Crown-Indigenous Relations and Northern Affairs Canada
Relations Couronne-Autochtones et Affaires du Nord Canada

CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's Mary River Project 2023 Annual Report

Canada

Nunavut Regional Office
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Your file - Votre référence
08MN053
Our file - Notre référence
GCDocs #126619128

July 4, 2024

Cory Barker, M.Sc.
Manager, Project Monitoring
Nunavut Impact Review Board
P.O. Box 1360
Cambridge Bay, NU, X0B 0C0
Via electronic mail to: info@nirb.ca

Re: Comment Request for Baffinland Iron Mines Corporation's Mary River Project 2023 Annual Report

Dear Cory Barker,

On May 9, 2024, as per Section 12.7.3 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty The Queen in Right of Canada* (*Nunavut Agreement*), s. 135(4) of the *Nunavut Planning and Project Assessment Act,* S.C. 2013, c. 14 *(NuPPAA)*, and the amended Mary River Project Certificate No. 005, the Nunavut Impact Review Board (NIRB) requested parties to review Baffinland Iron Mines Corporation's (Baffinland's) 2023 Annual Report with respect to effects and compliance monitoring.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) has conducted a review of the 2023 Annual Report and related documents in areas under its mandate pertaining to effects and compliance monitoring. On this basis, CIRNAC would like to provide the comments attached for the NIRB's consideration.

CIRNAC appreciates the opportunity to review Baffinland's Mary River Project 2023 Annual Report and looks forward to working with the NIRB and Baffinland through future reviews for this project. Should you have any questions, please do not hesitate to contact Alexandre Chaikine by email at alexandre.chaikine@rcaanc-cirnac.gc.ca.

Sincerely,

Richard Bingley
A/Manager, Impact Assessment

1. ***Effects Monitoring***

The 2023 Annual Report has been evaluated to assess the measurable changes to the valued components/indicators under CIRNAC areas of interest, compared to the potential effects that were predicted to result from a proposed development of the Mary River Iron Mine Project, taking into account the Final Environmental Impact Statement (FEIS), previous years' monitoring reports and the requirements included in the Project Certificate. The assessment considered the following:

a. ***Whether the conclusions reached by Baffinland in the 2023 Annual Report are valid; and,***
b. ***Any areas of significance requiring further supporting information or any changes to the monitoring program which may be required.***

Within the areas under its mandate, CIRNAC did not identify any information that would invalidate the conclusions reached by Baffinland in the 2023 Annual Report. However, CIRNAC is providing Technical Review Comments (TRCs) for the NIRB's consideration, with the following notes:

- TRC #1 – 6 incorporate ongoing recommendations from the 2022 Annual Report which, in the opinion of CIRNAC, have yet to be addressed.
- In addition to ongoing recommendations from prior years, CIRNAC has identified four TRCs (#7 - 10) that are new for the 2023 reporting year.

Comment Number:	**CIRNAC #1**
Subject:	**Dust Management and Monitoring**

Reference:	• Project Certificate No. 005 (Amendment 05) (November 17, 2023) Terms and Conditions #10, 21
	• Baffinland Iron Mines Corporation (Baffinland) 2023 Annual Report to the Nunavut Impact Review Board (NIRB) (May 03, 2024):
	  ○ Section 4.6.2 Air Quality
	  ○ Section 4.6.5 Groundwater & Surface Water
	  ○ Section 4.6.6 Vegetation
	• Baffinland. 2024. The NIRB's 2022-2023 Annual Monitoring Report for the Mary River Project – Updates to Parties Comments on the 2022-2023 Annual Report (NIRB File No. 08MN053)
	• EDI Environmental Dynamics Inc. (EDI) 2024. Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (TEAMR) (March 2024)
	• Nunami Stantec Limited (Nunami). 2023 Annual Air Quality, Dustfall and Meteorology Report. (April 30, 2024)
	• Nunami Stantec Limited and Independent Dust Audit Committee Members (Dust Audit Committee). 2023. Baffinland Dust Audit Final Recommendations Report. (February 8, 2023)

Issue/Rationale:	In the last three Mary River Annual Reports (2020 to 2022), CIRNAC recommended that Baffinland consider including the following measures to increase the quality of monitoring activities:

	a) Testing the chemical composition of soil base sites for bioavailable metal loadings from the dust, resulting from contact with surface water/soil moisture (for example, acidity, leachable metals, sulphate, nitrate). CIRNAC acknowledges that Baffinland will include leachability studies as a response option if soil metal concentrations are higher than baseline or Canadian Council of Ministers of the Environment (CCME) guideline values over two consecutive years. This measure would address ongoing concerns regarding the generation of dust by Project components and the potential effects of dustfall on aquatic receiving environments, which are reiterated in the Dust Audit Committee Report (2023). CIRNAC recognizes that seasonal dustfall rates are provided in the 2023 TEAMR; however, dust analytical data is absent in the reporting. The vegetation and soil base metals sampling program was not carried out in the 2023 season. The data would support the assessment of the impacts of dust on surface water and sediment quality. CIRNAC reiterates its 2022 Annual Review comment that, while bulk chemistry (including metals) soil sampling is a good measure of the spatial extent of dustfall related to the Project Development Area (PDA), it is not an indicator of contaminant mobility within aquatic receiving environments. Baffinland should determine if dustfall rates correlate with direct or indirect contaminant loading into aquatic environments based on geochemical testing of dust-impacted soil and sediment. To characterize contaminant mobility and potential impacts on aquatic environments, CIRNAC suggests pairing bulk metal soil sampling with leachability sampling to better understand the soluble constituents in the dustfall. Characterizing the leachability would help Baffinland understand the indirect transport pathways of dissolved soluble constituents to aquatic receptors, as dissolved soluble constituents are generally more bioavailable to aquatic receptors. To visualize and evaluate the sources and extent of metal contamination within the PDA, Baffinland should consider developing a dustfall impact Conceptual Site Model (CSM). The CSM should be a living document that is used to continually evaluate the sources of contamination, and direct and indirect dustfall transport pathways and identify where impacts to aquatic receptors may be occurring throughout the PDA. This CSM could be included in Appendix G.5.3: Program for Identifying Conditions with High Risk for Dust Dispersion.
Recommendation:	CIRNAC recommends that Baffinland consider improvements to the quality of monitoring activities, which could include the following measures:

	a) Develop a dustfall impact CSM to summarize and evaluate the sources and extent of contamination and transportation pathways while considering meteorological variables, and where impacts to receptors may be occurring within the PDA. b) Indicate how dustfall rates correlate with direct or indirect contaminant loading into aquatic environments based on geochemical testing of dust-impacted soil and sediment. c) Implement leachability studies in the Terrestrial Environment Mitigation and Monitoring Plans adaptive management action toolkit if soil metal concentrations are higher than baseline or CCME guideline values over two (2) consecutive years.

