

Environmental Protection Operations Directorate  
Prairie & Northern Region  
5019 52<sup>nd</sup> Street, 4<sup>th</sup> Floor  
P.O. Box 2310  
Yellowknife, NT X1A 2P7

ECCC File: 6100 000 011/001  
NIRB File: 08MN053



July 4, 2024

via email at: [info@nirb.ca](mailto:info@nirb.ca)

Cory Barker  
Manager, Project Monitoring  
Nunavut Impact Review Board  
29 Mitik Street  
P.O. Box 1360  
Cambridge Bay, NU X0B 0C0

Dear Cory Barker:

**RE: 08MN053 – Baffinland Iron Mines Corporation – Mary River Project – 2023 Nunavut Impact Review Board Annual Report**

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Impact Review Board (NIRB) regarding the above-mentioned annual report.

ECCC provides expert information and knowledge to project assessments on subjects within the department's mandate, including climate change, air quality, water quality, biodiversity, environmental preparedness and emergencies. This work includes reviewing proponent characterization of environmental effects and proposed mitigation measures. We provide advice to decision-makers regarding a proponent's characterization of environmental effects, the efficacy of their proposed mitigation activities, and may suggest additional mitigation measures. Any comments received from ECCC in this context does not relieve the proponent of its obligations to respect all applicable federal legislation.

The following comments are provided:

**1. Compliance Monitoring**

Comment

No authorizations from ECCC have been issued.

The Proponent's Mary River Project is captured under several pieces of ECCC legislation such as subsection 36(3) of the *Fisheries Act* (FA), *Metal and Diamond Mining Effluent Regulations* (MDMER), *Canadian Environmental Protection Act* (CEPA), *Environmental Emergency* (E2) *Regulations*, *Cross-border Movement of Hazardous Waste and Hazardous Recyclable Material Regulations* (XRB), *Storage Tank Systems for Petroleum Products and*



*Allied Petroleum Products Regulations (STSR), Sulphur in Diesel Fuel Regulations, and Greenhouse Gas Pollution Pricing Act/Output-Based Pricing System Regulations.*

#### On-Site Inspections

1. July 10-12, 2023

- Multi-regulation on-site inspection conducted to verify compliance under FA, MDMER, E2 Regulations, XRB, and STSR at Milne Inlet Port Site, Mary River Mine Site, the Tote Road, and the Haul Road via helicopter and truck.

2. October 9-11, 2023

- Multi-regulation on-site inspection conducted to verify compliance under FA, MDMER, E2 Regulations, XRB, and STSR at Milne Inlet Port Site, Mary River Mine Site, the Tote Road, and the Haul Road via helicopter and truck.
- MDMER chemistry and toxicity sampling not conducted during this inspection as all effluent discharges were stopped from all final discharge points (FDPs) at the time of the inspection.
- No non-compliance determined from this inspection.

#### MDMER

The Project is subject to the MDMER. The purpose of the MDMER is to authorize a deposit of certain deleterious substance(s) into water frequented by fish while monitoring the environmental effects of those deposits to ensure that deleterious substances are not released in quantities or concentrations that could result in harmful effects on waters frequented by fish. To do this, certain effluent deposit conditions (concentrations, limits and parameters) apply so that regulatees are exempted and protected from the more stringent prohibition of subsection 36(3) under the FA. Samples of the effluent by the Proponent must be taken and tested at the identified FDP to ensure the above conditions are met on a scheduled basis and reported. The four current FDPs are as follows:

1. FDP MS-06 Crusher Stockpile Pad Sedimentation Pond intermittently pumped during open water season via pipeline to Mary River.
2. FDP MS-08 Waste Rock Sedimentation Pond intermittently pumped during open water season to Water Treatment Plant then on tundra (land) to flow naturally to Mary River Tributary then to Mary River.
3. FDP MS-07 KM106 Stockpile Surface Water Management Pond intermittently pumped during open water season on tundra (land) to flow naturally 250M to Mary River.
4. FDP MS-11 KM105 Surface Water Management Pond intermittently pumped during open water season on tundra (land) to flow naturally to Sheardown Lake Tributary one to West Basin of Sheardown Lake.

