

**Table A.1: Response to QIA Comments on Baffinland's 2023 Annual Report to the NIRB**

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
<b>GENERAL COMMENTS</b>					
1	<b>QIA 2023 NWB GC#1.</b>	Description of site conditions for CV-021 and CV-030 both refer to site CV-001. Most likely a clerical error.	Please revise report to remove reference to site CV-001 while discussing sites CV-021 and CV-030.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report</p> <p><b>Section:</b> Appendix B Habitat Assessment Sheets (Part 3)</p> <p><b>Pages:</b> 6 and 13 of 56</p>	Baffinland confirms this is in administrative error. To address several administrative errors in Appendix B (Habitat Assessment Sheets) of the 2023 Tote Road Report in future reports.
2	<b>QIA 2023 NWB GC#2.</b>	Description of site conditions for CV-104 refer to site CV-102. Most likely a clerical error.	Please revise report to remove reference to site CV-102 while discussing sites CV-104.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report</p> <p><b>Section:</b> Appendix B Habitat Assessment Sheets (Part 5)</p> <p><b>Pages:</b> 37 of 54</p>	Baffinland confirms this is in administrative error. To address several administrative errors in Appendix B (Habitat Assessment Sheets) of the 2023 Tote Road Report in future reports.
3	<b>QIA 2023 NWB GC#3.</b>	Figures provided on pages 23, 24, 27, 28, 33-38, and 43 of the Snow Management Plan are of low resolution and are difficult to read and review.	QIA requests that the figures provided in the Snow Management Plan be replaced with higher-resolution figures.	<p><b>Document Name:</b> Baffinland NIRB Annual Report, Appendix G.8.8 Snow Management Plan</p> <p><b>Section:</b> Figures 1-11</p> <p><b>Pages:</b> 23, 24, 27, 28, 33-38, 43</p>	The figures provided have been reduced to allow to be sent electronically. Baffinland will provide high-resolution figures in the plan before it is finalized. If QIA requires the photos to assist their review Baffinland can share higher resolution figures at QIA's direct request.
<b>DUSTFALL</b>					
4	<b>QIA 2023 NIRB DF#1.</b>	Table 7-4 of the Terrestrial Environment Annual Report shows annual accumulations of dustfall from January 16, 2023, to January 7, 2024. The document states that "Extrapolated (winter) dustfall predictions were added to the observed dustfall amount." No further information on the method for extrapolating summer annual dustfall data, or considerations of factors affecting dustfall deposition rates is mentioned (i.e., through comparisons of particle size in winter vs. summer, longer transport distances in winter vs.	QIA requests that the proponent provide further justification for extrapolating summer dustfall monitoring data to the rest of the year.	<p><b>Document Name:</b> Baffinland NIRB Annual Report, Appendix G.5.1 Terrestrial Environment 2023 Annual Monitoring Report</p> <p><b>Section:</b> Table 7-4 Annual dustfall accumulation for sites sampled throughout 2023</p> <p><b>Page:</b> 73</p>	As is described in the 2023 TEAMR, dustfall monitoring stations that are >1km away from Project infrastructure are not visited monthly during winter due to accessibility and safety. Consequently, winter dustfall data are unavailable at stations >1km from the Project. A modeling approach was developed to extrapolate winter dustfall predictions to farther distances to address this data gap. Winter dustfall predictions are not made from summer dustfall data. Winter predictions for sites >1km are estimated using (1) mean dustfall during winter, and (2) the range of available data at each location (Mine, Milne Port, Tote Road); a linear slope across distance values that is either the same (i.e., a common slope term) or different (i.e., a season-by-distance interaction term) from summer dustfall predictions. This

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		summer, etc.). For example, seasonal differences in particle size dispersion (if present) will affect extrapolation methods.			<p>methodology is further detailed in a memo shared with and accepted by the QIA in February 2022 (EDI Environmental Dynamics Inc 2023).</p> <p><b>Reference</b></p> <p>EDI Environmental Dynamics Inc. 2023. Mary River Project — Winter Dustfall Predictions at Distance Monitoring Sites. Technical Memorandum. EDI File # 23Y0273. Prepared for Baffinland Iron Mines Corporation. 5 pp.</p>
5	QIA 2023 NIRB DF#2.	<p>In Section 4.6.2, Baffinland noted that dustfall has exceeded FEIS predictions in some locations, but dust does not appear to have measurable impacts in other environmental media (e.g., vegetation, freshwater quality). There is no further discussion regarding the assessments that have been completed to evaluate dust-related impacts. Baffinland referred to PC No. 58 for more information about dustfall. From review of PC No. 58, there is further reference to PC No. 10, No. 34, and No. 54 for discussion of dustfall impacts on environmental media. Thus, the reviewer is redirected twice (i.e., once to PC No. 58 then again to PC No. 10, No. 34, and No. 54) before finding a discussion on the evaluation of dust impacts on environmental media. In the recommendations/lessons learned for PC No. 10, Baffinland noted: “Baffinland will continue with a number of projects to fully consider the 2023 Dust Audit Report (NunamiStantec, 2023) suggestions with assessment/implementation of accepted recommendations from the independent Dust Audit at the earliest opportunity.” The timeline for implementing these recommendations, any anticipated mitigative effect of implementing the recommendations to reduce dust impacts to those predicted within the FEIS, or the relative impact of the recommendations is not provided in the NIRB annual report. Further, Baffinland indicated for PC No. 27 and PC No. 187 that a follow-up report will be issued by the Dust Audit Committee in Q2 of 2024. It is unclear if and how this follow-up report will be used to inform actions to mitigate dust impacts at the project. Baffinland discussed dustfall monitoring programs for the project in PC No. 10 (dust monitoring and management as part of the Air Quality and Noise Abatement Management Plan and Roads Management Plan), PC No. 21 (Dustfall</p>	<p>With respect to Section 4.6.2:</p> <ol style="list-style-type: none"> <li>Clarify what assessments have been completed to support the claim that there are no measurable impacts to environmental media from dustfall.</li> </ol> <p>With respect to PC No. 10, No. 27, and No. 187:</p> <ol style="list-style-type: none"> <li>Clarify if the implementation of recommendations from the 2023 Dust Audit Report are anticipated to return dustfall to FEIS predictions?</li> <li>Clarify whether the follow-up report from the Dust Audit Committee will be used to inform dust mitigations in 2024.</li> </ol> <p>With respect to PC No. 10, No. 21, and No. 50:</p> <ol style="list-style-type: none"> <li>Discuss how the results of the Dust Audit outcomes will be used to inform the Dust Monitoring Program and whether updates to the Dust Monitoring Program are needed based on the Dust Audit results.</li> </ol>	<p><b>Document Name:</b> Project Certificate Term and Condition No. 10, No. 21, No. 27, No. 34, No. 50, No. 54, and No. 187 (Section 4.6.2, 4.6.5, 4.6.6, 4.6.8, and 4.8.5)</p>	<p>With respect to Section 4.6.2:</p> <ol style="list-style-type: none"> <li>The Terrestrial Environment monitoring program evaluates multiple endpoints of the receiving environment, including changes in vegetation abundance and composition, and soil and vegetation base metals. These monitoring programs have not identified any measurable impacts or unifying trends.</li> </ol> <p>With respect to PC No. 10, No. 27, and No. 187:</p> <ol style="list-style-type: none"> <li>Implementation of recommendations from the 2023 Dust Audit Report and any independent dustfall mitigation activities identified by BIM will help the project decrease project-related dustfall. Mitigations do not each have related quantifiable predicted decreases in dustfall; therefore, it cannot be predicted if dustfall is anticipated to return to FEIS predictions.</li> <li>BIM evaluates all follow-up communications from the Dust Audit Committee and uses their input to inform dust mitigations.</li> </ol> <p>With respect to PC No. 10, No. 21, and No. 50:</p> <ol style="list-style-type: none"> <li>BIM appreciates the Dust Audit Committee’s feedback and has gained valuable insights from the Inuit Qaujimagatuqangit and community knowledge shared to date. BIM is open to adjustments to the Dustfall Monitoring Program when valid gaps are identified, and (where applicable) approved methodologies exist that can be implemented to bridge these gaps. These suggestions for revision may come from the Dust Audit Committee or other interested parties.</li> </ol>

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		<p>Monitoring Program as part of the Aquatic Effects Monitoring Plan), and PC No. 50 (dustfall monitoring as part of the Terrestrial Environment Mitigation and Monitoring Plan). Baffinland did not discuss how the results of the Dust Audit may impact dust monitoring programs at the site. It is unclear whether the results of the Dust Audit have been considered in relation to dust monitoring at site and whether updates to the monitoring programs are needed based on the Dust Audit results</p>			
6	<p><b>QIA 2023 NIRB DF #3.</b></p>	<p>PCC 10e. requires Baffinland "...take all adaptive management measures described in its Dust Management and Monitoring Plan if monitoring indicates that dust in the ambient air or dust deposition from the increased traffic associated with the increased volume of ore being shipped is greater than initially predicted." Despite Baffinland's efforts dust deposition along the Tote Road has consistently exceeded predictions (See annual TEAMR reports). One of the measures Baffinland has been using to suppress dust is the application of DUST/BLOKR®. However, its recent study found that this product, when applied as per the manufacturer's recommendations, was not suitable for dust reduction along the Tote Road and caused rapid degradation of the road's running surface relative to the application of calcium chloride solution. Baffinland plans to continue to investigate alternative methods for suppression of Tote Road dust, but in the interim plans to switch from using DUST/BLOKR® to using more calcium chloride solution for Tote Road dust suppression. This is a significant change in direction for Project dust mitigation. Further information is needed on how much calcium chloride will be applied annually, and on the effects this change may have on the terrestrial and aquatic receiving environments.</p>	<p>QIA requests Baffinland provide information on:</p> <ol style="list-style-type: none"> <li>1. how much calcium chloride it plans to apply to Project roadways for dust suppression in 2024,</li> <li>2. how this amount compares to use of this chemical in 2023,</li> <li>3. how this change may affect terrestrial and aquatic receiving environments along the Tote Road, and</li> <li>4. whether additional sampling is planned to monitor for effects from these applications.</li> </ol>	<p><b>Document Name:</b> 2023 NIRB AMR, App. G.5.1 Final Terrestrial Annual Monitoring Report (TEAMR) [240503-08MN053-2023 Annual Report-App GTEAMR-Pt 1-IMRE.pdf]</p> <p><b>Section:</b> 7.2</p> <p><b>Page:</b> 44 (PDF 86 of 123)</p>	<ol style="list-style-type: none"> <li>1. Baffinland estimates that calcium chloride will be applied to Project roadways for dust suppression purposes in 2024 at a rate of 800 kg/km per application. The total weight of calcium chloride that will be applied will be based on various factors including location, dust observations, road moisture content, time and intensity of precipitation events, and proximity to standing or running water.</li> <li>2. Once it was confirmed that alternate dust suppressants (DUST/BLOKR®) were ineffective when applied following the manufacturer's protocol, additional volumes of calcium chloride were purchased for application in 2024, compared to 2023 where 145,136 kg of calcium chloride was applied in conjunction with the application of DUST/BLOKR®. This represents a successful change in approach to dust suppression that has so far yielded improved results and has significantly reduced the need for excessive use of water as a dust suppressant. It should be noted that this approach helps reduce the potential for water withdrawal exceedences along the Tote Road for dust suppression purposes.</li> <li>3. Calcium chloride was applied according to a conservative protocol that ensures optimal product use while maintaining effective dust reduction. Due to the conservative application rate compared to rates applied in southern Canada, Baffinland does not anticipate changes to the terrestrial or aquatic receiving environments.</li> <li>4. Ongoing monitoring of streams along the Tote Road under the Tote Road Monitoring Program (TRMP) will continue, to ensure no adverse conditions result from the application of additional calcium chloride. Calcium chloride is a common and widely used product for dust suppression and is approved by Nunavut Department of Environment.</li> </ol>

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7	QIA 2023 NIRB DF #4.	<p>The purpose of PCC 21 is to mitigate potential impacts to surface and ground waters and in it Baffinland is directed "To facilitate comparison with existing guidelines and potentially with thresholds to be established using studies of Arctic char egg survival and/or other studies recommended by the Terrestrial Environment Working Group (TEWG)" (PCC 21.a.iii, p. 125). To meet this condition, sediment deposition on the bottom of Sheardown Lake is being monitored as part of the Aquatic Effects Monitoring Program (AEMP) (2023 QIA-NWB Ann. Rep., App. E.5.3, s.3.8.1, PDF p. 57 of 78).</p> <p>"The mean sediment accumulation thickness estimated for the 2022 to 2023 arctic charr egg incubation/larval pre-emergence period at Sheardown Lake NW (0.15 mm, 0.08 mm, and 0.10 mm at SHAL-1, SHAL-2, and DEEP-1, respectively) was at or below, but did not exceed, the draft AEMP Rev. 2 TARP Low Action threshold of 0.15 mm, and approximately 8 to 15% of the threshold level of 1 mm of sediment accumulation thickness purported to affect egg incubation success." (App. G.4.2, s.4, p. 22)</p> <p>When interpreting these sediment data, one must keep in mind that sediment risk thresholds in the draft Aquatic Effects Monitoring Plan (AEMP) are not based on studies of Arctic char or Project-generated sediment. This is a concern as the threshold may underestimate the effects of Project sediment on char eggs.</p> <p>Sediments entering Sheardown Lake can settle on char eggs that are laid in the fall and hatch in the spring. While the effects of different thicknesses of sediment deposited on char eggs are not known, there has been a strongly significant increase from 2013 to 2023 in the rate of sediment deposition on the bottom of Sheardown Lake at all of the depth ranges (SHAL-1, SHAL-2, DEEP-1) and in both seasons (ice-cover, open water) tested, with the exception of DEEP-1 open water (App. G.4.2, App. A, Fig. A.1, pp. 30 to 32). This trend is a concern given that the quantity of ore mined, crushed and transported may triple within the next 5 years, and with it the sediment deposition.</p>	<p>QIA requests Baffinland, prior to its planned production increase, implement additional precautionary dust and sediment mitigation measures to prevent potential threshold exceedances and undertake studies to validate sediment thresholds for Arctic char egg survival.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.5 Groundwater &amp; Surface Water, PCC 21</p> <p><b>Page:</b> 125 (PDF p. 143 of 641)</p> <p><b>Document Name:</b> 2023 NIRB AMR, App. G.4.2 Lake Sedimentation Monitoring Program [240503-08MN053-2023 Annual Report-App G-Lake Sed-IMRE.pdf]</p> <p><b>Section:</b> 4</p> <p><b>Page:</b> 22 (PDF p. 26 of 57)</p> <p><b>Section:</b> Appendix A, Figure A.1</p> <p><b>Pages:</b> PDF p. 30 to 32 of 57</p> <p><b>Section:</b> Appendix A, Figure A.10</p> <p><b>Pages:</b> PDF p. 50 of 57</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to QIA and NWB on Operations [NWB Registry: 240331 - 2023 QIA-NWB Annual Report for Ops - Appendix E.5.3 (AEMP) - As Sent.pdf]</p> <p><b>Section:</b> 3.8.1 Lake Sedimentation Monitoring Program</p> <p><b>Page:</b> 38 (PDF p. 57 of 78)</p>	<p>Baffinland has incorporated sedimentation thresholds for fish egg survival that are below, or in line with, a threshold of 1 mm accumulation supported in published literature for potential effects on fish egg mortality (i.e., 1 mm; Morgan et al. 1983, Fudge and Bodaly 1984, and Berry et al. 2011). Moreover, the sedimentation rates shown at Sheardown Lake NW have been well below the 0.54 mm sediment accumulation thickness predicted in the Baffinland Final Environmental Impact Statement. Therefore, Baffinland contends that because sedimentation has been well below published thresholds for potential effects, and well below FEIS predictions, studies to validate sediment thresholds for arctic char survival are currently not warranted. As indicated as a moderate action response in the TARP of the Aquatic Effects Monitoring Program (AEMP), should sedimentation levels approach 0.54 mm over the egg incubation period, studies to validate sediment thresholds for egg survival will be considered. This threshold setting was explicitly proposed by QIA, agreed to by Baffinland and recognized in Appendix B of the Project Certificate.</p> <p>Baffinland has recently hired two individuals with certification as Inspectors of Sediment and Erosion Controls (CAN-CISEC). Outcomes of ongoing works along the Tote Road and across both sites will continue to inform updates to the SWAEMP, to be consistent with current standards, as additional technologies and best practices come to light, and consistent with Baffinland's unique environmental conditions. Additional controls will also be trialed and implemented through out the Project as part of adaptive management.</p> <p>Baffinland will continue to work with QIA during the SOP2 process to ensure effective controls are in place in regards to dust and sediment management at the Project.</p>

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		<p>In recognition of this trend and anticipation of further increases in sediment deposition, precautionary mitigation should be implemented to suppress Project-generated dust and contain sediment and defensible risk thresholds should be established for deposition of local sediment on Arctic char eggs.</p>			
8	QIA 2023 NIRB DF #5.	<p>PC Condition 21 relates to Groundwater/Surface Waters – Aquatic Effects Monitoring Plan (AEMP) and dustfall monitoring.</p> <p>Under the Production Increase Proposal Renewal (PIPR) Baffinland committed (Commitment BIM ID #065, QIA ID-24A; NIRB 2022, p. 124) to a study to address QIA concerns regarding the impacts of Project-related dust and sediment on the ecology of streams along the Tote Road (Baffinland 2023, p. 12). In 2023 Baffinland planned to undertake an "initial pilot (special) investigation" to inform discussion for the design of a Tote Road monitoring program to assess potential Project-related impacts on aquatic conditions within the Phillips Creek watershed based on the establishment of long-term monitoring stations. A report on the pilot investigation was to be included as part of Baffinland's 2023 NIRB Annual Report but was not found during review. QIA is not aware of further discussion on the design of the 2-year study to follow.</p>	<p>QIA requests Baffinland provide an update on the results of its Pilot Project and plans for the 2024 study of Project generated dust and sediment effects on the ecology of Tote Road streams.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.5 Groundwater &amp; Surface Water, PCC 21 Page: 125 (PDF p. 143 of 641)</p> <p><b>Document Name:</b> Baffinland. 2023. Baffinland Response to Comments Received for Baffinland's 2022 NIRB Annual Report (NIRB Registry: 230814-08MN053-BIM Rsp to Comments 2022 NIRB Annual Report-IT4E.pdf)</p> <p><b>Section:</b> Table A.1, Response to QIA comments on Baffinland's 2022 Annual Report to the NIRB, Comment # 19 (QIA 2022 NIRB M&amp;AE# 8)</p> <p><b>Page:</b> 12 (PDF p. 15 of 222)</p> <p><b>Document Name:</b> Nunavut Impact Review Board [NIRB]. 2022. NIRB Project Certificate [No. 005] (221103-08MN053-NIRB Project Certificate No 005 Amendment 4-OT4E.pdf)</p> <p><b>Section:</b> Appendix B.</p> <p><b>Commitments Page:</b> 124 (PDF p. 124 of 129)</p>	<p>The initial pilot project investigation to assess potential sediment deposition to streams along the Tote Road from Tote Road operations was initiated in 2023. The initial trial involved deployment of six (6) sediment traps in upstream and downstream locations at the CV-099 culvert crossing location. The initial trial was completed during summer 2023. Results of the 2023 pilot investigation indicate no statistically significant difference in the weight of sediment collected between the downstream and upstream locations, essentially indicating that the Tote Road did not contribute significant amounts of sediment to the creek.</p> <p>The sediment monitoring program trial is planned to continue in 2024, using a similar approach to last year, and will include two (2) sediment trap deployment periods: a post freshet/open-water season period, and an overwintering/freshet period. Minor modifications may occur between the two (2) periods if needed to ensure collection of accurate data and/or to eliminate non-target bedload material from entering the deployed traps. Sediment traps for the 2024 early summer-late fall collection period have been deployed, and the over-winter deployment is scheduled to be completed during late fall, prior to freeze up conditions. Retrieval of the over-winter/freshet period traps will occur following freshet 2025. Analysis of the full pilot investigation will be conducted following that retrieval and if the pilot investigation yields applicable information then it will be used to develop an effective annual sediment monitoring program.</p>

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9	QIA 2023 NIRB DF #6.	<p>In Section 7.1, Baffinland states that they “...conducted a detailed evaluation of the efficacy of calcium chloride and DUST/BLOKR® from July 15 to August 31, 2023. ... results of this focused evaluation determined that DUST/BLOKR® ... is not suitable for use on the Tote Road...” (p. 44). Baffinland provides limited details of the evaluation methods, analyses, results or conclusions.</p> <p>Similarly, Baffinland describes trials of the application of DusTreat at the crusher and ore stockpiles, but provides limited details on the evaluation methods, analyses, results or conclusions.</p>	<p>QIA requests that Baffinland provide a copy of their evaluation of the efficacy of calcium chloride and DUST/BLOKR® and trial methods and results of their applications of DusTreat at the crusher and ore stockpiles. QIA expects that Baffinland’s detailed evaluation/ trial methods and results will include:</p> <ol style="list-style-type: none"> <li>1. Time periods of trials;</li> <li>2. Weather conditions during trails;</li> <li>3. Application methods, amounts and locations;</li> <li>4. Observation/data recording;</li> <li>5. Data analysis;</li> <li>6. Results;</li> <li>7. Comparisons of results with dustfall passive monitoring and satellite imagery data; and</li> <li>8. Conclusions / next steps.</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board;</p> <p><b>Section:</b> Section 7.1 Dustfall Suppression and Mitigation</p> <p><b>Page:</b> p. 44</p>	<p>Baffinland will provide the requested details following completion of the trials. The trials of DusTreat at the Crusher and ore stockpiles is ongoing, with trial timing and operational/environmental conditions and variables being taken into account for the overall assessment. In the meantime, however, Baffinland can provide the following answers to the specific questions for the trial that is completed for the assessment of DUST/BLOKR® on the Tote Road:</p> <ol style="list-style-type: none"> <li>1. The time period for the DUST/BLOKR® trial was July – August of 2023.</li> <li>2. Weather conditions are recorded, and generally during the time of the trial conditions were warm and dry with very little precipitation.</li> <li>3. Calcium chloride was added to the Tote Road at a rate of 800 kg/km per application from KM 91-97, with DUST/BLOKR® applied to kilometers 97-100 <b>exactly</b> according to the manufacturer’s specifications and under the supervision of a representative of Cypher Environmental during the application.</li> <li>4. Purple Air monitors were positioned adjacent to the trial areas at KM 93.5 and KM 98.5 (one on each side of the road to capture upwind and downwind conditions). Visual observations were also recorded in terms of visible dust, and road condition. Video and photographic evidence was collected and recorded for future analysis.</li> <li>5. The data analyzed included visual reports of dust, road conditions reports, weather, wind speed and direction, relative humidity, temperature, and particulate matter (PM2.5 and PM10) emissions. All data was compared to the trial timeline, with measurements of dust collected every 2 minutes.</li> <li>6. In the initial days following the initiation of the trial, CaCl and DUST/BLOKR® appeared to perform similarly in terms of dust reduction. However, after 7 days, the DUST/BLOKR® portion of the road was suffering significant damage and its ability to bind dust particles was greatly reduced. Cypher Environmental was contacted and advised that a maintenance coat be applied. Following the application of the maintenance coat, the DUST/BLOKR® section of the road quickly deteriorated and was ineffective at controlling dust, to the point of repelling water applied to the road and rendering the use of water as an additional control of dust ineffective. The calcium chloride portion of the road, however, remained relatively dust free, and greatly enhanced the additional control offered by a light application of water to the road. The results of the trial were conclusive that DUST/BLOKR® is ineffective at controlling dust on Project roadways. This is supported by the QIA inspector’s observations that this kind of dust mitigation chemical will not work with the kinds of roadbed material on the Project site.</li> </ol>

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					<p>7. As has been discussed previously with QIA, the comparison of area source monitoring against the Air Quality monitoring, Passive Dustfalls and satellite imagery is not something that can be scientifically accomplished due to incompatible data types. This passive dustfall and satellite imagery monitoring is to determine project related effects meanwhile the new Purple Air monitors are to inform implementation of dust controls by area.</p> <p>8. Conclusions of the DUST/BLOKR® trial are that calcium chloride is a vastly superior product to DUST/BLOKR® for controlling dust along the Tote Road and therefore Baffinland committed significant funds to procure sufficient calcium chloride to mitigate dust along the Tote Road in 2024. The next step is to monitor the performance of the calcium chloride application and compare it to the use of water only.</p>
10	<b>QIA 2023 NIRB DF #7.</b>	Baffinland used mixed effects models to test the relationship between distance from Project infrastructure and daily dustfall. These models appear to have included both distance from mine site and distance from road as variables, but Baffinland does not mention whether the collinearity of variables were assessed (e.g., via Spearman rank correlations)	QIA requests Baffinland confirm whether they tested for collinearity of variables used in their mixed effects models.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;</p> <p><b>Section:</b> Section 7.3.1.3</p> <p><b>Page:</b> p. 57</p>	<p>The mixed effects models used to test the relationship between distance from Project infrastructure and daily dustfall did not include distance from the mine site and road as variables; the model included the nearest distance to infrastructure, whether the road, mine or port.</p> <p>Since only one distance variable was used, no collinearity of variables was tested.</p>
11	<b>QIA 2023 NIRB DF #8.</b>	Within section 7.3.2.3, Baffinland notes that “The annual dustfall values were compared with the annual EIS predictions, however, this modelling was updated in 2023, and presented as part of the Sustaining Operations Proposal (SOP) Air Quality Assessment (Nunami Stantec Ltd. 2023). As this proposal was approved in late 2023, the annual dustfall data for 2024 will be compared with the updated dustfall predictions.” (p. 72). Baffinland notes that the 2024 dustfall data will be compared with this new modelling, but does not note whether there will still be a comparison to the FEIS predictions.	QIA requests that Baffinland include a comparison to both the FEIS predictions and the updated dustfall model as part of the 2024 TEAMR. This will help to ensure that any dustfall impacts above those predicted in the FEIS are noted, and that Baffinland efforts to improve the current understanding of dust dispersion and impacts are shown.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;</p> <p><b>Section:</b> Section 7.3.2.3</p> <p><b>Page:</b> p. 72</p>	<p>The 2024 annual dustfall data presented in the 2024 TEAMR will be discussed in comparison with the FEIS predictions and the updated modelling results presented in the Sustaining Operations Proposal 2 (SOP2) Air Quality Assessment (Nunami Stantec Ltd. 2023).</p>

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12	QIA 2023 NIRB DF #9.	<p>Within Table 7-4, Baffinland shows the annual dustfall accumulation for monitoring sites in 2023, which includes dustfall deposition above the FEIS predictions at 24 of the 43 dustfall monitoring sites.</p> <p>Continued dustfall deposition above the levels predicted within the FEIS continues to be a significant concern for QIA. QIA acknowledges that Baffinland has undertaken actions to improve dust mitigations and limit dustfall deposition, but notes that more actions can still be undertaken reduce dustfall deposition.</p> <p>As well in Tables 7-8 and 7-10, Baffinland notes the mean dustfall concentrations in areas of community concern based on satellite imagery analysis with Quarnak showing elevated dustfall concentrations relative to baseline and reference site concentrations.</p>	<p>QIA requests that Baffinland commit to the following:</p> <ol style="list-style-type: none"> <li>1. QIA requests that Baffinland continue to monitor lichen-metal concentrations more frequently than currently scheduled, annually, so that if thresholds noted in the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) are exceeded that suitable responses can be undertaken. QIA notes that they are still working with Baffinland on requested changes to the current draft of the TEMMP to address outstanding concerns which are related to thresholds and responses.</li> <li>2. Committing to undertaking a meeting with the QIA before September 2024 to resolve outstanding issues related to the isopleth modelling for the Project since February 2023.</li> <li>3. Baffinland to provide a review of operational and infrastructure controls that can be implemented throughout the ore handling chain to minimize dustfall by August 2024.</li> <li>4. Baffinland to commit to having a meeting with QIA to discuss proposed responses to threshold exceedances for dustfall before September 2024.</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;</p> <p><b>Section:</b> Section 7.3.2.3; Table 7-4; Section 7.4.2; Table 7-8; 7-10</p> <p><b>Page:</b> p. 72-73; p. 102</p>	<ol style="list-style-type: none"> <li>1. Table 1-1 of the 2023 TEAMR summarizes the frequency of previous and next anticipated Terrestrial Environment Monitoring components. As defined in the TEMMP, both soil/vegetation base metals sampling and vegetation abundance monitoring are conducted per 3–5 year intervals; BIM has either met or exceeded the prescribed monitoring frequency for these components, which BIM will continue to do into the future.</li> </ol> <p>Based on the most recent soil/vegetation base metal monitoring campaign (2022 TEAMR), soil metals predominantly indicated no significant change or were significantly lower than baseline values across all Project areas and sample distances. Many mean lichen-metals concentrations across Project areas and sample distances showed no significant changes from baseline values, although some discrete increases have been recorded (i.e., attributed to occasional 'spikes' in metal concentration, sample variability, and/or proximity to Project operations). These findings suggest that soil/vegetation base metals currently present a low environmental and human health risk.</p> <ol style="list-style-type: none"> <li>2. Baffinland will discuss this with QIA. Baffinland requests that QIA provide a consolidated summary of comments on the isopleth model prior to the meeting occurring.</li> <li>3. Baffinland will continue to work with the QIA and is providing a written response to previous commitments to QIA around implementation of dust controls at the Project.</li> <li>4. Baffinland will discuss this with QIA</li> </ol>
13	QIA 2023 NIRB DF #10.	<p>Within section 7.4.1.5, Baffinland notes that the dustfall concentrations for the imagery analysis were classified into 6 classes: 40 g/m<sup>2</sup> . QIA notes that the FEIS predictions include 1–4.5, 4.6– 50, and ≥50 g/m<sup>2</sup> , which differ from the classes provided by Baffinland and means that direct comparisons are difficult.</p>	<p>QIA requests that for future reporting on satellite imagery analysis that Baffinland using the following classes:</p> <p>&lt;1, 1–4.5, 4.5–10, 10–20, 20–40, 40-50 and ≥50 g/m<sup>2</sup>. BY actioning this change, Baffinland will make it easier to make comparisons to FEIS predictions and</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;</p> <p><b>Section:</b> Section 7.4.1.5</p> <p><b>Page:</b> p. 87</p>	<p>Baffinland uses the dustfall concentration classes &lt;1, 1–4.5, 4.5–10, 10–20, 20–40, and ≥40 g/m<sup>2</sup> for the dustfall satellite imagery analysis. The &gt;40 g/m<sup>2</sup> class can be split into two classes, 40–50 g/m<sup>2</sup> and &gt;50 g/m<sup>2</sup>, as recommended by QIA, will be used in the 2024 reporting for easier comparison with the FEIS predictions.</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
			increase the utility of the satellite imagery analyses.		
14	QIA 2023 NIRB DF #11.	<p>Within Section 7.4.2.2, Baffinland provides Figures 7-18 and 7-19 that show correlations between dustfall sampling data and the results of satellite image analyses. Based on these it appears that the correlations between passive dustfall samplers and image analysis results are quite low, suggesting a low level of accuracy with one or both of the monitoring methods. Baffinland does not provide details of any further improvements to satellite imagery analyses or dustfall sampling that will be undertaken in future years to achieve better correlation between the two monitoring programs.</p>	<p>QIA requests that Baffinland commit to undertaking improvements to satellite imagery analyses which will be undertaken in future years to achieve better correlation between the two monitoring programs.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1; <b>Section:</b> Section 7.4.2.2, <b>Page:</b> p. 91</p>	<p>The low correlations between passive dustfall samplers and the satellite imagery analysis results presented in Figures 7-18 and 7-19 of the 2023 TEAMR was identified in the 2021 TEAMR when this quantitative estimate of dust concentration was first introduced.</p> <p>As stated in the 2021 TEAMR, "The concentration from the passive dustfall monitors is based on the estimated dustfall rate over a period between the image acquisition date and the last estimated snowfall date. This estimate may not fully represent the dust concentration on the ground when the image was captured. Snow samples collected during satellite image acquisition may improve the model fit."(pg 76). The low correlation highlights the effects of other factors such as time since the last snowfall and dust redistribution on what has fallen (passive dustfall monitor) and what is on the ground (satellite image).</p> <p>Baffinland has since incorporated surface snow sampling for satellite ground truthing into its program, with 2024 being the third year of data collection. Surface snow sampling during image acquisition is intended to provide a more direct comparison since they are both capturing what is on the ground. No significant relationship has been identified as of the 2023 TEAMR. Improvements to the sampling program have been made to increase the number of usable samples including providing image footprints and corresponding image acquisition dates up to the end of May on days with minimal cloud cover.</p>
15	QIA 2023 NIRB DF #12.	<p>As part of the recommendations / lessons learned PC Term and Condition no. 10, Baffinland notes that they will be "...trialing different early notification methods to identify increasing dust levels on the Tote Road. Examples include establishing a communication protocol between drivers and Site Dispatch, and implementing a guideline for identifying high risk conditions for dust suppression, based on a variety of conditions, including weather." (p. 84). Baffinland does not provide further details on the proposed early notification methods they are proposing to trial, so it is currently difficult to assess how effective the proposed system may be at reducing dustfall levels.</p>	<p>QIA requests that Baffinland provide the following details for the proposed early notification methods to identify increasing dust levels on the Tote Road:</p> <ol style="list-style-type: none"> <li>1. What staff will be involved;</li> <li>2. What observation metrics will be used for recording high risk conditions (e.g. visual cues, road conditions, wind speeds, time since last precipitation event);</li> <li>3. What dust suppression responses may entail;</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; <b>Section:</b> Section 4.6.2; Project Certificate Term and Condition No. 10 <b>Page:</b> p. 84</p>	<ol style="list-style-type: none"> <li>1. Baffinland staff involved in this notification system are Ore Haul drivers, Ore Haul dispatchers, and Road Maintenance Supervisors who are responsible for the application of water if required to reduce dust. These are the staff involved because they are constantly on the road, know its condition the best, and have a stake in controlling dust from both personal and team safety perspectives.</li> <li>2. The primary metric involved in this notification system is visible dust. Ore haul drivers report visibility conditions (primarily line of site visibility).</li> <li>3. With the application of calcium chloride along 97 kilometers of the Tote Road, dust conditons change less rapidly than with the use of a water-only application. Water trucks are continually on the Tote Road and dust suppression responses involvev strategically sending the water trucks to the section(s) of road requiring rehydration of the calcium chloride. Elevated dust suppression responses could entail re-application of calcium chloride if the effectiveness has diminished.</li> </ol>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
			<ol style="list-style-type: none"> <li>4. Proposed timing of dust suppression responses relative to when the high risk conditions was noticed;</li> <li>5. How data will be recorded and conditions will be tracked;</li> <li>6. What the communications protocol will entail (e.g. who gets notified, follow-up from dustfall suppression staff); and</li> <li>7. Reporting for the program/system.</li> </ol>		<ol style="list-style-type: none"> <li>4. Dust suppression responses listed above would be actioned as soon as possible in the case of applying water to rehydrate the road, or on a case-by-case investigation into the road conditions when assessing the need to re-apply calcium chloride.</li> <li>5. For this specific item referenced by the reviewer, no data is recorded. Water truck drivers are engaged in dust suppression activities and are logging the KM markings where they disperse water. These areas are targeted because haul truck drivers notify their supervisors about worsening conditions along the Tote Road.  High priority areas are identified to the Operators to apply dust suppression at the referenced areas and recorded where dust suppression occurred.</li> <li>6. The typical protocol for identifying high priority areas that require attention of a dust suppressant is as follows: OHT Drivers notify OHT Dispatch of an area on the Tote Road that is encountering worsening conditions (ie. dust is observed due to traffic and drying of the previous dust suppressant application). Dispatch subsequently notifies a Road Maintenance Supervisor who dispatches an Operator to prioritize the area identified. Other staff may also routinely be involved in reporting a dusty area to Road Maintenance Supervisors, including OHT Supervisors, and Environment Department personnel.  The reporting mechanism for water and calcium needs involves OHT Operators, Road Maintenance Supervisors and OHT Supervisors coordinating with OHT Dispatch regularly to address any areas of concern that arise along the Tote Road. Response to issues reported is actioned on a priority basis.</li> </ol>
16	<b>QIA 2023 NIRB DF #13.</b>	With regards to PC Term and Condition no. 10, Baffinland states it has "...provided a program to identify high risk conditions for dust dispersion, based on numerous site conditions, including weather. ...Baffinland worked jointly working with QIA to establish a program to identify high risk conditions for dust dispersal and plan for additional mitigation measures in order to satisfy the requirements of PC Term and Condition No. 188." (p. 85). QIA and Baffinland have had three meetings between September 2023 and January 2024 regarding thresholds for dust dispersion. QIA notes that this work is still on-going and that there are still outstanding concerns related to the establishment of thresholds for dust dispersion that need to be addressed by Baffinland.	<ol style="list-style-type: none"> <li>1. QIA requests that Baffinland update the wording to accurately reflect the work that has been completed related to identifying high risk conditions for dust dispersion, specifically to note that: "Baffinland has been working jointly with QIA to establish a program to identify high risk conditions for dust dispersal and plan for additional mitigation measures in order to satisfy the requirements of PC Term and Condition No. 188, and this work is still ongoing."</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> Section 4.6.2; Project Certificate Term and Condition No. 10</p> <p><b>Page:</b> p. 85</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.3</p> <p><b>Section:</b> Table 1</p> <p><b>Page:</b> NA</p>	<ol style="list-style-type: none"> <li>1. As per recent communication with QIA Baffinland is providing an update on all commitments to date, and will continue working with QIA on this specific item. Baffinland agrees that input from QIA is critical and will continue to engage QIA on this item.</li> <li>2. Much of the requested information is still in development but Baffinland notes what has been outlined. Baffinland provided a program framework, but the level of detail QIA is asking for is not available at this time. A complete understanding of the interrelation between all environmental factors and mitigation methods and their effectiveness is underway with numerous trials and data collection. This information will inform the operational details of the program and will be communicated once finalized.  Baffinland notes that it is important to control dust during all environmental conditions and is continuing to focus efforts on development of suitable, reliable, and consistent monitoring processes as well as mitigation methodologies in a</li> </ol>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
			<p>2. QIA requests that Baffinland provide the following details related to the program for identifying conditions with high risk for dust dispersion:</p> <ul style="list-style-type: none"> <li>a. Literature review and meteorological data used to develop the proposed thresholds of 80 km/h;</li> <li>b. Thresholds for other conditions (e.g. time since last precipitation event) that will also be used to inform conditions where there is a high risk for dust dispersion;</li> <li>c. Monitoring methods that will be used to assess when triggers are reached including:               <ul style="list-style-type: none"> <li>i. Staff involved;</li> <li>ii. Frequency and timing of monitoring;</li> <li>iii. Locations of monitoring relative to project activities / infrastructure (e.g. monitoring location relative to proposed blasting activities, monitoring location relative to the crusher);</li> <li>iv. Equipment used in monitoring (e.g. anemometer);</li> <li>v. Details of the different visual cues that will be used including training / reference materials staff will use to reduce the subjectivity of the TARP table content (i.e. dust generally contained with</li> </ul> </li> </ul>		<p>unique Arctic environment. These trials and initiatives require full testing and evaluation before finalizing a program with these elements.</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
			<p>work area vs. dust mostly contained within work areas);</p> <p>vi. Communication pathways to between monitoring and operational staff; and vii. Data recording details.</p>		
<b>METEROLOGY AND CLIMATE</b>					
17	<b>QIA 2023 NIRB MC # 1.</b>	<p>The conclusions in the report state that <i>"the mitigation strategy defined for the prevention of acid generation and metal leaching from the pile is predicated on freezing of the PAG waste rock during winter, with deposition of additional rock in summer to keep the frozen rock isolated from the active zone, which is subject to seasonal freeze and thaw."</i></p> <p>This strategy appears to be effective, but QIA questions whether any accommodation for climate change has been incorporated into the model. Given the imminent temperature changes associated with climate change, particularly in the north, consideration should be given to the point at which rising temperatures result in less freezing and an increase in the depth of the active layer. When less freezing occurs and water infiltrating the WRF does not freeze, deeper seepage may occur. For example, is it possible for a portion of the waste rock pile to remain unfrozen, leading to an exothermic reaction and subsequent thawing?</p>	<p>QIA requests that consideration be given in the model to the potential impacts of climate change or that rationale be provided for why such consideration need not be included.</p>	<p><b>Document:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB</p> <p><b>Section:</b> Appendix G.5.8.1 5 of 5. 2023 Water Balance Update. Baffinland Iron Mines Mary River Project. December 15, 2023. December 18, 2023</p> <p><b>Page:</b> 50 of 92</p>	<p>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 is currently being developed. A memo summarizing the results of this investigation will be provided in the next update to the ICRP.</p>
18	<b>QIA 2023 NIRB MC # 2.</b>	<p>In PC No. 1 and PC No. 2, Baffinland discussed the impacts of the project on climate change. However, Baffinland did not discuss the potential impacts of climate change on the project and how these impacts may affect the existing environmental impacts of the project (e.g., permafrost degradation and seepage into the environment). It is unclear whether Baffinland has assessed potential climate change impacts on the project and whether Baffinland has considered mitigation measures and an adaptive management framework to manage climate change impacts on the project.</p> <p>For example, ongoing seepage has been identified at the KM 105 water management pond and discussed further in PC No.</p>	<ol style="list-style-type: none"> <li>1. Discuss the potential impacts of climate change on the project and the integrity of the environment (e.g., groundwater, permafrost).</li> <li>2. Discuss any mitigative and adaptive management measures that will be implemented for the project that are influenced by climate change (i.e., a warming climate) to manage environmental impacts.</li> </ol>	<p><b>Document Name:</b></p> <p>Project Certificate Term and Condition No. 1, No. 2, No. 17, No. 23, and No. 28 (Section 4.6.1, 4.6.4, and 4.6.5)</p>	<p>It is understood that climate change may result in potential impacts to the environment such as increased active layer thickness and permafrost degradation. These impacts may be seen across the entire Arctic region and would not be limited to the Mary River Project area. Discussion on climate change impacts is presented in Technical Supporting Document (TSD) 06 – Climate Change Assessment from the FEIS Addendum for the Phase 2 Proposal. The considerations of climate change impacts in this document remain broadly applicable to the Project, regardless of the Phase 2 Proposal not proceeding, and has accordingly been included as part of the SOP2 FEIS Addendum. The FEIS and FEIS Addendums for the ERP also consider the effects of climate change on the Project through Volume 4, Section 2 'Effects of the Environment on the Project'. The SOP FEIS Addendum Chapter 6, Section 6.7 provides an assessment of the Effects of the Environment on the Project. These are standard impact assessment components, which monitoring programs consider on</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		<p>17. However, the potential impacts of climate change on seepage at KM 105 water management plan are not discussed. In PC No. 23, Baffinland discussed groundwater monitoring and referred to the 2023 Groundwater Monitoring Program Memorandum, which indicated that leachate is being generated at the landfill. Baffinland did not discuss the potential impacts of climate change on leaching at the landfill or mitigative measures that may be implemented to manage climate change impacts on leaching. In PC No. 28, Baffinland discussed permafrost impacts along the Tote Road; however, Baffinland did not discuss the potential impacts of climate change on permafrost integrity and how this may impact preventative measures for the project. It is unclear how Baffinland has considered potential impacts from climate change in the development of preventative measures to maintain the integrity of environmental conditions (e.g., groundwater, permafrost) at the project area.</p>			<p>an annual basis through analysis of received data. 2. Baffinland is implementing design mitigations where appropriate to address potential impacts from climate change. For example, design flows for culvert replacements along the Tote Road and proposed at bridges on the South Railway have been increased to account for projected increases in precipitation. Similarly, modelling of the cover design for the waste rock facility will consider climate change as indicated in response to QIA 2023 NIRB MC #1. Baffinland's monitoring programs and adaptive management framework are built to identify and manage environmental impacts that are being observed and may be influenced by climate change.</p>
<b>WATER QUALITY</b>					
19	<b>QIA 2023 NIRB WQ #1.</b>	<p>At several stations it was observed that there were occurrences of elevated chlorophyll-a at Camp Lake, Sheardown Lake Tributary 12, and the Sheardown Lake NE and SW stations. While these concentrations were below the AEMP benchmark of 3.7 µg/L, they were elevated compared to 2023 seasonal samples from the same site reference and/or background. It does not appear that any further investigations were completed to identify the source or reason for the elevated chlorophyll-a concentrations.</p>	<p>Baffinland should include discussion in the report on chlorophyll-a samples that are approaching the AEMP benchmark. This discussion should include potential reasons for the elevated results and any follow up investigations that are being considered. Sites where chlorophyll-a are trending upward should also be flagged for future monitoring.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report  <b>Section:</b> 3.1.3 Phytoplankton  <b>Page:</b> 79</p>	<p>Baffinland provided discussion on chlorophyll-a concentrations that were higher at Camp Lake Tributary 1 (CLT1) than the reference creek in 2023 for the Section referred to by QIA (i.e., Section 3.1.3; page 79). Baffinland conducted benthic invertebrate community monitoring at the upper main stem of CLT1 in the past, as well as in 2023, which showed no adverse effect on the benthic invertebrate community.</p> <p>As discussed in the CREMP, for each of Camp Lake, Sheardown Lake Tributary 12, Sheardown Lake NE, and Sheardown Lake SW, average chlorophyll-a concentrations in 2023 were within the seasonal ranges previously observed (i.e., 2014 to 2022) and showed no consistent directional changes for any of the winter, summer, or fall seasons over time. These analyses have not indicated an upward trend, nor suggested a mine-related cause for the occasionally higher concentration of chlorophyll-a at any individual station within a given year. Because no mine-related change in chlorophyll-a concentrations has occurred, the existing AEMP Rev. 1 framework does not require additional investigation or follow-up analyses.</p> <p>Despite concentrations of chlorophyll-a occasionally approaching the AEMP benchmark at individual stations within mine-exposed waterbodies, similar 'elevated' concentrations were observed at individual stations of the reference lake (refer to CREMP Figures 3.11, 4.9, and 4.17 in which chlorophyll-a concentrations in</p>

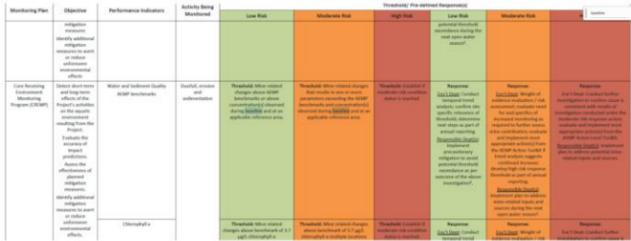
Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
					<p>fall 2015 and summer 2023 appeared 'elevated') and the reference creek (refer to CREMP Figure 4.3 in which chlorophyll-a concentrations in spring 2014 and fall 2014 and 2019 appear 'elevated'). Therefore, the chlorophyll-a concentration results observed at the various mine-exposed waterbodies appear to be in line with results documented at the reference areas.</p> <p>Baffinland will continue to monitor chlorophyll-a concentrations at all stations indicated within the CREMP in accordance with those committed to under the AEMP; no requirement for sites to be "flagged for future monitoring" is necessary.</p>
20	QIA 2023 NIRB WQ #2.	<p>The report states, "Chlorophyll-a concentrations at SDLT12 in the spring in 2023 were higher than concurrent concentrations observed at reference streams however, the spring SDLT12 concentration was the highest observed at any of the Sheardown Lake Tributaries or the reference streams since the initiation of sampling in the baseline period (Figure 4.3) suggesting that it may be an anomaly."</p> <p>Chlorophyll-a concentrations at SDLT12 in the spring of 2023 were higher than concurrent concentrations observed at reference streams. Additionally, the spring concentration at SDLT12 was the highest recorded at any of the Sheardown Lake Tributaries or the reference streams since the baseline period began. Follow up studies or investigations completed should be completed to determine what factors might contribute to the elevated chlorophyll-a levels at SDLT12?</p>	What statistical analysis or criteria were used to assess the data for outliers?	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 4.2.3 Sheardown Lake Tributary (SDLT12) - Phytoplankton</p> <p><b>Page:</b> 152-153</p>	<p>Analysis of the Sheardown Lake Tributary 12 (SDLT12) chlorophyll-a concentration data relative to data from the reference creek and to historical data were based on qualitative assessment of available data. Under AEMP Rev. 0 and Rev.1, water quality and phytoplankton monitoring was not specified for SDLT12 or SDLT9. Baffinland voluntarily began sampling water quality and phytoplankton at these tributaries in fall 2021 as a means of providing supporting information for analysis of potential effects on the benthic invertebrate community at each watercourse (the latter type of sampling of which was included under the AEMP). Beginning in fall 2021, a sample size of one (1) was collected at SDLT12 in each of spring, summer, and fall sampling events (as flow allowed) to augment the existing CREMP requirements. The overall sample size since 2021, as well as the annual level of replication, does not lend the chlorophyll-a concentration data to statistical analyses for SDLT12, including statistical analyses that may be used to identify outliers.</p> <p>The relatively high chlorophyll-a concentration at SDLT12 in spring of 2023 could be an error resulting from sample handling and/or sampling equipment, or it could be an accurate reflection the stream productivity at the time of sampling. Continued monitoring is expected to provide further insights into the validity of this observation.</p>
21	QIA 2023 NIRB WQ #3.	<p>The report states, "Chlorophyll-a concentrations at Sheardown Lake SE showed no spatial gradients with distance from the lake outlet during summer, fall, and winter sampling events in 2023 (Figure 4.8). Chlorophyll-a concentrations at Sheardown Lake SE in 2023 did not differ significantly between the summer and fall or winter and fall sampling events, but concentrations in winter were significantly higher than concentrations in summer (Figure 4.8; Appendix Tables E.6 and E.12)."</p>	Please correct the text in the report to accurately reflect the seasonal differences in chlorophyll-a concentrations at DLO-2. Does this have any implications for the evaluation of effects?	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 4.2.3 Sheardown Lake Tributary (SDLT12) - Phytoplankton Figure 4.8</p> <p><b>Page:</b> 152-153</p>	<p>Acknowledged. Chlorophyll-a concentrations at Sheardown Lake SE in 2023 did not differ significantly between the summer and fall or winter and fall sampling events, but concentrations in winter were indeed significantly <u>lower</u> than concentrations in summer (Figure 4.8; Appendix Tables E.6 and E.12)."</p> <p>This error does not have implications for the evaluation of mine-related effects. The observed higher concentrations of chlorophyll-a during the summer compared to the winter is an expected trend in lakes in the area due to higher productivity during warmer seasons, with no ice cover limiting light penetration which supports phytoplankton production. In addition, there were no observed increasing temporal trends during the summer or winter seasons for chlorophyll-a in</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		After reviewing Figure 4.8. it appears that the text (underlined) above is incorrect and that summer concentrations are significantly higher than the winter.			Sheardown Lake SE and no exceedances of the AEMP Benchmark for chlorophyll-a that would trigger further investigations under the response framework.
22	QIA 2023 NIRB WQ #4.	The WRMP states that "waste rock placed over an area of new WRF expansion shall be carried out in a manner conducive to aggrading permafrost, to limit potential for future development of acid rock drainage (ARD)" (p. 11). It is understood that all potentially acid-generating (PAG) rock will be allowed to freeze prior to additional deposition of lifts, such that PAG rock is contained in permafrost and immobile (i.e., no exposure to air/water). Given that the groundwater table across the site has been observed (in 2023 groundwater monitoring reports) to exist at ~0.5 to 2.3 m below ground surface, have the potential interactions with groundwater been considered in the plans and approach to expanding the waste rock facility (WRF)?	QIA requests that the proponent describe how shallow groundwater may interact with PAG waste rock in the WRF, to increase confidence that there are no environmental or migrating impacts from PAG waste rock. This discussion should be provided with specific detail regarding plans to expand the WRF.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.8.1 Phase I Waste Rock Management Plan (WRMP)  <b>Section:</b> 8.1 (Deposition Strategy and Guidelines)  <b>Page:</b> 11	Shallow groundwater is encountered from 1.5 – 3 m of depth across the site.  The WRF development strategy outlined in the PH1 WRMP states that for footprint expansion, "the first lift of the WRF on native ground shall be Non-AG waste rock. Waste rock placement over native ground shall be carried out in the winter to the extent practicable to maintain frozen conditions. As a minimum, the lift should be allowed to freeze prior to layering activities." The establishment of a frozen Non-AG base layer during footprint expansion will allow for permafrost to aggrade, preventing groundwater from interacting with placed PAG waste rock. As part of the design surface water runoff within the WRF is managed within water management infrastructure (ie. ditching and collection ponds).
23	QIA 2023 NIRB WQ #5.	Several limitations and concerns with the 2023 Groundwater Monitoring Program were identified, including QA/QC concerns (contaminated blank samples), groundwater monitoring well installation errors, and missing data in a key downgradient monitoring well. Groundwater quality data collected in 2023 was therefore deemed to be misrepresentative of groundwater conditions, and was not discussed further in Appendix E.11.1. Thus, there is no reliable groundwater monitoring data from 2023.  Groundwater monitoring wells installed in 2023 did not have a bentonite clay cap, allowing for surface water infiltration and water from depths outside the screened well interval to enter the well, contaminating groundwater and preventing evaluation of in-situ groundwater conditions. Additionally, some standpipes installed in 2022 were installed in reworked test pits, which are not representative of native sub-surface conditions. These standpipes, and all wells installed in 2023, are not usable for future monitoring periods.  In addition to conclusions and recommendations provided by Knight Piesold Consulting, new monitoring wells should be	QIA requests that Baffinland provide a concrete action plan and timeline for the correct installation of new wells to replace the incorrectly-installed wells from 2023, and the 2022 standpipes installed in reworked material. QIA also requests that a schedule be provided for implementing each of the recommendations provided by Knight Piesold Consulting (2023), regarding the future groundwater monitoring program.	<b>Document Name:</b> Baffinland NIRB Annual Report, Appendix G.3 Groundwater Monitoring Reports  <b>Section:</b> 4.2 – Well Installation Issues  <b>Page:</b> 18-19	New 2-inch PVC wells will be installed in the traditional manner using a drill during 2024 summer in the areas identified by Knight Piesold as information gaps in their 2023 groundwater assessment. Furthermore, current non-functional wells are scheduled to be replaced with drill-installed 2-inch PVC wells this summer. This is happening at both the Mary River Landfill and the Hazardous Waste Berms.  In total 12-14 new wells are scheduled to be installed in August of 2024. These wells will be properly installed, protected against permafrost damage, properly developed and slug-tested to determine hydraulic conductivities, and then water quality samples collected, with site QA/QC protocols carefully followed to ensure reliability of the data.

