APPENDIX E.5.6

Roads Management Plan

Baffinland Iron Mines Corporation

Roads Management Plan

BAF-PH1-830-P16-0023

Rev. 7

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Item No.	Description of Change	Relevant Section
1	Removed Targeted VECs and VSECs	Section 3
2	Removed Performance Indicators and Thresholds	Section 6
3	Added Tote Road Monitoring Program	Appendix D

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1 INTRODUCTION

As required by Baffinland Iron Mines Corporation's (Baffinland) Type 'A' Water Licence No. 2AM-MRY1325 – Amendment No. 1 (Type 'A' Water Licence), issued by the Nunavut Water Board (NWB), the Roads Management Plan (RMP) has been updated to reflect current operations at the Mary River Project (the Project). This Plan is a living document and will be revised, as required, based on future work scope modifications and associated approvals and in accordance with Baffinland's Type 'A' Water Licence, Commercial Lease – Q13C301 between Baffinland and the QIA, the Project Certificate No. 005 issued by the Nunavut Impact Review Board (NIRB) and any subsequent requirements which may be issued for the Project.

1.1 PURPOSE

This Plan has been developed to ensure the protection of people, wildlife and the environment by establishing the proper management of roads at the Project, in recognition of applicable best practices, permits, authorizations, approvals and Inuit Knowledge. The purpose of this Plan is to outline the responsibilities, policies and procedures adopted by the Project to manage the ongoing operation and maintenance of the Project road network. This Plan applies to all personnel and equipment working for or on-behalf of Baffinland, including Contractors and Sub-contractors (herein identified as "Contractors").

This Plan is applicable to all roads that comprise the Project road network, including:

- Service roads at Milne Port,
- The road between Milne Port and the Mine Site, known as the Milne Inlet Tote Road (Tote Road), and;
- Service roads at the Mine Site, including the Mine Haul Road (MHR).

The RMP provides a practical way to facilitate field implementation of operational, safety or environmental related regulations, practices, and procedures required to eliminate or reduce potential risks. The Plan is a working document for use in the workplace by Project personnel and Contractors, as well as at the corporate level, to ensure commitments made in the Company's policy statements are implemented and monitored.

1.2 REGULATORY FRAMEWORK

This Plan outlines the Project's roads management policies and procedures to ensure compliance with the relevant terms, conditions and regulations outlined in the following regulatory instruments:

- Project Certificate No. 005,
- Type 'A' Water Licence,
- Commercial Lease

- Tote Road Fisheries Authorization No. NU-06-0084 (DFO, 2007), and subsequent amendments for Project fish bearing water crossings, and;
- Mine Health and Safety Act and Regulations

Project activities are monitored for compliance with the regulatory instruments listed above. Where it is determined that Project activities fail to comply with the regulatory requirements, further assessment shall be completed to modify activities such that compliance is achieved or mitigation methods shall be implemented.

The reader is referred to Section 4.2 and Appendix B of this Plan for a discussion on the key regulatory requirements and approvals necessary for maintaining and modifying the Project road network and associated water crossings. A concordance table that outlines the terms and conditions included in the Project Certificate No. 005, Type 'A' Water Licence and the Commercial Lease that pertain to the management of the Project road network is provided in Appendix G of this Plan.

1.3 Baffinland Road Policy

For safety reasons, the use of service roads at Milne Port and the Mine Site will be restricted to Baffinland's employees and Contractors. The Tote Road is considered a public road. The management of public access to the Tote Road and Project sites is described further in Baffinland's Hunter and Visitor Site Access Procedure (BAF-PH1-830-PRO-0002) and Section 4.4.9 of this Plan.

1.4 Relationship to Other Management Plans

The construction, operation, and maintenance of the Project road network can affect site water quality, fish habitat, vegetation and other environmental components. Therefore, this Plan must be viewed in consideration with the following Environmental Management and Monitoring Plans for the Project.

- Environmental Protection Plan (BAF-PH1-830-P16-0008)
- Surface Water and Aquatic Ecosystem Management Plan (BAF-PH1-830-P16-0026)
- Fresh Water Supply, Sewage and Wastewater Management Plan (BAF-PH1-830-P16-0010)
- Aquatic Effects Monitoring Plan (BAF-PH1-830-P16-0039)
- Freshet Management and Preparation Plan (BAF-PH1-830-P16-0049)
- Interim Closure and Reclamation Plan (BAF-PH1-830-P16-0012)
- Air Quality and Noise Abatement Management Plan (BAF-PH1-830-P16-0002)
- Emergency Response Plan (BAF-PH1-830-P16-0007)
- Spill Contingency Plan (BAF-PH1-830-P16-0036)
- Terrestrial Environmental Management and Monitoring Plan (BAF-PH1-830-P16-0027)
- Borrow Pits and Quarry Management Plan (BAF-PH1-830-P16-0004)
- Cultural and Heritage Resource Protection Plan (BAF-PH1-830-P16-0006)

2 BAFFINLAND POLICIES

2.1 HEALTH, SAFETY AND ENVIRONMENT POLICY

This Baffinland Iron Mines Corporation Policy on Health, Safety and Environment is a statement of our commitment to achieving a safe, healthy and environmentally responsible workplace. We will not compromise this policy for the achievement of any other organizational goals.

We implement this Policy through the following commitments:

- Continual improvement of safety, occupational health and environmental performance
- Meeting or exceeding the requirements of regulations and company policies
- Integrating sustainable development principles into our decision-making processes
- Maintaining an effective Health, Safety and Environmental Management System
- Sharing and adopting improved technologies and best practices to prevent injuries, occupational illnesses and environmental impacts
- Engaging stakeholders through open and transparent communication.
- Efficiently using resources, and practicing responsible minimization, reuse, recycling and disposal of waste.
- Reclamation of lands to a condition acceptable to stakeholders.

Our commitment to provide the leadership and action necessary to accomplish this policy is exemplified by the following principles:

- As evidenced by our motto “Safety First, Always” and our actions Health and Safety of personnel and protection of the environment are values not priorities.
- All injuries, occupational illnesses and environmental impacts can be prevented.
- Employee involvement and active contribution through courageous leadership is essential for preventing injuries, occupational illnesses and environmental impacts.
- Working in a manner that is healthy, safe and environmentally sound is a condition of employment.
- All operating exposures can be safeguarded.
- Training employees to work in a manner that is healthy, safe and environmentally sound is essential.
- Prevention of personal injuries, occupational illnesses and environmental impacts is good business.
- Respect for the communities in which we operate is the basis for productive relationships.

We have a responsibility to provide a safe workplace and utilize systems of work to meet this goal. All employees must be clear in understanding the personal responsibilities and accountabilities in relation to the tasks we undertake.

The health and safety of all people working at our operation and responsible management of the environment are core values to Baffinland. In ensuring our overall profitability and business success every Baffinland and business partner employee working at our work sites is required to adhere to this Policy.

Brian Penney
Chief Executive Officer
May 2019

2.2 BAFFINLAND SUSTAINABLE DEVELOPMENT POLICY

At Baffinland Iron Mines Corporation (Baffinland), we are committed to conducting all aspects of our business in accordance with the principles of sustainable development & corporate responsibility and always with the needs of future generations in mind. Baffinland conducts its business in accordance with the Universal Declaration of Human Rights and ArcelorMittal's Human Rights Policy which applies to all employees and affiliates globally.

Everything we do is underpinned by our responsibility to protect the environment, to operate safely and fiscally responsibly and with utmost respect for the cultural values and legal rights of Inuit. We expect each and every employee, contractor, and visitor to demonstrate courageous leadership in personally committing to this policy through their actions. The Sustainable Development and Human Rights Policy is communicated to the public, all employees and contractors and it will be reviewed and revised as necessary on a regular basis. These four pillars form the foundation of our corporate responsibility strategy:

1. Health and Safety
2. Environment
3. Upholding Human Rights of Stakeholders
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, where everyone goes home safe everyday of their working life. Why? Because our people are our greatest asset. Nothing is as important as their health and safety. Our motto is "Safety First, Always".
- 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, awareness and promoting active courageous leadership. We allow our employees and contractors the right to stop any work if and when they see something that is not safe.

2.0 ENVIRONMENT

- Baffinland employs a balance of the best scientific and traditional Inuit knowledge to safeguard the environment.
- Baffinland applies the principles of pollution prevention, waste reduction 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 more sustainable practices.
- Baffinland ensures that an effective closure strategy is in place at all stages of project development to ensure reclamation objectives are met.

3.0 UPHOLDING HUMAN RIGHTS OF STAKEHOLDERS

- We respect human rights, the dignity of others and the diversity in our workforce. Baffinland honours and respects the unique cultural values and traditions of Inuit.
- Baffinland does not tolerate discrimination against individuals on the basis of race, colour, gender, religion, political opinion, nationality or social origin, or harassment of individuals freely employed.
- Baffinland contributes to the social, cultural and economic development of sustainable communities in the North Baffin Region.

- 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.
- We expect our employees and contractors, as well as community members, to bring human rights concerns to our attention through our external grievance mechanism and internal human resources channels. Baffinland is committed to engaging with our communities of interest on our human rights impacts and to reporting on our performance.

4.0 TRANSPARENT GOVERNANCE

- Baffinland will take steps to understand, evaluate and manage risks on a continuing basis, including those that may impact the environment, employees, contractors, local communities, customers and shareholders.
- Baffinland endeavours to 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 safety, health, environmental, socio-economic commitments and set annual targets and objectives.
- Baffinland conducts all activities in compliance with the highest applicable legal & regulatory requirements and internal standards.
- We strive to employ our shareholder's capital effectively and efficiently and demonstrate honesty and integrity by applying the highest standards of ethical conduct.

4.1 FURTHER INFORMATION

Please refer to the following policies and documents for more information on Baffinland's commitment to operating in an environmentally and socially responsible manner:

Health, Safety and Environment Policy
Workplace Conduct Policy
Inuktitut in the Workplace Policy
Site Access Policy
Hunting and Fishing (Harvesting) Policy
Annual Report to Nunavut Impact Review Board

If you have questions about Baffinland's commitment to upholding human rights, please direct them to contact@baffinland.com.

Brian Penney
Chief Executive Officer
March 2016

3 PROJECT ROAD NETWORK MANAGEMENT

3.1 DESIGN OF PROJECT ROADS AND WATER CROSSINGS

Project roads and water crossings shall be designed and constructed as outlined in the Project's Civil Design Criteria document (Hatch, 2013), and subsequent amendments, and shall comply with applicable federal and local laws and regulations. In general, 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 swales or drainage pathways adjacent to the road.

3.2 REGULATORY APPROVALS FOR CHANGES TO PROJECT ROADS AND WATER CROSSINGS

Within the Commercial Lease, Type 'A' Water Licence and Fisheries Act there are multiple terms and conditions that must be considered when making changes to Project roads and/or water crossings.

Under Section 2.8 of the Commercial Lease, adjustments to the Tote Road require approval from the QIA (landowner). Activities that constitute a 'Tote Road adjustment' are defined in the Tote Road Adjustment Notification (TRAN) process provided in Appendix E of this Plan. In summary, Baffinland must submit a TRAN application to the QIA for approval for changes to the Tote Road that meet one or more of the following criteria:

- A re-alignment of the Tote Road where the centre line of the road is moved > 10 metre (m) from the existing centre line.
- Addition of another lane to the Tote Road.
- Raising the existing grade of the Tote Road by > 2 m in elevation.
- Lowering the existing grade of the Tote Road in areas that have historically been prone to permafrost degradation.
    - Areas along the Tote Road that have historically been prone to permafrost degradation as a result of cuts and the lowering of road grade are outlined in Table 4-1. When lowering the existing grade of the Tote Road within these areas (Table 4-1), the potential impact on permafrost will be evaluated and where the potential for degradation exists, the submission of a TRAN will be required.
- Lowering the existing grade of the Tote Road by > 1 m in areas not identified in Table 4-1.
- Changing the design of an existing bridge or culvert. Upgrading an existing bridge or culvert to the approved design (e.g. IFC drawings included in the ERP approvals) will not require the submission of a TRAN.
- A re-alignment of the Tote Road that results in the placement of material within 31 metres of the High Water Mark of a natural water body.

TABLE 3-1: PERMAFROST SENSITIVE AREAS ALONG THE TOTE ROAD

Tote Road Areas requiring a Permafrost Assessment for Work involving Cuts and/or Lowering of Road Grade
Km 50 - 64
Km 70 - 100

For the purposes of defining a 'Tote Road adjustment' under the Commercial Lease, the Tote Road is defined as the main transport corridor starting at approx. Km 2.5 (N 71° 52' 02.3" W 80° 52' 51.1") near Milne Port and terminating at Km 100 (N 71° 19' 44.3" W 79° 22' 24.6") near the Mine Site. Activities that do not meet one or more of the criteria listed in the TRAN process, as shown above, will be defined as routine maintenance work required for the safe and efficient operation of the Tote Road. To provide clarity on the types of activities that would trigger the TRAN process and require QIA approval, Table 4-2 below outlines the types of work that are classified as maintenance activities and construction activities. Construction activities along the Tote Road, as outlined In Table 4-2, are considered a 'Tote Road adjustment' under Section 2.8 of the Commercial Lease and require QIA approval prior to implementation.

TABLE 3-2: TOTE ROAD MAINTENANCE VS. CONSTRUCTION ACTIVITIES

Maintenance Activities	Construction Activities
• Road grading that raises the road elevation by less than two (2) m. • Road grading that lowers the road elevation by less than one (1) m in areas not identified in Table 4-1. • Replacing an existing water crossing (culvert, bridges) without changing the water crossing's approved design. • Work that involves restoring and/or maintaining a road or water crossings to its approved design. • Armouring, re-contouring and regrading bank embankments and roadside swales and ditches.	• Road grading that raises the road elevation by more than two (2) m. • Road grading that lowers the road elevation by more than one (1) m. • Changing the design of an existing water crossings and/or sections of road. • Work that results in the center line of the road changing by more than ten (10) m. • Realignment of the Tote Road that results in the placement of material within 31 metres of the High Water Mark of a natural water body.

Other relevant requirements under the Commercial Lease that apply to changes made to the Project road network include:

- All Project infrastructure, including roads, will be within the limits of the Impact Areas outlined in the Commercial Lease.

- A 50 m buffer of undisturbed land shall be maintained between infrastructure and disturbed areas associated with the Project and the established limits of the Impact Areas outlined in the Commercial Lease.

Changes to the Project road network that encroach (within 50 m) or fall outside of the limits of the Impact Areas outlined in the Commercial Lease will need to be approved by the QIA through the Options Exercise Notice (OEN) process, outlined and further discussed in Appendix B of this Plan.

Under the federal Fisheries Act and Baffinland's Type 'A' Water Licence, changes to Project water crossings may require regulatory approvals. Approval processes under the Type 'A' Water Licence and Fisheries Act include the Water Licence Modification process and Fisheries Act Authorization process, respectively, both of which are discussed further in Appendix B of this Plan.

To ensure compliance with the regulatory requirements, Baffinland's Sustainable Development department shall be consulted for any changes to the Project road network and/or water crossings. No changes to the Project road network, including water crossings, shall be initiated without prior approval from Baffinland's Sustainable Development department.

Table 4-3 below outlines the typical work activities associated with managing the Project road network and the associated regulatory approvals required for each type of activity.