The MDMER required reports are to be submitted in ECCC's online database (Mine Effluent Reporting System [MERS]) and are reviewed by an assigned Enforcement Officer on a quarterly basis. The quarterly administrative regular report verifications are conducted to ensure the sampling and testing has been conducted in accordance with the MDMER and

that the reports are submitted on time. Each Enforcement Activity includes an administrative report verification of each quarterly report which are due 45 days at the end of each quarter: 1st Quarter (due May 15), 2nd Quarter (due Aug 14), 3rd Quarter (due Nov 14) and 4th Quarter (due Feb 14), as well as an administrative report regular verification of the 2023 Annual Effluent Monitoring Summary Report (due March 31). Furthermore, an administrative report regular verification was completed on the Environmental Effects Monitoring (EEM) 2022 Annual Report (information related to effluent and water quality monitoring studies) and as part of this verification, the officer submitted a copy of the report to the EEM Coordinator for review to also confirm compliance.

In 2023, the Proponent submitted all required MDMER reports as follows:

1. First Quarter:
  - Report submitted on time.
  - FDP MS-06: Administrative verification not conducted as no effluent was discharged through this FDP during Q1, therefore no compliance issues
  - FDP-MS-08: Administrative verification not conducted as no effluent was discharged through this FDP during Q1, therefore no compliance issues
  - FDP MS-07: Administrative verification not conducted as no effluent was discharged through this FDP during Q1, therefore no compliance issues
  - FDP MS-11: Administrative verification not conducted as no effluent was discharged through this FDP during Q1, therefore no compliance issues
2. Second Quarter:
  - Report submitted on time.
  - FDP MS-06: Effluent was discharged in Q2; no non-compliance was determined
  - FDP MS-08: Administrative verification not conducted as no effluent was discharged through this FDP during Q2, therefore no compliance issues
  - FDP-MS-07: Effluent was discharged in Q3; no non-compliance was determined
  - FDP-MS-11: Administrative verification not conducted as no effluent was discharged through this FDP during Q2, therefore no compliance issues
3. Third Quarter:
  - Report submitted on time.
  - FDP MS-06: Effluent was discharged in Q3; no non-compliance was determined
  - FDP-MS-08: Effluent was discharged in Q3; the following non-compliance was determined:
    - a. 4(1) MDMER - Deposit of a deleterious substance (Suspended Solids) concentration (33.3mg/l) exceeding the maximum authorized concentration (30.0mg/l). Also reported as Spill Report 2023-456 – Warning Letter Issued.
    - b. 4(1)(a) MDMER – Suspended Solids monthly (Sept 2023) mean concentration (33.3mg/l) exceedance in excess of the maximum authorized monthly mean concentration (15.0mg/L) in a grab sample. Also reported as Spill Report 2023-456 – Warning Letter Issued.

- c. 38(5) FA – Fail to notify an authority of a release of a deleterious substance (Suspended Solids) without delay.
- FDP MS-07: Effluent was discharged in Q3; no non-compliance was determined
- FDP MS-11: Effluent was discharged in Q3; no non-compliance was determined
- 4. Fourth Quarter:
  - Report submitted on time.
  - FDP MS-06: Administrative verification not conducted as no effluent was discharged through this FDP during Q4, therefore no compliance issues
  - FDP-MS-08: Administrative verification not conducted as no effluent was discharged through this FDP during Q4, therefore no compliance issues
  - FDP MS-07: Administrative verification not conducted as no effluent was discharged through this FDP during Q4, therefore no compliance issues
  - FDP MS-11: Administrative verification not conducted as no effluent was discharged through this FDP during Q4, therefore no compliance issues
- 5. 2023 Annual Effluent Monitoring Report:
  - Report was submitted on time and no compliance issues noted.
- 6. 2023 Annual EEM Report:
  - Report was submitted on time and no compliance issues noted.

