



# Nunavut Impact Review Board's 2013-2014 Annual Monitoring Report for Baffinland Iron Mines Corp.'s Mary River Project



**File No. 08MN053**

**Report title:** The Nunavut Impact Review Board's 2013– 2014 Annual Monitoring Report for the Mary River Project (NIRB File No. 08MN053)

**Project:** Mary River Project

**Project location:** Qikiqtani Region, Nunavut

**Project owner:** Baffinland Iron Mines Corporation  
2275 Upper Middle Road East, Suite 300  
Oakville, ON  
L6H 0C3

**Monitoring Officer:** Solomon Amuno

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**Cover photo:** View of Milne Port and Tote Road

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# 1 INTRODUCTION

The Nunavut Impact Review Board (NIRB or Board) Project Certificate [005] was issued for the Mary River Project on December 28, 2012 following an extensive public review of the ecosystemic and socio-economic effects of the proposed project, and pursuant to Section 12.5.12 of the Nunavut Land Claims Agreement (NLCA).

On January 13, 2013 Baffinland (Proponent) applied to the NIRB to for the Early Revenue Phase (ERP) proposal, which included amendments to its project development activities and schedule. The Board determined that it was appropriate to assess the potential ecosystemic and socio-economic effects of the ERP and to reconsider, under Section 12.8.2 of Article 12 of the NLCA, modifications to the terms and conditions of the original Project Certificate to reflect the potential effects of the ERP Proposal.

Following a thorough reconsideration process, on March 17, 2014, the NIRB issued its public hearing report to the Minister of Aboriginal Affairs and Northern Development Canada (AANDC) for the ERP Proposal. The report indicated that the proposed works and activities could be permitted to proceed subject to new and amended project-specific terms and conditions. Following the acceptance of the NIRB's report by the Minister, which included revised terms and conditions, on May 28, 2014, pursuant to Sections 12.5.5 and 12.8.2 of Article 12 of the NLCA, the NIRB issued an *Amended* Project Certificate for the Mary River Project. The amendment allowed the Project to proceed in accordance with Terms and Conditions as contained therein.

The NIRB is required to monitor Baffinland's Mary River Project in accordance with Section 12.7.1 and 12.7.2 of the NLCA and as outlined within the Mary River Project Certificate. As a result, this report has been prepared to provide findings for the 2013-2014 monitoring period with respect to:

- Baffinland's compliance with the terms and conditions of the Project Certificate; and
- The adequacy of the monitoring program to mitigate the potential ecosystemic and socio-economic impacts of the project.

## 1.1 *Project description*

The Mary River Project involves exploration, construction, operation, closure and reclamation of an open pit iron ore mine at what is known as Deposit No. 1, and includes mining at a rate of 18 Million tons per year (Mt/a). There are 3 main project locations – the Mine site, Milne Port located north of the Mine site, and Steensby Port located south of the Mine site. Milne Port is connected to the Mine site by the Milne Inlet Tote Road, approximately 100 kilometers (km) in length. The Project as originally proposed was to include construction of a railway approximately 150 kilometers (km) in length to connect the Mine Site to Steensby Port. It was anticipated that facilities at Steensby Port and the railway would take up to four years to construct.

As currently approved and in accordance with Baffinland's development plans, the extracted ore will be transported by truck along the Milne Inlet Tote Road and shipped

from Milne Port to European markets during the open water season using contracted vessels. The approved Project also involves additional facilities at Milne Port, including the construction of a fixed ore dock, 4.2 Mt ore stockpile and reclaim area, 3500 tonnes per hour ship loaders, a camp to accommodate workers and the extension or relocation of the airstrip to the west of the proposed ore stockpile. The ERP operations are expected to continue for the duration of the mine life (i.e., 21 years), and would continue in conjunction with the Mary River Project as originally proposed, once developed.

## ***1.2 Project Development Status***

During the first half of 2013, Baffinland engaged in procurement activities, implemented site planning programs and obtained relevant authorizations necessary to proceed with construction of the Mary River Project. Some of the major activities associated with the Project in 2013 included the re-opening of camp facilities at Milne Port and the Mine Site; as well as quarrying operations to generate aggregate for laydown areas at Milne Port and for maintenance of the Milne Inlet Tote Road. Furthermore, the installation of an additional 5 ML fuel tank, and construction of a second polishing waste stabilization pond (PWSP) at Milne Port to hold additional treated sewage was completed.

Baffinland also obtained and renewed different permits to facilitate site development. On May 25, 2013, Baffinland obtained a new Type “B” Water License (8BC-MRY1314), which allowed for early development and construction works. On July 23, 2013, a type “A” Water License (2AM-MRY1325) was also obtained to facilitate construction and operations. On September 6, 2013, Baffinland and the Qikiqtani Inuit Association (QIA) signed an Inuit Impact Benefit Agreement (IIBA), followed by the QIA’s issuance of a new Commercial Lease (No.Q13C301) in support of the construction and operation of the Project on Inuit Owned Land (IOL). Other authorizations obtained and/or required during the year included Fisheries and Oceans Canada’s Habitat Alteration Disturbance and Destruction (HADD) Authorization (NU-06-0084); AANDC Land Use Permit (No. N2007F0004) and Quarry Permit (No. N2006C3006).

From August 2013 onward, Baffinland engaged in “site capture” activities, to prepare for construction of the mine in 2014. By the end of 2013, the following works had been completed at various Project locations as indicated:<sup>1</sup>

## ***1.3 Milne Port***

- Development of Quarry Q1 and delineation of laydown areas including off-loading of 10 sealift deliveries of equipment and materials.
- Installation and commissioning of camp/accommodation facilities for 120 persons.
- Installation of wastewater treatment plant and camp incinerator.
- Construction and commissioning of diesel fuel (24 million litres or ML) storage and Jet A fuel (2.25 ML) storage areas; as well as receiving 34 ML of diesel and 2.25 ML of Jet A fuel through two ship-to-shore floating hose fuel transfers.

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<sup>1</sup> Refer to Executive Summary of 2013 Annual Report to the NIRB (March 2014)

- Establishment of supporting buildings such as: maintenance shop, emergency response building, trade shops, warming sheds, warehousing administration building and field offices.
- Decommissioning of the former bladder fuel farm including off-site disposal of empty bladders and on-site soil remediation.
- Back-haul of 1,463 cubic metres (m<sup>3</sup>) of contaminated water from the decommissioned bladder fuel farm to a licensed disposal facility in southern Canada.

#### ***1.4 Milne Inlet Tote Road and Mine Site***

- Road maintenance and repairs including roadbed improvements and culvert replacements to support the transport of equipment and materials.
- Haulage of equipment, materials and fuel delivered by sealift to Milne Port via the Tote Road to the Mine Site.
- Development of Quarry QMR2 and establishment of laydown areas.
- Installation and commissioning of a 210 person camp and related facilities.
- Installation of wastewater treatment plant, camp incinerator.
- Construction and commissioning of tanks for diesel fuel storage and Jet A fuel storage.
- Establishment of supporting buildings including: a maintenance shop, emergency response building, trade shops, warming sheds, warehousing administration building and field offices.

## **2 MONITORING ACTIVITIES**

The NIRB's monitoring program is focused on compliance and effects monitoring in order to determine the extent that the land or resource use in question is carried out within the predetermined terms and condition as stipulated pursuant to section 12.7 of the NLCA and within the Mary River Project Certificate. The monitoring program may also contribute the information base necessary for agencies to enforce terms and conditions of land or resource use approvals.

### ***2.1 General Reporting Requirements***

During the 2013–2014 monitoring period, Baffinland demonstrated compliance with most of the reporting requirements as contained within the Mary River Project Certificate. As part of Baffinland's commitment towards mitigating the potential ecosystemic impact of the Mary River Project, the following materials were submitted to the NIRB for the current monitoring period.

- a. 2013 Terrestrial Annual Report
- b. Monitoring Report on Exploration and Geotechnical Program
- c. Terrestrial Environment Working Group Terms of Reference
- d. Environment Canada Hudson Strait Common Eider and Polar Bear Surveys 2013 Field Season Report

- e. Environment Canada-Digges Island-Marine Habitat Use of Thick-billed Murres 2013 Field Season Trip Report and Update to Collaborators
- f. Inspection Report of 2013
- g. Quarry Management Plan
- h. Cultural Heritage Resource Protection Plan
- i. Bruce Head Monitoring Study
- j. Milne Inlet Marine Baseline 2013
- k. Training and Deployment Exercise Report
- l. Terrestrial Environment Monitoring and Management Plan (TEMMPP)
- m. Shipping and Marine Wildlife management Plan (SMWMP)
- n. Air Quality and Noise Abatement Management Plan
- o. Surface Water, Aquatic Effects Management Plan
- p. Site-specific Quarry Management Plans
- q. Oil Pollution Emergencies Plan-Milne Inlet Fuel Storage Facility
- r. Oil Pollution Emergencies Plan- Steensby Port
- s. Emergency Response Management Plan
- t. Spill Contingency Management Plan
- u. Construction Environmental Protection Plan (C-EPP)
- v. Interim Abandonment and Reclamation Plan
- w. Environmental, Health, and Safety Management System Framework Standard
- x. Hazard Identification and Risk Assessment Procedures
- y. Labour Market Analysis
- z. Marine Monitoring Protocols
- aa. Shipboard Observer Report
- bb. Milne Inlet Baseline Studies
- cc. Steensby Inlet Marine Baseline Studies
- dd. Temporary Closure Plan
- ee. Stakeholder Engagement Plan
- ff. Roads Management Plan
- gg. Blasting Management Plan
- hh. Explosives Management Plan
- ii. Fresh Water Supply, Sewage and Wastewater Management Plan
- jj. Fresh Water, Sewage and Wastewater Management Plan
- kk. Hazardous Materials and Hazardous Waste Management Plan
- ll. Waste Management Plan
- mm. Waste Rock Management Plan
- nn. Borrow Pits and Quarry Management Plan
- oo. Borrow Source Management Plan
- pp. Emissions Compliance Survey Monitoring Report
- qq. Environmental Effects Monitoring for Marine Mammal Disturbance 2012
- rr. Proposed Marine Mammal Monitoring for 2014
- ss. Hunting and Fish (Harvesting) Policy

However, the following information or updates have not been forwarded to the NIRB as part of the monitoring for the current reporting period:

- tt. Results of ash contents for the caribou pellets collected for the monitoring period (Condition 58 c).
- uu. Information regarding potential impacts to marine wildlife and marine habitat, with specific notes on conditions 101a, f, and h.
- vv. Evidence of monitoring baseline metal levels in organ tissue from caribou harvested within the local study area (Condition 35).
- ww. Information on measures to be implemented for bird deterrence in the Project Development Area (Condition 68)
- xx. Air quality monitoring (Condition 8) program

## **2.2 Baffinland's 2013 Annual Report**

On March 31, 2014 the NIRB received Baffinland's 2013 Annual Report for the Mary River Project. The NIRB circulated the report to its distribution list and requested that interested parties provide comments within their areas of expertise and/or jurisdiction as related to both effects and compliance monitoring. The NIRB received comments from the following parties regarding Baffinland's 2013 Annual Report: Qikiqtani Inuit Association

- Government of Nunavut
- Aboriginal Affairs and Northern Development Canada
- Environment Canada
- Department of Fisheries and Oceans
- Transport Canada

The comments received identified specific areas that may require further attention and/or discussion. The NIRB requested that Baffinland provide a response to a number of the comments received; the comments and Baffinland's responses have been considered throughout the remainder of this report.

## **2.3 Compliance with the NIRB Project Certificate**

During the 2013-2014 reporting period, Baffinland complied with most of the requirements of the Project Certificate which were relevant and applicable to the current development phase of the Mary River Project.

### **2.3.1 Atmospheric Environment**

#### **Condition 6**

*"The Proponent shall provide the results of any emissions calculations conducted to determine the level of sulphur dioxide (SO<sub>2</sub>) emissions, nitrogen oxide (NOX) emissions and greenhouse gases generated by the Project using fuel consumption or other relevant criteria as a basis".*



### **Condition 9**

*“The Proponent shall provide calculations of greenhouse gas emissions generated by activities at the Steensby Inlet and Milne Inlet port sites and other Project sources including aircraft associated with the Project. Calculations shall take into consideration, fuel consumption as measured by Baffinland’s purchase and use as well as the fuel use of its contractors and sub-contractors.”*

The Proponent is required to provide results of emissions (SO<sub>2</sub>, NO<sub>x</sub>) and greenhouse gases generated from the Project areas. Within its 2013 Annual Report to the NIRB, Baffinland provided results<sup>2</sup> of the total level of sulphur dioxide (SO<sub>2</sub>) emissions; nitrogen oxide (NO<sub>x</sub>) emissions and greenhouse gas (GHG) emissions generated using fuel consumption criteria. The results provided indicated that in 2013, the Mary River Project consumed about 6,767,459 L of diesel fuel and 1,174,260 L of Jet A fuel.

Based on the rate of fuel consumption across project areas, and by equipment type, Baffinland estimated that the total annual emissions of SO<sub>2</sub> and NO<sub>x</sub> generated by the Mary River Project were 1.1 tonnes and 96.3 tonnes respectively. Baffinland also presented results of the total emissions of GHG from different Project sources, which was estimated to be 21.8 Carbon dioxide equivalent kilotonne (CO<sub>2</sub>-eq kilotonnes) for the year.

### **Condition 11**

*“The Proponent shall develop and implement an Incineration Management Plan that takes into consideration the recommendations provided in Environment Canada’s Technical Document for Batch Waste Incineration (2010).”*

### **Condition 12**

*“Prior to commencing any incineration of on-site Project wastes, the Proponent shall conduct at least one stack test immediately following the commissioning of each temporary and permanent incinerator”.*

In accordance with these terms and conditions, the Proponent is required to implement an Incineration Management Plan and to conduct stack testing following the installation of incinerators on site. Within its 2013 Annual Report to the NIRB, Baffinland indicated that it had completed installation of incinerators at the Mine site and Milne Port respectively. Stack testing was conducted to determine compliance with operating requirements and Canada-Wide Standards (CWS) for Mercury, Dioxins and Furans (CCME, 2000 and 2001)<sup>3</sup>.

The stack test results provided in the Emission Compliance Survey Monitoring Report<sup>4</sup> indicated that mercury emissions were below the CWS emission limit, and that dispersion

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<sup>2</sup> Refer to Table 7.1 of the 2013 Annual Report submitted to the NIRB (March 2014).

<sup>3</sup> Refer to <http://www.ccme.ca/en/resources/air/mercury.html>

<sup>4</sup> Appendix O: Emissions Compliance Survey Monitoring Report – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014).

of dioxins and furans from the incinerators were within CWS emission limits. Baffinland also noted that it had consulted with Environment Canada on the stack test results.

### **2.3.2 Hydrogeology and Hydrology Monitoring**

#### **Condition 16**

*“The Proponent shall ensure that the water related infrastructure or facilities that are designed and constructed, including the modification of culverts, diversion of watercourses, and diversion of runoff into watercourses along the railway, access roads, port sites, the Milne Tote Road, and other areas of the Project site, are consistent with those proposed in the FEIS and FEIS Addendum in terms of type, location, and scope and that the requirements of all relevant regulatory authorities are satisfied advance of constructing those facilities”*

#### **Condition 47**

*“The Proponent shall ensure that all Project infrastructures 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.*

The Proponent is to ensure that all Project infrastructures in water courses are constructed in such a manner that they are consistent as proposed in the FEIS; and do not limit movement of water in fish bearing streams.

Baffinland has submitted technical drawings for water related infrastructure to the Nunavut Water Board in accordance with the requirement of its Water Licence (No. 2AM-MRY1325). Baffinland indicated within its 2013 Annual Report that it had submitted applications to Fisheries and Oceans Canada (DFO) for all of its proposed culvert upgrades and bridge crossings for the Tote Road, so as to determine whether the proposed construction would result in serious harm to fish as prohibited under subsection 35 (1) of the *Fisheries Act*. On December 16, 2013, Baffinland received DFO’s approval<sup>5</sup> for the construction upgrades to proceed.

#### **Condition 17**

*“The Proponent shall develop and implement effective measures to ensure that effluent from project-related facilities and/or activities, including sewage treatment plants, ore stockpiles, and mine pit, satisfies all discharge criteria requirement established by the relevant regulatory agencies prior to being discharged into the receiving environment.”*

Baffinland’s annual reporting indicated that it has implemented an effluent monitoring program<sup>6</sup> to ensure that contact water generated from the Project is collected, routinely monitored, and treated prior to discharge to the receiving environment.