TABLE 3-3: REGULATORY APPROVALS FOR CHANGES TO THE PROJECT ROAD NETWORK

Type of Work	Description of Work	Regulatory Approvals Required
Regrading of a road	1. Change in road grade that involves increasing road elevation by less than 2 m. 2. Change in road grade that involves increasing road elevation by more than 2 m. 3. Change in road grade that involves decreasing the elevation by less than 1 m in areas not identified in Table 4-1. 4. Change in road grade that involves decreasing the elevation in permafrost sensitive areas identified in Table 4-1.	1. None 2. TRAN (if change occurs on the Tote Road) 3. None 4. TRAN (if potential for permafrost degradation exists from proposed re-grading work and any associated cuts)

Type of Work	Description of Work	Regulatory Approvals Required
Change to an existing water crossing	1. A change that does not alter the approved design of a water crossing (i.e. size & number of culverts, bridge design). 2. A change that alters the approved design of a water crossing.	1. DFO approvals (if change occurs at a fish bearing water crossing) 2. TRAN (if change occurs on the Tote Road) DFO approvals (if the change occurs at a fish bearing water crossing)
Installation of a new water crossing	1. Installation of a new non-fish bearing water crossing 2. Installation of a new fish bearing water crossing.	1. TRAN (if the water crossing is along the Tote Road) 2. TRAN (if the water crossings is along the Tote Road) DFO approvals
Road realignment	1. A road re-alignment where the center line of the road is moved less than 10 m. 2. A road re-alignment where the center line of the road is moved more than 10 m.	1. OEN (if realignment encroaches on Impact Area limits) TRAN (if realignment occurs on the Tote Road and involves placing material within 31 metres of the High Water Mark of a nearby water body) 2. TRAN (if realignment occurs along the Tote Road) OEN (if realignment encroaches on Impact Area limits)
Construction of a new service or access road	1. Construction of a new service road at a Project site with no associated water crossings. 2. Construction of a new service road at a Project site that includes multiple water crossings.	1. OEN (if new road encroaches or fall outside the Impact Area limits) 2. Water Licence Modification under the Type 'A' Water Licence DFO approvals (if water crossings are fish bearing) OEN (if new road encroaches or falls outside of Impact Area limits)

3.3 Construction of Project Roads and Water Crossings

As operations at the Project continues to evolve, changes to Project roads and/or water crossings will be required. To minimize potential impacts to surface water quality and fish, construction of roads and the installation/modification of water crossings will occur during the winter months, when practical. Construction during the winter months will ensure that fish are absent from fish bearing water crossings near construction areas and will minimize sedimentation and water quality concerns associated with surface water drainage at or near construction areas. In the event that surface water flows are present

during construction, surface water drainage and sedimentation concerns will be managed using the sedimentation control measures outlined in Section 4.4.5 of this Plan and further outlined in the Project's Surface Water and Aquatic Ecosystem Management Plan (BAF-PH1-830-P16-0026).

Prior to finalizing a proposed change to the Project's road network, unique landforms and archaeological resources will be surveyed and taken into account. Whenever possible, the alignment of new roads will avoid unique landforms and archaeological sites. At all times, activity in or around unique landforms and archaeological sites will be conducted as per Baffinland's Cultural Heritage and Resource Protection Plan (BAF-PH1-830-P16-0006).

Construction of roads at the Project will be conducted using 1) the fill technique or 2) the cut-and-fill technique. Road construction using the fill technique will involve placing material on top of existing ground surfaces and spreading/contouring the material to design specifications. Materials for the fill technique will be sourced from approved sources, including approved borrow sources and quarries outlined in the Project's Borrow Pit and Quarry Management Plan (BAF-PH1-830-P16-004).

In contrast, the cut-and-fill technique will be used in areas where material will need to be relocated along a section of road to achieve the design road grade. To the greatest extent practical, material and aggregate used during the cut-and-fill technique will be sourced from existing road bed and approved sources, including approved borrow sources and quarries outlined in the Project's Borrow Pit and Quarry Management Plan (BAF-PH1-830-P16-004). In certain scenarios, road construction activities may require cuts to be made in the local topography to achieve the appropriate grade (e.g. road realignments). In such cases, surface and blasted material from cuts will be utilized to supplement aggregate and material quantities required to construct the road realignment. Quantities of material and aggregate used from these cuts will be determined using the methods outlined in the Milne Inlet Tote Road Quarry and Borrow Source Management Plan (BAF-PH1-830-P16-0048), further discussed in Section 7.7 of this Plan.

Because the cut-and-fill technique involves excavating sections of existing road bed and/or ground surface and can result in changes to the thermal regime (active layer and permafrost), as a new active layer is created, the cut-and-fill technique will be used in areas where the fill-technique is not practical and/or feasible as a result of the area's local topography. To prevent the ponding of water and mitigate risks associated with slope erosion and overall stability, the side slopes of cut and fill areas will be graded to a slope between 1H:1V to 2H:1V.

Environmental guidelines and mitigation measures implemented during the repair, modification and/or installation of water crossings (i.e. culverts), during frozen conditions and periods of flow, are detailed in Appendix C of this Plan. Culvert and bridge installations shall be designed and constructed as to not encroach on the natural channel width by the placement of abutments, footings or armouring below the ordinary High Water Mark (Type 'A' Water Licence, Part D, Item 22). Material from below the ordinary

High Water Mark of a water body will not be removed unless the removal has been authorized by the NWB (Type 'A' Water Licence, Part E, Item 12).

Post construction activities and performance monitoring for changes to Project roads and water crossings are discussed in Section 7.1 of this Plan.

3.4 Operation of the Project Roads Network

3.4.1 Routine Road Maintenance

Roads will be routinely graded to prevent rutting (furrow creation). Approved quarries and borrow sources will be maintained to secure access to sand and gravel as required for road maintenance.

3.4.2 Maintenance on Water Crossings

Water crossings (i.e. culvert, bridges) crossings will be regularly monitored to ensure unobstructed passage of water through the natural drainages and existing streams and rivers. Maintenance will be performed as required. Maintenance work conducted on water crossings will take into account the environmental guidelines outlined in Appendix C of this Plan for water crossing repairs, modifications and installations.

3.4.3 Snow Management

During the winter months, drifting snow is likely to accumulate in certain areas of the Project road network. Roads will be designed to minimize drifting snow on road embankments. Snow fence installations will be considered in areas of unavoidable accumulation to minimize these effects, if required. Roads will be cleared of snow, as required, to ensure the safe and efficient operation of the Project road network. The Snow Management Plan (BAF-PH1-300-P16-0002) further details how snow will be managed at the Project sites and along the Tote Road to address operational, safety and environmental concerns. As discussed in the Snow Management Plan, snow stockpile areas at Project sites and along the Tote Road have been located to minimize the release of sediment and debris into nearby water bodies during freshet. Where practical, sedimentation control measures (i.e. silt fences) will be installed downstream of snow stockpile areas to capture sediments contained within snow melt during freshet. Freshet preparation and management is further discussed in Section 4.4.4 of this Plan.

3.4.4 Freshet Management

Significant surface water flows that occur during freshet can result in erosion and damage to road embankments and water crossing infrastructure. Improper management and/or lack of preparation for freshet can lead to significant washouts of the Project's roads resulting in road hazards and safety concerns, environmental incidents (i.e. sediment releases), production losses, schedule delays, and loss of reputation for the Company, as well as regulatory enforcement.

Baffinland has gained a significant amount of experience managing freshet during its operation of the Project and has developed the following plans and procedures to mitigate potential impacts associated with freshet.

- Snow Management Plan (BAF-PH1-300-P16-0002)
- Freshet Preparations - Culvert Excavation Procedure (BAF-PH1-370-PRO-0005)

Personnel responsible for the management of roads and water crossings during freshet shall be familiar with the plans and procedures outlined above.

In general, the following mitigation measures are implemented each year to manage surface water flows during freshet.

- Removal of snow upstream and downstream of water crossings (i.e. culverts) prior to freshet,
- Steaming culverts that are blocked by ice or snow prior to freshet,
- Addressing identified obstructions that could prevent surface water flows at water crossings locations (i.e. steaming culverts, breaking up ice dams near bridges, etc.) during freshet,
- Installation of sedimentation control measures (i.e. silt fences, check dams, rip-rap), as required, and
- Conducting repairs/modifications to surface water management infrastructure, as required.

3.4.5 Sediment and Erosion Control

Land disturbances during maintenance activities, road construction and operation, culvert installation and excavation of cut and fill areas have the potential to cause erosion and release sediment-laden runoff into nearby water bodies. In addition, the removal of surface material in Arctic regions can cause the underlying permafrost to melt and result in the pooling of water, destabilization of landforms and sedimentation and erosion issues.

Prior to implementation, maintenance and construction activities associated with the Project road network will be assessed for potential risks associated with erosion, permafrost degradation and sedimentation. Based on the risk assessment, effective mitigation and control measures will be implemented prior to the commencement of the planned activities. Sediment and erosion control measures may include, but are not limited to, silt fences, erosion control mats (fascines), check dams, erosion blankets/geotextile lining, sand bags, terraces, benching, use of flocculants and rip-rap structures.

To mitigate possible permafrost degradation from surface material removal, the following measures will be implemented throughout the Project.

- Removal of surface material (e.g. cut-and-fill technique) shall be avoided where possible to reduce permafrost degradation and will only occur at approved locations,
- Areas will be graded by filling in low areas rather than cutting into high areas, where feasible, and

- Insulating material and/or erosion control material, such as concrete fabric or rip-rap, will be used to reduce erosion and potential permafrost degradation, as required.

Baffinland has developed multiple procedures and protocols to address concerns regarding erosion, permafrost degradation and sedimentation at the Project. As such, this Plan must be viewed in consideration with the following documentation for additional details on the mitigation and corrective measures implemented at the Project to address these concerns.

- Environmental Protection Plan (BAF-PH1-830-P16-0008)
    - Operation Environmental Standard (OES) – 2.3 – Land Disturbance
    - OES 2.9 – Sediment and Erosion Control
    - OES 2.17 – Road Construction and Borrow Development
    - OES 2.18 – Tote Road Watercourse Crossing Installation
- Surface Water and Aquatic Ecosystem Management Plan (BAF-PH1-830-P16-0026)

3.4.6 Dust Management

During the summer months, road dust has the potential to become a health, safety and environmental concern. Approved dust suppressants (i.e. calcium chloride, water, etc.) shall be used on the roads, particularly on heavy-use sections, as per Baffinland's Dust Management Protocol for the Project. Due to frozen conditions between September and May, dust suppressants shall only be used at the Project from June to August.

Throughout the life of the Project, Baffinland will continue to trial new dust suppressants to determine the most effective dust suppressants for site conditions. For dust suppressants not approved for use in Nunavut, Baffinland will seek approval for new dust suppressants by following the protocols outlined in Section 2.3 of the Environmental Guideline for Dust Suppression for Nunavut (Government of Nunavut, 2002).

The Site Services department will be responsible for the dust management of service roads at Project sites (e.g. Milne Port, Mine Site). The Road Maintenance department will be responsible for dust management of the Tote Road and the Mine Operations department will be responsible for the dust management of the Mine Haul Road and pit operations.

3.4.7 Traffic Management

The following subsections discuss how traffic on the Project road network will be managed.

3.4.7.1 Speed Control and Signage

Speed limits for Project roads have been established and communicated to all Project personnel. All Baffinland employees and Contractors who operate vehicles on-site will be required to undergo vehicle specific training sessions which will include training on all traffic management procedures and restrictions.

Road signs will indicate hazards and blind road curves or intersections, radio frequencies, and radio call-in requirements.

Kilometre markers are positioned approximately each kilometre along the Tote Road. These markers are used to identify the position of active road users, incidents and emergencies. The markers will also be used for reporting wildlife sightings and observations of non-Project personnel.

3.4.7.2 Right of Way

Whenever possible, all traffic will yield to wildlife encountered on roads and lighter vehicles will yield to heavier equipment. In the case of approaching ore haul trucks on the Tote Road, the southbound ore haul truck will yield to the northbound ore haul truck.

3.4.7.3 Road Closure

Whenever unsafe conditions are identified (washout, severe rutting, vehicle breakdown, whiteout conditions, etc.), sections of the Project road network will be closed until the required maintenance is completed or weather conditions have improved. Road closure and traffic management will be directed by the senior Road Maintenance representative, in consultation with the other senior management members on site. Tote Road travel and road management activities will adhere to the Project's Tote Road Travel Procedure (BAF-PH1-810-PRO-0002) and the Whiteout and Wind Storm Conditions Procedure (BAF-PH1-810-PRO-0001).

3.4.8 Communication

All on site Project vehicles will be equipped with radios. Incidents or unsafe road conditions shall be reported by road users to the Ore Handling Dispatch Operator and Security of the nearest Project site. To ensure the safety of road users and to mitigate potential vehicle incidents, road users will be required to radio their positions when departing or arriving at Project sites and when approaching blind curves or hills. These call-in locations will be posted and communicated to vehicle operators during orientation and mandatory training sessions.

3.4.9 Public Use of Project Road Network

For safety reasons, use of service roads at Milne Port and the Mine Site will be restricted to Baffinland's employees and Contractors. The Tote Road is considered a public road. The management of public access to the Tote Road and Project sites is described further in Baffinland's Hunter and Visitor Site Access Procedure (BAF-PH1-830-PRO-0002).

Sightings of non-Project personnel shall be reported to the Ore Handling Dispatch Operator and Security of the nearest Project site and recorded on the Human Use Logs posted at Project sites. Extreme care shall be taken at all times whenever non-Project personnel are sighted along Project roads, as they might not be aware of the hazards associated with Project activities and traffic. Refer to the Operational

Environmental Standard 2.2 – Avoiding Disturbance to Local Land Users, included in Baffinland's Environmental Protection Plan (EPP; BAF-PH1-830-P16-0008), for more information on reporting sightings of local land users and non-Project personnel.

3.4.10 Wildlife Sightings

Wildlife sightings along the Project road network shall be reported and recorded as incidental observations on the Wildlife Logs posted at Project sites. Refer to Operational Environmental Standard 2.23 – Wildlife Log Instructions, included in Baffinland's EPP for more information on reporting wildlife observations.

3.5 Closure and Reclamation of the Project Road Network

The Project road network will be rehabilitated as outlined in Baffinland's Interim Closure and Reclamation Plan (BAF-PH1-830-P16-0012). In general, road bed and road material stockpiles will be re-graded, as required, and water crossings removed to re-establish natural contours and drainage paths throughout the Project area.

3.6 Management of Historical Tote Road Borrow Sources

Aggregate and material along the side of the Tote Road has been used in the past to support Tote Road maintenance activities and upgrades. As result of these past activities, permafrost degradation has developed at several historical borrow source locations along the Tote Road.

As material and resources become available, Baffinland will endeavour to address the areas of permafrost degradation along the Tote Road. Historical borrow sources will prioritized and addressed based on safety and environmental concerns posed by the permafrost degradation. Permafrost degradation will be addressed by draining the borrow source of water; filling the borrow source with available material and aggregate to insulate the permafrost and prevent further degradation; and re-contouring the area to prevent pooling of precipitation and snow melt. Baffinland will continue to monitor for and address safety and environmental concerns associated with the historical borrow sources along the Tote Road.

Surface water runoff/discharges from historical borrow sources will be monitored as outlined in the Milne Inlet Tote Road Quarry and Borrow Source Management Plan.

4 ROLES AND RESPONSIBILITIES

Responsibilities for the operation, maintenance and management of the Project road network are as follows.

4.1.1 Chief Operations Officer (COO) / General Manager

- Reports to the Chief Executive Officer
- Responsible for providing oversight for all Project operations and allocating the necessary resources for the operation, maintenance and management of the Project road network.

4.1.2 Mine Operations Manager / Superintendent

- Reports to the COO / General Manager
- Provides oversight for all Mine operations, including the operation, construction and maintenance of the Mine Haul Road that runs from the open pit to the crushing operations at the Mine Site.