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		<p>installed as part of the 2024 monitoring program to replace 2023 wells (and standpipes in reworked sediment from 2022), as previously installed wells are vulnerable to surface water infiltration and are not representative of actual groundwater conditions on-site. Environmental borehole drilling and monitoring well installation should be conducted by a licensed professional. A concrete action plan should be developed to demonstrate Baffinland's commitment to providing a successful groundwater monitoring program in 2024.</p>			
24	<p><b>QIA 2023 NIRB WQ #6.</b></p>	<p>Several limitations and concerns with the 2023 Groundwater Monitoring Program were identified, including QA/QC concerns (contaminated blank samples), groundwater monitoring well installation errors, and missing data in a key downgradient monitoring well. This rendered the September 2023 data unreliable. Given that groundwater monitoring is only conducted annually at the site, there is no usable data from 2023. QA/QC protocols should be strictly adhered to in the 2024 monitoring program, and a concrete action plan including improvements to the groundwater monitoring program should be developed in advance of the 2024 monitoring period to ensure that future groundwater samples are collected following best management practices, such that samples are representative of on-site groundwater conditions. Sampling should be conducted by an environmental professional to a high standard of care.</p> <p>Going forward, it is also suggested that the 2024 groundwater monitoring be conducted bi-annually (e.g., freshet and fall monitoring), to eliminate the possibility of an incomplete dataset (i.e., missing annual data) if an error occurs during a future monitoring event. This is especially important given that leachate is likely being generated at the landfill site, and that concerns were previously raised regarding a potential liner leak at the northwest Hazardous Waste Berm. These concerns were unable to be evaluated during 2023 groundwater monitoring due to the program limitations.</p>	<p>QIA requests that the proponent provide a concrete action plan for improving QA/QC practices during groundwater sampling, following best management practices to ensure that the 2024 groundwater monitoring program is successful. QIA also requests that the proponent conduct bi-annual groundwater monitoring in future programs, to bolster the dataset, should concerns occur during a single monitoring event that would render the data unusable (as occurred in 2023).</p>	<p><b>Document Name:</b> Baffinland NIRB Annual Report, Appendix G.3 Groundwater Monitoring Reports</p> <p><b>Section:</b> 5.0: Conclusion and Recommendations</p> <p><b>Page:</b> 19</p>	<p>Baffinland is committed to ensuring all samples collected during the 2024 groundwater sampling campaign follow Baffinland's robust Sampling Program – Quality Assurance and Quality Control Plan, to ensure data reliability.</p> <p>Bi-annual groundwater monitoring is not viable because the active layer is only available for sampling for a very limited time annually. Previous attempts to collect samples prior to early September have resulted in frozen well conditions with no samples obtainable.</p>
25	<p><b>QIA 2023 NIRB WQ #7.</b></p>	<p>The 2023 Groundwater Monitoring Program Assessment states that "Baffinland has been conducting groundwater monitoring at the Landfill Facility since 2017" (p.5). The 2023 assessment and License Application does not include</p>	<p>QIA requests that the proponent include baseline data and an interpretation of historical groundwater quality trends in the License Application, and that detailed interpretation of trends be conducted</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.3.1 2023 Groundwater Monitoring Program Memo</p>	<p>This question seems to be regarding a licence application with the NWB and not the NIRB Annual Report. Nevertheless, historically across the mining industry, groundwater is not a constituent of concern in high arctic permafrost</p>

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		baseline groundwater monitoring data, or any reference to data collected prior to 2017 (i.e., prior to commencing operations). Baseline data is necessary for effects monitoring. Additionally, groundwater quality data collected from 2017-2022 is not appended or referenced in Appendix E.11, and no interpretation of historical trends in groundwater quality have been discussed/provided. Given that ~5 years of groundwater data has been collected at the site, interpretation of groundwater trends overtime should be included in the License Application, and should be thoroughly discussed in the 2024 program.	during the 2024 Groundwater Monitoring Program (as was not conducted in 2023 due to concerns with the dataset).	<p><b>Section:</b> 2.0: Background and Site Description</p> <p><b>Page:</b> 5</p>	<p>environments. Therefore, no groundwater data was collected prior to 2017 and does not form part of the baseline data for Baffinland.</p> <p>If QIA is referring to data other than pre-2017 groundwater data, Baffinland asks for clarification of the question</p> <p>Previously Baffinland has noted the following; due to challenges associated with sampling methodologies for groundwater data collection in a permafrost environment and the challenges in interpreting this data, further statistical trend analysis is recommended to evaluate the significance of changes in water quality between up-gradient and down-gradient monitoring locations as additional water quality data is collected in future years. However, it is important to note, that given the challenges associated with sampling methodologies for groundwater collection in a permafrost environment and the challenges in interpretation of this data, long-term trends may not be identified, even with an expanded dataset.</p>
26	QIA 2023 NIRB WQ #8.	<p>Water Balance Objectives for the Baffinland Water Balance model are stated as simulation of the following:</p> <ol style="list-style-type: none"> <li>1. The current and future water accumulation in the WRF Pond and water transfers</li> <li>2. Climate/hydrologic variability to understand the risks to current and planned water management strategies at the WRF Pond</li> <li>3. Potential site water quantity overflow to the receiving environment (if applicable)</li> <li>4. Input to the WRF water quality model</li> </ol> <p>And yet, not all of these objectives are discussed in the report as follows:</p> <p>For objective 1, flows are discussed but not accumulation.</p> <p>For 2, variability is incorporated but risks are not stated.</p> <p>For 3, is site water quantity overflow the to receiving environment applicable? This should be stated.</p>	Baffinland to provide documentation to demonstrate that all objectives have been completed, and ensure future iterations of the water balance continue to address all stated objectives.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.5.8.1 5 of 5. 2023 Water Balance Update. Baffinland Iron Mines Mary River Project. December 15, 2023.</p> <p><b>Pages:</b> 8 and 29 of 92</p>	<ol style="list-style-type: none"> <li>1. The WRF pond is drawn down prior to the winter period to prepare for the following freshet. Water is continually treated by the WRF water treatment plant (WTP) during operations.</li> <li>2. Dry, average and wet climate scenarios were modelled as part of the water balance and all scenarios are shown to be able to be successfully managed by the pond and WTP.</li> <li>3. No overflow was applicable. All modelling scenarios were successfully managed by the site infrastructure.</li> <li>4. The water balance was successfully integrated with the water quality model.</li> </ol>
27	QIA 2023 NIRB WQ #9.	In the TARP of the AEMP (see Table 5.2 below), low and moderate risk thresholds indicate " <i>concentration(s) observed during baseline and at an applicable reference area</i> ". However, not all stations have baseline data (sediment quality in lotic systems) or the reference sites were not	The QIA requests the Proponent update the AEMP and CREMP TARPS to detail how these sites and parameters without any baseline are evaluated and managed as	<b>Document Name:</b> Appendix G.8.4 Aquatic Effects Monitoring Plan (AEMP)	The AEMP used for the reporting year was revision 1, as rev 2 has not yet been approved and as such, it did not incorporate the TARP. Baffinland will discuss this with QIA during the review process.

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		<p>sampled for all seasons. How these sites and parameters are managed is not discussed in the AEMP and review of the CREMP suggests these sites and parameters are excused from adaptive management because of this data gap. The AEMP and CREMP should be updated to detail how these sites and parameters will be evaluated and managed as part of the AEMP.</p> <p>An example of this includes discussions of sediment quality at CLT1 north branch in the CREMP in Section 3.1.5.1 where the proponent states, <i>“Metal concentrations in sediments from CLT1north branch were generally elevated compared to those measured at lotic reference areas, but the source of elevated sediment metal concentrations at CLT1 north branch compared to reference in 2023 is unclear. Given that concentrations of metals besides iron in sediments were well below SQG and no adverse effects to phytoplankton and benthic invertebrate communities were indicated as a result of these metal concentrations in 2023, further investigation is not recommended.”</i></p> <p>Reference sites are used to tease apart natural versus mine related impacts. Natural localized changes in chemistry should be reflected at both mine and reference sites. If reference sites are not reflecting natural changes in sediment chemistry that are being observed at mine sites than reference sites currently being used by the proponent must defend as these reference sites are not performing as traditional reference sites.</p> <p>Another example of this includes discussions of sediment quality at CLT2 in the CREMP in Section 3.2.2 where the proponent states, <i>“Overall, concentrations of metals in sediment at CLT2 were well below applicable SQG in 2023 (Table 3.5; Appendix Tables D.7, D.11 and D.12). Higher metal concentrations in sediment at CLT2 stations compared to average lotic reference conditions were observed in 2023 but the reason(s) for these results are unclear and potentially unrelated to mine activity. Further, because no baseline data are available, evaluation of whether these concentrations reflect a mine-related influence was not possible.”</i></p>	<p>part of the AEMP, as currently the proponent is excluding them management. If the proponent does not believe the reference sites are representing natural localized changes in chemistry (acting as traditional reference sites) than the proponent should defend the use of the sites.</p>	<p><b>Section:</b> 3, 4 and 5</p> <p><b>Page:</b> 69</p>	

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		<p>Again, a lack of baseline data prevented proper evaluation of elevated contaminant concentrations in sediment and no management actions were recommended.</p> <p>An example discussing missing reference data is provided for lentic systems. Reference Lake 3 was not sampled in the winter limiting comparisons in water quality between reference conditions and Camp Lake, Sheardown Lake NW, Sheardown Lake SE, Mary Lake North Basin and Mary Lake South Basin. No explanation for the missing data was provided. It is impossible for parameter concentrations to be elevated above reference and baseline concentrations in all seasons if the proponent has not sampled the reference sites during all seasons.</p> 			
28	QIA 2023 NIRB WQ #10.	<p>Within the CREMP discussing effects determination the Proponent states, <i>"Determination of a mine related influence on water or sediment quality for a waterbody depended on water or sediment quality parameters that were consistently elevated at mine-exposed areas in all sampling seasons in 2023 compared to both reference conditions in 2023 and baseline conditions."</i></p> <p>The anticipated variability in water quality due to seasonal influences and associated pathways underscores the complexity of assessing the mine's impact. For example, contaminants associated with fugitive dust are expected to have elevated concentrations in the spring associated with freshet or during a storm event due to overland runoff. Parameters associated with effluent discharge are expected to have elevated concentrations in the summer during low flow conditions when the dilution capacity of creeks and</p>	<p>The QIA requests the Proponent update the effects determination of the CREMP to remove the requirement to have parameter concentrations to be elevated consistently elevated at mine-exposed areas and to complete seasonal trend analysis.</p>	<p><b>Document Name:</b> G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 2.5.1.1</p> <p><b>Page:</b> 62 of 307</p>	<p>The wording provided in the highlighted statement from Section 2.5.1.1 misstated the analysis that was conducted for determination of a mine-related influence on water quality or sediment quality. The following (italicized) wording is proffered: <i>"Determination of a mine-related influence on water or sediment quality for a waterbody depended on water or sediment quality parameters that were elevated at mine-exposed areas in any sampling season in 2023 compared to both reference conditions in 2023 and baseline conditions for the respective sampling season."</i></p> <p>Please note that, as is evident within the presentation of all data for the 2023 and all previous CREMP reports, despite the original wording provided in Section 2.5.1.1, seasonality has been recognized by Baffinland in the determination of mine-related effects. For all water quality and sediment quality parameters with AEMP benchmarks, those exceeding applicable benchmarks in individual samples have consistently been flagged and discussed as part of the effects assessment. Therefore, Baffinland's assessment of effects has not focused only on those parameters that may have been elevated in all seasons relative to reference conditions for any given year, nor relative to historical data at any given waterbody, in the 2023 or any previous reports. The above correction to text will be</p>

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		<p>rivers are minimal. Expecting consistently elevated contaminant concentrations in every sample event over the year might be unreasonable given the various contaminant pathways and interplay with seasonality (e.g., freshet). Instead, a nuanced approach involving seasonal trend analysis is crucial. This method would better elucidate the mine's influence on water and sediment quality over time, providing more accurate insights than qualitative comparisons.</p>			<p>incorporated into future CREMP reports to better reflect the analysis for determination of potential mine-related influences on water quality and sediment quality.</p> <p>Please note that Baffinland may complete seasonal trend analyses (where sample sizes are appropriate) under circumstances identified within Baffinland's AEMP Data Assessment Approach and Response Framework (see CREMP Figure 2.7) as outlined within AEMP Rev.1 until formal acceptance of any updated revisions of the document.</p>
29	QIA 2023 NIRB WQ #11.	<p>Discussions of temporal trend analysis completed as part of the 2022 CREMP for Camp Lake Tributary 1 water quality sampling stations did not address trends with baseline concentrations. Instead, only discussed trends during the operational period. Examples include:</p> <p>Total copper concentrations in CLT1 north branch where the proponent states, <i>"a temporal trend analysis completed as part of the 2022 CREMP found no significant trends for total or dissolved copper concentrations at upstream or downstream CLT1 north branch stations over the mine operational period from 2015 to 2022 (Minnow 2023)."</i></p> <p>Total and dissolved iron concentrations in CLT1 Upper main stem where the proponent states, <i>"Total iron concentrations in 2023 were slightly to moderately elevated relative to the reference stream and to baseline in fall and spring (Appendix Figure C.2; Appendix Table C.15) and dissolved iron concentrations were moderately elevated relative to the reference stream but similar to baseline conditions (Appendix Table C.17 and C.18). However, a temporal trend analysis completed as part of the 2022 CREMP found no significant trends for total or dissolved iron over the mine operational period from 2015 to 2022 (Minnow 2023)."</i></p> <p>The impact of the mine on water quality parameters may have been immediate (when the mine first went into operations) which would show up as a stepwise increase in concentrations compared to background. Therefore, it is important for baseline concentrations to be included as part of the temporal trend analysis. In addition, total iron</p>	<p>QIA requests the proponent incorporate baseline concentrations into temporal trend analysis completed as part of the 2022 CREMP and moving forward for all temporal trend analysis completed.</p>	<p><b>Document Name:</b> G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 3.1.1.2 and 3.1.1.3</p> <p><b>Page:</b> 72 and 74 of 307</p>	<p>Baseline concentrations have been included in temporal trend analyses. The temporal trend analyses completed as part of the 2022 CREMP included analyses for the period from 2005 to 2022 (i.e., including baseline) and for the period from 2015 to 2022 (i.e., mine operational period). Results were reported in Appendix H of the 2022 CREMP report (Minnow 2023).</p> <p>The evaluation of temporal changes in parameter concentrations for the CREMP has included a variety of comparative approaches that consider several factors. In some cases, comparison of temporal changes in parameter concentrations over the period of mine operations is preferable due to a high proportion of test results during baseline being below a higher laboratory MDL than achieved for the mine operation period since 2015. Use of high MDL for the baseline period can thus obscure potential changes in parameter concentrations over time in such instances. In some cases, reference area data was not collected during baseline (e.g., water chemistry data for lakes) and thus a direct comparison in changes in water chemistry over time at a mine-exposed area relative to a reference area was only possible using data collected since mine operations commenced. In other cases, parameter concentrations collected during baseline have been incorporated into the analysis of temporal changes. In all cases, step-wise comparison in parameter concentrations between the individual year in question and the average baseline concentration have been evaluated to capture potential changes in parameter concentrations since baseline.</p> <p>In future CREMP, for all temporal trend analyses, a description and rationale of the approach/data used will be included to provide better insight for the reader.</p>

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		concentrations met the low level threshold of the AEMP TARP in 2023. Therefore, trend analysis should be completed in 2024 using 2023 data.			
30	QIA 2023 NIRB WQ #12.	<p>In several sections of the CREMP elevated parameter concentrations have met the definitive objectives of the AEMP TARP but management actions have not been implemented leaving the receiving environment and the valued ecosystem components associated with them at risk of degradation. The following are examples of such situations.</p> <p>With regards to total aluminum concentrations at the CLT1 upper main stem the proponent states, <i>"Elevation of total aluminum concentrations above the AEMP water quality benchmark at the upper main stem in 2023 was likely related to suspended mineral material in the water column as reflected by high turbidity in samples from this station. Aluminum concentrations at the CLT1 upper main stem in 2023 were moderately elevated compared to the reference baseline only during spring, and the relative elevation of total aluminum was greater than dissolved aluminum, therefore the source of aluminum to the CLT1 main stem was likely related to background minerology of material entering the system during spring runoff events. Although aluminium concentrations were above the AEMP benchmark in 2023, because they are not related to mine operations no management response is required under the AEMP Management Response Framework (Figure 2.7)."</i></p> <p>The greater elevation of total aluminum concentrations compared to dissolved aluminum does not indicate the source is related to background minerology. It is always anticipated that total parameter concentrations are greater than their dissolved fractions. The fraction of aluminum anticipated to be released from the mine is predominantly particulate. This is because the aluminum is expected to be associated with fugitive dust that settles on snowpack and on land and is associated with snow melt during spring freshet or overland runoff during storm events. This demonstrates the importance of using definitive objectives for management and removing ambiguity introduced by</p>	QIA requests the proponent follow up with the appropriate AEMP TARP actions when the objective thresholds have been met.	<p><b>Document Name:</b> G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 3.1.5.2</p> <p><b>Page:</b> 89</p>	<p>In 2023, Baffinland was required to meet conditions for the CREMP that are stipulated within AEMP Rev.1 in which a prescriptive AEMP Data Assessment Approach and Response Framework is required (see CREMP Section 2.5.1.1). Therefore, the Trigger Action Response Plan (TARP) actions, outlined in the drafted AEMP Rev.2 document that has yet to receive official approval, were not applied as part of the 2023 CREMP.</p> <p>With regards to the example provided by the intervenor, total aluminum concentrations at the CLT1 upper main stem in 2023 were within the range of those observed at the reference creek stations since 2015. This indicated natural elevation in total aluminum concentrations above the AEMP benchmark for creek environments in the region, pointing to background minerology as a source for elevated total aluminum concentrations in the water of these watercourses. Natural weathering of geological material and subsequent entering watercourses from snow melt during spring freshet or overland runoff during storm events represents a likely source of aluminum within these environments. A high proportion of aluminum in the total fraction compared to the dissolved fraction indeed suggests that most of the aluminum was in particulate form from runoff sources rather than through groundwater sources influenced by mine operations in which a higher proportion of dissolved aluminum might be expected. Therefore, this provided another line of evidence that the source of aluminum was largely from overland runoff consistent with a natural background occurrence.</p> <p>Based on weight-of-evidence, determined by applying professional judgement supported by the scientifically defensible technical rationale described above, Baffinland contended that the source of aluminum to the CLT1 upper main stem did not reflect a mine related source. In accordance with the AEMP Rev.1 Data Assessment Approach and Response Framework, the change in aluminum concentration was not mine-related and thus no further management action was required.</p> <p>Baffinland contends that definitive objectives provide a basis for which investigation of potential Project-related influences on aquatic environments be initiated and tracked. Based on application of various tools, and through the use of professional judgement considering the weight-of-evidence, an evaluation of a</p>

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		<p>professional judgement. The moderate risk threshold has been triggered with the exceeded of the total aluminum AEMP benchmark, and elevated concentrations compared to baseline and reference site concentrations. Therefore, the response from the proponents Environmental Department includes using weight of evidence evaluation / risk assessment; evaluating the need for and specifics of increased monitoring as required to further assess mine contribution; evaluate and implement most appropriate action(s) from the AEMP Action Toolkit if trend analysis suggests continued increase; develop high risk response threshold as part of annual reporting.</p> <p>In section 3.2.1.2 the proponent notes total phosphorus concentration at CLT2 exceeded the WQG and were elevated compared to both reference and baseline concentrations in the summer. These patterns indicate a seasonal impact during low flow conditions when dilution in the tributary is low. Elevated concentrations compared to both reference and baseline concentrations meets the low risk thresholds; the proponent should therefore complete temporal trend analysis as per the TARP and determine next steps as part of the annual reporting.</p>			<p>mine-related effect can thus be substantiated and, if confirmed, acted upon in an appropriate fashion.</p> <p>With regards to total phosphorus concentrations in water at CLT2 in summer of 2023, Baffinland will continue to track concentrations over time to determine if the 'pattern' referred to by QIA is supported. Review of 2015 to 2022 historical data for the mine operational period indicated no such seasonal 'pattern' in any other year that could be supported by the rationale provided by QIA (the fall sampling event can often exhibit lowest seasonal flow during the open-water period, not summer), and no elevation compared to the reference creeks or to baseline data were evident. Therefore, the summer 2023 phosphorus concentration results for CLT2 appear to be an anomaly and are not consistent with a mine-related influence. No AEMP benchmark is applicable to total phosphorus concentrations in water, and thus the absence of a demonstrated mine effect combined with the absence of a benchmark precludes a defined action under the existing AEMP Rev.1 Data Assessment Approach and Response Framework.</p>
31	QIA 2023 NIRB WQ #13.	<p>When discussing in situ parameters the proponent does not compare values to baseline values for any of the lakes or tributaries. In Appendix E.12 Response to 2022 Annual Report Comments the proponent states, "<i>Field measurements of specific conductance during the time of biological monitoring in August 2022 were significantly greater at CLT2 than at the reference creek. In addition, specific conductance at CLT2 in August 2022 was significantly higher than during baseline for measures taken in August (t-test p-value &lt;0.001).</i>" Indicating baseline values are available for in situ parameters, however these values are not discussed in the annual report. While in situ parameters do not have AEMP benchmarks they are essential for aquatic biota and an indicator of ecosystem health. Moving forward please compare all water quality parameters including in situ values to baseline as outlined in the AEMP.</p>	<p>QIA requests the proponent provide baseline values for in situ parameters for all tributary and lake sites and compare current values to baseline has required by the AEMP TARP.</p>	<p><b>Document Name:</b> G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 3.2.1.1</p> <p><b>Page:</b> 91</p>	<p>As indicated by the reviewer, parameters of water temperature, dissolved oxygen, pH, and conductivity/specific conductance that are measured in situ do not have AEMP benchmarks. The existing revision of the AEMP focuses analysis on those parameters for which AEMP benchmarks have been developed as the basis for determination of effects from Project operations. The current revision of the AEMP does not include a requirement to compare annual measures of in situ parameters to baseline, in part reflecting the fact that Project operations are not expected to have any meaningful influence on parameters such as water temperature, dissolved oxygen, and pH, or as in the case for conductivity, no water quality guideline/objective has been developed on which to base the potential of an effect on water use/aquatic biota.</p> <p>Baffinland has included comparative spatial analysis of in situ parameters annually as part of the CREMP since Project operations commenced. This analysis was included to provide supporting information in the evaluation of differences between mine-exposed and reference area aquatic habitats and to potentially explore differences in biotic responses. The analysis of dissolved oxygen and pH has</p>

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					<p>also included comparison to available Water Quality Guidelines for the protection of aquatic life.</p> <p>Provided that no AEMP benchmarks exist for in situ parameters and no pathway of effects on water temperature, dissolved oxygen, or pH have been identified for the Project, Baffinland does not support conducting a temporal trend analysis for in situ parameters (whether including baseline data or not) for the annual CREMP reporting as it does not represent an effective allocation of time resources. In addition to the time requirements to conduct the statistical analyses themselves, the time needed to prepare additional discussion to potentially explain/explore spurious results related to conditions that are outside of Baffinland's control (e.g., natural differences in seasonal weather/temperature conditions year to year might then require analysis of meteorological data) may limit time put towards exploring meaningful analysis involving those parameters with established AEMP benchmarks. Please refer to QIA 2023 NIRB WQ #15 below for more information regarding specific conductivity.</p>
32	QIA 2023 NIRB WQ #14.	<p>When discussing metal concentrations in sediment of Camp Lake the proponent states, "Mean metal concentrations in sediment collected from Camp Lake littoral and profundal stations in 2023 were comparable to concentrations measured during the baseline period (2005 to 2013) except for boron which was highly elevated compared to baseline at both littoral and profundal stations (18.5- and 11-times greater, respectively; Figure 3.9; Appendix Table D.17)20...20 Boron concentrations in sediment from 2015 to 2023 were considerably higher (i.e., 10- to 70-times) than those reported during both the baseline and 2014 studies at all mine-exposed lakes. The lack of any distinct gradient in the magnitude of the elevation in boron concentrations among stations within each lake and among study lakes suggested that the stark contrast in boron concentrations between recent data and data collected prior to 2015 was likely due to laboratory-based analytical differences."</p> <p>The Figure the proponent directs the reader to (Figure 3.9) does not include Boron. This figure should be updated to include the metal of interest. The proponent suggests the difference in Boron concentration is due to laboratory-based analytical differences. No data was provided to support this rationale. The reviewer contact ALS laboratories and they indicated that there was no change in analytical techniques for either total boron by ICPMS or hot water soluble boron in</p>	<p>QIA requests the proponent provide data to support the theory that boron concentrations in Camp Lake are higher during operation than baseline due to analytical changes at the laboratory.</p>	<p><b>Document Name:</b> G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 3.3.2</p> <p><b>Page:</b> 111 to 118 of 307</p>	<p>The omission of Boron from figure 3.9 was an administrative error. Please see attached Fig. 3.9. Please refer to the initial 2015 CREMP (Minnow 2016). Weight-of-evidence evaluation overwhelmingly indicated a change in boron concentrations in sediment at all mine-exposed lakes (including Camp Lake) between 2015 and earlier baseline studies that was not related in any way to Project operations. Please consider the following points:</p> <ol style="list-style-type: none"> <li>1. Of a total of 95 samples collected amongst the mine-exposed lakes during baseline, only 44% of samples contained boron concentrations in sediment that were above the reported laboratory method detection limit of 0.5 mg/kg. In 2014, only 14% of samples collected (total n = 36) showed boron concentrations in sediment over the MDL of 0.5 mg/kg. The mean (calculated using the MDL when less than MDL was indicated) and maximum concentration of boron shown in sediment from the collective mine-exposed lakes samples for baseline was 1.3 mg/kg and 9.4 mg/kg, respectively.</li> <li>2. In the 2015 CREMP, mean boron concentrations measured in sediment of the mine-exposed lakes ranged from 23 mg/kg at Camp Lake to 29 mg/kg at Sheardown Lake NW among the near-field lakes and was actually higher at Mary Lake (36 mg/kg), farther from Project operations. The same stations were sampled in the 2015 CREMP as during baseline at each of these lakes.</li> <li>3. Beginning in 2015, Baffinland incorporated of a reference lake into the CREMP. Mean boron concentrations in sediment of Reference Lake 3 in 2015 were 18 mg/kg, well above the mean concentration of boron reported for sediment of</li> </ol>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		2014. They also indicated that last method change occurred in 2009 for digestion (Gayle Braun, Senior Project Manager, Environmental, ALS, May 7, 2024).			<p>the mine-exposed lakes over the baseline period (i.e., 1.3 mg/kg in which only 44% of data were above laboratory MDL).</p> <p>4. The analysis laboratory used for sediment quality analyses changed between the baseline and mine operation period studies. Before 2015, sediment digestions were conducted by EXOVA Canada. Starting in 2015, sediment quality analysis have been conducted by ALS Waterloo.</p> <p>5. Since 2015, mean concentrations of boron in sediment have not changed substantially at each of the mine-exposed lakes, nor the reference lake.</p> <p>6. An AEMP benchmark was not established for boron concentrations in water or sediment, reflecting the fact that no pathway of effect on water or sediment quality was expected for this parameter related to the Project.</p> <p>From these points, the occurrence of an immediate change in boron concentrations in sediment at the mine exposed lakes in 2015 compared to 2014 and earlier baseline information, the largest change of which was evident at the mine-exposed lake located farthest from the mine site, and boron concentrations in sediment at the reference lake higher than those ever reported at any of the mine exposed lakes during baseline, was clearly not consistent with a mine-related factor. No substantial change in concentrations of boron in sediment at any of the individual study lakes has occurred since 2015. The logical explanation for such a change between 2015 and baseline was thus a laboratory-related factor unrelated to the Baffinland Project.</p> <p>Because no AEMP benchmark has been established for boron and no increase in concentrations of boron in sediment has been indicated at any of the mine-exposed lakes since 2015, boron has not been, and will not be, included in temporal plots for the CREMP.</p>
33	<b>QIA 2023 NIRB WQ #15.</b>	Specific conductivity was significantly greater at Camp Lake Tributary 1, Camp Lake Tributary 2, Camp Lake and Sheardown Lake Tributary 1 compared to associated reference sites. As noted in a previous comment in situ values were not compared to baseline values. The source of the significantly greater specific conductivity at mine sites compared to the reference sites was not discussed for any mine exposed locations. Based on the proponents response to QIA's comment AEMP#2 found in Appendix E.12 we know that Specific Conductivity measured at CLT2 was significantly greater compared to background values in 2022. The proponent acknowledges that the elevated conductivity is associated with the mine. However, elevated conductivity	<p>QIA requests the proponent:</p> <ol style="list-style-type: none"> <li>1. Compare conductivity values with background values,</li> <li>2. Conduct temporal trend analysis for all sites that have elevated specific conductivity values compared to their associated reference site and baseline values, and</li> </ol>	<p><b>Document Name:</b> G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 3 and 5</p> <p><b>Page:</b> 135 to 253</p>	<p>Please see response to Comment QIA 2023 NIRB WQ #13 above, which indicates that in situ specific conductance does not have an established AEMP benchmark. Also, please note that Baffinland has consistently conducted spatial analysis of specific conductance between mine-exposed and reference areas since the 2015 CREMP.</p> <p>Measurement of specific conductance serves as a proxy for dissolved concentrations of major ionic substances (e.g., hardness, various 'salts') that may or may not be tied to a Project-related source. Most of these substances do not have toxicity thresholds (i.e., Water Quality Guidelines) associated with them pointing to limited potential for eliciting effects on biota. However, key exceptions include parameters of chloride and sulphate, for which AEMP benchmarks have been established. Therefore, Baffinland contends that changes in specific conductance</p>

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		values noted in 2023 for the aforementioned sites and the potential influence of the mine was not discussed in the text of the CREMP. At all mine exposed sites conductivity should be compared to baseline values. At sites where conductivity is higher at the mine exposed sites than both the reference and baseline, temporal trend analysis should be completed. Potential sources (e.g. dust suppressants) of the elevated conductivity should be discussed.	3. Discuss potential sources (e.g. dust suppressants) of the elevated specific conductivity values.		are effectively tracked/ assessed under the current CREMP design based on incorporation of chloride and sulphate parameters. As such, applying the existing AEMP Data Assessment Approach and Response Framework for these parameters essentially has served to evaluate changes in parameters ‘composing’ specific conductance. No additional, separate, analysis of specific conductance from a temporal trend perspective is deemed necessary. Should application of the existing or future AEMP Data Assessment Approach and Response Framework indicate a mine-related increase of these parameters composing specific conductance (i.e., chloride, sulphate), the need to conduct further investigations into sources/mitigation will be addressed at that time in accordance with steps outlined within the framework.
34	QIA 2023 NIRB WQ #16.	<p>With regards to turbidity and copper concentrations in water sampled at Sheardown Lake Tributary 1 the proponent states, <i>“The greater turbidity observed in all 2023 seasons compared to baseline likely reflects natural conditions related to high flow observed at site in 2023. Special investigation into copper concentrations above the AEMP benchmark at SDLT1 in 2021 involved spatially expanded sampling that did not indicate any distinct source of copper to SDLT1, suggesting a naturally occurring (not mine-related) source of copper to the system (Minnow 2022).”</i></p> <p>While higher flows could explain higher turbidity in 2023 compared to baseline, the proponent does not provide flow values for either 2023 or baseline studies. To support this hypothesis flow information for each season for each study (2023 and all baseline studies) would need to be provided. The proponent also indicates that the expanded sampling program did not find a distinct source of elevated copper concentrations. While a distinct source may not have been identified this line of reasoning does not eliminate the potential of a mine impact, but simply indicates that the proponent was not be able to identify the source based on the data collected. Given that concentrations of copper exceeded the AEMP benchmark in 2023 and concentrations were higher than background this triggers the low level threshold of the AEMP TARP. Therefore, the appropriate studies should be conducted.</p>	<p>QIA requests the proponent:</p> <ol style="list-style-type: none"> <li>1. Provide data to back up the hypothesis presented, and</li> <li>2. Complete temporal trend analysis for copper at the Sheardown Lake Tributary 1 site given concentrations exceeded the AEMP benchmark in 2023 and were elevated compared to background concentrations.</li> </ol>	<p><b>Document Name:</b> G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 4.1.1.2</p> <p><b>Page:</b> 139</p>	<ol style="list-style-type: none"> <li>1. Results of the 2023 AEMP Hydrometric Monitoring Program (North Water Environmental 2024) support the hypothesis presented. As part of the AEMP hydrometric monitoring program, the hydrometric station in CLT1 (i.e., the H05 Station) has been used since 2014 to provide a comparison of general flow conditions from year to year. The H05 station has been used for this purpose because it is positioned near the mine, has a relatively small drainage area, has had a stable rating relationship, and has a record of flow since 2006. According to North Water Environmental (2024), <i>“the total annual runoff recorded in 2023 at the H05 station was the third highest recorded from 2006 to 2023 for concurrent periods of record. The flow measured in 2023 was above normal in June to mid-July due to the majority of freshet occurring during this period. The volume of flow measured during summer (mid-July to mid-August) was below average, with few high magnitude flow events, and the volume of flow during late August and September was higher than average.”</i></li> <li>2. While copper concentrations at SDLT1 were above the AEMP benchmark in summer and fall in 2023, they were not elevated compared to reference or baseline concentrations in 2023 seasonal sampling events except for spring when they were slightly elevated (i.e., 3.8 to 3.9 times) compared to reference. Therefore, the results of comparisons to reference and baseline conditions do not support conclusion of a mine-related influence on copper in SDLT1 in 2023. Concentrations of copper at SDLT1 have frequently exceeded the AEMP benchmark, including almost all samples collected during the baseline period (Figure C.11; Minnow 2024). The special investigation into sources of copper to SDLT1, conducted in 2021 (Minnow 2022) by sampling additional locations upstream and downstream of the existing CREMP stations in fall 2021 indicated concentrations of total copper above the WQG at all stations at SDLT1 and above the AEMP Benchmark at all but one station at SDLT1. Highest total concentrations of these metals occurred in those samples with highest</li> </ol>

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					<p>turbidity, suggesting that these metals were likely bound to suspended mineral material and not bioavailable. Review of dissolved copper concentrations within SDLT1 indicated no upstream to downstream spatial changes that would suggest a distinct source of copper to the SDLT1 system. The intent of this special investigation was to examine whether the source of elevated copper concentrations at SDLT1 during baseline was related to an isolated source (e.g., key tributary, groundwater upwelling, etc.) within the system. Recognizing that current mine operations may have obscured historical spatial patterns, the spatial examination of dissolved copper concentrations within SDLT1 did not indicate any distinct source of copper to the system, suggesting that elevated concentrations of copper at SDLT1 during baseline were related to natural minerology of the bedrock/overburden in the SDLT1 catchment.</p> <p>3. Given the results of comparisons of copper concentrations at SDLT1 to reference and baseline conditions in 2023, and the results of the 2021 special investigation, Baffinland contends that no further response actions associated with copper concentrations at SDLT1 that were above the AEMP benchmark in 2023 are required at this time.</p>
35	QIA 2023 NIRB WQ #17.	<p>With regards to total cadmium concentrations at Sheardown Lake Tributary 1, "A temporal trend analysis also found a significant increasing trend in total cadmium at both SDLT1 sampling stations over the years of mine operation (2015 to 2023), as well as a significant increasing trend in dissolved cadmium at the downstream station (D1-00) since the baseline period. Similar temporal trends were not found at the reference streams. The temporal trend analysis suggested that, for cadmium, an increasing mine-related influence has occurred over time but has only recently resulted in exceedances of the AEMP benchmark (i.e., beginning in 2022)."</p> <p>Given that the actions associated with a moderate level threshold have indicated that there has been a mine related impact on water quality, with an increasing trend which has resulted in the exceedance of an AEMP benchmark in two consecutive years it suggests a high risk threshold, "moderate risk condition status is reached." Has been achieved. Therefore, environment department should complete the high level risk tasks, "Conduct further investigation to confirm cause is consistent with results of investigation conducted under the moderate risk response action; evaluate and</p>	<p>QIA requests the proponent complete the tasks associated with the high level risks for total cadmium in Sheardown Lake Tributary 1.</p>	<p><b>Document Name:</b> G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 4.1.5</p> <p><b>Page:</b> 149</p>	<p>Baffinland notes that the AEMP TARP is part of Revision 2 of the AEMP which as not yet been approved by the Nunavut Water Board. Therefore, all analyses and effects assessments in the 2023 CREMP followed the methods and response framework from Revision 1 of the AEMP (Baffinland 2015).</p> <p>As such, it was concluded that a moderate action response was required for cadmium at SDLT1 and the following action was recommended: "Upgrades and adjustments to facilities and systems associated with water management for the KM105 surface water management infrastructure in the upper SDLT1 system are ongoing, and therefore water quality information collected during the 2024 CREMP will be used to monitor water quality of SDLT1 and as a basis for informing the potential need for further investigations."</p> <p>Note that no adverse effects to phytoplankton or benthic invertebrate communities were indicated at SDLT1 in 2023, indicating that despite elevation in cadmium above the AEMP benchmark, no biological effects were associated with the elevated concentrations.</p>

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		<i>implement most appropriate action(s) from the AEMP Action Level Toolkit."</i>			
36	QIA 2023 NIRB WQ #18.	<p>When providing recommendations for follow up studies in Mary River the proponent states, "Based on this effluent monitoring, and because nitrate and sulphate concentrations have consistently remained below AEMP benchmarks within MRTF, as a Low Action Response within the AEMP Management Response Framework associated with increasing trends in nitrate and sulphate at MRTF, the following action is recommended:</p> <p><i>Baffinland will continue to closely monitor effluent quality and MRTF water quality and evaluate for any continually increasing trends in nitrate and/or sulphate concentrations that indicate the need for development of additional mitigation measures."</i></p> <p>The proponent has established a mine related impact on a valued ecosystem component. They have also established an increasing trend in concentrations of parameters of concern. The recommendation provided is vague leaving room for continued degradation of the valued ecosystem component, water quality. To provide useful management guidance, quantitative management targets need to be established to determine exactly when increasing trends in nitrate and/or sulphate concentrations need mitigation measures developed. It is recommended that Minnow (or another consultant) establish quantitative targets to provide to Baffinland to indicate when mitigation measures are required for nitrate and sulphate concentrations in Mary River Tributary F.</p>	QIA requests the Proponent establish quantitative targets to provide to Baffinland to indicate when mitigation measures for nitrate and sulphate in Mary River Tributary F are required.	<p><b>Document Name:</b> G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 5.2.5</p> <p><b>Page:</b> 253 and 254 of 307</p>	<p>Baffinland contends that quantitative targets used for the purpose of triggering mitigation measures related to nitrate and/or sulphate concentrations in water at Mary River Tributary-F (MRTF; Station F0-01) are not required. This contention is supported by the following points:</p> <ol style="list-style-type: none"> <li>1. Nitrate and sulphate concentrations at MRTF Station F0-01 have consistently remained below the respective AEMP benchmarks for these parameters. In addition, no adverse effects to phytoplankton or benthic invertebrates have been indicated within the MRTF system suggesting no degradation of biotic components. Baffinland has continued to meet water quality objectives for MRTF as set out in the approved AEMP, thus refutes the statement from QIA pertaining to "continued degradation of the valued ecosystem component, water quality" as stated by the reviewer related to nitrate and sulphate concentrations at MRTF.</li> <li>2. Evaluation of plotted data indicated that concentrations of nitrate increased from 2018 to 2022, and sulphate increased from 2017 to 2022, for some but not all seasons, relative to previous years (see CREMP Appendix Figure C.23). However, concentrations of both nitrate and sulphate in water at MRTF in 2023 were similar to concentrations observed prior to 2018 and 2017, respectively. This indicated that an on-going upward trend in concentrations of these parameters is not occurring over time.</li> <li>3. The source of nitrate and sulphate concentrations to MRTF is known to be the MS-08 effluent discharge. Therefore, Baffinland currently can manage concentrations of nitrate and sulphate in water of MRTF, at minimum, through the control of flow from the MS-08 discharge precluding the necessity to develop 'triggers' for mitigation. Effective management of release of effluent from the MS-08 discharge will thus ensure no adverse impacts to the MRTF system related to nitrate and sulphate concentrations.</li> <li>4. Additionally, as part of Environmental Effects Monitoring (EEM) for compliance with the Metal and Diamond Mining Effluent Regulation (MDMER), effluent quality is regularly monitored at FDP-MS-08 for compliance with MDMER targets, providing an additional evaluation of effluent inputs into MRTF.</li> <li>5. Adherence to the existing AEMP Rev.1 Data Assessment Approach and Response Framework (or any future versions) is thus considered adequate for tracking and responding to potential changes in nitrate and/or sulphate concentrations in water of MRTF over time.</li> </ol>

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37	QIA 2023 NIRB WQ #19.	Table 5 of the Snow Management Plan provides information on the monitoring that will be conducted regarding the potential impacts of snow stockpiling. Snow stockpiling from project roadways and infrastructure will "avoid or minimize the release of sediment and other contaminants from melting snow stockpiles" (P12), which will be indicated by concentrations of ammonia, nitrate, pH, conductivity, TSS, and oil and grease, as monitored by the Surveillance Network Program (SNP). The specific triggers (i.e., concentration levels, physical indicators, etc.) and mitigative actions for low, medium and high-risk scenarios are not provided in Table 5, but a reference to the Surface Water and Aquatic Ecosystem Management Plan (SWAEMP) is provided (although the SWAEMP was not included in the 2023 NIRB submission). The Snow Management Plan should be a comprehensive document that can be referred to by Baffinland staff in the event of a snow stockpile meltwater concern. The pertinent information from the SWAEMP that provides triggers, monitoring and responses should be provided in the Snow Management Plan for ease of review and document completeness, and to ensure that the triggered actions are sufficiently protective of the environment.	QIA requests that the proponent include pertinent information from the SWAEMP regarding the monitoring triggers and mitigative responses for snow stockpiling from project roadways and infrastructure, for ease of review, and to ensure that the Snow Management Plan is a comprehensive document that contains all pertinent information for monitoring and managing stockpile meltwater.  Please provide the (updated) SWAEMP in the NIRB annual submission, for technical review and submission completeness.	<b>Document Name:</b> Baffinland NIRB Annual Report, Appendix G.8.8 Snow Management Plan  <b>Section:</b> Table 5  <b>Page:</b> 13	The Snow Management Plan provides instruction to employees in order to complete inspections, clean up, and runoff monitoring to ensure the release of sediment and other contaminants are captured and and taken care of properly. QIA Environmental Monitors are also on site continually and are part of the monitoring of the snow stockpiles.  Baffinland will update the Snow Management Plan during the annual review of the plan and will include the updated Snow Management Plan in the 2024 NIRB Annual Report. If applicable, the SWAEMP will also be updated and would be included in the NWB and QIA Annual Report for Operations where the applicable technical review occurs under Baffinland's Type A Water Licence.
38	QIA 2023 NIRB WQ #20.	Figure 1 of the Snow Management Plan shows a snow stockpile location ~220 m upgradient (northeast) of Camp Lake, and a stockpile ~40 m upgradient (north) of Sheardown Lake. Figure 2 shows another snow stockpile ~150 m upgradient (northeast) of Sheardown Lake. Although these three stockpile locations maintain the 31 m setback from the ordinary high water mark, these upgradient locations may present problems during snowmelt, where potentially contaminated and sediment-laden meltwater will preferentially flow to downgradient Camp and Sheardown Lakes. Given ongoing concerns with meltwater inputs at Camp and Sheardown Lakes, snow stockpiling in upgradient locations should be more strictly managed and eliminated (if possible), and topographic considerations should be included in snow stockpile site selection.	QIA requests that the proponent provide the rationale for positioning snow stockpiles in upgradient areas near Camp Lake and Sheardown Lake, where contaminant/sediment-laden meltwater may preferentially flow downgradient to the lakes and may be difficult to contain and mitigate. Topographic considerations should be implemented into snow stockpile siting.	<b>Document Name:</b> Baffinland NIRB Annual Report, Appendix G.8.8 Snow Management Plan  <b>Section:</b> Figure 1 and 2: Snow Management – Mine Site  <b>Page:</b> 23-24	The selection of the locations of snow stockpiles are reviewed every year. Locations are selected based on accessibility, suitability of the area, safe access, and potential for impacts to the receiving environment. It is unavoidable to locate all snow stockpiles upstream of a receiving waterbody in the Project area because the nature of the number of water bodies, tributaries and surface flow on the tundra will inevitably result in snowmelt reaching a water body in the Project area. Baffinland will continue to assess the suitability of locations of proposed new snow stockpiles and to inspect and monitor snow stockpile locations as per the Snow Management Plan. Baffinland proposes to also include the QIA on site Environmental Monitors in this process to ensure their input is incorporated into location selection.
39	QIA 2023 NIRB WQ #21	The proponent states, "No Project activities were undertaken related to the development of the Steensby Railway or at Steensby Port in 2023, with the exception of physical and archaeological surveys, and studies to update baseline information on fish and fish habitat along the Steensby Railway and at Steensby Port to support additional permitting activities." Based on the information provided it is	It is recommended that the proponent initiate sediment and water quality studies related to the development of the Steensby Railway and Port to update the existing baseline characterization if they have not yet been initiated.	<b>Document Name:</b> 2023 Annual Report to the Nunavut Impact Review Board  <b>Section:</b> 3.1	The 2024 Steensby Baseline Studies Summary Attachment S1 – S15 provides a summary of baseline studies that have been undertaken for the Steensby Component from 2021 to the present, and that are planned for 2024 and 2025. Freshwater monitoring studies along the Steensby Railway and at Steensby Port are planned for 2025.