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<sup>5</sup> See DFO Letter of Advice (Appendix U) – Supplemental to 2013 Annual Report to the NIRB (March 2014).

<sup>6</sup> Appendix N.04: Section 9.2.1 of Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan- Supplemental to 2013 Annual Report submitted to the NIRB (March 2014).

### **Condition 23**

*“The Proponent shall develop and implement a Groundwater Monitoring and Management Plan to monitor, prevent and/or mitigate the potential effects of the Project on groundwater within the Project area.”*

Baffinland provided its Surface Water and Aquatic Ecosystem Management Plan<sup>7</sup> with materials as submitted to the NIRB with its annual reporting; the plan contained details on the ground water locations and monitoring plan for specific Project facilities (i.e. landfill and landfarm). It also indicated that groundwater samples will be collected from different monitoring stations, and analyzed for different field parameters to ensure that the Project is not adversely affecting ground water quality.

### **2.3.3 Geomorphology and Geotechnical Investigations**

### **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.*

Within its 2013 Annual Report, Baffinland provided technical material evidence<sup>8</sup> that indicated it had monitored potential seepages, cracks or subsidence in sensitive landforms around different Project infrastructure such as the PWSP, bulk fuel storage facility, helicopter fuel tank containment, and hazardous waste storage<sup>9</sup> areas around Mary River and Milne Port. The submitted construction summary report did not indicate occurrences of seepages, cracks or subsidence around sensitive land forms as a result of installation and operations of Project infrastructures.

### **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.”*

The Proponent is required to submit pertinent construction details, engineering designs and technical specifications of facilities or structures to regulatory agencies for the Mary River Project. Baffinland has complied with this condition by submitting engineering

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<sup>7</sup> Section 9.2.3 of Appendix N.04- Surface Water and Aquatic Ecosystem Management Plan – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014).

<sup>8</sup> Refer to Appendix P – Construction Summary Report – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>9</sup> Refer to Appendix D (Annual Geotechnical Information) of as contained in Appendix P – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014).

drawings for the proposed site drainage and water management structures<sup>10</sup> for Milne Port and the Mine Site. Baffinland further indicated<sup>11</sup> that copies of its construction engineering designs, drawings, and engineering specifications were submitted to the NRB in accordance with the requirement of Type A water licence.

#### **2.3.4 Erosion Management, Quarry Operations and Silt Control Plans**

##### **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”.*

##### **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”.*

##### **Condition 30**

*“The Proponent shall develop site-specific quarry operation and management plans in advance of the development of any potential quarry site or borrow pit.”*

##### **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.”*

The Proponent is required to develop a sediment-erosion plan, quarry operations and management plan and site drainage/silt control plan.<sup>12</sup> Compliance to the condition of sediment and erosion control has been met through Baffinland’s Surface Water, Aquatic Ecosystems, Fish and Fish Habitat Management Plan.<sup>13</sup> The Plan as submitted to the NRB provides information on a wide range of site-specific techniques to manage erosion.

Baffinland also submitted site-specific quarry operation and management plans for quarries Q7, Q11, Q19, D1Q1, D1Q2, Q1, and QMR2.<sup>14</sup> These plans addressed the potential environmental issues related to the use of explosives and implementation of mitigation measures. Lastly, Baffinland submitted its Site Drainage and Silt Control

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<sup>10</sup> Surface Water, Aquatic Effects Management Plan – Supplemental to 2013 Annual Report submitted to the NRB (March 2014).

<sup>11</sup> Section 1.2 and 6.0 of Appendix N.4 – Supplemental to 2013 Annual Report submitted to the NRB (March 2014).

<sup>12</sup> Table 4.1 of Appendix N.4 – Supplemental to 2013 Annual Report submitted to the NRB (March 2014)

<sup>13</sup> Refer to Section 4.1, 6.3.3, 7.1.1, 9.2.2 of Appendix N.4

<sup>14</sup> Refer to Borrow Pit and Quarry Management Plan (March 2014) and Quarry Management Plan - Milne Inlet Quarry Q1 (March 2013) – Supplemental to 2013 Annual Report submitted to the NRB (March 2014)

Plan<sup>15</sup> as required; it provides information regarding drainage and silt control measures to be used across the Project areas.

### **2.3.5 Terrestrial Monitoring**

#### **Condition 33**

*“The Proponent shall include relevant Monitoring and Management Plans within its Environmental Management System, Terrestrial Environment Management and Monitoring Plan (TEMMP).”*

#### **Condition 34**

*“The Proponent shall conduct soil sampling to determine metal levels of soils in areas with berry-producing plants near any of the potential development areas, prior to commencing operations.”*

The Proponent is required to include relevant monitoring and management plans within its Environmental Management System and Terrestrial Environment Management and Monitoring Plan (TEMMP). Baffinland has submitted a Monitoring Framework<sup>16</sup> within its Terrestrial Environment Management and Monitoring Plan<sup>17</sup> which addresses the requirements of Condition 33.

In addition, the Proponent is also required to conduct soil sampling in areas with berry producing plants near Project development areas prior to commencing operations. Baffinland submitted its 2013 Terrestrial Annual Report<sup>18</sup> to the NIRB which described the assessment of trace metals in soils and vegetation (lichens, willows and berries) it had conducted prior to commencing operations.

#### **Condition 36**

*“The Proponent shall establish an on-going monitoring program for vegetation species used as caribou forage (such as lichens) near Project development areas, prior to commencing operations.”*

#### **Condition 38**

*“The Proponent shall review, on an annual basis, all monitoring information and the vegetation mitigation and management plans developed under its Environmental Management System, Terrestrial Environment and Monitoring Plan (TEMMP) and adjust such plans as may be required to effectively prevent or reduce the potential for significant adverse project effects on vegetation abundance, diversity and health.”*

Baffinland noted that it had implemented a dustfall monitoring program to determine the level and trends of dustfall around Project areas, and the effect of this on vegetation

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<sup>15</sup> Table 4.1 of Appendix N.4 – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>16</sup> Section 4.0 of Appendix N.1– Supplemental to 2013 Annual Report to the NIRB (March 2014)

<sup>17</sup> Appendix N.1– Supplemental to 2013 Annual Report to the NIRB (March 2014)

<sup>18</sup> Appendix G– Supplemental to 2013 Annual Report to the NIRB (March 2014)

communities. The Terrestrial Environment Management and Monitoring Plan<sup>19</sup> as submitted to the NIRB indicated that Baffinland had installed 26 dustfall monitoring stations in 2013, covering four reference sites, three sample sites located in dust generating areas of the Mine, three sample sites in Milne Inlet, and two stations along Tote Road.

**Condition 49**

*“The Proponent shall establish a Terrestrial Environment Working Group (“TEWG”) which will act as an advisory group in connection with mitigation measures for the protection of the terrestrial environment and in connection with its Environmental Effects Monitoring Program, as it pertains to the terrestrial environment. Members may consider the draft terms of reference for the TEWG filed in the Final Hearing, but they are not bound by them. The role of the TEWG is not intended to either duplicate or to affect the exercise of regulatory authority by appropriate government agencies and departments.”*

**Condition 77**

*“A Marine Environment Working Group (“MEWG”) shall be established to serve as an advisory group in connection with mitigation measures for the protection of the marine environment, and in connection with the Project Environmental Effects Monitoring program, as it pertains to the marine environment. Membership on the MEWG will include the Proponent, Environment Canada, Fisheries and Oceans Canada, the Government of Nunavut, the Qikiqtani Inuit Association and other agencies or interested parties as determined to be appropriate by these key members. Makivik Corporation shall also be entitled to membership on the MEWG at its election. The MEWG members may consider the draft terms of reference for the MEWG filed in the Final Hearing, but they are not bound by them.”*

The Terrestrial Environment Working Group (TEWG) and Marine Environment Working Group (MEWG) have both been established with terms of reference for each having been finalized on March 4, 2013 and March 6, 2013, respectively. It was noted that the TEWG held meetings in May and October, 2013, to follow up on Baffinland’s progress on caribou protection measures, and other monitoring initiatives as required in conditions 35, 36, 52, 54, 55, 58, 61, 69, 70, 71, 73 and 74 of the Project Certificate.

It was also indicated that the MEWG held meetings on May 23 and 24, 2013, with respect to progress on marine environment monitoring initiatives, with specific notes on shore-based observation of narwhals, shoreline nesting survey in Milne Inlet, and ship-based marine mammal observation. The meeting also enabled discussion of action plans to fulfill conditions 76, 83, 87, 88, 89, 99, 101, 115, 123, 126, and 128 of the Project Certificate.

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<sup>19</sup> Appendix F2; Table 4-3 of Appendix N.1– Supplemental to 2013 Annual Report to the NIRB (March 2014)

### **Conditions 35, 54-58 (as related to Terrestrial Monitoring)**

Baffinland provided the NIRB with its updated Terrestrial Environmental Management and Monitoring Plan<sup>20</sup> along with its 2013 Annual Report. It also noted within reporting, its efforts to mitigate potential impacts to wolves; and ensure progressive reclamation of disturbed wildlife habitat. Baffinland also documented its efforts to ensure compliance with these terms through its consultation with different parties to the Terrestrial Environmental Working Group (TEWG).<sup>21</sup> The minutes of TEWG meetings as provided noted discussions by parties such as the GN, EC, and local HTOs regarding various approaches for terrestrial monitoring, and highlighted some items for immediate follow-up pursuant to Condition 35. The need to develop protocols for monitoring caribou, as well as implementation of a caribou tissue collection program, and initiatives for monitoring other terrestrial wildlife was also discussed during the meetings.

Pursuant to conditions 57 and 58, the Proponent is also required to report annually on its terrestrial environment monitoring efforts; and to include a review section that examines the extent of Project effects on caribou and terrestrial wildlife habitat including any proposed changes to monitoring or mitigating activities. Baffinland submitted the 2013 Terrestrial Annual Report<sup>22</sup> to the NIRB as required by conditions 57 and 58. The report described Baffinland's environmental monitoring efforts for 2013, which included the implementation of its dustfall monitoring program, vegetation and soil analyses (including trace metals), exotic vegetation monitoring, wildlife and bird monitoring. It also reported that camp installation, quarry and borrow area development, and upgrades of Milne Tote Road were some of the major activities affecting terrestrial wildlife and habitat within the Project area.

### **Condition 60**

*"Prior to construction, the Proponent shall develop a detailed blasting program to minimize the effects of blasting on terrestrial wildlife that includes, but is not limited to the restriction of blasting when migrating caribou, sensitive local carnivores or birds may be negatively affected."*

Baffinland has submitted a Blasting Management Plan<sup>23</sup> and Terrestrial Environment Monitoring Management Plan (TEMMP)<sup>24</sup> which provide details on measures implemented to minimize impacts of blasting on terrestrial wildlife (caribou and carnivores) and birds within the Project areas. The NIRB noted that within its TEMMP, Baffinland had committed to limit sensory disturbances in Project areas, and where possible suspend activities in the event that wildlife approach a project activity site. The Proponent also indicated that it would engage wildlife monitors during calving seasons to

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<sup>20</sup> Appendix N.1– Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>21</sup> Appendix F.2– Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>22</sup> Appendix G – Terrestrial Annual Report – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>23</sup> Appendix N.13 – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>24</sup> Refer to Section 3.3 of the Terrestrial Environment Monitoring Management Plan (Appendix N.01) – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

observe and monitor wildlife activities near the Tote Road, including wildlife behaviors in relation to traffic movements and sensory disturbance.

#### **Condition 63**

*“The Proponent shall liaise with local Hunters and Trappers Organizations in advance of carrying out terrestrial wildlife surveys. At a minimum, The Proponent shall also meet annually in person with Hunters and Trappers Organizations to discuss wildlife monitoring and mitigation plans and address community concerns regarding wildlife interactions. The Proponent may be required to facilitate these meetings through payment of honoraria and meeting costs.”*

Baffinland included within its annual reporting to the NIRB, an indication that it had met with the Mittimatalik Hunters and Trappers Organization on December 17, 2013.<sup>25</sup> Baffinland also indicated that during the meeting it provided updates with respect to its 2013 Environmental Effects Monitoring Program for the Mary River Project.

### **2.3.6 Birds Monitoring**

#### **Condition 74**

*“The Proponent shall continue to develop and update relevant monitoring and management plans for migratory birds under the Proponent’s Environmental Management System, Terrestrial Environment Mitigation and Monitoring Plan prior to construction. The key indicators for follow up monitoring under this plan will include: peregrine falcon, gyrfalcon, common and king eider, red knot, seabird migration and wintering, and songbird and shorebird diversity”.*

#### **Condition 75**

*“The Proponent’s monitoring program shall assess and report, on annual basis, the extent of terrestrial habitat loss due to the Project to verify impact predictions and provide updated estimates of the total project footprint.*

Baffinland provided a detailed record of all bird monitoring initiatives and habitat assessment it undertook for the reporting period within its annual reporting as submitted to the NIRB<sup>26</sup>, including PRISM surveys to establish baseline, bird encounter transects, pre-clearing nest surveys, roadside waterfowl surveys, coastline nesting and foraging habitat survey, raptor occupancy and productivity survey; and raptor nest site monitoring and management activities. Baffinland also reported on its engagement with Environment Canada in studying the distribution of Eider and Thick-Billed Murres around the Project area<sup>27</sup>. In addition, Baffinland also provided information<sup>28</sup> with respect

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<sup>25</sup> Refer to Section 4.0 of 2013 Annual Report. – Supplemental to 2013 Annual Report to the NIRB (March 2014)

<sup>26</sup> Appendix G – Annual Terrestrial Report includes details for monitoring work completed for Birds in 2013.

<sup>27</sup> Appendix K – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>28</sup> Refer to Section 7.4.1.3 of 2013 Annual Report submitted to the NIRB (March 2014)



to the Mary River Project footprint, and indicated that a total of 272 hectares of land were disturbed as a result of Project activities and infrastructures within the Project Development Area.

### 2.3.7 Marine Environment

#### Condition 76 (and 89-92)

*“The Proponent shall develop a comprehensive Environmental Effects Monitoring Program to address concerns and identify potential impacts of the Project on the marine environment”.*

Conditions 89 through 92 require that Baffinland develops an effective plan that will mitigate or prevent impacts to marine water quality resulting from ballast water exchange. Baffinland developed and submitted an Environmental Effects Monitoring Program as contained within its Shipping and Marine Wildlife Management Plan<sup>29</sup> which was designed to address concerns and impacts of the Project on the marine environment. The Environmental Effect Monitoring Program as developed by the Proponent is designed to address key marine impacts and issues such as onboard waste management (solid waste and sewage), ballast water management (anti-fouling management), fuel and dangerous goods, marine monitoring and reporting requirements, and adaptive management strategies.

#### Condition 99

*“The Proponent, working with the Marine Environment Working Group, shall consider and identify priorities for conducting the following supplemental baseline assessments:*

- a. Establish shipping season, inter-annual baseline in Steensby Inlet and Milne Inlet that enables effective monitoring of physical and chemical effects of ballast water releases, sewage outfall, and bottom scour by ship props, particularly downslope and downstream from the docks. This shall include the selection and identification of physical, chemical, and biological community/indicator components. The biological indicators shall include both pelagic and benthic species but with emphasis on relatively sedentary benthic species (e.g., sculpins).*
- b. The collection of additional baseline data:*
  - i. In Steensby Inlet on walrus, beluga, bearded seal anadromous Arctic Char abundance, distribution ecology and habitat use; and*
  - ii. In Milne Inlet on narwhal, bowhead and anadromous Arctic Char abundance, distribution ecology and habitat use.*
- c. Enhance baseline data on marine wildlife (fish, invertebrates, birds, mammals, etc.) and to provide more details on species abundance and distribution found in the Project area. This shall include, but not be limited to the following:*
  - i. Aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet and at an appropriate control location;*

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<sup>29</sup> Appendix N.2 – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

- ii. *Shore-based observations of pre-Project narwhal and bowhead whale behavior in Milne Inlet that continues at an appropriate frequency throughout the Early Revenue Phase and for not less than three consecutive years.*
- d. *Enhance the baseline for affected freshwater systems, which includes control sites to detect Project-related changes before they cause significant harm.”*

Pursuant to condition 99, the Proponent is required to provide supplemental baseline information and improve prediction for predictions for potential impacts to marine wildlife.