4.1.3 Site Services Manager / Superintendent

- Reports to the COO / General Manager
- Provides oversight for all Site Services operations, including the operation, construction and maintenance of the Project service roads located at Milne Port and the Mine Site, with the exception of the Mine Haul Road.

4.1.4 Road Maintenance Manager / Superintendent

- Reports to the COO / General Manager
- Provides oversight for all Road Maintenance operations, including the operation, construction and maintenance of the Tote Road that runs between Milne Port and the Mine Site.
- The Road Maintenance department has the lead responsibility of managing traffic on the Tote Road, which includes:
    - Monitoring weather forecasts and conditions,
    - Planning, scheduling and managing road construction and maintenance, and
    - Identifying operational, safety and environmental concerns on the Tote Road and taking the appropriate action.

4.1.5 Health, Safety & Environment (Sustainable Development) Departments

- Support the management of the Project road network in regards to health, safety and environmental concerns and obtaining the appropriate regulatory approvals.
- Report incidents to senior management and the appropriate regulatory agencies and stakeholders.

- Conduct inspections and monitoring to ensure compliance with applicable regulations and commitments.

4.1.6 Departmental Supervisors

Supervisors for all departments are responsible for the following:

- Ensure that any worker operating a vehicle on the Project road network is trained and qualified regarding road safety and driving communication protocols.
- Ensure that light vehicles or equipment travelling the Tote Road in winter months, or in periods of severe weather conditions, are equipped with an emergency survival kit.
- Ensure that any workers traveling on the Project road network have all the required safety equipment, and are following all PPE requirements and procedural controls.
- Ensure work crews comply with reporting when their vehicles enter and depart Project sites when using the Tote Road.
- Ensure weather conditions are suitable for the travel and/or work activity required.

4.1.7 Ore Haul Dispatch Operator

- Distribute, along with Security, Tote Road conditions and status updates, including applicable blasting notifications for maintenance and construction activities.
- Monitor ore haul traffic on the Tote Road.

4.1.8 Security at Project Sites

- Distribute, along with Ore Haul Dispatch, Tote Road conditions and status updates, including applicable blasting notifications for maintenance and construction activities.
- Maintain active traffic log of vehicles on the Tote Road.

4.1.9 Vehicle and Equipment Operators

All personnel operating vehicles or equipment at the Project are responsible to comply with the requirements of this Plan.

5 MONITORING AND REPORTING REQUIREMENTS

5.1 POST-CONSTRUCTION PERFORMANCE MONITORING AND REPORTING

5.1.1 ROADS

Post construction performance monitoring for changes to the Project roads will be conducted by the Road Maintenance department, in consultation with the Baffinland's Health & Safety and Environment departments. Significant changes to the Project road network, including changes that trigger the TRAN process (refer to Appendix E), will be included in the next scheduled geotechnical inspection prescribed by the Type 'A' Water Licence (Part D, Item 18; Part I, Items 12 & 13) and conducted by a contracted Professional Geotechnical Engineer registered in Nunavut.

The primary focus of the post construction monitoring for changes to Project roads, conducted by both the Road Maintenance department and the Professional Geotechnical Engineer, will be to confirm conformity of the road change to the applicable design criteria laid out in the Project's current Civil Design Criteria document (Hatch, 2013) and any supporting engineering drawings (e.g. IFCs). Recommendations made by the Professional Geotechnical Engineer will be documented in the biannual geotechnical reports submitted to the NWB, 60 days following each geotechnical inspection (Part D, Item 18; Part I, Item 13). Recommendations made by the Professional Geotechnical Engineer will be used by Baffinland to determine and prioritize any necessary corrective actions and future upgrades to the Project road network.

Changes made to the Project road network each year will be documented in the Annual Report prescribed by the Type 'A' Water Licence and Commercial Lease. As-built documentation will be provided to the appropriate regulators and stakeholders for Project road network changes that required the submission of IFC drawings to obtain the necessary approvals (e.g. TRAN, Water Licence Modification, etc.).

5.1.2 WATER CROSSINGS

Post construction performance monitoring for changes to Project water crossings will be required where work on a water crossing involved the installation, replacement and/or extension of a length of culvert or a design modification to a bridge. Any additional post construction monitoring committed to by Baffinland during the approvals process for a water crossing change (e.g. DFO) will also be performed.

The primary objective of post construction monitoring for changes to Project water crossings will be to confirm conformity of the water crossing change to the applicable design criteria laid out in Project's current Civil Design Criteria document (Hatch, 2013) and any supporting engineering drawings (e.g. IFCs). The secondary objective of post construction monitoring for changes to Project water crossings will be to confirm that the water crossing change has not resulted in significant impacts to the water quality of surface water flows and fish habitat/passage.

Design conformity for water crossing changes will be confirmed by a Professional Geotechnical Engineer during the next scheduled geotechnical inspection, required by the Type 'A' Water Licence (Part D, Item 18; Part I, Items 12 & 13). Recommendations made by the Professional Geotechnical Engineer will be documented in the biannual geotechnical reports submitted to the NWB, 60 days following each geotechnical inspection (Part D, Item 18; Part I, Item 13).

As a requirement of Baffinland's Tote Road Fisheries Authorization, an annual inspection of fish bearing water crossings along the Tote Road will be conducted each year by a Professional Fisheries Biologist. The focus of the annual inspection will be to assess the presence of fish, habitat quality, and fish passage success at all fish bearing water crossings and identify any potential impacts from recent upgrades to the Project road network. As a requirement of the Tote Road Fisheries Authorization, observations made by the Professional Fisheries Biologist during the annual inspection will be documented in the prescribed Annual Report(s) submitted to DFO by Baffinland each year (by December 31st).

Potential impacts to water quality from a water crossing change will be evaluated by conducting the post-construction monitoring program described in Appendix C of this Plan. Water quality monitoring will be conducted by trained personnel from the on-site Environment Department.

Observations and recommendations made by the Professional Geotechnical Engineer and the Professional Fisheries Biologist in concert with the post-construction water quality monitoring results will be used by Baffinland to determine and prioritize any corrective actions and future upgrades to the Project road network.

Changes made to Project water crossings each year will be documented in the Annual Report prescribed by the Type 'A' Water Licence and Commercial Lease. As-built documentation will be provided to the appropriate regulators and stakeholders for Project road network changes that required the submission of IFC drawings to obtain the necessary approvals (e.g. TRAN, Water Licence Modification, etc.).

5.2 Routine Monitoring of Project Roads and Water Crossings

Roads and water crossings are inspected regularly for signs of degradation and maintenance requirements. Periodic visual inspections will be conducted on the Project road network by trained personnel and will occur at regular intervals and after vehicle collisions, heavy precipitation events and construction activities. The Project road network shall be continually inspected over the life of the Project. Road safety, stability and erosion are several of the main factors that will be investigated during the routine inspections.

5.3 Environmental Monitoring Programs

Water quality monitoring conducted for changes made to the Project road network, including water crossings, are discussed in Section 7.1 and Appendix C of this Plan.

In addition to monitoring the water quality at locations where changes have been to made to the Project road network, Baffinland a conducts routine water quality monitoring at select water crossings along the Tote Road each year during freshet and summer months, referred to as the Tote Road Monitoring Program. The Tote Road Monitoring Program focuses on monitoring TSS concentrations upstream and downstream of select Tote Road water crossings and is fully outlined in Appendix D of this Plan.

In addition, to the water quality programs described above, Baffinland conducts multiple additional water quality monitoring programs as prescribed by the Project's water licences, Project Certificate, fisheries authorizations and other permits. Refer to Baffinland's Surface Water and Aquatic Ecosystem Management Plan (BAF-PH1-830-P16-0026) and Aquatic Effects Monitoring Plan (AEMP; BAF-PH1-830-P16-0039) for additional information on the water quality monitoring programs that are conducted to monitor aquatic effects at the Project.

5.4 Incidents

Incidents will be reported to the Health and Safety Superintendent and/or the Environmental Superintendent, depending on the nature of the incident, who will in turn communicate the incident to senior management. All incidents are reported, using the Baffinland Incident Investigation Form, and investigated to determine the cause(s) of the incident as well as the corrective actions necessary to prevent the reoccurrence of the incident.

5.5 Public Use of Project Road Network

For safety reasons, use of service roads at Milne Port and the Mine Site will be restricted to Baffinland's employees and Contractors. The Tote Road is considered a public road. The management of public access to the Tote Road and Project sites is described further in Baffinland's Hunter and Visitor Site Access Procedure (BAF-PH1-830-PRO-0002).

Sightings of non-Project personnel shall be reported to the Ore Handling Dispatch Operator and Security of the nearest Project site and recorded on the Human Use logs posted at Project sites. Refer to the Operational Environmental Standard 2.2 – Avoiding Disturbance to Local Land Users, included in Baffinland's EPP, for more information on reporting sightings of local land users and non-Project personnel.

This information will be used to formulate policies and initiatives for Project road use, wildlife harvesting observations, and other related matters. The information will be reported annually and upon request to regulators and stakeholders.

5.6 Wildlife Sightings

Wildlife sightings along the Project road network shall be reported and recorded as incidental observations on Wildlife Logs posted at Project sites. Refer to Operational Environmental Standard 2.23 –

Wildlife Log Instructions, included in Baffinland's EPP, for more information on reporting wildlife observations.

This information will be used to inform terrestrial wildlife studies and to formulate mitigation measures for wildlife protection, and will be included in annual (or more frequent) reports to government agencies and stakeholders. Project related wildlife mortalities are reported to the required government agencies and stakeholders.

5.7 Use of Specified Substances for Project Infrastructure

To monitor the use of Specified Substances (material/aggregate) and changes to Project infrastructure, satellite imagery and volumetric mapping (e.g. PhotoSat) of the Project will be taken on an annual basis using a consistent methodology as described in Schedule A of the Tote Road Reconciliation Agreement, referred to as the Mapping and Identification Process. The Mapping and Identification Process will be used to quantify the volumes of Specified Substances used to support changes to Project infrastructure. Further details on the Mapping and Identification Process, the Tote Road Reconciliation Agreement and compensation for Specified Substances used by the Project are provided in the Milne Inlet Tote Road Quarry and Borrow Source Management Plan (BAF-PH1-830-P16-0048).

5.8 Closure and Reclamation Security

For the purposes of reconciling reclamation and closure security, changes made to the Project road network and infrastructure will be tracked by taking satellite imagery and volumetric mapping (e.g. PhotoSat) on an annual basis as described in Schedule A of the Tote Road Reconciliation Agreement. Changes to reclamation and closure security amounts for the Project road network and infrastructure changes will be reconciled during the Annual Security Review process outlined in the Type 'A' Water Licence and Commercial Lease.

6 ADAPTIVE STRATEGIES

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

As per the requirements of Baffinland's EHS Management Framework (BAF-PH1-830-STD-0001), Baffinland 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, authorizations and approvals.

Appendix A – Steensby/ Mid-Rail Information

Construction and development of the infrastructure associated with Steensby Port and the southern railway corridor is not planned in the immediate future. Updates to this section of the Plan will be completed, as required.

A.1 Introduction

A.1.1 Purpose

The Roads Management Plan is applicable to the Project road network. Upon being constructed, the Project road network will include the following:

- Railway construction/access road between the Mine Site and Steensby Port, and
- Service roads at Steensby Port.

A.1.2 Baffinland Road Policy

The railway construction/access 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.

A.2 Mitigation Measures

A.2.1 Speed Control and Signs

Markers will be positioned approximately every kilometre along to the railway construction/access road. These markers will be used to identify the position of active road users and emergencies. The markers will also be used for reporting wildlife sightings and observations of non-Project personnel.

A.2.2 Use of Road by the Public

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

Sighting of non-Project personnel will be reported and recorded on the Human Use Logs posted at Project sites. Refer to the Environmental Protection Plan (BAF-PH1-830-P16-0008), Section 2.2, for additional details.

A.3 Monitoring and Reporting Requirements

A.3.1 Road Maintenance

Roads and water crossings are inspected regularly for signs of degradation and maintenance requirements. 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. Project roads will be continually inspected over the Project. Road safety, stability and erosion will be included in the regular inspections.

Appendix B

Regulatory Requirements for Changes to Project Roads and Water Crossings

The following subsections discuss the key regulatory requirements, terms and conditions for changes to Projects roads and/or water crossings.

B.1 - Commercial Lease

Section 2.8 – Tote Road Alignment of the Commercial Lease states the following:

> *The Tenant shall obtain written consent from the Landlord for any adjustments to the Milne Inlet Tote Road, such consent not to be unreasonably withheld. The parties acknowledge that adjustments to the alignment of the Milne Inlet Tote Road may be required to facilitate safe haul truck travel.*

To provide additional clarity on the condition above, Baffinland and QIA developed the Tote Road Adjustment Notification (TRAN) in 2018. In summary, a TRAN is required to be submitted to and approved by the QIA when changes are being made to the Tote Road that include one or more of the following:

- A re-alignment of the Tote Road where the centre line of the road is moved > 10 metre (m) from the existing centre line.
- Addition of another lane to the Tote Road.
- Raising the existing grade of the Tote Road by > 2 m in elevation.
- Lowering the existing grade of the Tote Road in areas that have historically been prone to permafrost degradation.
    - Areas along the Tote Road that have historically been prone to permafrost degradation as a result of cuts and the lowering of road grade are outlined in Table B-1. When lowering the existing grade of the Tote Road within these areas (Table B-1), the potential impact on permafrost will be evaluated and where the potential for degradation exists, the submission of a TRAN will be required.
- Lowering the existing grade of the Tote Road by > 1 m in areas not identified in Table B-1.
- Changing the design of an existing bridge or culvert. Upgrading an existing bridge or culvert to the approved design (e.g. IFC drawings included in the ERP approvals) will not require the submission of a TRAN.
- A re-alignment of the Tote Road that results in the placement of material within 31 metres of the High Water Mark of a natural water body.

TABLE B-1: PERMAFROST SENSITIVE AREAS ALONG THE TOTE ROAD

Tote Road Areas requiring a Permafrost Assessment for Work involving Cuts and/or Lowering of Road Grade
Km 50 - 64
Km 70 - 100

For the purposes of defining a 'Tote Road adjustment' under the Commercial Lease, the Tote Road is defined as the main transport corridor starting at approx. Km 2.5 (N 71° 52' 02.3" W 80° 52' 51.1") near Milne Port and terminating at Km 100 (N 71° 19' 44.3" W 79° 22' 24.6") near the Mine Site. Changes to the Project road network outside the defined Tote Road will not require the submission of a TRAN.

A copy of the TRAN is provided in Appendix E of this Plan.

Other relevant requirements under the Commercial Lease for changes to the Project road network include the following:

Section 2.5 – Impact Areas of the Commercial Lease states the following:

> *To the greatest extent possible, and subject to the requirements of any Environmental Management and Monitoring Plan, no activities or uses permitted within an Impact Area may occur on Lands that are within one hundred (100) meters of the surveyed boundary of the Property or within fifty (50) meters of the surveyed boundary of the Impact Area and any adjoining Land Use Area, and no activities shall take place within thirty (30) meters of the ordinary high water mark of any bed or body of water anywhere within the Impact Area unless approved by the Landlord;*

Section 3.1 - Land Classification Amendment Option of the Commercial Lease states the following:

> *The Landlord hereby grants to the Tenant the right and option (the "Land Classification Amendment Option") to seek amendments to re-classify specified Lands within Land Use Area(s), but subject always to any right, title or interest that the Landlord may have granted to any third parties with respect to Lands in the General Areas of the Property that have not already been designated an Impact Area or Exploration Area. The Tenant may exercise the Land Classification Amendment Option with the prior written consent of the Landlord, which consent may not be unreasonably withheld, pursuant to the procedures set forth in this Article 3. If the Landlord consents to an Option Exercise Notice.*

Section 3.2 – Options Exercise Notice of the Commercial Lease states the following:

> *The Tenant may exercise the Land Classification Amendment Option by delivering to the Landlord an "Option Exercise Notice".*

Changes to the Project road network shall be within the limits of the Impact Areas outlined in Commercial Lease and shall ensure a 50 meter buffer of undisturbed land is maintained between the Impact Area limits and the limits of infrastructure and disturbed areas associated with the Project. If required changes to the Project road network cannot not comply with the conditions above, an Options Exercise Notice (OEN) will be submitted to the QIA for review and approval, outlining the proposed new Impact Area limits, inclusive of the 50 m buffer of undisturbed land. Following the completion of the works associated

with the OEN, a survey of the revised limits for the affected Impact Areas shall be prepared by a Canada Land Surveyor and provided to the QIA.