#### ECCC Files Regarding Reported 2023 Spills

1. 2023-177 – Lead agency Crown-Indigenous and Northern Affairs Canada (CIRNAC) – Freshet Sediment Release to Sheardown Lake Tributary - File closed – No Enforcement Action Taken under FA 36(3)
2. 2023-208 – Lead Agency CIRNAC – Suspended Solids Dam Seepage From KM 105 Surface Water Pond – File Open
3. 2023-245 – Lead agency CIRNAC – Freshet Sediment Release to Milne Port - File closed – No Enforcement Action Taken under FA 36(3)
4. 2023-248 – Lead agency CIRNAC – Freshet Sediment Release to Camp Lake and Sheardown Lake - File closed – No Enforcement Action Taken under FA 36(3)
5. 2023-258– Lead agency CIRNAC – Freshet Sediment Release to water crossing BG-32 - File closed – No Enforcement Action Taken under FA 36(3)
6. 2023-276 – Lead Agency CIRNAC – Suspended Solids release at KM 106 stockpile- File closed – No Enforcement Action Taken under FA 36(3)
7. 2023-294 - Lead Agency CIRNAC - Uncontrolled sediment release into Milne Inlet - File Open
8. 2023-297 – Lead Agency CIRNAC – Effluent seepage from diversion east ditch leading to MS-08 pond - File Open
9. 2023-343– Lead Agency CIRNAC – Freshet Sediment Release to water crossings, KM-92, KM-84 CV-212, CV-214, BG-30, BG-01, BG-04, and BG-17 - File closed – No Enforcement Action Taken under FA 36(3)

10. 2023-366 – Lead Agency CIRNAC – Mary River Iron Ore Stockpile ditch seepage to tundra - File closed – No Enforcement Action Taken under FA 36(3)
11. 2023-456 – Lead Agency CIRNAC – Suspended Solids Exceedance – File Closed - Warning Letter Issued under MDMER

## **2. Non-compliant flights over Snow Geese Moulting Area**

### Reference(s)

- 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)
  - Table 4.18: Descriptions of Pilot Rationales Given for Low-Level Flights
- NIRB Appendix G.5.1: 2023 Terrestrial Environment Annual Monitoring Report (Environmental Dynamics Inc.; March 2024)

### Comment

The Proponent reported a 72% compliance rate with flight heights in snow goose areas during the moulting season (July-August). While ECCC understands that compliance is not always possible subject to pilot discretion, to verify the reported rates of compliance, reviewers need to know the acceptable and approved operational purposes which constitutes rationale for categorizing an otherwise non-compliant flight as compliant. A list of these rationale is provided in Table 4.18 of the 2023 Annual Report Main Document.

Further, rationale for flights within a horizontal distance of <1500m from Snow Goose Moulting Area have not been included in Table 4.18. Rationale is provided in the 2023 Terrestrial Environment Annual Monitoring Report (TEAMR) (Footnote 8, pg. 23):

*“...this 1,500 m horizontal buffer is not always practical as it results in longer flight times and prolongs potential disturbance. Alternatively, pilots occasionally fly over the eastern edge of the Snow Geese area to reduce flight time and minimize potential disturbance.”*

It is not clear whether the rationale to reduce flight time by flying over the Snow Goose Moulting Area has been approved by the Terrestrial Environment Working Group (TEWG) and the NIRB, and where this approval has been recorded. It is not clear whether flights over the Snow Goose Moulting Area were classified as compliant with rationale, non-compliant, or compliant.

### ECCC Recommendation(s)

ECCC recommends that the Proponent clarify how flights over the Snow Goose Moulting Area were classified, and how this is represented in reported rates of compliance.

ECCC recommends that the Proponent confirm whether the list of rationale for low level flights in Table 4.18, and the rationale for close vertical flights in the TEAMR, have been accepted by the TEWG and the NIRB.

ECCC recommends that the Proponent record all flight non-compliance rationale in the next version of the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP), which is currently under revision, and share that plan with reviewers.

### 3. Eider Species and Mortalities

#### Reference(s)

- NIRB Appendix G.5.1: 2023 Terrestrial Environment Annual Monitoring Report (Environmental Dynamics Inc.; March 2024)
- Re: Mary River Project - Bird Mortality Notification. (Email from Todd Swenson <todd.swenson@baffinland.com> to CWS North (ECCC) <cwsnorth-scfncord@ec.gc.ca>; January 25, 2024)

#### Comment

The 2023 TEAMR states that 13 King Eider mortalities were documented in 2023, all individual mortalities.

Canadian Wildlife Service (CWS)-ECCC received an email notification from Todd Swenson of Baffinland on November 2, 2023 (with a follow up on January 25, 2024), which reported 13 Common Eider mortalities occurred during a single incidence with the same cause of death for all individuals (ship loading infrastructure collision following winterization and reduced lighting). This mortality event has not been captured in the 2023 TEAMR.

More information about corrective measures taken following multiple mortalities can help to inform the effectiveness of corrective measures.