At Steensby Port, Baffinland indicated it had started conducting baseline studies including habitat mapping, water and sediment quality assessment, benthic and fish study (arctic char) as well as bathymetry and underwater video surveying of marine habitats within the Foxe Basin and Hudson Strait. Baffinland also indicated that it had initiated baseline studies at Milne Port,<sup>30</sup> including habitat mapping, water and sediment quality, benthic and fish surveys. Baffinland also indicated within its annual reporting that it completed the shore-based Bruce Head Narwhal monitoring program.<sup>31</sup>

### **Condition 101**

*“The Proponent shall incorporate into the appropriate monitoring plans the following items:*

- a. *A monitoring program that focuses on walrus use of Steensby Inlet and their reaction to disturbance from construction activities, aircraft, and vessels;*
- b. *Efforts to involve Inuit in monitoring studies at all levels;*
- c. *Monitoring protocols that are responsive to Inuit concerns;*
- d. *Marine monitoring protocols are to consider the use of additional detecting devices to ensure adequate monitoring through changing seasonal conditions and daylight;*
- e. *Schedule for periodic aerial surveys as recommended by the Marine Environment Working Group;*
- f. *Periodic aerial surveys for basking ringed seals throughout the landfast ice of Steensby Inlet, and a suitable control location. Surveys shall be conducted at an appropriate frequency to detect change inter-annual variability;*
- g. *Shore-based observations of pre-Project narwhal behavior in Milne Inlet, that continues at an appropriate frequency throughout the Early Revenue Phase (not less than three years);*
- h. *Conduct landfast ice monitoring for the duration of the Project Operations phase, which will include:*

<sup>30</sup>Appendix J: Milne Inlet Baseline (Part 1 and 2) – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>31</sup> Appendix B of Bruce Head Monitoring Study– Supplemental to 2013 Annual Report to the NIRB (March 2014)

- i. *The number of ship transits that are able to use the same track; and,*
- ii. *The area of landfast ice disrupted annually by ship traffic; and Monitoring strategy focused on assessing and mitigating interaction between humans and wildlife at the port site(s)."*

Baffinland indicated within its annual reporting that it fulfilled the requirement of condition 101(e) through completion of aerial surveys at Eclipse Sound, Pond Inlet and Milne Inlet. Compliance with conditions 101b-c was noted within the 2013 Annual Report,<sup>32</sup> however no information was given on the status for conditions 101a, f, and h for the monitoring period.

#### **Condition 102 (also applicable to 164 and 166)**

*"The Proponent shall ensure that routing of project vessels is tracked and recorded for both the southern and northern shipping routes, with data made accessible in real time to communities in Nunavut and Nunavik.*

Baffinland indicated that a website portal had streamed live during the shipping season, and that a real-time automated ship tracking mechanisms was not implemented to provide shipping information to communities in Nunavut and Nunavik as required.

#### **Condition 103**

*"The Proponent shall report annually to the NIRB regarding project-related ship track and sea ice information, including:*

- a. *A record of all ship tracks taken along both shipping routes covering the entire shipping season;*
- b. *An overlay of ship tracks onto ice imagery to determine whether ships are effectively avoiding shore leads and polynyas;*
- c. *A comparison of recorded ship tracks to the expected nominal shipping route, and probable extent of year-round shipping during periods of ice cover and open-water;*
- d. *An assessment of the level of adherence to the nominal shipping route and the spatial extent of the shipping zone of influence; and*
- e. *Marine bird and mammal species and number of individuals attracted to ship tracks in ice."*

Baffinland has submitted the Bruce Head Monitoring Study which indicated that a total of 26 vessels were observed during the 2013 narwhal study, and reported that seven large vessels, two medium vessels, and seventeen small vessels were observed transiting through the study area in August 2013.

#### **Condition 106**

*"The Proponent shall ensure that shipboard observers are employed during seasons where shipping occurs and provided with the means to effectively carry out assigned duties. The role of shipboard observers in shipping operations*

<sup>32</sup> Refer to Table 3.3 and Section 7.5 of the 2013 Annual Report submitted to the NIRB (March 2014)

*should be taken into consideration during the design of any ore carriers purpose-built for the Project, with climate controlled stations and shipboard lighting incorporated to permit visual sightings by shipboard observers during all seasons and conditions. Any shipboard lighting incorporated should be in accordance with the Canada Shipping Act, 2001's Collision Regulations, and should not interfere with safe navigation of the vessel."*

#### **Condition 108**

*"The Proponent shall ensure that data produced by the surveillance monitoring program is analyzed rigorously by experienced analysts (in addition to being discussed as proposed in the FEIS) to maximize their effectiveness in providing baseline information, and for detecting potential effects of the project on marine mammals, seabirds and seaducks in the Regional Study Area. It is expected that data from the long-term monitoring program be treated with the same rigor."*

With respect to condition 106, Baffinland noted within its annual reporting to the NIRB that it had implemented a Ship Board Observer Program<sup>33</sup> that included qualified technicians and Nunavut Inuit Observer trainees aboard Project vessels. It noted that observer training was conducted in July and September 2013, and also provided within Appendix A-1 of the Ship Observer Report, details of how data generated by the surveillance monitoring was coded and analyzed.

#### **Conditions 110-113**

Conditions 110-113 address ship noise, and require that the Proponent develop monitoring protocols to facilitate the assessment of the potential cumulative effects of vessel noise on marine mammals and marine populations as well as to develop thresholds for determining if negative impacts as a result of noise are occurring.

In its annual reporting to the NIRB, Baffinland noted that it had developed and implemented Marine Monitoring Protocols<sup>34</sup> which were designed to minimize impact of ship noise on marine mammals. It also noted that it had implemented regulations to reduce vessel speed during sensitive periods, as well as encouraging the conveying of vessels to generate marginal increases in noise levels in marine areas.

#### **Conditions 120-123**

Conditions 120-123 address marine mammal interactions with Project activities, and require that the Proponent prevent impacts to marine mammal and seabird colonies due to Project shipping. Baffinland noted within its annual reporting to the NIRB that it had implemented a shipboard observer Program during two voyages between Valleyfield

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<sup>33</sup> Appendix H: Ship Observer Report – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>34</sup> Appendix V1: Environmental Effects Monitoring for Marine Mammal Disturbance 2012 – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

Port, Quebec and Milne Port in 2013, and noted that the observers<sup>35</sup> recorded observations for marine mammals and bird sightings, but did not notice or record collisions with whales or other marine mammals or birds.

#### **Condition 126**

*“The Proponent shall design monitoring programs to ensure that local users of the marine area in communities along the shipping route have opportunity to be engaged throughout the life of the Project in assisting with monitoring and evaluating potential project-induced impacts and changes in marine mammal distributions.”*

Within its annual reporting to the NIRB, Baffinland provided information<sup>36</sup> on Inuit involvement in the marine monitoring program, and indicated that it employed over 50% Inuit in its environmental program, and considered Inuit Qaujimajatuqangit during its implementation of various monitoring initiatives for the Mary River Project.

#### **Condition 128**

*“The Proponent shall consult with local communities as fish habitat off-setting options are being considered and demonstrate its incorporation of input received into the design of the Fish Habitat Off-Setting Plan required to offset the Harmful Alteration, Disruption or Destruction of Fish and Fish Habitat (HADD).”*

Baffinland noted within its annual reporting submitted to the NIRB that on May 14, 2013 it consulted with the community of Pond Inlet to discuss fish habitat off-setting options,<sup>37</sup> and further indicated that its attempt to consult with the community of Igloolik had been cancelled due to a death in the community.

### **2.3.8 Population Demographics**

#### **Conditions 129-131**

Conditions 129 through 131 address socio-economic monitoring, and specifically, the Proponent’s participation in the Qikiqtaaluk Socio-Economic Monitoring Committee. According to these conditions, the Proponent is required to undertake socio-economic monitoring in order to identify areas of priorities and demographic changes as a result of the Project.

Baffinland noted within its annual reporting provided to the NIRB that the Mary River Socio-economic Monitoring Working Group<sup>38</sup> had been formed, and that its focus was aligned with the priorities of the Qikiqtaaluk Socio Economic Monitoring Committee

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<sup>35</sup> Appendix H: Ship Observer Report – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>36</sup> Table 3.3 of Annual Report 2013 Annual Report submitted to the NIRB (March 2014)

<sup>37</sup> Appendix X: 2013 Pond Inlet HADD Meeting Notes – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>38</sup> Appendix F.5; Appendix F.6 – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

(QSEMC). QSEMC priorities as identified by Baffinland include health and well-being; education, life skills, and training; employment and career progression; demographics; land use, culture, and food security. Baffinland indicated that the first meeting of the Mary River Socio-Economic Monitoring Working Group (a sub-group of the QSEMC) was on April 10, 2013 and held in Iqaluit, Nunavut.

### **Condition 132**

*“The Proponent is encouraged to partner with other agencies such as Hamlet organizations in the North Baffin region, the Municipal Training Organization, and the Government of Nunavut in order to adapt pre-existing, or to develop new programs which encourage Inuit to continue living in their home communities while seeking ongoing and progressive training and development. Programs may include driver training programs offered within Hamlets, providing upgraded equipment to communities for use in municipal works, providing incentives for small businesses to remain operating out of their community of origin, or supplementing existing recreational facilities and programming in North Baffin communities.”*

Baffinland indicated that it had implemented its Work Ready Program within communities of the Local Study Area, noting that it is organized into four modules as follows:

- Preparing for Fly-in/Fly-Out (FIFO) Employment
- Communication at Work and at Home
- Money Management
- Managing Stress

### **Condition 134**

*The Proponent shall include with its annual reporting to the NIRB a summation of employee origin information as follows:*

- a. The number of Inuit and non-Inuit employees hired from each of the North Baffin communities, specifying the number from each;*
- b. The number of Inuit and non-Inuit employees hired from each of the Kitikmeot and Kivalliq regions, specifying the number from each;*
- c. The number of Inuit and non-Inuit employees hired from a southern location or other province/territory outside of Nunavut, specifying the locations and the number from each; and*
- d. The number of non-Canadian foreign employees hired, specifying the locations and number from each foreign point of hire.*

Baffinland reported<sup>39</sup> that a total of 83 Inuit (and 1 non-Inuit) employees were recruited from the five North Baffin communities (Arctic Bay, Clyde River, Hall Beach, Igloolik, Pond Inlet and Iqaluit), with no recruitment of employees from the Kivalliq or Kitikmeot Regions in 2013. It was also reported that a total of 2 Inuit employees, 218 non-Inuit

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<sup>39</sup> Appendix S Supplemental to 2013 Annual Report submitted to the NIRB (March 2014); and Table 3.1 of 2013 Annual Report to the NIRB

employees and 1 non-resident were recruited from other provinces and territories in Canada.

### **2.3.9 Education and Training**

#### **Condition 135-136 and 141**

Conditions 135 through 136 address education and training, and specifically the proponent's participation in offering study programs and transferable skills that will enhance the long-term employability of Nunavummiut. According to these conditions, the proponent is required to work with the QIA, Government of Nunavut and Municipal Training Organization in ensuring the timely development of effective Inuit training and work ready programs.

Baffinland noted within its annual reporting to the NIRB that it had contracted Illisaqsivik Society of Clyde River to deliver work ready program to beneficiaries within the 5 North Baffin communities. It was indicated that the program was delivered 13 times within the communities, and had trained 277 graduates, with 150 of those graduated employed at the site.

#### **Condition 137**

*Prior to construction, the Proponent shall develop an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during employment at Mary River, such listing to indicate which of these certifications and licences would be transferable to a similar job site within Nunavut. This listing should be updated on an annual basis, and is to be provided to the NIRB upon completion and whenever it is revised.*

Baffinland noted within its annual reporting<sup>40</sup> to the NIRB that it had developed a listing of formal certificates and licenses that may be acquired by employees through on-site training during employment at Mary River. The following training programs were available for participation in 2013, and include:

- Fall Arrest
- First Aid (Standard)
- Fire Extinguisher
- Ice Auger
- Power Mobile Equipment Operation (machine specific, i.e. CAT 740, CAT 777)
- Support Equipment (machine specific, i.e. Skid Steer, Aerial Lift)
- WHMIS (Workplace Hazardous Materials Information System)

In addition, it was indicated that a heavy equipment operator training was being implemented on site.

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<sup>40</sup> Refer to Section 3.5 of 2013 Annual Report submitted to the NIRB (March 2014)

### **Condition 139**

*“Prior to commencing construction, the Proponent is requested to undertake and provide the results of a detailed labour market analysis which provides quantitative predictions of the number of employees that may reasonably need to be sourced from southern Canada and from foreign markets, identifying where applicable, the country of origin for the foreign labour. Within 90 days of the issuance of the Project Certificate, the Proponent is required to submit an updated Labour Market Analysis which considers requirements of the ERP as well as hiring points within Nunavut and outside of the North Baffin region and RSA.”*

Baffinland has complied with the requirement to undertake and provide the results of an updated, detailed labor market analysis. On December 18, 2013, it submitted a Labour Market Report<sup>41</sup> on workforce talent availability for the Mary River Project, and noted that the requirement to source employees from the rest of Nunavut or broader region would only take precedence after local Inuit and local non-Inuit employees are given preference. An updated version was submitted to the NIRB on September 26, 2014, which indicated labor availability for the ERP, and confirmed that local Inuit and local non-Inuit employees were to be given hiring preference as way to engage the local workforce. The updated report further stated that the Project is expected to generate an estimated 410 jobs between the Mine site and Milne port, with 41 of those jobs open for employees with low-skills. The report further indicated that the hiring of Inuit at all levels of employment, from entry-level positions to senior management would remain a priority for Baffinland.

### **Condition 142**

*“The Proponent is encouraged to address the potential direct and indirect effects that may result from Project employees’ on-site use of various Inuktitut dialects as well as other spoken languages, specifically paying attention to the potential alienation of some employees that may occur as a result of language or other cultural barriers.”*

Baffinland indicated it had adopted policies to encourage the use of Inuktitut on site and ensured that unilingual beneficiaries are not prevented from gaining employment at Mary River.

### **Condition 149**

*“Prior to the commencement of operations, the Proponent is required to undertake an analysis of the risk of temporary mine closure, giving consideration to how communities in the North Baffin region may be affected by temporary and permanent closure of the mine, including economic, social and cultural effects and taking into consideration the potential drop in employment between the construction and operations phases of the Project.”*

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<sup>41</sup> Appendix S: Labour Market Analysis- Supplemental to 2013 Annual Report to the NIRB (March 2014)



On September 25, 2014 Baffinland submitted a report entitled “Potential Effects of a Mine Closure” which included an analysis of the potential economic, social and cultural effects of closure of the Mary River Project. The report as submitted to the NIRB indicated that intermittent or temporary closure of the Mine may result to temporary or permanent layoff of staff employed at the Mary River Project. The report stated that in the event a permanent closure of more than 45 days was to occur, the mass termination provisions of Section 14.07 (1) of the *Nunavut Labour Standards Act* would come into effect, with Baffinland providing up to 16 weeks of paid working notice to employees.

It was further indicated that during layoff a Labour Market Partnership Program would be jointly established by Baffinland and the Government of Nunavut to assist affected employees by offering social services, including job-search assistance, resume preparations, interview skills, vocational and educational counselling and personal support in dealing with stress of job loss, as well as information on starting small businesses.

In the event of a temporary layoff of less than 45 days, the report indicated that an Employee Assistance Program would be established to assist affected employees and their families on stress and financial management. With respect to the potential economic impacts, it was indicated that a temporary mine closure of up to 45 days would result in decline of employment income of more than \$545,000<sup>42</sup> in the North Baffin area, noting that Pond Inlet, Arctic Bay and Iqaluit are likely to be the most affected communities in the event of a temporary or permanent closure.

### **Condition 150**

*“The Proponent will ensure the following:*

- a. The Proponent will maintain, where possible, a minimum flying altitude of 2,000 feet over the park, except for approaches to land, take-off or for safety reasons.*
- b. The Proponent will ensure that certification of noise compliance is current, where compliance is applicable.*
- c. For the purpose of briefing Park visitors, the Proponent will provide Parks Canada (1) prior to commencing the shipping season, with planned daily shipping schedules, and (2) annually, with air traffic information, and (3) to provide updates when significant variations from these are expected.*
- d. The Proponent is strongly encouraged to provide due consideration to wilderness experience during its operations in the open water season, especially during the month of August which is typically a time of high use by sea kayakers.”*

Baffinland noted<sup>43</sup> it informed pilots on the conditions and addressed flight altitude requirements through contracts with flight carriers and operators. With respect to

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<sup>42</sup> This calculation was based on hypothetical average weekly salary of Baffinland’s North Baffin employee and assumed weekly Employment Insurance payment over a temporary layoff of 45 days.