Comment Number:	**CIRNAC #2**
Subject:	**Waste Rock Facility – Identification and Management of Acid Rock Drainage / Metal Leaching Waste Rock Materials**

Reference:	• Project Certificate No. 005 (Amendment 05) (November 17, 2023) Terms and Conditions #16, 17, 23, 24, 46
	• CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's 2021 Annual Report for the Mary River Project (June 15, 2022)
	• Baffinland 2022 Annual Report to NIRB.
	  ○ Section 4.6.4 Hydrogeology and Hydrogeology
	  ○ Section 4.6.5 Groundwater & Surface Water
	  ○ Section 4.6.7 Freshwater Environment
	• Baffinland 2022 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual Report for Operations (March 31, 2023)
	• Baffinland 2022 QIA and NWB Annual Report for Operations:
	  ○ Appendix E.6. Waste Rock Geochemistry Analytical Sampling Results. (March 2023).
	• Baffinland Response to Comments Received for Baffinland's Production Increase Proposal Extension 2020 Annual Monitoring Report (August 2021).
	• Baffinland. 2024. The NIRB's 2022-2023 Annual Monitoring Report for the Mary River Project – Updates to Parties Comments on the 2022-2023 Annual Report (NIRB File No. 08MN053)

Comment Number:	CIRNAC #2

	• Baffinland 2023 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual report for Operations (March 31, 2024)
	• Baffinland Response to NIRB's Recommendations from the 2022-2023 Annual Report (March 20, 2024)
	• Waste Rock Management Plan – June 2023 through September 2026 (January 2024)
	• Appendix G.8.4 Aquatics Effects Management Plan (March 31, 2024)
	• 2023 QIA-NWB Annual Report (March 31, 2024)
	• Appendix G.8.3 Fresh Water Supply, Sewage and Wastewater Management Plan (April 20, 2024)
	• Baffinland 2023 Annual Report to NIRB:
	  ○ Section 4.6.4 Hydrogeology and Hydrogeology
	  ○ Section 4.6.5 Groundwater & Surface Water
	  ○ Section 4.6.7 Freshwater Environment
	• NIRB 2022-2023 Annual Monitoring Report – The Mary River Project (January 2024; NIRB File No. 08MN053)
	• 2023 QIA-NWB Annual Report. Appendix E 5.4 – Phase 2 Waste Rock Management Plan. Appendix A1 – 2020 to 2022 waste rock geochemistry report (January 16, 2024)

Issue/Rationale:	**<u>Increased Waste Rock Volumes</u>** CIRNAC's issues #1 and #2 raised in its 2021 review of the Annual Report remained relevant during the 2022 annual review cycle. Per Section 5.3.1 and Table 5.8 of the 2022 QIA and NWB Annual Report, the proportion of potential acid-generating (PAG) waste for the year (23.5%) remained above the anticipated total for the life of mine (LOM), warranting a comment on updated LOM tonnage estimates of PAG waste rock, and confirmation that the Waste Rock Facility (WRF) design and mitigation measures for operation and mine closure are still appropriate. In the updated Waste Rock Management Plan (January 2024), Baffinland estimates a PAG placement proportion of less than 10% between June 2023 and September 2026. A potential increase in PAG percentage on the validity of the conclusions of the Waste Rock Management Plan was not discussed. In 2023, 5% of the waste rock samples that were tested were classified as PAG, and 7% were classified as Uncertain and treated as PAG, resulting in a total of 12% of the waste material being treated as PAG. This value continues to be higher than the projected value (i.e., less than 10%). The potential for increased volumes of PAG waste rock is not discussed in the updated waste rock management plan. Increased PAG waste rock volumes affect closure costs and required bonds. CIRNAC notes that Baffinland will prepare a memo on waste rock reconciliation for material mined between 2014 and 2022, and will provide this memo to regulators no later than June 30th, 2024. **<u>Comparison of Field and Laboratory Measurements</u>**

Comment Number:	CIRNAC #2
	In the 2022 Annual Report, a review of the drill blast test work data (Appendix E.6) suggests approximately 17.5% of samples (924 samples) have an x-ray fluorescence scan (XRF-S) value between 0.05% and 0.2%. The Acid-Base Accounting (ABA) analysis reported in the 2023 QIA-NWB annual report shows that carbonates are not contributing to the neutralizing potential. It is therefore uncertain if acid neutralization would be fast enough to prevent acid rock drainage (ARD) in these rocks. Conservatively, this indicates a potential classification of rock as PAG. This suggests that previous requests by CIRNAC, as listed below, remain relevant in terms of the 2020 Baffinland commitment to '*further evaluation of the geochemical monitoring dataset and screening criteria*' (Baffinland Response to Comments Received for Baffinland's Production Increase Proposal Extension 2020 Annual Monitoring Report, 2021). The required monitoring and analysis of geochemical data is described below. During the review of the 2023 material, it was identified that the field protocol included measurement of sulfur content (by Leco and XRF) and paste pH. The updated Waste Rock Facility (WRF) Management Plan provides a comparison of the on-site measurement and full laboratory measurements including ABA for the 2020 to 2022 data set. According to that comparison, only 2% were incorrectly categorized as PAG, and 0.5% were incorrectly categorized as non-PAG. A sensitivity analysis regarding the uncertainty of the 0.2% threshold was performed. While the ABA analysis confirmed the field screening analysis, it also shows that no carbonate is available for the neutralization potential. Buffering by silicate minerals might be slow compared to the acid production by ARD depending on the mineralogy. Detailed analysis of the neutralizing minerals or results from humidity cells could determine the validity of the ABA results in the absence of carbonate minerals. An analysis of the uncertainty of the sulfur threshold has already been requested in 2023 and Baffinland committed to its inclusion in the updated Phase 1 Waste Rock Management Plan. However, the updated management plan does not include this analysis.
Recommendation:	CIRNAC recommends that Baffinland in the 2024 Annual report: a) Provide an updated LOM estimation of PAG tonnages and confirmation that the WRF design and contingencies for closure are still appropriate. b) Confirm the neutralization potential of the silicates in the waste rock and evaluate how the results impact the practice of determining ARD potential based on paste pH and 0.2% sulfur content only.