#### ECCC Recommendation(s)

ECCC recommends that the Proponent add the mortalities of the 13 Common Eiders.

ECCC recommends that the Proponent summarize, in future annual reports, any corrective measures taken following wildlife mortalities, and whether any further mitigations are being proposed, considered, or implemented to reduce further mortality events.

### 4. Project-related ship track and sea ice information – Marine Birds

#### Reference(s)

- 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)
  - Section 4: Performance on PC Terms and Conditions

#### Comment

Term and Condition #103 states: “*The Proponent shall report annually to the NIRB regarding project-related ship track and sea ice information, including ... e. When employing ice-breaking, marine bird and mammal species and number of individuals attracted to ship tracks in ice.*”

Information has been provided for marine mammal species and number of individuals attracted to ship tracks in ice; no information was provided on marine bird species related to ship track attraction. It is not clear if no data was collected, or if no data is available because no marine bird species were observed. Clarification should be included in the annual reports and were needed with a rationale for lack of data, to demonstrate full compliance.

ECCC notes that the Proponent did report that there were no seabird collision incidents in 2023.

ECCC Recommendation(s)

ECCC recommends the Proponent report on the number of marine birds attracted to ship tracks in ice and include this information in future annual reports to be compliant with Term and Condition #103.

## 5. Program for Regional and International Shorebird Monitoring

Reference(s)

- Terrestrial Environment Mitigation and Monitoring Plan (Baffinland; 2016)

Comment

The Proponent's TEMMP identified songbirds and shorebirds as a Key Indicator (KI) for follow-up monitoring. Section 2.2 Birds states (pg. 42 of 128): "*Baffinland will assist in regional-level monitoring by the Canadian Wildlife Service (CWS) looking at regional diversities of songbirds and shorebirds.*"

Section 4.4 Birds Monitoring further states (pg. 65 of 128) that Baffinland has "... *committed to assisting the CWS in regional baseline research and monitoring of these species. The monitoring program involves 20 PRISM plots conducted within the RSA every five years (Table 4-7).*" This is part of Term and Condition #73 and #74.

The 2023 Annual Report states that the previous Program for Regional and International Shorebird Monitoring (PRISM) survey was held more than 5 years ago, in 2018, and it consisted of 14 plots. While Covid-19 restrictions have been a challenge for maintaining monitoring programs, the collection of baseline data is still valuable and should be re-initiated.

ECCC Recommendation(s)

ECCC recommends that the Proponent re-initiate PRISM surveys to monitor shorebirds and provide an update on when the next PRISM surveys are planned.

## 6. Avian Mortalities

Reference(s)

- 2022-2023 Annual Monitoring Report for Baffinland Iron Mines Corporation's Mary River Project (NIRB; January 2024)
  - Table 3: Summary of Parties' Comments and the Proponent's Response on Baffinland's 2022 Annual Report

### Comment

In 2023, ECCC recommended that the Proponent report all avian mortalities to ECCC directly to ECCC's CWS (via [cwsnorthscfnord@ec.gc.ca](mailto:cwsnorthscfnord@ec.gc.ca)), as indicated in the TEMMP and in a detailed and timely manner (ECCC #7), and that the Proponent utilize the nesting window from late May to mid-August when applying mitigations (ECCC #8).

The 2023 Annual Report demonstrates that these recommendations have been implemented.

ECCC notes for the record that the 2022 Annual Monitoring Report for Baffinland Iron Mines Corporation's Mary River Project, comments ECCC #7 and ECCC #8 have been resolved.

### ECCC Recommendation(s)

N/A

## **7. Comparison of monitored PM<sub>2.5</sub> concentrations with CAAQS**

### Reference(s)

- NIRB Appendix G.2.1 2023 Air Quality, Dustfall, and Meteorology Report (Nunami Stantec Limited; April 30, 2024)
  - Section 1.1: Background and Objectives
  - Section 2.3.3: Respirable Particulates 2.5µm in Diameter and Less (PM<sub>2.5</sub>)
- 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)
  - Section 4: Performance on PC Terms and Conditions
- Canadian Ambient Air Quality Standards (<https://ccme.ca/en/air-quality-report#slide-7>) (Canadian Council of Ministers of the Environment)

### Comment

In the air quality report, the Proponent compared monitored PM<sub>2.5</sub> concentrations with the Nunavut Ambient Air Quality Standards (NAAQS) and Northwest Territories Ambient Air Quality Standards. While these have been considered the Project standards for PM<sub>2.5</sub>, it would be of value to compare the results with the Canadian Ambient Air Quality Standards (CAAQS) as the CAAQS is formulated from health-based science. If the comparison had been made with the CAAQS, more exceedances might have been observed at both monitoring stations (Port Site Complex [PSC] and Mine Site Complex [MSC]), as the CAAQS is the more stringent standard.