B.2 - Type 'A' Water Licence

The Type 'A' Water Licence includes multiple terms and conditions for the construction and operation of water management infrastructure at the Project. As such Baffinland employees and Contractors shall consult the Baffinland Sustainable Development department on the necessary regulatory approvals required to complete changes to Project roads and/or water crossings. Significant changes to Project roads and water crossings may require the submission of a modification application under Section G of the Type 'A' Water Licence.

Information required to support a Water Licence Modification application under the Type 'A' Water Licence includes:

- A description of the facilities and/or works be constructed;
- The proposed location of the structure(s);
- Identification of any potential impacts to the receiving environment;
- A description of any monitoring required, including sampling locations, parameters measured and frequencies of sampling;
- Schedule for construction;
- Drawings of engineered structures stamped by a Professional Engineer; and
- Proposed sediment and erosion control measures.

B.3 - Fisheries Act

The federal Fisheries Act, prohibits the harmful alteration, disruption or destruction of fish habitat. As such, Baffinland's Sustainable Development department shall be consulted on any changes to the Project road network and/or water crossings to determine the necessary regulatory approvals required. New water crossings and/or significant changes to existing crossings may require fisheries authorizations and approvals from DFO.

Appendix C

Environmental Guidelines for Project Water Crossing Repairs, Modifications and/or Installations

C.1 - Water Quality Monitoring Requirements and Guidelines

Prior to, during and following construction work that involves the repair, modification and/or installation of a water crossing (e.g. culvert, bridge), water quality monitoring will be conducted upstream and downstream of the affected water crossing(s). The following subsections discuss the monitored parameters, monitoring methods, sampling/monitoring locations and frequency for each phase of monitoring (pre, during and post).

1. Monitored Parameters

Monitored parameters and the method at which each parameter will be monitored are listed below.

i. Discrete Water Samples
   a. Total Suspended Solids (TSS; mg/L)
   b. Total Dissolved Solids (TDS; mg/L)
   c. pH (pH units)

ii. Field Monitoring (*in-situ*)
   a. Turbidity (NTU)
   b. pH (pH units)
   c. Specific Conductivity (µS/cm)
   d. Water Temperature (°C)
   e. Dissolved oxygen (mg/L, %)
   f. Presence/Absence of Sheen (visual inspection)

2. Methods and Equipment

Field monitored parameters will measured using a calibrated, multi-parameter water quality probe (e.g. YSI). A visual inspection will be conducted to determine the presence or absence of sheen.

Discrete water samples will be collected in accordance with the protocols outlined in Baffinland's Surface Water Sampling Program – Quality Assurance and Quality Control Plan (BAF-PH1-830-P16-0001; QA/QC Plan).

3. Monitoring Locations

Concurrent water sampling and field monitoring will be conducted at locations 100 metres downstream and 50 metres upstream of each water crossing being repaired, modified and/or installed. Field monitoring will also occur at a location 50 metres downstream of the affected water crossing. Deviations from these distances due to safety and/or accessibility concerns will be documented on the *Water Crossing Monitoring Form.*

Monitoring events will start at the monitoring location furthest downstream of the affected water crossing and progress in an upstream direction to prevent monitoring results from being affected by sediment re-suspended during sampling activities (e.g. stream bed disturbance).

4. Water Sampling and Monitoring Frequency

The following subsections discuss the frequency at which water quality monitoring will be conducted at water crossings that are repaired, modified and/or installed. Water quality is monitored prior to, during and following construction. Post-construction monitoring described below has been designed to assess the performance of the water crossing during an open water season and ensure water quality impacts, if any, are acceptable based on applicable water quality action levels.

Table C-1 – Summary of Water Quality Monitoring Frequency

Monitoring Method	Monitoring Phase		
	Pre-Construction	During Construction	Post Construction
Water Sampling	One (1) sampling event at locations 100 m downstream and 50 m upstream of the affected water crossing.	Every eight (8) hours at locations 100 m downstream and 50 m upstream of the affected water crossing. Adaptive water sampling events will also be conducted when downstream flows are suspected of encroaching on TSS and turbidity action levels.	One sampling event in June, July and August at locations 100 m downstream and 50 m upstream of the affected water crossing. Sampling events will occur at least 10 days apart.[2]
Field Monitoring	One (1) monitoring event (alongside water sampling event) at locations 100 m and 50 m downstream and 50 m upstream of the affected water crossing.	Every four (4) hours at locations 100 m and 50 m downstream and 50 m upstream of the affected water crossing.[1] Field monitoring will also be conducted alongside adaptive water sampling events outlined above.	Field monitoring will be conducted concurrently with the water sampling events listed above.[2]

Notes:

[1]Field monitoring should be conducted concurrently with water samples collected every eight (8) hours to allow for TSS/turbidity curve development.

[2]Additional monitoring may be required if applicable water quality action levels are exceeded. Refer to action response framework for post-construction performance monitoring presented in Section 7, ii.

i. Pre-Construction Monitoring

Concurrent water sampling and field monitoring will be conducted at least once at locations 100 metres downstream and 50 metres upstream of the water crossing to be repaired, modified and/or installed. During the same monitoring event, field monitoring will also be conducted at a location 50 metres downstream of the affected water crossing.

ii. During Construction Monitoring

Water samples will be collected at locations 100 metres downstream and 50 metres upstream of the affected water crossing every eight (8) hours. Field monitoring will occur at locations 100 metres and 50 metres downstream and 50 metres upstream of the affected water crossing every four (4) hours. Additional adaptive monitoring events will be conducted if downstream flows are suspected of encroaching on TSS and turbidity action levels, outlined in Section 5 below.

The during construction action response framework, provided below in Section 7, i, will be used for assessing during construction monitoring results and the performance of construction mitigation measures (i.e. silt fences) implemented.

iii. Post-Construction Monitoring

Post-construction water quality monitoring, at a minimum, will consist of three (3) concurrent water sampling and field monitoring events conducted during the open water season following the completion of construction at a water crossing. Water quality will be monitored during high flows (June), medium flows (July) and low flows (August) at locations 100 metres downstream and 50 metres upstream of the water crossing. Water sampling and field monitoring events will occur at least 10 days apart.

For example, a water crossing repaired, modified and/or installed during frozen conditions would be monitored at least once during June, July and August of the following open water season. In contrast, a water crossing repaired, modified and/or installed during July, would be monitored at least once during the following month (August) and once again during June and July of the following year. This approach will ensure that a modified water crossing's performance is assessed and determined to be adequate for varying flow conditions, representative of flow conditions during a typical open water season.

As shown in the post construction action response framework in Section 7, ii, below, additional monitoring events may be required if elevated TSS and/or turbidity are observed during sampling/monitoring events.

5. Water Quality Action Levels

Environmental concerns associated with construction work and the performance of water crossings focus on the potential effects of elevated suspended solids (sedimentation) on aquatic receiving environments. As such, turbidity and TSS monitoring conducted prior to, during and following construction on water crossings will be used to inform mitigation and management actions. Table C-1 outlines the water quality action levels that will be used to assess monitoring results during the first year of implementation. Action levels outlined below will be reassessed following the first year of implementation.

Table C-1 –Water Quality Action Levels

Parameter	Monitoring Phase		
	Pre-Construction	During Construction	Post Construction
Turbidity (NTU)	None. TSS will be the parameter used to assess the pre-construction water quality conditions near water crossings.	An increase of 25 NTU from background levels (DFO, 1999)[1], or an appropriate action level derived from site-specific TSS/turbidity datasets. The turbidity monitoring action level will be used to inform mitigation and management actions in the field, as outlined in the action response framework detailed in Section 7, i, below.	None. TSS will be the parameter used to assess the post-construction water quality conditions near water crossings.
TSS (mg/L)	A maximum increase of 50 mg/L from background levels (upstream) when background levels are between 25 and 250 mg/L. A maximum increase of 10% of background levels when background levels are greater than 250 mg/L.[2]	A maximum increase of 100 mg/L from background levels (upstream).[3]	A maximum increase of 50 mg/L from background levels (upstream) when background levels are between 25 and 250 mg/L. A maximum increase of 10% of background levels when background levels are greater than 250 mg/L.[2]

Notes:

[1] An increase of 25 NTUs approximates to an increase of 100 mg/L TSS (adapted from DFO, 1999)[1]

[2] Based on low risk to aquatic organisms, expressed as an increase over background levels (adapted from DFO, 1999)

[1] Department of Fisheries and Oceans Canada (DFO), 1999. The Effects of Sediment on Fish and their Habitat. ISSN 1480-4883.

[3] During construction TSS action level used in Aquatic Effects Monitoring Plan & Surveillance Network Program: Construction of the Inuvik to Tuktoyaktuk Highway (Government of NWT, 2014)

Water quality sampling, in comparison to the Type 'A' Water Licence criteria, will continue to be reported in the NWB/QIA Annual Report for Operations.

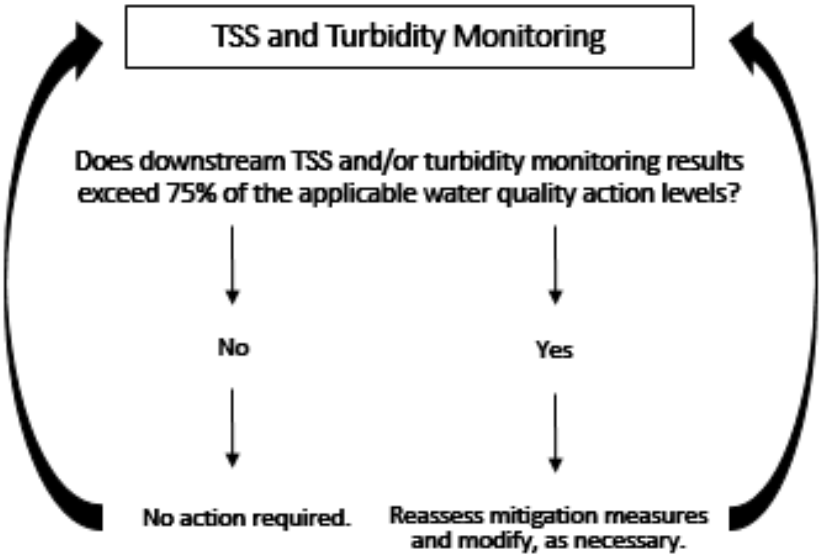
6. Data Management

All data collected during monitoring activities will be documented using the *Water Crossing Monitoring Form.* A *Water Crossing Monitoring Form* will be completed for each water crossing that is repaired, modified and/or installed. All documentation, including photos, will be saved on the onsite Environmental server.

7. Action Response Framework

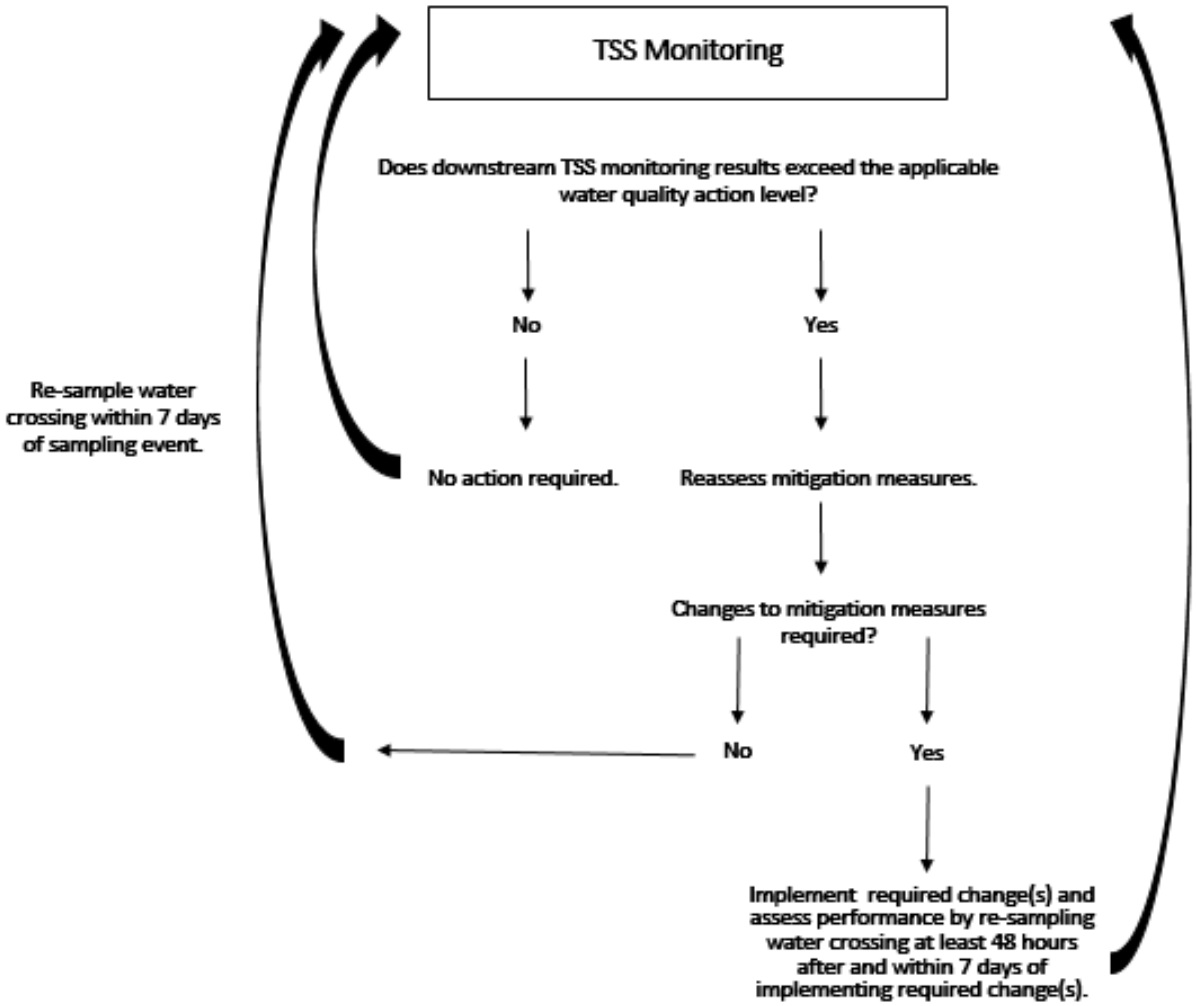
i. During Construction

The following action response framework will be used to assess the performance of the mitigation measures used during construction activities on water crossings, during periods of flow.



ii. Post- Construction

The following action response framework will be used to assess the performance of the water crossings in regards to water quality impacts following construction activities.



8. Data Reporting Requirements and Interpretation

Data collected during the monitoring program will, at a minimum, be presented in the Annual Report prescribed by the Project's Commercial Lease with the QIA and the Type 'A' Water Licence, issued by the NWB. In the Annual Report, Baffinland will present the data, compare the data against the interim water quality actions levels presented in Table C-1 and the Type 'A' Water Licence criteria and outline Baffinland's interpretation of the data and plans for any additional monitoring.

