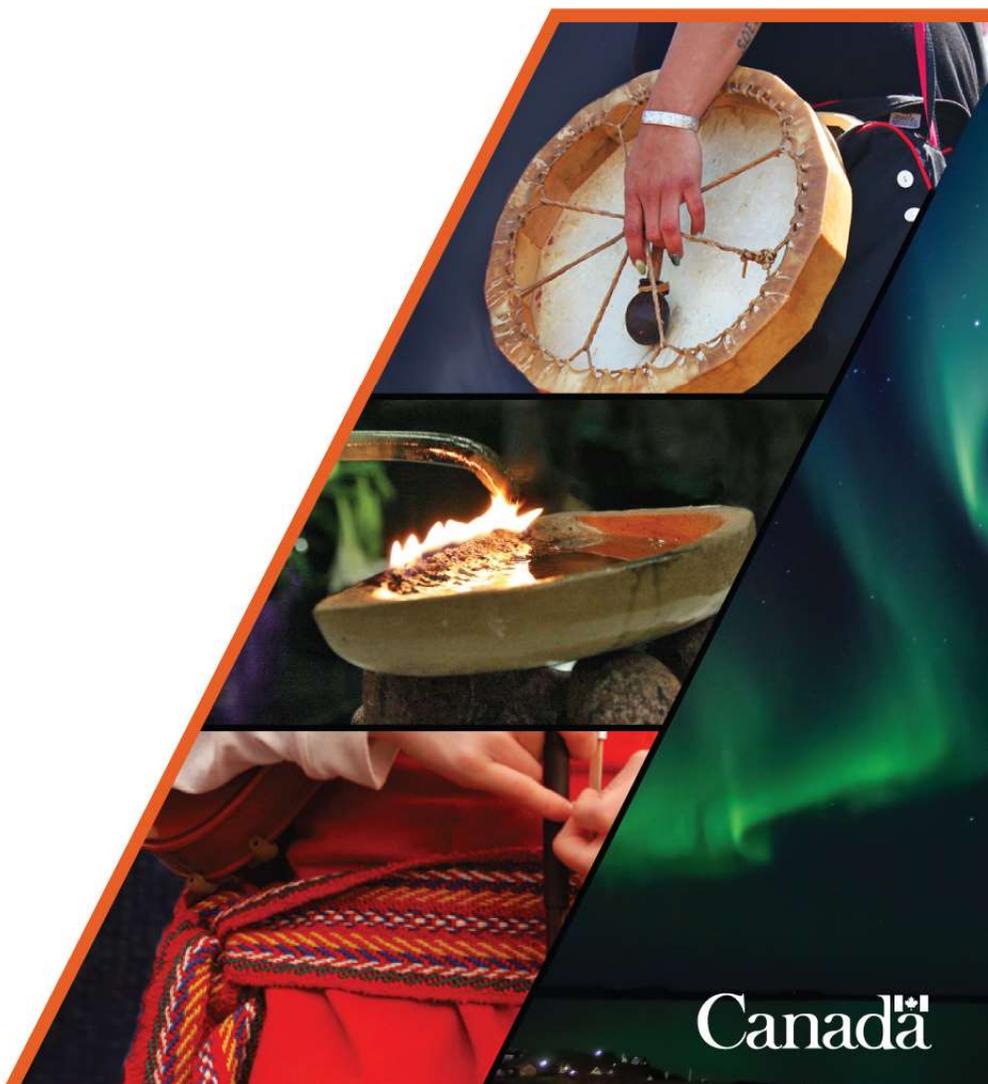


CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's Mary River Project 2024 Annual Report



Nunavut Regional Office
918 Sivumugiaq Street
Iqaluit, NU, X0A 3H0

Your file - Votre référence
08MN053
Our file - Notre référence
GCDOCS #138919071

July 8, 2025

Keith Morrison,
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 2024 Annual Report

Dear Keith Morrison,

On June 4, 2025, 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) 2024 Annual Report with respect to effects and compliance monitoring.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) has conducted a review of the 2024 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 2024 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
Manager, Impact Assessment



1. Effects Monitoring

The 2024 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 2024 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 2024 Annual Report. However, CIRNAC is providing Technical Review Comments (TRCs) for the NIRB's consideration, with the following notes:

- TRC #1 - 9 incorporate ongoing recommendations from the 2023 Annual Report, which, in the opinion of CIRNAC, have yet to be addressed.
- In addition to ongoing recommendations from prior years, CIRNAC has identified six TRCs (#10 - 15) that are new for the 2024 reporting year.
- One TRC (former #10), in the opinion of CIRNAC, was addressed by Baffinland.

| Comment Number: | CIRNAC #1 STATUS (Ongoing) |
|-----------------------|--|
| Subject/Topic: | Dustfall effects on Surface Water Quality, Groundwater and contributions to Land Contamination |
| References: | <ul style="list-style-type: none"> • Nunavut Impact Review Board (NIRB) Project Certificate [No.: 005] dated November 17, 2023 <ul style="list-style-type: none"> ○ Terms and Conditions (TC) #10, 21, and 34 • Baffinland Iron Mines Corporation (Baffinland) 2025. 2024 Annual Report to the NIRB including: <ul style="list-style-type: none"> ○ Section 4.6.2 Air Quality ○ Section 4.6.5 Groundwater & Surface Water ○ Section 4.6.6 Vegetation ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.2.1: Baffinland 2024 Annual Air Quality, Dustfall and Meteorology Report ○ Appendix G.2.5: Baffinland Dust Audit 2024 Annual Report ○ Appendix G.5: Terrestrial Environment 2024 Annual Monitoring Report (TEAMR). • Baffinland 2024. 2023 Annual Report to the NIRB. • Baffinland 2025. 2024 QIA-NWB Annual Report for Operations: |



| | |
|-----------------------|---|
| | <ul style="list-style-type: none"> ○ Appendix E.8.2: QIA inspection reports and Baffinland Responses |
| <p>Comment</p> | <p>Reviewing the last four Mary River Annual Reports (2020 to 2023), CIRNAC has been recommending that Baffinland consider including testing the chemical composition of soil base sites for bioavailable metal loadings from the dust, resulting from contact with surface water/soil moisture. During the review of the Mary River 2023 Annual Report to NIRB CIRNAC suggested that Baffinland consider:</p> <ul style="list-style-type: none"> a) Developing a dustfall impact Conceptual Site Model (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) Indicating how dustfall rates correlate with direct or indirect contaminant loading into aquatic environments based on geochemical testing of dust-impacted soil and sediment. c) Implementing 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. <p>Baffinland has noted that dust isopleth modelling was revised/updated in 2023 for the Project; therefore, a working CSM will not further inform dustfall modelling.</p> <p>CIRNAC acknowledges Baffinland’s responses for CIRNAC’s comments on the Mary River 2023 Annual Report, and considers these requests closed with the following exceptions:</p> <ul style="list-style-type: none"> a) Under Section 4.6.6 of the 2024 NIRB Annual Report (TC #34), it is identified that: <i>“Lichen-metal concentrations demonstrate some discrete increases at the Project, but values are mostly below or within an acceptable range for lichen-metal concentrations. Soil-metal and lichen-metal concentrations present a low risk to environmental and human health and safety. Monitoring will continue as outlined in the [Terrestrial Environment Management and Monitoring Plan] TEMMP schedule.”</i> <p>Given that potential increasing trends in lichen-metal concentrations have previously been noted, vegetation and soil monitoring in 2025 would be beneficial for metallic trend analysis. Conducting sampling in 2025 will align with the 2025-2027</p> |