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		unclear if additional water and sediment quality studies have been completed along the Railway and at Port. A lack of baseline sediment quality data at lotic systems at the main camp has interfered with AEMP and CREMP management initiatives. It would be prudent for the Proponent to learn from these limitations and improve management initiatives moving forward.		Page: 55 of 641	
40	QIA 2023 NIRB WQ #22.	The proponent states, "These annual rates were generally within the range of those observed at other Canadian arctic lakes (e.g., 7 to 50 mg/cm <sup>2</sup> /year; Lockhart et al. 1998) including the relatively higher annual sedimentation rates at SHAL-1 within one standard deviation (63 ± 24.2 mg/cm <sup>2</sup> /year)." It is unclear if the "Canadian arctic lakes" being referenced are natural or impacted by mines. Please clarify if the qualifying statement is in reference to natural or impacted or a combination of the two.	It is recommended the proponent clarify if the Canadian arctic lakes used to qualify the annual rates of sediment accumulation are natural lakes or those that have been impacted by mines or a combination of the two.	Document Name: Appendix G.4.2 2023 Lake Sedimentation Monitoring Report  Section: 3.1.1  Page: 18 of 57	The Canadian arctic lakes referenced by Lockart et al. (1998) used to qualify the annual rates of sediment accumulation at Sheardown Lake NW are natural lakes that have not been impacted by mines or any other anthropogenic activities. Study lakes have had little to no industrial or human activities within the drainage areas.
41	QIA 2023 NIRB WQ #23.	The proponent states, "Sediment accumulation thickness for the 2023 open water period in Sheardown Lake NW at the littoral and profundal areas (i.e., SHAL-1, SHAL-2, and DEEP-1) was significantly higher in 2023 than in 2015, 2019, and 2020 (Appendix Table A.13). The sediment accumulation thickness in 2023 was not statistically different than the 2018, 2021, and 2022 open water periods for all monitoring areas (Appendix Table A.13). During the open water period, there was an increase in sediment accumulation thickness with time at Sheardown Lake NW indicated by the significant, positive Spearman's correlation at the littoral SHAL-1 and SHAL-2 areas (Spearman's $\rho$ of 0.64 to 0.65, $p < 0.05$ ; Appendix Figure A.3). At the profundal DEEP-1 area, there was a moderate positive correlation of open water sediment accumulation thickness (Spearman's $\rho$ of 0.45, $p < 0.05$ ; Appendix Figure A.3). These results indicated that there was an increase in sediment accumulation at Sheardown Lake NW with year since mine operation."  While the proponent discusses the lack of implications for arctic char eggs due to the location and timing of the accumulation they do not discuss the implications of the increase in sediment accumulation to benthic invertebrate	It is recommended that the proponent discuss the implications of the increase in sediment accumulation over the mine operation period in Sheardown Lake NW, particularly in the silt-loam substrate, to the benthic invertebrate community and the impacts to arctic char (through the food-web).	Document Name: Appendix G.4.2 2023 Lake Sedimentation Monitoring Report  Section: 3.2.2  Page: 23 of 57	The benthic invertebrate community at Sheardown Lake NW has indeed been assessed yearly since 2015 under the CREMP. Reviewers are referred to Minnow 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, and 2024 for detailed discussion of potential effects on, and changes to, the benthic invertebrate community at Sheardown Lake NW since 2015.  Briefly, in the most recent 2023 CREMP study, no adverse effects on benthic invertebrates were indicated at littoral or profundal depositional habitat (i.e., habitat represented by silt-loam substrate) of Sheardown Lake NW (Minnow 2024) mirroring similar results in previous years of mine operation. More often than not, for key indicators of benthic invertebrate density, richness, and evenness, values have been higher at Sheardown Lake NW than at a reference lake since 2015.  In addition, no ecologically meaningful changes in key indicators of benthic invertebrate community health have been identified since baseline at Sheardown Lake NW. Overall, the absence of effects on benthic invertebrates of Sheardown Lake NW relative to reference conditions and to lake baseline conditions indicates no adverse influences of the Project on bottom-dwelling biota of the lake due to changes in physical sedimentation rate and/or sediment quality within depositional environments. By extension, no adverse effects to arctic char associated with changes in food-web characteristics can be attributed to Project-related influences on lake sedimentation and/or sediment chemistry at Sheardown Lake NW.

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		<p>communities, which serve as food for arctic char and are used as a rationale for monitoring locations: “Shallow Depositional Area (SL-SHAL-1): Silt-loam represents the dominant substrate type in Sheardown Lake NW, and therefore increased sedimentation on habitat characterized by this substrate has the greatest potential to affect overall lake benthic invertebrate density and/or community structure. In turn, changes in habitat of this type could affect benthic invertebrate productivity and/or community composition and thereby change food resources available for the arctic char population of Sheardown Lake. Silt substrate in the lake littoral zone was targeted for placement of this area to represent a potentially high sediment deposition habitat. Because this area is located near the outlet from SDLT1, information acquired from this area also serves to evaluate the extent to which sediment releases from key lake tributaries affect sedimentation at Sheardown Lake NW.” The implications of the increase in sediment accumulation over the mine operation period in Sheardown Lake NW, particularly in the silt-loam substrate, to the benthic invertebrate community and the impacts to arctic char (through the food-web) need to be discussed in the lake sedimentation study report.</p>			
42	<p><b>QIA 2023 NIRB WQ #24.</b></p>	<p>Baffinland identified PC No. 17 as “in progress”; however, they noted that there were four non-compliant effluent discharges that occurred in 2023. As there were non-compliant effluent discharges that occurred in 2023, it is unclear why PC No. 17 was considered in progress by Baffinland.</p> <p>In the discussion of results, Baffinland identified the non-compliant effluent discharges that occurred and the measured parameters in the effluent; however, there was limited discussion about delineation of these discharges and their potential environmental impact. It is unclear whether Baffinland has considered or assessed potential impacts to the environment from the four non-compliant effluent discharges that occurred in 2023. With respect to the KM 105 water management pond, there was limited discussion regarding the ongoing uncontrolled seepage that is being</p>	<ul style="list-style-type: none"> <li>• Change the status of compliance for PC No. 17 to “non-compliant”.</li> <li>• Discuss the results of any work that has been completed to delineate non-compliant effluent discharges and assess potential impacts to the receiving environment.</li> <li>• Discuss the results of any work that has been completed to characterize the quantity and composition of seepage being released at the KM 105 water management pond.</li> </ul>	<p><b>Document:</b> Project Certificate Term and Condition No. 17 (Section 4.6.4)</p>	<p>In 2023, all effluent discharge were compliant with the applicable discharge criteria with the exception of four (4). Below is a summary of the status of each of the four (4) incidents against compliance with PC Condition 17, which indicates: the Proponent shall develop and implement effective measures to ensure that effluent from project-related facilities and/or activities satisfies all discharge criteria requirements established by relevant regulatory agencies prior to being discharged into the receiving environment. Baffinland confirms this PC is in progress.</p> <ul style="list-style-type: none"> <li>• On June 12, 2023, a controlled discharge from the MP-03 bulk fuel storage facility exceeded water license criteria for total lead. At the time the laboratory results were received, the discharge from the MP-03 bulk fuel storage facility was complete for June. Prior to resumption of discharge from the facility in July 2023, additional pre-discharge sampling was conducted to ensure compliance with the full suite of relevant water license criteria. The potential impacts to the receiving environment are negligible as the discharge criteria for lead at this facility are based off of drinking water guidelines, which are unnecessarily restrictive.</li> </ul>

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		released; the quantity of seepage and seepage quality at the KM 105 water management pond is unknown.			<ul style="list-style-type: none"> <li>On September 5, 2023, a controlled discharge from the MP-04A Contaminated Snow Containment Berm exceeded water license criteria for TSS and total lead. Discharge from this facility has not occurred to date in 2024. All data will be reviewed in 2024, prior to initiating discharge from the facility. The potential impacts to the receiving environment are negligible as the discharge occurred to ground and the criteria for lead at this facility are based off of drinking water guidelines, which are unnecessarily restrictive.</li> <li>Analytical results of the sample collected at MS-08 on September 3 indicated a TSS concentration of 33.3 mg/L; exceeding the maximum water licence limit of 15 mg/ for TSS grab sample concentrations. MDMER limits for this location are 30 mg/L for which this was a minor exceedance. Subsequent resampling as per Baffinland's Spill Contingency Plan (BAF-PH1-830-P16-003) could not be attempted, as September 3 was also the final day of discharge for the year due to freezing conditions. However, field measurements of pH and turbidity, taken by the WTP operators to ensure that parameters remain within specified limits, indicated that results were within acceptable limits; thus, this exceedance may have been the result of a sampling error. Environmental effects are thought to be minimal as the discharge length of noncompliant water was very brief and the discharge occurred to ground where it flows over land before discharging into Mary river trib F.</li> <li>The status of the development and implementation of effective mitigation measures to address seepage from the KM105 facility remains in progress due to additional seepage in 2024 following remedial efforts at the facility over the winter. Baffinland is currently reviewing the potential remedial options of the water management structure at the KM 105 Pond provided by a third-party design consultant and Engineer of Record (EOR) to determine appropriate corrective actions. The status of the development and implementation of effective mitigation measures for this incident remains in progress. Baffinland will provide a full summary on activities related to the KM105 Pond in the 2024 NWB and QIA Annual Report for Operations, including details regarding the installation and commissioning of a water treatment system and a polishing step for TSS removal, and KM105 Pond water quality monitoring results.</li> </ul> <p>Baffinland's Aquatic Effects Monitoring Plan (AEMP) outlines the robust monitoring programs implemented to detect and assess potential short-term and long-term impacts to the receiving environment due to Project activities. As part of the CREMP, under the AEMP, potential mine-related influences on water quality, sediment quality, and aquatic biota at aquatic environments located near the mine</p>

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					<p>site are assessed annually including the downstream area of the dam. Results will continue to be reported in the annual CREMP report.</p> <p>Discharge volumes of seepage from the KM 105 pond were provided in monthly water licence reports and in the 2023 QIA-NWB Annual Report for Operations (Table 5.4: Daily, Monthly, and Annual Quantities of Discharge Stormwater - Surface Water Management Ponds – 2023). In 2023, discharge volumes prior to June 22 are unknown due to winter stream conditions preventing the installation of a pressure transducer in the downstream hydrology station. A pressure transducer was subsequently installed on June 22, 2023 and estimated discharge volumes from that point forward were provided. Similarly, water quality results characterizing the seepage at KM 105 are included in monthly water licence reports and in the 2023 QIA-NWB Annual Report for Operations (Table 7.3.1 to 7.3.21: Water Quality Results for Mine Site Water Licence Monitoring Locations; Tab 7.3.6 - KM105-SWMP-SEEP-02).</p>
43	QIA 2023 NIRB WQ #25.	<p>Baffinland noted that a comprehensive sediment and erosion management plan has been incorporated into Baffinland’s Surface Water and Aquatic Ecosystem Management Plan. However, in 2023, the DFO issued a Corrective Measures Order regarding sediment and erosion control. As an outcome of the DFO directive, Baffinland is required to develop a site-wide erosion and control plan. It is unclear whether mitigation measures described in the current sediment and erosion management plan are adequate to mitigate impacts from sediment and erosion as DFO noted sediment and erosion control issues that require the development of an erosion and control plan. Further, it is unclear what impacts may have occurred prior to issuance of the DFO directive and what impacts may occur during the interim while the erosion and control plan is being developed.</p>	<ul style="list-style-type: none"> <li>• Comment on whether updates to the sediment and erosion management plan may be needed to mitigate potential impacts to the environment from the sediment and erosion control issues that have been identified at the Mine.</li> <li>• Discuss the potential environmental impacts that may have occurred prior to issuance of the DFO directive and may occur during the interim while the erosion and control plan is being developed.</li> <li>• Discuss any mitigation measures that will be implemented to prevent adverse impacts to the environment during the interim while the erosion and control plan is being developed.</li> </ul>	<p><b>Document:</b> Project Certificate Term and Condition No. 22 and No. 26 (Section 4.6.5)</p>	<p>The management of erosion and sediment controls has been improved through the work of the International Erosion Control Association, with changes to several federal regulations in 2021, with increased focus on sediment and erosion control standardization. Baffinland has recently hired two individuals with certification as Inspectors of Sediment and Erosion Controls (CAN-CISEC). Outcomes of ongoing works along the Tote Road and across both sites will continue to inform updates to the SWAEMP, to be consistent with current standards, as additional technologies and best practices come to light, and consistent with Baffinland’s unique environmental conditions.</p> <p>Baffinland’s Surveillance Network Program (SNP) monitoring and Tote Road Monitoring Plan (TRMP) are designed to identify potential impacts to the receiving environment from site activities. The implementation of controls from Baffinland’s Management Plans, including the SWAEMP, are sufficient to prevent and mitigate adverse impacts and any updated control methodologies that can be implemented will be taken as required in conjunction with updates to the management plans.</p>
44	QIA 2023 NIRB WQ #26.	<p>Under the Marine Environmental Effects Monitoring Program (MEEMP (PCC 76, p. 277), “Baffinland has committed to a</p>	<p>QIA requests Baffinland sample the newly implemented Capesize monitoring stations</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report,</p>	<p>QIA provided the following as part of SOP review process (QIA ME-7(3): “<i>If Capesize vessels are used, Baffinland commits to augment its benthic sediment and infaunal monitoring programs by conducting annual sampling at existing sites SW-1 through</i></p>

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		<p>frequency of annual sampling of the newly implemented Capesize monitoring stations for three years following the initial use of Babycap and Capesize vessels.” (PCC 76, p. 279; PCC 85, p. 303). Given that the 2023 sampling of sediment and benthic invertebrates at the eight (8) sites occurred prior to the arrival of these vessels at Milne Port and that Baffinland considers the 2023 sampling to form part of the pre- Capesize “baseline” (PCC83a, p. 296), the three years of sampling identified above should include 2024, 2025, and 2026.</p>	<p>for effects on sediment and benthic invertebrates in 2024, 2025, and 2026.</p>	<p>file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.10 Marine Environment, PCC 76</p> <p><b>Page:</b> 277-280 (PDF p. 2304- 305 of 641)</p> <p><b>Section:</b> 4.6.10 Marine Environment, PCC 83a</p> <p><b>Page:</b> 296 (PDF p. 314 of 641)</p> <p><b>Section:</b> 4.6.10 Marine Environment, PCC 85</p> <p><b>Page:</b> 303 (PDF p. 321 of 641)</p>	<p><i>SW-4, SE-18-1 and SNW-1, and at two (2) new sites situated to ensure that any changes in bottom scouring by these longer, deeper vessels are captured—one site offshore the northwest corner of the dock at a similar distance/depth to SNW-1, the other between SW-1 and SW-2 but at the 25 m depth contour. Sampling shall continue annually at these locations for a minimum of three years following the initial use of Capesize vessels at Milne Port. Following this three-year period, Baffinland will consider a reduced frequency in sampling at these locations (once every three years) if sediment and benthic conditions at these sites are shown to be stable (and within the limits of impact predictions)."</i></p> <p>Baffinland confirms that the sampling for MEEMP began in 2023. This was confirmed at the MEWG in December 2023 and again in June 2024 with QIA in attendance.</p>
45	QIA 2023 NIRB WQ #27.	<p>The WRMP states that placement strategies for lifts (of waste rock) may be revised, as the thermal performance of the WRF becomes better understood. Further, the management plan states that <i>“In the event that waste rock deposition following the above guidelines is not possible, Baffinland will document short-term deviations from the above waste rock deposition strategies and develop corrective action plans to return to the long-term objectives”</i> (p.12). A log of changes that have been made to the waste rock deposition method should be provided in the WRMP, to track what has been learned about thermal performance over the operations phase, and how corrective actions have been implemented into the deposition strategy. Additionally, a record of instances where the deposition guidelines in the WRMP have not been able to be implemented (as mentioned on page 12) should be appended in this document, to assist reviewers in determining the frequency of deviations from the WRMP and evaluating any associated concerns.</p> <p>Further, it is understood that the WRF has been receiving waste rock throughout the life of the mine, and an estimated 640 MT of waste rock and 32 MT of overburden will require management from mining Deposit 1. Reference to (or inclusion of) the waste placement records to date, including depths and composition (PAG or non-PAG), should be</p>	<p>QIA requests that the proponent provide a log of learned information/strategies for waste rock deposition both in line with the WRMP and when deviations have occurred, that have evolved over the course of mine operations, and waste placement records to-date. The proponent is also requested to provide the current WRF capacity and an estimate of when the footprint will require expansion.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.8.1 Phase I Waste Rock Management Plan (WRMP)</p> <p><b>Section:</b> 8 (Deposition Strategy and Guidelines)</p> <p><b>Page:</b> 11-12</p>	<p>Waste placement records and a conformity assessment to the waste rock deposition guidelines outlined in the PH1 WRMP were included in the 2023 QIA-NWB Annual Report for Operations and will continue to be provided to regulators in the referenced annual report.</p> <p>For a list of the earlier guidelines, Baffinland directs the reader to the previous PH1 WRMP. Very few adjustments have been made in the waste rock deposition strategy when compared to those presented in the previous PH1 WRMP. Future updates to the PH1 WRMP will include a log of changes.</p> <p>IFC designs for the next WRF expansion are planned to be completed and issued to regulators in 2025, with construction planned for 2025 and 2026. The remaining capacity of the existing WRF footprint is 26 Mt as of this submittal.</p>

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		included, to evaluate progress and the volume of material in the WRF. Additionally, estimates of when the current WRF footprint will require expansion should be included/referenced, for context and document completeness.			
46	QIA 2023 NIRB WQ #28.	In Table 2 of the WRMP, many thermistor beads measuring temperature (and oxygen at BH1) were reported to be damaged across stations BH1, BH2, T2, and T5 (e.g., BH2 – beads from 0.2 to 3.8 m bgs; T5 – several beads at 22.4 m, 19.6 m, 25.6 m, etc.). Thermal data was also missing from several intervals, such as BH1 from November 2021 to April 2022. It is unclear whether the proponent has committed to repairing damaged beads, and how the missing data may have impacted thermal evaluations of the WRF.	QIA requests that the proponent provide a schedule/plan for replacing/repairing the damaged thermistor beads.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.8.1 Phase I Waste Rock Management Plan (WRMP), Part 4/5</p> <p><b>Section:</b> 2.3: Instrument Status (Table 2)</p> <p><b>Page:</b> 29-30</p>	This was included in the 2023 QIA and NWB Annual Report for Operations and Baffinland will similarly provide a WRF instrumentation update in its 2024 QIA-NWB Annual Report, and include instrumentation updates annually in future annual reports. This 2024 update will continue to include the plan for recovery of any “down” instrumentation, and whether or not new instrumentation is planned for the coming year. This annual review and update to the WRF instrumentation and installation plan has been incorporated into the QIA-NWB Annual Report to ensure monitoring of the WRF performance regularly communicated to regulators. Baffinland will clarify in the 2024 annual report that recovery of a “down” thermistor string does not indicate “repair” to damaged beads, as this is not feasible, but rather collection of data from existing undamaged beads on the thermistor string.
47	QIA 2023 NIRB WQ #29.	The WRMP states that <i>“The 2021 assessment based on a shorter temperature dataset suggested that local sudden increases in waste rock temperature, like the event observed at BH1 in July 2020, were possibly related to localized warmer airflow with increases in air temperature at the same period.”</i> , and, <i>“It is unlikely that migration of warmer air alone would be sufficient to sustain higher temperatures in that zone for several months and other factors, like a localized internal heat generation, were likely in play”</i> (p.43) It appears that a temperature increase extended for a period of 9 months. An extended period of warming is a concern, and suggests that waste rock must have thawed and produced a reaction to sustain elevated temperatures for such an extended period. Although the WRMP states that <i>“the existence of possible localized internal heat could generate temporary changes in waste rock temperature patterns”</i> (p. 43), 9 months is a rather extended time for thawing to occur, and should be addressed further in the WRMP, to show that steps have been taken to prevent this from occurring in the future.	QIA requests that the proponent provide additional information regarding the circumstances/details surrounding the 9-month temperature increase observed at BH1, and a more detailed action plan/analysis to determine the specific mechanisms involved in causing the prolonged temperature increase be conducted to ensure this does not happen again in the future.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.8.1 Phase I Waste Rock Management Plan (WRMP), Part 4/5</p> <p><b>Section:</b> 3.8: Summary of Instrumental Trends</p> <p><b>Page:</b> 42-43</p>	<p>Previous A thermal assessments completed in 2021 (Golder 2021) provided details around the localized warming event that was measured at BH1 in July 2020, which notably remained well below the freezing point at all times. When considering data from all available thermistor strings, it is evident that the pile is sustaining freezing conditions during all times, as per the design intent.</p> <p>Earlier in 2024, two new thermistor strings were installed in the WRF and a third thermistor string is still planned for installation in 2024. New thermistor strings will continue to be installed as the WRF expands.</p> <p>Together with water quality monitoring, temperature data from thermistor strings will continue to constitute the primary means for assessing the thermal behaviour of the pile, and if there is indication that the design intent could be compromised, a detailed investigation will be completed.</p>

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48	QIA 2023 NIRB WQ #30.	<p>The report presents surface water quality estimates based on certain conditions including Expected Case. In addition to the Expected Case, the following sensitivity analyses were developed as follows:</p> <ul style="list-style-type: none"> <li><b>Misclassification of Non-AG, 0.5%:</b> Assume that 0.5% of all Non-AG material is misclassified, and provides mass loading as if it were PAG material.</li> <li><b>Misclassification of Non-AG, 5.0%:</b> Assume that 5.0 % of all Non- AG material is misclassified, and provides mass loading as if it were PAG material.</li> <li><b>Conservative Loading:</b> Uses upper bound source terms for PAG and Non-AG rock (Table 2 Conservative Case, Appendix A). In this instance all exposed PAG rock is assumed to be actively producing acidic leachate with pH &lt;4.5 and elevated metal loadings relative to median concentrations.</li> </ul> <p>It is unclear what the basis of the assumptions is for 0.5% and 5.0% of Non- AG. No rationale has been provided to justify these values.</p>	<p>QIA requests that the rationale for these amounts of Non-AG be provided to provide confidence they represent an upper bound scenario for the miscategorization of PAG rock as Non-AG</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.8.1 Phase 1 Waste Rock Management Plan (WRMP)</p> <p><b>Section:</b> 2.3 Model Cases</p> <p><b>Page:</b> 43</p>	<p>As described in the PH1 WRMP, the uncertainty when using &lt; 0.2 wt. % S and paste pH &gt; 6 as an analogue for NPR of &gt; 2 is approximately 0.5%, with 0.51% of samples being incorrectly categorized as Non-AG. The 5.0% misclassification was chosen to represent an extreme scenario, which has not been observed during current monitoring of mining operations.</p>
49	QIA 2023 NIRB WQ #31.	<p>In Appendix A of the document, the Trigger Action Response Plan (TARP) is presented. Condition Status/Threshold is presented for various Project Activities and Objectives along with associated Performance Indicators. QIA questions how the thresholds for each Performance Indicator were determined for low, medium and high-risk thresholds as these are not indicated in the plan.</p>	<p>QIA requests that protocol or rationale be provided for determination of each of the performance indicators for low, medium and high-risk status.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.5.8.1 5 of 5. 2023 Water Balance Update. Baffinland Iron Mines Mary River Project. December 15, 2023. December 18, 2023</p> <p>Appendix B: Waste Rock Facility QA/QC Monitoring Plan</p> <p><b>Page:</b> 89 of 92</p>	<p>Due to the unique characteristics of each activity, site, risks and objectives, no overarching guidelines exist for the determination of TARP thresholds. Thresholds were developed for each particular activity and objective based on Baffinland's understanding of the variability of the underlying performance indicators and the relevant operational considerations related to the various Project activities (i.e. applicable time delays, speed of corrective actions, activity complexity, risk, consequences, etc). Where applicable, industry best practices and inputs from relevant consultants and operating manuals were incorporated.</p>
50	QIA 2023 NIRB WQ #32.	<p>When discussing the evaluation of water and sediment quality data in regards to the AEMP and TARP the proponent states, "A change may be detected statistically or qualitatively, relative to benchmarks, baseline values and/or spatial or temporal trends. A change may be statistically significant, but professional judgement will also be applied</p>	<p>QIA requests the Proponent remove professional judgement as part of the AEMP TARP and rely on objective thresholds to remove ambiguity in the adaptive management process.</p>	<p><b>Document Name:</b> Appendix G.8.4 Aquatic Effects Monitoring Plan (AEMP)</p> <p><b>Section:</b> 5.1</p>	<p>The weight-of-evidence analysis described under Section 5.1 of the newest drafted revision (Rev.2) of the AEMP inherently requires that professional judgement be used as the basis for determining whether a change in environmental conditions has occurred. Baffinland provided multiple approaches that may be considered/applied to data collected most recently to determine whether a change in environmental conditions has occurred. The application of several types of analysis for examining data ultimately requires that professional judgement be used</p>

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		<p><i>using the various evaluation tools to qualitatively assess for changes based on a weight-of-evidence analysis."</i></p> <p>Management and mitigation measures must be based on definitive objectives to prevent ambiguity in the adaptive management process. Professional judgement can be used as part of the discussion (not as an objective threshold) after evidence such as trend analysis and weight of evidence evaluation process have been completed as outlined in the AEMP TARP threshold responses.</p>		<p><b>Page:</b> 62 and 63 of 78</p>	<p>to ascertain such a change. Baffinland agrees that comparison to definitive objectives alone may be sufficient to qualify that an environmental condition has changed warranting progression to the next step in the management framework. Professional judgement, supported by an appropriate scientific rationale (which should be described to allow critique), is deemed by Baffinland to provide the basis for determining a change in environmental conditions based on the available weight-of-evidence. Therefore, Baffinland does not feel that removal of professional judgement, as part of the AEMP Data Assessment and Response process is justifiable.</p>
51	QIA 2023 NIRB WQ #33.	<p>Baffinland identified PC No. 16 as "in compliance"; however, it noted that seepage is occurring at the KM 105 water management pond. As such, remedial works are ongoing for the KM 105 water management pond. As the KM 105 water management pond is not functioning as intended, and additional remedial work is needed for this structure, it is unclear how this term and condition has been assessed as in compliance.</p>	<p>It is recommended that the status of compliance for PC No. 16 be updated to "non-compliant" until such a time that seepage has been mitigated and controlled for all water infrastructure.</p>	<p><b>Document:</b> Project Certificate Term and Condition No. 16 (Section 4.6.4)</p>	<p>Baffinland disagrees with the QIA's recommendation that the status of compliance for this condition should be changed to "non-compliant". PC Condition No. 16 outlines the requirement to ensure all water related infrastructure or facilities that are designed or constructed are consistent with those proposed with the FEIS and FEIS Addendum in terms of type, location, and scope and that the requirements of all relevant regulatory authorities are satisfied in advance of constructing those facilities. Construction of the KM105 Pond is consistent with those proposed in the FEIS and FEIS Addendum, and associated Type 'A' Water Licence. Prior to commencement of construction of the KM105 Pond applicable regulatory approvals were obtained by Baffinland for the Long Term Water Management Plan under Modification No. 13. Continued remedial work at the KM105 Pond is consistent with descriptions of works described in EIS documents, and applicable regulatory notifications were completed by Baffinland for the remedial activities.</p> <p>Baffinland also confirms that, hydrologically, discharges from the KM105 Pond have been fully assessed and discharges from the facility, regardless of whether they are controlled or due to seepage, do not present an issue with respect to the hydrology of the system.</p>
<b>TERRESTRIAL ENVIRONMENT</b>					
52	QIA 2023 NIRB TE #1.	<p>Baffinland indicated that a third-party consultant has been engaged to conduct a full review of the status of all historic borrow sources along the Tote Road. Assessments of borrow sources have been completed in 2009, 2014, and 2019, indicating a trend of assessments occurring every five years. It is unclear whether the scope of the assessment to be completed will be the same as that of the 2009, 2014, and 2019 assessments. It is unclear whether Baffinland intends to</p>	<p>1. Provide details regarding the scope of the assessment that will be completed by the third-party consultant and clarify whether this assessment will be a continuation of the work that was completed by Tetra Tech in 2014 and 2019 to better understand the</p>	<p><b>Document Name:</b> Project Certificate Term and Condition No. 25 (Section 4.6.5)</p>	<p>1. The recent historical borrow sources assessment is complete. The purpose of the current assessment is to update the assessment(s) previously completed by Tetra Tech in 2014 and 2019 and to support completing an update to the 2019 Tote Road Borrow Source Report. Therefore, it involve a similar scope of work to previous assessments. The updated report for the recent assessment is currently under review.</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		complete assessments of borrow sources every five years to understand and document impacts from the historic borrow sources and how these assessments are expected to contribute towards minimizing impacts from the project activities and infrastructure on sensitive landforms (i.e. permafrost).	<p>ongoing impacts from the Tote Road borrow sources on the road and permafrost.</p> <ol style="list-style-type: none"> <li>2. Confirm whether assessments of borrow sources are to occur every five years.</li> <li>3. Describe how these assessments are intended to contribute towards minimizing impacts from the project activities and infrastructure on sensitive landforms.</li> </ol>		<ol style="list-style-type: none"> <li>2. Baffinland confirms that the third-party assessments are scheduled to occur every 5 years to ensure information remains relevant for current operations.</li> <li>3. These assessments are completed to inform Baffinland on the status of borrow pits, and if the removal of material or the ponding of water is having any effects on local landforms due to permafrost degradation. Targeted and opportunistic remediation of borrow areas will be undertaken as applicable commensurate with identification of geotechnical risks.</li> </ol>
53	QIA 2023 NIRB TE #3.	<p>Within section 5.2.1, Baffinland notes that "Non-compliant flights were primarily related to transits to Steensby Inlet." (p. 23). In section 5.2.3, Baffinland notes that "...2023 had more flight hours within the Snow Geese area at 48.04 hours, second only to 2015 at 50.84 hours." (p. 33). As Steensby Port and southern railway construction are proposed to occur in the near future, this association between non-compliant flights and transit to Steensby Inlet, and increase in flights in the snow goose moulting area are worrying as presumably the number of flights to Steensby Inlet will continue to increase.</p> <p>Within Section 5.2.2, Baffinland notes with regards to the increase in low level flights associated with poor weather days in the snow goose moulting area that "This increase is contrary to the mitigation protocol implemented in 2021 (summarized in EDI Environmental Dynamics Inc. 2022), which requires helicopters to travel around the Snow Geese area during the moulting season on days with poor weather. Further investigation into leading causes is recommended." (p. 31). Baffinland does not provide any details of the investigative actions that will be undertaken to address this issue.</p> <p>QIA recognizes that health and safety is paramount and that there may not be feasible alternative measures to key project operations (such as slinging), but additional efforts must be made to investigate the impact this is having on breeding migratory birds and moulting Snow Geese. As shown on p.</p>	<ol style="list-style-type: none"> <li>1. QIA requests that Baffinland undertake proactive awareness training with pilots in advance of the moulting season to address non-compliance from helicopter flights.</li> <li>2. QIA requests that Baffinland provide their proposed investigation methods for review by the TEWG, to ensure that the investigation will identify the root causes of non-compliance.</li> <li>3. QIA requests that Baffinland provide the results of their investigation, and corrective actions they will undertake to determine why their mitigation protocol was not being followed correctly and how they can prevent this from occurring in the future. QIA expects that corrective actions will include:</li> <li>4. Moulting season orientation with pilots to emphasize the need to travel around the Snow Geese area during the moulting season on days with poor weather; and</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1</p> <p><b>Section:</b> 5.2.2 Compliance Rationale; 5.2.3 Inter-annual Trends</p> <p><b>Page:</b> p. 31; p. 33</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> Section 4.6.8; Project Certificate Term and Condition No. 59</p> <p><b>Page:</b> p. 228-234</p>	<ol style="list-style-type: none"> <li>1. Baffinland undertakes proactive awareness training annually when pilots arrive onsite. In addition, Baffinland's Helicopter Guidelines were developed to provide information to pilots performing work for environmental, Projects and exploration programs at the Project. The guidelines outline the areas around the Project site that may have flight restrictions that must be considered when flying, including wildlife zones, sensitive environmental monitoring equipment, archeologic resources, blasting zones, and aircraft zones. All pilots who will be working at the Project, and all personnel who will be flying in a helicopter are required to review Baffinland's Helicopter Guidelines and to sign-off that they have read and understood the requirements.</li> <li>2. Investigation methods will be included in the 2025 TEAMR following consultation and review with a third-party subject matter expert.</li> <li>3. Results of the investigation will be discussed in the 2024 TEAMR.</li> <li>4. Baffinland commits to completing moulting season orientation with pilots to re-emphasize the need to travel around the Snow Geese area during the moulting season on days with poor weather.</li> <li>5. Baffinland commits to completing a mid-moulting season assessment of pilot compliance and discussions with any pilots that have breached compliance of the 2021 migration protocol.</li> <li>6. The recommendation for helicopter overflight research is a reiteration of QIA 2022 NIRB TE#16, and has already been addressed by Baffinland (Baffinland 2023). Baffinland acknowledges that overflights below recommendations might be disturbing some birds and moulting snow geese.</li> </ol> <p><b>References</b></p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		233, Baffinland has no plans to study migratory bird and snow goose response to helicopter disturbance.	<p>5. Mid-moulting season assessment of pilot compliance and discussions with any pilots that have breached compliance of the 2021 mitigation protocol.</p> <p>6. QIA requests that Baffinland conduct research on the effects of both non-compliance and "compliance with rationale" flights on migratory bird breeding and snow goose moulting. An appropriate study design should be used to avoid additional impacts, particularly during the snow geese moulting season. This commitment to conduct research should be captured in the "Recommendations / Lessons Learned" section of Section 4.6.8, PC Condition 59. Until this research has been conducted and findings demonstrate no significant impact of low-level flying, Baffinland must continue to conservatively assume and disclose that its operations are harmful to breeding migratory birds and snow goose moulting.</p>		Baffinland Iron Mines Corporation. 2023. Baffinland Response to Reviewer Comments on the 2022 NIRB Annual Report. NIRB Registry Document #346627. 222 pp.
54	QIA 2023 NIRB TE #4.	Baffinland has not provided reporting of helicopter flights routes relative to walrus haulout locations. This is concerning to QIA as potential disturbance from aircraft could lead to adverse effects on walrus and details of flight routes relative to these locations should be provided.	<p>QIA requests that Baffinland provide mapping of the helicopter flights routes relative to walrus haulout locations in future annual reports.</p> <p>QIA expects that Baffinland will provide the results of their investigative and corrective measures within the 2024 Terrestrial Environment Annual Monitoring Report.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1</p> <p><b>Section:</b> General Comment</p> <p><b>Page:</b> N/A</p>	In 2023 Baffinland did not fly near any walrus haul outs, thus a map was not created. The walrus haul outs remain the same, and Baffinland did not fly near these areas. Baffinland can provide mapping of the helicopter flights routes relative to walrus haulout locations in future annual reports.
55	QIA 2023 NIRB TE #5.	Within Section 5, Baffinland notes that "No locations or boundaries of areas prescribed explicitly by the TEWG or areas of observed concentrations of other migratory birds were identified in 2023." (p. 22). It's currently unclear how	<p>1. QIA requests that Baffinland provide details on the documentation process that Baffinland will follow when</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1</p>	<p>1. If concentrations of migratory birds are observed, the area will be investigated to verify and delineate. Data and proposed locations will be submitted to TEWG members for comment.</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		information of observed concentrations of other migratory birds would be documented by Baffinland and how this documentation would lead to eventual implementation of helicopter avoidance areas.	<p>concentrations of other migratory birds are observed.</p> <p>2. QIA requests that Baffinland provide details on the reporting and mitigation process that would follow this documentation, including details of who reported observations will be sent to, how they will determine if an avoidance area is needed, and the timeline for this process overall.</p>	<p><b>Section:</b> Section 5 Helicopter Overflights</p> <p><b>Page:</b> p. 22</p>	<p>2. Observations of concentrations of migratory birds within the Project area can be reported to BIM Environment staff, who will pass along information to the appropriate personnel. Areas will then be assessed, and similar standards for current avoidance areas will be applied, if applicable. If the TEWG collaborates on reasonable and informed approaches, new avoidance areas could be applied within 12 months of initial reporting.</p>
56	<b>QIA 2023 NIRB TE #6.</b>	Within Table 0 of the Summary section, Baffinland notes that "In some areas, snowbanks could not be modified because of landscape or safety limitations." (p. xviii). Baffinland does not provide specific details of the landscape or safety limitations that affected the ability to conduct snowbank modifications. With the reduced compliance levels (88% in 2023 vs. 91% in 2022) there should be more details provided to explain the reductions in compliance.	QIA requests that Baffinland provide detailed explanations of the landscape and safety limitations that precluded snowbank height management in 2023. QIA expects that these detailed explanations will include mapping showing the locations of non-compliance and that future years of reporting will provide similar mapping of non-compliance areas for comparison to see whether chronic non-compliance is present. Baffinland is requested to consider whether these locations of non-compliance are important wildlife crossing areas. If they are, QIA requests Baffinland to explore alternative approaches to improve compliance in these areas.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;</p> <p><b>Section:</b> Summary, Table 0</p> <p><b>Page:</b> p. xviii</p>	To reduce snowbank height and drifting, efforts are made to 'feather' (i.e., push back and redistribute) large snow piles after substantial snowfalls. In the areas where snowbanks could not be modified, as previously communicated (refer to page 156 of the 2023 Terrestrial Environment Annual Monitoring Report), generally, snowbanks exceeding the 100 cm height threshold were where snow could not be adequately redistributed for safety and/or operational reasons (e.g., steep or uneven topography, narrow or winding road segments). In the case of steep vertical snow banks, there are multiple safety concerns that inhibit the ability of operators to feather the snow, such as falling snow and ice, uneven ground, poor visibility, and possible damage to equipment. When these concerns or others are identified, the safest course of action is to wait until conditions improve and revisit the site at a later date when safe conditions exist. Snow banks adjacent to water bodies may not be able to be made compliant due to concerns of pushing aggregate into the watercourse during the feathering process. Baffinland will review areas of important wildlife crossings to target snowbank management in line with the above considerations.
57	<b>QIA 2023 NIRB TE #7.</b>	Table 5 of the Snow Management Plan provides information on snow clearing along the Tote Road, and states that snow clearing will "avoid or minimize barrier effects on wildlife movement" (P13). No specific triggers or mitigative actions are provided in the document, although references to snowbank height monitoring (as part of the Terrestrial Environment Mitigation and Monitoring Plan - TEMMP) and the Roads Management Plan are provided. It is difficult to evaluate any potential impacts of the Tote Road snow clearing on wildlife mobility without specific information from the TEMMP snowbank height monitoring and Roads Management Plan. This information should be included in Table 5 of the Snow Management Plan, for ease of review and document completeness, providing a single streamlined document that can be consulted if snowbank height or Tote	QIA requests that Baffinland provide a more specific reference to the TEMMP snowbank height monitoring and Roads Management Plan, or provide pertinent information about the specific mitigative actions that will be taken if snowbanks on the Tote Road are found to be high enough to disrupt wildlife migration.	<p><b>Document Name:</b> Baffinland NIRB Annual Report, Appendix G.8.8 Snow Management Plan</p> <p><b>Section:</b> Table 5</p> <p><b>Page:</b> 13</p>	<p>Snowbanks along the Tote Road are 'feathered' (i.e. pushed back and redistributed) out into the tundra to minimize snow bank height to ensure impacts to wildlife are minimized. This is completed on an as-needed basis and as weather conditions allow. Safety and topographical conditions are considered in the reduction of snow bank heights throughout the winter.</p> <p>References to applicable sections of the TEMMP, Roads Management Plan, and Snow Management Plan are as follows:</p> <ul style="list-style-type: none"> <li>• Terrestrial Environment Mitigation and Monitoring Plan (TEMMP), BAF-PH1-830-P16-0027, Rev. 1, pages 52-53</li> <li>• Roads Management Plan, BAF-PH1-830-P16-0023, Rev. 7, page 15</li> </ul> <p>Snow Management Plan, BIM-5200-PLA-0006, Rev. 7</p>

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		Road snow clearing are found to be disruptive to wildlife migration.			
58	QIA 2023 NIRB TE #8.	<p>Within Table 0 of the Summary section, Baffinland notes that wildlife mortalities "...were low overall and represented a very small proportion of overall populations, consistent with impact predictions." (p. xix). Baffinland noted that 13 King Eider mortalities were recorded, and 4 additional avian mortalities (3 snow bunting and an unknown songbird), for a total of 17 avian mortalities, which is not a low number of mortalities, especially relative to previous years. Within the FEIS, it is noted that "Potential influences on mortality for Eider within the terrestrial RSA will be similar to those described above for Snow Goose." (p. 105), and under residual project effects to snow geese it is noted that "Direct mortality of any individual Snow Goose due to Project activities is not expected..." (p. 102). The mortalities of 13 King Eiders is concerning especially relative to FEIS predictions.</p> <p>As well, Baffinland has provided no explanation how it is tracking King Eider, and songbird abundance to substantiate its claim regarding a small proportion of the overall population. As well, Baffinland notes that "All avian mortalities were likely associated with building or infrastructure collisions." (p. 194). Baffinland does not indicate whether a retrospective review of building strike mitigations will take place, nor do they provide any details on enhanced mitigations that might be used to mitigate building collisions.</p>	<ol style="list-style-type: none"> <li>QIA requests that Baffinland provide further details to explain how they determined the 17 mortalities represents small proportions of the overall populations, with reference to appropriate population estimates.</li> <li>QIA requests that Baffinland provide a summary of the existing mitigations to prevent bird strikes on buildings and provide options for possible enhanced mitigations to reduce bird strikes (e.g. American Bird Conservancy Bird Tape for windows to reduce possible window strikes associated with buildings)</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;</p> <p><b>Section:</b> Summary, Table 0; Section 11 Wildlife Interactions</p> <p><b>Page:</b> p. xix; pp. 191-194</p> <p><b>Document Name:</b> Baffinland Iron Mines 2012 Mary River Project Final Environmental Impact Statement Volume 6 Terrestrial Environment</p> <p><b>Section:</b> Section 4.7 Common and King Eider; Section 4.6 Snow Goose</p> <p><b>Page:</b> pp. 99-104</p>	<ol style="list-style-type: none"> <li>Population estimates for King Eider and snow bunting are available on public online data sources. The population estimate for King Eider in Canada is 600,000 birds (Government of Canada 2015a). The 13 mortalities represent 0.002% of the population in Canada. The population estimate for snow bunting is 5,000,000 –50,000.000 adults (Government of Canada 2015b). The two mortalities represent 0.00% of the Canadian population.</li> <li>The event which resulted in thirteen (13) King Eider mortalities as a result of contact with the shiploading structure at Milne Port was a unique event. High winds and blowing snow likely reduced visibility, resulting in the collision. The shiploading structure includes a large conveyor and steel frame tower structures with lighting that is angled to minimize potential for attracting birds or other wildlife. Following completion of the 2023 shipping season, the shiploader was winterized and therefore the lighting was significantly reduced. Baffinland reviewed documentation of wildlife interactions and found no previous mortalities at the shiploader have occurred. Should this event be repeated for this facility, additional mitigation measures will be considered in accordance with Baffinland’s Terrestrial Environment Mitigation and Monitoring Plan (TEMMP).</li> </ol> <p>Additionally, general site mitigation measures to limit Project effects on bird species are implemented across the Project as per section of 3.2.1 of the TEMMP.</p> <p><b>References:</b></p> <p>Terrestrial Environment Mitigation and Monitoring Plan (TEMMP), BAF-PH1-830-P16-0027, Rev. 1, pages 44-45</p> <p>Government of Canada. 2015a. Population Status: King Eider (<i>Somateria spectabilis</i>). (<a href="https://wildlife-species.canada.ca/bird-status/tendance-trend-eng.aspx?sY=2019&amp;sL=e&amp;sB=KIEI&amp;sM=p1&amp;sT=f3852f38-83b4-4a30-9432-57f27231100e">https://wildlife-species.canada.ca/bird-status/tendance-trend-eng.aspx?sY=2019&amp;sL=e&amp;sB=KIEI&amp;sM=p1&amp;sT=f3852f38-83b4-4a30-9432-57f27231100e</a>). Accessed July 25, 2024.</p> <p>Government of Canada. 2015b. Snow Bunting (<i>Plectrophenax nivalis</i>). (<a href="https://wildlife-species.canada.ca/bird-status/oiseau-bird-eng.aspx?sY=2019&amp;sL=e&amp;sM=a&amp;sB=SNBU&amp;wbdisable=false">https://wildlife-species.canada.ca/bird-status/oiseau-bird-eng.aspx?sY=2019&amp;sL=e&amp;sM=a&amp;sB=SNBU&amp;wbdisable=false</a>). Accessed July 25, 2024.</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
59	QIA 2023 NIRB TE #9.	Within Section 11, Baffinland notes that there were 13 King Eider, 3 snow bunting, and 1 unknown songbird mortalities in 2023, and that the 17 bird mortalities were likely associated with building/infrastructure collisions. In figure 11-1 Baffinland notes for 2023 that there were more than 20 building collision mortalities, and 7 vehicle collision mortalities. The difference between the number of mortalities noted in Section 11 and Figure 11-1 is concerning, as it's unclear which accurately reflects the mortalities that occurred.	QIA requests that Baffinland revise section 11 or figure 11-1 to reflect the true number of building collision mortalities.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;  <b>Section:</b> Section 11; Figure 11-1;  <b>Page:</b> p. 191-193	Figure 11-1 will be updated to reflect Project –related mortalities.
60	QIA 2023 NIRB TE #10.	Within Table 1-1, Baffinland notes that caribou fecal pellets were collected in 2011–2014 and 2020. Baffinland does not provide any details on the analyses or reporting that were completed as part of the fecal pellet collection programs.	QIA requests that Baffinland share the results of the caribou fecal pellet programs and associated reporting.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;  <b>Section:</b> Table 1-1,  <b>Page:</b> p. 2	No analyses were conducted on the fecal pellets collected in 2011–2014 because the age of the pellets was unknown. No relevant information to the project effects was to be gained from an analysis of the 2020 fecal pellets.
61	QIA 2023 NIRB TE #11.	Baffinland notes in Section 9.1.1 that "If/when wildlife tracks were suspected, personnel would further investigate on foot to confirm the identity of the species and follow the tracks (to or from the roadway) to document the patterns of movement, behaviour, and habitat use (if/where possible)." (p. 148-149). Baffinland does not indicate how far personnel travelled to monitor the deflection.  Baffinland noted results of the track surveys as either deflections, paralleling, or crossing. QIA notes that it is possible for wildlife to be deflected from the road, cross it eventually, or parallel the road until it connects with the mine site or Milne port. From the details provided from Baffinland it's unclear for what distance tracks were followed to confirm the ultimate response of the individual wildlife (i.e. were tracks followed until the animal crossed the road, turned away, or for a specified distance).	QIA requests that Baffinland clarify whether or not staff follow the tracks until the tracks indicate the animal crossed the road, turned away from the road or for a specified distance (e.g. 1 km). QIA would expect that Baffinland staff would be undertaking these surveys to ensure all efforts are being made to document possible deflections through following tracks until they cross the road, are deflected or until 1 km of paralleling has been reached.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;  <b>Section:</b> Section 9.1.1.; Section 9.1.2  <b>Page:</b> pp. 148-149, pp. 149-152	Baffinland confirms that snow track survey staff follow tracks to document animal patterns of movement (i.e. to identify whether animals deflected, travelled along, or crossed the road). Snow tracks observed along the Tote Road are followed on foot within a reasonable distance to document patterns of movement, as well as, animal behaviour, and habitat use (if/where possible). Surveys are completed after all snowfall events and all tracks are documented on foot unless it is unsafe to do so (i.e. where the road is narrow or where there are blind corners or dips). If tracks are seen travelling along the Tote Road for longer distances, generally >100m when safe conditions exist), the survey crew will follow the tracks in a light truck traveling at a speed of ~30 km/hr until the tracks either cross the road or veer off into the Tundra.
62	QIA 2023 NIRB TE #12.	Regarding height of land surveys in 2023, Baffinland notes that "Efforts were made to visit all sites a second time but due to helicopters being grounded for safety reasons, a full second round was not able to be completed." (p. 160).	QIA requests that Baffinland provide more details on the safety reasons that led to helicopter being grounded, which impacted the completion of a second round of height of land surveys. Further to this, QIA request that Baffinland plan for	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;	Baffinland appreciates the QIA's comments on survey logistics and contingency planning, and can assure QIA that all reasonable efforts are made to plan for unexpected circumstances. We can confirm that contingency planning for inclement weather is always accounted for when planning field programs.