<sup>43</sup> Refer to Appendix A-Concordance to Project Conditions- Supplemental to 2013 Annual Report to the NIRB (March 2014).

conditions 150 b-d, Baffinland indicated that it was working with Parks Canada to develop information materials such as brochures to fulfill these requirements.

### **2.3.10 Human Health and Well-being**

#### **Condition 155** (also applicable to Conditions 135 & 142)

*“The Proponent is strongly encouraged to provide the NIRB with an updated report on its development of mitigation measures and plans to deal with potential cultural conflicts which may occur at site as these may become needed.”*

On March 11, 2013, Baffinland submitted an updated report<sup>44</sup> on employee cohesion and cultural-awareness. The report indicated that Baffinland would continue to encourage the use of Inuktitut and English on site, as well as facilitate the establishment of Inuktitut-speaking work groups. The report also indicated that efforts are being made to engage Inuit Elders to act as counsellors and mentors for Inuit employees that may be experiencing difficulties with Project work demands while on site.

#### **Condition 156**

*“The Proponent is encouraged to assist with the provision and/or support of recreation programs and opportunities within the potentially affected communities in order to mitigate potential impacts of employees’ absences from home and community life.”*

Baffinland indicated<sup>45</sup> that this condition was being addressed through the Ilagiiktunut Nunalinnullu Pivalliajutisait Kiinaujat Fund it initiated. While it was mentioned that the QIA was responsible for the administration of this fund, Baffinland indicated that the activities to be supported by the fund will include community projects, youth and elder program, family and community wide activities and other social activities as indicated in Arctle 12, Section 12.2.13 of the Inuit Impact and Benefit Agreement (IIBA).

#### **Condition 158**

*“The Proponent is encouraged to work with the Government of Nunavut and other parties as deemed relevant in order to develop a Human Health Working Group which addresses and establishes monitoring functions relating to pressures upon existing services and costs to the health and social services provided by the Government of Nunavut as such may be impacted by Project-related in-migration of employees, to both the North Baffin region in general, and to the City of Iqaluit in particular.”*

According to this condition, the Propoent is required to work with the GN and other parties to develop a Human Health Working Group. Within its annual reporting<sup>46</sup> to the

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<sup>44</sup> Refer to Baffinland’s letter: NIRB-130311-08MN053-BIMC Ltr NIRB Re 155-1A2E

<sup>45</sup> Refer to Appendix A-Concordance to Project Conditions- Supplemental to 2013 Annual Report to the NIRB (March 2014)

<sup>46</sup> Refer to Appendix A-Concordance to Project Conditions- Supplemental to 2013 Annual Report to the NIRB (March 2014)

NIRB, Baffinland indicated that this condition was being addressed as demonstrated by the Memorandum of Understanding it signed with the Department of Health, Government of Nunavut on November 2013. Further information has yet to be provided on the specific monitoring initiatives to be adopted in Iqaluit and other North Baffin communities in order to ensure that the health and social services provided are not affected due to potential in-migration of employees.

### **2.3.11 Community Infrastructure and Public Services**

#### **Condition 161**

*“The Government of Nunavut should be prepared for any potential increased need for policing, and ensure that the Royal Canadian Mounted Police is prepared to handle ongoing Project-related demographic changes and subsequent crime prevention that may be needed as a result of the development, operation, and closure of the Project.”*

Baffinland had indicated<sup>47</sup> through its annual reporting to the NIRB, that the Royal Canadian Mounted Police (RCMP) was informed of the banned substance (drug) inspection conducted on site. It was also noted that the Security Working Group, which include the GN, TC, RCMP and Custom Canada had been inactive in 2013, with no implementation of an integrated approach for managing Project-related demographic changes and crimes.

#### **Condition 162**

*“The Proponent should make all reasonable efforts to engage Elders and community members of the North Baffin communities in order to have community level input into its monitoring programs and mitigative measures, to ensure that these programs and measures have been informed by traditional activities, cultural resources, and land use as such may be implicated or impacted by ongoing Project activities.”*

It was noted through the annual reporting that Baffinland was in the process of employing an Elder in residence that will contribute to the Mary River monitoring program and mitigation measures.

#### **Condition 163**

*“The Proponent shall continue to engage and consult with the communities of the North Baffin region in order to ensure that Nunavummiut are kept informed about the Project activities, and more importantly, in order that the Proponent’s management and monitoring plans continue to evolve in an informed manner.”*

Within its annual reporting to the NIRB, Baffinland included a consultation log<sup>48</sup> with names of communities visited, description of events and dates of meetings at different

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<sup>47</sup> Refer to Appendix A-Concordance to Project Conditions- Supplemental to 2013 Annual Report to the NIRB (March 2014)

<sup>48</sup> Refer to Table 4.1 of the 2013 Annual Report to the NIRB (March 2014)

North Baffin communities. The log indicated that Baffinland had consulted with Arctic Bay on general Project update, including discussion of the ERP on April, and October, 2013. It was also noted that Baffinland had organized a community consultation meeting and open house forum at Clyde River on March and September, 2013. Project updates and discussions of the ERP were given by Baffinland at Igloolik in January and April, 2013. Public consultation sessions were also held at Pond Inlet in January through May, September and December 2013.

### **2.3.12 Accidents and Malfunctions**

#### **Condition 170**

*“The Proponent shall include in an updated Terrestrial Wildlife Management and Monitoring Plan, plans for increased caribou monitoring efforts including weekly winter track surveying and summer and fall surveys undertaken on foot twice per month.”*

Baffinland indicated within the updated Terrestrial Wildlife Management and Monitoring Plan (TWMMP)<sup>49</sup> as submitted to the NIRB, that it would monitor caribou movement within the zone of influence, and that it would implement monitoring programs to address the effect of Tote Road, including road maintenance activities, on caribou movements using snow track surveys, snow bank height monitoring, and remote motion-sensing cameras. It also indicated that analyses for caribou movement patterns would be carried out by the GN through the satellite collaring program.

#### **Condition 174**

*“The Proponent and the Canadian Coast Guard are required to provide spill response equipment and annual training to Nunavut communities along the shipping route to potentially improve response times in the event of a spill.”*

Baffinland indicated within its annual reporting to the NIRB that it conducted a Marine Spill Response Training from August 5-10, 2013 at Mary River and Milne Inlet. While members of the Canadian Coast Guard could not participate in the exercise, Baffinland indicated that a Pond Inlet community member was in attendance. The Proponent did not provide any indication of community meetings held with communities along the shipping route, nor was any mention made of equipment provided to these communities and no indication of Canadian Coast Guard involvement was provided.

### **2.3.13 Transboundary Effects**

#### **Conditions 180-181**

Baffinland has confirmed through the activities of Marine Environment Working Group (MEWG)<sup>50</sup> that representatives from Makivik Corporation (MC) had been invited to the

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<sup>49</sup> Refer to Section 4.5.2 of Appendix N.1- Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

<sup>50</sup> Appendix F.3; Appendix F.4 – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

MEWG, and that they had also been updated on the Project development. Baffinland noted that a representative of MC was present at a MEWG meeting held on May 23, 2013.

## **2.4 Compliance & Effects Monitoring**

On May 12, 2014 the NIRB requested that authorizing agencies with a mandate or jurisdictional responsibility for the Mary River project provide comments and information with respect to compliance and effects monitoring.

Specifically, comments were requested regarding the following as it pertains to compliance monitoring, an assessment undertaken by regulators and other authorizing agencies to establish whether or not a project is being carried out within defined regulations, commitments and agreements:

- a) How the authorizing agency has incorporated the terms and conditions from the Project Certificate into their permits, certificates, licences or other government approvals, where applicable;
- b) A summary of any inspections conducted during the reporting period, and the results of these inspections; and
- c) A summary of Baffinland's compliance status with regard to authorizations that have been issued for the Project.

The NIRB also requested comments with respect to effects monitoring, including:

- a. Whether the conclusions reached by Baffinland in the *Mary River Project 2013 Annual Monitoring Report* are valid; and
- b. Any areas of significance requiring further studies.

The following is a summary of the comments received from authorizing agencies regarding compliance and effects monitoring.

### **2.4.1 Qikiqtani Inuit Association (QIA)**

#### **▪ Site Visit and Inspections:**

The operation of the Mary River Project on Inuit Owned Land is governed by QIA's Commercial Lease (Q13C301), Inuit Impact Benefit Agreement and Water Compensation Agreement. On September 20-22, 2013, the QIA conducted site inspection for the Mary River Project. QIA directed the NIRB to its inspection report which had been provided by Baffinland as an appendix in its 2013 Annual Report to the NIRB. In this document, the QIA indicated that the major borrow area located at Kilometre 97 along the Tote Road (borrow pit #2) may require remedial action due to significant deterioration of permafrost. The QIA's report as submitted by Baffinland also noted that borrow pit #2 had been discharging water contained within the borrow area into Camp Lake, and noted concerns that it may present an environmental concern if not addressed.

The QIA's report as mentioned within Baffinland's report recommended that the Proponent implement a reclamation program to address the current and potential liabilities associated with the identified borrow areas along the Tote Road, and further, that Baffinland provide a plan to address uncontrolled seepage of waste into the Camp Lake.

- **Effects Monitoring**

The QIA did not provide any comment with respect to effects monitoring, and did not comment on the validity of Baffinland's conclusions as presented within its 2013 Annual Report.

#### **2.4.2 Aboriginal Affairs and Northern Development Canada (AANDC)**

- **Permitting and Regulatory Comments**

AANDC noted in its comments provided to the NIRB that on July 2007, it issued a Land Use Permit (No. N2007F0004) to Baffinland for the portion of the Tote Road that is not located on Inuit Owned Land, but that as the land use permit for the Tote Road was issued prior to the issuance of the NIRB Project Certificate, it was not practicable to incorporate terms and conditions into the permit. AANDC also indicated that land use and quarry permits would be renewed by Baffinland during 2014, and that AANDC would ensure that relevant term and condition from the Project Certificate were incorporated accordingly.

- **Water Quality Inspections**

AANDC also indicated in comments provided to the NIRB that on May 4 and 5, 2013, its Water Resource Officers conducted site inspections at the Mary River and Milne Inlet sites for compliance with the Type B Water Licence (2BB-MRY1114) as issued by the Nunavut Water Board. AANDC indicated that there were no issues regarding non-compliance that resulted from inspections of the water licence requirement at either site.

AANDC conducted a second inspection at Mary River, Milne Inlet and Steensby sites from August 15 to 17, 2013 (Water Licence Nos. 2BB-MRY1114, 2AM-MRY1325, 8BC-MRY-1314). AANDC noted that the results of this inspection did not identify any major issues or non-compliance concerns as pertaining to the respective water licence requirements for the Mary River Project.

- **Socio-Economic Monitoring**

Within its comments submission, AANDC noted that it had worked collaboratively with Baffinland and the Government of Nunavut to develop a socio-economic monitoring program that it anticipated would address conditions 129, 131, 133, 145, 148, 154, 159, 168 and 169. AANDC also indicated that work towards a comprehensive program was expected to continue throughout 2014.

- **Effects Monitoring**

AANDC noted that it had no concerns with regard to effects monitoring associated with the Mary River project, and provided no comment with respect to the validity of Baffinland's conclusions as presented within its 2013 Annual Report.

### **2.4.3 Government of Nunavut**

#### **Socio-Economic Comments**

The GN acknowledged the efforts made by Baffinland to establish the Mary River Socio-Economic Monitoring Working Group (MRSEMWG), and indicated the need for continued collaboration with MRSEMWG in order to finalize the socio economic monitoring program.

#### **Environment and Human Health**

- **Inclusion of Polar Bear in Marine Mammal Monitoring:**

The GN indicated that Baffinland's marine mammal monitoring program did not sufficiently account for polar bears as required under Project Certificate conditions 105 and 120. The GN also recommended that Baffinland address this gap by improving baseline data and refining study designs for polar bears in the Project Area.

- **Air Quality Monitoring**

The GN noted following its review of Baffinland's 2013 Annual Report that the Proponent did not comply with the requirement of air quality monitoring in condition 8 of Project Certificate. The GN recommended that Baffinland address this issue through an immediate implementation of air quality monitoring of the Mary River Project.

- **Caribou Organ Tissue Monitoring and Caribou Forage**

The GN observed a minor inconsistency with respect to information on caribou organ tissue sampling (Condition 35) as presented in the 2013 annual report.<sup>51</sup> In consideration of the vegetation species used as caribou forages and their potential effect on caribou health, the GN had indicated that the Proponent had not implemented a caribou organ tissue monitoring program, pursuant to conditions 35 and 36. The GN recommended that Baffinland implement appropriate monitoring measures to address these conditions, and that in the event that elevated levels of contaminants were observed in the caribou tissues, it advised that the GN Department of Health be notified for possible issuance of consumption advisories or warnings to the general public.

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<sup>51</sup> Baffinland indicated in Appendix A-Concordance to Project condition that information on Condition 35 is located on Section 7.4.1.4 of the 2013 Annual Report, however, information related to monitoring of baseline metal levels in caribou organs was not addressed in that section of the 2013 Annual Report.

- **Birds Monitoring**

The GN observed that the monitoring of project related impacts on certain bird species (rough-legged hawk gyrfalcon, peregrine falcons) was not effective for the bird monitoring program given the high variability of the species within the Project development area.

- **Mammal Monitoring**

Baffinland had indicated that it adopted different techniques (e.g. height-of-land (HoL) caribou surveys, caribou fecal pellet collection and incidental observations) for its terrestrial wildlife monitoring program. Following the GN's review of these techniques, it was noted that HoL surveys and incidental observations were insufficient for monitoring impacts on wildlife.

- **Statistical Analyses**

While it was acknowledged that Baffinland had used different statistical techniques for the analyses and interpretation of contaminants (trace metals), vegetation and dust-fall, it was indicated by the GN that there were statistical deficiencies for the analyses of cliff nesting raptors, caribou, and other terrestrial mammals.

#### **2.4.4 Environment Canada**

Environment Canada (EC) raised concerns relating to the absence of details regarding marine environment monitoring for the Mary River Project, including specific notes about Appendices J and R (supplemental to the 2013 Annual Report). Specifically, EC indicated that it could not be certain of how Baffinland intended to integrate baseline studies for Milne Inlet and Steensby Inlet within its overall marine monitoring plan, and noted that additional physical and ecological baseline information would be necessary to support later assessments of impacts.

#### **2.4.5 Department of Fisheries and Oceans (DFO)**

- **Regulatory Background**

Baffinland had obtained different authorizations from DFO to conduct various site activities for the Mary River Project. On August 3, 2007, DFO issued authorizations (NU-06-0084) for the "Mary River Bulk Sampling" Project pursuant to subsection 32 (2) of the Fisheries Act to allow for the repair of Box Culvert CV217 at Kilometre 80 on the Milne Inlet Access Tote Road. On December 8, 2008, an amendment to the *Fisheries Act* Authorization (NU-06-0084) was issued to defer the removal of selected water crossings (BG050, CV128, CV217, CV223, BG017, CV040, CV072, CV099, CV129, and CV077). On September, 2009, DFO indicated that it had issued authorizations to allow for the removal of perched culverts at BG01 and CV 225 on the Milne Inlet Access Tote Road, as well as repair of Box Culvert 217 at Kilometre 80.



- **Compliance Monitoring**

On June 14, 2014, DFO sent correspondence to the NIRB indicating it had incorporated terms and conditions from the Project Certificate into DFO licensing for the Mary River Project. The *Fisheries Act* authorization (14 HCAA-00525)<sup>52</sup> issued for the ERP included the following NIRB considerations:

DFO indicated through its correspondence to the NIRB that it had incorporated requirements of Condition 14 (a) of the NIRB Project Certificate as conditions 2,2.3,2.4 and 2.5 in the *Fisheries Act* 35 (2) (b) Authorization.

DFO also noted that it had modified NIRB Condition 87 and included it as Condition 3.1 in the *Fisheries Act* Authorization to specifically address the need to implement a monitoring program to evaluate changes to the marine fish, fish habitat and aquatic organisms, as well as introduction of non-native species resulting from ballast water discharges.