C.2 - Construction and Monitoring Guidelines during Frozen Conditions

2. General

All materials and equipment used for site preparation and construction shall be operated and stored in such a manner that prevents deleterious substances from entering nearby water bodies. Specifically:

a. Any excavated and stockpiled materials shall be stored and stabilized in a designated area that is at least 31 metres from the ordinary High Water Mark of nearby water bodies.
b. Any part of a vehicle and/or equipment entering the water shall be free of fluid leaks and externally cleaned/degreased;
c. Vehicle and equipment washing, re-fuelling, and/or maintenance shall be conducted in a location that is at least 31 metres from the ordinary High Water Mark of nearby water bodies.
d. Vehicles and equipment involved with construction activities shall be operated in a way that minimizes the disturbance to the banks of the watercourse/waterbody. If disturbance occurs, the banks shall be restored.
e. Fuel and any other materials associated with the servicing of machinery shall be stored at least 31 metres from the ordinary High Water Mark of nearby water bodies.

3. Typical Scope of Work for Culvert Repair/Installation

The basic construction scope of work expected at a culvert includes the following activities:

a. Excavate to desired elevation to install new or extend existing culvert(s).
b. Install new culverts, or new culvert lengths/extensions.
c. Back fill with compaction to finished grade.
d. Place rip-rap at culvert inlet and outlet ends, as required.
e. Clean up loose material around the culvert(s) prior to freshet to mitigate water quality impacts from construction.

4. Monitoring Activities

a. Take pre, during and post photographs of the affected water crossing, as outlined in the *Water Crossing Monitoring Form.*
b. Complete post-construction water quality monitoring during next open water season and record results and observations on the *Water Crossing Monitoring Form*, as outlined in Section C.1.
c. Include affected water crossing in the next biannual geotechnical inspection, prescribed by the Type 'A' Water Licence.
d. If fish bearing, include affected water crossing in the annual inspection of the Project's fish bearing water crossings, conducted by a Professional Fisheries Biologist.
e. Record all relevant information on *Water Crossing Monitoring Form*.

C.3 - Construction and Monitoring Guidelines during Periods of Flow

1. General

All materials and equipment used for site preparation and construction shall be operated and stored in such a manner that prevents deleterious substances from entering nearby water bodies. Specifically:

a. Any excavated and stockpiled materials shall be stored and stabilized in a designated area that is at least 31 metres from the ordinary High Water Mark of nearby water bodies.
b. Any part of a vehicle and/or equipment entering the water shall be free of fluid leaks and externally cleaned/degreased;
c. Vehicle and equipment washing, re-fuelling, and/or maintenance shall be conducted in a location that is at least 31 metres from the ordinary High Water Mark of nearby water bodies.
d. Vehicles and equipment involved with construction activities shall be operated in a way that minimizes the disturbance to the banks of the watercourse/waterbody. If disturbance occurs, the banks shall be restored.
e. Fuel and any other materials associated with the servicing of machinery shall be stored at least 31 metres from the ordinary High Water Mark of nearby water bodies.

2. Typical Scope of Work for Culvert Repair/Installation

The basic construction scope of work expected at a culvert includes the following activities:

a. Excavate to desired elevation to install new or extend existing culvert(s).
b. Install new culverts, or new culvert lengths/extensions.
c. Back fill with compaction to finished grade.
d. Place rip-rap at culvert inlet and outlet ends, as required.
e. Clean up loose material around the culvert(s) to mitigate water quality impacts from construction.

3. Pre-Construction Activities

Where there are construction activities occurring during periods of flow, the following steps will be taken prior to construction.

a. Complete a fish assessment prior to construction. Record information on the *Water Crossing Monitoring Form*.
b. If the stream survey yields the presence of fish, a salvage fishery will be conducted if any in-stream work is anticipated. If fish are present for any in-stream work, a barrier net will be placed downstream of the construction site to prevent additional fish potentially from accessing the construction site. Any fish present upstream of the barrier will be captured (using a backpack electrofisher) and transferred to fish-bearing habitat downstream of the barrier.

c. Take pre-construction photographs of the affected water crossing as outlined in the Water Crossing Monitoring Form.
d. Complete pre-construction water quality monitoring and record results and observations on the *Water Crossing Monitoring Form,* as outlined in Section C.1.
e. Install sediment control measures. Ensure sediment control measures are functioning properly prior to the start of construction. Record information on the *Water Crossing Monitoring Form*.
f. Record all relevant information on *Water Crossing Monitoring Form*.

4. During-Construction Activities

a. Complete construction activities.
b. Take during construction photographs of the affected water crossing as outlined in the *Water Crossing Monitoring Form*.
c. Complete during construction water quality monitoring and record results and observations on the *Water Crossing Monitoring Form*, as outlined in Section C.1.
d. Record all relevant information on *Water Crossing Monitoring Form*.

5. Post-Construction Activities and Performance Monitoring

a. Take post-construction photographs of the affected water crossing as outlined in the *Water Crossing Monitoring Form*.
b. Complete post-construction water quality monitoring and record results and observations on *Water Crossing Monitoring Form*, as outlined in Section C.1.
c. Include affected water crossing in the next biannual geotechnical inspection, prescribed by the Type 'A' Water Licence.
d. If fishing bearing, include affected water crossing in the annual inspection of the Project's fish bearing water crossings, conducted by a Professional Fisheries Biologist.
e. Record all relevant information on the *Water Crossing Monitoring Form*.

WATER CROSSING MONITORING FORM

Baffinland

WATER CROSSING MONITORING FORM
PART 1 - GENERAL INFORMATION

WATER CROSSING ID:									
Construction Duration:			**Start (YY/MM/DD XX:XX HRS):**		**Finish (YY/MM/DD XX:XX HRS):**				
During Frozen Conditions?	Yes / No								
During Periods of Flow?	Yes / No								
IF CONSTRUCTION OCCURS DURING PERIODS OF FLOW, COMPLETE ENTIRE FORM (PART 1 & PART 2A, B & C) (PRE, DURING AND POST CONSTRUCTION WATER QUALITY MONITORING)									
IF CONSTRUCTION OCCURS DURING FROZEN CONDITIONS, COMPLETE PART 1 & PART 2C OF THIS FORM (POST CONSTRUCTION WATER QUALITY MONITORING)									
CROSSING MODIFICATION / REPAIR DETAILS									
Change in existing design?	**Yes / No**		**If Yes, details of change:**						
Final Design (e.g. number of culverts, length, etc.):									
Applicable Approvals									
TRAN									
DFO Approvals									
Notes:									
LOCATION									
Datum:	**Zone:**								
Easting (m):	**Northing (m):**		**Elevation (from mapping):**						
Notes:									
FISH ASSESSMENT PRIOR TO CONSTRUCTION									
Date (YY/MM/DD):									
Fish Present?	Yes / No		**If Yes, distance from crossing:**					US / DS	
Spawning Arctic charr present at crossing?			Yes / No		If Yes, contact a biologist				
Spawning site present 20 m upstream or downstream of crossing?			Yes / No						
Notes:									
SEDIMENT AND EROSION CONTROL MEASURES									
Measures Installed:					Date installed:				
					Date removed:				
Measures taken to stabilize disturbed areas:									
Notes:									
PHOTOS									
View across water crossing, view from upstream, view from downstream and view of sediment controls employed.									
	Photo #	**Date (YY/MM/DD)**	**Direction**	**Vantage Point**		**Photo #**	**Date (YY/MM/DD)**	**Direction**	**Vantage Point**
Before					**After**				
Across					Across				
From US					From US				
From DS					From DS				
During					**Sed. Cont.**				
Across					Across				
From US					From US				
From DS					From DS				
Notes:									

Baffinland

WATER CROSSING MONITORING FORM
PART 2A - PRE-CONSTRUCTION WATER QUALITY MONITORING

WATER CROSSING ID:											Pg. (X/X):
Location (e.g. 100 m downstream)	Date (YY/MM/DD)	Time (XX:XX HRS)	Field Monitoring						Water Sample Collected (Yes / No)	Lab Water Sample ID	Notes
			Turbidity (NTU)	pH (pH Units)	Sp. Cond. (µS/cm)	Water Temp. (°C)	DO (mg/L)	DO (% Sat.)			

Monitoring Frequency:

Water Sampling - At least one (1) sampling event at locations 100 m downstream and 50 m upstream of the affected water crossing, prior to construction.

Field Monitoring - At least one (1) monitoring event (alongside water sampling event listed above) at locations 100 m and 50 m downstream and 50 m upstream of the affected water crossing, prior to construction.

Baffinland

WATER CROSSING MONITORING FORM
PART 2B - DURING CONSTRUCTION WATER QUALITY MONITORING

WATER CROSSING ID: **Pg. (X/X):**

Location (e.g. 100 m downstream)	Date (YY/MM/DD)	Time (XX:XX HRS)	Field Monitoring						Water Sample Collected (Yes / No)	Lab Water Sample ID	Notes
			Turbidity (NTU)	pH (pH Units)	Sp. Cond. (µS/cm)	Water Temp. (°C)	DO (mg/L)	DO (% Sat.)			

Monitoring Frequency:

Water Sampling - Every eight (8) hours at locations 100 m downstream and 50 m upstream of the affected water crossing, during construction.

Field Monitoring - Every four (4) hours at locations 100 m and 50 m downstream and 50 m upstream of the affected water crossing, during construction.

Note: Field monitoring and water sampling shall be conducted concurrently where frequency and locations overlap.

Adaptive water sampling events will also be conducted when downstream flows are suspected of encroaching on TSS and turbidity criteria limits.

Baffinland

WATER CROSSING MONITORING FORM
PART 2C - POST CONSTRUCTION WATER QUALITY MONITORING

WATER CROSSING ID: **Pg. (X/X):**

Location (e.g. 100 m downstream)	Date (YY/MM/DD)	Time (XX:XX HRS)	Field Monitoring						Water Sample Collected (Yes / No)	Lab Water Sample ID	Notes
			Turbidity (NTU)	pH (pH Units)	Sp. Cond. (µS/cm)	Water Temp. (°C)	DO (mg/L)	DO (% Sat.)			

Monitoring Frequency:

Water Sampling - Three sampling events: once in June, July and August at locations 100 m downstream and 50 m upstream of the affected water crossing. Sampling events will occur at least 10 days apart.

Field Monitoring - Field monitoring will be conducted concurrently with water sampling events listed above.

Appendix D

Tote Road Monitoring Program

1. Purpose and Scope

The Tote Road Monitoring Program (TRMP) has been developed to monitor the water quality of surface water flows at select water crossing (culverts, bridges) along the Milne Inlet Tote Road (Tote Road), with a primary focus on monitoring total suspended solids (TSS) concentrations upstream and downstream of Tote Road water crossings.

Monitoring data collected under the TRMP will be used to:

a) Inform Project operations of potential water quality impacts from Project activities at water crossings along the Tote Road.
b) Guide and prioritize Tote Road maintenance work, corrective actions and improvements projects for surface water management infrastructure;
c) Adjust mitigation measures and management strategies for Project activities along the Tote Road; and,
d) Expand the Project's understanding of natural water quality conditions along the Tote Road (upstream) and the natural factors that contribute to changes in surface water quality.

2. Monitored Parameters

Water quality monitoring conducted to date along the Tote Road have identified TSS as a parameter of concern. Observations indicate that sources of TSS can be both Project-related, such as construction activities, and natural, such as bank erosion and streambed scouring during high flow periods.

In addition to TSS, the TRMP will monitor for additional parameters, including metals, nutrients, oil & grease, and routine chemistry, such as dissolved anions, turbidity and total dissolved solids (TDS).

Tables D-1 and D-2 outline the field and analytical parameters that will be monitored under the TRMP.

Table D-1 – Tote Road Monitoring Program – Field Parameters

Parameter Type	Method	Units	Parameter Group
Turbidity	1	NTU	Group 1
pH	1	pH units	
Specific Conductivity	1	µS/cm	
Water Temperature	1	°C	
Dissolved Oxygen	1	mg/L, %	
Oil & Grease Sheen	2	Presence/Absence	

Notes:

[1]Method 1 – *In-situ* testing using a multi-parameter water quality probe (i.e. YSI)
Method 2 – Visual inspection during water sampling event.

Table D-2 – Tote Road Monitoring Program - Analytical Parameters

Parameter Type	Method[1]	Units	Parameter Group
pH	3	pH units	Group 2
Total Suspended Solids (TSS)	3	mg/L	
Total Dissolved Solids (TSS)	3	mg/L	
Conductivity	3	µS/cm	
Oil & Grease	3	mg/L	Group 3
Hardness	3	mg/L as $CaCO_3$	Group 4
Alkalinity	3	mg/L as $CaCO_3$	
Chloride (Cl^-)	3	mg/L	
Ammonia	3	mg/L N	
Total Phosphorus	3	mg/L N	
Nitrate (NO_3^-)	3	mg/L N	
Nitrite (NO2)	3	mg/L N	
Dissolved Organic Carbon (DOC)	3	mg/L N	
Total Organic Carbon (TOC)	3	mg/L N	
Total and Dissolved Metals	3	mg/L	

Notes:

[1]Method 3 – analytical testing of water samples by an accredited third party laboratory

3. Monitoring Methods and Equipment

Field monitored parameters will measured using a calibrated, multi-parameter water quality probe (e.g. YSI). A visual inspection will be conducted to determine the presence or absence of sheen.

Discrete water samples will be collected, transported and analyzed in accordance with the protocols outlined in Baffinland's Surface Water Sampling Program – Quality Assurance and Quality Control Plan (BAF-PH1-830-P16-0001; QA/QC Plan).

4. Monitoring Locations

Water crossings monitored under the TRMP have been selected to give a geographically representative sample set of water crossings for each given watershed intersected by the Tote Road (Phillips Creek, Ravn River, Mary River), presented in Figure D-1. In selecting the Tote Road water crossings within each watershed, the following factors were considered:

a) Key depositional habitats downstream of the Tote Road (e.g. fish habitat);
b) Areas historically prone to sedimentation events;
c) Historical borrow source locations; and,
d) Existing monitoring locations and programs.

Using the factors and criteria listed above, the following 20 Tote Road water crossings, presented in Table D-3, were identified as monitoring locations.

Table D-3 – Water Crossings Monitored under TRMP

Water Crossing	Watershed	Approximate Tote Road Chainage
CV167	Phillips Creek	6
CV162	Phillips Creek	8
CV128*	Phillips Creek	17
CV129	Phillips Creek	17
CV115	Phillips Creek	27
CV112	Phillips Creek	31
CV106	Phillips Creek	33
CV099*	Phillips Creek	37
CV093*	Phillips Creek	41
CV078*	Phillips Creek	51
CV071	Phillips Creek	54
CV060	Phillips Creek	58
BG50*	Ravn River	62
CV040*	Ravn River	72
BG32	Ravn River	78
CV217*	Ravn River	80
BG30	Ravn River	84
BG24*	Mary River	87
CV001	Mary River	94
CV223	Mary River	97

Notes:

Water crossing with an asterisk (*) are HADD fish bearing water crossings.

5. Monitoring Frequency

During each year, water quality monitoring under the TRMP will commence with the start of flows and end with the freeze-up of flows. Water quality monitoring will be divided into two seasons: Freshet and Summer. Freshet will be begin with the start of flows and end July 15. Summer will begin July 16 and end with the freeze-up of flows in September. Selected water crossings will be sampled weekly (4 events per month) during Freshet and monthly during the Summer.

Tables D-4 and D-5 outline the frequency of sampling events for the primary parameters (Groups 1 & 2) and additional parameters (Group 4), respectively. As shown in Tables D-4 and D-5, primary parameters will be monitored weekly during Freshet and monthly during Summer while the additional parameters will only be sampled once per season at HADD fish-bearing water crossings. Water samples will be collected for oil & grease (Group 3) during sampling events in which visible sheen is observed.