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		Baffinland does not provide a rationale as to why the full second round was not able to be completed. This is concerning as it would be beneficial to understand why surveys were limited in 2023, so that the same situation can be planned for and avoided during subsequent years.	these possible eventualities in the future, so that a second round of surveys can be completed (e.g. planning to have a couple extra/spare days in case of bad weather to ensure staff and equipment are available).	<p><b>Section:</b> Section 9.3.1.1</p> <p><b>Page:</b> page 160</p>	In this specific case, an aviation incident that caused significant damage to one of the helicopters onsite resulted in the extended grounding of the entire fleet until a full investigation could be completed. The time required to complete the investigation <b>which included the Transportation Safety Board</b> far exceeded the contingency planning room within multiple field program schedules. <b>Of importance, in order to resume grounded helicopter operations, all rotary winged aircraft must be released/approved by the Transportation Safety Board and Transport Canada.</b> We hope the QIA can appreciate that this kind of event is not possible to plan for.
63	QIA 2023 NIRB TE #13.	<p>Regarding incidental wildlife, Baffinland provides a list of common species recorded on wildlife log in 2023 and notes piping plover (<i>Charadrius melodus</i>) among the common species observed. Baffinland provides no further details of the observations of piping plovers.</p> <p>QIA notes that both subspecies of piping plover (<i>Charadrius melodus circumcinctus</i> and <i>Charadrius melodus melodus</i>) are listed as Endangered under the <i>Species at Risk Act</i> (ECCC, 2022; EC 2006), and that further details should be provided on these observations, as the current known range of piping plover in Canada does not include Nunavut, and potential impacts of the project on piping plover were not assessed as part of the FEIS.</p>	<p>QIA requests that Baffinland provide further details on the incidental observations of piping plovers (e.g. location of observations, timing, photos or descriptive details).</p> <p>QIA also requests what Baffinland provide details of what measures were taken once piping plovers were identified to reduce potential disturbance of individuals and their habitat.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;</p> <p><b>Section:</b> Section 9.6</p> <p><b>Page:</b> p. 183</p> <p><b>Other Documents:</b> Environment and Climate Change Canada. (2022). "Recovery Strategy (Amended) and Action Plan for the Piping Plover <i>melodus</i> subspecies (<i>Charadrius melodus melodus</i>) in Canada." <i>Species at Risk Act Recovery Strategy Series</i>. Environment and Climate Change Canada, Ottawa. viii + 124 pp. Environment Canada. (2006). "Recovery Strategy for the Piping Plover (<i>Charadrius melodus circumcinctus</i>) in Canada." <i>Species at Risk Act Recovery Strategy Series</i>. Environment Canada, Ottawa. vi + 30 pp.</p>	Baffinland thanks QIA for bringing this observation forward. Incidental observations are made by staff at site, including non-expert observers. There are inherent limitations to characterizing species, age, or sex of bird or wildlife groups or individuals. The requested information is not available. Upon reflection, the birds were unlikely piping plover because Mary River is completely outside of the range but BIM will endeavour to be as accurate in the incidental observations as possible.
64	QIA 2023 NIRB TE #14.	Within Section 9.6, Baffinland notes that 103 caribou were recorded as part of the incidental wildlife observations in 2023. Baffinland does not provide a map of the location of these caribou observations, nor do they provide details on the group sizes for all of the caribou observations. QIA notes that further details on the location of caribou (e.g. a map), and group sizes would be provide greater clarity on the	QIA requests that Baffinland provide mapping of the location of caribou observations and details on groups sizes for these observations made during 2023, as well as previous years where possible. For future annual reports QIA requests that Baffinland record the approximate locations of wildlife observed as part of	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;</p> <p><b>Section:</b> Section 9.6</p>	The incidental observation logs are intended to capture awareness of and general observations of wildlife by project personnel at the Project. Some observations are made well outside the terrestrial RSA (e.g., during travel to/from exploration areas). For caribou group sizes and observations, the 2023 aerial survey or other surveys specific to caribou (i.e., having clearly defined methodology and data collection and

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		context of the observations, and contribute to informative data on trends in caribou observations over the life of the project.	the incidental wildlife monitoring and include mapping of observations within the annual reports, and details of the different group sizes observed.	Page: p. 183-184	analysis procedures) should be reviewed to quantify the details requested by the QIA.
65	QIA 2023 NIRB TE #15.	<p>Within Section 10, Baffinland notes that as part of activities to address PC 74 "In consultation with the Terrestrial Environment Working Group and Canadian Wildlife Service (CWS), it was resolved that effects monitoring for tundra breeding birds could be discontinued. Instead, Baffinland Iron Mines Corporation (Baffinland) would commit to the following:</p> <ul style="list-style-type: none"> <li>• completing coastline nesting surveys of the identified islet near the proposed Steensby Port Site before the construction of the port;</li> <li>• continuing monitoring programs for cliff-nesting raptors (annual occupancy and productivity) and inland waterfowl (roadside waterfowl surveys) when qualified biologists are available and on site (paused indefinitely since 2021 since no Project-related trends have been observed)." (p. 188)</li> </ul> <p>With the construction of the southern railway and Steensby Port due to commence in the near future, QIA is concerned about potential project-related impacts to cliff nesting raptors and waterfowl, and that important components of the bird monitoring programs are currently not planned in the future. QIA notes that while Baffinland previously completed cliff nesting raptor and roadside waterfowl surveys, these were associated with the Milne Port, Tote Road and Mine site, the construction and operation of the southern railway and Steensby Port may produce different effects on cliff nesting raptors and waterfowl and should be monitored. As it currently stands with no monitoring in place for future years, adverse effects may occur and there would be no mitigative response.</p> <p>Additionally, within Table 1-1, Baffinland notes that no surveys are scheduled but that they "may reassess in future years" (p. 2). QIA notes that the cliff nesting raptor surveys</p>	<p>QIA requests that Baffinland undertake the following monitoring in future years:</p> <ul style="list-style-type: none"> <li>• Updated coastline nesting surveys of the identified islet near the proposed Steensby Port Site;</li> <li>• Cliff-nesting raptors (annual occupancy and productivity) surveys around the Mine site, southern railway route, and Steensby Port;</li> <li>• Peregrine nesting (annual occupancy and productivity) surveys around the Tote Road, and Milne Port; and</li> <li>• Roadside/railside waterfowl surveys around the Mine site, southern railway route, and Steensby Port.</li> </ul> <p>By undertaking these surveys, Baffinland will help to ensure that potential project related effects on birds are being monitored and that mitigative measures can be implemented if needed.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1;</p> <p><b>Section:</b> Section 10; Table 1-1</p> <p><b>Page:</b> p. 188; p. 2</p>	<p>Baffinland offers the following in response to QIA's request:</p> <ul style="list-style-type: none"> <li>• The islet survey will be conducted before southern commercial shipping begins.</li> <li>• Cliff-nesting raptor surveys are unlikely to be re-instituted. The disturbances associated with the southern operation are either no different or less than those observed in the northern operation.</li> <li>• Peregrine falcon occupancy and productivity surveys will not be continued along the Tote Road or Milne Port. The data collection and analyses to date were sufficient to illustrate no relationship between occupancy and productivity and distance to disturbance.</li> </ul> <p>As the potential to develop the Steensby Component approaches with more certainty, Baffinland will engage the QIA and TEWG to carry out thorough discussions on this topic to ensure that all parties understand the results of monitoring programs to date and their applicability to southern operations effects monitoring.</p>

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		<p>appeared to show a slight declining trend in peregrine falcon nest occupancy before the program was discontinued.</p> <p>As well, QIA notes that the coastline nesting surveys were last completed in 2012 and that conditions may have changed in the past 12 years, which could lead to a mischaracterization of project effects on coastline nesting birds. An updated coastline nesting survey would provide a more robust assessment of current conditions for coastline nesting birds, which future monitoring could compare against to assess potential project effects.</p>			
66	QIA 2023 NIRB TE #16.	<p>Within Section 4.6.6, Baffinland provides an overview of the terms and conditions related to vegetation and the associated vegetation monitoring they undertake, including lichen-metal sampling. Baffinland notes that lichen-metal sampling was not undertaken in 2023, but that the next sampling period would be between 2025 and 2027. QIA remains concerned by the statistically significant increases in lichen-metal concentrations relative to baseline levels shown in 2022 (i.e. arsenic, cadmium, copper, lead, selenium), especially with some far sampling sites (e.g. arsenic, cadmium, and selenium at the Mine Site far sampling sites) and one reference sampling site (i.e. selenium at the Tote Road reference sampling site) showing these statistically significant increases for certain contaminants of potential concern.</p> <p>QIA is concerned that, by not having consistent annual monitoring, potential statistically significant increases or increases above lichen indicator values could occur and there would be no timely mitigative response engaged.</p>	<p>QIA requests that Baffinland continue to monitor lichen-metal concentrations more frequently than currently scheduled, annually so if thresholds noted in the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) are exceeded that suitable responses can be undertaken.</p> <p>QIA notes that they are still working with Baffinland on requested changes to the current draft of the TEMMP to address outstanding concerns which are related to thresholds and responses.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board;</p> <p><b>Section:</b> Section 4.6.6, Project Certificate Term and Condition No.</p> <p><b>Page:</b> p. 147</p> <p><b>Document Name:</b> Baffinland Iron Mines Corporation Mary River Project 2022 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2022 Final Terrestrial Environment Annual Monitoring Report</p> <p><b>Section:</b> Table 9-16</p> <p><b>Page:</b> p. 163</p>	<p>This QIA Comment/Recommendation relates to the 2022 TEAMR, and reiterates QIA 2023 NIRB DF #9, bullet #1 (above).</p> <p>As defined in the TEMMP, both soil/vegetation base metals sampling and vegetation abundance monitoring are conducted per 3-5 year intervals; BIM has either met or exceeded the prescribed monitoring frequency for these components. Increasing the sampling frequency is not warranted.</p> <p>Based on the most recent soil/vegetation base metal monitoring campaign (2022 TEAMR), soil metals predominantly indicated no significant change or were significantly lower than baseline values across all Project areas and sample distances. Many mean lichen-metals concentrations across Project areas and sample distances showed no significant changes from baseline values. However, some discrete increases have been recorded (i.e., being attributed to occasional ‘spikes’ in metal concentration, sample variability, and/or proximity to Project operations). Altogether, these findings suggest that soil/vegetation base metals currently present a low environmental and human health risk.</p>
67	QIA 2023 NIRB TE #17.	<p>Regarding Term and Condition No. 35, Baffinland notes that, for the potential launch of a caribou tissue sampling program based out of the Mine Site and Milne Port, “Teeth aging would be completed at Matson’s Lab in Montana, USA, as no Canadian facilities currently offer this analysis.” (p. 157). QIA</p>	<ol style="list-style-type: none"> <li>QIA suggests that Baffinland explore potentially looking at Canadian options for teeth aging such as the Wildlife Analytics Lab at Lethbridge College (led by Dr. Everett Hanna),</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board;</p>	<ol style="list-style-type: none"> <li>Baffinland thanks the QIA for the suggestion.</li> <li>Baffinland has consulted with the Government of Nunavut and industry specialists and is using the same methods, payment, and analysis as the GN program. There are parameters (blood, hair and skin) that the GN collected that Baffinland is not collecting and therefore the price is commensurate with</li> </ol>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		<p>notes that there are Canadian facilities that offer this analysis.</p> <p>As well, Baffinland notes that, regarding compensation for samples, "Baffinland confirms that it does not intend to offer increased compensation for the proposed on site caribou tissue sampling program under discussion, as this may deter participation from other regional monitoring programs." (p. 157). QIA remains concerned by the low number of samples submitted to the GN and NCP programs, and notes that compensation should be at a minimum on par with those two programs.</p>	<p>who offer fee-for-service cementum analysis of wildlife teeth.</p> <p>2. QIA requests that Baffinland provide at a minimum \$120 for sampling kits submitted through their proposed on site caribou tissue sampling program so it is on par with the compensation for GN and NCP sampling kits.</p>	<p><b>Section:</b> Section 4.6.6; Project Certificate Term and Condition No. 35</p> <p><b>Page:</b> p. 157</p>	<p>what the GN paid for the same samples (liver, kidney, teeth, muscle). Baffinland is looking specifically at metal accumulation and the liver and kidney. Baffinland is also testing muscle, as it is a primary food source and teeth for aging.</p>
68	QIA 2023 NIRB TE #18.	<p>Term and Condition No. 53 stipulates that Baffinland shall consider the "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." (p. 205). Baffinland notes that the TEMMP "...will include an updated surveillance system once the railway becomes viable." (p. 207). Baffinland does not provide details of the timeframe that corresponds with railway viability. As well, Baffinland does not indicate when the operational protocols will be developed.</p> <p>This is concerning to the QIA: to ensure adverse impacts to caribou are avoided, a surveillance program and operational protocols should be developed well in advance of railway operations. The details of the surveillance plan and operational protocols should be provided to the QIA for review and comment in advance of railway operations to ensure that the program is sufficiently robust and protective of caribou.</p>	<p>QIA requests that Baffinland provide details of the planned timing of the development of the surveillance program and operational protocols relative to the initiation of railway operations. QIA expects at a minimum that Baffinland will provide the proposed surveillance program and operational protocols to the QIA and TEWG within two years in advance of the operation of the railway for their review and comment.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board;</p> <p><b>Section:</b> Section 4.6.8; Project Certificate Term and Condition No. 53</p> <p><b>Page:</b> p. 205-207</p>	<p>Baffinland commits to providing the caribou surveillance program and operational protocols related to caribou for the Steensby Railway to the QIA and TEWG for review in advance of the start of railway operations. At present, experimental design for this monitoring activity has not yet been formalized. Program details will be shared at the appropriate time/venue.</p>
69	QIA 2023 NIRB TE #19.	<p>Term and Condition No. 55 notes that Baffinland will "...develop an adaptive management plan applicable to wolves and wolf habitat..." (p. 214), and that considers:</p>	<p>QIA requests that Baffinland:</p> <ul style="list-style-type: none"> <li>Provide estimates for the available esker habitats within the RSA and PDA; and</li> </ul>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board;</p>	<p>Baffinland (2012) FEIS Appendix 6F highlighted that there is low abundance of wolves in the RSA. As the potential to develop the Steensby Component approaches with more certainty, Baffinland will undertake the work to develop baseline information along the southern railway corridor and Steensby Port location.</p> <p>Reference: Baffinland (2012). Final Environmental Impact Statement. Volume 6 – Terrestrial Environment. Appendix 6F Terrestrial Wildlife Baseline Report. Feb. 2012.</p>

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		<p>B. “Estimating the available (glacio-fluvial materials) esker habitat within the Regional Study Area/PDA and identifying such habitat as ecologically sensitive;” (p. 214)</p> <p>C. “Developing “wolf indices” for presence/abundance of wolves (by conducting studies) to set a baseline pre-construction baseline;” (p. 214)</p> <p>QIA is not aware of the estimation of esker habitat or the development of indices for presence/relative abundance of wolves.</p> <p>With the construction of the southern railway proposed to occur as noted in Sustaining Operations Proposal 2 (SOP2), QIA is concerned by the lack of progress made on estimating the available esker habitat within the RSA and PDA, and development of a wolf indices for presence/abundance of wolves to set a baseline. QIA notes that the results of the 2023 caribou survey showed that caribou numbers have increased to meet the threshold for a potential collaring program; based on this increase it is plausible that wolf numbers have also increased or will increase in the near future.</p>	<ul style="list-style-type: none"> <li>Undertake work to develop baseline information and associated indices for wolf presence / abundance particularly along the southern railway corridor / Steensby Port area.</li> </ul>	<p><b>Section:</b> Section 4.6.8; Project Certificate Term and Condition No. 53</p> <p><b>Page:</b> p. 214-215</p>	
70	QIA 2023 NIRB TE #20.	<p>Regarding Term and Condition No. 74, Baffinland notes that “Upon the recommendation of CWS-ECCC, Red Knot monitoring using ARUs will resume before increasing activities in the southern transportation corridor.” (p. 263). Baffinland does not provide details on:</p> <ul style="list-style-type: none"> <li>Number of ARUs that will be deployed;</li> <li>Length of deployment of the ARUs;</li> <li>ARU deployment timing; and</li> <li>Location ARUs will be deployed.</li> </ul> <p>Without these details it is difficult to determine how effective the proposed monitoring program will be at detecting red knots.</p>	<p>The QIA requests that Baffinland provide the methods for the proposed ARU deployment for their review and comment in advance of undertaking the program so that their comments and concerns can be addressed before the ARUs are deployed. Specifically, QIA requests that the methods include the following details:</p> <ul style="list-style-type: none"> <li>Number of ARUs that will be deployed;</li> <li>Length of deployment of the ARUs;</li> <li>ARU deployment timing;</li> <li>Location ARUs will be deployed;</li> <li>Proposed data analysis approach</li> </ul>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board;</p> <p><b>Section:</b> Section 4.6.9; Project Certificate Term and Condition No. 74</p> <p><b>Page:</b> p. 262-263</p>	<p>Baffinland welcomes discussion on this topic with the TEWG, particularly seeking input from ECCC-CWS and their thoughts on the utility of this program and the likelihood/concern with finding Red Knots in the southern portion of the RSA</p>

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71	QIA 2023 NIRB TE #21.	<p>Baffinland continues to avoid sharing information on the directional orientation of the remote cameras selected for this program as well as information on proximity of remote cameras to project components (e.g., X m west of the Tote Road). It would be useful for Baffinland to start reporting on this information to assist with interpreting the results.</p> <p>Using the detection range provided (i.e. 30 meters / 100 feet) as per QIA's request in 2022, it would be useful for Baffinland to quantify the maximum area covered by remote cameras, similar to the viewshed modelling and analysis that has been provided for HOL surveys. This context is necessary to interpret the results of remote camera monitoring, and whether study design is sufficient to maximize the potential for detection of caribou and other wildlife species.</p> <p>QIA notes that this unknown information contributes to QIA's overarching concerns regarding the effectiveness of Baffinland's overall program to monitor the potential effects of the project on caribou, including their avoidance of project components and calving areas. Until this issue and other deficiencies related to the caribou monitoring program are addressed, QIA does not consider Baffinland to be in compliance with Term and Condition 53</p>	<p>To better understand how remote camera monitoring results provide insight on caribou avoidance of the project area and improve compliance with Term and Condition 53, Baffinland is requested to report on and analyze the following for the 2024 remote camera monitoring program:</p> <ul style="list-style-type: none"> <li>orientation of each remote camera deployed (e.g., north, east south, west);</li> <li>if relevant, proximity of each remote camera / HOL station to project components, including distance and type of component. QIA notes that project components within at least 500m should be reported; and</li> <li>use the detection range provided to quantify a maximum total viewshed for each camera and HOL station (a map of each remote camera viewshed, relative to the HOL viewshed would be also ideal) to assist with interpreting the findings of remote camera monitoring, including its spatial limitations.</li> </ul>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1</p> <p><b>Section:</b> Section 4.6.8; Project Certificate Term and Condition No. 53; Section 9.4</p> <p><b>Page:</b> p. 205-210; 164-170</p>	<p>Baffinland would like to remind QIA that their comments/recommendations on the Wildlife Remote Camera program have been discussed at length (cf. Comments on 2022 TEAMR/NIRB report, QIA 2022 NIRB TE# 8). The current/ongoing remote camera program was also discussed at the 13-14 December 2023, TEWG meetings.</p> <p>Experimental design parameters (and limitations) are described in the 2022 Terrestrial Environment Annual Monitoring Report (TEAMR; EDI, 2023; refer to 10.4 Remote Cameras, 10.4.1 Methods; pg.226-227). Remote Camera Locations are described in Appendix D, including HOL Site Name, Camera ID, Location (Tote Road Marker), Camera Orientation, Latitude/Longitude coordinates, and representative Site Photo. Distance to/from Project Infrastructure can be added as part of future reporting.</p> <table border="1"> <thead> <tr> <th rowspan="2">HOL #</th> <th rowspan="2">Camera</th> <th colspan="5">Distance to</th> </tr> <tr> <th>PDA (m)</th> <th>Height</th> <th>Lati</th> <th>Longitude</th> <th>Direction</th> </tr> </thead> <tbody> <tr><td>1</td><td>Baffin-3</td><td>0.0</td><td>1.4</td><td>71.87102</td><td>-80.8828</td><td>NE</td></tr> <tr><td>1</td><td>Baffin-4</td><td>0.0</td><td>1.4</td><td>71.87102</td><td>-80.8828</td><td>SW</td></tr> <tr><td>3</td><td>Baffin-7</td><td>482.2</td><td>1.4</td><td>71.72974</td><td>-80.4418</td><td>NE</td></tr> <tr><td>3</td><td>Baffin-12</td><td>482.2</td><td>1.4</td><td>71.72974</td><td>-80.4418</td><td>SW</td></tr> <tr><td>4</td><td>Baffin-8</td><td>55.8</td><td>1.4</td><td>71.60734</td><td>-80.347</td><td>E</td></tr> <tr><td>4</td><td>Baffin-10</td><td>55.8</td><td>1.4</td><td>71.60734</td><td>-80.347</td><td>W</td></tr> <tr><td>6</td><td>Baffin-1</td><td>593.6</td><td>1.4</td><td>71.48321</td><td>-80.213</td><td>NE</td></tr> <tr><td>6</td><td>Baffin-5</td><td>593.6</td><td>1.4</td><td>71.48321</td><td>-80.213</td><td>SW</td></tr> <tr><td>10</td><td>Baffin-9</td><td>142.8</td><td>1.4</td><td>71.3732</td><td>-79.6859</td><td>N</td></tr> <tr><td>10</td><td>Baffin-11</td><td>142.8</td><td>1.4</td><td>71.3732</td><td>-79.6859</td><td>S</td></tr> <tr><td>16</td><td>Baffin-2</td><td>96.4</td><td>1.4</td><td>71.33213</td><td>-79.4779</td><td>NW</td></tr> <tr><td>16</td><td>Baffin-6</td><td>96.4</td><td>1.4</td><td>71.33213</td><td>-79.4779</td><td>SE</td></tr> </tbody> </table> <p>Viewshed analysis is provided below (refer to inset figure) based on the camera manufacturer's specifications. It is unclear if/how QIA recommendation/request regarding viewshed would assist or improve data interpretation.</p>	HOL #	Camera	Distance to					PDA (m)	Height	Lati	Longitude	Direction	1	Baffin-3	0.0	1.4	71.87102	-80.8828	NE	1	Baffin-4	0.0	1.4	71.87102	-80.8828	SW	3	Baffin-7	482.2	1.4	71.72974	-80.4418	NE	3	Baffin-12	482.2	1.4	71.72974	-80.4418	SW	4	Baffin-8	55.8	1.4	71.60734	-80.347	E	4	Baffin-10	55.8	1.4	71.60734	-80.347	W	6	Baffin-1	593.6	1.4	71.48321	-80.213	NE	6	Baffin-5	593.6	1.4	71.48321	-80.213	SW	10	Baffin-9	142.8	1.4	71.3732	-79.6859	N	10	Baffin-11	142.8	1.4	71.3732	-79.6859	S	16	Baffin-2	96.4	1.4	71.33213	-79.4779	NW	16	Baffin-6	96.4	1.4	71.33213	-79.4779	SE
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					<p><b>References:</b></p> <p>Environmental Dynamics Inc. (EDI), 2022. 2021 Mary River Project Terrestrial Environment Annual Monitoring Report - Prepared for Baffinland Iron Mines Corporation. April 2022.</p> <p>Environmental Dynamics Inc. (EDI), 2023. 2022 Final Mary River Project Terrestrial Environment Annual Monitoring Report - Prepared for Baffinland Iron Mines Corporation. April 28, 2023.</p>
72	QIA 2023 NIRB TE #22.	<p>QIA has previously recommended that Baffinland take reasonable measures to prevent field of view obstructions due to blowing snow, ice, or fog. Examples provided to Baffinland in response to the 2021 and 2022 TEAMR included installing a cover or shelf or a protective case, using silica gel packs to prevent moisture build-up in cases, and applying anti-fogging products. There is no indication in Section 9.4 of the 2023 TEAMR that Baffinland attempted any of these measures.</p> <p>In the 2023 TEAMR (Appendix E), Baffinland reasoned that "there are limitations to implementation due to the project setting and climate." Baffinland has failed to provide explicit</p>	<p>To maximize remote camera monitoring data to provide insight on caribou avoidance of the project area and improve compliance with Term and Condition 53, Baffinland is requested to implement measures to minimize field of view obstructions due to snow, ice, or fog, including:</p> <ul style="list-style-type: none"> <li>installing a protective case and shade on each deployed camera</li> </ul>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2023 Final Terrestrial Environment Annual Monitoring Report</p> <p><b>Section:</b> Section 4.6.8; Project Certificate Term and Condition No. 53; Section 9.4</p> <p><b>Page:</b> p. 205- 210 of 623; 159-163</p>	<p>Baffinland would like to remind QIA that their comments/recommendations on the Wildlife Remote Camera program have been discussed at length (cf. Comments on 2022 TEAMR/NIRB report, QIA 2022 NIRB TE# 9. The current/ongoing remote camera program was also discussed at the 13-14 December 2023, TEWG meetings.</p> <ol style="list-style-type: none"> <li>As highlighted in the BIM response to QIA 2023 NIRB TE #21 (above), weather-related obstruction of the camera view field appears specific to only two (2) camera locations and represents a localized issue. BIM will review the proposed mitigation to minimize the accumulation of fog and ice. BIM will improve the log we have and can review it with QIA onsite monitors at their request.       <ul style="list-style-type: none"> <li>Cameras are already contained in a protective case</li> <li>Viability of anti-moisture packs will be evaluated.</li> </ul> </li> </ol>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		<p>rationale for what these limitations are and explain why each of QIA's provided suggestions would be ineffective. As shown in Table 9-2 (p. 167), cameras positioned at HOL station 6 still incurred a high number of days where the camera field of view was obstructed. Baffinland commented on the high occurrence of view obstruction in Appendix E stating that "...only 2 cameras (Baffin-a, Baffin-5 at HOL 6) were excessively affected by fog and ice crystals suggesting that this issue may be localized." If the issue is localized, what is Baffinland doing to avoid this issue in the future? What modifications, if any, will be undertaken to ensure cameras at HOL station 6 have less view obstructions in subsequent survey periods?</p> <p>While QIA acknowledges that weather events are beyond Baffinland's control, Baffinland should at least attempt to implement easy potential solutions or provide rationale and evidence that the proposed solution has not worked in the past in similar contexts. If the measures do not work, then this can be reported on in the following year's TEAMR. In addition, in Section 9.4.1, it is generally stated that cameras are to be periodically checked (2-4 times annually), but there is not reporting on how frequently each remote camera was checked in Section 9.4.2 or in Table 9-2, making it difficult to assess the level of reasonable effort to minimize non-active days.</p> <p>QIA notes that these issues contribute to the integrity of Baffinland's overall program to monitor the potential effects of the project on caribou, including their avoidance of project components and calving areas. Until this, and other deficiencies related to the caribou monitoring program are addressed, QIA does not consider Baffinland to be in compliance with Term and Condition 53.</p>	<ul style="list-style-type: none"> <li>using silica gel packs to prevent moisture build-up within cases</li> <li>applying anti-fog products to camera lenses</li> </ul> <p>If Baffinland is unable to implement any of the above measures, Baffinland must provide an explicit rationale for why each suggestion provided is not viable, based on an experimental period, or evidence that the proposed solution has not worked in the past in similar contexts.</p> <p>QIA also requests Baffinland report on the number of times (and date) when each remote camera was checked (on a per camera basis), whether servicing was required, and if so, what type (e.g. removal of obstruction, battery replacement, SD card collection, etc.).</p>		<ul style="list-style-type: none"> <li>Viability of applying anti-fog products to camera lenses.</li> </ul> <p>2. BIM will highlight any relevant outcomes in future reporting and as part of the TEWG forum.</p>
73	QIA 2023 NIRB TE #23.	<p>In response to the 2021 and 2022 TEAMR, QIA requested that Baffinland deploy remote cameras at all 24 HOL stations (vs. a sample of only 6), or if this was not possible, to select locations based on the best available IQ and western science. Since the purpose of the remote camera monitoring is to capture supplemental data on caribou movement in relation to the Project, locations should be selected based on maximizing the potential for detecting caribou. Baffinland</p>	<p>To respond to study design concerns regarding remote camera monitoring and improve compliance with PC Condition 53, Baffinland is requested to provide the following information:</p> <p>Baffinland to confirm whether or not MHTO was asked to comment on the use</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2023 Final Terrestrial Environment Annual Monitoring Report</p>	<p>Baffinland would like to remind QIA that their comments/recommendations on the Wildlife Remote Camera program have been discussed at length (cf. Comments on 2022 TEAMR/NIRB report, QIA 2022 NIRB TE# 10). The current/ongoing remote camera program was also discussed at the 13-14 December 2023 TEWG meetings.</p> <p>1. The remote cameras were deployed at stations to address GN and QIA concerns that the duration of HOL surveys insufficiently covered the time that caribou are expected to be in the area. The Remote Camera program was</p>

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		<p>responded that it was not feasible to deploy cameras at all 24 HOL stations due to accessibility considerations, mainly with ongoing maintenance requirements in mind.</p> <p>In the 2023 TEAMR (Appendix E), Baffinland reasoned that that HOL stations 1, 3, 4, 6, 10 and 16 were selected “to provide a regular distribution along/at the Project,” claiming that “Methods/experimental design are appropriate for current regional low-density of caribou.” QIA continues to ask whether Baffinland explicitly verified these locations with MHTO prior to deploying cameras. In addition, are these six HOL stations the only ones that can be accessed as required for maintenance (per Baffinland, 2-4 times per year)? QIA notes that HOL stations 1 – 16 are generally accessed on foot (Section 9.3.1). Has Baffinland considered deploying remote cameras at HOL stations subject to access constraints in an effort to capture at least some data (e.g., during seasons when caribou are known to be calving or migrating)? QIA notes that all HOL stations are at least accessible during some portions of the year (i.e., when HOL monitoring typically occurs in June) and that remote cameras could be deployed at this time with the intention of collecting at least some data.</p> <p>QIA notes that these study design questions regarding remote camera locations contribute to QIA’s overarching concerns regarding the effectiveness of Baffinland’s overall program to monitor the potential effects of the project on caribou, including their avoidance of project components and calving areas. Until this, and other deficiencies related to the caribou monitoring program are addressed, QIA does not consider Baffinland to be in compliance with Term and Condition 53</p>	<p>of HOL stations 1, 3, 4, 6, 10, and 16 prior to remote camera program initiation.</p> <p>Baffinland to clarify whether HOL stations 1, 3, 4, 6, 10 and 16 are the only ones that can be accessed 2-4 times a year, as needed for remote camera maintenance.</p> <p>Baffinland is further requested to make additional effort to deploy remote cameras at as many HOL stations as possible, even if this means only collecting data for limited periods of the year (due to maintenance inaccessibility).</p>	<p><b>Section:</b> Section 4.6.8; Project Certificate Term and Condition No. 53; Section 9.4</p> <p><b>Page:</b> p. 205-210; 164-170</p>	<p>developed with input from the Terrestrial Environment Working Group (TEWG), inclusive of MHTO Membership. Pond Inlet elders are also instrumental in establishing the height of land program and by extension site selection.</p> <ol style="list-style-type: none"> <li>Sites 1, 3, 4, 6, 10 and 16 were selected to provide a regular distribution along/at the Project; this approach was deemed appropriate for current regional low- density of caribou. Considerations for logistics and safety were also considered.</li> <li>Based on monitoring outcomes to date, additional Camera deployment is not warranted. BIM will consider if/when caribou population numbers at the project were to increase.</li> </ol> <p><b>References:</b></p> <p>Environmental Dynamics Inc. (EDI), 2023. 2022 Final Mary River Project Terrestrial Environment Annual Monitoring Report - Prepared for Baffinland Iron Mines Corporation. April 28, 2023.</p>
74	<b>QIA 2023 NIRB TE #24.</b>	<p>As expressed in the past, QIA remains concerned that snow track surveys are insufficient for several reasons. This is a good example of a broader pattern where Baffinland has been dismissive of, or unwilling to implement, reasonable and relatively minor adjustments proposed by QIA. We reiterate the following concerns (and reasonable, minor</p>	<p>To address concerns regarding snow track survey deficiencies and improve compliance with Term and Condition 53, Baffinland is requested to commit to the following, in relation to snow track surveys for the next monitoring period (i.e., fall 2024):</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2023 Final Terrestrial Environment Annual Monitoring Report</p>	<p>Snow track surveys are observational surveys intended to characterize wildlife presence/absence at the Project.</p> <ul style="list-style-type: none"> <li>It is not clear what the QIA are suggesting for ‘testing survey efficacy’. For example, searcher efficiency assessments typically refer to wildlife mortality surveys and carcass persistence assessments. This is not the intent of the snow track surveys.</li> </ul>

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		<p>recommendations), which were not effectively addressed by Baffinland in response to the 2022 TEAMR.</p> <p>First, QIA remains concerned about the study design of snow track surveys. QIA previously requested that Baffinland test the efficacy of these surveys by completing two simultaneously and comparing the results. Baffinland’s response to this related to the need to complete surveys around the deposit of fresh snow. However, from QIA’s perspective, instructions can be provided to surveyors to ensure they do not disrupt snowfall to the point that tracks are not identifiable. QIA maintains that efficacy testing should be done to assuage concerns related to these results. There is no indication in Section 9.1 that Baffinland completed efficacy testing for snow track surveys.</p> <p>Second, QIA has requested that Baffinland determine species-specific thresholds at which deflections from roads can be considered significant for each species. Again, there is no consideration of significance in Section 9.1.2, which limits the usefulness of these findings.</p> <p>QIA notes that these deficiencies related to snow track surveys contribute to QIA’s overarching concerns regarding the effectiveness of Baffinland’s overall program to monitor the potential effects of the project on caribou, including their avoidance of project components and calving areas. Until this, and other deficiencies related to the caribou monitoring program are addressed, QIA does not consider Baffinland to be in compliance with Term and Condition 53.</p>	<ul style="list-style-type: none"> <li>test the efficacy of snow track surveys by completing two simultaneously and comparing the results; and</li> <li>conduct research regarding wildlife road crossings and significance thresholds and analyze survey results relative to these to improve the usefulness of this survey. This emphasizes the need for a</li> </ul> <p>These commitments were already proposed to Baffinland by QIA in 2022 and none were acknowledged in the 2023 report.</p>	<p><b>Section:</b> Section 4.6.8; Project Certificate Term and Condition No. 53; Section 9.1</p> <p><b>Page:</b> p. 205-210; 148-154</p>	<ul style="list-style-type: none"> <li>Baffinland can review literature regarding wildlife crossing. However, as above, snow track surveys are observational surveys; QIA should clarify what is the purpose of ‘efficacy testing’ and associated thresholds.</li> </ul> <p>Note: The QIA comment/recommendation appears to be incomplete or truncated</p>
75	<b>QIA 2023 NIRB TE #25.</b>	<p>QIA remains concerned about the absence of monitoring for potential effects of blasting on wildlife. In the 2023 report on compliance with PC Condition 60, Baffinland states that “no wildlife has been knowingly harmed or disturbed by blasting activities during construction”. However, there is no information to substantiate this claim and nothing in the 2023 TEAMR to indicate that Baffinland makes an effort to monitor for potential effects of blasting on wildlife, including to caribou during sensitive timing windows (e.g., calving, post-calving). Baffinland states that personnel are required to scan for and report the presence of wildlife sightings, but no such log has been provided or summarized. This makes QIA concerned that it is possible these effects are occurring and Baffinland is simply unaware of it due to monitoring program constraints.</p>	<ol style="list-style-type: none"> <li>Baffinland is requested to provide data logs to substantiate their claims that project personnel scan for and report wildlife presence (prior to blasting proceeding).</li> <li>Baffinland must also commit to undertaking targeted engagements with MHTO to evaluate concerns about the impacts of explosive use of caribou and identify periods when explosives may not be used.</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1 – 2023 Final Terrestrial Environment Annual Monitoring Report</p> <p><b>Section:</b> Section 4.6.8; Project Certificate Term and Condition No. 60</p> <p><b>Page:</b> p. 235</p>	<ol style="list-style-type: none"> <li>A Quarry Blasting Caribou Mitigation Hierarchy was developed to inform decision-making and procedures to minimize potential adverse effects on caribou related to quarry blasting. This includes a caribou observation form to be used to characterize caribou behavior/responses and applied mitigation measures.</li> <li>Baffinland welcomes engagement with the MHTO on blasting procedures/concerns should they request it. To date blasting has been discussed mostly with respect to dust through the Dust Audit Committee and Baffinland is implementing the recommendations received. Baffinland is also amenable to adding this to a future TEWG agenda and expects it to be a subject explored through the QIA’s North Baffin Caribou Study.</li> </ol> <p>Reference: EDI (2023). Internal Memo/Guidance.</p>

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		QIA has repeatedly requested Baffinland to provide evidence that wildlife are not harmed by blasting and to work with the MHTO and TEWG to evaluate concerns about the impacts of explosives on caribou and identify periods when explosive use is not permitted. Similarly to Baffinland’s responses to many other concerns raised by QIA, there’s no indication that Baffinland has made any targeted effort (e.g., outside of limited TEWG meetings that already have full agendas) to have these discussions in order to ensure compliance with Term and Condition 60.			
76	<b>QIA 2023 NIRB TE #26.</b>	<p>In 2023, QIA requested that Baffinland address item (h) in the annual report. Item (h) states that, among others, the Proponent must annually report the following information:</p> <p>“h. A discussion of any proposed changes to the monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program.”</p> <p>Reporting specific to condition (h) remains absent in the current 2023 NIRB report.</p>	Baffinland to report on proposed changes to terrestrial monitoring survey methodologies, statistical approaches or proposed adaptive management stemming from the results of the monitoring program.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.6.8, Project Certificate Term and Condition No. 57</p> <p><b>Page:</b> p. 217-220</p>	<p>This request has been addressed in the 2022 TEAMR (EDI, 2023), which describes methods, assumptions, and adaptive management approaches for multiple TEMMP components. Historical changes to and progression of assessment protocols are also outlined in opening subsections of most Terrestrial Environment monitoring components in the TEAMR. Per the 2023 TEAMR, examples include:</p> <ul style="list-style-type: none"> <li>• Section 5.1.1 (Helicopter Overflights) Monitoring History and Changes in Analytical Procedures (pg.19)</li> <li>• Section 7.1 History of Dustfall Monitoring at the Project (pg.42)</li> <li>• Section 7.2 Dustfall Suppression and Mitigation (pg.44)</li> <li>• 8.1.1.1 (Vegetation and Soil Base Metals Monitoring) Monitoring History and Changes in Sampling Procedures (pg. 121)</li> </ul> <p>Methodological rationale and assumptions are also described in the TEAMR for each topic/discipline-specific methods section.</p> <p><b>References:</b></p> <p>Environmental Dynamics Inc. (EDI), 2024. 2023 Final Mary River Project Terrestrial Environment Annual Monitoring Report - Prepared for Baffinland Iron Mines Corporation.</p>
77	<b>QIA 2023 NIRB TE #27.</b>	Baffinland discussed the recommendations and lessons learned for PC No. 28, which include continuance of bi-annual geotechnical inspections and an execution plan for high priority locations along the Tote Road. Baffinland noted that they are currently developing the execution plan; however, Baffinland also noted that the execution plan began implementation in 2019. Thus, the timeline for	Clarify the timeline for developing the permafrost execution plan for high priority areas along the Tote Road.	<b>Document Name:</b> Project Certificate Term and Condition No. 28 (Section 4.6.5)	Baffinland’s execution plan for high priority locations along the Tote Road involves focused and opportunistic remediation of highest priority borrow areas based on safety and permafrost degradation risk.

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		developing the execution plan is unclear as it is already being implemented.			
<b>MARINE AQUATIC ENVIRONMENT</b>					
78	<b>QIA 2023 NIRB MAE #1.</b>	<p>Mitigation measures for marine mammals have evolved over time, and additions and changes implemented via adaptive management have led to improved mitigation. The addition of mitigations like convoys (e.g., s. 1.3, p. 4-5; s.3.2, p. 38; Project Certificate Term and Condition No. 105, s. 4.6.11, p. 361) and spring shipping criteria related to ice concentration (e.g., Project Certificate Term and Condition No. 185; s. 4.8.5, pp. 593-596) have been particularly important. Convoys resulted in a reduction in transits, and acoustic monitoring by both Baffinland (Appendices G.6.10 and G.6.17) and other parties (June 2024 MEWG presentation by Dr. J. Jones, University of California) clearly show the value of convoys in reducing noise exposure. In 2023 there were 39 convoys of 2-5 vessels, with most consisting of two vessels (32 of 39, n = 1 each for convoys of 4 and 5 vessels) (Baffinland update at Dec. 2023 MEWG meeting, Iqaluit, NU). The convoy program is opportunistic (e.g., described as such in s. 1.3, p. 4-5). Voyage scheduling is logistically challenging, but are there opportunities to schedule increased convoys (more convoys and/or more vessels in individual convoys)? QIA notes the importance of maintaining mitigations such as the ice-breaking prohibition, convoys, speed restrictions, and buffer areas (mitigation measures are summarized in Table 4.61, Project Certificate Term and Condition No. 183, s. 4.8.5, p. 598), and acknowledges that Baffinland is planning to implement the same measures in 2024 (Project Certificate Term and Condition No. 105, s. 4.6.11, p. 366). Baffinland's assertions that vessel traffic has not affected narwhal abundance and distribution (e.g., Appendix G.6.2, s. 3.6.1, pp. 86-87) are not convincing. Factors such as climate change and predator abundance undoubtedly affect narwhal, but they do so in concert with shipping-related impacts. It is likely that the main factor in recent increases in narwhal abundance in the RSA is the introduction of key mitigations such as icebreaking prohibitions and convoys. It is important that these mitigations be maintained, and augmented if monitoring indicates that additional adaptive management is required (e.g., removal of loudest vessels from fleet, based</p>	<ol style="list-style-type: none"> <li>1. QIA requests that Baffin report on opportunities to schedule increased convoys (more convoys and/or more vessels in individual convoys), if possible.</li> <li>2. QIA requests that repeat survey averaging, as recommended by DFO, be employed for abundance surveys of marine mammals in future.</li> <li>3. QIA requests that NIRB consider which DFO narwhal survey should be considered baseline (2004 or 2013).</li> <li>4. QIA requests that Baffinland plan to conduct leg 2 aerial surveys in 2025, not 2026 as proposed in the 5-year monitoring program schedule.</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> s. 1.3 Existing Project Overview, s.3.2 2023 Highlights and Challenges, 4.6.11 Marine Wildlife (PC Terms and Conditions 99 through 128), 4.8.5 Verification of Project Monitoring and Mitigation for Potential Effects on Marine Mammals (PC Terms and Condition 183 through 189)</p> <p><b>Page:</b> 4-5, 48-42, 331-424, 578-605</p> <p><b>Document Name:</b> Appendix G.6.2 - 2023 Marine Mammal Aerial Survey Program Report (2023 Annual Report to NIRB)</p> <p><b>Section:</b> full document</p> <p><b>Page:</b> full document</p> <p><b>Document Name:</b> Appendix G.6.10 - Vessel Source Level Summary, Milne Port Shipping Activities 2015-2023 (2023 Annual Report to NIRB)</p> <p><b>Section:</b> full document</p> <p><b>Page:</b> full document</p>	<ol style="list-style-type: none"> <li>1. Baffinland acknowledges that convoys are an important mitigation to the marine environment, particularly to underwater noise. As QIA notes, convoys are scheduled opportunistically. We aim to have vessels travel in convoys whenever possible but there are practical realities that prevent Baffinland from predetermining a schedule. Baffinland would be happy to have the Head of Shipping attend the MEWG to discuss these practicalities. However, Baffinland cannot provide a report as requested on the opportunities but assures QIA that convoys are reported on through the annual report and optimized over the season at every opportunity.</li> <li>2. Baffinland has discussed this with the MEWG and has asked that DFO provide the MEWG with written rationale in the form of a technical memo for members to weigh against Baffinland's technical memo. Baffinland has established a set of survey criteria required for survey replicates to be included in averaging for the purpose of deriving an abundance estimate for narwhal (WSP 2024). Criteria for determining when replicate survey averaging is appropriate for abundance estimates include: 1) Replicate surveys should be undertaken within several days of one another to minimize the potential for sampling a population that has changed in composition between successive surveys (due to animal movement in and out of the summering ground), 2) There should be no statistically significant difference between replicate surveys, and 3) Surveys occurring during early or late summer when narwhal migratory movements are known to occur should not be included in averaging since results are likely to reflect narwhal abundance before or after peak abundance levels on the summering/calving grounds. The exact dates considered as 'early' or 'late' will vary from year to year depending on ice conditions and other factors affecting the timing of narwhal movements in the region. These criteria are consistent with methods previously adopted by DFO (Asselin et al. 2011; Marcoux et al. 2019) and other research institutions in the High Arctic (Heide-Jørgensen 2010) when calculating narwhal abundance estimates based on multiple aerial survey replicates (Heide-Jørgensen 2010).</li> <li>3. Please see response to DFO-2. Baffinland requests that NIRB provide MEWG members with their evidence-based rationale should they make a formal</li> </ol>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		<p>on existing noise signature data reported in Appendices G.6.10 and G.6.17)</p> <p>Improved mitigation has possibly led to an increase in Eclipse Sound narwhal abundance after years of significant declines. Leg 2 aerial surveys in August 2023 estimated the Eclipse Sound narwhal summer stock size as 10,492 animals (CV= 0.05; CI = 9,578 - 11,494) (as reported by WSP Canada Inc. in Appendix G.6.2). During review of the Sustaining Operations Proposal (SOP), the Department of Fisheries and Oceans (DFO) recommended taking the average of survey repeats rather than selecting one of several survey replicates as the reported estimate. Baffinland addressed this request in a recent technical memo, which is included in the Annual Report package as Appendix G.6.15 (also see main report regarding Project Certificate Term and Condition No. 183, s. 4.8.4, p. 584, Table 4.59). Using a survey averaging approach for 2023, as recommended by DFO, results in a revised population estimate of 10,015 narwhals (CV = 0.0336, 95% CI = 9,378 - 10,696). This estimate is not significantly different, but is more precise (i.e. lower CV), than the estimate reported in Appendix G.6.2. Appendix G.6.15 provides an informative comparison of population estimates using the two methods for surveys conducted between 2004 and 2023. In all cases where there are survey replicates (i.e., excluding years with only one survey replicate), the DFO averaging method is shown to be more precise (Appendix G.6.15) while showing the same trends in abundance. QIA recommends that repeat survey averaging be employed moving forward, in cases where it is applicable.</p> <p>DFO has also questioned Baffinland's assertion that 2013 should be considered the baseline year for narwhal abundance (Project Certificate Term and Condition No. 183, s. 4.8.4, p. 584, Table 4.59), and QIA agrees with DFO (as do other parties on the MEWG). DFO conducted aerial surveys of the Eclipse Sound narwhal summer stock in 2004 and 2013. Baseline data are a Proponent responsibility, but Baffinland did not conduct a systematic aerial survey to estimate narwhal abundance in the Regional Study Area, and they are therefore relying on DFO results. Construction at Milne Port started in 2013 (e.g., see main report s. 1.3, p. 7, Table 1.1), therefore this year cannot be considered baseline. The year 2013 saw a significant increase in regional vessel traffic due to Baffinland shipping (Appendix G.6.14). The Baffinland memo (Appendix G.6.14) does not show the</p>		<p><b>Document Name:</b> Appendix G.6.14 - Project Shipping Levels in Regional Study Area (RSA) Prior to 2013 (2023 Annual Report to NIRB)</p> <p><b>Section:</b> full document</p> <p><b>Page:</b> full document</p> <p><b>Document Name:</b> Appendix G.6.15 - Rationale and Methodology for Averaging Abundance Estimates from Aerial Replicate Surveys (2023 Annual Report to NIRB)</p> <p><b>Section:</b> full document</p> <p><b>Page:</b> full document</p> <p><b>Document Name:</b> Appendix G.6.17 - Vessel Characteristics and Annual Voyage Summary (2015-2023) (2023 Annual Report to NIRB)</p> <p><b>Section:</b> full document</p> <p><b>Page:</b> full document</p>	<p>recommendation on this matter, relative to the points raised in Technical Memorandum 1663724-488-TM-Rev0-77000 (WSP 2023).</p> <p>4. See DFO-1 response, please.</p> <p><b>References:</b></p> <p>Asselin, N.C. and P.R. Richard. 2011. Results of narwhal (<i>Monodon monoceros</i>) aerial surveys in Admiralty Inlet, August 2010. DFO Can. Sci. Advis. Sec. Res. Doc. 2011/065. iv + 26 p.</p> <p>Marcoux, M., L.M. Montsion, J.B. Dunn, S.H. Ferguson and C.J.D. Matthews. 2019. Estimate of the abundance of the Eclipse Sound narwhal (<i>Monodon Monoceros</i>) summer stock from the 2016 photographic aerial survey. DFO Can. Sci. Advis. Sec. Res. Doc. 2019/028. iv + 16 p.</p> <p>Heide-Jørgensen, M.P., K. L. Laidre, M. L. Burt, D. L. Borchers, T. A. Marques, R. G. Hansen, M. Rasmussen and S. Fossette. 2010. Abundance of narwhals (<i>Monodon monoceros</i>) on the hunting grounds in Greenland. <i>Journal of Mammalogy</i>, 91(5), 1135-1151.</p> <p>WSP Canada Inc. (WSP). 2023. Project shipping levels in Regional Study Area (RSA) prior to 2013. Technical Memorandum No. 1663724-488-TM-Rev0-77000. 20 November 2023.</p> <p>WSP. 2024. Rationale and methodology for averaging abundance estimates for aerial replicate surveys completed in support of Baffinland's marine mammal aerial survey program (MMASP). Technical Memorandum. 1663724-487-TM-Rev0-77000. 22 March 2024.</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		<p>spatial distribution of vessel traffic, so it is not clear how many vessels that entered the RSA in 2013 transited into southern Milne Inlet, as all the Baffinland-chartered vessels would have. QIA anticipates a written recommendation from DFO to the MEWG and will respond through that forum but, in summary, we agree with DFO that 2004 is the only survey available that is suitable to represent conditions prior to Project establishment and activities.</p> <p>The 2023 estimate of 10,015 narwhal (using DFO's averaging approach) is half the population size estimated in 2004 (20,225, CV = 0.36, 95% CI 9,471- 37,096) (Appendix G.6.15). While there have been encouraging recent signs of increasing narwhal presence in the RSA, the number of whales summering in the region is still significantly reduced from baseline conditions, and careful adaptive management is still required.</p> <p>Baffinland has indicated, via MEWG meetings in May and June 2024, that they will not be conducting leg 2 aerial surveys in 2024 due to a lack of aircraft availability. Project Certificate Term and Condition No. 101 (s. 4.6.11, p. 348) states the decision was made due to narwhal abundance being similar to 2013 but, as noted above, this is not an appropriate baseline. There is some uncertainty associated with the 2023 narwhal abundance estimate due to unusual ice conditions and the influence this may have had on narwhal migration patterns (i.e., if animals seen in northern Navy Board Inlet included any that were delayed moving into Admiralty Inlet and points west).</p> <p>Aerial surveys have been a key monitoring tool that has tracked significant changes in narwhal abundance and informed adaptive management and mitigation. The loss of this information source will add uncertainty to 2024 adaptive management. Baffinland has introduced a 5-year monitoring program schedule for MEWG consideration and discussion (see Project Certificate Term and Condition No. 105, s. 4.6.11, p. 366). QIA will be providing written comments through the Working Group process, and will point out the need for careful monitoring of narwhal summer stock abundance for effective adaptive management, which should include an aerial survey in 2025, not 2026 as proposed in the 5-year monitoring program schedule.</p>			