| | |
|--------------------------------|--|
| | <p>TEMMP scheduled monitoring period.</p> <p>b) To maintain compliance with TC #34, QIA has recommended the frequency of soil and vegetation monitoring be increased. Increasing the monitoring frequency will establish a more robust data-set and support trend analysis of metal concentrations in vegetation and soils (2024 TEAMR). CIRNAC supports this recommendation.</p> |
| Conclusion/ Request | <p>CIRNAC requests that Baffinland:</p> <p>a) Include the results and details of the 2023 Dust Isopleth Modeling Study conducted by Nunami Stantec as part of the 2025 Annual Report ;</p> <p>b) Conduct soil and vegetation monitoring in 2025 and following years to support ongoing trend analysis; and,</p> <p>c) Revise the soil and vegetation monitoring schedule to increase the sampling frequency from every 3 to 5 years to every 2 to 3 years.</p> |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #2 STATUS (Ongoing) |
| Subject/Topic: | Waste Rock Management: Waste rock facility – identification and management of acid rock drainage / metal leaching waste rock materials and permafrost |
| References: | <ul style="list-style-type: none"> • NIRB Project Certificate [No.: 005] dated November 17, 2023 <ul style="list-style-type: none"> ○ TCs #16, 17, 23, 24, 41, 46 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Section 4.6.4 Hydrogeology and Hydrogeology ○ Section 4.6.5 Groundwater & Surface Water ○ Section 4.6.7 Freshwater Environment ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report • Baffinland 2025. 2024 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual Report for Operations: <ul style="list-style-type: none"> ○ Appendix E.7: Quarry Geochemistry Analytical Sampling Results • Baffinland 2024. Aquatics Effects Monitoring Plan Rev 2 • Baffinland 2024. Phase 1 Waste Rock Management Plan Rev 4.1, including: <ul style="list-style-type: none"> ○ Appendix A: Waste Rock Management Plan – June 2024 through September 2026 • Baffinland 2024. 2023 Annual Report to the NIRB. |
| Comment | CIRNAC recognizes the effort undertaken to assess the Metal |



| | |
|-----------------------------------|---|
| | <p>Leaching/Acid Rock Drainage (ML/ARD) potential of waste rock and waste rock management at the Project. Baffinland has largely addressed CIRNAC's comments under Technical Review Comments for 2023 NIRB Annual Report; however, CIRNAC notes the following:</p> <p>a) As per the 2024 Phase 1 Waste Rock Management Plan, rev 4.1 (Baffinland, 2024), Baffinland's ARD classification is continuously monitored and validated with off-site Acid-Base Accounting (ABA) and Shake Flask Extraction (SFE) testing with a frequency of 1 hole per 40,000 t of material. However, the results and interpretation of these tests conducted in 2023 and 2024 are not presented in the 2024 Annual Report. Only operational test results (paste pH and sulfur content) were provided in Appendix E.7 of the 2024 QIA-NWB Annual Report for Operations. The results of these tests would support assessing the potential effects of the Project on water quality within the Project area.</p> <p>b) It is reported that Potentially Acid Generating rock (PAG) and Non-PAG placement on the waste rock facility (WRF) was in accordance with the Phase 1 Waste Rock Management Plan (Rev 4.1), confirmed with the analytical testing of in place waste rock material and as delivered at WRF. Further, it has been reported that the drainage from the WRF has shown no exceedances on geochemistry parameters; however, no trends of time v/s placement and time v/s geochemistry parameters were provided.</p> <p>Providing this information would demonstrate the effectiveness of the new placement strategy, i.e., between the date of waste rock placement (as per revised strategy) and geochemistry, were the improvements in drainage geochemistry observed to be instantaneous (with no time lag) or after a specified period of time.</p> <p>Geochemistry process in waste rock is supposed to be slowly occurring, but Baffinland reporting indicates as if it is instantaneous.</p> <p>c) No results presented for thermal monitoring at the WRF.</p> |
| <p>Conclusion/ Request</p> | <p>CIRNAC requests that, in their 2025 Annual Report, Baffinland:</p> <p>a) Provide the 2023 and 2024 ABA and SFE results on waste rock. These results would support monitoring the potential effects on water quality within the Project area.</p> <p>b) Provide time v/s placement and time v/s geochemistry graphs to demonstrate the effectiveness of the new placement strategy.</p> |



| | |
|--|---|
| | c) Report the results of thermal monitoring at the WRF. |
|--|---|

| Comment Number: | CIRNAC #3a STATUS (Ongoing) |
|---------------------------|---|
| Subject/Topic: | Groundwater: Installation of new and additional groundwater monitoring wells is incomplete |
| References: | <ul style="list-style-type: none"> • Project Certificate No. 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs #17, 23, 24 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Section 4.6.5 Groundwater & Surface Water ○ Appendix E: Baffinland response to Comments on 2023 NIRB Annual Report ○ Appendix G.3: Groundwater Monitoring Report ○ Appendix G.4: 2024 Core Receiving Environment Monitoring Program Report (CREMP) • Baffinland 2025. 2024 QIA- NWB Annual Report for Operations |
| Comment | <p>As per TC# 17, Baffinland “<i>shall develop and implement effective measures to ensure that effluent from project-related facilities and/or activities.... satisfies all discharge criteria requirement established by the relevant regulatory agencies prior to being discharged into the receiving environment.</i>”</p> <p>Baffinland is required to demonstrate through reliable and representative data that implemented measures, such as well monitoring, are effective. Baffinland noted (see 2024 Annual Report App E.1 Response to Comments 2023 NIRB Annual Report) that the 2023 groundwater monitoring program may not have provided representative water quality and hydraulic conductivity values at the Mary River Landfill Facility and Hazardous Waste Berms areas due to limitations with the wells.</p> <p>In an effort to address the limitations of the groundwater monitoring program, Baffinland indicated that new and additional wells would be installed in 2024 to address reliability issues and data gaps that were previously identified.</p> <p>CIRNAC notes that the installation of the new and additional wells is outstanding.</p> |
| Conclusion/Request | <p>CIRNAC requests that, in the 2025 Annual Report, Baffinland:</p> <ol style="list-style-type: none"> a) Provide a schedule for completing the installation of new groundwater monitoring wells with appropriate bentonite seals/ installation procedures. b) Include borehole logs, along with cross-section diagrams to allow |