Comment Number:	CIRNAC #3
Subject:	**Groundwater Monitoring and Management Plan**
Reference:	• Project Certificate No. 005 (Amendment 05) (November 17, 2023) Term and Condition 23 • CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's 2021 Annual Report for the Mary River Project (June 15, 2022) • Baffinland. 2024. The NIRB's 2022-2023 Annual Monitoring Report for the Mary River Project – Updates to Parties Comments on the 2022-2023 Annual Report (NIRB File No. 08MN053) • Baffinland. 2022 Annual Report to NIRB (April 30, 2023): ○ Section 4.6.5 Groundwater & Surface Water • Knight Piesold Consulting (Knight Piesold). 2023a. 2022 Groundwater Monitoring Program Report (March 2023) • Knight Piesold. 2023b. 2022 Groundwater Monitoring Program Assessment (March 2023) • Knight Piesold. 2024a. 2023 Annual Groundwater Monitoring Program (March 2024) • Knight Piesold. 2024b. Mary River Project Groundwater Monitoring Program Review and Assessment • Minnow Environmental Inc (Minnow). 2023. Mary River Project 2022 Core Receiving Environmental Monitoring Program (CREMP) Report (March 2023) • Tetra Tech, 2021. 2021 Groundwater Monitoring Program Mary River Mine Project (March 24, 2022)
Issue/Rationale:	Baffinland continues to implement the Groundwater Monitoring and Management Plan to monitor, prevent and/or mitigate the potential effects of the Project on groundwater within the Project area (Knight Piesold 2024a). No analytical data was presented as part of the 2023 program so there is no evidence to show that groundwater was sampled, and no comment was provided on water quality exceedances, trends, water quality issues or preventative/mitigation efforts. Knight Piesold 2024a indicated that the new wells were installed without bentonite seals, as is the standard practice, which means that surface water can directly enter the wells and negatively impact the quality of groundwater. Since its review of Baffinland's 2021 Annual Report, CIRNAC has consistently recommended that the program be expanded to include the Waste Rock Facility (WRF). CIRNAC notes that two shallow test pits were advanced in the 2021 program in the WRF area however no information was provided regarding their location, field observations (i.e. test pit logs) or photos. Regardless of their location, two test pits are not representative of the WRF area due to the overall size; therefore, the data collected from the two test pits is insufficient to gain a better understanding of the

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	groundwater levels, stratigraphy characterization, permeability, groundwater quality, and groundwater flow direction. Increasing mine-related water quality trends have been identified in the downgradient surface water sample Mary River Tributary-F (MRTF) which have been suggested by Baffinland to be related to effluent discharge from the WRF at MS-08. If there is groundwater bypassing the WRF collection trenches since the WRF is unlined then the impacts observed in MRTF may not be related to the discharge of treated water.
Recommendation:	CIRNAC recommends that Baffinland: a) Provide the results of the 2023 groundwater monitoring program to confirm that sampling was done and impacts on groundwater quality have been identified. b) Confirm if the new wells will be equipped with bentonite seals and what preventative and/or mitigation measures will be completed to prevent surface water from entering the wells and impacting groundwater quality sampling c) Provide additional rationale as to how two test pits are deemed satisfactory for determining the presence of groundwater within the WRF. This should include a map of test pit locations, test pit logs, photos of the test pits, and a conceptual site model showing how the two test pits characterize potential groundwater within the WRF area. d) Expand the groundwater monitoring program to include additional testing in the WRF area and other potentially significant sources of groundwater contamination at the mine in future years,

Comment Number:	CIRNAC #4
Subject:	**Aquatic Effects Monitoring Plan and Dustfall Monitoring**

Reference:	• Project Certificate 005 (Amendment 05) (November 17, 2023) Term and Condition (T&C) 21
	• Baffinland. 2024. The NIRB's 2022-2023 Annual Monitoring Report for the Mary River Project – Updates to Parties Comments on the 2022-2023 Annual Report (NIRB File No. 08MN053)
	• Baffinland Iron Mines Corporation (Baffinland) 2023 Annual Report to the Nunavut Impact Review Board (NIRB) (May 03, 2024):
	  ○ Section 4.6.4 Hydrology and Hydrogeology
	  ○ Section 4.6.5 Groundwater & Surface Water
	• Appendix G.5. Terrestrial Environment Reports. EDI Environmental Dynamics Inc. (EDI) 2024. 2023 Terrestrial Environment Annual Monitoring Report (TEAMR). (March 2024).

Comment Number:	CIRNAC #4
	• Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report. Minnow Environmental. 2024. Mary River Project 2023 CREMP (March 2024) • Appendix G.4.3. 2023 Lake Sedimentation Monitoring Report. Minnow Environmental. 2024. Mary River Project - Lake Sedimentation Monitoring 2022/2023. • Appendix. G.8.4. Aquatic Effects Monitoring Plan (AEMP) (Rev 2) Document # BIM-5200-PLA-0023 (March 31, 2024)
Issue/Rationale:	Term and Condition 21 requires the inclusion of measures for dustfall monitoring "*to assess seasonal deposition (rates, quantities) and chemical composition of dust entering aquatic systems along representative distance transects at right angles to Tote Road and radiating outward from Milne Port and the Mine Site.*" As noted by CIRNAC in its 2022 Annual Report review, incorporating dustfall results from the TEAMR into the reporting for the Core Receiving Environment Monitoring Program (CREMP) and Lake Sedimentation Monitoring Program (Appendices G.4.1 and G.4.3) would support validating the effectiveness of the respective monitoring activities. CIRNAC recommends taking, an adaptive management approach to identifying the need for added protection measures, adaptations to the monitoring programs, and updates to the Aquatic Effects Monitoring Program (AEMP). In Its reply to CIRNAC Baffinland indicated that "*the results of Baffinland's dustfall monitoring program will be considered in the interpretation of data for the CREMP and Lake Sedimentation programs in the future. Specifically, changes in environmental conditions determined from the CREMP and/or Lake Sedimentation programs will be evaluated considering information from the dustfall monitoring program to assess for potential source-related linkages*". While the 2023 TEAMR states that "*dustfall samples were also analyzed for total metals concentrations to characterize contaminants of potential concern…*" the referenced section and report contain no analytical data for dust samples
Recommendation:	CIRNAC recommends that Baffinland: a) Provide the dustfall chemical composition data as required by Term and Condition 21; and, b) Update the CREMP and Lake Sedimentation Monitoring Program to clearly define the trends in dustfall with the intent of informing the adaptive management of these activities..