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
79	QIA 2023 NIRB MAE #2.	<p>Baffinland has run the narwhal observation program at Bruce Head (Iluvilik) since 2014 (a pilot program occurred in 2013, and there was no program in 2018 due to safety issues with the observation platform). This program addresses components of two Project Certificate Term and Conditions: no. 99, which requires the collection of additional baseline data in Milne Inlet on narwhal abundance, distribution, ecology and habitat use; and no. 101, which requires shore-based observations of pre-Project narwhal behavior in Milne Inlet, and continue at an appropriate frequency throughout the Proponent's ore shipping operations via Milne Inlet.</p> <p>Data on narwhal relative abundance and distribution are collected in a large Stratified Study Area (SSA), and narwhal behavioural observations (focal follows) are also recorded (in a smaller Behavioural Study Area (BSA) and/or via drone-based follows of narwhal focal groups). The methodology used has largely been consistent across all program years, but the analytical methods (e.g., model specification) have changed to varying degrees over the life of the program to date.</p> <p>Examples of these methodological changes, summarized in Appendix G.6.7, include:</p> <p>1) changes in how small vessels (defined as those &lt; 50 m in length) were included in models (modelled as either total count present during each RAD count or as present/absent in prior years, and omitted from 2023 analyses completely) (Appendix G.6.7, s. 4.2.4, p. 32)</p> <p>2) changes in how potential effects of vessels were assessed (up to 15 km in 2017, up to 10 km in 2019, 7 km in 2020, and 5 km in 2021) (Appendix G.6.7, s. 4.3.1.1, p. 35). These progressive reductions in spatial extent were intended to reduce unexplained variation in the data and enable better quantification of the effects at closer distances.</p> <p>These changes to model structure add uncertainty to results and make year to year comparisons difficult. A summary of all the model specification changes over the years should be prepared, with some comparative analyses to show the effects of model changes. A better understanding of model</p>	<ol style="list-style-type: none"> <li>QIA requests that Baffinland prepare a summary of all the model specification changes over the years of the Bruce Head program.</li> <li>QIA requests that Baffinland prepare a detailed memo on received sound levels and associated narwhal responses to inform the selection of an appropriate noise disturbance threshold.</li> <li>QIA requests that Baffinland report on the potential value of integrating vessel-specific noise signature data into models.</li> <li>QIA requests that Baffinland clarify whether or not small vessels were included in models?</li> <li>QIA requests that Baffinland re-run the applicable models with the removed cases due to known killer whale presence added and report on any differences in results.</li> <li>QIA requests that Baffinland consider and report on ways to increase EWI sample sizes from the Bruce Head program in 2024.</li> </ol>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.11 Marine Wildlife (PC Terms and Conditions 99 through 128)</p> <p><b>Page:</b> 331-424</p> <p><b>Document Name:</b> Appendix G.6.7 - 2023 Bruce Head Shore-based Monitoring Program Report (2023 Annual Report to NIRB)</p> <p><b>Section:</b> full document</p> <p><b>Page:</b> full document</p>	<ol style="list-style-type: none"> <li>The information on annual modeling approaches, and changes made between years, are detailed in the existing reports. Any modifications to the statistical/analytical models used for the Bruce Head Program are detailed in the respective annual monitoring reports under the 'Methods' section (e.g., in section titled 'Methods / Data Analysis / Statistical Models / Updates to Analytical Approach' in the 2019-2021 annual monitoring reports, and in section titled 'Methods / Data Analysis / Statistical Models / Analytical Approach' in the 2022-2023 annual monitoring reports). In addition, the tables of statistical significance and model coefficients are provided each year in the appendices to the Bruce Head annual monitoring reports. That is, the information on annual modeling approaches, and changes made between years, are detailed in the existing reports.</li> <li>Baffinland does not currently have measured received sound levels associated with observed narwhal behavioural responses. There has been insufficient spatial overlap of the locations of visual observations and the locations of the acoustic recorders to facilitate such an analysis. Received sound levels corresponding to narwhal behavioural responses would need to be estimated through a detailed modelling analysis, such as that requested in recommendation 3, below. Baffinland maintains that the currently accepted threshold of 120 dB is conservative for assessing narwhal responses to vessel noise, since it is based on observed responses of whales classified in the low-frequency cetacean hearing group (Southall et al. 2019) for which vessel noise occurs in their frequency range of best hearing. Narwhal, by comparison, are classified in high-frequency cetacean hearing group and their frequency range of best hearing does not include the dominant frequencies in vessel noise.</li> <li>As this is a novel undertaking, Baffinland will consider viable options to integrate vessel-specific noise signature data into the Bruce Head analytical model and will continue to explore this with the MEWG.</li> <li>Small vessels were included in the analysis of Relative Abundance and Distribution (RAD), as detailed in Sections 4.3.2.1 and 4.3.2.2, and shown in model significance and coefficient information in Appendix C of the 2023 Bruce Head Shore-based Monitoring Program – Annual Report (Table C-1). We acknowledge that Section 4.2.4 erroneously stated that small vessels were omitted from analysis (this is not the case).</li> <li>Killer whales acoustically detected on the 'Low Island (LI)' acoustic recorder referenced in the Sportelli et al. (2022) study does not equate to 'known killer whale presence' in the Bruce Head study area. The 'LI' recorder was stationed in North Milne Inlet (north of Stephen's Island), approximately 21 km north of</li> </ol>

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		<p>structure changes is needed to assess program value and opportunities for improvement.</p> <p>The assumptions underlying some of these changes centre on the 120 dB threshold for noise disturbance, and there is evidence (Inuit Qaujimagatuqangit; on-going work by Oceans North, University of California, and the Mittimatalik HTO) to indicate that the 120 dB threshold might not be a precautionary approach for narwhal. Narwhal responses occur at received sound levels between 100 and 150 dB (P. Rouget, WSP Canada Inc., June 2024 MEWG meeting). A detailed memo on received sound levels and associated narwhal responses should be prepared to inform the selection of an appropriate threshold. Baffinland has vessel-specific noise signature data - can this information be integrated into models (as a continuous variable or possibly coded as a categorical variable for different noise output categories)?</p> <p>Specific to analysis changes for small vessels, s. 4.2.4 of Appendix G.6.7 states that they were omitted from 2023 analysis, as noted above. The 2023 Bruce Head results (Appendix G.6.7, s. 5.4, p. 74), however, state that the "presence of small vessels in the SSA was not significant (P=0.6)". Were small vessels included in models or not? Discrepancies such as this make it difficult to assess results.</p> <p>Some of the data filtering methods employed may also contribute to questionable results. For example, data collected on days when killer whales were known to be present in southern Milne Inlet (1,780 cases, representing 2.5% of total individual substratum surveys) were removed. Killer whales were known to be present on four days of the combined dataset: 12 August 2015, 18 August 2019, 26-27 August 2020, and 10 August 2021 (actually 5 days, but reported as 4 days in the Bruce Head report) (Appendix G.6.7, s. 4.3.1.7, p. 40). These are days that killer whales were known to be present, but this is undoubtedly an under-representation of true killer whale occurrence in Milne Inlet. For example, Sportelli et al. (2022) reported passive acoustic monitoring detections of killer whales in southern Milne Inlet on 12 different days between late August and mid-September, 2017. Bruce Head surveys in 2017 ran from 31</p>			<p>the Bruce Head study area. Killer whales vocalizing in the 'LI' area would not be audible to narwhals located near Bruce Head and Koluktoo Bay, based on the overall distance and presence of land masses between these two sites. As such, it cannot be assumed that killer whales present in North Milne Inlet on a given day were also present in South Milne Inlet on that same day. On the contrary, WSP has, in the past, observed killer whales limiting their hunting movements to North Milne Inlet prior to returning to Eclipse Sound (P. Rouget, personal communication, 21 March 2024). Furthermore, of the 12 dates listed in Sportelli et al. (2022) as having confirmed detections of killer whale vocalizations at the 'LI' recorder in North Milne Inlet in 2017, only one date (22 August 2017) overlapped with periods of active data collection at Bruce Head in 2017. The 11 other dates listed in Sportelli et al. (2022) occurred after the 2017 Bruce Head Program was completed that season. The lack of killer whale sightings at Bruce Head on 22 August 2017 (despite optimal sighting conditions on that day), combined with the absence of any evidence of anti-predator behaviour by narwhal that day (narwhal typically exhibit an obvious 'freeze' behaviour when in the presence of killer whales with animals huddling tightly along the shore), suggests that killer whales present in North Milne Inlet on 22 August 2017 did not enter the Bruce Head study area (South Milne Inlet) that day during the active survey period.</p> <p>6. The EWI sample size at Bruce Head depends on the occurrence of narwhal transits (including herding events) through the BSA. Visual observations outside of the BSA is not sufficiently reliable to collect life stage data, and drone data are not sampled at random, which would bias the resulting EWI estimates. Overall, the data are simply restricted based on the number of narwhals that pass through the Bruce Head BSA in that year.</p>

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		<p>July to 29 August (Appendix G.6.7, s. 5.1, Table 5-1, p. 55), so some of the observational data that were retained in the models were also collected when killer whales were known to be present (in late August).</p> <p>QIA is not presenting this example to suggest that additional data be removed, but to identify issues with the removal of cases that do not provide a full picture of killer whale presence in the study area. Without a full accounting of killer whale occurrence (which will be difficult), none of these cases should be excluded when it is known that killer whales were present in other cases that were included. How do model results compare when these four examples are kept in?</p> <p>Baffinland will not be conducting an aerial survey in August 2024. This potentially has significant implications for the value of the Early Warning Indicator (EWI), namely the proportion of immature narwhal relative to the baseline values. Bruce Head data from 2023 suggested an increase in the annual proportion, but this assessment was limited by a small sample size and the absence of adult narwhal in the Bruce Head area due to an ice blockage in northern Milne Inlet early in the program. The proportion of immature narwhal was therefore also assessed using the 2023 aerial survey photographs (similar to previous years), with different findings (Appendix G.6.7, s. 5.5.1, pp. 82-83). The potential for limited sample sizes at Bruce Head again in 2024 is concerning given that we will not have additional information for an aerial survey to reduce uncertainty. We will be relying entirely on Bruce Head data for EWI information for 2024, and Baffinland should therefore consider ways to increase sample sizes.</p> <p>Sportelli, J.J., J.M. Jones, K.E. Frasier, K.H. Westdal, A.J. Ootoowak, J.W. Higdon, and J.A. Hildebrand. 2022. Killer whale (<i>Orcinus orca</i>) pulsed calls in the eastern Canadian Arctic. <i>Arctic</i> 75(3): 344-363.</p>			
80	QIA 2023 NIRB MAE #3.	A number of Project Certificate Term and Conditions outline the requirements and expectations for a vessel based marine wildlife observer program (Nos. 103, 106, 107, 108, 122, and	1. QIA requests that Baffinland clarify whether the collection of marine mammal behavioural observations is a	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report,	1. The collection of marine mammal behavioural observations is not a new component of the SBO program. However, the data collection protocol for 'behaviour' was updated in 2023 to allow for additional analyses of marine

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		<p>123). Baffinland has run a Shipboard Observer (SBO) program in 2013 to 2015, 2018, 2019, and 2023, and introduced the Marine Mammal Observation Network (MMON) program in 2020, when the coronavirus pandemic precluded running the SBO program. The MMON is a voluntary marine mammal incidental sightings program that in 2023 included participation by the MSV Botnica, MSV Fennica, Nordic Bulk Carriers, Golden Bulk Carriers, and Oldendorff Carriers. In 2023, the SBO program ran during the fall shoulder season, from 21-30 October, on the MSV Botnica and MSV Fennica.</p> <p>Reporting on the 2023 SBO program notes that "additional survey protocol was developed to assess the behavioural responses of marine mammals to icebreaking activities in the RSA" (p. 353, Project Certificate Term and Condition No. 103). During the Phase 2 review process, Baffinland committed (commitment ID 224) to "reporting on observed behavioural responses of ringed seal collected through the Ship-Based Observer Monitoring Program during the shoulder seasons" (see Appendix C of NIRB Phase 2 report, pdf page 370 of 441). The SBO training manual has always included a behavioural observation data element. As such, QIA was under the impression that behavioural response data for all marine wildlife species were available pre-2023, and Baffinland should clarify this (also see below re: marine birds). Baffinland should also clarify its plans for future ship-based monitoring in the Regional Study Area for the northern shipping route. In reporting on Project Certificate Term and Condition No. 106 (p. 368), Baffinland states that "continuation of the program utilizing the MSV Botnica and MSV Fennica will be evaluated for 2024". When will this evaluation be finished? Does Baffinland expect to have the SBO program running in 2024? Will the collection of behavioural response data be continued?</p> <p>The SBO program report (Appendix G.6.3, Table 14, p. 65) indicates that over half of the closest point of approach (CPA) measurements were done with the naked eye (i.e., estimated without the use of measurement tools like reticle binoculars or clinometers). Accurate assessment of behavioural responses of marine mammals to vessels requires accurate distance measurements. What efforts are made to assess</p>	<p>new component of the SBO establishment.</p> <p>2. If the data collection procedures outlined in the SBO training manual have been followed since program establishment, QIA requests that Baffinland report on behavioural response data across all program years.</p> <p>3. QIA requests that Baffinland provide an update on its evaluation of whether to continue the SBO program in 2024 and whether behavioural response data will be collected if it continues.</p> <p>4. QIA requests that Baffinland provide additional details on how estimation accuracy for CPA distances is assessed for estimates made with the naked eye.</p> <p>5. QIA requests that Baffinland address the inconsistencies between the Annual Report text and Appendix G.6.18 regarding the supposed grey seal observations.</p> <p>6. QIA requests that Baffinland summarize all observations from the MMON program from 2020 to 2023 including those outside the RSA, and use those observations to assess potential transboundary effects on migratory marine mammals.</p> <p>7. QIA requests that Baffinland compile, analyze, and report on marine bird behavioural observations collected</p>	<p>file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> s. 4.6.9 Birds (PC Terms and Conditions 65 through 75); 4.6.11 Marine Wildlife (PC Terms and Conditions 99 through 128)</p> <p><b>Page:</b> 244-269, 331-424</p> <p><b>Document Name:</b> Reconsideration Report and Recommendations for Baffinland's Phase 2 Development Proposal. NIRB File No. 08MN053. May 2022.</p> <p><b>Section:</b> Appendix C - Final Table of Post Phase 2 Approval/Regulatory Phase Commitments.</p> <p><b>Page:</b> pdf page 370 of 441</p> <p><b>Document Name:</b> Appendix G.6.3 - 2023 Ship-based Observer (SBO) Program Report (2023 Annual Report to NIRB)</p> <p><b>Section:</b> full document</p> <p><b>Page:</b> full document</p> <p><b>Document Name:</b> Appendix G.6.4 - 2023 Incidental Marine Mammal Sightings (2023 Annual Report to NIRB)</p> <p><b>Section:</b> full document</p> <p><b>Page:</b> full document</p> <p><b>Document Name:</b> Appendix G.6.18 - Marine Mammal Observation Network (MMON) Season 2023 Summary (2023 Annual Report to NIRB)</p>	<p>mammal behavioural responses to icebreaking activities (specifically around potential flush/flee responses by ringed seal and polar bear).</p> <p>2. Data collection procedures related to behaviour have changed since the start of the SBO program. Data collection protocols are summarized each year in the training manual, included in each of the annual monitoring reports. Due to changes in the methodology over the years, behavioural response data is not comparable across all years. In the 2024 SBO Program Annual Report, Baffinland will include behavioural data dating back to 2023 (when the new methodology was established).</p> <p>3. Baffinland is continuing the SBO program in 2024 and behavioural response data will continue to be collected following the data collection protocol from 2023.</p> <p>4. The method used to measure or estimate distance was at the discretion of the MWOs. MWOs were encouraged to use reticle binoculars (when the horizon was visible) or a clinometer, to measure distances to the associated sightings. During MWO watches, MWOs regularly compared their naked eye estimations to measurements made using the reticle binoculars (when the horizon was visible), clinometers or objects seen in the ship's radar, e.g., icebergs, other vessels. Additionally, during data analyses, measured and estimated distances were truncated at 2 km to minimize uncertainty in distance estimation and measurement, species identification and group size at farther distances. For behavioural response modeling, sightings were also binned in 500-m categories, reducing the potential for estimation inaccuracies.</p> <p>5. The MMON program is continuing to develop and is new to many of these vessels. Vessel crew are continuing to learn and improve on their ability to identify and collect data on marine mammal observations, but it is important to note that these sightings are not made by qualified experts/ experienced MWOs. As the program continues, we expect species identification and data recording to improve.</p> <p>6. The data presented in the annual NIRB report is relevant to observations in the Regional Study Area (RSA) only. The data reported outside of the RSA through the MMON program does not have sufficient effort (e.g., 24 sightings of 94 individuals from August to October) to be considered as a tool for assessing transboundary effects, nor is it designed to do so given the data is not collected systematically by qualified MWOs/wildlife experts (sightings are made opportunistically by vessel crew while transiting from their port of origin to Milne Port and back).</p>

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		<p>estimation accuracy of the different marine mammal observers?</p> <p>Baffinland is planning to continue with the incidental marine mammal sightings program in collaboration with MMON (Project Certificate Term and Condition No. 106, p. 368). Incidental sightings program such as this have the potential to provide useful information to inform monitoring, mitigation, and adaptive management. However, the usefulness of these data is potentially suspect based on 2023 reporting. Table 4.26 (Project Certificate Term and Condition No. 103, p. 353) summarizes MMON observations from August– October 2023. The table includes two reported sightings (totaling 35 individuals) of grey seals in October 2023. QIA is not aware of any confirmed records of this species in Nunavut waters, and neither are DFO Research Scientists who conduct seal research in the territory (Drs. S.H. Ferguson and D.J. Yurkowski, DFO Winnipeg, pers. comm.). It is most likely that these observations were of harp seals. It is also uncertain as to whether grey seals were actually reported by the participating vessel, given discrepancies between the Annual Report main document (and Appendix G.6.4) and Appendix G.6.18 (an MMON-provided summary of Baffinland’s results).</p> <p>The data summary in Appendix G.6.18 includes reported observations of ringed seals, bearded seals, and seal sp. (i.e., observations of pinnipeds not identified to species), but no grey seal observations. The lack of harp seal observations in the Appendix G.6.18 summary is also surprising. Baffinland vessels participating in the MMON program also recorded a number of observations of North Atlantic odontocetes (e.g., northern bottlenose whale, long-finned pilot whale, white-beaked dolphin, harbour porpoise, sperm whale) and baleen whales (e.g., minke whale, blue whale, fin whale) in 2023, which are reported in Appendix G.6.18 but not in the main Annual Report document. Many of these observations were along the West Greenland coast and thus outside the Regional Study Area, but the data are relevant to assessing, monitoring, and mitigating transboundary effects, and should be thoroughly summarized in Baffinland’s annual reporting. A compilation of all MMON sightings, across all years of the program to date, should be completed.</p>	<p>using the ECSAS standardized protocol.</p> <p>8. QIA requests that Baffinland compile all common eider and king eider observations from all years of SBO program monitoring and analyze these data to determine habitat use, areas and timing of interaction with Project activities, and behavioural responses to vessels.</p>	<p><b>Section:</b> full document</p> <p><b>Page:</b> full document</p>	<p>7. The final seabird sightings database is provided to the Canadian Wildlife Service (CWS). The data compiled and reported consists of location data (presence/absence) and density when sightings numbers allow. At no point during consultations or while conducting the SBO program have Inuit indicated a concern that shipping operations were resulting in adverse impacts on seabird behaviour in a manner that could result in population-level effects.</p> <p>8. All SBO reports include summary information (number of sightings, number of individuals observed, dates observed, and location) on common and king eider observations. A summary of common and king eider observations since the beginning of the SBO program, including data on location, timing and behaviour, will be added in future reports. It should be noted that at no point during consultations or while conducting the SBO program have Inuit indicated a concern that shipping operations was impacting common and king eider occurrence or behaviour in a way that could impact these populations.</p>

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		<p>There are a number of Project Certificate Term and Conditions (Nos. 73 and 74 in s. 4.6.9, 107 and 108 in s. 4.6.11) that outline requirements for marine bird monitoring. Project Certificate Term and Condition No. 73 requires a "detailed and robust" monitoring plan for migratory marine birds. Project Certificate Term and Condition No. 74 states that common and king eiders and seabird migration and wintering should be "key indicators for follow up monitoring". Project Certificate Term and Condition No. 107 requires that Baffinland "improve the likelihood of detecting strong marine mammal, seabird or seaduck responses occurring too far ahead of the ship to be detectable by observers aboard the ore carriers". Project Certificate Term and Condition No. 108 requires a monitoring program that is capable of "detecting potential effects of the project on marine mammals, seabirds and seaducks in the Regional Study Area".</p> <p>The current monitoring of marine birds in the RSA is largely not able to meet these Project Certificate Term and Condition requirements. For example, reporting on Project Certificate Term and Condition No. 107 does not indicate how interactions with seabirds or seaducks occurring too far ahead of the ship to be detectable by observers are monitored, and reporting for Project Certificate Term and Condition No. 108 does not indicate how effects of the Project on seabirds and seaducks in the Regional Study Area are comprehensively monitored. Baffinland uses the Eastern Canada Seabirds at Sea (ECSAS) standardized protocol for pelagic seabird surveys from moving and stationary platforms, and shares the data with the Canadian Wildlife Service (CWS). The seabird survey protocol includes the collection of marine bird behaviour classes including vessel avoidance. These data should be analyzed and reported in the annual reporting and SBO program reports.</p> <p>For Project Certificate Term and Condition No. 74 (s. 4.6.9, p. 266), Baffinland states that "bird densities of most species have been found to be insufficient to monitor project effects", including eiders. But there has not been a detailed assessment of eider data across all years of SBO program monitoring to inform this assessment. Data from all years of the program (2013, 2014, 2015, 2018, 2019, and 2023) should be compiled and analyzed for common eider and king</p>			

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		<p>elder to determine habitat use, areas and timing of interaction with Project activities, and behavioural responses to vessels.</p>			
81	QIA 2023 NIRB MAE #4.	<p>Project Certificate Term and Condition No. 99 requires collection of additional baseline data from Steensby Inlet on walrus, beluga, bearded seal, and anadromous Arctic char abundance, distribution, ecology and habitat use; No. 101 requires establishment of a monitoring program that focuses on walrus use of Steensby Inlet and their reaction to disturbance from construction activities, aircraft, and vessels. A monitoring program will need to be established prior to the start of shipping activity in Steensby Inlet, and requires an appropriate baseline to effectively monitor for impacts. The Project Certificate also requires Baffinland to work with the MEWG on these issues.</p> <p>At the December 2023 MEWG meeting in Iqaluit, Baffinland indicated plans to conduct a 2024 winter aerial survey in Hudson Strait, and to conduct walrus haulout surveys in Foxe Basin during the open water season. The walrus program was proposed to occur over a 4-5 week period. Representatives from both QIA and the Sanirayak HTO pointed out issues with Baffinland's preliminary plans, in particular that the program would not be able to accurately account for walrus movements between sites. This would preclude accurate estimations of population size for future comparisons. Baffinland's consultants proposed to follow up with MEWG members to further discuss design elements, but this is yet to occur.</p> <p>In reporting for Certificate Term and Condition No. 99, Baffinland reports that "supplemental baseline assessments are complete (pre-2021)". However, the baseline requirements for Steensby Inlet have not yet been met. Reporting for Certificate Term and Condition No. 101 states that the baseline requirements are "[n]ot applicable in 2023". The collection of additional Steensby Inlet baseline data on marine wildlife, while not explicitly required in 2023, does need to occur over a sufficiently lengthy period to allow the collection of robust data on walrus, beluga, bearded seal, and anadromous Arctic char abundance, distribution, ecology and habitat use, and to use the walrus data to develop an appropriate monitoring plan. QIA recommends that the</p>	<p>QIA requests that the Proponent provide an update on its plans to meet the Steensby Inlet baseline requirements identified in Project Certificate Term and Condition Nos. 99 and 101, including anticipated timelines.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.11 Marine Wildlife (PC Terms and Conditions 99 through 128)</p> <p><b>Page:</b> 335-336 (Project Certificate Term and Condition No. 99) and 340-349 (Project Certificate Term and Condition No. 101)</p> <p><b>Document Name:</b> Appendix C 2023 Working Group Meeting Records and Correspondences</p> <p><b>Section:</b> December 2023 minutes</p> <p><b>Page:</b> 24-25 (pdf file pages 413-414 of 507), 28 (pdf file pages 417 of 507)</p>	<p>Appended to this submission is a summary of baseline studies that have been undertaken for the Steensby Component from 2021 to the present, and that are planned for 2024 and 2025. Marine baseline studies are planned for 2024 and 2025.</p> <p>Marine mammal aerials surveys are tentatively planned for 2025 throughout Foxe Basin and Hudson Straight beginning as early as March 2025. Walrus surveys would be planned for Aug/Sept 2025. Baffinland will consult with MEWG members prior to these programs to discuss design elements. The final timing will be tied to the final receipt of permits, and closure of financing to support a positive construction decision and subsequent schedule.</p> <p>Ringed seal aerial surveys were completed in Steensby Inlet in June 2021 and June 2024. Results will be presented in a Steensby Inlet Ringed Seal Aerial Survey Report that is currently in preparation. This report will be submitted to MEWG members for comment no later than as part of Baffinland's 2025 Annual Report to the NIRB.</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		Proponent provide an update on its plans to meet these Certificate Term and Condition requirements, including anticipated timelines.			
82	<b>QIA 2023 NIRB MAE #5.</b>	<p>The AEMP discusses the methods for collecting benthic invertebrates from stream and river habitat. The report states that "...of the Mine Site (Figure 3.3). At each stream and river study area, benthic sampling will be conducted at five (5) stations except for Sheardown Lake Tributary 12, where only three stations will be sampled due to limited habitat available for sampling."</p> <p>There are no further details discussing the habitat limitations or if there are ongoing limitations with this particular site, nor what alternatives are being considered.</p>	QIA requests that the Proponent describe the limitations with Sheardown Lake Tributary 12 site, if this is an ongoing concern that affects sampling efforts and if alternative sites with consistent flow are being considered.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.8.4 Aquatic Effects Monitoring Plan (AEMP)</p> <p><b>Section:</b> 3.7.5 Benthic Invertebrates</p> <p><b>Page:</b> 53-54</p>	<p>Benthic invertebrate community sampling replication under the original (Rev.0) AEMP specified three (3) stations at each lotic monitoring location. At the outset of the 2015 CREMP, Baffinland voluntarily increased the level of replication at lotic locations to five (5) stations to provide consistency with federal Environmental Effects Monitoring (EEM) standards (Environment Canada 2012). This increased level of replication, however, was not able to be met at Sheardown Lake Tributary 12 (SDLT12) due to limited habitat available for sampling using conventional gear suitable for erosional habitat.</p> <p>The SDLT12 watershed size is the smallest of the tributaries sampled for the CREMP, and thus the small catchment means that flows are generally lowest in this tributary. In addition, portions of the watercourse exhibit a high gradient characterized by boulder substrate in which subterranean flow is often encountered limiting the number of locations containing suitably sized substrate for placement and sampling using a conventional Surber sampler.</p> <p>These limitations preclude increasing sample replication for the benthic invertebrate community survey to five at SDLT12. In each CREMP field study, it is generally a challenge to even locate three stations that can meet the sample replication requirements (i.e., composite of three grabs at each station) at SDLT12. In fact, field biologists conducting the benthic invertebrate community are instructed to place cobble-gravel sampled for the survey back to the creek at the same location the sampler was placed to ensure that suitable substrate will be present in the creek the following year.</p> <p>After ten years of sampling, Baffinland can assure there are no "alternative sites" available for sampling at SDLT12. Baffinland has demonstrated commitment to sampling using the most up-to-date and scientifically defensible standards, in addition to providing transparency over the years. Should reviewers question the methodology applied since the outset of the CREMP program, they are encouraged to become familiar with the complete file by referring to historical reports.</p>
83	<b>QIA 2023 NIRB MAE #6.</b>	The report states, "In 2022, a new benthic area was sampled at the existing water quality station F0-01 in anticipation of future baseline work; but sampling was not completed at this location in 20236 (Table 1.1)."	Given that only one year of baseline data has been collected, it raises concerns about the adequacy of this dataset for future reliable analysis. Additionally, there is a lack of clarity regarding the omission of benthic invertebrate sampling at Mary	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report	The CREMP program outlined under AEMP Rev.1 includes water quality monitoring at Station F0-01 of MRTF. During years in which EEM biological studies are required, additional water quality sampling and benthic invertebrate community sampling are also conducted at MRTF.

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		<p>Further footnote #6 states, "In 2022, a benthic invertebrate community study area was included at the existing Mary River Tributary-F water quality station F0-01 (located between Deposit No. 1 and Deposits No. 2 and 3) as part of baseline studies for Deposits No. 2 and 3. Benthic invertebrate and sediment quality sampling was not continued at F0-01 in 2023 but sampling may be reinitiated, as needed, to support future baseline studies."</p> <p>One year of baseline data is not sufficient to capture the range of natural variability of the tributary; it is not clear why benthic invertebrate sampling was not completed at Mary River Tributary F station F0-01 in 2023.</p>	<p>River Tributary F station F0-01 in 2023. Can Baffinland provide detailed explanations on the following points:</p> <ol style="list-style-type: none"> <li>1. Provide rationale for why a single year of baseline data for a station is considered sufficient for future comparisons, particularly when natural variation exists across analytical benthic invertebrate endpoints (e.g., proportion of the population comprised of EPT).</li> <li>2. What specific factors led to the decision not to conduct benthic invertebrate sampling at station F0-01 in 2023?</li> <li>3. How will the absence of this data impact the overall study and its conclusions?</li> </ol> <p>Please note that it is not necessary to collect baseline data at F0-01 if Baffinland does not plan on including that area in the baseline dataset. If that is the case, it is not clear why Baffinland started monitoring there otherwise.</p>	<p><b>Section:</b> 2.4.2.1 General Design</p> <p><b>Page:</b> 49</p>	<p>Reviewer comments provided historically requested that, where possible, information for separate but similar AEMP programs be integrated/discussed within each individual report (relatedly, see CIRNAC #4 comment below). In efforts to appease reviewers in this request, information collected from the EEM biological study has been summarized in the CREMP reports for years in which the former was implemented (e.g., Minnow 2021, 2023). Similarly, Baffinland proactively felt that should the development of Deposits 2 and 3 go ahead in the future, acquiring additional benthic invertebrate community data at MRTF could be included in the CREMP as a logical place to document and track benthic invertebrate community conditions at this location. This information ultimately may serve as a basis from which future assessment of aquatic effects from mining of Deposits 2 and 3 could be evaluated. Based on the critical tone of the reviewer comment, and provided that benthic invertebrate sampling is not a requirement at MRTF Station F0-01 under the existing AEMP, perhaps Baffinland should exclude such proactive information from the CREMP and restrict information to only that required to meet conditions within the AEMP.</p> <ol style="list-style-type: none"> <li>1. Baffinland has not indicated that a single year of baseline data is sufficient for evaluating effects on sediment quality/benthic invertebrate communities.</li> <li>2. There is no requirement to sample benthic invertebrate communities at Station F0-01 under any of the existing AEMP programs (the EEM benthic invertebrate community sampling occurs further upstream in MRTF, closer to the confluence with the MS-08 effluent discharge, and not at Station F0-01).</li> </ol>
84	QIA 2023 NIRB MAE #7.	<p>There were several sampling programs that either could not be completed or were affected by weather conditions during the fish, sediment and benthic sampling programs. Examples of this include:</p> <ul style="list-style-type: none"> <li>• Sediment and benthic invertebrate sampling BL0-01 in Mary Lake</li> <li>• Gill netting at Reference Lake</li> </ul>	<p>Please outline what contingencies (i.e. additional days included in schedule) are available to manage inclement weather during the sampling program to ensure that all required data is collected for proper analysis to support the ongoing evaluation of project effects.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 4.24 Benthic Invertebrate Community</p> <p><b>Page:</b> 153</p>	<p>Baffinland takes sampling requirements under the various AEMP programs very seriously and barring threats to personnel safety, is committed to ensure that sufficient data is collected for proper analysis to support the ongoing evaluation of Project-related effects. A few sites, including Mary Lake and Reference Lake 3, are only accessible by helicopter which potentially limits access due to inclement weather for transport by helicopter. Such was the case in 2023.</p> <p>Minnow has been leading the collection of sediment/biological samples to meet CREMP requirements since 2015. Minnow therefore has a strong understanding of the delays that may occur due to inclement weather and other factors and, indeed, working with Baffinland, has incorporated contingencies for weather delays to avoid failures to execute components of monitoring programs. With the exceptions</p>

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		Given the variable weather conditions in the north and understanding the limited time schedule available for these studies, Baffinland should incorporate contingencies for weather delays to avoid failures to execute components of monitoring programs. This proactive approach will help ensure that the studies are completed thoroughly and accurately, despite potential weather-related disruptions.			noted for 2023, since 2015 the only cases in which sufficient sample sizes have not been achieved for the CREMP program included littoral/profundal arctic charr at Reference Lake 3 in 2015, 2016, and 2017, prior to locating ideal sampling locations where adequate sample sizes could be acquired. The 2024 sampling program will be initiated on August 7th 2024. The previous sampling program (2023 CREMP) was initiated on August 10th. The earlier initiation of the program is to support having adequate sampling days in the season to allow for an extension of the program if there is increment weather. This earlier start date is still within range of the sampling dates of the CREMP since 2015. The earlier initiation of the program is anticipated to prevent a situation where sampling cannot be completed due to periods of unforeseen weather conditions prior to freeze up.
85	QIA 2023 NIRB MAE #8.	<p>The report states, “<i>Determination of a mine- related influence on water or sediment quality for a waterbody depended on water or sediment quality parameters that were consistently elevated at mine-exposed areas in all sampling seasons in 2023 compared to both reference conditions in 2023 and baseline conditions. Determination of a mine-related effect on aquatic biota (i.e., phytoplankton, benthic invertebrate community, fish) was based on weight-of-evidence that considered incidences in which the AEMP benchmarks were exceeded and/or mine-related influences were concluded for water and sediment quality in addition to corroboration of adverse effects on aquatic biota based on the results of biological monitoring as described in Sections 2.4.1.2, 2.4.2.3, and 2.4.3.2.</i>”</p> <p>While sediment and water quality are important components of the weight of evidence approach, it is crucial to also consider biological factors first and foremost. Water quality samples provide a snapshot in time that may miss transient conditions; samples reflect a potentially temporary state of various parameters such as chemical concentrations and biological activity. Because these conditions can fluctuate due to natural processes and anthropogenic influences, continuous monitoring and analysis over time are essential for a comprehensive understanding of water quality and its long-term trends. With regards to sediment, an indirect pathway between sediment and higher trophic level aquatic biota is acknowledged.</p>	The TARP for fish should be triggered exclusively by differences between exposure and reference, and/or baseline and current results. Statistical approaches such as a BACI analysis should be used to objectively evaluate if there is a mine-related impact. QIA recommends the continued use of the remaining ecosystem components (i.e., water, sediment, benthics) as part of the investigation to identify causes that may have resulted in the observed impacts to fish.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 2.5 Effects Assessment</p> <p><b>Page:</b> 62</p>	<p>Please note that the 2023 CREMP was executed to meet the design and assessment requirements specified under Baffinland (2015) AEMP Rev.1, for which the AEMP Data Assessment Approach and Response Framework does not include a TARP. The TARP described in AEMP Rev.2 will become effective, and be applied to the CREMP, upon approval of drafted AEMP Rev.2.</p> <p>Baffinland agrees with the premise of this reviewer comment and will adjust the text in future CREMP to reflect the general principles presented. Fundamentally, the general approach described by the reviewer is that which was followed (or was the theoretical basis) for the effects assessment for the current and past CREMP fish surveys. For instance, the initial step was to determine whether a difference in a fish health endpoint (or endpoints) existed between a mine-exposed and reference area in the given year, and/or between the Project-operational year of interest and baseline at a mine-exposed area. If a difference was determined based on statistical testing, then supporting information from water quality, sediment quality, phytoplankton and benthic invertebrate community analyses were considered to assess whether the difference in fish health endpoint was consistent with an effect that could be attributable to a mine-related factor. A key distinction between the approach described by the reviewer is that a fish health endpoint shown to be statistically different between a mine-exposed and reference area, or between a mine-operational year and baseline, does not in itself constitute a mine-related impact. Evaluation of a mine-related impact on a fish health endpoint will be determined through application of a weight-of-evidence approach that considers the supporting study components as described above.</p>

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		<p><i>The Fisheries Act</i> (R.S.C. 1985) focuses on the protection of fish and fish habitat. This includes potential effects from mine related activities on fish. A weight of evidence approach that incorporates fish, benthic invertebrates, phytoplankton (Chlorophyll-a), sediment and water quality is helpful in determining the pathway through which fish have been affected. However, fish metrics integrate the influences of all contributing ecosystem components that may be influenced by the project. Differences in fish metrics and numbers observed between the exposure and reference sites and/or baseline and current results should be considered a significant change requiring low action level responses or higher.</p>			
86	QIA 2023 NIRB MAE #9.	<p>The report indicates that the higher densities of fish found in Camp Lake, Sheardown Lake NW and Sheardown Lake SE may be linked to greater productivity based on higher chlorophyll-a concentrations in the water compared to reference. However, the report states that chlorophyll-a concentrations in these three lakes are indicative of oligotrophic conditions based on comparison to Wetzel (2001) lake trophic status classification categories (i.e., chlorophyll-a &lt; 4.5 µg/L).</p>	<p>How can the higher densities of fish in Camp Lake, Sheardown Lake NW, and Sheardown Lake SE be explained by greater productivity from higher chlorophyll-a concentrations, despite these lakes being classified as oligotrophic according to Wetzel (2001) with chlorophyll-a concentrations below 4.5 µg/L.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 3.3.5.1 Camp Lake Fish Community</p> <p><b>Page:</b> 124</p>	<p>This inference was not based on eutrophic or oligotrophic lake classification but rather relative concentrations of chlorophyll-a and relative fish densities.</p> <p>As stated in Section 3.3.5.1, higher density of fish at Camp Lake compared to Reference Lake 3 may be linked to higher chlorophyll-a concentrations in water (indicative of greater phytoplankton density) and greater benthic invertebrate density at Camp Lake. The CREMP has consistently suggested higher primary productivity (i.e., greater phytoplankton abundance) and secondary productivity (i.e., benthic invertebrate density) at Camp Lake versus the reference lake.</p> <p>Although both Camp Lake and Reference Lake 3 are classified as oligotrophic, such a designation does not mean that productivity must be the same between lakes. Oligotrophy itself may be further broken down into 'ultraoligotrophic', 'oligotrophic', and 'oligomesotrophic' categories (essentially indicating low, moderate, and high oligotrophic status, respectively; see Wetzel 2001) within the trophic status scale. Biological productivity also reflects sources other than phytoplankton (e.g., plants, planktonic invertebrates/microbiota, benthic invertebrates) that can be fuelled by allochthonous organic inputs (versus phytoplankton). Such 'littoral' or 'allochthonous' productivity is not necessarily incorporated into trophic status designations (the latter tend to be based on measures of phytoplankton and/or nutrient concentrations). The combination of higher phytoplankton abundance and benthic invertebrate density at Camp Lake (and other mine-exposed lakes) is consistent with higher biological productivity compared to the reference lake. As indicated in the CREMP report, greater productivity of lower trophic status groups at Camp Lake (and other mine-exposed lakes) is believed to result in higher fish densities compared to the reference lake.</p>

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87	QIA 2023 NIRB MAE #10.	<p>There are several instances throughout the CREMP and the EEM where essential information pertinent to the report has been provided in a footnote instead of the body of the report.</p> <p>Examples taken from CREMP:</p> <p><i>9 Nearshore fish were collected from the lake shoreline using a backpack electrofisher. Fish caught using this method were typically small, juvenile, arctic charr individuals (in 2023, fork lengths of nearshore fish ranged from 2.6 cm to 17.2 cm) or small-bodied ninespine stickleback.</i></p> <p><i>10 Littoral/profundal fish were collected from the lake using gill nets with mesh sizes ranging from 38 to 76 mm (1.5" to 3"). Fish caught using this method were large, sub-adult and adult, arctic charr individuals; in 2023, fork lengths of littoral/profundal fish ranged from 20 cm to 78.9 cm.</i></p> <p><i>11 Similar statistical evaluations were not possible in CREMP studies from 2015 to 2017 due to limited sample sizes.</i></p> <p><i>12 The EEM fish survey included aspects of both traditional (lethal) and non-lethal sampling designs to reflect the occurrence of fish in non-reproductive condition (i.e., juveniles) and the consequent inability to visually identify the sex of individuals using either external or internal cues.</i></p> <p><i>21 Caution is warranted around the interpretation of statistical comparisons of fish health between Camp Lake and Reference Lake 3 as a small sample size of fish were captured by gill netting at Reference Lake 3 in 2023 (n = 12), of which one fish was removed from analyses due to measurement error.</i></p>	<p>This information should be included in the body of the text instead of the footnote. Including it in the main text ensures it is not overlooked and is readily available for accurate data interpretation.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 3.3.5.1 Camp Lake Fish Community</p> <p><b>Page:</b> N/A</p>	<p>The use of footnotes reflects personal preference. The intent of the footnotes is to provide extra supporting content about material mentioned in the statement without breaking the flow of thought/detracting from the key messaging presented in the paragraph. In some cases, the use of content footnotes in the CREMP/EEM reports helps avoid repeating verbiage given that a similar format is followed for each results section. For instance, because the same reference area is used for each of Camp, Sheardown NW, Sheardown SE, and Mary Lakes as part of the CREMP, the same statement regarding small sample size of fish at the reference lake is repeated in the discussion of littoral/profundal fish results. Placing this information as a content footnote ensures supporting information is close at hand but doesn't distract from messaging in the text.</p> <p>In future reports, additional thought will be used to determine whether content pertinent to the discussion at hand is placed in the main text rather than as a content footnote.</p>
88	QIA 2023 NIRB MAE #11.	<p>The report states, "A total of 102 and 12 arctic charr were sampled from littoral/profundal habitat of Camp Lake and Reference Lake 3, respectively, in August 2023 (Table 3.11)21."</p> <p>Footnote 21 "Caution is warranted around the interpretation of statistical comparisons of fish health between Camp Lake and Reference Lake 3 as a small sample size of fish were captured by gill netting at Reference Lake 3 in 2023 (n = 12), of which one fish was removed from analyses due to measurement error."</p>	<p>It is not statistically accurate to compare two different sample sizes (100 and 12) to each other. Comparisons should be made using comparable sample sizes to ensure the validity of the results.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 3.3.5.1 Camp Lake Fish Community</p> <p><b>Page:</b> N/A</p>	<p>Baffinland recognizes that the sample size of fish captured at the reference lake for the assessment of effects on littoral/profundal arctic char health at the mine-exposed lakes was inadequate in 2023. Although up to 100 littoral/profundal arctic char will be targeted from all study lakes in future studies conducted to meet AEMP Rev.1 requirements, based on previous power analysis results, from 25 to 30 fish is considered the minimum acceptable for assessing differences in littoral/profundal arctic char condition (i.e., a 10% difference between the mine-exposed and reference lake populations and based on alpha and beta set equally at 0.1).</p> <p>A difference in sample sizes does not violate the assumptions of ANOVA (i.e., homogeneity of variance, normality, independence of observations and group</p>

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		<p>The report then goes on to compare the fish health metrics from Camp Lake and the Reference Lake and conclude the following, "Therefore, no mine-related adverse effects on the health of adult arctic char at Camp Lake are suggested since mine operations commenced in 2015."</p> <p>Baffinland provided a footnote with a caution around statistical comparison of the fish caught from Camp Lake and the reference lake, due to the difference in number of fish caught. It is not appropriate that this data is used as a line of evidence to conclude no mine-related impacts. Baffinland needs to use other statistical comparable endpoints or VECs to draw this conclusion.</p>			<p>mean), or ANCOVA (i.e., normally distributed residuals, homogeneity of regression slopes and independence of observations). Additionally, these analyses are relatively robust to violations of assumptions. The footnote was included to acknowledge that 12 was a small sample size and comparisons with small sample sizes have less power and that this was taken into consideration in the evaluation of results.</p> <p>A power analysis was completed and indicated that there was enough power to detect a difference for condition at the critical effect size (there was a significant difference detected between the two lakes for body condition, but the differences was below the critical threshold of 10 %). Further, the comparison between the mine-exposed and reference sites in 2023 were not the only line of evidence used to conclude that there were no mine-related adverse effects on the health of arctic char at Camp Lake. Comparison to baseline (samples sizes were 100 or greater for both years) were also completed and trends in fish endpoints were evaluated over time.</p>
89	<b>QIA 2023 NIRB MAE #12.</b>	<p>There are several instances in the CREMP where benthic invertebrate results are identified as ecologically meaningful as detailed by the Critical Effect Size described in Table 5.2 Trigger Action Response (TARP) Table in the AEMP, but no trigger action responses are initiated. The CREMP performance indicator for benthic invertebrates is the following:</p> <p>Benthic Invertebrates Critical Effects Sizes: Density: <math>\pm 2</math> SD of baseline or reference mean Simpson's Evenness Index: <math>\pm 2</math> SD of baseline or reference mean Taxa Richness: <math>\pm 2</math> SD of baseline or reference mean</p> <p>Further, on page 50 of the pdf, the report states, "The sampling of five stations from each zone at each study area ensured adequate statistical power to detect ecologically meaningful differences in benthic metrics of <math>\pm</math> two standard deviations (SDs) of the comparable reference area mean using an equal <math>\alpha</math> and <math>\beta</math> of 0.10 (Environment Canada 2012) 8."</p>	<p>QIA requests Baffinland remove professional judgment as part of the AEMP TARP and rely solely on objective thresholds. This action aims to eliminate ambiguity in the adaptive management process, ensuring clarity and consistency in decision-making.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> Benthic Invertebrate</p> <p><b>Page:</b> N/A</p>	<p>Please note that the 2023 CREMP was executed to meet the design and assessment requirements specified under Baffinland (2015) AEMP Rev.1, for which the AEMP Data Assessment Approach and Response Framework does not include a TARP. The TARP described in AEMP Rev.2 will become effective, and be applied to the CREMP, upon approval of drafted AEMP Rev.2.</p> <p>The analysis of effects on benthic invertebrate communities at mine-exposed areas included comparisons between respective mine-exposed and reference areas for 2023, as well as comparisons between 2023 and baseline for individual mine-exposed areas. Based on a weight-of-evidence analysis that considered the results of these comparisons for key effect indicators (i.e., density, richness, Simpson's Evenness), as well as supporting water quality, sediment quality, phytoplankton, and ancillary benthic invertebrate community endpoints (e.g., dominant groups, functional feeding groups, habit preference groups), deductive reasoning (i.e., professional judgement) was used to determine whether the ecologically meaningful differences in key benthic endpoints were consistent with a mine-related cause.</p> <p>Baffinland agrees that comparison to definitive objectives alone may be sufficient to warrant progression to the next step in the management framework. However, professional judgement, supported by an appropriate scientific rationale (which should be described to allow critique), is deemed by Baffinland to be the basis for determining whether environmental and/or biological conditions in aquatic habitats associated with the Project have been affected by Baffinland operations through incorporation of a weight-of-evidence evaluation. The weight-of-evidence is not</p>