| | |
|--|--|
| | for review of hydrogeological interpretations. |
|--|--|

| Comment Number: | CIRNAC #3b STATUS (Ongoing) |
|---------------------------|--|
| Subject/Topic: | Groundwater: Groundwater Monitoring Program Expansion |
| References: | <ul style="list-style-type: none"> • Project Certificate No. 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs #17, 23, 24 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Section 4.6.5 Groundwater & Surface Water ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.3: Groundwater Monitoring Report ○ Appendix G.4: CREMP • Baffinland 2025. 2024 QIA-NWB Annual Report for Operations: • Baffinland 2024. 2023 QIA-NWB Annual Report for Operations: <ul style="list-style-type: none"> ○ Knight Piesold 2024a |
| Comment | <p>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).</p> <p>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 re-iterates 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. Two test pits are not representative of the WRF area due to the overall size regardless of their location; therefore, the data collected from the two test pits is insufficient to gain a better understanding of the groundwater levels, stratigraphy characterization, permeability, groundwater quality, and groundwater flow direction.</p> <p>Furthermore, Baffinland reported that there is a potential leak the lined seepage collection pond at the WRF. If there is groundwater bypassing the WRF collection trenches, it is possible that increasing mine-related water quality trends observed in Mary River Tributary-F (MRTF) may be related to WRF since it is unlined. Baffinland has previously suggested that the MRTF water quality trends may be related to effluent discharge from the WRF at MS-08.</p> |
| Conclusion/Request | <p>CIRNAC requests that, in their 2025 Annual Report, Baffinland:</p> <ul style="list-style-type: none"> a) Re-evaluate the potential for groundwater interaction with the WRF. |



| | |
|--|--|
| | <p>b) Provide rationale and back-up data to support using two test pits as the basis for discounting the presence of groundwater at and adjacent to the WRF. Back-up data should include a map of test pit locations, test pit logs, photos of the test pits, and a conceptual site model (with any form of statistical analysis) showing how the two test pits to characterize potential groundwater within the WRF area.</p> |
|--|--|

| Comment Number: | CIRNAC #4 STATUS (Ongoing) |
|-----------------------|--|
| Subject/Topic: | Surface Water Quality: Aquatic effects and dustfall monitoring |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TC #21 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Section 4.6.4 Hydrology and Hydrogeology ○ Section 4.6.5 Groundwater & Surface Water ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.5.1: TEAMR ○ Appendix G.4.1: CREMP ○ Appendix G.4.3. Mary River Project – Lake Sedimentation Monitoring 2023/2024. • Baffinland 2024. Aquatics Effects Monitoring Plan Rev 2 <ul style="list-style-type: none"> ○ Baffinland 2024. 2023 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Appendix G.2.1 Air Quality, Dustfall and Meteorology Report ○ Appendix G.5.1: TEAMR |
| Comment: | <p>TC #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.”</p> <p>Incorporating dustfall results into 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 previously recommended 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).</p> <p>In response, Baffinland indicated that “dustfall chemical composition data will be submitted in subsequent annual monitoring reports when available (if there is sufficient material to perform the analysis).</p> |



| | |
|----------------------------|--|
| | <p><i>Baffinland will investigate the link of dustfall chemistry data with sediment trap data (and any proximal lake sediment data) for the next report cycle if there is sufficient sediment volumes to run the analysis.”</i></p> <p>Both the CREMP and Lake Sedimentation Monitoring Program referenced the submission of samples for analysis of metals in the 2023 and 2024 Terrestrial Environment Annual Monitoring Report (TEAMR). The 2023 Air Quality, Dustfall and Meteorology Report indicates that there are 49 passive dustfall sampling locations but data is only presented for three locations within the Mary River Project – Lake Sedimentation Monitoring 2023/2024.</p> |
| Conclusion/ Request | <p>CIRNAC requests that, in their 2025 Annual Report, Baffinland:</p> <ul style="list-style-type: none"> a) Provide the analytical dustfall data with a comparison to applicable regulatory criteria referenced in the 2023 and 2024 TEAMR reports. b) Integrate the data into the CREMP for comparison with water quality data, to assess for potential changes in water chemistry related to dustfall deposition. |

| | |
|------------------------|---|
| Comment Number: | CIRNAC #5 STATUS (Ongoing) |
| Subject/Topic: | Infrastructure and Engineering related to Mine Works: Performance of new MS-11 surface water management pond at KM 105 |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs # 16, 17, 22 and 24 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Section 3.1 Site Activities Completed in 2024 ○ Section 4.3 Summary of 2024 Compliance with Terms and Conditions ○ Section 4.5.2 Unauthorized Discharges and Spills ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.2.6 2024 Geotechnical Inspection Reports • NWB Water Licence No. 2AM-MRY2540/Type A dated April 28, 2025. • Baffinland 2025. 2024 QIA-NWB Annual Report for Operations: <ul style="list-style-type: none"> ○ Appendix E.8.1: CIRNAC Inspection reports and Baffinland Responses ○ Appendix E.8.2: QIA Inspection Reports and Baffinland Response |
| Comment: | 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). |



| | |
|----------------------------|---|
| | <p>In 2023, 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. Monitoring was continued at the seepage location KM105-SWMP-SEEP-02 for the duration of the 2023 flowing water season as a follow-up to the initial spill report. Additionally, seepage remediation work was undertaken in 2023.</p> <p>As reported in the 2024 Annual Report, Baffinland engaged third-party engineers and water treatment experts to identify and assess potential mitigation and improvements for 2025. The evaluation acknowledged that the engineering solutions for the KM105 dam have not proven effective to date, and further grouting was deemed unreliable as there is a possibility that frozen ground will thaw and open new pathways, allowing seepage to propagate.</p> <p>The review concluded that water management within the facility footprint below and above the dam should be the focus for 2025 as opposed to continuing the 2024 grout curtain project.</p> <p>A preliminary conceptual mitigation plan was provided in the January 22, 2025 letter included in Appendix E.8.3 of the 2024; however, a detailed mitigation plan has not yet been developed and final As-built(s) are not complete.</p> |
| Conclusion/Request: | <p>CIRNAC requests that Baffinland:</p> <ul style="list-style-type: none"> a) Provide a detailed description outlining the mitigation plan (below and above the dam) and associated water management infrastructure being completed in lieu of the grout curtain approach by August 15, 2025 or before the next Geotechnical, CIRNAC, or QIA Inspection. b) Provide a schedule for completing the associated plans and a schedule for implementation and reporting. It is understood that Baffinland will provide detailed reporting as required under TCs #16, 17, 22, and 24. It is understood these modifications are still in development with the third-party engineer. |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #6 STATUS (Ongoing) |
| Subject/Topic: | Surface Water Quality – Elevated nitrate in surface water |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs # 17, 20, and 24 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ 4.6.5 Groundwater & Surface Water ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.3: Groundwater Monitoring Report ○ Appendix G.4.1: CREMP |