Comment Number:	CIRNAC #5
Subject:	**Performance of New MS-11 Surface Water Management Pond at KM105**

Reference:	• Project Certificate 005 (Amendment 05) (November 17, 2023) Term and Condition 16, 17, 22 and 24
	• Baffinland. 2024. The NIRB's 2022-2023 Annual Monitoring Report for the Mary River Project – Updates to Parties Comments on the 2022-2023 Annual Report (NIRB File No. 08MN053)
	• Baffinland Iron Mines Corporation (Baffinland) 2023 Annual Report to the Nunavut Impact Review Board (NIRB) (May 03, 2024):
	  ○ Section 3.1 Site Activities Completed in 2023
	  ○ Section 4.3 Summary of 2022 Compliance with Terms and Conditions
	  ○ Section 4.5.2 Unauthorized Discharges and Spills
	  ○ Appendix G.2.4 2023 .2.Geotechnical Inspection Reports
	• NWB. 2013. NWB Type "A" Water Licence No. 2AM-MRY1325
	• NWB. 2015. NWB Type "A" Water Licence No. 2AM-MRY1325, Amendment No. 1
	• Baffinland 2023 QIA and NWB Annual Report for Operations:
	  ○ 7.3.6 Mine Site KM105 Surface Water Management Pond
	  ○ Appendix E.8.2 - QIA Inspection Reports and Baffinland Response
	• Knight Piesold. 2021. Mary River Project – Mine Site Water Management Plan. June 30. Ref: NB102-181/63/2, Rev 2.

Issue/Rationale:	MS-11 surface water management pond at KM 105 (KM105 pond) is a part of the first phase of the Long-Term Water Management Plan (LTWMP) implementation to address erosion and sedimentation at the Mine Site (Knight Piesold 2021). KM105 pond collects surface water runoff from the main mine Deposit No.1 which was operational in 2022. An exceedance of Total Suspended Sediment (TSS) was detected during an uncontrolled discharge event on May 20, 2023 before the initiation of controlled discharge of effluent. The initial event resulted in an elevated TSS concentration of 200 mg/L. This measurement was above the water licence criteria of 30 mg/L for TSS concentrations in a grab sample in water quality samples collected from a newly established water quality monitoring station. According to the pond design, TSS settling was expected to be met after three days of retention. Seepage was reported to flow through the porous geologic structures adjacent to and below the dam structure, and Baffinland reported that these events have had no impact on the dam integrity. Seepage monitoring showed a gradual reduction in TSS over the summer; however, the water quality was subject to fluctuations in sediment suspension observationally correlated with heavy rainfall events throughout the month of August. Monitoring was continued at seepage location KM105-SWMP-SEEP-02 for the duration of the 2023 flowing

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	water season as a follow-up to the initial spill report. Seepage remediation work implemented in 2023 included the use of a bentonite mixture to fill voids. Immediate response for seepage remediation included: • Multiple bentonite plugs to seal the seepage in the base of the KM 105 Pond which were deemed to be unsuccessful. • Manually pre-dosing coagulant/flocculent treatment of run-off inflow to the pond to accelerate settling along the flow path of the run-off through the structure to reduce seepage TSS levels. • Mitigation measures of temporary check dam installations upstream and downstream of KM 105 and • Ditch regrading in accordance with Baffinland's Surface Water and Aquatic Ecosystem Management Plan (SWAEMP; BAF-PH1-830-P16-0026) for sediment control. The development of long-term remedial measures at the KM 105 Pond is ongoing. An engineered grout curtain barrier is currently being installed up-stream of the dam structure to permanently address the seepage. Installing a grout curtain to provide a seepage barrier through the dam foundation is expected to be completed prior to the 2024 freshet. Baffinland is also investigating the addition of a seepage collection system to capture any potential residual seepage at the toe of the dam, with the intent to redirect non-compliant water back to the dam. No water treatment for TSS removal was implemented at the MS-11/KM105 Pond prior to freshet 2023, to meet the conditions of the Metal and Diamond Mining Effluent Regulations (MDMER) and Type "A" Water Licence Discharge Criteria. Term and Condition 24 relates to water treatment for TSS removal.
Recommendation:	CIRNAC recommends that Baffinland address and report on the following measures taken on KM105 Pond in Appendix G.2.4 (Geotechnical Inspection Reports) of its 2024 Annual Report: a) Confirm installation and commissioning of a water treatment system as a polishing step for TSS removal; and, b) provide the results of MS-11/KM105 pond monitoring in the 2024 Annual Report as per Terms and Conditions 24.

Comment Number:	CIRNAC #6
Subject:	**Surface Water – Elevated Nitrate in Surface Water**
Reference:	• Project Certificate 005 (Amendment 04) Term and Condition 17 and 20 • Baffinland. 2022 Annual Report to NIRB (April 30, 2023): ○ Section 4.6.5 Groundwater & Surface Water • Knight Piesold. 2023a. 2022 Groundwater Monitoring Program Report (March 2023) • Knight Piesold. 2023b. 2022 Groundwater Monitoring Program Assessment (March 2023) • Minnow. 2023. Mary River Project 2022 CREMP (March 2023) • Minnow. 2024. Mary River Project 2023 CREMP (March 2024) • Okane 2024, Mary River Mine 2023 Environmental Audit
Issue/Rationale:	Increasing leveland/or mine-related influences of nitrogen parameters were noted in several water bodies including the Mary River Tributary, Sheardown Lake Tributaries, and Sheardown Lakes. Baffinland indicated that they will monitor water quality effluent from the waste rock facility (WRF) and MRTF, as well as assess for potential sources of certain parameters within the Sheardown system. As per 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.
Recommendation:	CIRNAC recommends that Baffinland: a) Conduct monitoring and source contaminant characterization along the Mary River Tributary to assess additional potential impacts of explosives; and, b) Provide additional details on how the trends for nitrogen parameters from mine-related influences will be investigated across the whole mine site.