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		<p>Some examples where ecologically meaningful differences were identified in the benthic invertebrate data are as follows:</p> <ul style="list-style-type: none"> <li>• North Branch (CLT1-US)</li> <li>• Upper Main Stem (CLT1-L2)</li> <li>• Camp Lake</li> <li>• SDLT1</li> </ul> <p>Management and mitigation measures must be based on objective triggers / performance indicators to prevent ambiguity in the adaptive management process. Professional judgment should be used as part of the discussion rather than as an objective threshold. It should only be applied after completing evidence-based evaluations, such as trend analysis and the weight of evidence evaluation process, as outlined in the AEMP TARP threshold responses.</p>			<p>subjective as it specifically examines whether there is evidence that a quantified mine-associated change in water or sediment chemistry to conditions that exceed an AEMP benchmark also has an ecologically meaningful influence on aquatic life that occurs over consecutive studies. This framework avoids the expenditure of resources on biological differences that are not mine related.</p> <p>Therefore, Baffinland does not feel that removal of professional judgement as part of the AEMP Data Assessment and Response process is justifiable.</p>
90	<p><b>QIA 2023          NIRB          MAE          #13.</b></p>	<p>There are several instances in the CREMP where benthic invertebrate results are identified as ecologically meaningful as detailed by the Critical Effect Size described in Table 5.2 Trigger Action Response (TARP) Table in the AEMP, but no trigger action responses are initiated. The CREMP performance indicator for benthic invertebrates is the following:</p> <p>Critical Effects Sizes for Arctic char health:</p> <p>Total body weight at age:</p> <ul style="list-style-type: none"> <li>• ± 25% of reference mean</li> </ul> <p>Liver weight at total body weight:</p> <ul style="list-style-type: none"> <li>• ± 25% of reference mean</li> </ul> <p>Total body weight at length (condition):</p>	<p>QIA requests Baffinland remove professional judgment as part of the AEMP TARP and rely solely on objective thresholds. This action aims to eliminate ambiguity in the adaptive management process, ensuring clarity and consistency in decision-making.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> Fish Health Assessment</p> <p><b>Page:</b> N/A</p>	<p>Please note that the 2023 CREMP was executed to meet the design and assessment requirements specified under Baffinland (2015) AEMP Rev.1, for which the AEMP Data Assessment Approach and Response Framework does not include a TARP. The TARP described in AEMP Rev.2 will become effective, and be applied to the CREMP, upon approval of drafted AEMP Rev.2.</p> <p>The analysis of effects on arctic char (fish) health at mine-exposed areas included comparisons between respective mine-exposed and reference lakes for 2023, as well as comparisons between 2023 and baseline for individual mine-exposed lakes. Based on a weight-of-evidence analysis that considered the results of these comparisons for key effect indicators (i.e., condition), as well as supporting water quality, sediment quality, phytoplankton, and benthic invertebrate community data, deductive reasoning (i.e., professional judgement) was used to determine whether the ecologically meaningful differences in fish health were consistent with a mine-related cause. For the examples referred to by the reviewer, arctic char condition at the mine-exposed lakes showed no consistent differences year-to-year compared to the reference area and/or to baseline. Coupled with minimal to no effects on water quality, phytoplankton, and benthic invertebrate communities, no mine-related effects on fish health were suggested at these waterbodies. These results, described in the CREMP report, thus required no management response in</p>

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		<ul style="list-style-type: none"> <li>± 10% of reference</li> </ul> <p>Age:</p> <ul style="list-style-type: none"> <li>± 25% of reference mean</li> </ul> <p>Some examples where ecologically meaningful differences were identified in the Arctic Char data are as follows:</p> <ul style="list-style-type: none"> <li>Camp Lake – nearshore Arctic Char</li> <li>Sheardown Lake NW – Littoral/Profundal Arctic Char</li> <li>Sheardown Lake SE – Nearshore and Littoral/Profundal Arctic Char</li> </ul> <p>Management and mitigation measures must be based on definitive objectives to prevent ambiguity in the adaptive management process. Professional judgment should be used as part of the discussion, not as an objective threshold, and only after evidence such as trend analysis and the weight of evidence evaluation process have been completed, as outlined in the AEMP TARP threshold responses.</p>			<p>accordance with the AEMP Rev.1 Data Assessment Approach and Response Framework.</p> <p>Baffinland agrees that comparison to definitive objectives alone may be sufficient to warrant progression to the next step in the management framework. However, professional judgement, supported by an appropriate scientific rationale (which should be described to provide transparency), is deemed by Baffinland to be the basis for determining whether environmental and/or biological conditions in aquatic habitats associated with the Project have been affected by Baffinland operations using a weight-of-evidence evaluation. The weight-of-evidence is not subjective as it specifically examines whether there is evidence that a quantified mine-associated change in water or sediment chemistry to conditions that exceed an AEMP benchmark also has an ecologically meaningful influence on aquatic life that occurs over consecutive studies. This framework avoids the expenditure of resources on biological differences that are not mine related. Therefore, Baffinland does not feel that removal of professional judgement as part of the AEMP Data Assessment and Response process is justified.</p>
91	QIA 2023 NIRB MAE #14.	<p>The report states, “Factors unrelated to effluent exposure are likely to have contributed to significantly smaller size (i.e., length and weight) of arctic char at the Mary River effluent-exposed area compared to the Angijurjuk Lake Tributary reference area, potentially including fish age. Overall, the absence of any significant differences in EEM effect indicators related to growth and relative liver size in arctic char captured at the Mary River effluent-exposed area compared to those captured at the Angijurjuk Lake Tributary reference area indicate no adverse effluent influences on health of arctic char at the Mary River in 2023.”</p> <p>There is no discussion in the report what the factors are that may have contributed to the significantly smaller size of Arctic Charr at the Mary River effluent-exposed areas compared to reference area.</p>	<p>Baffinland to identify what factors may have contributed to the significantly smaller size of Arctic char in the Mary River effluent-exposed areas compared to the reference area.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the NIRB, Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report</p> <p><b>Section:</b> 5.1.5 Fish Population</p> <p><b>Page:</b> 246-247</p>	<p>Please refer to previous Mary River Project Environmental Effects Monitoring (EEM) study designs and interpretive reports (e.g., Minnow 2020, 2021, 2023, 2024) for relevant information regarding effluent receiving environment fish community characteristics (including fish movement) and comparative analyses of fish health relative to reference areas.</p> <p>The Mary River Project EEM fish health survey was conducted at the same Mary River effluent-exposed area and Angijurjuk Lake Tributary reference area, and applied the same methodology, for the second (2020) and third (2023) studies.</p> <p>At the Mary River effluent exposed area the main factor was potentially fish age as there was some indication that fish sampled at the Mary River effluent-exposed area were slightly younger than fish sampled at the Angijurjuk Lake Tributary. However, this cannot be confirmed as not all fish were lethally sampled for age analysis.</p> <p>Additionally, it is important to note that although there were significant differences in length and weight of arctic char between the effluent-exposed and reference</p>

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					<p>areas, the absolute magnitudes of difference did not exceed the critical effect sizes of 25% for length and weight and 10% for condition. Other endpoints, including growth (i.e., fork length-at-age and body weight-at-age) and relative liver size (i.e., liver weight-at-body weight) did not differ significantly between the Mary River effluent-exposed area and the Angijurjuk Lake Tributary reference area.</p> <p>For the second EEM, arctic char at Mary River were significantly larger (i.e., longer and heavier) and showed no difference in condition compared to the reference area, whereas for the third EEM, arctic char at Mary River were significantly smaller but showed significantly greater condition than char from the reference area. As a result of the opposing difference in arctic char size between the second and third EEM studies, speculation into factors contributing to these differences is not prudent based on the available data, nor warranted based on EEM requirements.</p>
92	QIA 2023 NIRB MAE #15.	<p><i>"The Proponent shall adhere to the No-Net-Loss principle at all phases of the Project to prevent or mitigate direct or indirect fish and fish habitat losses."</i> (Baffinland 2023 NIRB AMR, PCC 45, p. 177)</p> <p><i>"The Proponent shall ensure that all Project infrastructure in watercourses are designed and constructed in such a manner that they do not unduly prevent and limit the movement of water in fish bearing streams and rivers."</i> (PCC 47, p. 182).</p> <p>In spring 2023, Baffinland conducted electrofishing assessments of fish habitat use upstream and downstream of 44 fish bearing Tote Road crossings (App.G.2.6, s.3.3, p. 7 and Table 3, PDF p. 63 and 64 of 135). Juvenile Arctic char were found downstream of 18 crossings and only upstream at site CV- 102 (Table 4, PDF p. 65-69 of 135). The low number of upstream sites where these fish were present is a concern, given that in other years they have managed to pass through more crossings to access important summering habitat upstream. In 2021, for example, spring electrofishing was only conducted at 28 crossings, but Arctic char were caught downstream of 26 and upstream of 16 (BIM 2021 QIA NWB AMR, Appendix C.3, Table 4, PDF p. 38-40 of 70).</p> <p>The 2023 catches were also lower at many of the crossings compared with previous sampling (BIM 2023 NIRB AMR, s.3.3, p. 7). These reduced catch rates were attributed to high flows and low water temperatures at the time of the survey. If this is the case, it suggests the stream conditions must be taken into greater account when timing these spring surveys to ensure their results are comparable.</p>	<p>QIA requests Baffinland provide an update by the end of September 2024 on the remediation status of the 10 culverts, with another update by the end of March 2025 on plans for further culvert remediation.</p> <p>QIA recommends Baffinland:</p> <ul style="list-style-type: none"> <li>consider adjusting the timing of its Tote Road surveys based on environmental variables to improve their interannual comparability,</li> <li>assess how the fish passage issues have affected the abundance and condition of juvenile Arctic char in the affected streams, and</li> <li>complete Tote Road culvert remediation prior to the 2026 freshet to ensure unobstructed fish passage by juvenile Arctic char.</li> </ul>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 Main report (NIRB registry file: 240503- 08MN053-2023 Annual Report-Main Body-IMRE.pdf)</p> <p><b>Section:</b> 4.6.7 Freshwater Environment, PCC 45</p> <p><b>Page:</b> 177 (PDF p. 195 of 641)</p> <p><b>Section:</b> 4.6.7 Freshwater Environment, PCC 47</p> <p><b>Page:</b> 182 (PDF p. 200 of 641)</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to QIA and NWB on Operations [NWB Registry: 240331 - 2023 QIA-NWB Annual Report for Ops - Main Body - As Sent.pdf]</p> <p><b>Section:</b> 7.3.8 <b>Page:</b> 36 (62 of 90)</p> <p><b>Section:</b> 10.1.4 <b>Page:</b> 57 (83 of 90)</p>	<p>Baffinland will provide an update to relevant regulatory agencies on the Tote Road culvert remediation project in applicable annual reports as well as future plans pending feedback on designs and approvals from the required regulatory agencies to execute such a scope of work.</p> <p>Baffinland appreciates the recommendations and will consider them when assessing fish passage and fish health, and planning for future culvert crossing remediation.</p>

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		<p>This assessment is complicated by the fact that culverts at numerous crossings were either perched (n=9), blocked (n=7), perched and blocked (n=2), or had a high flow rate (n=1) (Table 6, PDF p. 75 -77 of 135). Some of these issues have been outstanding since at least 2020 (QIA 2022 NWB AMR comment FH#2, PDF p. 39-41 of 42). Further information is needed to assess whether the low upstream numbers are evidence of a seasonal delay in upstream migration, loss of 2023 upstream access, or harm to the population from protracted loss of access by juvenile Arctic char to upstream summering habitats.</p> <p><i>"On January 19, 2024 DFO issued a Letter of Advice (LOA) for Baffinland's Tote Road Culvert Remediation proposal to implement a permanent crossing solution for ten (10) corrugated steel pipe (CSP) crossings along the Tote Road (DFO, 2024)."</i> (BIM 2023 QIA NWB AMR, s.7.3.8, p. 36 (PDF p, 62 of 90)). QIA understands that some of this work began prior to the 2024 spring freshet (s.10.1.4, p. 57 (PDF p. 83 of 90)). When will fish passage issues be permanently corrected in the 10 culverts identified, and what other culvert fish passage issues remain to be addressed?</p>		<p><b>Document Name</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report [NIRB Registry: 240503-08MN053-2023 Annual Report-App G-Tote Road Fish Hab-Pt 1-IA1E.pdf]</p> <p><b>Section:</b> 3.3</p> <p><b>Pages:</b> 7 (12 of 135)</p> <p><b>Section:</b> Tables 3 through 6</p> <p><b>Pages:</b> 63-77 of 135</p> <p><b>Document Name:</b> Qikiqtani Inuit Association Review of Baffinland's 2022 Qikiqtani Inuit Association and Nunavut Water Board Annual Report for Operations [NWB Registry: 230706 2AM-MRY1325 2022 Annual Report QIA Comments-IMLE.pdf]</p> <p><b>Section:</b> Fish Habitat Comment QIA 2022 NWB FH# 2</p> <p><b>Pages:</b> 39 to 42 of 42</p> <p><b>Document Name:</b> Baffinland Iron Mines 2021 QIA – NWB Annual Report [NWB Registry: 220331 - 2021 QIA-NWB Annual Report for Ops - Appendix C.3 (DFO) - 1 of 2 - As Sent Tote Road Report.pdf]</p> <p><b>Section:</b> Appendix C.3 DFO Tote Road Report, Table 4</p> <p><b>Pages:</b> 38 to 40 of 70</p>	

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
93	QIA 2023 NIRB MAE #16.	<p>The objective of PCC 48a is to determine the presence and health of Arctic char in freshwater aquatic habitat (2023 NINB AMR, p. 185). Part of this work involves the comparison of data collected on Arctic char populations in exposed and reference areas under the Core Receiving Environment Monitoring Program (CREMP) and Environmental Effects Monitoring (EEM) studies.</p> <p>In 2023, littoral/profundal gillnet sampling caught at least 100 Arctic char from each Project lake but only 12 from Reference Lake 3 (App. 9.1 (CREMP), s. 3.3.5.2, p. 108 (130 of 307)). The latter small sample limits meaningful comparisons between catches from the Project lakes and Reference Lake 3. The latter were lower than in previous years, perhaps due to weather conditions influencing fish movements and areas of the lake that could be accessed for sampling. Similar issues with environmental conditions may be occurring in Tote Road stream sampling, where the sampling program caught far fewer fish than in past years (BIM 2023 NIRB AMR, s.3.3, p. 7). Both issues may be related to the timing of sampling in relation to environmental conditions, possibly due to constraints in the field sampling schedule(s).</p> <p>During the 2023 EEM Study, the total number of young-of-the-year (YOY) Arctic char caught was similar in the Angijuruk Lake tributary (reference; n=104) and Mary River (effluent-exposed; n=102) (Table I.2, p. 265). The catch-per-unit-effort (CPUE; char caught per minute of electrofishing) reported was also similar (0.53 cf. 0.66). However, the length of reference stream sampled was half that of the effluent stream (200 m cf. 400 m), and the time spent electrofishing each meter of stream reach was 2.5 times greater on average (i.e., Angijuruk reference; 200 m @ 58.8 sec/m; Mary River effluent-exposed; 400 m @ 23.1 sec/m). These differences may alter the area of habitat sampled and the sampling effort in each area</p>	<p>QIA recommends that Baffinland consider increasing the timing flexibility of its field sampling programs for Arctic char in the Project and Reference lakes, and Tote Road streams, to improve their intra- and inter- annual comparability over time.</p> <p>QIA requests Baffinland clarify:</p> <ul style="list-style-type: none"> <li>• how differences in length of stream reach sampled (areal coverage) and time spent electrofishing each meter of stream (sampling effort per unit of area) affect comparability and interpretation of catch per unit effort (CPUE), and</li> <li>• how the 2023 reach lengths and electrofishing durations compare with those of previous EEM CPUE studies.</li> </ul>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.7 Freshwater Environment, PCC 48a</p> <p><b>Pages:</b> 185-187 (PDF p. 203-205 of 641)</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024. Appendix G.4.1 Core Receiving Environment Monitoring Program (CREMP) Report (NIRB Registry: 240503- 08MN053-2023 Annual Report-App G-CREMP-Pt 1-IMRE.pdf)</p> <p><b>Section:</b> s. 3.3.5.2</p> <p><b>Pages:</b> 108 (PDF p. 130 of 307)</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024. Appendix G.4.1 Core Receiving Environment Monitoring Program (CREMP) Report (NIRB Registry: 240503- 08MN053-2023 Annual Report-App G-CREMP-Pt 3-IMRE.pdf)</p> <p><b>Section:</b> App. I. Third EEM Biological Study (2023) Results, Table I.2</p> <p><b>Pages:</b> 265 of 275.</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report</p>	<p>Please refer to response to Comment QIA 2023 NIRB MAE #7. Additionally, field studies conducted for the CREMP have purposely been conducted at the same time each year (i.e., mid-August) since 2015 to ensure temporal continuity among studies. To the extent possible, this has ensured that benthic invertebrates and fish sampled for the program are at a similar stage of development year-to-year facilitating direct temporal comparisons. Given the short growing season and its marked influence on speed of development, flexibility around field sampling timing has intentionally been kept to a minimum. That said, natural year-to-year differences in weather, and even differences within the two- to three-week sampling period each year, have presented challenges for attaining target sample sizes for the fish survey. Baffinland's experience has indicated that colder weather and/or the occurrence of passing cold fronts during a field study can result in markedly lower catches that in turn can affect fish survey success. Despite the latter potential issues, maintaining a similar, tighter, timing for the CREMP fish survey over time is deemed by Baffinland to outweigh potential confounding influences introduced by incorporating a more protracted (or flexible) sampling period. Therefore, Baffinland asserts that the field study timing used historically for the CREMP be maintained moving forward.</p> <p>With regards to electrofishing effort applied to the EEM fish survey, please consider that the objective of EEM is to determine whether effluent discharge affects fish health. The EEM program does not require that an estimate of the absolute size of fish populations to be determined. Electrofishing CPUE for the Mary River Project EEM is included to provide information on relative abundance of the target fish species between study areas. The CPUE itself is not a regulatory endpoint for the EEM fish survey, and thus serves as ancillary information.</p> <p>Electrofishing effort, or CPUE, is 'standardized' as the number fish captured per active electrofishing activity (i.e., the amount of time that electricity is applied to the water). If physical conditions within lotic environments are perfectly uniform in terms of substrate size, water depth, water clarity, and water velocity (among other biophysical factors) within and between two separate study areas, uniform fish density theoretically can be expected. For the Mary River Project EEM study, such uniform environments do not exist within or between the mine-exposed and reference study areas and thus fish sampling conducted over the same length of reach cannot be expected to yield the same number of fish per unit distance within a study area, or between study areas. Hence, basing an evaluation of relative fish abundance on the number of fish captured per unit distance cannot be expected to provide a strong basis for comparison. Duration of electrofishing effort was not standardized between study areas (reference and effluent-exposed) because a target number of fish (100 per area) was prescribed for capture. Therefore,</p>

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				<p>[NIRB Registry: 240503-08MN053-2023 Annual Report-App G-Tote Road Fish Hab-Pt 1-IA1E.pdf]</p> <p><b>Section:</b> 3.3</p> <p><b>Pages:</b> 7 (12 of 135)</p>	<p>sampling continued at each area until the target number of fish were collected, regardless of electrofishing duration.</p> <p>For EEM studies, a total of 100 arctic char are targeted/required, and thus habitat likely to 'hold' arctic char is preferentially sampled during surveys. In addition, limitations for the electrofishing gear, including water depth and potentially water clarity (as a potential function of depth) also exist. As a result, waters considered too deep or too shallow, those lacking cover structure, etc., are generally avoided during sampling whereas those habitats deemed more appropriate for capturing fish are preferentially sampled. Based on this approach, sampling reach length can vary considerably between areas. The use of fishing effort applied per unit distance per reach thus is a poorer endpoint for comparing relative fish abundance. Because in practice fish sampling is conducted at similar, 'fish-holding', habitat within the physical conditions allowable by backpack electrofishing sampling gear, evaluation of CPUE as simply the number of fish captured per unit electrofishing time provides a more direct comparison of relative fish abundance between or among different study areas.</p>
94	QIA 2023 NIRB MAE #17.	<p>The Report outlines that the primary objective of the 2023 monitoring program was to "assess the presence of fish, habitat quality, and upstream accessibility through installed culverts at fish-bearing sites and identify crossings that require remediation to fish habitat or passage through culverts."</p> <p>While Baffinland did provide photographs of site conditions both upstream and downstream of each of the Tote Road Crossings, the photographs of the culverts themselves did not provide sufficient detail to evaluate potential issues. They were either taken from too far away or at incorrect angles, making it difficult for the reviewer to accurately assess the condition of the culverts and the potential issues related to fish passage. This gap in photographic evidence hinders a comprehensive understanding of the culvert conditions and the necessary remediation measures.</p>	<p>To address this issue, it is recommended that Baffinland ensure photographs of culverts are taken from closer distances and from multiple angles, including directly in front of the culverts from both the upstream and downstream ends. This will provide a clearer and more comprehensive view of the culvert conditions.</p> <p>By enhancing the quality and comprehensiveness of the photographic documentation, Baffinland can improve the effectiveness of the monitoring program and ensure that any necessary remediation measures for fish habitat and passage through culverts are accurately identified and implemented.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report</p> <p><b>Section:</b> Part 1 to Part 8 – General Comment</p>	<p>Baffinland acknowledges QIA's comment but clarifies that photos provided in the Habitat Assessment Sheets which form Appendix B of the 2023 Tote Road Fish Habitat Monitoring Annual Report are intended to show the overall condition of the culverts, as well as habitat assessment information such as habitat quality, and water inflow and outflow velocity and depth. Baffinland will work with the onsite QIA Environmental Monitors to facilitate site visits to the culvert locations of interest to QIA to ensure QIA is able to obtain the desired supplemental photographic information to support their assessment.</p>
95	QIA 2023 NIRB	<p>Section 3.4 states, "Eight (8) crossings (CV-129, CV-114, CV-111, CV-106, CV061, CV-061b, BG-50, and CV-216) had perched fish passage culverts in spring 2023."</p>	<p>Please clarify which crossing is identified as BG-50 and specify whether it is a culvert or a bridge structure. Additionally, confirm if the photographs in Appendix B under the label BG-50 are indeed of that crossing or</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact</p>	<p>BG-50 is the culvert crossing immediately south of the KM 63 bridge. Appendix B photos correctly show the bridge structure at KM 63 and adjacent culvert crossing BG-50. Appendix B page 59 and page 60 which are labelled CV-216 and include photos of the watercourse and crossing structures at BG-50 are artifacts of the</p>

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	<b>MAE #18.</b>	Based on the photos provided in Appendix B – Part 2, crossing BG-50 is not a culvert but a bridge crossing. Further, photographs provided in the Appendix are labelled as CV-126.	if they are mistakenly labeled and are actually of CV-126. Furthermore, please clarify which crossing had perched culverts that are affecting fish passage. This information should also be included in future annual reports.	Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report  <b>Section:</b> 3.4 Remediation Works and Appendix B Habitat Assessment Sheets  <b>Pages:</b> 13 of 135 (main report) and 53 – 60 of Part 2	document editing process and should be disregarded. The habitat assessment forms and photos for CV-216 are found in Appendix B (Section 7) pages 45 to 53. To address several administrative errors in Appendix B (Habitat Assessment Sheets) of the 2023 Tote Road Report in future reports.
96	<b>QIA 2023 NIRB MAE #19.</b>	Section 3.4 states, " <i>Crossings BG-01, BG-17, BG-24, BG-30, BG-50, CV- 078, CV- 079, CV-11, CV-224, CV-225, CV-106, CV-114 and CV-216 are included in the 2024/2025 remediation plan.</i> "  The report refers to a CV-11 above which was not in any of the Habitat Assessment sheets and could not be located on Figure 1.	Please confirm if this is a clerical error and which site should be discussed for inclusion in the 2024/2025 remediation plan.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report  <b>Section:</b> 3.4 Remediation Works  <b>Pages:</b> 13 of 135	Baffinland confirms this is a clerical error and the name of the culvert crossing referenced is CV-112. To address several administrative errors in Appendix B (Habitat Assessment Sheets) of the 2023 Tote Road Report in future reports.
97	<b>QIA 2023 NIRB MAE #20.</b>	The report indicates that Ninespine Stickleback were captured for the first time in 2023 on the downstream side of Tote Road. Upon further review of the photographs provided, that the downstream culvert is a fish barrier to fish movement upstream.	Please discuss whether the culvert at BG-03 will be considered for remediation now that fish have been caught downstream. This new information about the presence of fish downstream may indicate the need for improved fish passage through this culvert, and its consideration for remediation is crucial for ensuring habitat connectivity and fish migration.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report  <b>Section:</b> Appendix B Habitat Assessment Sheets  <b>Pages:</b> 109 - 114	BG-03 was assessed during Spring 2024 as part of the Tote Road Fish Habitat Assessment program. There is a gentle ascent toward the culvert at BG-03, on the downstream side among the rocks, accessible to Stickleback. This area could be improved with some minor movement or shifting of a few rocks. The downstream portion of the stream has rarely contained Stickleback and the area experiences low water levels throughout most of the open water season. As a result, Baffinland will continue to monitor if major construction works are required to ensure sufficient fish passage at BG-03 is maintained.
98	<b>QIA 2023 NIRB MAE #21.</b>	The photograph on the downstream side of Tote Road shows three culverts, of which two are clearly perched. The photo is at a distance where the condition of the middle culvert cannot be confirmed.	Please confirm if the middle culvert can or does become perched during low flow conditions.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report  <b>Section:</b> Appendix B Habitat Assessment Sheets	It was noted in late July 2023 that the outlet of the middle culvert was perched. The culverts at BG-04 were subsequently replaced in early 2024, following the submission of the 2023 Tote Road Annual Report.

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
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99	QIA 2023 NIRB MAE #22.	Photographs of the downstream side of Tote Road at CV-021 show two culverts. Both of these culverts appear to be perched, which is confirmed in Table 3 of the report. Stickleback were captured downstream of the culvert but are unlikely able to pass through.	Please confirm if there are any plans to remediate the culverts at crossing CV-021 to improve fish passage through the culverts. If not, please add this culvert to the list of those requiring remediation or justify why this is not required.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report</p> <p><b>Section:</b> Appendix B Habitat Assessment Sheets (Part 3)</p> <p><b>Pages:</b> 10 of 56</p>	CV-021 was assessed for fish habitat and fish passage during Spring 2024 as part of the Tote Road Fish Habitat Assessment program. Upstream habitat was confirmed to be accessed by Arctic Char, as individuals were observed in the upstream pond. Therefore, there is no need to complete additional remediation for Arctic Char to access the upstream area. Stickleback have only been captured in the lacustrine-type habitat, located downstream of the CV-021 culvert, which is adjacent to and an extension of the nearby lake. They have not been captured in the riffle habitat within 10 m downstream of the culvert. Since stickleback will not attempt to swim upstream, there is similarly no need to complete any remediation of the culvert to provide access to the upstream environment.
100	QIA 2023 NIRB MAE #23.	Table 6 provides potential project related fish passage or habitat issues related. Crossing CV-099 is identified as having <i>"Some seepage under the road to the left of the culverts on the downstream side."</i>  However, there is no further discussion on what remedial actions are being taken and the potential impacts to downstream fish habitat.	Additional information is needed to understand the steps being implemented to mitigate this problem and to assess the implications for the downstream aquatic environment.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report</p> <p><b>Section:</b> Table 6.</p> <p><b>Pages:</b> 75 of 135</p>	The seepage noted in 2023 at crossing CV-099 is not consistent from year to year. Consequently, there is no potential impacts to fish or fish habitat at CV-099. The site will continue to be assessed as part of the Tote Road Fish Habitat Assessment program.
101	QIA 2023 NIRB MAE #24.	Table 6 provides potential project related fish passage or habitat issues related. Crossing CV-128a states <i>"Culvert under old road is buried with sediment causing water to flow over the road during freshet, blocking fish passage."</i>  However, there is no further discussion on what remedial actions are being taken and the potential impacts to downstream fish habitat.	Additional information is needed to understand the steps being implemented to mitigate this problem and to assess the implications for fish passage.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report</p> <p><b>Section:</b> Table 6.</p> <p><b>Pages:</b> 75 of 135</p>	Preliminary results of the 2024 Tote Road Fish Habitat Assessment program did not identify any blockage at CV128a. Consequently, no mitigation actions are required. The site will continue to be monitored during the Tote Road Fish Habitat Assessment program.
102	QIA 2023 NIRB MAE #25.	Table 6 provides potential project related fish passage or habitat issues related. Crossing CV-186 states <i>"Some debris had washed into the stream and culverts outlets damaged."</i>	Additional information is needed to understand the steps being implemented to mitigate this problem and to assess the implications for fish passage.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Appendix G.2.6 Tote Road Fish Habitat Monitoring Annual Report</p>	Preliminary results of the 2024 Tote Road Fish Habitat Assessment program indicate damage to the outlets of both culverts has occurred since the previous (2023) assessment, potentially affecting fish passage at this crossing. A remediation will be developed for review by DFO, QIA and relevant regulatory agencies to address the recently observed condition of the CV-186 crossing.

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		However, there is no further discussion on what remedial actions are being taken and the potential impacts to downstream fish habitat.		<p><b>Section:</b> Table 6.</p> <p><b>Pages:</b> 77 of 135</p>	
103	QIA 2023 NIRB MAE #26.	For Project Certificate Term and Condition No. 48 (a) it is stated, "The Proponent shall develop plans to conduct additional surveys for the presence of Arctic char in freshwater bodies and ongoing monitoring of Arctic char health where applicable, within watersheds proximal to the mine, tote road and Milne Inlet Port project development areas, including but not limited to, Phillips Creek, Tugaat and Qurluktuk. The Proponent shall consult with the MHTO regarding the design, timing, and location of proposed surveys and ongoing monitoring." While monitoring was completed for Tugaat and Qurluktuk in 2021 and 2022 and there are plans to continue this sampling in 2024 there was no mention of sampling conducted in Phillips Creek.	It is recommended the proponent provide a rationale for not sampling Phillips Creek or include sampling progress in this creek in the methodology as per Term and Condition No. 48.	<p><b>Document Name:</b> 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.6.7</p> <p><b>Page:</b> 203</p>	Baffinland consulted with the MHTO on sampling locations for the 2021 and 2022 monitoring programs as per the term and condition. Baffinland is currently discussing the future of this monitoring program and will review locations with the MHTO for future programs. Baffinland respects the input of the MHTO and the value of their IQ in developing this program with community inputs, and will sample the lakes and streams identified by community members as per their priorities.
104	QIA 2023 NIRB MAE #27.	<p>Baffinland conducted studies of fish and fish habitat in Steensby Inlet in 2021, 2022, and 2023 to support its Fisheries Act Authorization Application for Steensby Port, and update existing pre-2010 baseline data (App. G.1, p. 1). Additional baseline data are needed from the marine environment for comparison with future monitoring (PCC 1, 83, 83a, 99), and further studies are under consideration for 2024 (WSP 2023, p. 57 of 66).</p> <p>The temporal separation of these sampling programs raises many questions, in particular,</p> <ul style="list-style-type: none"> <li>• did the pre-2010 and post-2020 studies collect information on the same parameters, using the same methods, and from the same stations and, if not, how has or will this affect the strength and quality of the pre-Project baseline and its value for future monitoring comparisons; and</li> <li>• to what extent will either of these data sets be directly comparable with future pre-Project baseline studies and operational monitoring?</li> </ul>	<p>QIA requests Baffinland clarify:</p> <ul style="list-style-type: none"> <li>• whether the pre-2010 data from the FEIS marine baseline studies are directly comparable with the post-2020 data, and to what extent;</li> <li>• what additional sampling will be conducted prior to Steensby Port construction to augment the marine baseline, and to what extent will it be directly comparable to the earlier data;</li> <li>• whether the same sampling sites, methods, and parameters will be monitored when the southern route is operational, and</li> <li>• when Baffinland plans to seek MEWG input on the design and implementation of marine monitoring programs and collection of further</li> </ul>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.1 Meteorology and climate, PCC 1</p> <p><b>Page:</b> 58 (PDF p. 76 of 641)</p> <p><b>Section:</b> 4.6.10 Marine environment, PCC 83</p> <p><b>Page:</b> 295 (PDF p. 313 of 641)</p> <p><b>Section:</b> 4.6.10 Marine environment, PCC 83a</p>	Pre-2010 studies at Steensby Inlet included oceanography/water quality, sediment quality, phytoplankton, zooplankton, benthic infauna community, fish community sampling, length-weight and tissue analysis (metals) of Arctic char, video surveys of fish and fish habitat. Post-2020 studies conducted to date include oceanographic/water quality studies (currents, tides, temperature, salinity), sediment quality, benthic infauna community, fish community sampling, video surveys of fish and fish habitat. There is substantial overlap in parameters, scope and methods. The sampling sites were not exactly matched in the two time periods as these were responsive to evolving plans for port design. Also, the 2021 and 2022 data collection program was designed to meet requirements of an FAA permit application and Disposal-at-sea (DAS) permit application, and not to support a future Environmental Effects Monitoring (EEM) program. Baffinland is presently designing an EEM program for Steensby Port, with Year 0 sampling planned for summer of 2025 prior to the start of any marine-based construction activities. Baffinland will consult with MEWG members prior to execution of this program to discuss design elements.

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		<p>Design of the marine monitoring programs to be used during the operations phase should be established now, based on lessons learned at Milne Inlet, to ensure the parameters, methods, and sampling locations are comparable over time, to improve their power to detect changes, and allow fulsome review by intervenors.</p>	<p>marine baseline data from the southern route.</p>	<p><b>Page:</b> 301 (PDF p. 314-319 of 641)</p> <p><b>Section:</b> 4.6.10 Marine environment, PCC 99</p> <p><b>Page:</b> 335 (PDF p. 353 of 641)</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024. Appendix G.1 2021-2022 Physical Oceanographic Program [240503-08MN053-2023 Annual Report-App G-Steensby Oceanography-IMRE.pdf]</p> <p><b>Section:</b> 1.2</p> <p><b>Page:</b> 1 (PDF p. 8 of 68)</p> <p><b>Document Name:</b> WSP 2023 Presentation to the December 13, 2023 meeting of the Marine Environment Working Group (MEWG) entitled "Baffinland 2023 Marine Monitoring Programs – Field Program Summary, 13 December 2023", 66 pp. [WSP_DEC2023_MEWG_ENG_IKT-compressed.pdf]</p>	
105	<p><b>QIA 2023 NIRB MAE #28.</b></p>	<p>PCC 13 encourages Baffinland to work with DFO at the regulatory phase and to take a precautionary approach when selecting the overpressure threshold to be applied to explosives use for the protection of fish and aquatic life (see also PCCs 14a, 44, 48, 116, 117, 118). Use of explosives in or near water was not required in 2023, but will be required to construct the southern railway and associated infrastructure.</p> <p>Reviews by Cott et al. (2003) and Godard et al. (2008) have found significant evidence that the 100 kPa overpressure DFO blasting guideline (Wright and Hopky 1998) does not provide sufficient protection for various life stages of fish.</p>	<p>QIA requests Baffinland follow the more precautionary 50 kPa overpressure threshold for all Project activities in or near water, and clarify in its discussions of related PCCs whether it has followed this threshold.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.3 Noise &amp; Vibration PCC 13  <b>Page:</b> 91 (PDF p. 109 of 641)</p>	<p>As noted by QIA, Baffinland has previously committed to adhere to the 50 kPa threshold, such as in Section 2.3.6.4 of the AEMP: "Baffinland applies a more stringent overpressure threshold of 50 kPa instead of the published 100 kPa threshold identified by Wright and Hopky (1998)".</p> <p>Baffinland will adhere to the 50 kPa overpressure threshold during construction and operation of Steensby Port and other infrastructure along the southern route.</p>

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		<p>They have recommended that instantaneous overpressure changes not exceed 50 kPa. During numerous document updates (e.g., AEMP, SWAEMP) and reviews over the past several years Baffinland has agreed to follow the more protective 50 kPa threshold for work in or near fish bearing water, but this is not reflected in the Annual Report discussion.</p> <p>Will BIM adhere to the 50 kPa overpressure threshold during construction and operation of Steensby Port and other infrastructure along the southern route?</p> <p><u>References</u></p> <p>Cott, P.A., Hanna, B.W., and Dahl, J.A. 2003. Discussion on seismic exploration in the Northwest Territories 2000-2003. Can. Manuscr. Rep. Fish. Aquat. Sci. 2648: vi + 36 p.</p> <p>Godard, D.R., Peters, L., Evans, R., Wautier, K., Cott, P.A., Hanna, B., and Palace, V. 2008. Histopathological assessment of the sub-lethal effects of instantaneous pressure changes (IPCs) on Rainbow Trout (<i>Onchorhynchus mykiss</i>) early life stages following exposure to detonations under ice cover. Environmental Studies Research Funds Report 164. Winnipeg. 93 p.</p> <p>Wright, D.G., and G.E. Hopky. 1998. Guidelines for the use of explosives in or near Canadian fisheries waters. Can. Tech. Rep. Fish. Aquat. Sci. 2107: iv + 34 p.</p>		<p><b>Section:</b> 4.6.3 Noise &amp; Vibration PCC 14a  <b>Page:</b> 96 (PDF p. 114 of 641)</p> <p><b>Section:</b> 4.6.7 Freshwater Environment, PCC 44  <b>Page:</b> 176 (PDF p. 194 of 641)</p> <p><b>Section:</b> 4.6.7 Freshwater Environment, PCC 48  <b>Page:</b> 182 (PDF p. 202 of 641)</p> <p><b>Section:</b> 4.6.11 Marine Wildlife, PCC 116  <b>Page:</b> 399 (PDF p. 417 of 641)</p> <p><b>Section:</b> 4.6.11 Marine Wildlife, PCC 117  <b>Page:</b> 400 (PDF p. 418 of 641)</p> <p><b>Section:</b> 4.6.11 Marine Wildlife, PCC 118  <b>Page:</b> 402 (PDF p. 420 of 641)</p>	
106	QIA 2023 NIRB MAE #29.	<p>In the 2023 Marine Environmental Effects Monitoring Program (MEEMP) report (PCC 76) Baffinland has expressed concern regarding the ongoing problem of limited statistical power to detect changes, and may consider "<i>assessing differences between Fishing Areas using effect sizes rather than a strict adherence to statistical significance.</i>" (App. G.6.8, p. vii).</p>	<p>QIA requests Baffinland report both effect sizes and statistical power.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.10 Marine Environment, PCC 76</p> <p><b>Page:</b> 277-280 (PDF p. 2304- 305 of 641)</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact</p>	<p>Effect size and statistical power are complementary metrics that are currently being reported together and will continue to be reported in the MEEMP annual reports. The specific example cited by QIA is in relation to fish community monitoring and was presented as a suggestion to handle cases of lack of statistical significance, despite medium or large effect sizes, due to the inherent high variability of the data. Relying more heavily on the effect sizes, rather than on the statistical significance, is a conservative approach to result interpretation.</p>

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				<p>Review Board, May 3, 2024 App. G.6.8 2023 Marine Environmental</p> <p>Effects Monitoring Program Report (NIRB Registry file: Appendix G.6.8 - 2023 Final Marine Environmental Effects Monitoring Program Report – Full.pdf)</p> <p><b>Section:</b> Exec. Summ., Marine fish community</p> <p><b>Page:</b> vii (PDF p. 8 of 1778)</p>	
107	<p><b>QIA 2023 NIRB MAE #30.</b></p>	<p>In its annual summary for PCC 78, Baffinland cites two recent studies that it has commissioned for the southern route, one on an aerial survey of the sea ice (VIC 2024) and another on a modelling study of sea ice thickness (VIC 2023). Both studies provide useful information and raise important questions related to gaps in the understanding of sea ice conditions along the shipping route.</p> <p>The aerial survey was conducted between 28 June and 1 July 2023, when ice break-up/melting processes were ongoing in a majority of the survey area (VIC 2023). This limited the ability of onboard radar to identify ridge structure in fields of pack ice. No ice ridges were identified visually or using the aircraft's onboard radar. Icebergs were identified visually and using the onboard radar. Reflections (echoes) from other ice features made it difficult to identify icebergs in pack ice, so most were located in open water.</p> <p>The aerial survey did not cover Steensby Inlet or the northern half of Foxe Basin (VIC 2023). However, ice conditions in along this portion of the route, and the presence of old ice (growlers) and ice of land origins (icebergs) from Prince Charles Island to the eastern entrance of Hudson Strait, are expected to define the requirements of marine shipping via the southern route when ice is present.</p> <p>Modelling and satellite observations of sea ice cover have been used to estimate landfast ice thickness in the Steensby Inlet area (VIC 2023). In situ measurements of ice thickness are needed along the southern shipping route--including</p>	<p>QIA requests Baffinland clarify what further studies will be conducted to ensure Project vessels are capable of operating safely along the entire southern route in open water, during shoulder seasons, and in winter.</p> <p>QIA further requests Baffinland provide reports on future sea ice studies with the annual reporting to NIRB.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.10 Marine Environment, PCC 78</p> <p><b>Page:</b> 286-287 (PDF p. 299- 305 of 641)</p>	<p>No additional studies are anticipated at this time. Should any be commissioned Baffinland will provide them to the NIRB through the annual reporting process.</p>

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		<p>Steensby Port, particularly in areas where there is landfast ice, and at ice edges and pressure ridges where ice push can create much thicker ice barriers to shipping (VIC 2023). The thickness of brash ice that forms in old shipping channels (tracks) is also a consideration as it determines the ice resistance acting on ships proceeding along the channel.</p> <p>At least four (4) polynyas form in northeastern Foxe Basin along or near the southern shipping route (VIC 2023). The timing of their ice edge formation (November 1 - January 1) and disappearance (24 June - 24 July) varies, and their extents are not always captured by the CIS ice charts. These features typically provide key wintering habitat for marine mammals and birds, but are difficult to study due to the low winter light conditions, so more information is needed on their persistence and importance to regional wildlife.</p> <p>QIA is concerned by the important gaps in knowledge of sea ice conditions along the southern route, particularly related to ice thickness and quality in Foxe Basin and Steensby Inlet; the presence of pressure ridges, multi-year ice, and icebergs; and the persistence and importance of polynyas. What further ice studies are planned to fill these gaps and inform shipping requirements, safety and spill response, and environmental impacts?</p> <p>References:            Viking Ice Consultancy (VIC), 2023. Steensby Inlet Iron Ore Shipping Project. Fixed Wing Survey. June 2023. PDF 31 pp. [Fixed Wing Survey Report_VIC-BAF-009.pdf]            Viking Ice Consultancy (VIC), 2024b. Steensby Inlet Fast Ice study. 2024. [Fast Ice Report_VIC-R-BAF-010.pdf]</p>			
108	QIA 2023 NIRB MAE #31.	<p>Baffinland states "All ships arriving at Milne Port in 2023 were compliant with either the D-1 standard or the D-2 standard of the BWM Convention." (2023 NIRB AMR, PCC 88, p. 316). This does not mean that all of the vessels equipped for ballast water treatment met the D-2 standards for reducing the number of live organisms in their ballast water. While salinity testing suggests that all of the vessels (PCC 88, Table 4.2.3, p. 314ff) have conducted at least some mid-ocean exchange of ballast, and most have treatment systems in place, lack of biological testing of their ballast water means</p>	<p>QIA requests Baffinland, following the Risk-based assessment of ship's ballast water, apply the lessons learned to mitigate risk from the introduction of non-indigenous species via Project vessel ballast water, and continue sampling Project vessels to ensure that their treatment practices and systems are meeting both the D-1 and D-2 standards.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board, May 3, 2024 (Main report, file "240503-08MN053-2023 Annual Report-Main Body-IMRE.pdf")</p> <p><b>Section:</b> 4.6.10 Marine Environment, PCC 88</p> <p><b>Page:</b> 309-311 (PDF p. 327- 329)</p>	<p>As per DFO-TRC-02 from the Sustaining Operations Proposal (SOP) commitments:</p> <ul style="list-style-type: none"> <li>• Baffinland will update the Risk Assessment for Introductions of Aquatic Invasive Species from Ballast Water in collaboration with DFO after the Milne Port Biological Ballast Water Sampling Program is complete and the results are available.</li> <li>• Baffinland will continue to support the collection of biological data to evaluate efficacy of ballast management measures and identify species of concern, in collaboration with DFO, through the Milne Port Biological Ballast Water Study Program initiated in 2023 (as outlined in 210324-08MN053-DFO Draft Ballast Study Plan- IT4E.pdf).</li> </ul>

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		<p>that the efficacy of these treatment systems under Project operating conditions is uncertain.</p> <p>In 2023, DFO and Baffinland conducted a Pilot Project to inform the design and execution of a two-year, risk-based biological study of Project ore carrier ballast water (Howland 2023; see also 2023 NIRB AMR, App. G.6.10, PCC 88, p. 309). The Pilot Project sampled ballast water from ore carriers that exchanged and treated their ballast water to reduce the risk of introducing non-indigenous species into Milne Port. Ballast water in two (2) of the four (4) vessels sampled did not meet the D-2 treatment standards for reducing the number of live organisms. Four other vessels were boarded but did not allow the study team to sample ballast water.</p> <p>International testing of ballast water has found that many vessels have treatment systems that are either unable to meet D-2 standards under their operating conditions, or are not properly maintained and/or operated (e.g., Drillet and Talbot 2021 – 36% non-compliant (NC); Jallal 2024 – 39% NC; Outinen et al. 2024 – 44 - 49% NC). The rate of compliance was higher for commissioning testing (i.e., when the treatment system was installed, 10% NC) than under normal operating conditions and compliance rates did not improve over time (2017-2023) (Outinen et al. 2024). Non-compliance was also observed in the concentration of total residual oxidant (TRO) remaining in the water discharged from some vessels (Drillet and Talbot 2021 – 22% NC; Jallal 2024 – 5% NC). These results mean compliance testing of ships’ ballast water should be undertaken to ensure that their treatment systems remain operational after commissioning and meet requirements of the D-2 standard (Outinen et al. 2024).</p> <p>The risk-based study will run in 2024 and 2025, and require greater assistance from Baffinland to ensure reliable access to vessels when it is possible to sample their ballast water. Given the high international rate of failure of ballast water treatment systems to meet D-2 standards (Drillet and Talbot 2021; Jallal 2024; Outinen et al. 2024), and planned increases in Project shipping via the southern route, ballast water monitoring should continue following the risk-based study to</p>			<ul style="list-style-type: none"> <li>Baffinland will update the Project-specific Risk Assessment for Introductions of Aquatic Invasive Species from Ballast Water in collaboration with DFO within six months after the Milne Port Biological Ballast Water Sampling Program is complete and the results are available. Final drafts and plain language summaries will be shared with the MEWG for discussion the first meeting following.</li> </ul>

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		<p>inform invasive species risk and mitigation in both Milne and Steensby ports.</p> <p><u>References</u></p> <p>Drillet, G., and Talbot, C. 2021. Study on the implementation of the Ballast Water Management Convention in Australia 2019-2020. Prepared by SGS Australia and SGS Global Marine Services, Perth Airport, WA for Australian Government Department of Agriculture, Water and the Environment, Canberra City, ACT. 23 pp. [IMO MEPC 76/INF.56 Annex, 36 pp.]</p> <p>Jallal, C. 2024. High non-compliance rates found in treated ballast water in Australian ports. <a href="https://www.rivieramm.com/news-content-hub/news-content-hub/high-non-compliance-rates-found-in-ballast-water-treatment-in-australian-ports-79464">https://www.rivieramm.com/news-content-hub/news-content-hub/high-non-compliance-rates-found-in-ballast-water-treatment-in-australian-ports-79464</a> [Accessed July 1, 2024]</p> <p>Outinen, O., Bailey, S.A., Casas-Monroy, O., Delacroix, S., Gorgula, S., Griniene E, Kakkonen, J.E., and Srebaliene, G. 2024. Biological testing of ships' ballast water indicates challenges for the implementation of the Ballast Water Management Convention. <i>Front. Mar. Sci.</i> 11:1334286.doi: 10.3389/fmars.2024.1334286</p>			
<b>SOCIOECONOMIC ENVIRONMENT</b>					
109	<b>QIA 2023 NIRB SE #1.</b>	<p>PC Condition 129 states, "The Proponent is strongly encouraged to engage in the work of the Qikiqtaaluk Socio-Economic Monitoring Committee along with other agencies and affected communities, and it should endeavor to identify areas of mutual interest and priorities for inclusion into a collaborative monitoring framework that includes socio-economic priorities related to the Project, communities, and the North Baffin region as a whole."</p> <p>Baffinland stated, "A 2-day meeting of the QSEMC took place May 2-3 2023 in Iqaluit". Additionally, the Socio-Economic Monitoring Report stated "Baffinland was able to meet with</p>	<p>QIA requests Baffinland engage in further discussions with QSEMC regarding shared interest and priorities and provide additional detail on what collaborative monitoring will occur.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.1, PC Condition 129</p> <p><b>Page:</b> 427 to 428 (PDF p. 445 to 456 of 641)</p>	<p>Baffinland and QIA are both participants of the QSEMC, and the frequency at which the QSEMC meets is at the discretion of the Government of Nunavut, who chairs and organizes these meetings. Baffinland is happy to have further discussions with QSEMC and through the Socio-Economic Working Group, which QIA is a member, to further discuss priorities and collaboration.</p>