Furthermore, DFO indicated that it had incorporated Condition 105 (a, b) as Condition 3.5 in the *Fisheries Act* Authorization, and that NIRB Condition 109 was addressed by DFO Condition 3.2.

The requirements of NIRB Condition 110 were modified as indicated by DFO and incorporated as Condition 3.3 in the *Fisheries Act* authorization, while Condition 3.4 of the DFO permit addressed NIRB Conditions 121-123.

#### **2.4.6 Transport Canada**

- **Regulatory Requirements**

Transport Canada (TC) confirmed within its comment submission to the NIRB that it received eight (8) applications from Baffinland regarding construction and the installation of new structures at watercourse crossing locations along the Milne Inlet Tote Road. TC stated that approvals for these works were issued in February 2014 under the *Navigable Waters Protection Act* (NWP).

TC also noted that from May 13-15, 2014 it visited Mary River Mine Site to review the watercourse crossings upgrade construction along the Tote Road, as well as to assess the current and proposed facilities at Milne Inlet.

Noting that legislative amendments to the NWP came into force on April 1, 2014 including a name change to the *Navigation Protection Act* (NPA), TC advised that Baffinland may be required to apply under the NPA for proposed structures in Milne Inlet, as well as for other structures proposed to be built across any scheduled waterways.

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<sup>52</sup> <http://ftp.nirb.ca/03-MONITORING/08MN053-MARY%20RIVER%20IRON%20MINE/01-PROJECT%20CERTIFICATE/03-AUTHORIZATIONS/05-DFO/01-LICENSE%20OR%20PERMIT/140704-08MN053-DFO%20License-Milne%20Inlet%20Dock-IA1E.pdf>

TC recommended that Baffinland review the *Order Amending the Minor Works and Waters Order*, and determine whether proposed works at site may be considered minor works, as these do not require notice or approval by TC.

- **Explosives Management**

Baffinland had indicated not exceeding the net explosive quantity (20,000kilograms) “allowable” for transportation under existing regulations. TC had clarified through its comments on the 2013 Annual Report that the existing Transport of Dangerous Goods Act and Regulations does not impose the above restriction on the volume of explosives being transported. However, TC did mention that there is a requirement for an Emergency Response Assistance Plan for the transportation of UN2426<sup>53</sup> with a volume greater than 1000 litres.<sup>54</sup>

- **Communication Towers**

Condition 68 requires that Baffinland ensure flashing red, red strobe or white strobe lights and guy-wire deterrents are used on communications towers established for the Project. The condition also requires that consideration be given to reducing lighting when possible in areas where it may serve as an attractant to birds or other wildlife

TC indicated within its comments on the 2013 Annual Report that installation of communications towers will require the completion of an Aeronautical Obstruction Clearance Form and submission to TC Aerodromes and Air Navigation section for evaluation as to whether w proposed marking and lighting will be required in accordance with Canadian Aviation Regulation (621.19-Obstruction Marking and Lighting Standards).

## ***2.5 NIRB Review of Baffinland’s 2013 Annual Report***

The following is a summary of the NIRB’s review of Baffinland’s 2013 Annual Report for the Mary River Project.

### **2.5.1 Soil Sampling**

Project Certificate term and conditions 34 and 36 require Baffinland to conduct soil sampling to determine metal levels of soils in areas with berry-producing plants and to establish an on-going monitoring program for vegetation species used as caribou forage (such as lichens) near project development areas prior to commencing operations. With respect to these conditions, the NIRB requested that Baffinland provide clarification on the following points as referenced from the 2013 Terrestrial Annual Report<sup>55</sup>:

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<sup>53</sup> Ammonium Nitrate Liquid (hot concentrated solution) with not more than 0.2 per cent combustible material, in a concentration exceeding 80 per cent.

<sup>54</sup> Refer to Schedule 1 and Part 7 of the Transportation of Dangerous Goods Regulations (TDGR)

<sup>55</sup> Appendix G (page 8-24) – Supplemental to 2013 Annual Report submitted to the NIRB (March 2014)

- **Sampling**

The NIRB noted from its review of the 2013 Annual Report that Baffinland did not provide any information to confirm whether a consistent depth was maintained for soil sampling. While it is important to sample surface soils at different depths in order to understand the accumulation and migration patterns of soil trace metals, however, in the annual Report, no information was provided which would confirm whether all soil samples collected were from the same depth. The NIRB requested that Baffinland confirm the depths of soil samples taken, and in its response, Baffinland indicated that surface soil samples were collected from a consistent depth of not less than 10 centimeters, as that depth typically represents the layer of soil that plants uptake metals.

- **Ambiguity between Reference and Onsite Sampling Areas**

The NIRB also noted that Baffinland's Annual Report did not differentiate the number of samples that were collected from the reference areas and from onsite areas (including Steensby Port and Milne site). The Annual Report did mention the total number of samples retrieved (20 soils, 17 lichens, 14 willow and 4 blue berries) but did not clearly note how many of each were collected from reference or/and onsite areas. The NIRB noted that such generalizations could make monitoring difficult and requested that information regarding the collection of samples from onsite and/or reference areas be provided. Baffinland indicated in response that it analyzed the sample results by focusing on how metals levels changed in relation to increasing distance from the Project, and furthermore, that the vegetation and soil samples collected in 2012 and 2013 represented background/baseline values prior to site operation.

- **Lack of Comparison**

The NIRB also noted that Baffinland did not provide a rationale for not having compared observed elemental changes in the samples (soils, lichens, willow and blue berries) collected in 2012 and 2013 against 2008 baseline data, and requested that Baffinland provide this information from a time series perspective on how observed concentrations recorded in 2012 and 2013 differ from 2008 baseline data. Baffinland responded, indicating that the vegetation and soil samples collected in 2012 and 2013 were intended to act as background values against which future sampling would be compared. Baffinland also noted that because the 2012 and 2013 samples were collected in different geographic areas (2012 in the southern sections of the Regional Study Area (RSA) and 2013 in the northern areas) of the RSA, analyzing temporal trends was not necessary.

## **2.5.2 Dustfall Monitoring Program**

Pursuant to term and conditions 10, 21, 54 and 58, Baffinland is required to monitor the impact of dust dispersion and deposition on soil, vegetation (caribou forage) and aquatic environment; as well as determine the effects of dust on wildlife health, particularly caribou. While it was indicated in the 2013 Terrestrial Monitoring Report that Baffinland had installed dust fall monitoring stations at different Project locations, the NIRB observed that Baffinland had not fully complied with aspects of dust monitoring as indicated below:

- Aquatic Effects Monitoring: Condition 21 (iii) requires that Baffinland “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”. This condition was not addressed for the current monitoring period, although it was indicated by the Proponent that this will be completed 60 days prior to mining in third quarter of 2014.
- Terrestrial Wildlife: Condition 58 (c-d) stipulate that the Proponent report on its measured levels of dustfall on vegetation, and ash content of caribou fecal pellets, as well description of how the monitoring results, including, road traffic, air traffic and dustfall contribute to cumulative effects of the project. As noted within the Terrestrial Monitoring Report, Baffinland has not provided results of the ash contents for the caribou pellets collected for the monitoring period.

### **2.5.3 Exotic Vegetation Monitoring**

Condition 37 stipulates that *“The Proponent shall incorporate protocols for monitoring for the potential introduction of invasive vegetation species (e.g. surveys of plant populations in previously disturbed areas) into its Terrestrial Environment and Monitoring Plan. Any introductions of non-indigenous plant species must be promptly reported to the Government of Nunavut Department of Environment.”*

Baffinland indicated that it encountered invasive species, the common dandelion (*Taraxacum officinale*), during field surveys in the Project area, but that it has not implemented a monitoring program for invasive species.

### **2.5.4 Noise and Vibration Monitoring**

Conditions 14 and 14b require Baffinland to report annually on its noise and vibration monitoring as well as mitigate potential impacts of noise to wildlife and people during project operation. The NIRB noted during its review of the 2013 Annual Report that the Proponent had indicated it could not satisfy this condition due to site capture activities.

### **2.5.5 Marine Monitoring**

Pursuant to Condition 101 (a-h), Baffinland is required to monitor for potential impacts to marine wildlife and marine habitat. The NIRB noted that Baffinland had met the requirement of condition 101 (e) and had deferred monitoring for conditions 101a, f, and h.

## **2.6 Site Visit**

As an integrated part of the NIRB’s continuous monitoring program of the Project, the NIRB’s Monitoring Officer visited the Mary River site on September 16 and 17, 2014. The site visit at Mary River included tours of the wastewater treatment facility, effluent water discharge area, sewage lagoon, landfill, fuel tank farm, water quality monitoring stations, sludge pond, incinerator, Quarry 2, and the iron ore stockpile.

During the site visit, the NIRB Monitoring Officer also travelled along the Tote Road to Milne Port, where observations were made at the quarry, incinerator, landfarm, ore dock area, bladder rarm decommissioning area, open burn pit area, crusher and ore stockpiles, water treatment facility, quarry area and fuel tank farm. The following outlines the NIRB's findings as they relate to Project Certificate Terms and Conditions as applicable, and to the site visit in general:

- Based on observations made during the site visit, facilities in operation and those that remained under construction appear to be in proper sanitary conditions, well-managed and maintained. However, some items were identified to require improvement to further ensure that potential adverse impacts to the environment are adequately mitigated.
- It was noted that many terms and conditions as contained within the Mary River Project Certificate are not applicable or have not been completely adopted at this time due to the current phase of development of the Mary River Project.

The NIRB has, however, noted several items and areas where improvement is required in order to fully meet the requirements of the Project Certificate Terms and Conditions. The following outline the major findings from the site visit:

## **2.6.1 General Waste Management Issues**

### **2.6.1.1 Sewage Sludge Disposal from Membrane Bioreactor (MBR)**

During the site visit, the NIRB observed that sewage sludge from the Membrane Bioreactor (MBR) was not disposed of properly. It was noted that the wastes recovered from the MBR process was bagged in non-biodegradable materials and stored in an external containment unit without a protective lid or cover. The NIRB noted that disposal practice could potentially expose the wastes to activities from wildlife, birds or natural elements (precipitation, runoff and wind); or generate localized malodours if and when the wastes are exposed to air. While this issue is not directly related to the NIRB Project Certificate, the Board has recommended that Baffinland adopt best practices to ensure that sewage sludge is properly disposed.

### **2.6.1.2 Waste Landfill Protection Barrier**

The NIRB also observed that the protective mesh around the landfill was significantly damaged, with some areas not properly enclosed with protective barrier to contain litter or debris that could be carried away by wind action or wild life activities. The issue as noted by the NIRB is an important item for consideration given that the Project term and condition 64 stipulates the Proponent's waste management practices prevent carnivores from being attracted to the Project site(s).

This item should be addressed in order to ensure that wastes disposed of in the landfill are properly contained and not allowed to be accessed by wildlife or dispersed off-site due to natural elements such as wind, runoff and precipitation.

### 2.6.1.3 Liquid Wastes and runoff to Drainage System

The NIRB Project certificate [005] term and conditions 24 and 46 stipulate that:

*The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carry out treatment if necessary to ensure that discharge conditions are met at all times.”*

*“The Proponent shall ensure that runoff from fuel storage and maintenance facility areas, sewage and wastewater other facilities responsible for generating liquid effluent and runoff meet discharge requirements”*

During the visit to Milne Port, the NIRB noticed oil contaminated wastes on the floor of the incinerator facility. The liquid waste was observed to have originated from waste containment leakage at the facility. While the NIRB could not immediately verify the specific source of the leakage, or ascertain when the leakage started, there are concerns that the containment used at the facility may not be effective in containing waste materials, particularly liquid wastes. It was also observed that there had been runoff of the waste into the drain located at the incinerator facility. Although the NIRB could not determine whether the drainage system in question feeds the MBR, it is important to emphasize that the potential occurrence of oil or grease in liquid waste may upset the MBR process and damage the MBR membranes, thus adversely affecting the quality of effluent generated from the system.

### 2.6.2 Land farm for Contaminated Snow, Soil and Synthetic Liners

The NIRB visited the landfarm that is currently used as a disposal site for contaminated snow and soils. While at the landfarm, it was also noted that synthetic liners had been co-disposed of within the landfarm. The site perimeter of the landfarm was not enclosed with any kind of protective fencing to prevent the discarded synthetic liners from being dispersed offsite by wind action or wildlife activities.

Furthermore, no monitoring stations were observed within and around the vicinity of the landfarm. Term and condition 24 of the Project Certificate stipulates that:

*“The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carry out treatment if necessary to ensure that discharge conditions are met at all times.”*

Monitoring stations are essential to ensure that relevant parameters of the effluent from the landfarm are continuously monitored and meet water quality criteria prior to discharge to the receiving environment. The NIRB has indicated the need for Baffinland to be consistent with the monitoring protocol as outlined in its Surface Water and Aquatic Ecosystem Management Plan.<sup>56</sup>

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<sup>56</sup> Section 9.2.3 of Appendix N.04- Surface Water and Aquatic Ecosystem Management Plan (Supplemental to 2013 Annual Report).

### 2.6.3 Discharge Monitoring Station

The NIRB observed the presence of snow and ice formations on the weir used for monitoring ground/surface water around Mary River. Term and condition 23 states:

*The Proponent shall develop and implement a Groundwater Monitoring and Management Plan to monitor, prevent and/or mitigate the potential effects of the Project on groundwater within the Project area*

Given that the Monitoring station is sensor based, the NIRB has indicated that ice formation could interfere with the normal functioning, and likely destabilize the proper calibration for monitoring.

### 2.6.4 Blasting and Explosive Residue Monitoring

In consideration of the blasting activities that took place on site, and the likelihood for the occurrence of ammonia nitrate residues and associated runoff from blasted areas, the Monitoring Officer was not made aware of any system in place at any of the Project locations that specifically addresses monitoring of explosive residues and related by-product as stipulated in Term and Condition 20:

*The Proponent shall monitor the effects of explosives residue and related by-products from project-related blasting activities as well as develop and implement effective preventative and/or mitigation measures, including treatment, if necessary, to ensure that the effects associated with the manufacturing, storage, transportation and use of explosives do not negatively impact the Project and surrounding areas.*

For a comprehensive review of the NIRB's 2014 site visit and observations, please refer to the NIRB's 2014 Mary River Site Visit Report, included as Appendix I.

## 2.7 Follow Up to NIRB's 2013 Recommendations

As a result of the NIRB's 2013 monitoring program, the Board made nine recommendations to Baffinland in order to provide guidance on compliance to the Mary River Project Certificate. The recommendations are outlined below, including updates from the Proponent and the Board's follow up on the items as requested:

**Recommendation 1** (Outstanding Plans): *The Board requests that Baffinland provide the following outstanding submissions within 30 days' receipt of these recommendations:*

- *Dust Management and Monitoring Plan (Condition 10)*
  - *Sediment Erosion and Management Plan (Condition 22, 26 and 43)*
  - *Groundwater Monitoring and Management Plan (Condition 23)*
- a. Dust Management and Monitoring Plan: Baffinland indicated that it could not practically implement specific plans for monitoring dust along the first few kilometres of the rail corridor leaving the Mary River Mine site due to the deferred

construction of the railway. Baffinland had updated its Air Quality and Noise Abatement Management Plan (as submitted for the ERP), and has addressed monitoring of dustfall along the Tote Road.

- b. **Sediment Erosion and Management Plan:** Pursuant to Condition 26, the NIRB noted that Baffinland had developed a detailed sedimentation and erosion control measure within its Surface Water and Aquatic Ecosystems Management Plan (SWAEMP). It was further indicated that the SWAEMP was updated and submitted to the NWB for the issuance of the Type A Water License (No. 2AM-MRY1325) in September 2013.
- c. **Site Drainage and Silt Control Plan:** With respect to condition 46, the NIRB noted that Baffinland had submitted a Site Drainage and Silt Control Plan as part of its application to DFO for upgrading the water crossings along the Tote Road.
- d. **Ground Water Monitoring and Management Plan:** Baffinland indicated that Section 10.2.2 of the SWAEMP address this condition.

**Recommendation 2** (Additional Geotechnical Investigation): *The Board requests that Baffinland provide outstanding information on additional geotechnical investigations that were to be undertaken prior to the commencement of construction activities within 30 days' receipt of these recommendations.*

The NIRB indicated it received engineering drawings in the Addendum to the FEIS for upgrades of the Tote Road in June 2013, but that it was not provided with information to address geotechnical considerations and engineering design for the protection of sensitive landforms. However, for the 2013-2014 monitoring period, the Board has received Baffinland's construction report that addresses impacts of Project activities and infrastructure on sensitive landforms.