Comment Number:	CIRNAC #7 (new)
Subject:	**Thermal Monitoring of WRF**
Reference:	• 2022 QIA-NWB Annual Report. • Baffinland. 2023 Annual Report to NIRB • 2023 QIA-NWB Annual Report. Appendix E5.4 – Phase 2 Waste Rock Management Plan. Appendix A2 – Thermal model and

Comment Number:	CIRNAC #7 (new)
	assessment of conceptual summer deposition strategies for the waste rock storage facility at Mary River Mine technical memorandum.
Issue/Rationale:	In the 2023 Annual Report, no further updates to the WRF instrumentation beyond 2019 have been included. Previously, CIRNAC requested that Baffinland use additional instrumentation and update the thermal analysis, including heat and oxygen balances across the WRF. Results from a study of thermal monitoring were provided as part of the 2023 annual report to QIA-NWB but were not included in the report to NIRB. Baffinland lists the installation of additional WRF temperature monitoring instrumentation including at known areas of PAG disposal in the "Conclusion and Recommendations" section. The original instrumentation program implemented for the thermal assessment included thermistors, oxygen sensors, fluid pressure sensors, barometers, and piezometers. Of the original two oxygen probes and two piezometers only one piezometer was still working in 2022. Of the thermistors, at least half were considered inactive in 2022, and no 2023 status update was provided. No oxygen or soil moisture data has been presented to date. It is difficult to verify the mitigation strategy of frozen waste rock in the deposition strategy without monitoring data from thermistors and oxygen sensors. Without the ability to verify the strategy's efficacy, any management methods that require the plan's success cannot be verified either. Baffinland provided a thermal model of the WRF based on the thermistor data. The thermal model is based on conductive heat transfer, and no inputs from heat generation from geochemical reactions or convective air flow have been incorporated into the model. Deviations from the conductive model have been attributed to geochemical changes and/or convective airflow, with no analytical basis. **Calibration, validation, and sensitivity analysis of the model** Section 4 and 5 of "2023 QIA-NWB Annual Report. Appendix E.5.4 – Appendix A2 – Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock Storage Facility at Mary River Mine Technical Memorandum" presents a model of the temperature distribution and future predictions in the WRF. The standard procedure is that the model is calibrated based on a set of historical data and the calibration is validated based on a second, independent set of data. Following the validation, a sensitivity analysis is performed. A validation step was not mentioned in the report, a sensitivity analysis is briefly mentioned without providing details. The model has been calibrated with temperature data from three years, one of which was missing data for about six months. The

Comment Number:	CIRNAC #7 (new)
	gap was filled with data from the previous year (2020-2021). While no additional data was available when the report was written, a discussion of the impact of calibration with a very short data set must be included in the 2024 Annual Report. **Thermistor data for BH1** <u>Temporary warming</u> The vertical thermistor string at BH1 shows rapid temperature increases at 4.86 m, 6.86 m, and 9.85 m, which was explained by a preferential flow path bringing in warmer air. Baffinland suggests that chemical reactions such as ARD could also be contributing to the warming. ARD consumes oxygen during the process of sulfide oxidation. Information on oxygen concentrations is therefore required to be able to exclude ARD as a potential heat source. This would help to verify the validity of the mitigation strategy and safety of the downstream environment. <u>Rising temperatures at depth</u> The temperatures measured at location BH1 are increasing throughout the measuring period. This includes the deepest thermistors, which are not affected by seasonal temperature changes. Other heat sources are briefly mentioned, but their potential impact was not discussed. An increasing temperature at 20m depth within the WRF will render the long-term mitigation strategy of inactivating ML/ARD in the permafrost defective. **Negative surface elevation changes** At instrumentation locations T2 and T3, negative elevations of 2 to 4 m have been reported. These have been attributed to seasonal snow-pack accumulation, survey errors, pile consolidation, excavation, etc. It appears that the report does not consider ground subsidence. Without any discussion and verification of ground subsidence in the areas that had no rock fill, it is difficult to determine if there is a trend in increasing temperature that could impact subgrade settlement. Verification of potential ground subsidence needs to be examined, especially because very little or no rockfill was placed at these two locations during the period where negative elevations were observed.
Recommendation:	CIRNAC requests that Baffinland complete the following: a) Install new temperature, oxygen, and soil moisture probes in the WRF.

Comment Number:	CIRNAC #7 (new)
	b) Present the available oxygen, barometric, and soil moisture data in the 2024 Annual report. c) Describe all the calibration steps performed for the thermal model, how the calibration was validated, and the kind of sensitivity analysis performed. d) Discuss its rationale for not incorporating heat generation from geochemical reaction and convection into the present thermal model. e) Investigate the cause of the elevated temperatures in the WRF and discuss the potential impact on future ML/ARD development within the WRF. f) Provide flow characteristics of the frozen waste rock mass and verify that it meets the design intent. g) Discuss the potential for ground subsidence to contribute to the negative elevation observations and install settlement plates to monitor ground elevation.

Comment Number:	CIRNAC #8 (new)
Subject:	**Groundwater and Surface Water ML/ARD Investigations**
Reference:	• NIRB 2022-2023 Annual Monitoring Report – The Mari River Project (January 2024; NIRB File No. 08MN053) • 2022 QIA-NWB Annual Report. • Baffinland. 2023 Annual Report to NIRB • 2023 QIA-NWB Annual Report. Appendix E5.4 – Phase 2 Waste Rock Management Plan. Appendix A2 – Thermal model and assessment of conceptual summer deposition strategies for the waste rock storage facility at Mary River Mine technical memorandum. • 2023 QIA-NWB Annual Report. Appendix E 5.4 – Phase 2 Waste Rock Management Plan. Appendix A1 – 2020 to 2022 waste rock geochemistry report (January 16, 2024)
Issue/Rationale:	**<u>Sampling and analysis</u>** In its 2023 Annual Report, Baffinland presents temperature anomalies within the WRF which might indicate Acid Rock Drainage (ARD) activity. Additionally, Baffinland continues to limit its performance monitoring commentary in both Section 9.6.3 (2022 QIA and NWB Annual Report) and Section 4.6.5 (2022 NIRB Annual Report) to pH values and discharge compliance. Thermal monitoring in the WRF identifies a temporal increase in waste rock temperatures, which Baffinland explains as an ingress of warm air in the summer months. However, CIRNAC is of the opinion that chemical processes such as ARD might also be