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		the QSEMC in May 2023 to discuss 2022 socio-economic monitoring results."			
110	<b>QIA 2023 NIRB SE #2.</b>	<p>PC Condition 130 states, "The Proponent should consider establishing and coordinating with smaller socio-economic working groups to meet Project specific monitoring requirements throughout the life of the Project."</p> <p>Baffinland stated, "Baffinland will continue to engage with the QSEMC, SEMWG and North Baffin LSA communities on the Project's monitoring program and will consider establishing smaller, focused Socio- Economic Working Groups to address specific community issues or Project challenges if deemed appropriate."</p>	QIA requests Baffinland continue to engage the SEMWG and QSEMC and review specific monitoring requirements and determine if smaller socio-economic working groups are necessary.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.1, PC Condition 130</p> <p><b>Page:</b> 429 to 430 (PDF p. 447 to 448 of 641)</p>	Baffinland will continue to engage with the QSEMC and the SEMWG on the Project's socio-economic monitoring program. In addition, Baffinland regularly engages North Baffin community members through its community engagement program, and other committees that operate under provisions of the Inuit Impact and Benefit Agreement (IIBA), on various socio-economic topics.
111	<b>QIA 2023 NIRB SE #3.</b>	<p>PC Condition 131 states, "The Qikiqtaaluk Socio-Economic Monitoring Committee is encouraged to engage in the monitoring of demographic changes including the movement of people into and out of the North Baffin communities and the territory as a whole. This information may be used in conjunction with monitoring data obtained by the Proponent from recent hires and/or out-going employees in order to assess the potential effect the Project has on migration."</p> <p>The data used to monitor in migration of non-Inuit, out-migration of Inuit from the North Baffin LSA has not been updated since 2016. Additionally, Nunavut net migration data has not been updated since 2019.</p>	QIA requests Baffinland seek more reliable, updated sources on in-migration of Inuit from to the North Baffin LSA, out-migration of Inuit from North Baffin LSA, and Nunavut net migration rather than drawing information from 2016 and 2019 data.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.1, PC Condition 131</p> <p><b>Page:</b> 431 to 432 (PDF p. 449 to 450 of 641)</p>	<p>Baffinland continues to provide demographic change information in its annual socio-economic monitoring report and presents these data for review and discussion with the QSEMC on an annual basis.</p> <p>Updated data from the Government of Nunavut is not available for the indicators 'in-migration of non-Inuit to the North Baffin LSA' and 'out migration of Inuit from the North Baffin LSA'. For this reason, Baffinland continues to present data from various non-government sources (e.g. Inuit Employee Survey, BCLO migration survey, Baffinland human resources data) to help better understand this topic.</p> <p>These data are discussed in the <i>Population and Migration</i> section of Baffinland's annual Socio-Economic Monitoring Report. Baffinland will add this topic for discussion at the next SEMWG meeting to better understand if QIA has other sources of data for consideration.</p>
112	<b>QIA 2023 NIRB SE #4.</b>	<p>PC Condition 132 states, "The Proponent is encouraged to partner with other agencies such as Hamlet organizations in the North Baffin region, the Municipal Training Organization, and the Government of Nunavut in order to adapt pre-existing, or to develop new programs which encourage Inuit to continue living in their home communities while seeking ongoing and progressive training and development. Programs may include driver training programs offered within Hamlets, providing upgraded equipment to communities for use in municipal works, providing incentives for small businesses to remain operating out of their community of origin, or supplementing existing recreational facilities and programming in North Baffin communities."</p> <p>QIA agrees with Baffinland's assessment of compliance.</p>	<p>QIA requests Baffinland provide additional information regarding how programs such as the Work Ready Program, ABE, PASS or Pre-Trades training were adapted or changed.</p> <p>QIA requests Baffinland provide more information on their liaison with Nunavut Arctic College and their involvement in the promotion of work or mine-related programs.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.1, PC Condition 132</p> <p><b>Page:</b> 433 to 434 (PDF p. 451 to 452 of 641)</p>	<p>Baffinland's primary focus is to train people to work at the mining operation. The Community Work Ready Program has been enhanced in 2023 to focus on ensuring that its graduates have acquired skills to make them ready to take on employment at Baffinland or elsewhere, while continuing to be delivered over a five-day period in each of the five surrounding communities and Iqaluit.</p> <p>As part of the discussions with Inuit employees during their Career Development Plan, Baffinland discusses the possible options for those employees who wish to pursue further studies, such as apprenticeship program. For those who do not have a sufficient education level, we encourage them to apply to the ABE and PASS programs, or to take a Pre-trades program when it is available in their community. When advised that these programs are being delivered in a community, Baffinland</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
					<p>publishes it on its Employment and Training Facebook page and ensures that those employees who could benefit from it are informed.</p> <p>Baffinland will provide more detailed information on outreach with Arctic College in future reports. Baffinland is often invited to speak with the Environmental Technology Program students about its environmental monitoring programs and opportunities with Baffinland.</p>
113	<b>QIA 2023 NIRB SE #5.</b>	<p>PC Condition 133 states, "The Proponent is encouraged to work with the Qikiqtaaluk Socio-Economic Monitoring Committee and in collaboration with the Government of Nunavut's Department of Health and Social Services, the Nunavut Housing Corporation and other relevant stakeholders, design and implement a voluntary survey to be completed by its employees on an annual basis in order to identify changes of address, housing status (i.e., public/social, privately owned/rented, government, etc.), and migration intentions while respecting confidentiality of all persons involved. The survey should be designed in collaboration with the Government of Nunavut's Department of Health and Social Services, the Nunavut Housing Corporation and other relevant stakeholders. Non-confidential results of the survey are to be reported to the Government of Nunavut and the NIRB."</p> <p>Baffinland states, "In total, Baffinland collected 81 responses to the survey, representing a response rate of 22%. This represents an increase from an 18% response rate achieved in 2022, and 32.5 response rate achieved in 2020."</p> <p>QIA agrees with Baffinland's assessment of compliance.</p>	<p>QIA requests Baffinland describe how the survey was designed in collaboration with the Government of Nunavut's Department of Health and Social Services, the Nunavut Housing Corporation. Baffinland to discuss the option to take an online survey to increase survey response rate.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.1, PC Condition 133</p> <p><b>Page:</b> 435 to 439 (PDF p. 453 to 457 of 641)</p>	<p>Baffinland actively engages and collaborates with the QIA, CIRNAC, and the Government of Nunavut on the Inuit Employee Survey through the Socio-Economic Monitoring Working Group. Baffinland will add this topic for discussion at the next SEMWG meeting.</p>
114	<b>QIA 2023 NIRB SE #6.</b>	<p>PC Condition 134 states, "The Proponent shall include with its annual reporting to the NIRB a summation of employee origin information as follows:</p> <ol style="list-style-type: none"> <li>a. The number of Inuit and non-Inuit employees hired from each of the North Baffin communities, specifying the number from each.</li> <li>b. The number of Inuit and non-Inuit employees hired from each of the Kitikmeot and Kivalliq regions, specifying the number from each.</li> </ol>	<p>QIA requests Baffinland provide further information on the location of the three international employees. Baffinland to describe why FTEs are reported over headcounts.</p> <p>QIA notes that this is the same request as last year.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.1, PC Condition No. 134</p> <p><b>Page:</b> 440 to 443 (PDF p. 458 to 461 of 641)</p>	<p>Information relating to the three (3) FTEs is provided in results section of Term and Condition no. 134 in the 2023 NIRB Annual Report.</p> <p>Baffinland provides employment summaries through full-time equivalent (FTE) and headcount tools in its annual reports. An FTE is used to describe the number of workers employed at Mary River. One FTE represents 2,184 hours, which is the approximate time one person works on a full-time basis for a year on a three-week in/three-week out rotational schedule. Reporting on FTEs represents the number of people who would work at the mine site during a year if every person worked the full year in a full-time position. Mining operators across Nunavut use FTEs when reporting on employment numbers. Headcount, in contrast, provides a count of the</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		<p>c. The number of Inuit and non-Inuit employees hired from a southern location or other province/territory outside of Nunavut, specifying the locations and the number from each.</p> <p>d. The number of non-Canadian foreign employees hired, specifying the locations and number from each foreign point of hire."</p> <p>Baffinland does not provide the information required by this PC Condition. Specifically, employee origin information is represented as Full Time Equivalents (FTE) rather than a headcount of employees and contractors hired from different origins. Information on hires from the Kitikmeot region is not provided. Annual levels of employment for various demographics over different geographical areas are not synonymous with predictions of average annual working hours for one employee.</p>			number of people employed at a given time and therefore is not indicative of actual hours worked by employees.
115	QIA 2023 NIRB SE #7.	<p>PC Condition 135 states, "The Proponent is encouraged to consider offering additional options for work/study programs available to Project employees (in addition to study programs at project sites that would be offered to employees when off-shift)."</p> <p>QIA agrees with Baffinland's assessment of compliance.</p>	QIA requests Baffinland continue to provide information on any additional offerings for work/study programs available, including whether participants were hired by the company.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.2, PC Condition No. 135</p> <p><b>Page:</b> 445 to 447 (PDF p. 463 to 465 of 641)</p>	Baffinland will continue to report on work/study programs available to Project employees.
116	QIA 2023 NIRB SE #8.	<p>PC Condition 136 states, "The Proponent is encouraged to work with training organizations and/or government departments offering mine-related or other training in order to provide additional opportunities for employees to gain meaningful and transferable skills, credentials and certifications especially where such training of employees offered by the Proponent remains valid only at the Mary River Project sites."</p> <p>QIA agrees with Baffinland's assessment of compliance.</p>	QIA encourages Baffinland to provide credentials and certificates that can be transferrable to other workplaces and the number of employees that take part.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.2, PC Condition No. 136</p> <p><b>Page:</b> 448 to 450 (PDF p. of 641)</p>	Baffinland will continue to provide opportunities to its employees when possible. For example, in 2023, one Inuk employee from our Information Technology department successfully passed a Cisco Certified Network Associate course with an external training organization. This is transferrable to other workplaces.
117	QIA 2023 NIRB SE #9.	<p>PC Condition 137 states, "Prior to construction, the Proponent shall develop an easily referenced listing of formal certificates and licenses that may be acquired via on-site training or training during employment at Mary River, such listing to indicate which of these certifications and licenses would be transferable to a similar job site within Nunavut. This listing should be updated on an annual basis and is to be</p>	QIA requests Baffinland clarify where this information is located for easy access to training participants or employees.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.2, PC Condition No. 137</p>	Baffinland provides this information to any employee who requests it. To make it easier to find, we will look at posting this on a bulletin board in the Training Department.

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		provided to the NIRB upon completion and whenever it is revised."  QIA agrees with Baffinland's assessment of compliance.		Page: 451 to 452 (PDF p. 469 to 470 of 641)	
118	QIA 2023 NIRB SE #10.	PC Condition 139 states, "Prior to commencing construction, the Proponent is requested to undertake and provide the results of a detailed labour market analysis which provides quantitative predictions of the number of employees that may reasonably need to be sourced from southern Canada and from foreign markets, identifying where applicable, the country of origin for the foreign labour. Within 90 days of the issuance of the Project Certificate, the Proponent is required to submit an updated Labour Market Analysis which considers requirements of the Early Revenue Phase as well as hiring points within Nunavut and outside of the North Baffin region and RSA."  QIA does not agree with Baffinland's assessment of compliance. Baffinland does not provide the information required by this PC Condition. Baffinland does provide an explanation for the purpose of a Labour Market Analysis and expresses the need to source skilled employees from Southern Canada and foreign countries. However, they do not provide the requested quantitative number of these hires. Baffinland also does not provide which country, if any, from which they hire foreign workers.	QIA requests Baffinland report on the quantitative number of southern/foreign employees as well as directly address the point of hiring foreign labour by indicating the number of employees sourced from foreign markets and the country of origin of foreign labour.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board  <b>Section:</b> 4.7.2, PC Condition No. 139  <b>Page:</b> 455 to 457 (PDF p. 473 to 475 of 641)	The labour market review is conducted every 3 years to align the results close to census data. NIRB's previous assessment on this TC was "In Compliance - Baffinland provided a revised labor market analysis in the 2014 Annual Report." In 2022, Baffinland and QIA continued to work with Mining Industry Human Resources Council to develop a skills equivalency to assess Inuit skills and knowledge acquired through traditional skills as opposed to southern education. Baffinland is in compliance with Term and Condition No. 139.  All employees from territory as well as southern employees are all reported and is captured in TC no. 134.
119	QIA 2023 NIRB SE #11.	PC Condition 140 states, "The Proponent is encouraged to survey Nunavummiut employees as they are hired and specifically note the level of education obtained and whether the incoming employee resigned from a previous job placement or educational institution in order to take up employment with the Project."  QIA believes the information provided to be insufficient. Baffinland states they survey employee candidates on the level of education and current employee status. However, they do not provide the results of this assessment.	QIA requests Baffinland to bring reporting into compliance with the PC Condition, by providing the results of a survey detailing the employees' level of education and previous employment status.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board  <b>Section:</b> 4.7.2, PC Condition No. 140  <b>Page:</b> 458 to 461 (PDF p. 476 to 479 of 641)	Baffinland provides high-level results of new hire employees' level of education and previous employment status in the Results section of Term and Condition no. 144 in the 2023 NIRB Annual Report. These data are discussed in detail in the Employment and Livelihood section (refer to page 35 and 36) of the 2023 Socio-Economic Monitoring Report, appended to the 2023 NIRB Annual Report.  Baffinland is therefore in compliance with PC Term and Condition No. 140.
120	QIA 2023 NIRB SE #12.	PC Condition 144 states, "The Proponent is encouraged to make requirements for employment clear in its work-readiness and other public information programs and documentation, including but not limited to: education	QIA requests Baffinland provide Inuit employees with information regarding their rights under the IIBA.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board	This information will continue to be provided in the IIBA Orientation.

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		<p>levels, criminal records checks, policies relating to drug and alcohol use and testing, and language abilities.”</p> <p>QIA agrees with Baffinland's assessment of compliance.</p>		<p><b>Section:</b> 4.7.3, PC Condition No. 144</p> <p><b>Page:</b> 471 (PDF p. 489 of 641)</p>	
121	<b>QIA 2023 NIRB SE #13.</b>	<p>PC Condition 145 states, “The Proponent is encouraged to work with the Government of Nunavut and the Qikiqtaaluk Socio-Economic Monitoring Committee to monitor the barriers to employment for women, specifically with respect to childcare availability and costs.”</p> <p>Baffinland stated, “Appropriate community-level indicator data are currently unavailable for the topic of childcare availability and costs.” Additionally, Baffinland did not provide any data on how barriers in the employment of women are affected by childcare availability and costs.</p>	<p>QIA requests Baffinland seek community-led indicator data on the topic of barriers to the employment of women with respect to childcare availability and costs.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.3, PC Condition No. 145</p> <p><b>Page:</b> 472 to 474 (PDF p. 490 to 492 of 641)</p>	<p>Baffinland administered its Inuit Employee Survey in Q4 of 2023, where questions relating to childcare availability and cost were posed to Inuit employees at Mary River. This is one of the several avenues Baffinland is able to track the barrier of childcare availability. Other avenues include data obtained from employee exit interviews and the Arnait Action Committee .The Committee focuses on engaging with Inuit women who work at site to understand existing barriers affecting their inclusion in the workplace. Lack of dependable childcare was identified as a barrier during 2023 committee discussions.</p> <p>Baffinland looks forward to engaging with the Government of Nunavut and Government of Canada to identify and better understand community-level indicator data regarding the topics of childcare availability and cost at future QSEMCs.</p>
122	<b>QIA 2023 NIRB SE #14.</b>	<p>PC Condition 147 states, “The Proponent is encouraged to work with the Government of Nunavut and the Nunavut Housing Corporation to investigate options and incentives which might enable and provide incentive for employees living in social housing to maintain employment as well as to negotiate for and obtain manageable rental rates.”</p> <p>QIA agrees with Baffinland's assessment of compliance.</p>	<p>QIA requests Baffinland to detail the efforts and discussions taken place regarding the negotiation for manageable rental rates and potentially emphasize this in the basic financial literacy training currently offered.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.3, PC Condition No. 147</p> <p><b>Page:</b> 476 to 477 (PDF p. 494 to 495 of 641)</p>	<p>The Nunavut Housing Corporation is responsible for the setting of rent scales and the development of housing-related policy. Baffinland will continue to communicate housing-related issues, especially those relating to Project employees, through its annual reporting (i.e. SEMR, NIRB Annual Report). Baffinland will also continue to engage and discuss housing-related issues with the GN and NHC through the SEMWG and QSEMC processes.</p> <p>Baffinland will remain open to any discussions relating to housing the GN and NHC wishes to have.</p>
123	<b>QIA 2023 NIRB SE #15.</b>	<p>PC Condition 148 states, “The Proponent is encouraged to undertake collaborative monitoring in conjunction with the Qikiqtaaluk Socio-Economic Monitoring Committee's monitoring program which addresses Project harvesting interactions and food security, and which includes broad indicators of dietary habits.”</p> <p>Baffinland stated a new question was added to the Inuit Employee Survey regarding food security and whether total household income was enough to meet respondent's needs.</p>	<p>QIA requests Baffinland provide detailed information regarding broad indicators of dietary habits.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.4, PC Condition No. 148</p> <p><b>Page:</b> 480 to 486 (PDF p. 498 to 504 of 641)</p>	<p>Baffinland has been waiting for the submission of the Pond Inlet Country Food Baseline Study, the CRLU Assessment and the Inuit Stewardship Plan before making any amendments to its own monitoring programs. It is important Baffinland and QIA do not duplicate efforts and add any unnecessary consultation requirements on Inuit. Baffinland encourages QIA to complete the work it has assumed so all parties can benefit from the information that has been collected since 2020 that could address the issues identified in this comment.</p> <p>Baffinland tracks food security indicators for Project employees through the annual Inuit Employee Survey. Furthermore, Baffinland does provide information regarding dietary habits through the monitoring of annual harvesting rates for narwhal and</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		QIA believes the information provided to be insufficient. Broad indicators of dietary habits from the conclusions drawn on food security are not detailed.			caribou in North Baffin communities. Refer to table 4.46 and 4.47 in the 2023 NIRB Annual Report.  Baffinland is therefore in compliance with PC Term and Condition No. 148.
124	<b>QIA 2023 NIRB SE #16.</b>	<p>PC Condition 149 states, "Prior to the commencement of operations, the Proponent is required to undertake an analysis of the risk of temporary mine closure, giving consideration to how communities in the North Baffin region may be affected by temporary and permanent closure of the mine, including economic, social and cultural effects and taking into consideration the potential drop in employment between the construction and operations phases of the Project."</p> <p>Baffinland stated, "Due to experiencing operational uncertainty and the Project being assessed as being in a 'moderate to high' risk profile for temporary closure in 2022, Baffinland implemented a variety of mitigation measures to promote the wellbeing employees in the event of temporary closure." However, the risk profile for 2023 was not discussed.</p>	QIA requests Baffinland indicate the risk profile for temporary closure in 2023.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.4, PC Condition No. 149</p> <p><b>Page:</b> 487 to 488 (PDF p. 505 to 506 of 641)</p>	The risk profile for temporary closure in 2023 is low. Baffinland is committed to continuing and expanding its operations, as indicated through the submission of the Sustaining Operations Proposal 2 (SOP2) to the NIRB, which represents a longer-term application of sustained 6 Mtpa activity levels along the Northern Transportation Corridor.
125	<b>QIA 2023 NIRB SE #17.</b>	<p>PC Condition 150 states, "The proponent will ensure the following:</p> <p>The Proponent will maintain, where possible, a minimum flying altitude of 2,000 feet over the park, except for approaches to land, take-off or for safety reasons:</p> <p>The Proponent will ensure that certification of noise compliance is current, where compliance is applicable</p> <p>For the purpose of briefing Park visitors, the Proponent will provide Parks Canada (1) prior to commencing the shipping season, with planned daily shipping schedules, and (2) annually, with air traffic information, and (3) to provide updates when significant variations from these are expected</p> <p>The Proponent is strongly encouraged to provide due consideration to wilderness experience during its operations in the open water season, especially during the month of August which is typically a time of high use by sea kayakers."</p>	<p>QIA requests Baffinland provide all required information identified in PC Condition 150.</p> <p>QIA requests Baffinland to include all required information in future Annual Reports.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.4, PC Condition No. 150</p> <p><b>Page:</b> 489 to 492 (PDF p. 507 to 510 of 641)</p>	<p>PC condition 150 describes how Baffinland ensures these conditions are met.</p> <p>All flights flown across Sirmilik National park were above 2,000 feet. Parks Canada also confirmed at May 13<sup>th</sup> MEWG meeting that scientific and research activities that the MMASP is exempt from the 2,000 feet altitude restriction across Tallurutiup Imanga National Marine Conservation Area.</p> <p>Daily shipping schedules are publicly available on Baffinland's Facebook page as well can be accessed on Baffinland's website in real time. Baffinland will tag Parks Canada on its Facebook posts in the 2024 season and circulate the rolling 10 day schedule to the MEWG .</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		QIA does not agree with Baffinland's assessment of compliance. Baffinland does not provide the information detailing efforts to ensure current noise compliance certification, planned daily shipping schedules, annual air traffic information, and considerations to wilderness experience during its operations in open water season.			
126	QIA 2023 NIRB SE #18.	<p>PC Condition 151 states, "The Proponent is encouraged to investigate measures and programs designed to assist Project employees with homeownership or access to affordable housing options."</p> <p>QIA believes the information provided to be insufficient. Baffinland stated "In 2023, Baffinland continued to provide basic financial literacy training, which covered topics such as budgeting that considers rent/housing as well as loans, through the Work Ready Program (WRP)." However, Baffinland has not implemented measures to assist access to affordable housing for their employees, despite statistics demonstrating a lack of knowledge from their employees on the topic.</p>	QIA requests Baffinland consider additional programs or measures to facilitate homeownership or access to affordable housing.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.4, PC Condition No. 151</p> <p><b>Page:</b> 493 to 495 (PDF p. 511 to 513 of 641)</p>	<p>Baffinland provides basic financial literacy training, which covers topics such as budgeting that considers rent/housing, as well as loans, through the Work Ready Program (WRP).</p> <p>Results from Baffinland's Inuit Employee Survey indicate a large proportion are unaware of how to go about purchasing a home and/or are unaware of housing-related programs available through the NHC. Baffinland recognizes these potential barriers to homeownership by Project employees and looks forward to engaging with the GN and the NHC to connect employees to housing-related government resources.</p> <p>Baffinland is therefore in compliance with PC Term and Condition No. 151.</p>
127	QIA 2023 NIRB SE #19.	<p>PC Condition 153 states, "The Proponent is encouraged to employ a mental health professional to provide counselling to Inuit and non-Inuit employees in order to positively contribute toward employee health and well-being."</p> <p>QIA agrees with Baffinland's assessment of compliance.</p>	QIA requests Baffinland provide information about access to mental health counseling for employees who are not on site.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.5, PC Condition No. 153</p> <p><b>Page:</b> 519 to 521 (PDF p. 501 to 503 of 641)</p>	Baffinland's benefit plan includes an Employee and Family Assistance Program, which offers employees (both on- and off-site) and their dependents professional short-term counselling as well as topic-specific life coaching on an as-needed basis. Pursuant to the IIBA, Baffinland provides Inuit employees with access to professional career counselling and professional counselling for personal issues on an as-needed basis. Such services are available from Inuktitut-speaking counsellors through the Ilisaqsivik Society, and are available to Inuit employees, both on an off site
128	QIA 2023 NIRB SE #20.	<p>PC Condition 154 states, "The Proponent shall work with the Government of Nunavut and the Qikiqtaaluk Socio- Economic Monitoring Committee to monitor potential indirect effects of the Project, including indicators such as the prevalence of substance abuse, gambling issues, family violence, marital problems, rates of sexually transmitted infections and other communicable diseases, rates of teenage pregnancy, high school completion rates, and others as deemed appropriate."</p> <p>"Absence from the community during work rotation / Prevalence of gambling issues / Prevalence of family violence / Prevalence of marital problems / Rates of teenage</p>	QIA requests Baffinland outline the specific information that is tracked through the QSEMC process.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.5, PC Condition No. 154</p> <p><b>Page:</b> 504 to 505 (PDF p. 522 to 523 of 641)</p>	Baffinland tracks information relating to Valued Socio-economic Components as defined in the Project's Socio-economic Monitoring Plan (SEMP) through the QSEMC process. As topics discussed during QSEMC meetings vary annually, information captured through the QSEMC process varies year-to-year. Information gathered through the QSEMC process is integrated into Baffinland's annual SEMR, where relevant.

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		pregnancy" is added as an indicator in Appendix G.7.1; however, specific data is not discussed.			
129	<b>QIA 2023 NIRB SE #21.</b>	<p>PC Condition 155 states, "The Proponent is strongly encouraged to provide the NIRB with an updated report on its development of mitigation measures and plans to deal with potential cultural conflicts which may occur at site as these may become needed."</p> <p>QIA believes the information provided to be insufficient. Baffinland provides information regarding mitigation measures to deal with potential cultural conflicts. However, Baffinland does not demonstrate any intent to provide NIRB with an updated report as encouraged by the PC Condition.</p>	QIA requests Baffinland describe their intent in providing an updated report outlining the detailed action taken in to deal with conflict at site.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.5, PC Condition No. 155</p> <p><b>Page:</b> 506 to 508 (PDF p. 524 to 526 of 641)</p>	<p>The author has not provided any additional information, or indicated a deficiency with Baffinland's previous response. Baffinland has provided a list of mitigation measures whose aim are to encourage on-site cohesion of employees through cultural awareness and social programs, which are found in pp. 506 - 508 of the 2023 NIRB Annual Report. Baffinland is therefore in compliance with PC Term and Condition No. 155.</p> <p>Baffinland has no additional information to provide at this time.</p>
130	<b>QIA 2023 NIRB SE #22.</b>	<p>PC Condition 157 states, "The Proponent should consider providing counseling and access to treatment programs for substance and gambling addictions as well as which address domestic, parenting, and marital issues that affect employees and/or their families."</p> <p>QIA agrees with Baffinland's assessment of compliance.</p>	QIA requests Baffinland continue to promote the EFAP to employees and their families.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.5, PC Condition No. 157</p> <p><b>Page:</b> 512 to 513 (PDF p. 530 to 531 of 641)</p>	Baffinland will continue to make the EFAP available to Project employees and their families.
131	<b>QIA 2023 NIRB SE #23.</b>	<p>PC Condition 158 states, "The Proponent is encouraged to work with the Government of Nunavut and other parties as deemed relevant in order to develop a Human Health Working Group which addresses and establishes monitoring functions relating to pressures upon existing services and costs to the health and social services provided by the Government of Nunavut as such may be impacted by Project-related in-migration of employees, to both the North Baffin region in general, and to the City of Iqaluit in particular."</p> <p>Baffinland stated, "Baffinland signed an MoU directly related to health care services with the GN Department of Health in 2017 regarding site health services and medevac procedures. More specifically, the MoU describes the health care staff and services Baffinland will provide on-site". However, Baffinland did not state whether there is currently a plan to develop a Human Health Working Group.</p>	QIA requests Baffinland develop a Human Health Working Group alongside the Government of Nunavut.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.7.6, PC Condition No. 158</p> <p><b>Page:</b> 516 to 518 (PDF p. 530 to 536 of 641)</p>	Baffinland actively engages the Government of Nunavut through the SEMWG and QSEMC. Baffinland presents indicator performance data relating to pressure on existing health and social services through these working groups. Furthermore, Baffinland engages with the GN through an MOU directly related to health care services with the GN's Department of Health. The development of an additional working group to discuss human health with the Government of Nunavut would be repetitious in nature.
132	<b>QIA 2023 NIRB SE #24.</b>	PC Condition 167 states, "The Proponent and the Government of Nunavut are strongly encouraged to, as soon as practical following the issuance of the Project Certificate,	QIA requests Baffinland negotiate a Development Partnership Agreement with the Government of Nunavut.	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p>	Baffinland and the Government of Nunavut cannot negotiate a Development Partnership Agreement as instructed by PC Term and Condition No. 167 as the program no longer exists.

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		enter into discussions to negotiate a Development Partnership Agreement."  Baffinland stated, "a DPA between the GN and Baffinland has not yet been formalized" and "In lieu of a Development Partnership Agreement, Baffinland and the GN signed a Memorandum of Understanding (MoU) in 2019".		<b>Section:</b> 4.7.8, PC Condition No. 167  <b>Page:</b> 539 (PDF p. 557 of 641)	
133	<b>QIA 2023 NIRB SE #25.</b>	PC Condition 168 states, "The specific socio-economic variables as set out in Section 8 of the Board's Report, including data regarding population movement into and out of the North Baffin Communities and Nunavut as a whole, barriers to employment for women, project harvesting interactions and food security, and indirect Project effects such as substance abuse, gambling, rates of domestic violence, and education rates that are relevant to the Project, be included in the monitoring program adopted by the Qikiqtani Socio-Economic Monitoring Committee."	Refer to requests under PC Term and Condition 140, 145, 148 and 154.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board  <b>Section:</b> 4.7.8, PC Condition No. 168  <b>Page:</b> 541 to 544 (PDF p. 559 to 562 of 641)	QIA requests have been addressed in Baffinland's response to PC Terms and Conditions identified.
<b>INUIT KNOWLWDGE, CULTURE, LAND AND RESOURCE USE &amp; INUIT QUAJIMAJATUQANGIT</b>					
134	<b>QIA 2023 NIRB CRLU/IQ #1.</b>	PC Condition 164 states, "The Proponent is required to provide notification to communities regarding scheduled ship transits throughout the regional study area including Eclipse Sound and Milne Inlet, real-time data regarding ships in transit and any changes to the proposed shipping schedule to the MEWG and agencies within Pond Inlet on a weekly basis during open water shipping, and to the RSA communities on a monthly basis."  QIA agrees with Baffinland's assessment of compliance.	QIA requests Baffinland address whether shipping schedules are proposed to MEWG and adjacent agencies on a weekly basis, and to the RSA communities on a monthly basis.	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board  <b>Section:</b> 4.7.7, PC Condition No. 164  <b>Page:</b> 531 to 532 (PDF p. 549 to 550 of 641)	Shipping schedules are provided to the community of Pond Inlet via the Hamlet and MHTO, with QIA in cc, on a rolling basis throughout the shipping season. They have not been provided to MEWG members or adjacent agencies historically but can be despite all Project vessels being available for live tracking through the AIS system. Baffinland will provide a rolling 10 day shipping schedule to the MEWG in 2024.
135	<b>QIA 2023 NIRB CRLU/IQ #2.</b>	The objective of PC Condition 162 is "To ensure the ongoing and consistent involvement of Elders and community members in developing and revising monitoring and mitigation plans" (525). Baffinland has undertaken a number of mechanisms to involve Elders and community members from in-person meetings and call-in radio shows to the hiring of Inuit Knowledge Holders and Community Relation Guides in each of the five North Baffin communities as well as in Kimmirut and Kinngait. Baffinland also continues to provide funding for the development of QIA's Inuit Stewardship Plan and acknowledges the importance of Inuit Qaujimajatuqangit in its work with Baffin communities.	QIA requests that Baffinland provide concrete examples from its engagement activities regarding mitigation and monitoring of community member and Elder input and how this input has influenced or informed Baffinland's operations.  QIA additionally requests that Baffinland provide some basic evaluation data regarding engagement on the topic of mitigation and monitoring; data should	<b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Main Body  <b>Section:</b> 4.7.7, PC Condition 162 & 163  <b>Page:</b> 525-530	Baffinland reports where Elders and other Inuit have influenced project and/or monitoring program design on a case by case basis. For example, the expansion of the survey area for the March 2023 Caribou Aerial Survey was driven by an HTO representatives input during the February 2023 Terrestrial Environment Working Group meeting. The expansion was confirmed at the meeting and included in the final survey report and the TEAMR. Another prime example includes the evolution of our shipping operations, which were shaped by community input, specifically from Pond Inlet. Since shipping began Baffinland has modified the shipping operation to establishing no-go zones at Kuluktoo Bay and the western shores of Milne Inlet above Bruce Head, reducing vessels in the Ragged Island area to no more than three, avoiding drifting wherever possible, set speed limits, the use of convoys and more. These modifications have all been reported in the years they were developed and implemented in response to relevant term and condition

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		<p>While “Baffinland meets and/or shares Project-related information including monitoring programs implemented annually with various community groups on a regular basis” (526) it is not clear to what extent Baffinland ensures a two-way flow of information between communities and the company. For example, Baffinland has highlighted its efforts to engage with communities and notes the importance of local knowledge to understand community perspectives and priorities and “ensure the Company provides tailored, relevant and culturally appropriate services in their communities” (527). However, it has not provided evidence how and if any of the information and insight received through engagement has impacted Baffinland’s monitoring and mitigation activities. This makes it unclear whether or not Baffinland is meaningfully applying community input. The company indicates that information to this effect has been shared with communities (“Additionally, a workshop was held in the Fall of 2023 to provide an update on the Steensby Component and how Inuit Qaujimagatuqangit (IQ) was integrated into baseline studies, monitoring, design and construction plans” (530). It should therefore not be difficult for Baffinland to integrate this information into its next report.</p> <p>It would also add value to Baffinland’s reporting to share metrics such as participation numbers (e.g., are people making use of Baffinland’s radio call ins and, if so, how many/how often?) as well as some assessment of satisfaction with engagement activities on the part of communities.</p>	<p>include both quantitative (e.g., participation metrics) and qualitative (e.g., participant satisfaction) aspects of engagement.</p>		<p>updates. Baffinland does not issue a consolidated report each year that summarizes the modifications it’s made to its monitoring programs or mitigation strategies, based on Elders input or any other reason. Modifications are developed and discussed holistically through our various reporting obligations and should be evident to reviewers based on their areas of concentration.</p> <p>Baffinland stores its engagement records in StakeTracker software and will review the required data fields and opportunities to provide more quantitative data in subsequent reports. Baffinland is reluctant to provide qualitative data, which may be subjective and cast Baffinland as altering some participant’s perceptions of the engagement.</p>
136	<p><b>QIA 2023 NIRB CRLU/IQ #3.</b></p>	<p>QIA believes the information provided regarding this PC Condition to be insufficient. Baffinland has four refuge stations, and 11 Seacan structures, which is far less than what is recommended in this PC Condition (“In the event that [emergency shelters] cannot, for safety or other reasons be open to the public, the Proponent is encouraged to set up another form of emergency shelters (e.g., Seacans outfitted for survival purposes) <b>every 1 kilometre along the rail line and Milne Inlet Tote Road</b>” (533, emphasis added). No usage data or analysis is offered to suggest that what is in place is adequate aside from reporting that no Project related health and safety incidents with hunters and visitors occurred in 2023.</p>	<p>QIA requests Baffinland provide usage data on existing emergency shelter purposes and an analysis on whether the number and location of shelters is adequate.</p> <p>QIA notes that the same request was made last year.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2022 Annual Report to the Nunavut Impact Review Board Main Body</p> <p><b>Section:</b> 4.7.7, PC Condition 165</p> <p><b>Page:</b> 533-534</p>	<p>Baffinland confirms that this request has previously been made by QIA in annual report comments in both 2021 and 2022 and subsequently addressed by Baffinland in it’s responses to QIA’s comments.</p> <p>The objective of PC Condition No. 165 is as follows:</p> <p><i>“To provide for human safety precautions in the event of adverse weather or other emergency situations along segments of linear transportation infrastructure.”</i></p> <p>In 2021, Baffinland provided the following response:</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
					<p>Baffinland is in compliance with PC Condition No. 165, as confirmed by the NIRB Monitoring Report determinations of 2019-2020, and 2020-2021. Baffinland has made buildings along the Milne Inlet Tote Road accessible to employees and land users for emergency shelter purposes, negating the strong encouragement to install 'another form' of emergency shelters every 1 km. PC Condition No. 165 includes no wording requiring Baffinland to monitor usage data or carry out analysis with respect to refuge stations and sea can structures.</p> <p>In 2022, Baffinland provided the following response:</p> <p>Baffinland has four (4) refuge stations along the Tote Road at KM 33, KM 40, KM 60, and KM 69. These are equipped with emergency supplies. These have not been used for any overnight emergency for the life of the Project. On one occasion in 2018 during a whiteout, six (6) drivers met at the KM 33 refuge station so that they could all be in a central location for pick up/escort back to camp. No emergency supplies were utilized.</p> <p>PC Term and Condition No. 165 was originally intended for the development of the southern railway to Steensby Inlet. For the Emergency Response Plan, use of the Tote Road means that there are multiple types of vehicles readily available to access a person in need of assistance. Construction of emergency shelters along the railway to Steensby Port will be planned in concert with other interested Parties when this phase of the Project becomes active.</p> <p>Baffinland further confirms there has been no use of emergency shelters, nor any requests or calls for aid within the PDA in 2023.</p>
137	<b>QIA 2023 NIRB CRLU/IQ #4.</b>	<p>The Proponent is encouraged to undertake collaborative monitoring in conjunction with the Qikiqtaaluk Socio-Economic Monitoring Committee's monitoring program which addresses Project harvesting interactions and food security, and which includes broad indicators of dietary habits. QIA believes the information provided to be insufficient. Baffinland provides some information about their own employees' food security and harvesting time but fails to provide information on food security, harvesting interactions or dietary habits outside of its own employees. Baffinland does report on how Project employment has impacted employees' families' ability to participate in harvesting and other land-based activities but fails to</p>	<p>QIA requests that Baffinland provide information on food security and harvesting interactions for Inuit, including Inuit who are not employees of Baffinland. QIA additionally requests that Baffinland include a discussion of specific Project interactions with harvesting in future reports.</p> <p>QIA notes that this is the same request as last year.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board Main Body</p> <p><b>Section:</b> 4.7.4, PC Condition 148</p> <p><b>Page:</b> 479-486</p>	<p>Baffinland has been waiting for the submission of the Pond Inlet Country Food Baseline Study, the CRLU Assessment and the Inuit Stewardship Plan before making any amendments to its own monitoring programs. It is important Baffinland and QIA do not duplicate efforts and add any unnecessary consultation requirements on Inuit. Baffinland encourages QIA to complete the work it has assumed so all parties can benefit from the information that has been collected since 2020 that could address the issues identified in this comment.</p>

Cmt. #	QIA Cmt. #	Reviewer’s Detailed Comment	QIA Recommendations	Reference Section	Baffinland’s Response
		<p>meaningfully discuss specific Project interactions with harvesting activities and opportunities.</p> <p>QIA recognizes that Baffinland added a new question regarding food security to its Inuit Employee Survey in 2023. While this does increase understanding of the circumstances and wellbeing of Baffinland employees, it does not address the issue cited above of the lack on information regarding the food security of non-employees.</p> <p>QIA also recognizes Baffinland’s ongoing funding of QIA’s Inuit Stewardship Plan and its contributions to other programs which support food security in area communities including school lunch programs and community food bank donations.</p>			
138	QIA 2023 NIRB CRLU/IQ #5.	<p>Baffinland has designed and is implementing terrestrial environment monitoring programs. For several years, QIA has requested that Baffinland describe if and how IQ has informed terrestrial environment monitoring design, analysis and interpretation of results, as well as conclusions.</p> <p>In Baffinland’s response to QIA comments respecting the 2021 Annual Monitoring Report, Baffinland identified that <i>“as part of the Phase 2 submission, Baffinland summarized how Inuit Qaujimajatuqangit has been incorporated throughout the project, including monitoring programs”</i> (Baffinland Response to Comments Received for the 2021 Annual Monitoring Report PDF p. 27). This response suggests that IQ has been incorporated into monitoring programs; however, the inclusion of IQ is not evident from the 2022 or 2023 Annual Monitoring Reports. Baffinland provided no response to QIA’s comments regarding the inclusion of IQ in 2023.</p> <p>In the 2023 Terrestrial Environment Annual Monitoring Report, Inuit Qaujimajatuqangit is mentioned only two times–</p> <ol style="list-style-type: none"> <li>1. “Work completed for the Terrestrial Environment Monitoring Program is guided by Inuit Qaujimajatuqangit and the Terrestrial Environment Mitigation and Monitoring Plan” (Appendix G.5.1, p. 1 of 201),</li> <li>2. “The HOL survey methods were developed in consultation with the TEWG... and incorporated Inuit Qaujimajatuqangit into strategies for detecting caribou” (Appendix G.5.1, p 160 of 201).</li> </ol>	<p>As requested numerous times in the past, Baffinland is requested to include in its Annual Monitoring Report indication of which terrestrial, marine, and freshwater monitoring programs are designed with IQ, and which ones utilize IQ for analysis and interpretation of results. An explanation of how IQ shaped the monitoring program and supported interpretation of the results should be included in an overview section as a component of compliance with this requirement, which appears in numerous PCCs. Baffinland should also indicate how IQ is being used, confirm that it meets Inuit expectations re: Ownership, Control, Access and Possession (OCAP) and from where that IQ was obtained.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board</p> <p><b>Section:</b> 4.6.8 Project Certificate Term and Condition No. 49 through 64</p> <p><b>Page:</b> 190-243</p> <p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.1</p> <p><b>Section:</b> Table 0; Section 0; Section 9.3</p> <p><b>Pages:</b> xv – xix; p. 1.; p. 160</p>	<p>Baffinland has provided an adequate response to this request each year it has been issued, explaining in detail how various terrestrial, marine, freshwater, atmospheric and socio-economic programs have been developed in the past with consideration for IQ and community knowledge. This information is readily presented in the VC specific annual reports and in the associated management plans. If a reference is absent in a report and its analysis it is possible IQ or community knowledge was not provided to Baffinland in that year that it was applicable, or the information is not explicitly described as being Inuit Qaujimajatuqangit (IQ) and its simply labeled as community knowledge, Inuit input, Inuit feedback, etc. IQ is not the sole source of relevant information that can come from Inuit as it is generally referred to as what Inuit have always known, and may not capture more contemporary or every day information. Baffinland suggests path forward here may be through QIA’s review of Baffinlands IQ Framework, which has been publically available for review since May 2023. Many of the items raised by QIA that relate to IQ could be answered by that document in its current form, or through edits and additions could be addressed.</p>

Cmt. #	QIA Cmt. #	Reviewer's Detailed Comment	QIA Recommendations	Reference Section	Baffinland's Response
		<p>QIA recognizes that IQ has been used to develop and implement monitoring programs; however, this is repeatedly not reflected in Baffinland's Annual Monitoring Reports. Most of Baffinland's discussion is centered on western science integration into terrestrial, freshwater, and marine environment monitoring programs. Given that, as Baffinland states, IQ is a valuable component to the development of these programs, more information on how IQ has been incorporated into them should be included in Annual Monitoring Reports.</p>			
139	<p><b>QIA 2023 NIRB CRLU/IQ #6.</b></p>	<p>Terms and Conditions 39 and 40 relate to measures that Baffinland should take to develop progressive revegetation of disturbed areas that are no longer required for project operations (e.g., use of test plots, reseeding, replanting, erosion control considerations). While it is not an explicit requirement of PC Conditions 39 or 40, QIA has previously requested that Baffinland involve Inuit and use IQ to inform reclamation pilot research, including defining reclamation goals, end land uses, reclamation techniques, and criteria/measurements to determine success. However, in Baffinland's reports on compliance with PC Conditions 39 and 40, there is no indication that they made any effort to involve Inuit or consider IQ in the 2023 revegetation surveying and reclamation pilot work. Appendix G.5.2. provides more detailed reporting on revegetation survey and preliminary reclamation trial activities completed in 2023, but again, does not include any indication that Inuit involvement or IQ was considered. Within the recommendations / lessons learned sections for these reports, there is no indication that Baffinland intends to do so in the future.</p>	<p>QIA requests Baffinland consider IQ and Inuit involvement in progressive and end of life reclamation planning activities. Baffinland is requested to identify whether and how Inuit will be involved in this work in subsequent years.</p>	<p><b>Document Name:</b> Baffinland Iron Mines 2023 Annual Report to the Nunavut Impact Review Board; Appendix G.5.2 (General)</p> <p><b>Section:</b> Section 4.6.6 Project Certificate Term and Condition No. 39, 40</p> <p><b>Page:</b> 164-170</p>	<p>Baffinland agrees that Inuit involvement and IQ are important considerations in closure planning for the Project. Baffinland is currently engaged in preparing a new revision of the Interim Closure and Reclamation Plan (ICRP) for the Project. Specific discussions have been held with QIA on plans for future engagements with Inuit regarding closure, and the next revision of the ICRP will include further details on the engagement strategy that Baffinland will implement to support closure planning.</p> <p>The Reclamation Pilot Study (EDI 2024) was intended to identify early successional patterns and biophysical constraints to reclamation in the Canadian High Arctic. Project-specific definition of end-land use objectives are not addressed in this Study.</p> <p>The Project has already committed to engagement/consultation with stakeholders/rights holders and integration of IQ in life of mine/end-land use planning. The revised/DRAFT Interim Closure and Reclamation Plan (ICRP) describes BIM's approach to integrating IQ into the Project's reclamation strategy.</p> <p><b>References:</b></p> <p>Environmental Dynamics Inc. (EDI), 2024. Mary River Project Reclamation Pilot Study: Revegetation Survey &amp; Preliminary Reclamation Trial (2023 Project Update). EDI File # 22Y0273.</p>

Table A.2: Response to GN Comments on Baffinland's 2023 Annual Report to the NIRB

Cmt. #	GN Cmt. #	Reviewer's Detailed Comment	GN Recommendation	Reference Section	Baffinland's Response
<b>SNOW TRACK SURVEYS</b>					
1	GN AR #01	<p>The Government of Nunavut (GN) has identified three concerns with the snow track survey study design and results presented in Baffinland Iron Mines Corporation's (Baffinland, BIMC, or the Proponent) Mary River Project Terrestrial Environment 2023 Annual Monitoring Report, Appendix G.5.1 (Appendix G.5.1; Baffinland, 2024). Specifically, these concerns include:</p> <ol style="list-style-type: none"> <li>1) the definitions used to categorize data;</li> <li>2) the presentation/assessment of interannual trends; and,</li> <li>3) the absence of a distance metric in the study design to determine the effective detection range of snow tracks by observers.</li> </ol> <p>As the snow track surveys aim to evaluate potential project impacts on caribou and other terrestrial wildlife, it is crucial to ensure that study designs and subsequent analyses are robust.</p> <p><u>Definitions</u></p> <p>The methodology in the Appendix G.5.1, indicates that wildlife snow tracks recorded by observers driving along the Tote Road were categorized as "deflected, travelled along, or crossing the road," and the point of deflection was defined as "the point where the animal redirected its path away from the road (Page 148; BIMC, 2024)." Appendix G.5.1 summarizes that in 2023:</p> <p>11% of recorded Ptarmigan, 15% of Arctic hare and 2% of foxes deflected from the road, whereas 67% of Ptarmigan, 40% of lemming, 23% of Arctic hare and 54% of foxes travelled along the Tote Road... [o]nly 4.3% of all tracks were recorded as deflections the Tote Road (Page 149; Baffinland, 2024)</p> <p>The GN has concerns with two of the definitions (i.e., deflections and "traveling along the road") used for categorizing snow tracks.</p>	<p>The GN recommends the following regarding the above concerns:</p> <ol style="list-style-type: none"> <li>1. In this and future reports, the Proponent should ensure the definition of deflection used in snow track surveys mirrors the definition provided in the Draft TEMMP (Baffinland, 2023).</li> <li>2. In this and future reports, the Proponent should distinguish (during data collection, subsequent analyses, and data visualization) between tracks found moving parallel to the road versus those moving along the road itself when categorizing snow tracks.</li> <li>3. In this and future reports, the Proponent should present snow track frequency data adjusted for survey effort.</li> <li>4. In future surveys the Proponent should record the distance of track from the road at the time of first observation. This information should be summarized by species in future annual reports.</li> </ol>	<p><b>54dii, 58f (Project Certificate No. 005, Amendment No. 004).</b></p> <p>Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (March 2024).</p> <p>Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2022 Annual Monitoring Report (April 2023a).</p> <p>Baffinland Iron Mines Corporation. Terrestrial Environment Mitigation and Monitoring Plan, BAFPH-830-P16-0027 (March 2016).</p> <p>Baffinland Iron Mines Corporation. Draft Terrestrial Environment Mitigation and Monitoring Plan, BAFPH-830-P16-0027 (March 2023b).</p> <p>Boulanger, J., Kite, R., Campbell, M., Shaw, J., Lee, D., &amp; Atkinson, S. (2024). Estimating the effects of roads on migration: a barren-ground caribou case study. <i>Canadian Journal Zoology</i>, 102, 476–493. <a href="https://doi.org/10.1139/cjz-2023-012">https://doi.org/10.1139/cjz-2023-012</a></p> <p>Chen, H.L., &amp; Koprowski, J.L. (2019). Can we use body size and road characteristics to anticipate barrier effects of roads in mammals? A meta-analysis. <i>Hystrix: The Italian Journal of Mammalogy</i>, 30(1),1–7. <a href="https://doi.org/10.4404/hystrix-00185-2019">https://doi.org/10.4404/hystrix-00185-2019</a></p> <p>Severson, J.P., Vosburgh, T.C., &amp; Johnson, H.E. (2023). Effects of vehicle traffic on space use and road crossings of caribou in</p>	<ol style="list-style-type: none"> <li>1. During the 22 May 2024 TEWG Meeting (T-22052024), BIM committed to reviewing and refining the definition of caribou deflection at the Project. Outcomes of this commitment will be shared with the TEWG and included in future reporting. Outcomes will be updated within the snow track survey protocol to align with field classification of snow tracks and subsequent reporting.</li> <li>2. Snow track monitoring and associated data capture will be reviewed and updated in relation to the refined definition of deflection. Columns for additional behaviour data (paralleling road vs along the road itself) can be added to data collection sheets and defined in snow tracking protocols.</li> <li>3. Baffinland will consider adding survey effort in updated datasheets and protocols for future annual reports.</li> <li>4. Baffinland will consider adding track distance estimations from the road in future annual reports.</li> </ol>

Cmt. #	GN Cmt. #	Reviewer’s Detailed Comment	GN Recommendation	Reference Section	Baffinland’s Response
		<p>The GN suggests that tracks approaching the Tote Road and then turning to run parallel without crossing it could be categorized as deflections. Indeed, in Baffinland’s Draft Terrestrial Environment Mitigation and Monitoring Plan (Draft TEMMP; Baffinland 2023b), caribou deflection is defined as, “[c]aribou that fail to cross the Railway or Tote Road after approaching it (Page 25; Baffinland, 2023).” By this definition, caribou that approach and then parallel the road, without crossing it, would be categorized as deflectors regardless of whether they are observed turning away from the road. As such, this same definition should be applied to the categorization of snow tracks. If wildlife tracks are seen approaching a road and then turning to move parallel to it (without crossing), they should be classified as deflections.</p> <p>A high percentage of wildlife tracks were categorised as travelling “along the Tote Road” (Page 149; Baffinland, 2024). However, the photographic evidence presented in Appendix G.5.1 illustrate that the tracks are seen moving alongside the Tote Road (Photo 9-3) and parallel to the Tote Road (Photo 9-1), rather than on the road itself. In categorizing snow tracks, a distinction should be made between tracks travelling on the road itself versus those traveling alongside it. The latter may reflect animals that have avoided crossing (i.e., deflected from) the road, while the former are likely those using the road for ease of travel.</p> <p><u>Presentation/Assessment of Interannual Trends</u></p> <p>Figure 9-2. 2023 interannual trends — snow track survey (2014 to 2023) in Appendix G.5.1 summarizes the number of tracks observed by species across years. The data presented in this figure do not account for variation in survey effort. For example, in 2022 4 snow track surveys were conducted (Baffinland, 2023) while in 2023, 6 snow track surveys were conducted (Baffinland, 2024). The exclusion of this information impacts the interpretation of interannual trends.</p> <p><u>Detection Range</u></p> <p>The stated purpose of snow track surveys is to, “[m]onitor the patterns of movement and response of caribou and other</p>		<p>the Arctic. Ecological Applications, 33(8): e2923. <a href="https://doi.org/10.1002/eap.2923">https://doi.org/10.1002/eap.2923</a></p> <p>Smith, A., &amp; Johnson, C.J. (2023). Why didn’t the caribou (<i>Rangifer tarandus groelandicus</i>) cross the winter road? The effect of industrial traffic on the road-crossing decisions of caribou. <i>Biodiversity and Conservation</i> 32, 2943–2959. <a href="https://doi.org/10.1007/s10531-023-02637-4">https://doi.org/10.1007/s10531-023-02637-4</a></p> <p>Agnico Eagle Mines Limited: Meliadine Division, Appendix 25 – 2023 Terrestrial Environment Management and Monitoring Plan Annual Report (March 2024).</p>	