Table D-4 – Monitoring Frequency for Primary Parameters (Groups 1 & 2)[1]

Month	May				June				July			August			September			
All Water Crossings	F	F	F	F	F	F	F	F	F	F		S			S			S	

Notes:

F – Indicates Freshet water sampling event
S – Indicates Summer water sampling event
[1]Water samples for Group 3 (oil & grease) will be collected where visible sheen is observed.

Table D-5 – Monitoring Frequency for Additional Parameters (Group 4)[1]

Month	May	June	July	August	September
HADD Fish-Bearing Water Crossings[2]		F		S	

Notes:

F – Indicates Freshet water sampling event
S – Indicates Summer water sampling event
[1]Water samples for Group 3 (oil & grease) will be collected where visible sheen is observed.
[2]HADD fish-bearing water crossings are identified in Table D-3.

During each water sampling event, water samples will be collected at a location approximately 100 metres downstream and 50 metres upstream of each monitored water crossing, as access allows. Field monitoring (*in-situ*) parameters will be measured at the same locations. Deviations from these established distances due to safety and/or accessibility concerns will be documented on the *TRMP – Sampling Event Monitoring Form.*

Water sampling events will start at the monitoring location furthest downstream of the monitored water crossing and progress in an upstream direction to prevent monitoring results from being affected by sediment re-suspended during sampling activities (e.g. stream bed disturbance).

It should be noted that additional monitoring may be required if the TSS water quality action levels, presented in Section 6 below, are exceeded. Additional sampling requirements and responses to documented TSS exceedances under the TRMP are outlined in the action-response framework presented in Section 6.

6. TSS Water Quality Criteria and Response-Action Framework

The Tote Road Monitoring Program will utilize a response-action framework to identify, mitigate and monitor for Project related changes in TSS concentrations, if present. The response framework is outlined in the Figure D-2.

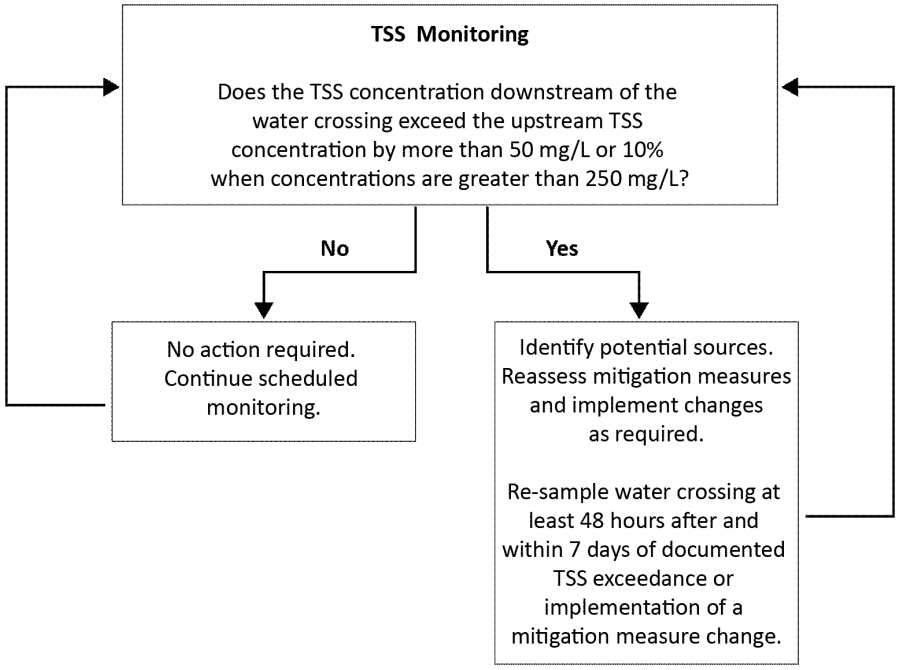


Figure D-2 – TSS Response-Action Framework

To evaluate the potential for a Project related change to concentrations of TSS within the Tote Road LSA, water samples will be collected at designated locations approximately 100 m downstream and 50 m upstream of the crossing, as access allows, at the frequency outlined in Section 3.3.1.4. Following receipt of analytical results, TSS concentrations at the upstream and downstream location will be compared. When upstream concentrations are less than 250 mg/L, a potential Project related change is defined as a greater than 50 mg/L increase in the downstream concentration. Where concentrations are greater than 250 mg/L in the upstream sample, a potential Project related change is defined as a greater than 10% increase in the downstream sample.

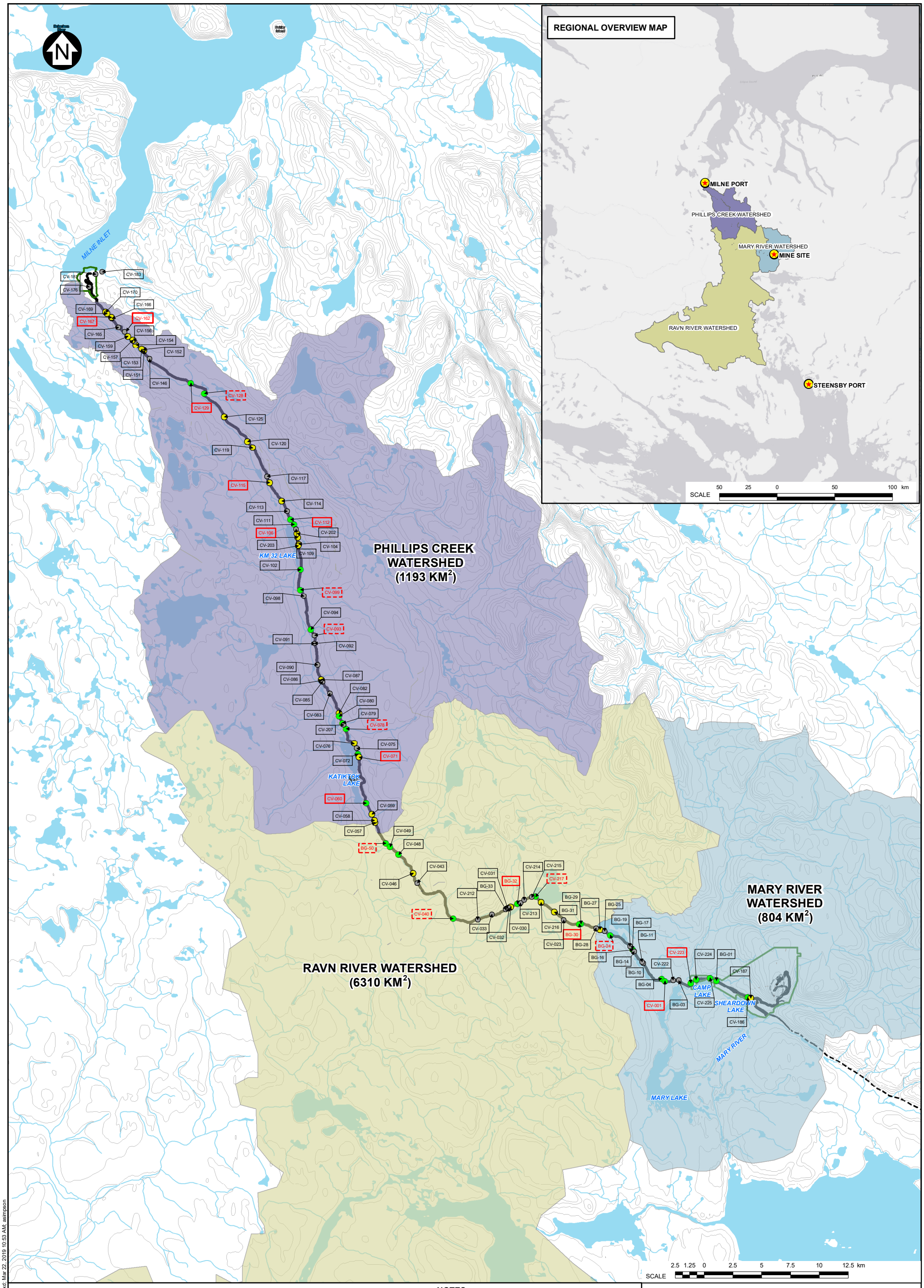
If the results of a sampling event identify a potential Project related change, Baffinland will implement new mitigation measures and/or assess the effectiveness of existing mitigation measures. During the assessment, the water crossing will be evaluated to determine the potential sources of the observed sedimentation event(s) and TSS concentration increases, including natural phenomenon. The water crossing will then be re-sampled at least two (2) days, but not later than seven (7) days, following receipt of sampling results to confirm that mitigation and/or corrective actions have reduced TSS concentrations below the appropriate action level.

7. Data Management

All data collected during monitoring activities will be documented using the *TRMP – Sampling Event Monitoring Form.* During each sampling event, a *TRMP – Sampling Event Monitoring Form* will be completed. All documentation, including photos, will be saved on the onsite Environmental server.

8. Data Reporting Requirements and Interpretation

Data collected during the TRMP will be presented in the Annual Report prescribed by the Project's Commercial Lease with the QIA and the Type 'A' Water Licence, issued by the NWB. In the Annual Report, Baffinland will present the data, compare the data against the applicable water quality criteria and outline Baffinland's interpretation of the data and plans for any additional monitoring in the upcoming field season.



LEGEND:

- WATER
- MILNE INLET TOTE ROAD
- POTENTIAL DEVELOPMENT AREA
- WATER CROSSING MONITORED BY TOTE ROAD MONITORING PROGRAM
- HADD FISH BEARING WATER CROSSING MONITORED BY TOTE ROAD MONITORING PROGRAM

FISH BEARING STATUS

- NO
- MARGINAL
- IMPORTANT

NOTES:

1. COORDINATE GRID IS IN METRES. COORDINATE SYSTEM: UTM NAD83 ZONE 17N.
2. BASE MAP: © HER MAJESTY THE QUEEN IN RIGHTS OF CANADA DEPARTMENT OF NATURAL RESOURCES (2009). ALL RIGHTS RESERVED.
3. CONTOUR INTERVAL IS 40 METRES.
4. CATCHMENT BASED ON JULY 2006 INSPECTIONS.
5. FISH BEARING STATUS BASED ON: BAFFINLAND IRON MINES CORP., FISH HABITAT MONITORING 2017 ANNUAL REPORT, TABLE 2, DECEMBER 2017.

REV	DATE	DESCRIPTION	DESIGNED	DRAWN	REVIEWED
0	22MAR'19	ISSUED WITH TRANSMITTAL	AV	AS	AV

BAFFINLAND IRON MINES CORPORATION

MARY RIVER PROJECT

TOTE ROAD MONITORING PROGRAM

Baffinland

P/A NO.	REF NO.
NB102-181/54	NB19-00240

FIGURE D-1 REV 0

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TRMP – Sampling Event Monitoring Form

TOTE ROAD MONITORING PROGRAM - SAMPLING EVENT MONITORING FORM

Water Crossing ID	Monitoring Location Description (e.g. 100 m downstream)	Coordinates of Monitoring Location (UTM; NAD83)[1]			Date (YY/MM/DD)	Time (XX:XX HRS)	Field Monitoring							Water Samples Collected (Yes / No)	Reason for Sampling (e.g. Scheduled Sampling Event, Follow-up, etc.)	Mitigation Measures Implemented (Yes / No)	Photos IDs	Notes (General Observations, Weather, Deviations from Protocol, etc.)
		Zone	Easting	Northing			Turbidity (NTU)	pH (pH Units)	Sp. Cond. (µS/cm)	Water Temp. (°C)	DO (mg/L)	DO (% Sat.)	Sheen Observed (Yes / No)					

Notes:
[1]Coordinates will be recorded for sampling events that deviate from the prescribed distances upstream (50 m) and downstream (100 m) of water crossings.

Appendix E

Tote Road Adjustment Notification
Lease Operations Guide

Baffinland Iron Mines Corporation and Qikiqtani Inuit Association
Commercial Lease No.: Q13C301
Tote Road Adjustment Notification

Background

BIMC is required to follow this procedure for any adjustment to the design of the Tote Road submitted to QIA. Under Section 2.8 of the Commercial Lease:

> *"The Tenant shall obtain written consent from the Landlord for any adjustments to the Milne Inlet Tote Road, such consent not to be unreasonably withheld. The parties acknowledge that adjustments to the alignment of the Milne Inlet Tote Road may be required to facilitate safe haul truck travel."*

Calendar of activities

BIMC submits Tote Road Adjustment Notification (TRAN)	TRANs can be submitted at any time as required by BIMC; it is expected that they will typically be submitted by November 1 with the Annual Work Plan or by March 1 as a follow-up to the Annual Work Plan.
QIA reviews TRAN	TRAN review timelines are described in detail below.
QIA submits Notice of Consent or Rejection	Once QIA has reached a decision, an approval or rejection of the TRAN application will be issued to BIMC as per the timelines described below.

Submission requirements

The TRAN Application Form is to be used by BIMC when submitting any and all TRANs (see Appendix A).

A TRAN is required when the following changes are being made to the Tote Road:

- A re-alignment of the Tote Road where the centre line of the road is moved >10 metre (m) from the existing centre line.
- Addition of another lane to the Tote Road.
- Raising the existing grade of the Tote Road by >2 m in elevation.
- Lowering the existing grade of the Tote Road in areas that have historically been prone to permafrost degradation.
    - Areas along the Tote Road that have historically been prone to permafrost degradation as a result of cuts and the lowering of road grade are outlined in Table 1. When lowering the existing grade of the Tote Road within these areas (Table 1), the potential impact on permafrost will be evaluated and where the potential for degradation exists, the submission of a TRAN will be required.
- Lowering the existing grade of the Tote Road by >1 m in areas not identified in Table 1.
- Changing the design of an existing bridge or culvert. Upgrading an existing bridge or culvert to the approved design (e.g. IFC drawings included in the ERP approvals) will not require the submission of a TRAN.

- A re-alignment of the Tote Road that results in the placement of material within 31 metres of the High Water Mark of a natural water body.

For the purposes of the TRAN process, the Tote Road is defined as the main transport corridor starting at approx. Km 2.5 (N 71° 52' 02.3" W 80° 52' 51.1") near Milne Port and terminating at Km 100 (N 71° 19' 44.3" W 79° 22' 24.6") near the Mine Site.

Adjustments to the Tote Road, as well as all Project roadways and infrastructure, must fall within the limits of the Impact Areas outlined in the Commercial Lease. A 50 m buffer of undisturbed land must also be maintained between infrastructure and disturbed areas associated with the Project and the established limits for Impact Areas outlined in the Commercial Lease. Adjustments to the Tote Road that encroach (within 50 m) or fall outside the limits of the Impact Areas will need to be approved by the QIA through the Options Exercise Notice (OEN) process.

Issued for Construction (IFC) drawings shall be included for any engineered structure (e.g. bridges, culverts) that deviates in physical characteristics from the existing approved design. For water crossing locations where IFC and supporting specifications do not currently exist or were not previously submitted for approval, this information will be provided with the TRAN submission for approval.

Routine maintenance and minor upgrades to the existing road surface, crossings, embankments or safety structures (barriers, signage, etc) are part of normal operations and will not require submission or review of a TRAN. As defined by the Nunavut Water Board[1] (NWB), "Routine Maintenance" is considered to encompass actions that BIMC may take to ensure that the Tote Road is in an acceptable condition (from a safety and operational perspective) to facilitate its intended use. Examples of routine maintenance include but are not limited to; grading, re-decking of bridges, and replacement of existing culverts consistent with their approved design. The term "Minor Upgrade" means upgrades that do not significantly alter the structure or makeup of the road. Examples of minor upgrades include but are not limited to; adding a shoulder to a section of road, and modifying the radius/turns of sections of the road for safety purposes. Adding another lane to the Tote Road would not be considered a minor upgrade.

