marine water.
- Fuel required will be transported in fuel drums or double-walled day tanks. Drip pans are used under the tanks to prevent spills.
- All bridges and culvert crossings have been designed for an appropriate hydraulic event return period with allowance made for ice accumulation.
- For all construction work requiring the use of explosives in or near water, Baffinland and its EPCM contractor will adhere to the Blasting in Water Procedure (Section 2.24, Environmental Protection Plan, Appendix 3B, Volume 3 of the FEIS).
- Each stream/river crossing is assessed for potential loss of fish habitat. Some crossings will result in the Harmful Alteration, Disruption, or Destruction (HADD) of fish habitat under Section 35(2) of the Fisheries Act, and an authorization will be sought from DFO. HADD is expected at the water intake and sewage outfall portions of watercourse crossings. For the compensation plan for HADD, see the Conceptual Fish Habitat Compensation Plan.
- 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.
- Smaller temporary tank farms and secondary storage consisting of multiple 20,000 L capacity double-walled iso-containers will be established at construction camps, quarries and major bridge sites. These smaller tank farms will be re-supplied using tanker trucks. Equipment at the railway construction fronts will be refuelled using smaller fuel trucks.

- For each method of fuel storage and transfer, specific procedures related to fuel storage and transfer will be developed and proper containment and emergency response equipment will be provided to meet or exceed regulatory requirements (see EPP procedures).
- The Emergency and Spill Response Plan (SD-ERP-001) will govern land-based operations, and a Transport Canada-approved Oil-Handling Facility (OHF) Plan (Milne Port OPEP SD-ERP-002 and Steensby Port OPEP SD-ERP-003) will govern ship-to-shore fuel transfers.

3.2 Operation

3.2.1 Road Maintenance

Roads will be regularly graded to prevent rutting (furrow creation). Active borrow sites will be maintained to secure access to sand and gravel as required (see Appendix 10D-6: Borrow Pit and Quarry Management Plan).

Snow Removal

During the winter months, drifting snow is likely to accumulate in preferential areas of the roads. Roads will be designed to minimize drifting snow on the road embankment. Snow fences might be considered in those areas of unavoidable accumulation to minimize these effects. Roads will be ploughed as necessary.

Dust Control

During the summer months, road dust might be problematic. Water or other dust suppressants could be used on the roads as required, particularly on heavy-use sections. During the winter when everything is frozen solid there will be no dust suppressants used on the roadways, however during the summer months water will be used to damp down the roads and control the dust.

A chemical binding agent (Midwest's EK35) will be used as a chemical binding agent applied once or twice a year to reduce dust emissions and to improve the wear resistance along the airstips. EK35, a synthetic organic dust control product on the market. Unique in the industry, this product has a resin binder system that captures fines and keeps them locked into the surface, preventing fugitive dust from escaping. EK35 provides longer-lasting performance and requires fewer applications than other dust control and surface-stabilization methods – regardless of season. EK35 is verified safe for people and the environment; it is readily biodegradable in natural environments and works with all types of soils and aggregates. This product is does not evaporate or leach out of the surface and works well at extreme temperatures and is suitable product to used as a dust suppressant. Calcium chloride or other biodegradable binding agents may be used on roads where there is little soil or vegetation that might be affected.

Road Closure

Whenever unsafe conditions are identified (washout, severe rutting), the road will be closed until the required maintenance is completed. Road closure plan description will be addressed in the Preliminary Mine Closure in Reclamation Plan which will be updated prior to the submission of the Final Environmental Impact Statement.

3.2.2 Freshet Management and Spring Thaw

Extreme flows occurring during freshets can result in erosion and damage to road embankments, stream-crossing structures, and fish habitat. Under Baffinland's Harmful Alteration, Disruption, or Destruction (HADD) authorizations and Letters of Advice for road and stream-crossing construction and ongoing operations, impacts on fish habitat must be minimized and fish passage for all life stages must be maintained. Several operating procedures have been developed to mitigate potential impacts caused by freshet events. These procedures include:

- Establishing/marking locations of all susceptible crossings.
- Clearing of snow from roads where culverts/crossings are located.
- Excavating downstream and upstream of creek crossing before the melt.
- Monitoring culverts for clearance of snow and ice.
- Where snow and ice blocks occur, ensure that that blocks are removed to ensure free flow of water.
- Monitoring crossing conditions regularly to ensure acceptable conditions for fish migration.
- Effecting repairs/modifications to crossing structures as required.

3.2.3 Speed Control and Signs

Speed limits for Project roads have been established and communicated to all Project personnel operating vehicles. Road signs will indicate hazards and blind road curves or intersections, radio frequencies, and radio call-in requirements.

Markers are positioned approximately each kilometre along to the Milne Port–mine road and the railway construction road. These markers are used to identify position in case of emergencies. They are also used for reporting wildlife sightings and non-Project human visitor observations.

3.2.4 Right of Way

Whenever possible, traffic will yield to wildlife encountered on roads.

3.2.5 Use of Road by the Public

The Milne Port–mine road and the railway construction road might also be used by non-project individuals (snowmobile, ATV) from nearby communities (e.g., Pond Inlet and Igloolik). Extreme care must be taken at all times whenever non-Project individuals are sighted along these roads as they might not be aware of the hazards associated with Project activities and traffic.

Sighting of non-Project personnel are reported and recorded on posted logs (see Volume 10, Appendix 10B: EPP, Section 2.2).

3.2.6 Wildlife Interaction

The potential effect to wildlife along the proposed road alignments is expected to be low for most species. Caribou are likely the most sensitive to sensory disturbance caused by truck traffic. Mitigation measures to reduce the likelihood of a barrier effect and reduced habitat effectiveness of caribou include:

- Limiting truck traffic with trucks travelling in convoy; and

- Using snow management practices that will grade snow banks along the roadway so caribou can easily cross the transportation corridor.