**Recommendation 3** (Progressive Vegetation Program): *The Board requests that Baffinland submit the outstanding details of its progressive revegetation program to the NIRB within 30 days' receipt of these recommendations.*

Baffinland indicated to the Board that it had not implemented a revegetation program due to limited construction activities onsite, and unavailability of disturbed areas requiring immediate revegetation.

**Recommendation 4** (Blasting in Marine Areas): *The Board requests that Baffinland submit the information on mitigation measures to minimize the effects of blasting on marine fish and fish habitat as well as thresholds for the use of specific mitigation measures to prevent or limit disturbance to marine wildlife and that this information is provided within 30 days' receipt of these recommendations.*

The NIRB noted that Baffinland did not blast in or near marine areas, and that appropriate mitigation measures to minimize the effects of blasting had been submitted



within the Quarry Management Plans (D1Q1, D1Q2, Q19, Q11 and Q7) to the NWB in accordance with Part D, Item 7 of Type A License (No. 2AM-MRY1325).

**Recommendation 5** (Labour Market Analysis): *The Board requests that Baffinland submit the results of the detailed labour market analysis as required by Condition 139 to the NIRB within 30 days' receipt of these recommendations.*

On December 18, 2013, Baffinland responded to this requirement by submitting its labour market analysis. The report indicated that the requirement to recruit employees from the rest of Canada would only be considered after local Inuit and local non-Inuit employees have been given employment preference as required under the Inuit Impact and Benefit Agreement between Baffinland and QIA.

**Recommendation 6** (Air Quality Monitoring): *The Board requires that Baffinland set up air quality monitoring stations and conduct analyses of air quality to ensure that the mitigation measures are in place and are achieving their objectives. The Board requests that Baffinland provide photographs and a description of the monitoring stations and locations where each monitoring station has been installed, as well as a description of the protocols and procedures for air quality sampling and analysis. The Board requests that this information is provided within 60 days' receipt of these recommendations.*

The NIRB noted that Baffinland has not complied with this requirement. The Proponent indicated that it did not fulfill this requirement due to limited construction activities at the Mine site and Steensby site, but has committed to provide plans for air quality monitoring in 2014, and implement monitoring of SO<sub>2</sub> and NO<sub>x</sub> for 3 years once shipment of ore commence at Milne Port.

**Recommendation 7** (Bird Deterrence): *The Board requests that Baffinland install lights and/or guy-wire deterrents on communication towers within 60 days' receipt of the Board's recommendations and that it provide follow up photos which detail how and where such deterrents have been installed to the NIRB within 90 days' receipt of these recommendations.*

Baffinland responded that it had consulted with agencies in the TEWG on this condition, and was made aware that lights on guy wires may attract birds and not serve the intended purpose of deterrence. It further indicated that given that birds are active during the periods of 24 hours day light, the use of flashing lights might not be useful for the Project. However, based on the NIRB follow-up of this item from the preceding year to the current monitoring period, it was noted that Baffinland has yet to provide updates or new information to the Board on how it plans to comply with the intent of this condition to deter birds from communication towers and guy-wires.

**Recommendation 8** (Fuel Transfer): *The Board requests that Baffinland provide a detailed description of methods employed to protect the marine environment during marine fuel transfer events, describe its previous and current compliance to Condition*

173, and discuss the use of full containment booms employed at other mine sites and/or during major marine re-fuelling activities in Nunavut (i.e. community fuel re-supply).

The Board had requested prior to the amendment of Condition 173<sup>57</sup> that Baffinland employ full containment booms during all ship-to-shore and other marine-based fuel transfer events. Baffinland had responded to the Board indicating that the employment of full containment during ship-to shore transfer was not required under existing regulation, and that its use had been cautioned against following its consultations with experts.

**Recommendation 9 (Fuel Storage Facilities):** *Although there are no specific terms and conditions regarding the regular operation and maintenance of fuel storage facilities, the Board requests that Baffinland employ best practices in the operation and maintenance of fuel storage facilities in order to limit and mitigate potential impacts to the surrounding environment. Fuel storage facilities should be maintained so as to limit the amount of contact water that is produced. The Board requests that Baffinland provide a plan of action to reduce the volume of contact water in fuel storage facilities as well as provide a report on any instances of fuel leakage at site and instances of malfunction at the facilities which are either ongoing or which have been addressed.*

The NIRB noted that the Proponent had addressed concerns on accumulation of contact water in the secondary containment through Section 6 of the SWAEMP.

As a follow-up to the 2012-2013 recommendation to the Proponent, the NIRB had assessed the Proponent's comments<sup>58</sup> and reviewed the outstanding materials supplied in response to the Board's recommendations and has noted that Baffinland has yet to fully address recommendations on air quality monitoring (Condition 8) and bird deterrence (Condition 68), as well to correct reporting deficiencies for these items. Baffinland has not provided new updates or information to the NIRB on its consultation with agencies in the TEWG as to the next plan of action on Condition 68.

### 3 FINDINGS AND CONCLUSIONS

During the 2013–2014 monitoring period, Baffinland demonstrated compliance with most of the reporting requirements as contained in the Project Certificate, and as applicable to the current phase of the Mary River Project. During the site visit in September 2014 the NIRB did not observe many items of significant concern, however the notes raised with respect to general waste management, landfarm operations, surface water discharge, and explosives residue monitoring were considered, as addressed in more detail in the site visit report (Appendix I). While certain Terms and Conditions of the Project Certificate pertain to later phases in the Mary River Project's development

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<sup>57</sup> Condition 176 has been amended following the approval of the ERP in the Amended Project Certificate [005].

<sup>58</sup> Refer to letter dated December 20, 2013: Baffinland Response to the Nunavut Impact Review Board's 2012 - 2013 Annual Monitoring Report for the Mary River Project and Board Recommendations

and are not applicable at this stage in the NIRB's monitoring program, it was noted that Baffinland has not provided updates or information with respect to the following items:

- a. Results of ash contents for the caribou pellets collected for the monitoring period (Condition 58 c).
- b. Information regarding potential impacts to marine wildlife and marine habitat, with specific notes on conditions 101a, f, and h.
- c. Evidence of monitoring baseline metal levels in organ tissue from caribou harvested within the local study area (Condition 35).
- d. Information on measures to be implemented for bird deterrence in the Project Development Area (Condition 68)
- e. Air quality monitoring program (Condition 8).
- f. Public consultation reporting that indicates concerns expressed by affected communities about the impacts that changes to the topography and landscape have had on the aesthetic value of the Project area (Condition 27).
- g. Information regarding additional surveys for the presence of arctic char in freshwater bodies and ongoing monitoring of arctic char health in the Project Area (Condition 48a).
- h. Include details regarding how it (and the Canadian Coast Guard, if applicable) has provided spill response equipment and annual training to Nunavut communities along the shipping route to potentially improve response times in the event of a spill (Condition 174).

Furthermore, Baffinland needs to address comments and findings from authorizing agencies as indicated below:

- i. Land degradation and water discharge concerns as indicated by QIA<sup>59</sup>, with specific notes on the borrow area located at km 97 along Tote Road. A plan to address seepage of wastes into camp lake may need to be considered in order to protect the integrity of the affected area.
- j. Inclusion of polar bear in marine mammal monitoring and improving study designs to account for polar bears as recommended by the GN in accordance with conditions 105 and 120 of Project Certificate.<sup>60</sup>
- k. Improve terrestrial monitoring program by addressing the following:
  - i. Conditions 34-36: Increase sample size for subsequent vegetation and soil monitoring. As noted in the current Terrestrial Monitoring Report, the total number of vegetation and soil samples (20 soils, 17 lichens, 14 willow and 4 blue berries) collected for monitoring was relatively small as compared to the geographical extent of the Project area.
  - ii. Conditions 54-57: Adopt relevant survey tools for monitoring impact on terrestrial wildlife. As indicated by the GN, the survey techniques (Height-of-Land, caribou surveys, caribou fecal pellet collection, and incidental

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<sup>59</sup> Refer to QIA Inspection Report (Appendix L4 and L.5)-

<sup>60</sup> Refer to GN Letter to the NIRB (dated 13 June 2014) RE: Comment Request for Baffinland Iron Mines Corp.'s Mary River Project 2013 Annual Monitoring Report

observations) currently in use by Baffinland have not sufficiently addressed mine related impact on wildlife.

- iii. Conditions 58e: Improve statistical analyses for birds (cliff nesting raptors), caribou and other terrestrial mammals as indicated by the GN.
- iv. Conditions 65-75: Bird surveys as carried out by the Proponent had been focused on monitoring species with high variability, with limited information on species prevalent within the Project development area.<sup>61</sup>

## 4 SUMMARY

Baffinland began construction of the Mary River Project in May 2013.<sup>62</sup> Since issuance of the original NIRB Project Certificate in December 2012 and the amended certificate on May 28, 2014, Baffinland has continued to work towards compliance with the Terms and Conditions that apply to the current phase of the development of the Mary River Project. Emphasis is now made on some key outstanding issues which require Baffinland's attention as observed during the NIRB's site visit, and as have been mentioned throughout this report. These are further addressed in the Board's 2014 recommendations issued to the Proponent and other parties under separate cover. Pursuant to NLCA Sections 12.7.2 and 12.7.3, the NIRB will continue to work with Baffinland and other agencies in order to undertake the required evaluation of Project information, conduct and coordinate monitoring efforts, and to review results and Project compliance in accordance with the requirements set out in the NIRB Project Certificate.

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<sup>61</sup> Refer to GN Letter to the NIRB (dated 13 June 2014) RE: Comment Request for Baffinland Iron Mines Corp.'s Mary River Project 2013 Annual Monitoring Report

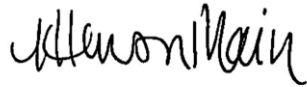
<sup>62</sup> Baffinland, "Construction Schedule," document submitted to the NIRB on September 26, 2013

Report Prepared by: Solomon Amuno, PhD  
Title: Monitoring Officer  
Date: October 2, 2014



Signature: \_\_\_\_\_

Reviewed by: Amanda Hanson Main  
Title: Director of Technical Service  
Date: October 23, 2014



Signature: \_\_\_\_\_

## **APPENDIX I: JUNE AND SEPTEMBER 2014 SITE VISIT REPORT**

# Summary of NIRB June 3-5, 2014 Mary River Site Visit Report

## *The Purpose of the Site Visit*

In accordance with sections 12.7.1 and 12.7.2 of the Nunavut Land Claims Agreement (NCLA) and the Mary River Project Certificate as issued for Baffinland Iron Mines Corporation's (Baffinland) Mary River Project, the NIRB is responsible for the establishment of a monitoring program for the Project, which includes conducting periodic site visits. One objective of the NIRB's site visit is to determine whether and to what extent the land or resource use in question is being carried out within the predetermined terms and conditions as outlined in the Mary River Project Certificate.

## *Itinerary*

On June 3, 2014, members of the NIRB staff including Ryan Barry, Executive Director, Amanda Hanson, Director of Technical Services, and Heather Rasmussen, Technical Advisor flew from Iqaluit, NU to the Mary River Project site via Baffinland's regularly scheduled aircraft. The site visit was led by Baffinland staff including Oliver Curran, Director of Sustainable Development, Jim Millard, Environmental Manager, and Jennifer St. Paul-Butler, Environmental Analyst. The visit commenced upon the NIRB staff's arrival on June 3<sup>rd</sup>, and included a full day tour on June 4<sup>th</sup>, with the morning of June 5<sup>th</sup> allowing for a de-brief meeting and discussion with members of Baffinland's staff prior to departing via Baffinland's regularly scheduled aircraft back to Iqaluit, NU.

The tour on-site involved mobilization on foot, via truck, and via helicopter. NIRB staff toured all three of the approved Project sites, including the Steensby Port, Mary River site (both the main camp and previous/geology camp), and Milne Inlet Port site.

The afternoon of June 3<sup>rd</sup> involved a safety orientation briefing, as well as foot and truck-supported tours of the facilities at the Mary River site. This included the accommodations buildings, a quarry site, fuel storage, water and waste treatment facilities, incinerator, landfill and landfarm facilities, the effluent discharge area as well as a brief drive to kilometre 97 of the Milne Inlet Tote Road where replacement bridge construction was underway.

During the morning of June 4<sup>th</sup>, the NIRB staff were flown via helicopter along the approved railway alignment, where the helicopter set down at the Steensby Port facility to allow members of the tour to take a brief walk about the Project infrastructure. At the time, infrastructure and activity at the Steensby Port site was very limited (small camp and associated outbuildings and equipment), notably because the site remained closed following the winter season, and no active development of that site was planned at the time. Upon returning to the Mary River site, the flight path also provided a tour of Deposit No. 1, including an aerial view of associated roads, explosives areas and the overall Mary River site.

In the afternoon of June 4<sup>th</sup>, NIRB staff were flown via helicopter along the Milne Tote Road and given an aerial view of the general area near the Bruce Head marine mammal monitoring station north of the Milne Port site. The tour returned to the Milne Port site, where staff were provided an on foot tour of the accommodations and office facility, and a truck tour of associated facilities at the Milne Port site, including the landfarm, future dock site, airstrip, waste management area, fuel storage and general laydown sites. The site tour returned later in the afternoon on June 4<sup>th</sup> to the Mary River site via helicopter along the Milne Inlet Tote Road.

On June 5<sup>th</sup> the NIRB staff and Baffinland staff met in the administrative offices at the Mary River site to discuss the site visit and general monitoring requirements as set out in the NIRB's Project Certificate. Just before noon on the 5<sup>th</sup>, NIRB staff checked out of the Mary River site and were flown back to Iqaluit.





## **2014 Site Visit Report**

for the NIRB's Monitoring of  
**Baffinland Iron Mines Corp.'s Mary River Project**



**Nunavut Impact Review Board**

**November 2014**

**Full Report Title:** 2014 Site Visit Report for the Nunavut Impact Review Board's Monitoring of Baffinland Iron Mine Corp.'s Mary River Project (NIRB File No. 08MN053)

**Project:** Mary River Project  
**Project Location:** Qikiqtani Region, Nunavut

**Project Owner:** Baffinland Iron Mines Corporation  
2275 Upper Middle Road East, Suite 300  
Oakville, ON  
L6H 0C3

**Proponent Contact:** Oliver Curran, Director, Sustainable Development  
**Telephone:** (416) 814-3195

**Visit conducted by:** Solomon Amuno, Technical Advisor and Monitoring Officer  
**Telephone:** (867) 983-4603

**Site visit dates:** September 16 and 17, 2014

**Report prepared by:** Solomon Amuno, Monitoring Officer  
**Pictures by:** Solomon Amuno, Monitoring Officer

**Cover picture:** View of Milne Port and Tote Road

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# **1 INTRODUCTION**

The Nunavut Impact Review Board (NIRB or Board) was established through Articles 10 and 12 of the Nunavut Land Claims Agreement (NLCA) and is responsible for post environmental assessment monitoring of a Project in accordance with Part 7 of Article 12 of the NLCA.

This report provides the findings that resulted from the NIRB's site visit to Mary River on September 16 and 17, 2014 as such forms a part of the NIRB's monitoring program.

## ***1.1 Objectives & Purpose of Site Visit***

The objective of the NIRB's site visit was to determine whether, and to what extent, the land or resource use in question is being carried out within the predetermined Terms and Conditions of the NIRB's Project Certificate issued for the Mary River Project, in accordance with Section 12.7.2(b) of the NLCA.

The observations resulting from this site visit shall, wherever possible, be incorporated into the measurement of the relevant effects of the project according to Section 12.7.2(a), as well provide the information necessary for agencies to enforce terms and conditions of land or resource use approvals as required under Section 12.7.2(c). Observations will also be used to assess the accuracy of the predictions contained in the project impact statements according to Section 12.7.2(d) of the NLCA.

## ***1.2 Introduction of the Mary River Project***

The Mary River Project involves exploration, construction, operation, closure and reclamation of an open pit iron ore mine at what is known as Deposit No. 1, and includes mining at a rate of 18 Million tons per year (Mt/a). There are 3 main project locations – the Mine site, Milne Port located north of the Mine site, and Steensby Port located south of the Mine site. Milne Port is connected to the Mine site by the Milne Inlet Tote Road, approximately 100 kilometers (km) in length. The Project as originally proposed was to include construction of a railway approximately 150 kilometers (km) in length to connect the Mine Site to Steensby Port. It was anticipated that facilities at Steensby Port and the railway would take up to four years to construct.