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	involved. A trend analysis of the WRF drainage could aid in interpreting the temperature anomaly and understanding the risk for a negative environmental impact of such an occurrence. Key markers of acid rock drainage include many parameters, including pH, acidity, sulphate, aluminum, iron, manganese, and other dissolved metals and metalloids of environmental concern, such as cadmium, chromium, copper, lead, mercury, nickel, lead, selenium, and zinc. Both surface water and groundwater monitoring locations in the immediate vicinity of all potential ARD point sources for the project (e.g., open pit, quarries, and ore stockpiling and haulage routes) should have collection of the key markers of ARD/ML (pH, sulphate, aluminum, iron, manganese, cadmium, chromium, copper, lead, mercury, nickel, lead, selenium, and zinc) in the associated watershed. In Baffinland's responses to NIRB's recommendations they argue that because the Trigger Action Response Plan (TARP) has not been activated, it will not consider looking into temporal and spatial trends. In the 2023 NWB Annual Report, Baffinland presented some temporal trends for sulfate and nickel concentrations and stated that other parameters do not show a discernable trend. The Shake Flask Extraction (SFE) analyses resulted in several waste rock samples with copper (Cu), lead (Pb), and zinc (Zn) concentrations above their respective Metal and Diamond Mining Effluent Regulations (MDMER) criteria. No information is given as to whether these were PAG or non-PAG samples. The results demonstrate the potential for ARD independent metal leaching as SFE incubations are too short to allow ARD to occur. While Baffinland responded that "All point sources with potential ARD are monitored through the site SNP and/or CREMP monitoring programs", the results are neither presented nor discussed; nor is a specific reference given as to where those data can be found. Without the data of the trend analyses CIRNAC cannot evaluate if the ARD mitigation strategy is functional or if additional actions are required.
Recommendation:	CIRNAC requests that Baffinland complete the following: collect, evaluate, and discuss temporal and spatial surface water quality trends for total and dissolved fractions above reporting limit for the following key markers of ML/ARD: pH, acidity, sulphate, aluminum, iron, manganese, cadmium, chromium, copper, lead, iron, mercury, nickel, lead, selenium and zinc reported by BIMC as elevated in relation to baseline conditions. This should include

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	potential points sources for the project (e.g., open pit, quarries, WRF, ore stockpiling, and haulage routes).

Comment Number:	CIRNAC #9 (new)
Subject:	**Permafrost as Main ML/ARD Mitigation Strategy**
Reference:	• Baffinland. 2023 Annual Report to NIRB • 2023 QIA-NWB Annual Report. Appendix E5.4 – Phase 2 Waste Rock Management Plan. Appendix A2 – Thermal model and assessment of conceptual summer deposition strategies for the waste rock storage facility at Mary River Mine technical memorandum. • Tetra Tech 2019 Inspection of the Milne Inlet Tote Road and associated borrow sources • Okane. 955-221 Mary River Mine 2023 Environmental Audit (November 17, 2023)
Issue/Rationale:	The main mitigation method used in the waste rock dump to prevent Metal Leaching/Acid Rock Drainage (ML/ARD) is the freezing of waste rock and keeping the potential acid-generating (PAG) waste rock away from the edge/active zone of the dump that experiences seasonal thawing. Substantial investigations were undertaken to determine if the PAG waste rock is frozen within a reasonable amount of time to prevent ML/ARD. Temperatures below the active zone in the waste rock dump ranged from -5°C to -7°C. The 955-221 Mary River Mine 2023 Environmental Audit states that "*Thermal modelling of the WRF has not been completed to understand the thermal regime within the WRF under future conditions, or any climate change scenarios*." The thermistors at BH1 show an increase in temperature trend throughout the WRF (down to 19 m). This observation underpins the need for an understanding of long-term climatic trends in the region including the long-term stability of the permafrost. Future permafrost degradation may compromise the ML/ARD mitigation strategy at the Mary River project and thus may require that Baffinland develop a new PAG waste rock management strategy.
Recommendation:	CIRNAC requests that Baffinland: a) Evaluate the predicted ground surface temperatures and permafrost development in light of the effects of climate change on the waste rock pile using recent climate change predictions; and,

Comment Number:	CIRNAC #9 (new)
	b) Discuss as to the implications on the thermal/physical stability of and potential of ML/ARD development in the waste rock. This discussion has to include results from the climate change predictions and an evaluation of the increasing sub-surface temperatures at BH1 at about 19 m depth.

Comment Number:	CIRNAC #10 (new)
Subject/Topic:	**Anti-discriminatory policies and mechanisms to minimize any potential cultural conflicts in the workplace**
References:	• Baffinland's 2023 Annual Report to the NIRB, Appendix F, Commitment No. 93 • Project Certificate 005 (Amendment 04), Term and Condition 135
Comment:	Appendix F.1: "Status of Proponent Commitments in 2023", included in BIM's 2023 Annual Report notes that BIM complies with Commitment No. 93. The commitment's description states: "Baffinland is committed to providing cross-cultural training to both Inuit and non-Inuit employees and to institute anti-discriminatory policies and mechanisms to minimize any potential cultural conflicts in the workplace." BIM refers to the summary sheet for Project Certificate T&C No. 135 included in its 2023 Annual Report for further information on this commitment's compliance status. Following a review of the 2023 Annual Report and the amended Project Certificate, CIRNAC understands that T&C 135 of the amended Project Certificate addresses work/ study programs for BIM employees. This does not align with the intent of Commitment No. 93 as presented in Appendix F.1. CIRNAC appreciates that BIM is implementing a variety of cross-cultural training programs for its Inuit and non-Inuit employees as presented in the 2023 Annual Report summary sheets for Project Certificate T&C's 139, 142, and 155. These programs demonstrate BIM's work to advance the cross-cultural training aspect of Commitment No. 93. CIRNAC believes that it would be helpful for BIM to provide a revised status update for Commitment No. 93, including its efforts to "institute anti-discriminatory policies and mechanisms to minimize any potential cultural conflicts in the workplace."
Conclusion/Request:	CIRNAC requests that BIM provide a revised status update concerning efforts undertaken to remain compliant with Commitment No. 93 included in Appendix F.1 of its 2023 Annual Report.