Extra consideration has been given to developing protocols and mitigation measures to reduce the potential for road related mortality of caribou. The following recommendations will also be beneficial for all other wildlife VEC's occurring in the area:

- All drivers will undergo informational and training sessions during orientation regarding the potential for wildlife and vehicle collisions.

- The Tote Road and Rail Access Road will have posted speed limits to ensure interactions between ungulates and vehicles can be avoided. Speed limits will be strictly enforced by HSE Manager and security personnel.

- The location of herds of caribou or individual animals observed in the vicinity of project facilities will be reported to the on-site Environmental Lead who will inform all potentially affected project employees of their presence. This ongoing communication system will ensure that unexpected encounters between animals and vehicles are minimized. Trucks will be equipped with radios so drivers can alert each other of caribou and other wildlife approaching or crossing roads.

- When animals are present on or moving/migrating across roads, they will be given the right of way.

- Wildlife logs of wildlife consisting of locations, numbers, and directions of travel will be kept (see Volume 10, Appendix 10B: EPP, Section 3, 3).

- For all vehicle-wildlife collisions associated with the Project, a report will be completed. This information will be analyzed on an annual basis to determine whether threshold mortality rates have been exceeded and changes to mitigation measures warranted.

- Every effort will be made to enforce a no hunting zone 1 km of project owned roads to reduce project-related effects on wildlife in that area and to protect the safety of Project personnel. Consultation will be held with the public to emphasize the importance of these measures and with territorial and federal stakeholders as they relate to land use issues in the region. Signs will be posted along roads.

- Mine employees will not be permitted to carry firearms or hunt while on shift or off rotation in Project areas. Only authorized personnel will carry firearms for specific purposes.

- Protocols will be established for relaying and important information about caribou and other wildlife to central wildlife registry that contains all information reported about wildlife. This will be administered by the HSE Manager on site. The HSE Manager will also be familiar with procedures in the event of a potentially dangerous or uncontrollable situation involving wildlife.

Caribou mortality along project roadways is expected to be minimal and likely limited to individual animals.

3.2.7 Communication

Baffinland vehicles are equipped with radios. Unsafe road conditions must be reported by drivers. To ensure safety and prevent accidents, drivers must radio their positions when departing or arriving at camps and when approaching blind curves or hills. These call-in locations are posted and communicated to vehicle operators.

4. Roles and Responsibilities

For the construction phase, the Engineering, Procurement, Construction, And Management (EPCM) contractor is responsible for road construction and maintenance. For the operation phase, the Mine Maintenance Superintendent will likely be responsible for maintenance of roads and creek crossings.

Drivers must report unsafe road conditions to the EPCM road contractor, to their immediate supervisors, to others using the road who might be at risk, and to Baffinland's Maintenance Department.

Sighting of wildlife and non-Project individuals must be reported to the Environmental Lead or HSE Manager, who will ensure the sightings are posted on appropriate logs. The logs will be managed by the HSE Manager or their designate.

Vehicles drivers must have the appropriate driver's licence. Only authorized Project personnel are allowed to drive company vehicles (light trucks, ATV, snowmobiles).

5. Performance Indicators and Thresholds

The ultimate performance indicators are the number of vehicle accidents recorded and the number of harmful vehicle-wildlife interactions (e.g., where wildlife are injured or killed). Baffinland's objectives are zero accidents and zero road kill.

6. Monitoring and Reporting Requirements

6.1 Road Maintenance

Roads and creek crossings are inspected regularly for signs of degradation and maintenance requirements. The maintenance department keeps a registry of all road maintenance work. Periodic visual inspections will be conducted on all roads by trained personnel and will occur at regular intervals and after any vehicle collision, heavy precipitation event or construction activity occurs. The three roads that will be continually inspected over the project will be the Railway Access Road, the Tote Road and the Local Site. Road safety, stability and erosion are some of the things that will be investigated during regular inspections.

6.2 Incidents and Accidents

Incidents and accidents are reported to the HSE Lead who will communicate the incident to the Safety Lead. Where warranted, an investigation and report on the causes and corrective actions to prevent reoccurrence of the incident/accident.

6.3 Use of Roads by Non-Project Individuals

The Safety Lead maintains a registry of sightings locations and frequencies of non-Project-related individuals in a human use log. For reporting requirements and types of observations to be recorded, see Appendix 10B: EPP, Section 2.2. This information is used to formulate policies and initiatives for Project road use, wildlife harvesting observations, and other related

matters. The information is reported annually or more frequently (as requested) to government and stakeholders.

6.4 Wildlife Sighting

The Safety Lead maintains a registry of wildlife sighting locations and frequencies. For reporting requirements and types of observations to be recorded, see Appendix 10B: EPP, Section 2.23. This information is used to inform terrestrial wildlife studies and to formulate mitigation measures for wildlife protection, and is included in annual (or more frequent) reports to government and stakeholders.

7. Adaptive Strategies

Baffinland is committed to continuous improvement in its work activities with the aim of reducing risks to the environment and improving operational effectiveness. The strategy employed at Baffinland is regular monitoring supported by operational change and adoption of other mitigation measures when warranted.

As per the requirements of Baffinland's EHS Management Framework (SD-STD-001), the company will conduct and document regular management reviews of its Road Management Plan. Such reviews will ensure monitoring results for the road management plan are integrated with other aspects of the Project and that necessary adjustments are implemented as required. These reviews also provide a formal mechanism to assess effectiveness of management in achieving company objectives and maintaining ongoing compliance with Project permits and authorizations.

END OF SECTION