The NIRB Project Certificate was issued for the original Mary River Project on December 28, 2012. On January 13, 2013, Baffinland informed the NIRB that it was proposing an Early Revenue Phase (ERP) that would change the schedule and specific activities associated with the Project development as initially approved. The ERP involved an amendment to the Mary River Project, and included the extraction of up to an additional 4.2 Mt/a of iron ore from the Mary River Mine site, with ore to be transported via the Milne Inlet Tote Road and port at Milne Inlet during the open water season only. Given the scope of the amendment to the Project, the Board determined that it was appropriate to assess the potential ecosystemic and socio-economic effects of the ERP Proposal and to reconsider, under Section 12.8.2 of Article 12 of the NLCA, modifications to the terms and conditions of the original Project Certificate to reflect the potential effects of the ERP.

On May 28, 2014, pursuant to Sections 12.5.5 and 12.8.2 of Article 12 of the NLCA, the NIRB issued an *Amended Project Certificate* [005], allowing the Project to proceed in accordance with Terms and Conditions issued therein. The Board is responsible for monitoring this Project as stipulated in Sections 12.7.1 and 12.7.2 of the NLCA.

As currently approved and in accordance with Baffinland's development plans, the extracted ore will be transported by truck along the Milne Inlet Tote Road and shipped from Milne Port to European markets during the open water season using contracted vessels. The approved Project also involves additional facilities at Milne Port, including the construction of a fixed ore dock, 4.2 Mt ore stockpile and reclaim area, 3500 tonnes per hour ship loaders, a camp to accommodate workers and the extension or relocation of the airstrip to the west of the proposed ore stockpile. The ERP operations are expected to continue for the duration of the mine life (i.e., 21 years), and would continue in conjunction with the Mary River Project as originally proposed, once developed.

### ***1.3 Preparations for the Site Visit***

In preparation for the site visit, the Monitoring Officer reviewed the Mary River Project Certificate, Baffinland's 2013 Annual Report submitted to the NIRB for the Mary River Project, as well as other supplemental materials submitted as appendices to the 2013 annual report.

## **2 SITE VISIT**

The site visit was conducted on September 16 and 17, 2014 by Solomon Amuno, NIRB Monitoring Officer. On Tuesday, September 16, 2014, the Monitoring Officer flew via aircraft chartered by Baffinland from the Iqaluit Airport to Mary River and was met by Baffinland's personnel, Jennifer St. Paul-Butler and Allan Knight. Once at the site, the Monitoring Officer was provided with basic health and safety orientation before undertaking a tour of the Mary River site, which included visits to: deposit No. 1, driving simulator room, environmental laboratory, Quarry D1Q2, pre-packaged explosive storage area, land-fill, water quality monitoring locations, effluent water discharge area, waste water treatment plant, potable water system, power generator, sewage Lagoon, sludge Pond, water Intake station, historical camp area and fuel tank farm.

On Wednesday, September 17, 2014, the Monitoring Officer also visited other Project components of the Mary River site before taking for a tour of facilities at Milne Inlet. The areas visited prior to Milne Port included the incinerator, Quarry (QM R2), water monitoring stations (for surface discharge water), delineated areas of Tote Road re-alignment and ore stockpile sites. After the visit, the Monitoring Officer, Jennifer St. Paul Butler and Allan Knight travelled to Milne Inlet via the Tote Road by truck.

At the Milne Port site, the Monitoring Officer visited the incinerator, Polishing Wastes Stabilization Pond (PWSP), potable water intake location, settling pond, ore dock area, fuel tank farm, sealift and barge landing area, bladder farm decommissioning area, open burn pit area, crusher and ore stockpiles, power generators, water treatment facility, quarry area and associated water quality monitoring stations, effluent discharge location and land-farm.

Later in the evening and again the morning of September 18, 2013, the Monitoring Officer discussed several issues pertaining to the project and Project Certificate with Jenifer St. Paul-Butler and Allan Knight. The site visit provided the Monitoring Officer the opportunity to view the major project component areas, as well as to make note of completed and ongoing construction activities.

## **2.1 General Observations**

The following are general observations made during the site visit and do not pertain specifically to any particular terms or conditions of the Project Certificate:

- a. Explosives materials were stored close to areas of quarry operations. Blasting activities were ongoing at the Mine site, with Quarry 2 in full operation mode. Heavy trucks were also observed carrying full loads of rocks and earth materials from Deposit No. 1.
- b. The proposed maintenance building and vehicle shop/mechanical unit near the main building at Mary River was still under construction. Construction activities were also observed around the ore loading area of Milne Port (Picture 1). Steensby site was not visited by the Monitoring Officer.
- c. Membrane bioreactors (MBR) and fuel tanks were fully installed and appeared to be in good working condition at both the Mary River and Milne Port sites. A new environmental testing laboratory was in full operation at Mary River.
- d. The incinerator at Milne Port was appropriately contained in a housing unit, however the incinerator at Mary River was not yet contained, a.
- e. Along the Tote road, raptors and other bird species were observed during the drive to Milne Port. A fox was spotted near the tank farm at Milne Port, and two (2) ravens were observed close to the landfill at the Mary River camp.
- f. Security systems were in place before entry to the main buildings at the Mary River and Milne site.

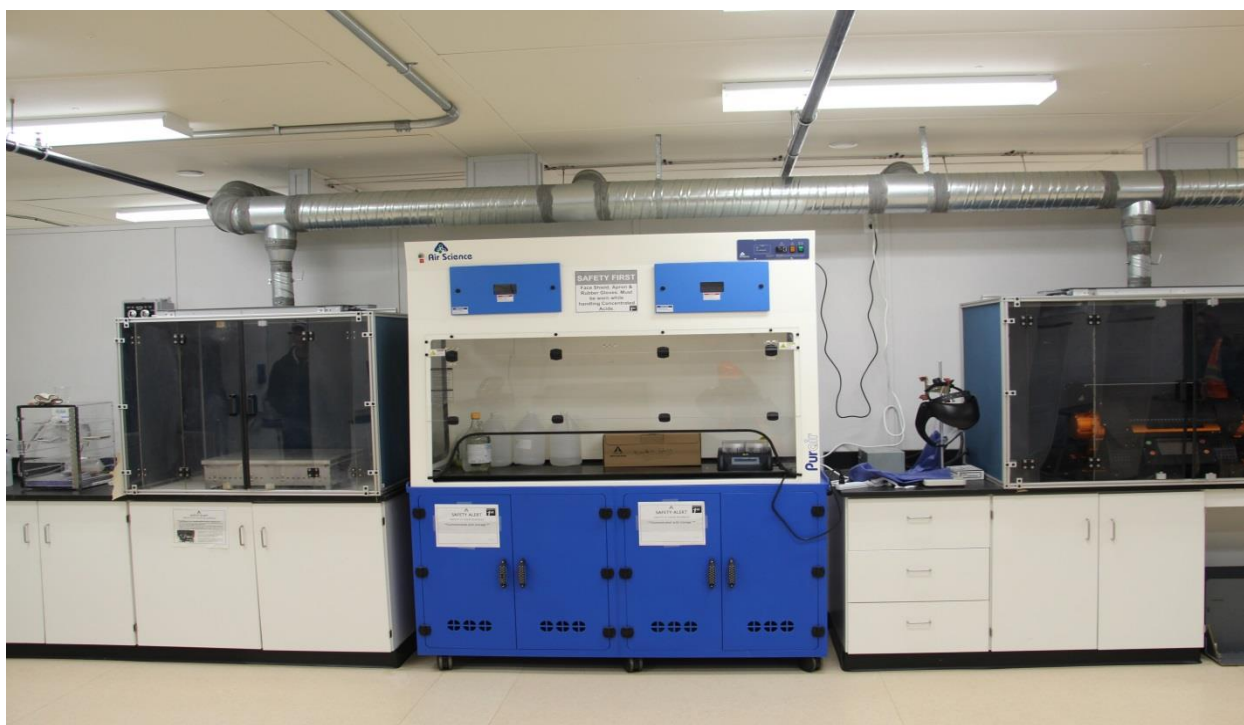


**Picture 1: Construction at Milne Port**





**Picture 2. Country food kitchen in the main building at Mary River**



**Picture 3. New laboratory**

### **Observations Based on NIRB Project Certificate [005]**

The following are observations made during the site visit that pertain specifically to terms and conditions of the Project Certificate:



## 2.2 Meteorology and Climate -Weather Monitoring Data

### Condition 5

*“The Proponent shall endeavour to explore and implement reasonable measures to ensure that weather-related information for the various Project sites is readily accessible to the public on a continual basis throughout the life of the Project.”*

The Monitoring Officer noticed a Weather Station at Mary River (Picture 4). Mr. Knight mentioned that there was limited public transmission of weather-related information from the station due to technological issues currently being addressed by Baffinland, but that he expected this would be improved by the next monitoring period. The technological upgrades proposed for onsite weather monitoring would ensure that weather-related information is readily accessible to the public from Baffinland’s website.



Picture 4: Weather station at Mary River

## 2.3 Air Quality- Dust Management and Monitoring Plan

### Condition 10 (item c)

*“The Proponent shall update its Dust Management and Monitoring Plan to address and/or include the following additional items:*

...

- c. *Outline specific plans for monitoring dustfall at intervals along and in the vicinity of the Milne Inlet Tote Road to determine the amount and extent of dustfall”*

During the site visit, the Monitoring Officer observed several dust-fall monitoring stations around the Mary River site and along the Tote Road. Through visual observation, the

Monitoring Officer further noted that the integrity of dust fall stations was not compromised from potential disturbance from natural elements (ice, precipitation or wind), carnivores or land based activities (Picture 5).



**Picture 5. Dustfall monitoring station**

## **2.4 Hydrology and Hydrogeology - Effluent Management**

### **Condition 17**

*“Develop and implement effective measures to ensure that effluent from project-related facilities and/or activities.....satisfies all discharge criteria requirement established by the relevant regulatory agencies prior to being discharged into the receiving environment.”*

### **Condition 24**

*“The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carry out treatment if necessary to ensure that discharge conditions are met at all times.”*

Baffinland has invested in different technological innovations to ensure that effective measures are taken to monitor effluents generated from the site; as noted during site visit, membrane bioreactors (MBR) and polishing waste stabilization ponds (PWSP) were in use at the Mary River and Milne Port sites to ensure effluents and treated sewage discharge criteria are met (Pictures 7 and 8). It was communicated to the Monitoring Officer that the use of a rotating biological contractor (RBC) for maintaining effluent quality had been replaced with the use of

the MBR. At Mary River, the Monitoring Officer noticed that the RBC was being used as a temporary holding tank for wastes prior to treatment or discharge (Picture 9).



**Picture 6. Effluent Discharge Area**



**Picture 7. MBR**



**Picture 8. PWSP**



**Picture 9. RBC**

## **2.5 Ground/Surface Water-Explosives**

### **Condition 20**

*“The Proponent shall monitor the effects of explosives residue and related by-products from project-related blasting activities as well as develop and implement effective preventative and/or mitigation measures, including treatment, if necessary, to ensure that the effects associated with the manufacturing, storage, transportation and use of explosives do not negatively impact the Project and surrounding areas.”*



During the site visit, the Monitoring Officer noticed that pre-packaged explosives were stored in explosive magazine storage; and that blasting activities was ongoing at different Project locations (Pictures 10 and 12). The area around the magazine storage appeared to be well maintained and isolated from sites frequented by workers. While plastic cones and liners were the only physical materials observed on recently blasted areas, the Monitoring Officer did not observe any existing site specific activities which indicated active monitoring, or treatment of explosive residues and related by-products from blasting activities (Picture 13).

#### **Condition 60**

*“Prior to construction, the Proponent shall develop a detailed blasting program to minimize the effects of blasting on terrestrial wildlife that includes, but is not limited to the restriction of blasting when migrating caribou, sensitive local carnivores or birds may be negatively affected.”*

The Monitoring Officer did not observe any migrating wildlife such as caribou, carnivores or birds within or around the vicinities of blasted areas.



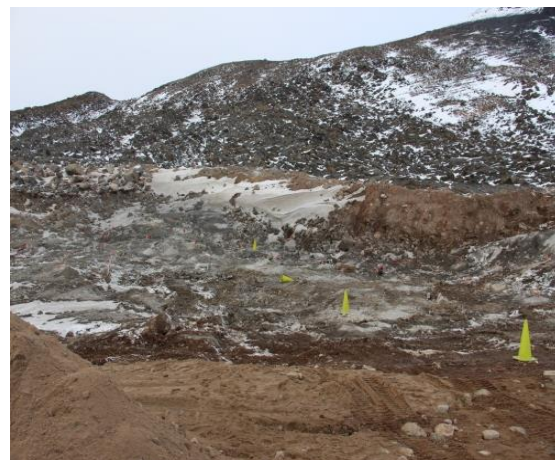
**Picture 10. Pre-packaged explosives storage**



**Picture 11. Explosives manufacturing plant**



**Picture 12. Vehicle used for blasting**



**Picture 13. Cones around a blasted area**

### Condition 23

*“The Proponent shall develop and implement a Groundwater Monitoring and Management Plan to monitor, prevent and mitigate the potential effects of the Project on groundwater within the Project area.”*

At Mary River, the Monitoring Officer noticed the installations of weirs for measuring volumetric flow rate; and groundwater monitoring stations around the landfill and ore stockpile area (Picture 14). Given the weather conditions during the site visit, the Monitoring Officer observed ice formations on the weir installations. The Monitoring Officer was not provided information as to whether ice conditions could interfere with the calibration of the sensor in the weir. It was also indicated that the monitoring points were sampled monthly to ensure that contact water met discharge criteria, and Mr. Knight mentioned that contact water which did not meet the water quality criteria would be treated prior to discharge.



**Picture 14: Water monitoring station**

## 2.6 Landforms, Geology and Geomorphology, Soils and Permafrost

### 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.”*

During the drive to Milne Port site, the Monitoring Officer identified some areas along the Tote road where it appeared that permafrost had been affected due to previous Project related disturbances (Picture 15). The Monitoring Officer was not given specific information regarding which preventative measures were adopted for use by Baffinland to protect the integrity of permafrost onsite.



**Picture 15: Area of disturbed permafrost along Tote Road**

## **2.7 Vegetation**

### **Condition 32**

*“The Proponent shall ensure that equipment and supplies brought to the Project sites are clean and free of soils that could contain plant seeds not naturally occurring in the area. Vehicle tires and treads in particular must be inspected prior to initial use in Project areas.”*

The Monitoring Officer noticed that heavy vehicles and machinery was in use at various Project sites (Picture 16). Mr. Knight commented that all vehicles were washed at the originating port prior to loading into seacans for transport to the Project sites. He further indicated that routine inspections were also conducted on the vehicle tires and treads to ensure that they are clean and free of soils that could contain plant seeds not indigenous to the area.



**Picture 16: Haul truck at Mary River**



## **2.8 Fresh Water Aquatic Environment**

### **Condition 46**

*“The Proponent shall ensure that runoff from fuel storage and maintenance facility areas, sewage and wastewater other facilities responsible for generating liquid effluent and runoff meet discharge requirements”*

The Monitoring Officer inspected the drain at the Milne Port incinerator and observed that there was runoff of liquid discharge going directly into the drainage. The Monitoring Officer did not observe any existing site specific activities which indicated active monitoring or treatment of the contaminated runoff from the containment units at the facility as indicated in Term and condition 24 of the Project Certificate:

*“The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carry out treatment if necessary to ensure that discharge conditions are met at all times”*

## **2.9 Terrestrial Wildlife and Habitat**

### **Caribou**

#### **Condition 53**

*“The Proponent shall demonstrate consideration for the following:*

- a. Steps taken to prevent caribou mortality and injury as a result of train and vehicular traffic, including operational measures meant to maximize the potential for safe traffic relative to operations on the railway, Milne Inlet tote road and associated access roads.*
- b. Monitoring and mitigation measures at points where the railway, roads, trails and flight paths pass through caribou calving areas, particularly during caribou calving times....”*

#### **Condition 61**

*“Whenever practical and not causing a human safety issue, a stop work policy shall be implemented when wildlife in the area may be endangered by the work being carried out. An operational definition of ‘endangered’ shall be provided by the Terrestrial Environment Working Group.”*

The Monitoring Officer did not observe caribou at Mary River, Milne Port or along the Tote Road. Mr. Knight mentioned that caribou were not frequently sighted around the Project areas; and in that the event that caribou or other wildlife are encountered, a right of way policy that requires vehicles to stop in order to allow wildlife to pass is in place. Ms. St. Paul-Butler and Mr. Knight further reported that wildlife logs, located in the main camp building, are kept up to date with a history of wildlife encountered or observed around Mary River and along the Tote Road (Picture 17).





location of the birds could not be verified, the Monitoring Officer noted that the cruising altitude and lateral distance maintained by the aircraft was not likely to pose any risk or threats to the birds (Pictures 18 and 19).