2. ***Compliance Monitoring***

a. *Provide a summary of any compliance monitoring and/or site inspections undertaken in association with the project, including specifically:*

i. *Identify the terms and conditions from the Project Certificate that have been incorporated into any permits, certificates, licenses, or other approvals issued for the Project, where applicable.*

CIRNAC has a broad mandate for the co-management of water resources and the management of Crown land in Nunavut under the following applicable acts and regulations:

- The *Department of Crown-Indigenous Relations and Northern Affairs Act;*
- The *Nunavut Land Claims Agreement Act* and the *Nunavut Agreement;*
- The *Arctic Waters Pollution Prevention Act* and *Regulations;*
- The *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and *Regulations; and*
- The *Territorial Lands Act* and *Regulations.*

In terms of water management in Nunavut, CIRNAC has several different responsibilities. The Minister of Northern Affairs has a decision-making role with regard to the Nunavut Water Board's (NWB) issuance of Water Licences associated with any project. Furthermore, CIRNAC participates as an intervenor in the water licensing process, providing advice and expertise.

When a proposed project is approved to proceed, CIRNAC is responsible for inspecting and enforcing any Terms and Conditions contained within any Water Licence associated with the project. The NWB ensures that Project Certificate Terms and Conditions are incorporated in Water Licences.

CIRNAC issued the following authorizations for BIMC's Mary River Project:

- Land use permit N2019Q0011
- Land use permit N2019J0010
- Land use permit N2019C0009
- Surface lease O47H16001

CIRNAC has reviewed the Type 'A' Water Licence associated with the Mary River Project with respect to Project Certificate [No. 005] and has included a concordance table (Appendix A) that outlines how these T&Cs have been incorporated into the Water Licence.

In 2021, the project activities and monitoring were conducted under the following Water Licences:

- Type 'A' Water Licence 2AM-MRY1325
- Type 'B' Water Licence 2BE-MRY1421

ii. A summary of any inspections conducted during the 2023 reporting period, and the results of these inspections.

CIRNAC's Water Resource Officers (Inspectors) conducted three inspections of the Mary River Mine, on January 25, 2023, July 12, 2023, and September 7, 2023.

A summary of the concerns identified in the inspection reports is presented below for NIRB's consideration.

January 25, 2023

The inspectors were mainly focused on Mary River Mine site and did not visit Milne Port site. The following items were inspected for compliance with the issued and valid water license:

Open Burn facility (KM99)	Camp Lake Jetty Water Intake facility
Polishing Waste Stabilization Ponds #2 and #3	Hazardous Waste Berm #7
Land farm and Land Fill	Effluent Discharge Site
Main camp area	Waste Management Building laydown (incinerator) and hazardous waste berm #6
Mine Pit/Dump and Waste rock water treatment plant	KM105 Dam
Ore Haul Truck Laydown	Sailiviik Waste Water and Water Treatment Plants

The Inspector verified that a copy of the water license was present and available in the water treatment plant, waste treatment plant, and water intake facility. Signage for waste sorting (waste sorting guidelines) is present in the incinerator building.

During the time of inspection, snow on the ground made it difficult to see leaks or stains and there were deep snow-covered portions of the road. The inspector was not able to access some facilities such as PWSP #1, the Waste rock stockpile, the Waste rock water treatment plant, and the water runoff holding pond containing the Waste Rock contact water.

The Inspector noted 8 concerns of noncompliance with water licence related to waste management, spill prevention, and conditions of secondary containments. The list of actions required was documented and Baffinland has to ensure that the non-compliances listed are remediated within 30 days of receiving the inspection report.

July 12, 2023

The inspection focused on the Mary River Mine site and the Milne Port site.

The following items were inspected for compliance with the issued and valid water license:

Sailiviik Waste Water and Water Treatment Plants	Camp Lake Jetty Water Intake facility
Polishing Waste Stabilization Ponds #2 and #3	Hazardous Waste Berm #7

Land farm and Land Fill	Effluent Discharge Site
Main camp area	Waste Management Building laydown (incinerator) and hazardous waste berm #6
Mine Pit/Dump and Waste rock water treatment plant	KM105 Dam and Ore Haul Truck Laydown

The Inspector noted 11 concerns of noncompliance with water licence related to waste management, spill prevention and management, state of the berms, and conditions of secondary containments. The list of actions required was documented and Baffinland has to ensure that the non-compliances listed are remediated.

September 7, 2023

The following items were inspected for compliance with the issued and valid water license:

culverts along the tote road, both diesel tank farms, KM 105 Surface Water Management Pond.

While conducting culvert inspections along the tote road, inspectors observed erosion around culverts that will be replaced to fix the road and prevent erosion this year.

Inspectors noted the fuel staining and fuel odour present at both light and heavy refueling stations. One spot in particular had fuel present under the flex line, which may have been caused by fuel running under the station. No damage was seen on the flex line itself.

The list of actions required was documented and Baffinland has to ensure that the non-compliances listed are remediated.

Baffinland Response to Inspection

Baffinland provided written responses to the inspection reports. In these responses, Baffinland provided the updates and photos for confirmation that actions were taken and provided a timeline for action on culvert repairs. The response to September 7 inspection described the Project certificate conditions reviewed on site.

Detailed inspection reports, and Baffinland's responses to the inspections, can be accessed through the NWB Public Registry:

ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MRY1325%20BIMC/3%20TECH/0%20SCOPE%20ENFORCE%20(A)/1%20INSPECTION/

iii. A summary of Baffinland's compliance status with regard to authorizations that have been issued for the project.

Although some issues were identified in 2023, CIRNAC is generally satisfied with Baffinland's response to the concerns raised by the Inspectors in 2023. CIRNAC will continue to work with Baffinland to ensure compliance with all water licence requirements associated with Mary River project.