| | |
|----------------------------|--|
| Comment: | <p>In the 2024 Annual Report and CREMP, Baffinland identified that mine related impacts to surface water quality, specifically increasing nitrogen and ammonia concentrations within the Sheardown Lake system, are likely related to the Dyno Emulsion Plant. As per TC #20, Baffinland <i>“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.”</i></p> <p>To comply with TC #20, it is recommended that Baffinland implement mitigation measures and/or treatment to prevent negative effects within the Project and surrounding areas.</p> <p>CIRNAC also notes that the increasing nitrogen and ammonia concentrations could be considered a change from the existing water quality conditions (i.e., elevated nitrates), which suggests that the Dyno Emulsion Plant should be added to the groundwater monitoring program to support identifying impacts to the Sheardown Lake system</p> |
| Conclusion/Request: | <p>CIRNAC requests that Baffinland, in the 2025 Annual Report, provide a summary of activities and a timeline on what and when mitigation efforts will be implemented to address impacts associated with the Dyno Emulsion Plant.</p> |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #7a STATUS (Ongoing) |
| Subject/Topic: | Infrastructure and Engineering related to Mine Works: Thermal monitoring of Waste Rock Facility |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs #25 and 28 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.2.6: 2024 Geotechnical Inspection Reports • Baffinland 2025. 2024 QIA-NWB Annual Report for Operations: <ul style="list-style-type: none"> ○ Appendix E.8.1: CIRNAC Inspection reports and Baffinland Responses ○ Appendix E.8.2: QIA Inspection Reports and Baffinland Response ○ Appendix E.10: Assessment of Active Zone Depth Considering SSP1-2.6 Climate Change Projections at Mary River Mine, dated October 4, 2024. • Baffinland 2024. Phase 1 Waste Rock Management Plan Rev 4.1, including: <ul style="list-style-type: none"> ○ Appendix A: Waste Rock Management Plan – June 2024 through September 2026: |



| | |
|-----------------------|---|
| | <ul style="list-style-type: none"> ▪ Appendix A2: TECHNICAL MEMORANDUM: Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock Storage Facility at Mary River Mine |
| <p>Comment</p> | <p>Previously, CIRNAC requested that Baffinland use additional instrumentation and update the thermal analysis, including heat and oxygen balances across the WRF. Baffinland provided a WRF instrumentation update in its 2023 QIA-NWB Annual Report for Operations.</p> <p>CIRNAC acknowledges Baffinland’s previous responses, but some aspects highlighted in CIRNAC’s issue #7 raised in its 2023 review of the Annual Report remain relevant during the 2024 annual review cycle.</p> <p>An installation update for thermistors at the WRF has been provided in the 2024 QIA-NWB Annual Report; however, no monitoring data was included in the report for the 2023-2024 period. Without this information, it is not possible to validate the performance of the mitigation strategy with the non-AG frozen cover.</p> <p>The variation of the waste rock thickness above the thermistors’ beads should be monitored simultaneously to ensure proper interpretation of the collected ground temperature data.</p> <p>The addition of two years of data should be used to reassess the observations/statements made earlier for the WRF about:</p> <ul style="list-style-type: none"> - Increasing temperature at depth at BH-1 - Effect of local warmer zones on the performance of the ARD limitation on the long-term - Heat generation from geochemical reaction and convection not considered in the thermal modeling. <p>An assessment of the active zone depth at WRF considering SSP1-2.6 climate change projections (WSP, 2024) has been provided in the 2024 QIA-NWB Annual Report. The SSP1-2.6 scenario is the most optimistic, projecting significant reductions in greenhouse gas emissions and a sustainable future. However, it is essential to also consider more conservative scenarios to gain a comprehensive understanding of the potential impacts on the WRF future geochemical stability.</p> <p>CIRNAC recommends that Baffinland consider multiple climate change scenarios when forecasting the long-term temperature evolution in the non-AG cover at WRF. By evaluating a range of scenarios, a comprehensive understanding of the potential impacts of varying climate conditions on the site can be gained. This comprehensive approach will help ensure that predictions are robust and account for different possible futures.</p> <p>CIRNAC notes that no monitoring data for the thermistors at the WRF was provided for the 2023-2024 period. Without this information, it is</p> |



| | |
|---------------------------|--|
| | not possible to validate the performance of the mitigation strategy with the non-AG frozen cover. |
| Conclusion/Request | CIRNAC requests that Baffinland provide the temperature evolution since instrument installation, at the different monitoring stations, as a function of time and depth. These requests should be addressed in the 2025 Annual Report. |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #7b STATUS (Ongoing) |
| Subject/Topic: | Infrastructure and Engineering related to Mine Works: Thermal monitoring of Waste Rock Facility |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs #25 and 28 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.2.6: 2024 Geotechnical Inspection Reports • Baffinland 2025. 2024 QIA-NWB Annual Report for Operations: <ul style="list-style-type: none"> ○ Appendix E.8.1: CIRNAC Inspection reports and Baffinland Responses ○ Appendix E.8.2: QIA Inspection Reports and Baffinland Response ○ Appendix E.10: Assessment of Active Zone Depth Considering SSP1-2.6 Climate Change Projections at Mary River Mine, dated October 4, 2024. • Baffinland 2024. Phase 1 Waste Rock Management Plan Rev 4.1, including: <ul style="list-style-type: none"> ○ Appendix A: Waste Rock Management Plan – June 2024 through September 2026: <ul style="list-style-type: none"> ▪ Appendix A2: TECHNICAL MEMORANDUM: Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock Storage Facility (WRSF) at Mary River Mine |
| Comment | <p>CIRNAC acknowledges Baffinland’s previous responses to CIRNAC 2023 annual report comment #7, but some aspects highlighted in CIRNAC’s issue #7 raised in its 2023 review of the Annual Report remain relevant during the 2024 annual review cycle.</p> <p>An assessment of the active zone depth at WRF considering SSP1-2.6 climate change projections (WSP, 2024) was provided in the 2024 QIA-NWB Annual Report. The SSP1-2.6 scenario is the most optimistic, projecting significant reductions in greenhouse gas emissions and a sustainable future. However, it is essential to also consider more conservative scenarios to gain a comprehensive understanding of the potential impacts on the WRF future geochemical stability.</p> |



| | |
|---------------------------|---|
| Conclusion/Request | CIRNAC recommends that Baffinland consider multiple climate change scenarios when forecasting the long-term temperature evolution in the non-AG cover at WRF, in order to provide a robust understanding of potential impacts of varying climate conditions, and provide a description of the considerations in the 2025 Annual Report. |
|---------------------------|---|