**Picture 18. Bird concentration at Mary River**



**Picture 19. Aircraft flying height**

## **Fire Arms and Wildlife Harvesting**

### **Condition 62**

*"The Proponent shall prohibit project employees from transporting firearms to site and from operating firearms in project areas for the purpose of wildlife harvesting."*

Mr. Knight and Ms. St. Paul-Butler informed the Monitoring Officer that, except for polar bear monitors, all employees are prohibited from having firearms in their possession while onsite. The Monitoring Officer was further informed that all firearms are stored in a secure location and are not used for wildlife harvesting.

## **Environmental Protection Plan**

### **Condition 64**

*"The Proponent shall ensure that its Environment Protection Plan incorporates waste management provisions to prevent carnivores from being attracted to the Project site(s)..."*

During the site visit, it was observed that the protective mesh around the landfill was significantly damaged, with some areas not properly enclosed with protective barrier to contain litter or debris that could be carried away by wind action or wildlife activities (Picture 21). The Monitoring Officer also observed that carnivore-proof skirting was installed to cover some areas of the kitchen and accommodation facilities at Mary River and Milne Port (Picture 22). The installation of skirting was not fully completed at the time of the site visit. No fence or protective barriers were observed at the land-farm located at Milne port. The Monitoring Officer also noted that the incinerator at Milne Port site was appropriately contained in a facility, while the incinerator at the Mary River site was not properly contained (Picture 20).



**Picture 21. Incinerator at Mary River**



**Picture 20. Waste landfill at Mary River**



**Picture 22. Carnivore-proof skirting**

## Birds

### Condition 66

*“If Species at Risk or their nests and eggs are encountered during Project activities or monitoring programs, the primary mitigation measure must be avoidance. The Proponent shall establish clear zones of avoidance on the basis of the species-specific nest setback distances outlined in the Terrestrial Environment Management and Monitoring Plan.”*

### Condition 70

*“The Proponent shall protect any nests found (or indicated nests) with a buffer zone determined by the setback distances outlined in its Terrestrial Environment Mitigation and Monitoring Plan, until the young have fledged. If it is determined that observance of these setbacks is not feasible, the Proponent will develop nest-specific guidelines and procedures to ensure bird’s nests and their young are protected.”*

During the site visit, Mr. Knight commented that one part of Baffinland’s bird monitoring strategy involved surveying Project areas for nests and eggs prior to the commencement of construction or operations. The Monitoring Officer was informed that four plover eggs and snow goose nests were encountered during a recent operation at Mary River, and that buffer zones and setback distances were in place to ensure that eggs, bird nests and the young are not disturbed by Project related activities until fledging has taken place (Picture 23). No specific information was given on what was done with these eggs and nests.



**Picture 23. Zones of avoidance for birds, nests and eggs along Tote Road**

## 2.10 Marine Environment

### Condition 92

*“The Proponent shall ensure that it maintains the necessary equipment and trained personnel to respond to all sizes of potential spills associated with the Project in a self-sufficient manner (marine shipping).”*



During the visit to Milne Inlet, the Monitoring Officer visually inspected the equipment used for oil spill response. While the fuel storage facilities at the Milne Port and the Mine site were fully commissioned, the Monitoring Officer did not observe any fuel leakage or spills. Spill kits were appropriately located at the Mary River and Milne Port sites (Pictures 25, 26 and 27). Mr. Knight and Ms. St. Paul-Butler also informed the Monitoring Officer that spill response training was recently conducted at the Milne Port site.



**Picture 25. Oil spill containment boom storage**



**Picture 24. Fuel Storage at Milne Port**



**Picture 27. Oil spill kit at Mary River**



**Picture 26. Marine oil spill equipment**

#### **Condition 124**

*“The Proponent shall prohibit project employees from recreational boating, fishing, and harvesting of marine wildlife in project areas, including Steensby Inlet and Milne Inlet. The Proponent is not directed to interfere with harvesting by the public in or near project areas, however, enforcement of a general prohibition on harvesting in project areas by project employees during periods of active employment (i.e. while on site and between work shifts) is required.”*

Mr. Knight and Ms. St. Paul-Butler noted that Baffinland has developed a hunting and harvesting policy<sup>1</sup> that requires check-in procedures for hunters in the area or those who are passing through the site for hunting activities.

### **2.11 Education and Training**

#### **Transferable skills and training**

#### **Condition 137**

*“Prior to construction, the Proponent shall develop an easily referenced listing of formal certificates and licences that may be acquired via on-site training or training during employment at Mary River, such listing to indicate which of these certifications and licences would be transferable to a similar job site within Nunavut. This listing should be updated on an annual basis, and is to be provided to the NIRB upon completion and whenever it is revised.”*

During the tour of the main building at Mary River, the Monitoring Officer visited the driving simulator room. Ms. St. Paul-Butler and Mr. Knight commented that the facility was commissioned in order to train employees on how to drive heavy equipment for site operations (Picture 28).



**Picture 28. Mary River driving simulator room**

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<sup>1</sup> Refer to Appendix W, supplemental to Baffinland’s 2013 Annual Report to the NIRB

## **2.12 Livelihood and Employment**

### **Employee family contact**

#### **Condition 143**

*“The Proponent is encouraged to consider the use of both existing and innovative technologies (e.g. community radio station call-in shows, cell phones, video-conferencing, Skype, etc.) as a way to ensure Project employees are able to keep in contact with family and friends and to ward off the potential for feelings of homesickness and distance to impact on employee retention and family stability.”*

The Monitoring Officer observed that the accommodation camps for resident employees at Mary River were equipped with land phones to allow employees stay in contact with family and friends while employed at site.

## **2.13 Human Health and Wellbeing**

#### **Condition 153**

*“The Proponent is encouraged to employ a mental health professional to provide counseling to Inuit and non-Inuit employees in order to positively contribute toward employee health and well-being.”*

The Monitoring Officer visited the health room at Mary River (Picture 29). The facility appeared well equipped with important health care instrumentations and pharmaceuticals. Ms. St. Paul-Butler also indicated that Baffinland would be recruiting mental health professionals in the future to provide mental health counselling for Inuit and non-Inuit employees.



**Picture 29. Mary River health room**



## 2.14 Culture, Resources and Land Use

### Condition 165

*“The Proponent is strongly encouraged to provide buildings along the rail line and Milne Inlet Tote Road for emergency shelter purposes, and shall make these available for all employees and any land users travelling through the Project area. In the event that these buildings cannot, for safety or other reasons be open to the public, the Proponent is encouraged to set up another form of emergency shelters (e.g. seacans outfitted for survival purposes) every 1 kilometre along the rail line and Milne Inlet Tote Road....”*

The Monitoring Officer observed two emergency shelters along the Milne Inlet Tote Road, at Kilometres 33 and 69 respectively (Picture 30). The Monitoring Officer was informed that these emergency shelters were for use by Project personnel only.



Picture 30. Emergency shelter along Tote Road (at Kilometre 33)

## 3 FINDINGS AND SUMMARY

Due to the ongoing development of the Mary River Project, it was noted that many terms and conditions as contained within the NIRB Project Certificate may not be applicable for this monitoring period and/or have not been completely adopted at this time by Baffinland.

During the site visit, the Monitoring Officer observed that facilities in operation and those that were under construction were generally well-maintained. In order to fully meet the requirements of the Project Certificate terms and conditions, and to ensure that potential adverse impacts to the environment are adequately mitigated, the Monitoring Officer has identified several issues that require follow-up and corrective action:

### **3.1 Waste Management**

#### **3.1.1 Sewage Sludge Disposal from Membrane Bioreactor (MBR)**

During the site visit, the Monitoring Officer observed that sewage sludge from the membrane bioreactor (MBR) was not disposed of properly. It was noted that the wastes recovered from the MBR process were contained in what appeared to be non-biodegradable bags and stored in an external containment unit without a protective lid or cover (Picture 31 and 32). This disposal practice could potentially expose the wastes to activities from wildlife, birds or natural elements (precipitation, runoff and wind); or generate localized malodours if and when the wastes are accidentally exposed to air.



**Picture 32. Sewage sludge disposal**



**Picture 31. Improper solid waste disposal**



**Picture 34. Damaged landfill fence**



**Picture 33. Land-fill waste**



### 3.1.2 Waste Landfill Protection Barrier

Also during the site visit, the Monitoring Officer observed that the protective mesh around the landfill was significantly damaged, with some areas not properly enclosed with protective barrier to contain litter or debris that could be carried away by wind action or wildlife activities (Pictures 33 and 34). The issue as noted by the Monitoring Officer is an important item for consideration given that the NIRB Project Certificate term and condition 64 stipulates that:

*“The Proponent shall ensure that its Environment Protection Plan incorporates waste management provisions to prevent carnivores from being attracted to the Project site(s).”*

There is need for immediate follow-up action on this item in order to ensure that waste disposed of in the landfill is properly contained and does not attract wildlife or become dispersed off-site due to natural elements such as wind or runoff.

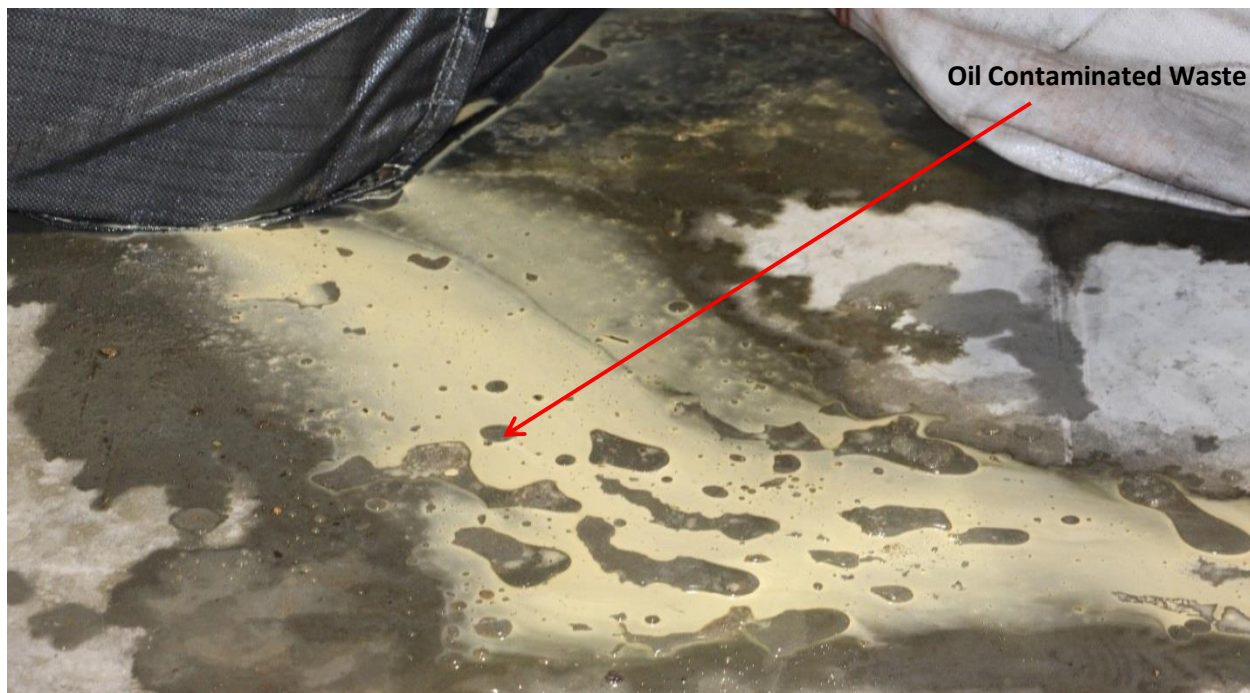
### 3.1.3 Liquid Wastes and runoff to Drainage System

The NIRB Project Certificate term and conditions 24 and 46 stipulate respectively, that:

*“The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carry out treatment if necessary to ensure that discharge conditions are met at all times.”*

*“The Proponent shall ensure that runoff from fuel storage and maintenance facility areas, sewage and wastewater other facilities responsible for generating liquid effluent and runoff meet discharge requirements”*

During the visit to Milne Port, the Monitoring Officer noticed oil contaminated wastes on the floor of the incinerator facility (Pictures 35 and 36). The waste was observed to have originated from containment leakage at the facility. While the Monitoring Officer could not verify the specific source of the leakage, or ascertain when the leakage started, there are concerns that containment methods employed at the facility may not be effective in containing liquid wastes. It was also observed that there had been runoff of the waste into the floor drain located at the incinerator facility. The Monitoring Officer did not verify whether the drainage was connected to the waste water treatment facility or MBR, however, it is noted that any potential occurrence of oil and grease presence in the liquid discharge may upset the MBR process and damage the MBR membranes, thus adversely affecting the quality of effluent generated from the system.



**Picture 35. Liquid influents on the floor of the incinerator facility at Milne Inlet**



**Picture 36. Runoff of oil contaminated discharge to waste drain**

### 3.2 Landfarm - Contaminated Snow, Soil and Synthetic Liners

At Milne site, the Monitoring Officer visited the landfarm that is currently used as a disposal site for contaminated snow and soils. While at the landfarm, it was noted that synthetic liners had been co-disposed of with other contaminated snow and soil materials (Picture 37). The landfarm was not enclosed with any kind of protective fencing to prevent the discarded synthetic liners from being dispersed offsite by wind action or being accessed by wildlife. The NIRB Project Certificate term and condition 64 stipulates that:

*“The Proponent shall ensure that its Environment Protection Plan incorporates waste management provisions to prevent carnivores from being attracted to the Project site(s).”*

Furthermore, no monitoring stations were observed within and around the vicinity of the landfarm. Term and condition 24 of the Project Certificate stipulates that:

*“The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carry out treatment if necessary to ensure that discharge conditions are met at all times.”*

Monitoring stations are essential to ensure that relevant parameters of the effluent from the landfarm are continuously monitored and meet relevant criteria prior to discharge to the receiving environment. The Monitoring Officer has indicated the need for Baffinland to be consistent with the monitoring protocol as outlined in its Surface Water and Aquatic Ecosystem Management Plan.<sup>2</sup>



Picture 37. Landfarm

<sup>2</sup> Section 9.2.3 of Appendix N.04- Surface Water and Aquatic Ecosystem Management Plan (Supplemental to 2013 Annual Report).



### 3.3 Discharge Monitoring Station

The Monitoring Officer observed the presence of snow and ice formations on the weir used for monitoring ground/surface water discharge around Mary River. Term and condition 23 of the NIRB Project Certificate states:

*“The Proponent shall develop and implement a Groundwater Monitoring and Management Plan to monitor, prevent and/or mitigate the potential effects of the Project on groundwater within the Project area.”*

As Baffinland indicated that the monitoring station is sensor-based, the Monitoring Officer noted concerns that ice formation could interfere with the station’s normal functioning and could destabilize calibration for monitoring.



Picture 38. Water monitoring station

### 3.4 Blasting and Explosive Residue Monitoring

In consideration of the ongoing blasting activities on site and the likelihood for the occurrence of ammonia nitrate residues and associated runoff from blasted areas, the Monitoring Officer was not made aware of any system in place that specifically addresses the monitoring of explosive residues and related by-products as stipulated in Project Certificate Term and Condition 20:

*“The Proponent shall monitor the effects of explosives residue and related by-products from project-related blasting activities as well as develop and implement effective preventative and/or mitigation measures, including treatment, if necessary, to ensure that*

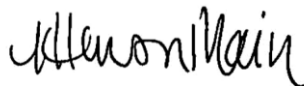
*the effects associated with the manufacturing, storage, transportation and use of explosives do not negatively impact the Project and surrounding areas.”*

**Prepared by:** Solomon Amuno, PhD  
**Title:** Technical Advisor/Monitoring Officer  
**Date:** October 2, 2014



Signature: \_\_\_\_\_

**Reviewed by:** Amanda Hanson Main  
**Title:** Director, Technical Services  
**Date:** October 23, 2014



Signature: \_\_\_\_\_