As mentioned in Section 1.1 of the air quality report, *"The potential applicability of the 2020 CAAQS to the Project was considered as part of the monitoring framework and Baffinland determined that the 2020 CAAQS would be used for comparison purposes only in agreement with the CCME objective to "keep clean areas clean" with respect to ambient air quality."*

While monitored NO<sub>2</sub> and SO<sub>2</sub> concentrations were compared to the CAAQS, this was not the case for PM<sub>2.5</sub>.



#### ECCC Recommendation(s)

ECCC recommends that the comparison of monitored PM<sub>2.5</sub> concentrations be made with the CAAQS, in addition to the already considered standards.

### **8. Issues at monitoring stations**

#### Reference(s)

- NIRB Appendix G.2.1 2023 Air Quality, Dustfall, and Meteorology Report (Nunami Stantec Limited; April 30, 2024)
  - Section 5.1: Ambient Air Quality Monitoring Program
- 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)
  - Section 4: Performance on PC Terms and Conditions

#### Comment

In the air quality report (Section 5.1), the Proponent mentions a few issues that occurred with the monitoring stations, which prevented the collection of monitored data for a certain period. The PSC monitoring station was unable to gather data on concentrations from January to April (4 months) due to cold temperatures causing flow controller and air temperature sensor failures. Additionally, the MSC SO<sub>2</sub> monitor experienced an ultraviolet (UV) lamp failure, which resulted in data invalidation for March and April (2 months). Although the situation was corrected by replacing the UV lamp or the SO<sub>2</sub> monitor, the Proponent doesn't mention any measures to avoid this type of event.

#### ECCC Recommendation(s)

ECCC recommends that the Proponent investigate the issues that prevented collection of monitored data and determine any lessons learned that would prevent reoccurrences of these.

### **9. Exceedances of monitored PM<sub>2.5</sub> concentration**

#### Reference(s)

- NIRB Appendix G.2.1 2023 Air Quality, Dustfall, and Meteorology Report (Nunami Stantec Limited; April 30, 2024)
  - Section 5.1: Ambient Air Quality Monitoring Program
- 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)
  - Section 4: Performance on PC Terms and Conditions

#### Comment

In the air quality report (Section 5.1), the Proponent mentions exceedances of monitored PM<sub>2.5</sub> and total suspended particulates (TSP) concentrations. At the mine complex site monitoring station, the annual average and 24-hour average TSP concentrations were greater than the Project standard. The average annual PM<sub>2.5</sub> concentrations (6.17 µg/m<sup>3</sup>)

were less than the Project standard (10 µg/m<sup>3</sup>) but are just slightly below the CAAQS PM<sub>2.5</sub> standard (8.8 µg/m<sup>3</sup>). At the PSC monitoring station, the annual average TSP concentrations were less than the Project standard. However, there were 17 instances of 24-hour TSP monitored concentrations exceeding the Project standard. Regarding PM<sub>2.5</sub>, there were 2 occurrences of monitored concentrations being higher than the Project standard, and more exceedances could be observed when compared to CAAQS.

While the monitored concentrations, due to their location, may not be directly compared to standards (NAAQS, CAAQS), they provide insight into air quality impacts that may occur outside the project's designated area. Continuous application of best practices is important to ensure a reduction in air quality emissions trends over the years. The Proponent could implement a preventive approach framework based on trigger values with associated additional mitigation measures.

Furthermore, the Proponent mentions the following in the air quality report (Section 5.1): *"Additional controls to limit the amount of fugitive dust that escapes during ore crushing and transportation activities at the mine site should be investigated and implemented where possible"*. A follow-up is required to determine what will be done in this regard.

#### ECCC Recommendation(s)

ECCC recommends that dust related best practices continue to be applied to minimize particulate matter concentration and dust deposition levels.