Upgrades to the Tote Road that are completed to the approved design drawings submitted as part of the Project Description for the Early Revenue Phase (ERP) approvals, including the Project Certificate Amendment and Type 'A' Water Licence, are considered to be already approved and will not require the submission TRAN or additional QIA approval.

Table 1 – Permafrost Sensitive Areas along the Tote Road

Tote Road Areas requiring a Permafrost Assessment for Work involving Cuts and/or Lowering of Road Grade
Km 50 - 64
Km 70 - 100

[1] Nunavut Water Board (2015) Commitment No. 2 – List of Commitments Generated during the Technical Meeting and Pre-Hearing Conference for the Mary River Project Amendment No. 1 Application to Licence 2AM-MRY1325. February 25, 2015.

Approval process

Upon receiving the TRAN, QIA will review it for completeness and notify BIMC if any additional information is required within fourteen (14) days. If no additional information required, then within thirty (30) days of the submission date, QIA will provide BIMC with a Notice granting its consent, consent with conditions or its rejection of the submission with reasonable grounds.

If additional information is required, then within thirty (30) days of receipt of additional information or within sixty (60) days of the submission of the TRAN, *whichever occurs later*, QIA will provide BIMC with a Notice granting its consent, consent with conditions or its rejection of the submission with reasonable grounds.

Where any adjustments of the Tote Road encroach (within 50 m) or fall outside the limits of the Impact Areas defined in Commercial Lease, an Options Exercise Notice (OEN) will be submitted together with the TRAN application. Where an OEN is required, timelines for review will be superseded by those outlined in Section 3.3 of the Commercial Lease and the *Lease Operations Guide for Options Exercise Notice*.

If the TRAN is submitted with the Annual Work Plan, where permissible, QIA will review the TRAN application in coordination with the review of the Work Plan and no additional processing fees will be applied. If the TRAN is submitted outside the Annual Work Plan, BIMC will be charged a reasonable processing fee by QIA to process the application. If the TRAN is submitted with an OEN, the reasonable processing fee should be inclusive of both applications and not duplicative.

Fast track option

If BIMC wishes to fast track a TRAN application, it will provide the complete TRAN application and a rationale as to why the fast track option is being pursued. QIA will respond within five (5) business days as to whether the fast track option may be acceptable, along with an estimate of time to process the TRAN.

In particular, fast tracking of TRANs will be considered for simpler applications; this will be determined on a case by case basis. Fast tracking is not preferred by BIMC or QIA and will not be guaranteed to be entered into upon request.

Follow-up Reporting

Within 90 days of completion of the construction of a Tote Road Adjustment, Baffinland will provide QIA with a summary report of activities including before and after pictures. As-built documentation will be provided to QIA for Project road network changes that required the submission of IFC drawings to obtain the necessary approvals (e.g. TRAN). The Annual Report required by the Commercial Lease will also include a summary of any Tote Road Adjustments completed and an updated map of the Tote Road, if applicable. Through annual use and

submission of Photosat (or equivalent aerial imagery and survey), BIMC will reconcile additional disturbed areas with respect to reclamation securities. Such satellite imagery will also be utilized to develop plan view as-built drawings for Project road network changes. Cross-sections for water crossing changes (e.g. bridges and culverts) will be provided, and additional cross sections may also be provided as required by QIA. As-built drawings will be signed and stamped by a Professional Engineer registered in Nunavut.

APPENDIX A – TRAN APPLICATION FORM

#	**TRAN Application Form**	
The Tote Road Adjustment Notice (TRAN) Application Form is to be used to satisfy Section 2.8 of the Commercial Lease[2]. Routine Maintenance, considered to encompass actions BIMC may take to ensure that the Tote Road is in an acceptable condition (from a safety and operational perspective) to facilitate its intended use, does not require a TRAN. A TRAN is required when the following changes are being made to the Tote Road: • A re-alignment of the Tote Road where the centre line of the road is moved > 10 m from the existing centre line. • Addition of an independent lane to the Tote Road (e.g. doubling a section of road). • Raising the existing grade of the Tote Road by >2 m in elevation. • Lowering the existing grade of the Tote Road in areas that have historically been prone to permafrost degradation. o Areas along the Tote Road that have historically been prone to permafrost degradation as a result of cuts and the lowering of road grade are outlined in Table 1 (refer above). When lowering the existing grade of the Tote Road within these areas, the potential impact on permafrost will be evaluated and where the potential for degradation exists, the submission a TRAN will be required. • Lowering the existing grade of the Tote Road by >1 m in areas not identified in Table 1 (refer above). • Changing the design of an existing bridge or culvert. Upgrading an existing bridge or culvert to the approved design (e.g. IFC drawings included in the ERP approvals) does not require the submission of a TRAN. • A re-alignment of the Tote Road that results in the placement of material within 31 metres of the High Water Mark of a natural water body. For the purposes of the TRAN process, the Tote Road is defined as the main transport corridor starting at approx. Km 2.5 (N 71° 52’ 02.3” W 80° 52’ 51.1”) near Milne Port and terminating at Km 100 (N 71° 19’ 44.3” W 79° 22’ 24.6”) near the Mine Site. If unsure of whether work is considered Routine Maintenance or an Adjustment, a completed TRAN should be submitted to QIA for clarification.		
1	TRAN Title / Identification	
2	Approximate Km marker(s) on the Tote Road and general geographic UTM coordinates of the areas subject to the proposed Tote Road Adjustment.	
3	A description of the characteristics of the land and water that will be impacted.[3]	
4	The proposed work activities to be conducted (associated maps, drawings and designs to be attached). Issued for Construction (IFC) drawings shall be included for any engineered structure (e.g. bridges, culverts).	

[2] QIA and BIMC (2013) Commercial Lease No. Q13C301. September 6, 2013.
[3] This description shall at a minimum include a description of the following components:

i. Disturbed or undisturbed
ii. Wildlife
iii. Vegetation
iv. Permafrost
v. Water quality
vi. Archeology / carving stone presence.

5	Proposed schedule of the activities.	
6	The reason for the adjustment and if any new operations or activities will be conducted on the land (e.g., crushing plant).	
7	Applicable Environmental Management and Monitoring Plans.	
8	Confirmation that the Tote Road Adjustment area is within the limits of the Impact Areas identified in the Commercial Lease (including 50 m buffer) and the Project Development Area.[4]	
9	List all regulatory approvals required for the adjustments. Indicating the status of each and whether any changes are required to existing approvals, licences, plans, permits or authorizations (i.e. DFO, etc.).	
10	Indicate the source and volume of Specified Substances associated with the Tote Road adjustment. Where applicable, provide the name of Quarry, Quarry Management Plan, version and approval date associated with the Specified Substances to be used.	
11	Adjustment to current closure/reclamation security or confirmation that the required amount of security is in place.	
12	Indicate if this work is reclamation or closure based.	
13	If yes, indicate any reclamation work to be conducted as part of the proposed Tote Road Adjustment.[5]	

[4] Confirmation will, at a minimum, include a map presenting pre-construction conditions, the limits of the relevant Impact Areas identified in the Commercial Lease and the limits of the proposed Tote Road Adjustment. A map presenting the post-construction conditions, the limits of the relevant Impact Areas identified in the Commercial Lease and the as-built limits of the Tote Road Adjustment will be submitted to the QIA within 90 days of construction completion.

[5] Pursuant to Section 3.6 and 9.7 of the Commercial Lease, this description is intended to provide confirmation of a plan to complete or completed work with the eventual intent of requesting QIA to release the relevant portion of security deposit. QIA reserves the ability to request additional information prior to issuing a Letter of Clearance.

Appendix F

Options Exercise Notice
Lease Operations Guide

Baffinland Iron Mines Corporation and Qikiqtani Inuit Association
Commercial Lease No.: Q13C301
Option Exercise Notice Submission

Background

BIMC is required to follow this procedure for any and all Option Exercise Notices (OENs) submitted to QIA.

Calendar of activities

BIMC submits OEN	OENs can be submitted at any time as required by BIMC; it is expected that they will typically be submitted by November 1 with the Annual Work Plan.
QIA reviews OEN	OEN review timelines are described in detail below.
QIA submits Notice of Consent or Rejection	Once QIA has reached a decision an approval or rejection of the OEN application will be issued to BIMC as per the timelines described below. If the OEN seeks to reclassify or surrender lands QIA will issue a Letter of Clearance along with the Notice of consent (if consent is granted), specifying QIA's conditions for approval.

Submission requirements

A standardized OEN Application Form is to be used by BIMC when submitting any and all OENs (see Appendix A).

If the OEN seeks to surrender lands the application must also include:

- The results from a Canada Land Survey that certifies the boundaries of each Land Use Area to be surrendered. This will include copies of all survey data, digital files and surveyors' notes. The plans of survey will include the aggregate number of hectares comprising each Land Use Area and the location and size of all Waste Storage Areas and quarry sites; and
- In the case of surrendering Impact Areas and Exploration Areas, evidence that closure objectives and criteria are met according to the requirements of a Closure and Reclamation Plan (CRP).

Approval process

Upon receiving the OEN, QIA will review it for completeness and notify BIMC if any additional information is required within sixty (60) days. If no additional information required, then within ninety (90) days of the submission date, QIA provides BIMC with a Notice granting its consent, consent with conditions, or its rejection of the submission with reasonable grounds.

If additional information is required, then within thirty (30) days of receipt of said information or within ninety (90) days of the submission of the OEN, *whichever occurs later*, QIA provides BIMC with a Notice granting its consent, consent with conditions or its rejection of the submission with reasonable grounds.

If submitted with the Annual Work Plan, where permissible, QIA will aim to review the OEN application in coordination with the Work Plan.

Fast track option

If BIMC wishes to fast track an OEN application, it will provide the complete OEN application and a rationale as to why the fast track option is being pursued. QIA will respond within five (5) business days as to whether the fast track option may be acceptable, along with an estimate of time to process the OEN.

In particular, fast tracking of OENs will be considered for simpler applications; this will be determined on a case by case basis. Fast tracking is not preferred by QIA and will not be guaranteed to be entered into upon request.

Surrender of Impact Areas and Exploration Areas

The surrender of Impact Areas and Exploration Areas may occur only after the final completion of all Work, activities and requirements of a Closure and Reclamation Plan for such part or parts of the Lands to be surrendered, to the reasonable satisfaction[1] of the Landlord in accordance with a Letter of Clearance, which may include monitoring obligations following surrender of the subject Lands.

If the lands have not been reclaimed to QIA's satisfaction, the Letter of Clearance will not permit the Lands to be surrendered and will either retain the classification of Impact and/or Exploration Areas or reclassify the lands to General Areas. In the latter case, the Letter of Clearance may also contain ongoing monitoring requirements.

Surrender of General Areas

The approval process for the surrender of General Areas Lands requires QIA to submit the OEN submission to QIA with the requirements listed above. Once the Canada Land Survey results are received by QIA then the Lands are deemed to be surrendered – no approval process is required.

[1] As defined in Section 3. Land Classifications Amendments of the Lease.

APPENDIX A – OEN APPLICATION FORM

#	**OEN Application Form**	
1	OEN Title	Click here to enter text.
2	General geographic UTM coordinates of the areas subject to amendment	Click here to enter text.
3	A description of the characteristics of the land including acknowledgement and explanation of any environmental sensitivities[2]	Click here to enter text.
4	The specific nature of activities that have historically occurred on the proposed Lands[3]	Click here to enter text.
5	The specific nature of activities to be conducted on the proposed Lands[4]	Click here to enter text.
6	Proposed duration of the activities	Click here to enter text.
7	Associated changes to all Environmental Management and Monitoring Plans[5]	Click here to enter text.
8	All related Annual Work Plan amendments, if any.[6]	Click here to enter text.

[2] This description shall at a minimum include a complete description of the following components:

i. Wildlife
ii. Vegetation
iii. Permafrost
iv. Water quality (includes Acid Rock Drainage and Metal Leaching)
v. Air quality
vi. Associated map(s), sketches and other information in sufficient detail and in a scale as to QIA to consider the amendment request, including clear presentation of existing geographical features and relevant project facilities. The map(s) will include nearby facilities and geographical features (e.g. water bodies, topography).
vii. Photographic record of pre-operations in the OEN area.

[3] Indicate whether lands are disturbed or undisturbed - if disturbed, nature and duration of past disturbance (e.g. hectares of land disturbed, tonnes of material quarried, other types of activities etc.)

[4] Associated drawings and designs are to be included as annexes.

[5] Relevant environmental management plans associated with the OEN. If there are no revisions required to management plans, a list of the most current environmental management plans will be provided.

[6] Indicate whether activity is outside of scope of relevant Annual Work Plan.

9	Relevant information concerning financial security, including the Security Deposit.	Click here to enter text.
10	Indicate whether changes are required to existing approvals, licences, plans, permits or authorizations.	Click here to enter text.
11	The anticipated increase or decrease in Rent payment where the increase or decrease is shown compared against the initial Rent payment amount pre-OEN approval.	Click here to enter text.

Appendix G

Concordance Table of Relevant Terms and Conditions

The following table outlines the relevant terms and conditions regarding the operation and construction of the Project road network included in the Project's Project Certificate No. 005 – Amend. No. 1, issued by NIRB, the Type 'A' Water Licence – 2AM-MRY1325 – Amend. No. 1, issued by the NWB, and the Commercial Lease, agreed upon by Baffinland and the QIA.

Compliance to the terms and conditions included in the Tote Road Fisheries Act Authorization No. NU-06-0084, and subsequent amendments and authorizations for Project fish bearing water crossings, will be documented in the prescribed Annual Report(s) provided to DFO by Baffinland each year (by December 31st).

Requirements and regulations outlined in the Mine Health and Safety Act and Regulations will be addressed in the Project's Civil Design Criteria document (Hatch, 2013), and subsequent amendments.

Terms and Conditions	Reference and Comments
Project Certificate No. 005 – Amend. No. 1[1]	
Condition 19 The Proponent shall ensure that it develops and implements adequate monitoring and maintenance procedures to ensure that the culverts and other conduits that may be prone to blockage do not significantly hinder or alter the natural flow of water from areas associated with the proposed mine. In addition, the Proponent shall monitor, document and report the withdrawal rates for water removed and utilized for all domestic and industrial purposes.	Monitoring and maintenance of the Project road network, including water crossings, is discussed in Sections 4 and 7 of the Roads Management Plan. Withdraw rates from water sources will be monitored and reported as outlined in the Type 'A' and 'B' Water Licences.
Condition 21 The Proponent shall ensure that the scope of the Aquatic Effects Monitoring Plan (AEMP) includes, at a minimum: a. Monitoring of non-point sources of discharge, selection of appropriate reference sites, measure to ensure the collection of adequate baseline data and the mechanisms proposed to monitor and treat runoff, and sample sediments; and b. Measures for dustfall monitoring designed as follows: - To establish a pre-trucking baseline and collect data during Project operation for comparison; - To facilitate comparison with existing guidelines and potentially with thresholds to be established using studies of Arctic char egg survival and/or other studies recommended by the Terrestrial Environment Working Group (TEWG); and, - To assess the seasonal deposition (rates, quantities) and chemical composition of dust entering aquatic systems along representative distance transects at right angles to the Tote Road and radiating outward from Milne Port and the Mine Site	Addressed by the Project's AEMP and Air Quality and Noise Abatement Management Plan.