| | |
|------------------------|---|
| Comment Number: | CIRNAC #7c STATUS (Ongoing) |
| Subject/Topic: | Infrastructure and Engineering related to Mine Works: Thermal monitoring of Waste Rock Facility |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs #25 and 28 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.2.6: 2024 Geotechnical Inspection Reports • Baffinland 2025. 2024 QIA-NWB Annual Report for Operations: <ul style="list-style-type: none"> ○ Appendix E.8.1: CIRNAC Inspection reports and Baffinland Responses ○ Appendix E.8.2: QIA Inspection Reports and Baffinland Response ○ Appendix E.10: Assessment of Active Zone Depth Considering SSP1-2.6 Climate Change Projections at Mary River Mine, dated October 4, 2024. • Baffinland 2024. Phase 1 Waste Rock Management Plan Rev 4.1, including: <ul style="list-style-type: none"> ○ Appendix A: Waste Rock Management Plan – June 2024 through September 2026: <ul style="list-style-type: none"> ▪ Appendix A2: Technical Memorandum: Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock Storage Facility at Mary River Mine |
| Comment | <p>Previously, CIRNAC requested that Baffinland use additional instrumentation and update the thermal analysis, including heat and oxygen balances across the WRF. Baffinland provided a WRF instrumentation update in its 2023 QIA-NWB Annual Report for Operations.</p> <p>CIRNAC acknowledges Baffinland’s previous response but some aspects highlighted in CIRNAC’s issue #7 raised in its 2023 review of the Annual Report remain relevant during the 2024 annual review cycle.</p> <p>Baffinland provided the status of all instrumentation at WRF updated to March 2025. The status update includes those that were installed in 2024, those that are permanently down (non-functional), and those that are active.</p> <p>Only thermistors and one vibrating wire piezometer (VWP) are active, going forward. They have discontinued with other instruments such as</p> |



| | |
|---------------------------|--|
| | <p>oxygen sensors, barometers and additional VWP. Their discontinuation has been associated with their usefulness and operational success. Thermistors are both vertical and horizontal strings, covering waste rock and foundations.</p> <p>Additional thermistors will be installed during Q2 to verify ongoing freeze-back of placed materials.</p> <p>It has been reported that the waste rock pile is in a perpetually frozen state, except for the near surface 2 to 3m of active layer.</p> <p>Baffinland is of the opinion that the thermistors installed in targeted locations will provide the necessary monitoring to confirm the deposition strategy is working; however, it is not clear how the geochemical model will be updated without the factual data of oxygen consumption, air and heat generation/flow within the pile. Neither has there been any update on geochemical model of the WRF presented.</p> |
| Conclusion/Request | <p>CIRNAC requests that Baffinland, in their 2025 annual report:</p> <ol style="list-style-type: none"> a) Provide an explanation for how the geochemical model will be updated without the factual data of oxygen consumption, air and heat generation/flow within the pile. b) Provide commentary on when an update of the geochemical model for the WRF will be presented. |

| | |
|------------------------|---|
| Comment Number: | CIRNAC #8 STATUS (Ongoing) |
| Subject/Topic: | Groundwater and Surface Water Quality: ML/ARD investigations related to mine works |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs # 21 and 23 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ 4.6.5 Groundwater & Surface Water ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.3: Groundwater Monitoring Report ○ Appendix G.4.1: CREMP • Baffinland 2024. Phase 1 Waste Rock Management Plan Rev 4.1, including: <ul style="list-style-type: none"> ○ Appendix A: Waste Rock Management Plan – June 2024 through September 2026: <ul style="list-style-type: none"> ▪ Appendix A1: 2020 to 2022 Waste Rock Geochemistry Report ▪ Appendix A2: Technical Memorandum: Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock Storage Facility at Mary River Mine |
| Comment | CIRNAC understands that ongoing monitoring at the WRF water quality monitoring was conducted in 2023 at the east and west ditches where |



| | |
|----------------------------|--|
| | <p>they flow to the WRF Pond, as well as in two (2) other locations upstream in the east and west ditches. In addition, sampling of drainage/seepage at the perimeter toe of the WRF pile was conducted. Baffinland continued to implement a similar WRF water quality monitoring program in 2024. The 2023-2024 monitoring results from the thermistors at the WRF can be interpreted in correlation with water quality in the east and west peripheral ditches, in the WRF surface water pond, in effluent MS-08, and in the downstream receiving water courses.</p> <p>CIRNAC acknowledges Baffinland's ongoing water quality monitoring and temperature data collection as a “<i>primary means for assessing the thermal behaviour</i>” of the waste rock pile; however, the 2023-2024 monitoring results from the thermistors installed at the WRF were not provided with the 2024 Annual Report (See CIRNAC #7a)</p> |
| Conclusion/Request: | CIRNAC requests that Baffinland provide the 2023-2024 monitoring results from the thermistors at the WRF, validate the performance of the PAG material management with the non-AG cover, and provide detailed discussions on the thermistor and PAG material management in the 2025 annual report. |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #9 STATUS (Ongoing) |
| Subject/Topic: | Infrastructure and Engineering related to Mine Works: Permafrost and ML/ARD mitigation strategy |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TC #2 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ 4.6.5 Groundwater & Surface Water ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.3: Groundwater Monitoring Report ○ Appendix G.4.1: CREMP • Baffinland 2025. 2024 QIA-NWB Annual Report for Operations: <ul style="list-style-type: none"> ○ Appendix E.10: Reclamation Research Studies (WSP 2024. Assessment of Active Zone Depth Considering SSP1-2.6 Climate Change Projections at Mary River Mine, dated October 4, 2024). • Okane 2023. 955-221 Mary River Mine 2023 Environmental Audit (November 17, 2023) |
| Comment: | Under the Mary River Project Certificate TC 2, Baffinland is required to provide feedback on the impact that climate change might be having on the project. This includes providing results of any new or revised assessments and studies done to validate and update climate change impact predictions for the Project. |



| | |
|---------------------------|--|
| | <p>It is recommended to consider multiple climate change scenarios when forecasting the long-term temperature evolution in the non-acid generating (AG) cover at WRF.</p> <p>By evaluating a range of scenarios, a comprehensive understanding of the potential impacts of varying climate conditions on the site can be gained. This comprehensive approach will help ensure that predictions are robust and account for different possible futures.</p> <p>Past audits and assessments, such as the 2023 Environmental Mine Audit and WSP 2024, have shown 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.</p> <p>CIRNAC acknowledges that Baffinland is developing a thermal model to predict the impact of climate change on the depth of ground subject to seasonal freezing and thawing (active zone) at the WRF. Baffinland expects to provide a memo with the results of the investigation for the next update to the Interim Closure and Remediation Plan (ICRP).</p> |
| Conclusion/Request | <p>CIRNAC requests that Baffinland provide a schedule for developing a thermal model and preparing a summary memorandum on the prediction of the impact of climate change on the depth of ground subject to seasonal freezing and thawing at the WRF. Baffinland’s memorandum should consider:</p> <ul style="list-style-type: none"> a) Evaluating 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, b) Discussing the implications on the thermal/physical stability of and potential of ML/ARD development in the waste rock. This discussion should include results from the climate change predictions and an evaluation of the increasing sub-surface temperatures at BH1 at about 19 m depth. <p>CIRNAC also requests supporting data used in the development of the model be appended to the proposed memorandum.</p> <p>The memorandum should be included as part of the next update to the ICRP.</p> |