ECCC recommends that a preventive approach framework based on trigger values with associated additional mitigation measures be implemented.

ECCC recommends the Proponent, when available, should provide information regarding the additional controls that will be implemented to limit the amount of fugitive dust that escapes during ore crushing and transportation activities.

## **10. Inter-annual trends for air contaminants**

#### Reference(s)

- 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)
  - Section 4: Performance on PC Terms and Conditions

#### Comment

In the main report (page 245), it is mentioned that *"Subsequent annual reports will include an explicit comparison of inter-annual trends determined by passive dustfall monitoring and satellite imagery analysis"*. Providing inter-annual mean annual concentrations of dust deposition enables detection of trends and readjustments when necessary. It may be beneficial to provide inter-annual concentrations for other relevant air contaminants.

#### ECCC Recommendation(s)

ECCC recommends that the Proponent provide inter-annual concentrations trends for other relevant air contaminants (PM<sub>2.5</sub>, TSP, NO<sub>2</sub>, SO<sub>2</sub>).

## 11. Incinerator stack testing

### Reference(s)

- 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)
  - Section 4: Performance on PC Terms and Conditions
- NIRB Appendix G.2.2 – Incinerator Stack Testing Report (WSP Canada Inc.; February 2023)
  - Section 6.2: Observations and Comments
- NIRB Appendix G.8.2 – Waste Management Plan (Baffinland; April 15, 2024)
  - Section 4.5: Incinerators

### Comment

Stack testing was conducted for the two incinerators, one at the mine site and one at the port. At the port site incinerator, the average concentration of dioxins and furans (126 µg/DRm<sup>3</sup>) exceeded the Canadian Council of Ministers of the Environment Canada-wide Standard of 80 µg/DRm<sup>3</sup>, with a peak concentration of 242 µg/DRm<sup>3</sup>.

In the Incinerator Stack Testing Report (Section 6.2, p.13), it is mentioned that oily rags were incinerated prior to the stack testing. Additionally, during testing, the quantity of waste was measured largely in descriptive terms, with no weight or details of the garbage bag contents available.

Furthermore, in the Waste Management Plan (Section 4.5, p.24), it is mentioned that *‘Incinerator waste will be segregated according to the Incinerator Operation Procedure (BAF-PH1-320-PRO-0002) to ensure only suitable materials are incinerated to achieve a complete burn-cycle. Incineration of hazardous wastes, non-combustible materials, or treated wood products is prohibited. The incineration of plastics will be minimized to the maximum extent practicable. Incineration of some food-related and other plastics will be unavoidable; however, best efforts will be made to reduce/prevent incineration of plastics containing chlorine molecules, which can generate dioxins and furans.’*

To ensure minimization of incomplete combustions and of dioxins and furans emissions, it is important to follow the Incinerator Operation Procedure during testing or during normal operations.

### ECCC Recommendation(s)

ECCC recommends that segregation of incineration waste be conducted accordingly to the Incinerator Operation Procedure to limit the emissions of dioxins and furans.

## 12. Open Burning

### Reference(s)

- NIRB Appendix G.8.2 – Waste Management Plan (Baffinland; April 15, 2024)
  - Table 2 Waste Disposal by Generation Location

### Comment

In the Waste Management Plan (Table 2), it is mentioned that untreated wood and cardboard may either be incinerated or open burned. The Nunavut's Environmental Guideline for the Burning and Incineration of Solid Waste (page 9) discourage open burning as a method for disposing of unsegregated or mixed solid waste. ECCC also discourages the use of open burning and would prioritize other options such as incinerating cardboard and untreated wood.

### ECCC Recommendation(s)

ECCC recommends that cardboard and untreated wood be incinerated or disposed of in another cleaner way instead of being open burned.

## **13. Change in vessel type**

### Reference(s)

- Appendix G.6.16 - Comparative Assessment of Shipping Operations Along the Northern Shipping Route with and Without Capesize Ore Carriers (Baffinland; January 31, 2024)
  - Section 3: Summary
- 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)
  - Section 4: Performance on PC Terms and Conditions

### Comment

In Appendix G.6.16 (Section 3.0), the use of a larger vessel (Capesize) is considered to reduce the number of vessels, transits, and berthing and loading events.