Terms and Conditions	Reference and Comments
Project Certificate No. 005 – Amend. No. 1[1] cont'd	
Condition 22 The Proponent shall develop a detailed Sediment and Erosion Management Plan to prevent and/or mitigate sediment loading into surface water within the Project area.	Addressed by the Project's Surface Water and Aquatic Ecosystem Management Plan. Sediment and erosion management measures used at the Project are discussed in Section 4 of the Roads Management Plan.
Condition 25 The Proponent shall undertake the additional geotechnical investigations to identify sensitive landforms, modify engineering design for Project infrastructure, develop and implement preventative and/or mitigation and monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms.	Baffinland will continue to conduct geotechnical drilling programs and assessments to inform the design, construction and operation of Project infrastructure. Construction considerations, including geotechnical assessments for permafrost sensitive areas along the Tote Road, are discussed in Section 4 of the Roads Management Plan. Biannual geotechnical inspections, prescribed by the Type 'A' Water Licence, are discussed in Section 7 of Roads Management Plan.
Condition 26 The Proponent shall develop and implement a comprehensive erosion management plan to prevent or minimize the effects of destabilization and erosion that may occur due to the Project's construction and operation.	Addressed by the Project's Surface Water and Aquatic Ecosystem Management Plan. Sediment and erosion management measures used at the Project are discussed in Section 4 of the Roads Management Plan.
Condition 28 The Proponent shall monitor the effects of the Project on the permafrost along the railway and all other Project affected areas and must implement effective preventative measures to ensure that the integrity of the permafrost is maintained.	Baffinland will continue to conduct geotechnical drilling programs and assessments to inform the design, construction and operation of Project infrastructure. Construction considerations, including geotechnical assessments for permafrost sensitive areas along the Tote Road, are discussed in Section 4 of the Roads Management Plan.
Condition 29 The Proponent shall provide to the respective regulatory authorities, for review and acceptance, for-construction engineering design and drawings, specifications and engineering analysis to support design in advance for constructing those facilities. Once project facilities are constructed, the Proponent shall provide copies of the as-built drawings and design to the appropriate regulatory authorities.	Design and construction documentation for Project infrastructure will be provided to regulators and stakeholders as prescribed by the Type 'A' Water Licence, TRAN process and Fisheries Act.

Terms and Conditions	Reference and Comments
Project Certificate No. 005 – Amend. No. 1[1] cont'd	
Condition 43 Prior to the start of construction, the Proponent must submit a Site Drainage and Silt Control Plan to the appropriate regulatory authorities for approval.	Addressed by the Project's Surface Water and Aquatic Ecosystem Management Plan.
Condition 45 The Proponent shall adhere to the No-Net-Loss principle at all phases of the project to prevent or mitigate direct or indirect fish and fish habitat losses.	Adherence to the No-Net-Loss principle will be assessed and documented in the prescribed reports provided to DFO for the Project's Fisheries Act Authorizations.
Condition 47 The Proponent shall ensure that all Project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent and limit the movement of water in fish bearing streams and rivers.	Project infrastructure in watercourses will be designed to the specifications outlined the Project's most current Civil Design Criteria document. Monitoring of Project water crossings is discussed in Section 7 and Appendix C of the Roads Management Plan.
Type 'A' Water Licence – 2AM-MRY1325 - Amend. No. 1	
Part D, Item 1 All final design and construction drawings shall be stamped and signed by a Professional Engineer.	Issued-for-Construction (IFC) drawings provided to regulators and stakeholders for Project infrastructure will be stamped and signed by a Professional Engineer registered in Nunavut.
Part D, Item 3 Quarrying activities shall be conducted in accordance with all applicable legislation, guidelines and industry standards including the Northern Land Use Guidelines, Pits and Quarries (INAC, 2009).	Project quarrying activities will adhere to the Project's Borrow Pit and Quarry Management Plan.
Part D, Item 4 The Licensee shall implement sediment and erosion control measures, as required, prior to and during all Phases of the Mary River Project to prevent and/or minimize sediment loading into Water.	Sediment and erosion management measures used at the Project are discussed in Section 4 of the Roads Management Plan, with additional details provided in the Project's Surface Water and Aquatic Ecosystem Management Plan.
Part D, Item 8 The Licensee shall implement preventive and mitigation measures to prevent any Wastes associated with the undertaking from entering any Water bodies.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix C of the Roads Management Plan.

Terms and Conditions	Reference and Comments
Type 'A' Water Licence – 2AM-MRY1325 - Amend. No. 1 cont'd	
Part D, Item 9 The Licensee shall locate equipment storage areas on gravel, sand or other durable land, at a distance of at least thirty-one (31) metres above the ordinary High Water Mark of any Water body in order to minimize impacts on surface drainage and Water quality.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix C of the Roads Management Plan.
Part D, Item 10 The Licensee shall minimize disturbance to terrain, permafrost and drainage during movement of contractors' equipment and personnel around the site, including the railway corridor, during all phases of the Project.	During the design of Project infrastructure, including the Project road network, landforms, permafrost and archaeological resources will be surveyed and taken into account. Design and construction considerations are discussed in Section 4 of the Roads Management Plan.
Part D, Item 11 The Licensee shall not store material on the surface of frozen streams or lakes except what is required for immediate use.	Baffinland will not store material on the surface of frozen streams or lakes except what is required for immediate use.
Part D, Item 12 The Licensee shall use fill material for construction from approved sources that have been demonstrated by appropriate geochemical analyses to not possess Acid-Generating and Metal Leaching properties.	Material used for construction and operation of the Project road network will be sourced from approved quarries and borrow sources outlined in the Project's Borrow Pit and Quarry Management Plan. The use of material from unconventional quarry and/or borrow locations along the Tote Road (e.g. opportunistic use of materials from cuts made to support changes to the Project road network) will follow the protocols outlined in the Milne Inlet Tote Road Quarry and Borrow Source Management Plan. Blasted material used by the Project will be demonstrated to be non-acid generating and non-metal leaching.
Part D, Item 15 All surface runoff during all phases of the Project, where flow may directly or indirectly enter a Water body, shall be sampled Weekly and not exceed the following Effluent quality limits (refer to Table 1).	Surface water monitoring programs for the Project are discussed in the Project's Surface Water and Aquatic Ecosystem Management Plan and Aquatic Effects Monitoring Plan (AEMP).

Terms and Conditions	Reference and Comments
Type 'A' Water Licence – 2AM-MRY1325 - Amend. No. 1 cont'd	
Part D, Item 16 The Licensee shall supervise and field check through an appropriately qualified Engineer, all construction of Engineered Structures in such a manner that the Project specification can be enforced, and where required, the quality control measures followed.	Significant Project road network changes, including changes that trigger the TRAN process and/or Water Licence Modification process, will be included in the biannual geotechnical inspections prescribed by the Type 'A' Water Licence (Part D, Item 18; Part I, Item 13). Construction will be supervised by qualified personnel.
Part D, Item 18 The Licensee shall conduct inspections of earthworks and geological and hydrological regimes of the Project Biannually during the summer or as otherwise approved by the Board in writing. The inspection shall be conducted by a Geotechnical Engineer and the inspection report shall be submitted to the Board within sixty (60) days of the inspection, including a cover letter from the Licensee outlining an implementation plan to respond to the Engineer's recommendations.	Discussed in Section 7 of the Roads Management Plan.
Part D, Item 19 The Licensee shall prevent any chemicals, fuel or Wastes associated with the undertaking from entering any Water body.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix C of the Roads Management Plan.
Part D, Item 21 The Licensee shall undertake necessary corrective measures to mitigate impact on surface drainage resulting from the Licensee's activities.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix C of the Roads Management Plan. Additional detail on mitigation measures employed by the Project to mitigate impacts on surface drainage is discussed in the Project's Surface Water and Aquatic Ecosystem Management Plan.
Part D, Item 22 For the purposes of culvert and bridge installations, the Licensee shall not encroach on the natural channel width by the placement of abutments, footings or armoring below the ordinary High Water Mark.	Design and construction considerations for Project water crossings are discussed in Section 4 and Appendix C of the Roads Management Plan.

Terms and Conditions	Reference and Comments
Type 'A' Water Licence – 2AM-MRY1325 - Amend. No. 1 cont'd	
Part D, Item 23 The Licensee shall construct and operate all infrastructure and Facilities authorized by the Board that are designed to contain, withhold, divert or retain Water and/or Waste, in accordance with all applicable legislation and industry standards.	Project infrastructure will be designed and constructed to the applicable standards and regulations outlined in the Project's approved Civil Design Criteria document, and subsequent amendments.
Part D, Item 25 The Licensee shall prevent the deposition of debris or sediment from entering into or onto any Water body, with respect to the construction of access roads, site laydown pads and areas or other earthworks. These materials shall be disposed of at a distance of at least thirty one (31) metres from the ordinary High Water Mark in such a manner that they do not enter the Water.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix C of the Roads Management Plan. Additional detail on mitigation measures employed by the Project to mitigate impacts on surface drainage is discussed in the Surface Water and Aquatic Ecosystem Management Plan.
Part E, Item 12 The Licensee shall not remove any material from below the ordinary High Water Mark of any water body unless authorized.	Design and construction considerations for Project water crossings are discussed in Section 4 and Appendix C of the Roads Management Plan.
Part E, Item 13 The Licensee shall not cause erosion to the banks of any body of Water and shall provide necessary controls to prevent such erosion.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix C of the Roads Management Plan. Additional detail on the mitigation measures employed by the Project address erosion are discussed in the Project's Surface Water and Aquatic Ecosystem Management Plan.
Part E, Item 17 The Licensee shall designate an area for the deposition of excavated and stockpiled materials that is at least thirty-one (31) metres above the ordinary High Water Mark of any water body.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix C of the Roads Management Plan.
Part E, Item 18 The Licensee shall not cut any stream bank or remove any material from below the ordinary High Water Mark of any Water body.	Design and construction considerations for Project water crossings are discussed in Section 4 and Appendix C of the Roads Management Plan.

Terms and Conditions	Reference and Comments
Type 'A' Water Licence – 2AM-MRY1325 - Amend. No. 1 cont'd	
Part E, Item 19 The Licensee shall undertake appropriate corrective measures to mitigate impacts on surface drainage resulting from the Licensee's operations.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix C of the Roads Management Plan. Additional detail on mitigation measures employed by the Project to mitigate impacts on surface drainage is discussed in the Project's Surface Water and Aquatic Ecosystem Management Plan.
Part E, Item 20 The Licensee shall limit any in-stream activity, as much as possible, to low Water periods. In-stream activity is prohibited during fish migration.	To limit in-water work, cconstruction of roads and the installation/modification of Project water crossings will occur during the winter months, when practical. Discussed in Section 4 of the Roads Management Plan.
Part E, Item 21 The Licensee shall locate stream crossings to minimize approach grades. Approaches shall be stabilized during construction and upon completion of Project activities, to control runoff, erosion and subsequent siltation to any Water body.	Design and construction considerations and mitigation measures for Project water crossings are discussed in Section 4 and Appendix C of the Roads Management Plan.
Part E, Item 22 The Licensee shall not permit machinery to travel up the stream bed and fording of any Water body is to be kept to a minimum and limited to one area. Equipment used should be well cleaned and free of oil and grease and maintained free of fluid leaks.	General mitigation measures to prevent the release of hazardous materials and sediment into nearby water bodies are discussed in Section 4 and Appendix C of the Roads Management Plan. Construction of roads and the installation/modification of Project water crossings will occur during the winter months, whenever practical, in order to minimize in water work and mitigate potential associated impacts.
Part E, Item 23 The Licensee shall provide to the Board for review, for-construction design drawings for stream culverts, bridges and any other structures, which may impact the quantity, quality and flow of water, at least thirty (30) days prior to construction.	Issued-for-construction drawings will be provided for Project road network changes that trigger the TRAN process and/or Water Licence Modification process.
Part G – Modifications (refer to Type 'A' Water Licence)	Water Licence Modifications will be submitted to the NWB for approval as required. Requirements for Water Licence Modifications are discussed in Appendix B of the Roads Management Plan.

Terms and Conditions	Reference and Comments
Type 'A' Water Licence – 2AM-MRY1325 - Amend. No. 1 cont'd	
Part G, Item 13 The Licensee shall submit to the Board, within sixty (60) days of completion of the geotechnical inspection referred to in Part I, Item 12, a Geotechnical Engineer's Report that shall include a cover letter from the Licensee outlining an implementation plan to address the recommendations of the Geotechnical Engineer.	Discussed in Section 7 of the Roads Management Plan.
Part G, Item 15 The Licensee shall obtain a digital photographic record of all the watercourse crossings before, during, and after the completion of construction as required under Schedule D, Item 1.	Photographs will be taken before, during and after construction of Project water crossings, as outlined in Appendix C of the Roads Management Plan.
Part J, Item 8 The Licensee shall, unless otherwise identified within the approved Plan under Part J, Item 1, and/or Part J, Item 2 remove all culverts and open the natural drainage channel. In carrying out this activity, measures shall be implemented to minimize erosion and sedimentation.	Closure and removal of water crossings will be conducted as outlined in the Project's Interim Closure and Reclamation Management Plan.
Commercial Lease	
Section 2.5 – Permitted Activities and Use (refer to Commercial Lease)	Applicability discussed in Appendix B of Roads Management Plan.
Section 2.8 – Tote Road Alignment The Tenant shall obtain written consent from the Landlord for any adjustments to the Milne Inlet Tote Road, such consent not to be unreasonably withheld. The parties acknowledge that adjustments to the alignment of the Milne Inlet Tote Road may be required to facilitate safe haul truck travel. In such event, the Tenant shall take all necessary or desirable steps to avoid or limit the Environmental Impacts and/or Environmental Damage caused by or incidental to such work, including, without limitation, avoiding disturbance to existing Lands and waters and returning any abandoned section of the Milne Inlet Tote Road to a condition that is consistent with the natural environment. The Tenant shall pay the Landlord in accordance with a Quarry Concession Agreement the applicable fees for any Specified Substances or other materials taken by the Tenant from any Lands, including the Milne Inlet Tote Road (except for surface granular material and waste rock from Operations as provided for in Subsection 2.7 (b)).	Discussed in Section 4.2 and Appendix B of the Roads Management Plan.

Terms and Conditions	Reference and Comments
Commercial Lease cont'd	
Section 3.1 – Land Classification Amendment Option The Landlord hereby grants to the Tenant the right and option (the "Land Classification Amendment Option") to seek amendments to re-classify specified Lands within Land Use Area(s), but subject always to any right, title or interest that the Landlord may have granted to any third parties with respect to Lands in the General Areas of the Property that have not already been designated an Impact Area or Exploration Area. The Tenant may exercise the Land Classification Amendment Option with the prior written consent of the Landlord, which consent may not be unreasonably withheld, pursuant to the procedures set forth in this Article 3. If the Landlord consents to an Option Exercise Notice pursuant to Section 3.3 or if the Tenant surrenders a part or parts of the Property pursuant to Section 3.7. then the amount of Rent payable pursuant to Section 4.1 shall be adjusted in accordance with Section 4.5.	Discussed in Section 4.2 and Appendix B of the Roads Management Plan.
Section 3.2 – Options Exercise Notice The Tenant may exercise the Land Classification Amendment Option by delivering to the Landlord an "Option Exercise Notice". An Option Exercise Notice may be submitted without cost to the Tenant with its annual Work Plan pursuant to Section 6.1 provided that if not submitted with a Work Plan at the time specified in Section 6.1 the Tenant shall pay the Landlord a reasonable processing fee, as determined by the Landlord, acting reasonably, to compensate the Landlord for its costs of the additional review process.	Discussed in Section 4.2 and Appendix B of the Roads Management Plan.

[1]Project Certificate No. 005 terms and conditions regarding dust and air quality are addressed in the Project's Air Quality and Noise Abatement Management Plan.