| | |
|------------------------|---|
| Comment Number: | CIRNAC #10 STATUS (New) |
| Subject/Topic: | Waste Rock Management: Physical slope stability of Waste Rock Facility |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TC #25 • Baffinland 2025. 2024 Annual Report to the NIRB |



| | |
|---------------------------|---|
| | <ul style="list-style-type: none"> • Baffinland 2025. 2024 QIA-NWB Annual Report for Operations: <ul style="list-style-type: none"> ○ Appendix E.8.2: QIA inspection reports and Baffinland Responses |
| Comment: | <p>Project Certificate TC #25 states that Baffinland “<i>shall undertake additional geotechnical investigations to identify sensitive landforms, modify engineering design for Project infrastructure, develop and implement preventative and/or mitigation and monitoring measures to minimize the impacts of the Project’s activities and infrastructure on sensitive landforms.</i>”</p> <p>Okane and QIA inspection report (August 21, 2024) observed localized surface slope instability of waste rock deposited. They attributed the instability to the material gradation variability and the possibility of finer material presence in this area. Another observation was noted that the strength parameters for the slope stability analysis of the WRF in general are based on assumed values. The inspection report recommended carrying out testing on as-deposited material and determining the factual strength parameters.</p> |
| Conclusion/Request | <p>CIRNAC requests that Baffinland, in addition to the instrumentation placed or planned for thermal stability of the WRF:</p> <ul style="list-style-type: none"> a) Implement the Okane and QIA inspection report recommendation to determine the as-placed waste rock fill properties b) Install instrumentation for WRF deformation monitoring, such as Shape Accel Arrays, for early warning on any slope instability. |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #11 STATUS (New) |
| Subject/Topic: | Surface Water Quantity: Waste Rock Facility - Water Balance |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TC #17 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ 4.5.2 Unauthorized Discharge and Spills ○ 4.6.5 Groundwater & Surface Water ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report • NWB Water Licence No. 2AM-MRY2540/Type A dated April 28, 2025. • Baffinland 2024. Phase 1 Waste Rock Management Plan Rev 4.1, including: <ul style="list-style-type: none"> ○ 8.1 Deposition Strategy and Guidelines ○ 9. WRF Water Management ○ 9.3 Water Volume Tracking |



| | |
|----------------------------|---|
| | <ul style="list-style-type: none"> ○ Appendix A: Waste Rock Management Plan – June 2024 through September 2026: <ul style="list-style-type: none"> ▪ Appendix A.3: 2023 Water Balance Update Report |
| Comment: | <p>The Annual Report indicated that on June 21, 2024, rising of ambient temperature and rapid snowmelt resulted in the WRF Pond water levels rising significantly over a short period. A controlled discharge was subsequently initiated with three additional pumps to lower the water level in the pond, and pumping commenced over the spillway onto frozen ground adjacent to the WRF on June 24.</p> <p>The report also indicated that the discharge was compliant with applicable water licence NWB (2015) and <i>Metal and Diamond Effluent Regulations</i> (MDMER) requirements, and the event was reported to regulators.</p> <p>Results of Baffinland’s investigation of the incident at the WRF identified evaluating the water balance and existing pump infrastructure to ensure it is fit-for-purpose to accommodate the freshet flow by pumping water to the approved Final Discharge Point (FDP) as preventative measures to be taken to prevent a similar reoccurrence.</p> <p>CIRNAC does not object the investigation outcomes and believes that updating the water balance with current climate, hydrology and land cover would have predicted such scenarios and eliminates such outcomes.</p> <p>The objectives of the Water Balance model include simulation of the current and future water accumulation in the WRF Pond and water transfers, to understand the risks to current and planned water management strategies and potential site water quantity overflow to the receiving environment.</p> |
| Conclusion/Request: | <p>CIRNAC requests that Baffinland update the Water Balance model, particularly to include:</p> <ul style="list-style-type: none"> • Collection of climate data, hydrometric data; and, • Investigation of methods for collecting snowfall and snowpack within the WRF pond catchment. |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #12 STATUS (New) |
| Subject/Topic: | Groundwater: Explosive Magazine Area |
| References: | <ul style="list-style-type: none"> • Project Certificate No. 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs #17, 23, 24 • Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Section 4.6.5 Groundwater & Surface Water ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.3: Groundwater Monitoring Report |



| | |
|---------------------------|--|
| | <ul style="list-style-type: none"> ○ Appendix G.4: 2024 Core Receiving Environment Monitoring Program Report (CREMP) ● Baffinland 2025. 2024 QIA-NWB Annual Report for Operations ● Knight Piesold 2024. Mary River Project: 2023 Annual Ground Water Monitoring Program. ● Knight Piesold 2023. Mary River Project: Ground Water Monitoring Program Review and Assessment. |
| Comment | <p>CIRNAC notes that the risk-based ranking criteria used in Knight Piesold 2023 and 2024 differ throughout the groundwater monitoring program. For example, in Knight Piesold (2024) the 'contaminant present' category was removed because no groundwater monitoring was completed at Milne Port; however, in Knight Piesold (2023), the 'contaminant present' category applies to facilities within the Mine Site even though groundwater monitoring was not completed at nearly all facilities.</p> <p>Furthermore, Baffinland previously reported that the Explosive Magazine area was considered high risk for groundwater to impact surface water (Knight Piesold 2023). Based on this ranking, the Explosive Magazine Area likely should be added to the groundwater monitoring program.</p> |
| Conclusion/Request | <p>CIRNAC requests that Baffinland:</p> <ol style="list-style-type: none"> a) Provide rationale for the differing risk based ranking methodologies between key site areas (e.g., Milne Port, Mine Site, Waste Rock Facility, Explosive Magazine area, etc.). b) Expand the groundwater monitoring program to investigate the Explosive Magazine area because it has been categorized as 'high risk'. |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #13 STATUS (New) |
| Subject/Topic: | Groundwater: Groundwater monitoring program expansion - Milne Port ore stockpile area |
| References: | <ul style="list-style-type: none"> ● Project Certificate No. 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs #17, 24 ● Baffinland 2025. 2024 Annual Report to the NIRB; including: <ul style="list-style-type: none"> ○ Section 4.6.5 Groundwater & Surface Water ○ Appendix E: Baffinland response to Comments on 2024 NIRB Annual Report ○ Appendix G.3: Groundwater Monitoring Report |