Using a larger vessel generally contributes to higher air quality contaminant concentrations over shorter periods (hourly, 24-hour), even if the annual average concentration may decrease. Upon analyzing future monitored results at the PSC monitoring station with the new vessels, further mitigation measures could be beneficial to reduce the impact during the shipping season.

### ECCC Recommendation(s)

ECCC recommends that the monitored concentrations at the PSC station be analyzed regularly during the shipping season for any changes in vessel type during onshore wind conditions to assess whether any changes in air contaminant concentrations occur for shorter periods. If an upward trend is observed, further mitigation measures should be considered.

## **14. Erosion and sedimentation control measures**

### Reference(s)

- 2023 QIA-NWB Annual Report for Operations (Baffinland; March 31, 2024)

- Section 7.3.9: Snow Stockpile Monitoring
  - Section 7.3.10: Freshet Monitoring
  - Section 7.4: Surface Water Runoff Downstream of Project Areas and Quarries
- NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2023, Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2024)
  - Section 4.4.2: Sediment Quality

### Comment

Controlling erosion and sedimentation on site during freshet continues to be challenging. Uncontrolled seepage of 447 319 m<sup>3</sup> from the KM105 Surface Water Management Pond resulted in release of water with elevated TSS. This release impacted water quality at downstream stations (MS-C-A, MS-C-B & MS-C-F), and is potentially impacting sediment quality in Sheardown Lake NW. A prompt and permanent solution to managing water routed to this pond is necessary to prevent future releases.

Several other total suspended solids (TSS) exceedances were noted, including at the snow stockpiles and quarries. At both locations, erosion and sedimentation control measures were installed and maintained including coir logs, silt fences and rock check dams. In the case of quarries, these measures were implemented after sampling indicated there was a problem. It is not clear if measures at the snow stockpiles were installed before or after sampling indicated TSS exceedances. Since both these areas can be expected to generate runoff with high TSS, mitigation measures should be proactive and installed prior to TSS exceedances.

Elevated concentrations of suspended sediment degrade water quality and controlling releases are particularly important around the mine site as sediment will likely have high metal concentrations.

### ECCC Recommendation(s)

ECCC recommends the Proponent take proactive measures to prevent erosion and sedimentation in areas that are expected to generate runoff with high TSS.

## **15. Investigation on quality of distilled water**

### Reference(s)

- 2023 QIA-NWB Annual Report for Operations (Baffinland; March 31, 2024)
  - Section 7.8: Quality Assurance and Quality Control (QA/QC)
- NWB Appendix E.11.1/NIRB Appendix G.3.1 - 2023 Annual Groundwater Monitoring Program (Knight Piésold Consulting; March 28, 2024)
  - Section 4.1: QA/QC and Laboratory Issues

### Comment

Field and travel blanks for both the Surveillance Network Program surface water samples and the groundwater monitoring samples had an anomalously high number of parameters detected. The annual report states: “*Quality of distilled water and/or laboratory analytical error is a likely explanation for these elevated parameter values. In 2024, Baffinland plans on testing the distilled water used to make field and travel blanks to determine if our assessments are correct.*” It is not clear if the results of the testing will be analyzed sufficiently early in 2024 to implement any necessary corrective actions, and if the results and follow-up will be shared with reviewers.

Quality Assurance and quality control are integral to water sampling as they qualify what confidence we can have in the results.

### ECCC Recommendation(s)

ECCC recommends the Proponent promptly determine the source of detectable concentrations in the field and travel blanks for water samples and bring the necessary corrections prior to field sampling in 2024. Test results and corrective measures should be described in the next annual report.

## **16. Mitigation measures for mine related influences identified in Core Receiving Environment Monitoring Program**

### Reference(s)

- NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2023, Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2024)
  - Table 6.1: Summary of AEMP Benchmark Exceedances and Effects Determination for the Mary River Project 2023 CREMP and Monitoring Recommendations Based on the Results

### Comment

For three monitoring locations concentrations of certain water quality parameters in exceedance of Aquatic Effects Monitoring Plan benchmarks, are elevated relative to reference and baseline conditions, and show increasing trends. For these locations, recommendations include an investigation of potential sources. The parameters of interest are:

- Sheardown Lake Tributary 9: ammonia, nitrate and total Kjeldahl nitrogen (TKN)
- Sheardown Lake NW: nitrate, chloride, sulphate, total and dissolved molybdenum and uranium
- Sheardown Lake SE: nitrate, sulphate, and total and dissolved molybdenum and uranium

In addition to identifying potential sources, further work should also include recommending mitigation measures to reduce mine impacts to water quality once potential sources have been identified.