Appendix A: Mary River Project Certificate Terms and Conditions incorporated into any permits, certificates, licences or other approvals issued for the Project

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
10	The Proponent shall update its Dust Management and Monitoring Plan to address and/or include the following additional items: a. Outline the specific plans for monitoring dust along the first few kilometres of the rail corridor leaving the Mary River mine site. b. Identify the specific adaptive management measures to be considered should monitoring indicate that dust deposition from trains transporting along the rail route is greater than initially predicted. 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. d. Identify the specific adaptive management measures to be considered if monitoring indicates that dust deposition from traffic on the Milne Inlet Tote Road is greater than initially predicted.		**N2019Q0011**, Part 31(1) (m) 48
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).	Part F, Item 7 (requirement to test and dispose bottom ash and record analysis results and volumes of ash)	
14	The Proponent shall conduct noise and vibration monitoring at Project accommodations sites located at the Mary River mine site, Steensby Inlet Port site, and Milne Inlet Port site. Sampling shall be undertaken during the summer and winter months during all phases of Project development. (b) The Proponent, through coordination		**N2019Q0011**, Part 31 (1) (m) 49

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	with the TEWG as may be appropriate, shall demonstrate appropriate adaptive management for project activities during operations which have the potential to produce noise and sensory disturbance to wildlife and other users of project areas.		
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, the Milne Tote Road, and other areas of the Project site, are consistent with those proposed in the FEIS in terms of type, location, and scope and that the requirements of all relevant regulatory authorities are satisfied advance of constructing those facilities.	Part D	
17	The Proponent shall develop and implement effectives 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.	Parts F and I	
18	The Proponent shall carry out continued analyses over time to confirm and update, accordingly, the approximate fill time for the mine pit lake identified in the FEIS	Part F, Item 3	
19	The Proponent shall ensure that it develops and implement adequate monitoring and maintenance procedures to ensure that the culverts and other conduits that may be prone to blockage do not significantly hinder or alter the natural flow of water from areas associated with the proposed mine. In addition, the Proponent shall monitor, document and report the withdrawal rates for water removed and utilized for all	Parts B, D, Item 23, E Item 23, and I	

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	domestic and industrial purposes.		
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 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.	Part E, Item 24, Part I, Item 23, and Part D, Item 18, g	
21	The Proponent shall ensure that the scope of the *Aquatic Effects Monitoring Plan* (AEMP) includes, at a minimum, monitoring of nonpoint sources of discharge, selection of appropriate reference sites, measures to ensure the collection of adequate baseline data and the mechanisms proposed to monitor and treat runoff, and sample sediments.	Part I	
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.	Part D	
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.	Part I, Item 14 (requirement to conduct opportunistic monitoring on any observed seepage)	
24	The Proponent shall monitor as required the relevant parameters of the effluent generated from Project activities and facilities and shall carryout treatment if necessary to ensure that discharge conditions are met at all times.	Part E and F.	
25	The Proponent shall undertake the additional geotechnical investigations to identify sensitive landforms, modify engineering design for Project infrastructure and develop mitigation and	Part D, Item 19 and Part I, Item 12 (for water infrastructure)	

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms.		
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.	Parts D, E, and F (requirement to prevent or minimize erosion)	N2019Q0011, part 31 (1) (m) 50
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.	Part D, Item 10 (requirement to minimize disturbance to permafrost around the site, including railway corridor)	
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	Part D, Item 2 and Part E, Item 23	
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.	Part D, Item 5	**N2019Q0011**, Part 31 (1) (m) 51
31	The Proponent shall ensure that Project activities are planned and conducted in such a way as to minimize the Project footprint.	A general requirement	
33	The Proponent shall include relevant Monitoring and Management Plans within its Environmental Management System, Terrestrial Environment Management and Monitoring Plan (TEMMP)	Part J, Item 2	
39	The Proponent shall develop a progressive revegetation program for disturbed areas that are no longer required for operations, such program to incorporate measures for the use of test	Part J, Item 11 (requirement to implement progressive reclamation	

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	plots, reseeding and replanting of native plants as necessary. It is further recommended that this program be directly associated with the management plans for erosion control established for the Project.	including revegetation)	
40	The Proponent shall include revegetation strategies in its Site Reclamation Plan that support progressive reclamation and that promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment.	Part J, Items 10 and 11	
41	Unless otherwise approved by regulatory authorities, the Proponent shall maintain a minimum 100-metre naturally-vegetated buffer between the high-water mark of any fishbearing water bodies and any permanent quarries with potential for acid rock drainage or metal leaching.	Part D, Items 13 and 14	
42	The Proponent shall maintain minimum a 30- metre naturally-vegetated buffer between the mining operation and adjacent water bodies.	Parts D, E, F, and H	
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.	Part D, Item 2	
44	The Proponent shall meet or exceed the guidelines set by Fisheries and Oceans Canada for blasting thresholds and implement practical and effective measures to ensure that residue and by-products of blasting do not negatively affect fish and fish habitat.	Part E, Item 24	
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	Part F	
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	Part E, Item 23	**N2019Q0011**, Part 31 (1)(f) 16.

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	and limit the movement of water in fish bearing streams and rivers		
48	The Proponent shall engage with Fisheries and Oceans Canada and Qikiqtani Inuit Association in exploring possible Project specific thresholds for blasting that would exceed the requirements of Fisheries and Oceans Canada's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters (D.G. Wright and G.E. Hopky, 1998).	Part E, Item 24 (requirement to submit Blasting Management Plans)	
53	The Proponent shall demonstrate consideration for the following: a. Steps taken to prevent caribou mortality an 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. c. Evaluation of the effectiveness of proposed caribou crossings over the railway, Milne Inlet tote road and access roads as well as the appropriate number. d. Development of a surveillance system along the railway corridor to identify the presence of caribou in proximity to the train tracks and operational protocols for the train to avoid collisions and enable caribou to cross the train tracks unimpeded. e. Protocols for documentation and reporting of all caribou collisions and e. mortalities, as well as mechanisms for adaptive management responses		**N2019Q0011,** Parts 31 (1) (h) 36-38, and 31 (1) (m) 52

Project Certificate 005 Term & Condition		Implemented in NWB water licence 2AM-MRY1325 Amendment #1	Implemented in CIRNAC's land use permit
	designed to prevent further such interactions.		
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). Consideration must be given to the following measures: a. installation of an incinerator beside the kitchen that will help to keep the food waste management process simple and will minimize the opportunity for human error (i.e. storage of garbage outside, hauling in a truck (odours remain in truck), hauling some distance to a landfill site, incomplete combustion at landfill, fencing of landfill, etc.). b. installation of solid carnivore-proof skirting on all kitchen and accommodation buildings (i.e., heavy-duty steel mesh that would drop down from the edge of the buildings/trailers and buried about a half meter into the ground to prevent animals from digging under the skirting).	Part F, Item 7	**N2019Q0011,** Part 31 (1) (g) 27
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.	Part H, Item 5	**N2019Q0011,** Part 31 (1) (g) 30, 31