| | |
|----------------------------------|---|
| | <ul style="list-style-type: none"> ○ Appendix G.4: CREMP ● Baffinland 2025. 2024 QIA-NWB Annual Report for Operations |
| Comment | <p>CIRNAC previously noted limited surface and water monitoring at the Milne Port ore stockpile area. Aerial imagery presented in the 2024 QIA-NWB Annual Report showed orange-stained contact waters being captured and conveyed around all sides of the ore stockpile(s). Most notable, unlined ditches with orange-stained contact water were present immediately adjacent to the river system to the west. Given the proximity to the river and Milne Port Bay, a shallow groundwater table is expected.</p> <p>While monitoring is conducted within the marine environment in the bay to the north, no monitoring appears to be conducted in the adjacent river. Furthermore, no porewater or shallow groundwater investigation has been completed to confirm the presence or absence of mine impacts to groundwater from the ore stockpile.</p> |
| Conclusion/Request (2025) | <p>CIRNAC requests that Baffinland:</p> <ol style="list-style-type: none"> a) Expand the groundwater monitoring program to include the ore stockpile at Milne Port. b) Conduct additional surface water and porewater monitoring/sampling surrounding the ore stockpile at Milne Port to confirm mine-impacted contact water is not migrating to the receiving environment via groundwater and porewater. Include the results in the 2025 Annual Report. |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #14 STATUS (NEW) |
| Subject/Topic: | Elevated Major Ions and Salinity in Downstream Waters |
| References: | <ul style="list-style-type: none"> ● Project Certificate 005 (Amendment 05) (November 17, 2023) ● TCs # 17, 21, 23, 24 ● Appendix G.4.1 – 2024 Mary River CREMP Report, Part 1 <ul style="list-style-type: none"> ○ Section 4.2: Water quality in Sheardown and Mary River systems ● Appendix G.4.1 – 2024 CREMP Report (Table 6.1) ● Type 'A' Water Licence 2AM-MRY1325 – Part F, Condition 8 and Schedule 4 |
| Comment: | <p>The monitoring data shows a rising trend in major ions (e.g. sulfate, chloride, sodium) and related parameters in downstream water bodies. Appendix G.4.1 indicates that both Sheardown Lake NW and SE exhibited mine-related influences for sulfate. Although sulfate concentrations did not exceed the Aquatic Effects Monitoring Plan (AEMP) benchmark, they were elevated relative to baseline and were</p> |



| | |
|----------------------------|---|
| | found to have increasing trends over time. Appendix G.4.1 also notes upward trends in total dissolved solids in waters receiving mine drainage. For example, water flowing from the Mine Site Water Management Pond (station F001) has consistently higher specific conductance than natural streams, indicating high dissolved ion content. Over time, such loading of major ions can alter the freshwater habitat (by increasing hardness/salinity). These minor but cumulative changes may become significant if trends continue. In particular, molybdenum and uranium levels, which remained below guidelines, were markedly higher in 2024 mine-affected lakes than in reference lakes. |
| Conclusion/Request: | <p>The significance of gradually increasing major ion concentrations requires a precautionary approach. CIRNAC suggests that Baffinland:</p> <ul style="list-style-type: none"> a) Establishes a trend threshold for key parameters like sulfate in the AEMP. b) Undertake a source identification study to pinpoint why sulfate and other ions are increasing. c) Incorporate a salinity monitoring plan into the Surface Water Management Plan, with specific conductance monitoring at key downstream locations to ensure early detection of further salinity increases. <p>These requests should be addressed in the 2025 Annual Report.</p> |

| | |
|------------------------|--|
| Comment Number: | CIRNAC #15 STATUS (NEW) |
| Subject/Topic: | Metal Accumulation in Lake Sediments |
| References: | <ul style="list-style-type: none"> • Project Certificate 005 (Amendment 05) (November 17, 2023) <ul style="list-style-type: none"> ○ TCs # 10, 21, 22, 187 • Appendix G.4.2 – Mary River Lake Sedimentation Monitoring Report <ul style="list-style-type: none"> ○ Section 3 and 4: Sedimentation Rates and Sediment Chemistry in Sheardown Lake NW • Appendix G.4.1 – 2024 CREMP Report, Part 1 <ul style="list-style-type: none"> ○ Section 4.3 : Sediment Quality Results • 2024 CREMP Report, Part 1 • CCME Sediment Quality Guidelines <ul style="list-style-type: none"> ○ Interim Sediment Quality Guidelines (ISQGs) • Final Environmental Impact Statement (Baffinland) |
| Comment: | Sediment concentrations of arsenic, copper, and iron in Sheardown Lake NW exceeded AEMP benchmark levels (e.g. exceeded CCME sediment quality guidelines). Statistical analysis confirms increasing trends in the concentration of these metals since the baseline period. The Annual Report’s appendices suggest a continuing pattern: mean iron levels in both littoral and profundal sediments of Sheardown Lake NW in 2024 remained above benchmarks. |



| | |
|----------------------------|---|
| Conclusion/Request: | CIRNAC requests that Baffinland initiate a focused investigation in 2025 into the sources of arsenic and copper in Sheardown Lake NW sediments in the 2025 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 Planning and Project Assessment Act*;
- 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 2024, the project activities and monitoring were conducted under the following Water Licences:

- Type 'A' Water Licence 2AM-MRY1325 Amendment #1 (replaced by 2AM-MRY 2540 which has been approved in June 2025)
- Type 'B' Water Licence 2BE-MRY1421 (currently 2BE- MRY2131)



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 five inspections of the Mary River Mine, on February 14-15, 2024, April 03-05, 2024, July 31-August 01, 2024, August 21-22, 2024, and October 22-23, 2024.

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

February 14, 2024

The inspectors were mainly focused on the Mary River Mine and Camp sites. The following items were inspected for compliance with the issued and valid water license:

Ore Stockpile, KM 105 Dam, Heavy/Light Duty Maintenance Shop, Open Burn Pit, Water Intake Station, Polishing Waste Pond, Incinerator, Landfill, Landfarm, Light Duty Vehicle Refueling Station, Main Camp Area, Heavy Duty Vehicle Refueling Station, Waste Water Treatment Plant, Hazardous Waste Berm.

During the inspection, CIRNAC Inspector identified several totes filled with waste oil outside the Ore Haul Truck (OHT) Wash Bay. These totes were not situated within secondary containment and are in noncompliance with Part H – Section 3 of the Water License. Part H – Section 3 states "The Licensee shall provide secondary containment for fuel and chemical storage as required by applicable standards and acceptable industry practice."

At KM105, the Dam has been leaking, causing sediment laden water to escape into the surrounding area. The Licensee has since put up mitigation measures to prevent the migration of the water.

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

Baffinland acknowledged the observation and clarified that conditions at the KM105 pond and dam are fully frozen, and there is currently no flow into or out of the pond.