#### ECCC Recommendation(s)

ECCC recommends the Proponent propose mitigation measures to reduce mine impacts following their investigations of potential sources impacting water quality at Sheardown Lake Tributary 9, Sheardown Lake NW, and Sheardown Lake SE, as applicable.

### **17. Suitability of wells installed in 2023 for groundwater monitoring**

#### Reference(s)

- NWB Appendix E.11.1/NIRB Appendix G.3.1 - 2023 Annual Groundwater Monitoring Program (Knight Piésold Consulting; March 28, 2024)
  - Section 4.2: Well Installation Issues
  - Section 5.0: Conclusion and Recommendations

#### Comment

Several issues with the groundwater monitoring well installation are identified. These issues include factors that can affect representativity of groundwater level measurements (such as the perforated casings) and groundwater quality (such as the lack of a bentonite seal). Results from the 2023 monitoring program were not discussed as “*a result of the limitations that occurred during the 2023 monitoring program*”. Though there were also issues with Quality Assurance/Quality Control, sampling and well development, it is not clear if the wells installed in 2023 will be suitable for groundwater monitoring in the future.

Groundwater monitoring at the landfill is necessary to identify if contaminants are migrating towards Sheardown Lake so that mitigation measures can be taken as appropriate to protect the aquatic environment.

#### ECCC Recommendation(s)

ECCC recommends the Proponent discuss if groundwater wells installed in 2023 can be used to collect reliable data. If so, they should include a discussion of any corrective measures necessary on the wells and caveats that will be associated with the data. If wells are unsuitable for use, ECCC recommends the Proponent install new wells.

### **18. Migration of contaminants in groundwater next to landfill**

#### Reference(s)

- NWB Appendix E.11.1/NIRB Appendix G.3.1 - 2023 Annual Groundwater Monitoring Program (Knight Piésold Consulting; March 28, 2024)
  - Section 5.0: Conclusion and Recommendations

- NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2023, Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2024)
- NWB Appendix E.12 - Response to 2022 Annual Report Comments (Baffinland; March 2024)
  - Table E.12.2: Response to ECCC Comments on Baffinland's 2022 QIA-NWB Annual Report for Operations
- NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2022 Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2023)
- NWB Appendix E.12.3/NIRB Appendix G.3.3 - Development of a Conceptual Contaminant Transport Model for the Landfill at the Mary River Mine Site (Knight Piésold Consulting; March 28, 2023)

#### Comment

Potential migration of contaminants through groundwater from the landfill to Sheardown Lake was identified as a pathway in the 2022 the Core Receiving Environment Monitoring Program Report and a conceptual contaminant transport model was outlined in a memorandum; however, there was insufficient data to populate the model.

This issue from 2022 is not presented in the 2023 annual report. The 2023 Core Receiving Environment Monitoring Program Report no longer mentions the landfill as a potential source of contaminants, above 2023 groundwater monitoring results were not interpreted, and no reference to the contaminant transport model was found. The Proponent's response on ECCC's 2022 comment on this topic states they "*will continue to collect sufficient additional groundwater data to complete the contaminant transport model.*" The response also proposed three potential mitigation measures "*In the absence of the results of the contaminant transport model*". It is not clear if any of these potential mitigation measures will be implemented and if so, on what timeline.

#### ECCC Recommendation(s)

ECCC recommends the Proponent:

- clarify why the landfill is no longer included as a potential source of contaminants to Sheardown Lake in the Core Receiving Environment Monitoring Program Report;
- specify a timeline for completion of the contaminant transport model; and
- clarify if any of the proposed potential mitigation measures for preventing contaminant migration through groundwater from the landfill to Sheardown Lake will be implemented, and if so, provide a timeline.

If you need more information, please contact Melissa Pinto at (867) 445-5384 or [Melissa.Pinto@ec.gc.ca](mailto:Melissa.Pinto@ec.gc.ca).



Sincerely,

*[original signed by]*

Melissa Pinto  
Senior Environmental Assessment Officer

cc: Eva Walker, Head, Environmental Assessment North (NT and NU)  
Richard Dwyer, Manager of Licensing, Nunavut Water Board