A geotechnical drilling program was completed in late 2023 and this information has been used to develop a comprehensive remediation plan that involves installing a grout curtain to provide a seepage barrier to reduce seepage through the dam foundation. This remediation program has been initiated to be completed prior to the Freshet 2024.

All identified totes with waste oil and oily wastewater were removed from the OHT Washbay area and placed within secondary containment.

April 03, 2024

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

Dam 105 km, Crusher area, Fuel storages, Water intake jetty, Open burn pit, Incinerator building, Land farm/Landfill, Sewage treatment facility, Tote Road up to KM 95.

The Inspector noted several concerns of noncompliance with water licence related to spill prevention and management and state of the landfill fence.

Baffinland is committed to repairing the fence around the landfill as soon as reasonably possible. The repair has been scheduled for completion once the area is snow-free and the ground beginning to thaw. A Work Order has been created for the repair to be completed by early June.



Baffinland confirmed that the generators used on the site have a Fluid Containment System that holds up 110% of the fuel and engine oil capacity, and their operation does not require an additional containment.

July 31, 2024

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

Quarry, Land farm/snow dump, Pond 1, Pond 2, Ditches around ore stockpile, Temporary waste storage area, Incinerator, Fuel tank farm, Loading port, Jetty, Tote Road, Bridges/crossings, Culverts.

Multiple loose objects noticed at the land farm. Mainly loose construction material poses environmental hazard issue should the material become windblown.

The action required was to secure the loose objects/material within the grounds of the specified area. The area was cleaned up.

August 21, 2024

The Waste Rock Facility was inspected for compliance with the issued and valid water license. The focus of the inspection was licensee's progressive reclamation in alignment with the Phase 1 Waste Rock Management Plan and Waste Rock Facility QA/QC monitoring program. The work progress made was visually verified by the inspector during the inspection conducted of the WRF alongside Baffinland's staff personnel.

The inspector is satisfied with the overall progress of the WRF reclamation efforts and does not see/note any discrepancies with the facts as presented in the licensee's quarter 1 and quarter 2 reports.

October 23, 2024

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

Tote hauling road, Water intake jetty, Fuel storage farm, Waste rock facility, Overall conditions of the site.

During the rain event in late September that saw roughly 77mm of rain over the 24 hours period, a large part of the road was washed out preventing any travel to and from Milne Inlet site. As emergency measures, Baffinland was able to temporarily repair the road just enough for one-lane traffic so that the movement of the iron ore can resume as well as establish physical contact between the two sites, Mary River site and Milne Inlet port site.

As this location is the fish-bearing crossing, the complete repairs, including necessary work on the culverts, will be done once the canal freezes over to ensure the fish is not traveling while the work is being done.

The Inspector noted several concerns of noncompliance with water licence related to hydrocarbon rugs/pads out of containment and culvert misplacements.

Baffinland cleaned up the fuel mod area and removed the used absorbent hydrocarbon pads. The culverts downstream of the km 63.5 crossing will be removed when conditions have fully frozen and working around the high water mark with heavy equipment is safe to do so.



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.

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

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 2024, CIRNAC is generally satisfied with Baffinland's response to the concerns raised by the Inspectors in 2024. 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-MRY2540 | Implemented in CIRNAC's land use permit |
|----|---|--|--|
| 10 | <p>The Proponent shall update its Dust Management and Monitoring Plan to address and/or include the following additional items:</p> <ul style="list-style-type: none"> 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 | <p>The Proponent shall develop and implement an <i>Incineration Management Plan</i> that takes into consideration the recommendations provided in Environment Canada's Technical Document for Batch Waste Incineration (2010).</p> | Part F, Item 7 (requirement to test and dispose bottom ash and record analysis results and volumes of ash) | |
| 14 | <p>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.</p> <p>(b) The Proponent, through coordination with the TEWG as may be appropriate,</p> | | N2019Q0011 , Part 31 (1) (m) 49 |



| | Project Certificate 005 Term & Condition | Implemented in NWB water licence 2AM-MRY2540 | Implemented in CIRNAC's land use permit |
|----|---|---|--|
| | 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 effective measures to ensure that effluent from project-related facilities and/or activities, including sewage treatment plants, ore stockpiles, and mine pit, satisfies all discharge criteria requirement established by the relevant regulatory agencies prior to being discharged into the receiving environment. | 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 domestic and industrial purposes. | Parts B, D, Item 20, E Item 17, and I | |
| 20 | The Proponent shall monitor the effects of | Part E, Item 24, | |



| | Project Certificate 005 Term & Condition | Implemented in NWB water licence 2AM-MRY2540 | Implemented in CIRNAC's land use permit |
|----|---|---|--|
| | 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 I, Item 21, | |
| 21 | The Proponent shall ensure that the scope of the <i>Aquatic Effects Monitoring Plan</i> (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 <i>Sediment and Erosion Management Plan</i> to prevent and/or mitigate sediment loading into surface water within the Project area. | Part D | |
| 23 | The Proponent shall develop and implement a <i>Groundwater Monitoring and Management Plan</i> to monitor, prevent and mitigate the potential effects of the Project on groundwater within the Project area. | Part I, Item 11 (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 monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms. | Part D, Item 16 and Part I, Item 09 (for water infrastructure) | |



| Project Certificate 005 Term & Condition | | Implemented in NWB water licence 2AM-MRY2540 | Implemented in CIRNAC's land use permit |
|---|--|---|--|
| 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 1 and Part E, Item 17 | |
| 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 |
| 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 1 | |
| 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 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. | Part J, Item 10 (requirement to implement progressive reclamation including revegetation) | |
| 40 | The Proponent shall include revegetation strategies in its Site Reclamation Plan that | Part J, Items 09 and 10 | |



| | Project Certificate 005 Term & Condition | Implemented in NWB water licence 2AM-MRY2540 | Implemented in CIRNAC's land use permit |
|----|--|---|--|
| | support progressive reclamation and that promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment. | | |
| 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 12 and 13 | |
| 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 1 | |
| 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 and limit the movement of water in fish bearing streams and rivers | Part E, Item 23 | N2019Q0011 , Part 31 (1)(f) 16. |
| 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: | | N2019Q0011 , Parts 31 (1) (h) 36-38, and 31 |



| Project Certificate 005 Term & Condition | Implemented in NWB water licence 2AM-MRY2540 | Implemented in CIRNAC's land use permit |
|--|---|---|
| <ul style="list-style-type: none"> 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 mortalities, as well as mechanisms for adaptive management responses designed to prevent further such interactions. | | (1) (m) 52 |
| <p>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:</p> <ul style="list-style-type: none"> 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.). | Part F, Item 6 | N2019Q0011 , Part 31 (1) (g) 27 |



| | Project Certificate 005 Term & Condition | Implemented in NWB water licence 2AM-MRY2540 | Implemented in CIRNAC's land use permit |
|----|---|---|--|
| | 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). | | |
| 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 |