Cmt. #	GN Cmt. #	Reviewer’s Detailed Comment	GN Recommendation	Reference Section	Baffinland’s Response
		<p>wildlife to Project-related activities based on their observable tracks in proximity to roadways” (Page 148; BIMC, 2024).</p> <p>Section 9.1.1 of Appendix G.5.1 describes the data recorded for each track observed during surveys. However, the methodology does not include recording the distance of a track from the road when it was first observed. Recording this distance metric would help determine the effective detection range of snow track surveys and assess the power of these surveys to detect road impacts on wildlife.</p> <p>Species are expected to react to roads at differing spatial scales, with response distance potentially linked to species size (Chen and Koprowski, 2019). For instance, larger species like caribou may alter their movements in response to roads and traffic at distances ranging from hundreds of meters to several kilometers (e.g., AEM 2024; Boulanger et al., 2024; Severson et al. 2023; Smith and Johnson, 2023). In contrast, small species, like lemmings, may respond to roads at distances of only a few meters. Therefore, the GN believes that the specified distance metric would be valuable in helping assess whether the detection range of snow track surveys aligns with potentially differing species-specific response distances. Ultimately, it is crucial that snow track surveys achieve their intended purpose.</p>			
<b>CARIBOU AERIAL SURVEY</b>					
2	GN AR #02	<p>As described in Section 9.5 Aerial Caribou Survey of Appendix G.5.1 (Baffinland, 2024), the stated objective of the caribou aerial survey was to estimate the abundance and density of North Baffin caribou within the survey study area. However, the GN notes that this result is not reported. Additionally, the GN requests clarity on the Proponent’s modeling process, specifically, the stated assumption of independence of observations made by the primary and secondary observers.</p> <p>The objective of the aerial survey conducted by the Proponent and described in Section 9.4 of Appendix G.5.1 was:</p> <p><i>[to] estimate the abundance and density of North Baffin caribou in the northern (i.e., active Project area) and southern</i></p>	<p>The GN recommends the following regarding the above concerns:</p> <ol style="list-style-type: none"> <li>1. The Proponent should revise Appendix G.5.1 to include the results on caribou abundance and density.</li> <li>2. The Proponent should provide justification (or additional clarification) for the assumption of independence of observations made by the primary and secondary observers.</li> </ol>	<p><b>53b, 54b, 58b (Project Certificate No. 005, Amendment No. 004)</b></p> <p>Baffinland Iron Mines Corporation. Appendix G.23 –Mary River Project 2021 Annual Report, Caribou Monitoring Triggers and Recommendations Report. (March 2022)</p> <p>Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report. (March 2024)</p>	<ol style="list-style-type: none"> <li>1. Regrettably, Section 9.5 Aerial Caribou Survey of Appendix G.5.1 was missing results on abundance and density estimates. The 2023 TEAMR has been revised to include this missing information and reissued to the NIRB public record.</li> </ol> <p>Note: A stand-alone version of the Aerial Caribou Survey summary report (with complete results) was circulated to the QIA for preliminary review in June 2023.</p> <p><b>Reference:</b></p> <p><i>EDI 2023. Mary River Project: 2023 Late-Winter Aerial Caribou Survey. EDI File # 23C0111, June 2023, Prepared for Baffinland Iron Mines Corp. Pg.28.</i></p> <ol style="list-style-type: none"> <li>2. Baffinland re-iterates that the methods followed for the aerial survey were the same as those used by the GN – including those for the primary and secondary observers.</li> </ol>

Cmt. #	GN Cmt. #	Reviewer's Detailed Comment	GN Recommendation	Reference Section	Baffinland's Response
		<p><i>(i.e. planned/future Project area) subregions of the wildlife RSA (EDI Environmental Dynamics Inc. 2022b). (Page 171; Baffinland, 2024)</i></p> <p>However, Appendix G.5.1 appears to lack a subsection discussing the estimated abundance and density of caribou resulting from this aerial survey. The GN notes that the last subsection presented on this topic in Appendix G.5.1 is section 9.5.2.2 Modelling Outcomes. While this omission may be an editorial oversight, the GN emphasizes that providing complete information in annual reports is essential for a thorough review and promotes transparency for all stakeholders. Additionally, the GN wishes to highlight the relevancy of these results with respect to Baffinland's 2022 Caribou Monitoring Triggers and Recommendations Report which states:</p> <p><i>... a sample of 35 collared caribou per year is most likely required for a study informing potential Project impacts on caribou. The collaring program and analyses require at least 350 caribou, or 35 groups, to be present within the study area(s) (Baffinland, 2022).</i></p> <p>In section 9.5.1.3 of Appendix G.5.1, the Proponent states "An MRDS model was developed with the following assumptions: (1) independence of observation made by the primary and secondary observers and (2) point independence" (Page 176; Baffinland, 2024). The GN requests justification for this approach as the detections made by one observer may influence the detections of the other observer in double-observer studies through various modalities like body language.</p>			<p>To the degree possible, primary and secondary observers made independent observations of caribou. Specific caribou observations were not discussed during surveys. We acknowledge that there is potential for error in this process, as the GN suggests. There are two common options to deal with the double-observer protocol in mark-recapture distance sampling (MRDS): (1) primary and secondary observers search with complete independence, and (2) a trial configuration whereby the secondary observer generates 'trials' for the primary observer (Burt et al. 2014). It is likely that survey protocols fell somewhere in between these two options. For future aerial surveys, Baffinland is open to discussing the pros/cons of the 'independent observer' versus 'trial configuration' protocols to develop MRDS functions and estimate abundance/density of caribou.</p>
<b>TOTE ROAD TRAFFIC</b>					
3	<b>GN AR #03</b>	<p>Baffinland's 2023 Annual Report to the Nunavut Impact Review Board (NIRB) (Annual Report) indicates that Baffinland transported approximately of 5.5 million tonnes of ore via the Tote Road (Page 568, Baffinland, 2024a). Additionally, Appendix G.5.1 indicates that the mean number of ore haul transits in 2023 is near the predicted value presented in the Final Environmental Impact Statement (FEIS)</p>	<p>The GN recommends the following regarding the above concerns:</p> <ol style="list-style-type: none"> <li>Based on project-specific traffic data, the Proponent should provide revised haul truck and non-haul truck traffic predictions necessary for the</li> </ol>	<p><b>179(b) (Project Certificate No. 005, Amendment No. 004).</b></p> <p>Baffinland Iron Mines Corporation. Baffinland Iron Mines Corporation Mary River Project – 2023 Annual Report to the Nunavut Impact Review Board (May 2024a).</p>	<ol style="list-style-type: none"> <li>Baffinland reports on ore haul truck traffic for all years in the TEAMR and can verify that in years when 6Mt of ore has been hauled the ore haul transits have remained within a reasonable range of the 236 average daily transits as included in the PIP, PIPE, PIPR and SOP.</li> </ol>

Cmt. #	GN Cmt. #	Reviewer’s Detailed Comment	GN Recommendation	Reference Section	Baffinland’s Response
		<p>Addendum for the Production Increase Proposal (PIP) (Page 39; Baffinland, 2024b) necessary for transporting 6 Mtpa. As such, the GN is concerned that haul truck traffic necessary to transport the target of 6 Mtpa may exceed FEIS Addendum predictions.</p> <p>In 2023, approximately 5.5 million tonnes of ore were hauled via the Mary River Project’s (the Project) Tote Road (Page 568, Baffinland, 2024a). As such, the total amount of ore hauled via the Project’s Tote Road in 2023 was less than the Proponent’s target of 6 Mtpa as described in Baffinland’s FEIS Addendum for the PIP (Page 39; Baffinland, 2024b). Additionally, the Annual Report indicates that the mean number of haul truck transits (i.e., one-way trips) per day in 2023 was 234.2/day (Page 219; Baffinland, 2024a). Appendix G.5.1 indicates that the mean number of ore haul transits in 2023 is near the predicted value presented in the necessary for transporting 6 Mtpa (i.e., 236/day) (Page 39; Baffinland, 2024b).</p> <p>These findings suggest that if the Project’s goal of transporting 6 Mtpa are achieved, ore truck traffic rates on the Tote Road are likely to exceed FEIS Addendum predictions. Based on 2023 data, a simple calculation suggests that transport of 6 million tonnes would require an 8.3% increase in traffic above FEIS predictions. However, neither the 2023 Annual Report nor Appendix G.5.1 discusses this likely exceedance of predictions, any required mitigation(s) or its potential impacts on the terrestrial environment, in terms of dustfall and disturbance of wildlife.</p> <p>Recent studies have demonstrated that industrial roads can impact the behaviour and movements of wildlife, such as barren-ground caribou, at traffic rates of less than 15 vehicles per hour (e.g., Severson et al., 2023; Smith and Johnson, 2023). Traffic rates on the Tote Road are already more than an order magnitude greater than this rate, suggesting that the road likely presents a major barrier to wildlife movement in North Baffin. As such, any exceedances of predicted traffic rates should be rigorously scrutinized.</p>	<p>transport of 6 Mtpa of ore on the Tote Road in future years.</p> <ol style="list-style-type: none"> <li>The Proponent should describe any additional mitigation or monitoring that will be implemented in response to any predicted exceedance of Tote Road traffic rates provided in the FEIS.</li> <li>The Proponent should provide a revised version of Figure 6-1 (Baffinland, 2024b) showing corrected mean daily traffic rates.</li> </ol>	<p>Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (March 2024b).</p> <p>Baffinland Iron Mines Corporation. NIRB Application for Screening #125893 Sustaining Operations Proposal 2 (March 2024c).</p> <p>Severson, J.P., Vosburgh, T.C., &amp; Johnson, H.E. (2023). Effects of vehicle traffic on space use and road crossings of caribou in the Arctic. <i>Ecological Applications</i>, 33(8): e2923. <a href="https://doi.org/10.1002/eap.2923">https://doi.org/10.1002/eap.2923</a></p> <p>Smith, A., &amp; Johnson, C.J. (2023). Why didn’t the caribou (<i>Rangifer tarandus groelandicus</i>) cross the winter road? The effect of industrial traffic on the road-crossing decisions of caribou. <i>Biodiversity and Conservation</i> 32, 2943–2959. <a href="https://doi.org/10.1007/s10531-023-02637-4">https://doi.org/10.1007/s10531-023-02637-4</a></p>	<ol style="list-style-type: none"> <li>Baffinland implements a robust monitoring program along the Tote Road that effectively monitors for applicable valued ecosystem components of concern (VECs), regardless of haul traffic. Baffinland supports an adaptive management strategy of regular monitoring supported by operational change and adoption of other mitigating measures where necessary. Accordingly, should monitoring data at any time suggest a potential for impacts to VECs as a result of operations or activities on the Tote Road, Baffinland will adjust decisions and actions accordingly through adaptive management measures (e.g., enhanced monitoring, follow-up studies, alternative study designs, and new or enhanced mitigation measures). Adaptive management mechanisms are also applied to Tote Road operations to mitigate potential impacts due to changing conditions. For example, the speed of haul truck traffic may be reduced during periods of inclement weather and/or poor road conditions. Baffinland notes that there is no exceedance or non-compliance issue for the reasons described above in No. 1.</li> <li>The 2023 TEAMR will be revised and now includes the updated Figure 6.1.</li> </ol>

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		<p>Figure 6-1 of Appendix G.5.1 (Page 40; Baffinland, 2024b) indicates that the Project has not consistently transported 6 Mtpa on the Tote Road. However, Table 6-1 in Appendix G.5.1 (Page 39; Baffinland, 2024b) indicates that mean daily ore haul truck traffic rates have regularly been near or exceeded the FEIS Addendum prediction for the transport of 6 Mtpa (e.g., 2019, 2020, 2022). Updated and accurate predictions of Tote Road traffic rates using project-specific data should be provided to the NIRB and other parties. This recommendation is being provided in light of the Proponent’s awareness of the Project’s repeated exceedance of the FEIS prediction and their recent application to the NIRB to continue shipping 6 Mtpa via Milne Inlet, until such time as the southern railway is operational (Baffinland, 2024c).</p> <p>The GN notes an error in Figure 6-1 found in Appendix G.5.1 (Page 40; Baffinland, 2024b). In this figure, the mean total (both ore haul and non-haul vehicle) daily traffic rate for 2023 is reported as less than 250. Meanwhile, the Table 6-1 in Appendix G.5.1 (Page 39; Baffinland, 2024b) indicates that the combined vehicle transits for 2023 was 258.7.</p>			
<b>PASSIVE DUSTFALL MONITORING</b>					
4	GN AR #4.	<p>Appendix G.5.1 presents results of the Project’s passive dustfall sampling in 2023. Results indicate that annual dustfall exceeded predictions at most monitoring sites. However, these exceedances and their causes are not discussed in the Appendix G.5.1.</p> <p>Table 7-4. Annual dustfall accumulation for sites sampled throughout 2023 of Appendix G.5.1 shows that annual dustfall exceeded dustfall modelling predictions at 24 of 43 (56%) of monitoring sites in 2023 (Pages 72-73; Baffinland, 2024). The frequency of these exceedances suggests significant deficiencies in the dustfall modeling for the Project, resulting in inaccurate predictions.</p> <p>Additionally, discussion of the above exceedances is concerning absent from text presented elsewhere in</p>	<p>The GN recommends the following regarding the above concerns:</p> <ol style="list-style-type: none"> <li>1. That the Proponent provide an explanation as to what deficiencies or invalid assumptions in the Project’s dustfall modelling could have resulted in the exceedances presented in Table 7-2.</li> <li>2. That the Proponent provide an explanation as to how future dustfall modelling FOR THE Project will be modified to account for the current inaccuracy that exists.</li> </ol>	<p><b>36, 50, 54d, 58c, 187, and 188 (Project Certificate No. 005, Amendment No. 004).</b></p> <ul style="list-style-type: none"> <li>• Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report. (March 2024)</li> </ul>	<p>In general, it is difficult to make comparisons between air dispersion modelling results, especially from 2013, and dustfall monitoring results of an active mine site from 10 years later in 2023. Updated air dispersion model results for dustfall are available in the Mary River Project – Sustaining Operations Proposal Air Quality Assessment (Nunami Stantec Limited 2023). Nunami Stantec Limited 2023 includes comparisons between the air dispersion model predictions for dustfall and measured annual dustfall between 2018 and 2021. Air dispersion models are based on a number of assumptions and are typically expected to agree with actual ambient air quality measurements within a factor of two (US EPA 1992). In addition, the U.S. EPA and other regulatory agencies have conducted extensive testing of the CALPUFF model, including evaluating uncertainties in input values, limitations of model physics, and representation of the random nature of the atmosphere by a model, leading to the accepted use of the CALPUFF in regulatory decisions. For assessments that cannot complete a model performance evaluation, the US EPA (2005) recommends decision makers use modelling as a ‘best estimate’ of effects</p>

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		Appendix G.5.1. For example, Table 0. Summary of environmental effects monitoring and research activities at the Mary River Project in 2023 in Appendix G.5.1. does not cite the exceedances at monitoring sites. Instead, Table 0 concludes that “2023 dustfall results were consistent with predictions that the highest dustfall would be within the PDA” (Page xvi; Baffinland, 2024).			<p>based on understanding that the assessment follows a sound modelling methodology and used representative inputs for the Project.</p> <p>References</p> <p>United States Environmental Protection Agency (US EPA). 1992. Protocol for Determining the Best Performing Model. United States Environmental Protection Agency (US EPA). Office of Air Quality, Planning and Standards. Research Triangle Park, NC 27711. EPA-454/R-92-025. December 1992.</p> <p>US EPA. 2005. 40 CFR (Code of Federal Regulations) Part 51 Revision to the Guideline on Air Quality Models: Adoption of a Preferred General Purpose (Flat and Complex Terrain) Dispersion Model and Other Revisions; Final Rule. Available at: <a href="https://www.epa.gov/sites/default/files/2020-09/documents/appw_17.pdf">https://www.epa.gov/sites/default/files/2020-09/documents/appw_17.pdf</a>. Accessed February 2024.</p>
<b>DUSTFALL IMAGERY ANALYSIS</b>					
5	<b>GN AR #5.</b>	<p>As detailed in section 7.4 Dustfall Imagery Analysis of Appendix G.5.1, the Project’s dust fall monitoring program includes conducting studies which examine dust fall extent in the vicinity of the Project through satellite imagery. The use of imagery is being developed by calibrating the satellite-derived Snow Darkening Index (SDI) against two methods of direct ‘on-the-ground’ dust fall measurement; (a) dust fall (g/m<sup>2</sup>) from passive collection canisters, and (b) Total Suspended Solids (TSS) (mg/L) from snow samples. In reviewing the Project’s annual report regarding dust fall monitoring, the GN notes the following:</p> <p><u>Interannual Trends</u></p> <p>Figure 7-23 presents satellite-derived dustfall extents from 2004; 2013-2023 which illustrates a spike in 2019 (Baffinland, 2024, figure 7-23). However, Appendix G.5.1 does not discuss or investigate potential factors that may have contributed to this peak in 2019. Information that contributed to this spike in 2019 could inform future dust monitoring and mitigation and should be presented.</p>	<p>The GN recommends the following regarding the above concerns:</p> <ol style="list-style-type: none"> <li>1. That the Proponent provide discussion, further investigation, and supporting evidence regarding factors which may have contributed to the sharp peak in dustfall extent detected in 2019 by satellite imagery.</li> <li>2. That the Proponent continue the snow sampling pilot study in 2024. In 2024, more samples should be collected during a broader sampling period. Additionally, the GN recommends that snow sampling should target days with minimal cloud cover.</li> </ol>	<p><b>36, 50, 54d, 58c, 187, and 188 (Project Certificate No. 005, Amendment No. 004).</b></p> <p>Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (March 2024).</p> <p>Government of Nunavut. Government of Nunavut Comments on the Mary River Project 2022 Annual Report (July 2022).</p>	<ol style="list-style-type: none"> <li>1. Several 2019 satellite images had extensive dust in classes &lt;4.5 g/m<sup>2</sup> (as extracted by the Snow Darkening Index and converted to g/m<sup>2</sup>). A visual review of these images showed less snow cover than (a) images in the same year with less extensive dust and (b) images in 2020 on or within a day of the same date. Less snow cover could result in more exposed ground, a possible source of dust, and potential misclassification of ground as dust. There were no peaks in total annual ore hauled or Tote Road traffic in 2019 compared to 2018 and 2020. Further investigation and discussion will be provided in the 2024 TEAMR.</li> <li>2. The snow sampling pilot study was continued in the Spring of 2024. Samples were collected between May 18 and 22. Image footprints and corresponding image acquisition dates up to the end of May were provided to the sampling field crew to better align sampling and imagery. Samples were collected on days with minimal cloud cover. Baffinland will take the GN’s recommendation into consideration for the 2025 sampling program.</li> </ol>

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		<p><u>Snow Sampling Pilot Study</u></p> <p>An update on the pilot study exploring at the relationship between the satellite image-derived SDI and measurements of TSS in snow samples is provided in 7.4.4 Snow Samling Pilot Study of Appendix G.5.1 (Baffinland, 2024). A significant relationship between these two metrics was not detected, despite pooling data from 2022 and 2023 (Page 117; Baffinland, 2024). The GN notes, that the sample size used in this study to date has been limited by the total number of snow samples collected, the availability of satellite images corresponding to the dates of snow sampling and cloud cover on sampling days (Page 117; Baffinland, 2024). Additionally, the GN notes that, as demonstrated in Figure 7-25, sampling in the higher portion of the range of TSS measured to date (i.e., &gt; 200 mg/L) has been limited to only two data points (Page 117; Baffinland, 2024).</p> <p>Furthermore, Section 7.4.4 of the report states that:</p> <p>Continuation of the pilot study is being evaluated in relation to the need for and viability of improvements to experimental design, including increased data/image capture and improved geolocation of snow sampling in relation to available satellite imagery. (Page 117; Baffinland, 2024)</p> <p>The GN maintains its position, as noted in comments on Baffinland's 2022 Annual Report (GN-AR-03; GN, 2023), that this pilot should continue, and that increasing sample size is a viable means to improve the study design. Additional sampling is needed to increase sample size and provide more data points in the higher part of TSS range. The GN believes this could be achieved by increasing the overall number of snow samples collected, broadening the sampling window to spread sampling over a range of dates greater than in 2022 (May 1 to 9) and 2023 (May 6 to May 15), as well as focusing sampling on days with minimal cloud cover.</p>			
<b>HELICOPTER TRAFFIC</b>					
6	<b>GN AR #6.</b>	Section 5 Helicopter Overflights of Appendix G.5.1 summarizes helicopter traffic supporting Project operations	The GN recommends the following regarding the above concerns:	<b>59, 71 and 72 (Project Certificate No. 005, Amendment No. 004)</b>	1. The meaning of the terms "unreasonable" and "impractical" are at the discretion of the pilot as described in Table5-6. List of rationale was discussed January 5, 2023 with the GN and presented and discussed at the February 14,

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		<p>in 2023. After reviewing this section, the GN has three key comments regarding this material. These concerns include:</p> <ol style="list-style-type: none"> <li>1) the number of low-level flights;</li> <li>2) the definition used to justify short distance flights; and,</li> <li>3) the need for a review of helicopter flight corridors to incorporate areas that may be of significance for caribou.</li> </ol> <p><b>1) Low-level Flights</b></p> <p>In 2023, between May and September, 1,799 helicopter flights (totalling 1,041 hours of flying) were made to support Project-related activities (Tables 5-2 and 5-3; Baffinland 2024). Table 5-5 illustrates that of these flights, 72.53% were below the minimum altitudes set by Project terms and conditions for reducing disturbance of migratory birds and other wildlife (e.g., Term and Conditions 71) and established in the TEMMP (Baffinland, 2016) and draft TEMMP (Baffinland, 2023) to avoid disturbance of other wildlife. However, ~68% of these low-level flights had a rationale for flying below minimum altitude thresholds. Consequently, the Proponent deemed these flights to be compliant with Project terms and conditions. Nevertheless, low-level helicopter flights are a potential source of disturbance to wildlife such as caribou (e.g., Wilson and Wilmhurst, 2019; Wolfe et al., 2000).</p> <p>With respect to helicopter traffic reported in 2023, the GN notes several comments as follows.</p> <p><b>2) Short Distance Flights</b></p> <p>In Appendix G.5.1, the Proponent provides a summary of the various rationales provided by pilots to justify flying below the minimum altitude thresholds. As per Table 5-7, the second most common justification provided was the short distance of a flight; this justification accounted for ~19% of total flight hours in 2023 (Page 33; Baffinland, 2024). In Table 5-6, the Proponent provides pilot rationales for low-level</p>	<ol style="list-style-type: none"> <li>1. The Proponent should provide additional details on what is meant by “unreasonable” and “impractical” in the justifications for low-level flights in Table 5-6 of the Appendix G.5.1.</li> <li>2. In this, and future annual reports, the Proponent should ensure that the category for short distance flights is subdivided to distinguish between flights where low-level flying is: (a) Itself a specific regulatory requirement of the activity being undertaken; (b) Necessary for safety; (c) Necessary to collect the samples, themselves, during a monitoring activity; (d) Being justified solely on the preference to save time, fuel or other factors.</li> <li>3. In this and future annual reports, the Proponent should provide data summarizing the distance of low-level flights that are classified as short distance according to the subdivisions specified in the above recommendation. Pursuant to this recommendation, the Proponent should provide the mean, maximum and minimum distances of low-level flights.</li> <li>4. In collaboration with the TEWG, the Proponent should undertake an evaluation of the Project’s helicopter flight corridors in relation to the distribution and movements of caribou. Using Inuit Qaujimatuaqangit and Inuit Qaujimaningit and recent scientific data (collected via aerial surveys and satellite collaring) the TEWG should determine whether</li> </ol>	<p>Baffinland Iron Mines Corporation. Appendix G.5.1 – Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (March 2024).</p> <p>Baffinland Iron Mines Corporation. Terrestrial Environment Mitigation and Monitoring Plan, BAFPH-830-P16-0027 (March 2016).</p> <p>Baffinland Iron Mines Corporation. Draft Terrestrial Environment Mitigation and Monitoring Plan, BAFPH-830-P16-0027 (March 2023).</p> <p>Wolfe, S.A., Griffith, B. &amp; Wolfe, C.A.G. (2000). Response of reindeer and caribou to human activities. <i>Polar Research</i>, 19, 63–13. <a href="https://doi.org/10.1111/j.1751-8369.2000.tb00329.x">https://doi.org/10.1111/j.1751-8369.2000.tb00329.x</a></p> <p>Wilson, S. F., &amp; Wilmshurst, J. F. (2019). Behavioural responses of southern mountain caribou to helicopter and skiing activities. <i>Rangifer</i>, 39(1), 27–42. <a href="https://doi.org/10.7557/2.39.1.4586">https://doi.org/10.7557/2.39.1.4586</a></p>	<ol style="list-style-type: none"> <li>2023 TEWG meeting (Meeting ID T-16022023). Item (Action ID T-28042022-2) was designated as complete at the December 13-14, 2023 meeting (Meeting ID T-13122023).</li> <li>2. At the request of the GN, the pilot rationale table was reviewed in 2023, and the action item completed as detailed in 1. This request for further detail is unreasonable and unlikely to lead to improvements to overflight mitigation.</li> <li>3. The pilot rationale table was reviewed in 2023, and the action item completed as detailed in 1.</li> <li>4. Baffinland will consider this request.</li> </ol>

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		<p>flights. In this table, the description for short distance flights is as follows:</p> <p><i>At the discretion of the pilot who is operating the aircraft during the flight, by considering the distance travelled during a flight as well as other contributing factors, it is determined that gaining an altitude of 650 magl is unreasonable, unsafe, or impractical. These types of trips are generally associated with specific monitoring programs that are MANDATORY and there are no other practical ways of completing them (e.g., water sampling locations not accessible by foot or boat, dustfall sampling, wildlife observations, noise sampling, prospecting) (Page 32; Baffinland, 2024).</i></p> <p>The GN notes that the description of this category of low-level flights appears to combine activities where low-level flying is either a safety or regulatory requirement with those where it is preferred by the Proponent for time and cost savings. Consequently, this category should be subdivided into flights where low-level flying is specifically required for safety, regulatory purposes, or to complete an aerial-based monitoring activity, versus those where it is done solely for efficiency.</p> <p>For instance, it is the GN's understanding that activities listed in Table 5-6, such as dustfall sampling, water sampling, and noise sampling, do not typically require low-level flying, as the sampling itself is not conducted while airborne. In contrast, some aerial-based wildlife monitoring (e.g., aerial surveys) specifically requires low-level flying to maintain detection probabilities. Distinguishing between low-level flights that are necessary, versus those that are preferred by the Proponent, is essential for reviewers and the NIRB to fully understand the trade-offs being made by the Proponent in terms of operational efficiency versus wildlife disturbance.</p> <p><b><u>Flight Corridors</u></b></p> <p>Term and condition 59 of the Project Certificate states that:</p> <p><i>The Proponent shall ensure that aircraft maintain, whenever possible (except for specified operational purposes such as drill moves, take offs and landings), and subject to pilot</i></p>	<p>areas of significant wildlife importance can be delineated and avoided.</p>		

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		<p><i>discretion regarding aircraft and human safety, a cruising altitude of at least 610 metres during point-to-point travel when in areas likely to have migratory birds, and 1,000 metres vertical and 1,500 metres horizontal distance from observed concentrations of migratory birds (or as otherwise prescribed by the Terrestrial Environment Working Group) and use flight corridors to avoid areas of significant wildlife importance...</i></p> <p>With respect to the flight corridors for avoiding areas of significant wildlife importance, section 5.2.1 of the report states that:</p> <p><i>Only the key moulting area for Snow Geese was identified for helicopter avoidance in 2023. No locations or boundaries of areas prescribed explicitly by the TEWG or areas of observed concentrations of other migratory birds were identified in 2023 (Baffinland, 2024).</i></p> <p>The Project has accumulated 9 years of helicopter flight corridor data. Given the ongoing concerns about the status of North Baffin caribou combined with the availability of current data on caribou distribution and movements provided by the Proponent’s recent aerial survey (e.g., 9.5 Aerial Survey; Baffinland, 2024) and the GN’s collaring program, flight corridors currently used by the project should be evaluated to ensure they are avoiding areas of highest caribou use. This evaluation should be undertaken by the Proponent in collaboration with the Terrestrial Environment Working Group (TEWG).</p>			
<b>LANGUAGE PROTECTION</b>					
7	<b>GN AR #7.</b>	<p>Baffinland is implementing a program that will enable the company to comply with Nunavut's language laws.</p> <p>“In 2023 the Company launched Aulatijiit, the Inuit Leadership and Development Program (ILDLP) at the Mary River Project”. This program integrates Inuit cultural aspect and the use of Inuktitut. Can Baffinland give more details about the use of Inuktitut on its site? Is Aulatijiit complying</p>	<p>The GN makes the following recommendations:</p> <ul style="list-style-type: none"> <li>• That the proponent provide additional details in the annual report about the use of Inuktitut across the project sites.</li> </ul>	<p>NIRB Project Certificate No. 005          2023 Mary River Socio-Economic Monitoring Report</p>	<p>Baffinland has an “Inuktitut in the Workplace” policy. All employees are made aware of the policy during the course of their employment. For all safety related protocols, English is and remains the language of the Mary River Mine. There is no such report to capture number of times Inuktitut language is used.</p> <p>Baffinland has ensured that the Aulatijiit program makes available to its participants documentation in English and Inuktitut. For example, the participant workbooks used during the Aulatijiit program are available in both English and</p>

Cmt. #	GN Cmt. #	Reviewer's Detailed Comment	GN Recommendation	Reference Section	Baffinland's Response
		with the Inuit Language Protection Act, (ILPA), especially section 3 of this Act?	<ul style="list-style-type: none"> <li>That the proponent include in its annual reports an assessment of how its Aulatijiit program supports compliance with the Inuit Language Protection Act, (ILPA), especially section 3 of this Act</li> </ul>		<p>Inuktitut versions. An experienced Inuit co-facilitator who speaks Inuktitut has also been used for all Aulatijiit workshops.</p> <p>A minimum of 50% of the working group that has guided the development of the program is Inuit. Paul Quassa, senior advisor to our CEO, has also been instrumental in developing the program, including the use of Inuktitut in its communications and the use of Inuit Qaujimagatuqangit (IQ).</p>
<b>GENDER-BASED DIFFERENCES IN EMPLOYEE RETENTION RATES</b>					
8	<b>GN AR #8.</b>	<p>Baffinland's 2023 report shows that the proportion of Inuit women who keep their jobs is higher than that of men in the region.</p> <p>The proportion of Inuit women working on the site from 2022 to 2023 has increased, compared to the previous year. This means in the Qikiqtaaluk region; women are more likely to keep their jobs at the mine. In the same period, and compared with the Kivalliq region, the opposite trend is observed.</p>	<p>The GN makes the following recommendation:</p> <ul style="list-style-type: none"> <li>That the proponent provide an assessment or explanation of which of the proponent's strategies or programs put in place which help to set and maintain this trend. Information on successful efforts are valuable for Inuit, stakeholders, and proponents alike.</li> </ul>	<p>NIRB Project Certificate No. 005</p> <p>2023 Mary River Socio-Economic Monitoring Report</p>	<p>The proportion of Inuit women working on site increased slightly when compared to 2022 values. This increase does not necessarily mean Inuit women are more likely to maintain a role for a longer period than male Inuit employees. Many variables influence employment rates such as introduction of new positions, variance in qualifications between applicants, turnover, etc.</p> <p>Baffinland is committed to Inuit employment through all phases of the Mary River Project. This includes providing equal opportunity to both Inuit women and men. In this regard, Article 7.17 of the amended IIBA places special emphasis on the promotion of Inuit women's access to employment opportunities in the Project workforce. For instance, Baffinland implemented the Arnait Action Plan. Since 2022, the Arnait Action Plan committee has resumed efforts on reducing barriers to employment for Inuit women. Works has focused on engaging with Inuit female employees to understand existing barriers affecting (or preventing) their inclusion in the workplace and to recommend strategies and plans to remove and or overcome barriers.</p>

Table A.3: Response to ECCC Comments on Baffinland's 2022 Annual Report to the NIRB

Cmt. #	ECCC Cmt. #	Reviewer's Detailed Comment	ECCC Recommendations	Reference Section	Baffinland's Response
<b>NON-COMPLIANT FLIGHTS OVER SNOW GEESE MOULTING AREA</b>					
1	ECCC #2.	<p>The Proponent reported a 72% compliance rate with flight heights in snow goose areas during the moulting season (July-August). While ECCC understands that compliance is not always possible subject to pilot discretion, to verify the reported rates of compliance, reviewers need to know the acceptable and approved operational purposes which constitutes rationale for categorizing an otherwise non-compliant flight as complaint. A list of these rationale is provided in Table 4.18 of the 2023 Annual Report Main Document.</p> <p>Further, rationale for flights within a horizontal distance of &lt;1500m from Snow Goose Moulting Area have not been included in Table 4.18. Rationale is provided in the 2023 Terrestrial Environment Annual Monitoring Report (TEAMR) (Footnote 8, pg. 23):</p> <p><i>"...this 1,500 m horizontal buffer is not always practical as it results in longer flight times and prolongs potential disturbance. Alternatively, pilots occasionally fly over the eastern edge of the Snow Geese area to reduce flight time and minimize potential disturbance."</i></p> <p>It is not clear whether the rationale to reduce flight time by flying over the Snow Goose Moulting Area has been approved by the Terrestrial Environment Working Group (TEWG) and the NIRB, and where this approval has been recorded. It is not clear whether flights over the Snow Goose Moulting Area were classified as compliant with rationale, non-compliant, or compliant.</p>	<ol style="list-style-type: none"> <li>ECCC recommends that the Proponent clarify how flights over the Snow Goose Moulting Area were classified, and how this is represented in reported rates of compliance.</li> <li>ECCC recommends that the Proponent confirm whether the list of rationale for low level flights in Table 4.18, and the rationale for close vertical flights in the TEAMR, have been accepted by the TEWG and the NIRB.</li> <li>ECCC recommends that the Proponent record all flight non-compliance rationale in the next version of the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP), which is currently under revision, and share that plan with reviewers.</li> </ol>	<ul style="list-style-type: none"> <li>2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)             <ul style="list-style-type: none"> <li>Table 4.18: Descriptions of Pilot Rationales Given for Low-Level Flights</li> </ul> </li> <li>NIRB Appendix G.5.1: 2023 Terrestrial Environment Annual Monitoring Report (Environmental Dynamics Inc.; March 2024)</li> </ul>	<ol style="list-style-type: none"> <li>Flights over the Snow Goose area include the 1,500 m horizontal buffer in July and August (moulting season) when the Snow Goose area applies (2023 TEAMR, section 5.1.2 pg 20-21 and 2023 NIRB Section 4 pg 230). These flights are broken down into compliant, compliant with rationale and non-compliant as described in Table 5-1 (2023 TEAMR pg 22) and Table 4.19 (2023 NIRB pg 230). The compliance results for the Snow Goose area are presented in Section 5.2 of the 2023 TEAMR and in tables 5-3, and 5-12 under the ≥1,100 magl Cruising Altitude Requirement heading and a breakdown of the compliant with rationale flights in table 5-7 (also under ≥1,100 magl heading), A subset is presented in Section 4 of the 2023 NIRB and Table 4.20 (rationale breakdown under the ≥1,100 magl heading) and Figure 4.12.</li> <li>The list of rationale was discussed Jan 5, 2023 with the GN and presented and discussed at the February 14, 2023 TEWG meeting (Meeting ID T-16022023). Item (Action ID T-28042022-2) was designated as complete at the December 13-14, 2023 meeting (Meeting ID T-13122023).</li> <li>The table of non-compliance rationale will be considered for inclusion in the next version of the TEMMP.</li> </ol>
<b>EIDER SPECIES AND MORTALITIES</b>					
2	ECCC #3.	<p>The 2023 TEAMR states that 13 King Eider mortalities were documented in 2023, all individual mortalities.</p> <p>Canadian Wildlife Service (CWS)-ECCC received an email notification from Todd Swenson of Baffinland on November 2, 2023 (with a follow up on January 25, 2024), which reported 13 Common Eider mortalities occurred during a</p>	<ol style="list-style-type: none"> <li>ECCC recommends that the Proponent add the mortalities of the 13 Common Eiders.</li> <li>ECCC recommends that the Proponent summarize, in future annual reports, any corrective</li> </ol>	<ul style="list-style-type: none"> <li>NIRB Appendix G.5.1: 2023 Terrestrial Environment Annual Monitoring Report (Environmental Dynamics Inc.; March 2024)</li> <li>Re: Mary River Project - Bird Mortality Notification. (Email from</li> </ul>	<ol style="list-style-type: none"> <li>In fact, the 13 King (not Common) Eider mortalities were documented in section 11.1 (Wildlife Interactions and Mortalities) of the 2023 TEAMR. Regrettably, 'common eider' was incorrectly listed in the notification to ECCC (Nov 2023).</li> <li>A description of corrective measures following wildlife mortalities can be included in future monitoring.</li> </ol>

		<p>single incidence with the same cause of death for all individuals (ship loading infrastructure collision following winterization and reduced lighting). This mortality event has not been captured in the 2023 TEAMR.</p> <p>More information about corrective measures taken following multiple mortalities can help to inform the effectiveness of corrective measures.</p>	<p>measures taken following wildlife mortalities, and whether any further mitigations are being proposed, considered, or implemented to reduce further mortality events.</p>	<p>Todd Swenson          &lt;todd.swenson@baffinland.com&gt; to          CWS North (ECCC) &lt;cwsnorth-          scfnord@ec.gc.ca&gt;; January 25, 2024)</p>	
<b>PROJECT-RELATED SHIP TRACK AND SEA ICE INFORMATION – MARINE BIRDS</b>					
3	<b>ECCC #4.</b>	<p><i>Term and Condition #103 states: "The Proponent shall report annually to the NIRB regarding project-related ship track and sea ice information, including ... e. When employing ice-breaking, marine bird and mammal species and number of individuals attracted to ship tracks in ice."</i></p> <p>Information has been provided for marine mammal species and number of individuals attracted to ship tracks in ice; no information was provided on marine bird species related to ship track attraction. It is not clear if no data was collected, or if no data is available because no marine bird species were observed. Clarification should be included in the annual reports and were needed with a rationale for lack of data, to demonstrate full compliance.</p> <p>ECCC notes that the Proponent did report that there were no seabird collision incidents in 2023.</p>	<p>ECCC recommends the Proponent report on the number of marine birds attracted to ship tracks in ice and include this information in future annual reports to be compliant with Term and Condition #103.</p>	<p>2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)</p> <ul style="list-style-type: none"> <li>○ Section 4: Performance on PC Terms and Conditions</li> </ul>	<p>Marine birds attracted to ship tracks in ice has not been observed or reported to date by any of the Inuit MWOs or biologist MWOs working on the SBO program. This has also not been raised as an issue of concern by Inuit community members or the MHTO. During future SBO surveys, if sightings are made of marine birds attracted to ship tracks in ice, this information will be recorded and included in the SBO Program Annual Report.</p>
<b>PROGRAM FOR REGIONAL AND INTERNATIONAL SHOREBIRD MONITORING</b>					
4	<b>ECCC #5</b>	<p>THE Proponent's TEMP identified songbirds and shorebirds as a Key Indicator (KI) for follow-up monitoring. Section 2.2 Birds states (pg. 42 of 128): "<i>Baffinland will assist in regional-level monitoring by the Canadian Wildlife Service (CWS) looking at regional diversities of songbirds and shorebirds.</i>"</p> <p>Section 4.4 Birds Monitoring further states (pg. 65 of 128) that Baffinland has "... committed to assisting the CWS in regional baseline research and monitoring of these species. The monitoring program involves 20 PRISM plots conducted within the RSA every five years (Table 4-7)." This is part of Term and Condition #73 and #74.</p> <p>The 2023 Annual Report states that the previous Program for Regional and International Shorebird Monitoring (PRISM) survey was held more than 5 years ago, in 2018, and it consisted of 14 plots. While Covid-19 restrictions have been a</p>	<p>ECCC recommends that the Proponent re-initiate PRISM surveys to monitor shorebirds and provide an update on when the next PRISM surveys are planned.</p>	<ul style="list-style-type: none"> <li>○ Terrestrial Environment Mitigation and Monitoring Plan (Baffinland; 2016)</li> </ul>	<p>Baffinland can discuss PRISM plot surveys with ECCC-CWS at their convenience. The intent was to support ECCC's ongoing PRISM monitoring programme.</p>

		challenge for maintaining monitoring programs, the collection of baseline data is still valuable and should be re-initiated.			
<b>COMPARISON OF MONITORED PM2.5 CONCENTRATIONS WITH CAAQS</b>					
5	<b>ECCC #7</b>	<p>In the air quality report, the Proponent compared monitored PM2.5 concentrations with the Nunavut Ambient Air Quality Standards (NAAQS) and Northwest Territories Ambient Air Quality Standards. While these have been considered the Project standards for PM2.5, it would be of value to compare the results with the Canadian Ambient Air Quality Standards (CAAQS) as the CAAQS is formulated from health-based science. If the comparison had been made with the CAAQS, more exceedances might have been observed at both monitoring stations (Port Site Complex [PSC] and Mine Site Complex [MSC]), as the CAAQS is the more stringent standard.</p> <p>As mentioned in Section 1.1 of the air quality report, <i>“The potential applicability of the 2020 CAAQS to the Project was considered as part of the monitoring framework and Baffinland determined that the 2020 CAAQS would be used for comparison purposes only in agreement with the CCME objective to “keep clean areas clean” with respect to ambient air quality.”</i></p> <p>While monitored NO<sub>2</sub> and SO<sub>2</sub> concentrations were compared to the CAAQS, this was not the case for PM<sub>2.5</sub>.</p>	ECCC recommends that the comparison of monitored PM2.5 concentrations be made with the CAAQS, in addition to the already considered standards.	<p>NIRB Appendix G.2.1 2023 Air Quality, Dustfall, and Meteorology Report (Nunami Stantec Limited; April 30, 2024)</p> <ul style="list-style-type: none"> <li>○ Section 1.1: Background and Objectives</li> <li>○ Section 2.3.3: Respirable Particulates 2.5µm in Diameter and Less (PM2.5)</li> <li>● 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)             <ul style="list-style-type: none"> <li>○ Section 4: Performance on PC Terms and Conditions</li> </ul> </li> </ul> <p>Canadian Ambient Air Quality Standards (<a href="https://ccme.ca/en/air-quality-report#slide-7">https://ccme.ca/en/air-quality-report#slide-7</a>) (Canadian Council of Ministers of the Environment)</p>	<p>The annual CAAQS for PM2.5 (8.8 ug/m3) is the 3-year average of the annual average of the daily 24-hour average concentrations. The 24-hour CAAQS for PM2.5 (27 ug/m3) is the 3-year average of the annual 98th percentile of the daily 24-hour average concentrations. Both rely on 3 years of data. Since 2023 was the 2nd year of using the BAM 1020s to monitor PM2.5 at the MSC and PSC, a CAAQS PM2.5 comparison will be made in the 2024 Annual Air Quality, Dustfall and Meteorology Report. Below are PM2.5 CAAQS comparisons (annual and 24-hour) for monitoring data collected at MSC and PSC during 2023.</p> <ul style="list-style-type: none"> <li>● The one-year average of the annual 98th percentile of the 2023 daily 24-hour average PM2.5 concentrations measured at MSC is 30.8 µg/m3. A direct comparison cannot be made with the CAAQS 2020 numerical value for the 24-hour averaging time (27 µg/m3) since the BAM 1020 particulate monitors have only been collecting data since April 2022.</li> <li>● The average over a single calendar year (2023) of the daily 24-hour average PM2.5 concentrations measured at MSC is 6.2 µg/m3. A direct comparison cannot be made with the CAAQS 2020 numerical value for the annual averaging time (8.8 µg/m3) since the BAM 1020 particulate monitors have only been collecting data since April 2022.</li> <li>● The one-year average of the annual 98th percentile of the 2023 daily 24-hour average PM2.5 concentrations measured at PSC is 23.3 µg/m3. A direct comparison cannot be made with the CAAQS 2020 numerical value (27 µg/m3) since the particulate monitors have only been collecting data since April 2022.</li> </ul> <p>The average over a single calendar year (2023) of the daily 24-hour average PM2.5 concentrations measured at PSC is 4.8 µg/m3. A direct comparison cannot be made with the CAAQS 2020 numerical value for the annual averaging time (8.8 µg/m3) since the BAM 1020 particulate monitors have only been collecting data since April 2022.</p>
<b>ISSUES AT MONITORING STATIONS</b>					
6	<b>ECCC #8</b>	<p>In the air quality report (Section 5.1), the Proponent mentions a few issues that occurred with the monitoring stations, which prevented the collection of monitored data for a certain period. The PSC monitoring station was unable to gather data on concentrations from January to April (4 months) due to cold temperatures causing flow controller and air temperature sensor failures. Additionally, the MSC</p>	ECCC recommends that the Proponent investigate the issues that prevented collection of monitored data and determine any lessons learned that would prevent reoccurrences of these.	<ul style="list-style-type: none"> <li>● NIRB Appendix G.2.1 2023 Air Quality, Dustfall, and Meteorology Report (Nunami Stantec Limited; April 30, 2024)             <ul style="list-style-type: none"> <li>○ Section 5.1: Ambient Air Quality Monitoring Program</li> </ul> </li> </ul>	<p>Baffinland continues to work with Met-One to identify the cause of cold temperature ‘air temperature sensor failures’. Baffinland is getting backup air temperature sensors as well as additional pumps and wearable components to minimize equipment downtime.</p>

		SO2 monitor experienced an ultraviolet (UV) lamp failure, which resulted in data invalidation for March and April (2 months). Although the situation was corrected by replacing the UV lamp or the SO2 monitor, the Proponent doesn't mention any measures to avoid this type of event.		2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024) <ul style="list-style-type: none"> <li>○ Section 4: Performance on PC Terms and Conditions</li> </ul>	
<b>EXCEEDANCES OF MONITORED PM<sub>2.5</sub> CONCENTRATION</b>					
7	<b>ECCC #9</b>	<p>In the air quality report (Section 5.1), the Proponent mentions exceedances of monitored PM<sub>2.5</sub> and total suspended particulates (TSP) concentrations. At the mine complex site monitoring station, the annual average and 24-hour average TSP concentrations were greater than the Project standard. The average annual PM<sub>2.5</sub> concentrations (6.17 µg/m<sup>3</sup>) were less than the Project standard (10 µg/m<sup>3</sup>) but are just slightly below the CAAQS PM<sub>2.5</sub> standard (8.8 µg/m<sup>3</sup>). At the PSC monitoring station, the annual average TSP concentrations were less than the Project standard. However, there were 17 instances of 24-hour TSP monitored concentrations exceeding the Project standard. Regarding PM<sub>2.5</sub>, there were 2 occurrences of monitored concentrations being higher than the Project standard, and more exceedances could be observed when compared to CAAQS.</p> <p>While the monitored concentrations, due to their location, may not be directly compared to standards (NAAQS, CAAQS), they provide insight into air quality impacts that may occur outside the project's designated area. Continuous application of best practices is important to ensure a reduction in air quality emissions trends over the years. The Proponent could implement a preventive approach framework based on trigger values with associated additional mitigation measures.</p> <p>Furthermore, the Proponent mentions the following in the air quality report (Section 5.1): <i>"Additional controls to limit the amount of fugitive dust that escapes during ore crushing and transportation activities at the mine site should be investigated and implemented where possible"</i>. A follow-up is required to determine what will be done in this regard.</p>	<p>ECCC recommends that dust related best practices continue to be applied to minimize particulate matter concentration and dust deposition levels.</p> <p>ECCC recommends that a preventive approach framework based on trigger values with associated additional mitigation measures be implemented.</p> <p>ECCC recommends the Proponent, when available, should provide information regarding the additional controls that will be implemented to limit the amount of fugitive dust that escapes during ore crushing and transportation activities.</p>	<ul style="list-style-type: none"> <li>● NIRB Appendix G.2.1 2023 Air Quality, Dustfall, and Meteorology Report (Nunami Stantec Limited; April 30, 2024) <ul style="list-style-type: none"> <li>○ Section 5.1: Ambient Air Quality Monitoring Program</li> </ul> </li> <li>● 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024) <ul style="list-style-type: none"> <li>○ Section 4: Performance on PC Terms and Conditions</li> </ul> </li> </ul>	<p>Baffinland thanks ECCC for their comment and input, and wants to re-assure ECCC that this is currently in development.</p> <p>Baffinland is currently conducting trials of both monitoring and mitigation tools to gain an understanding of the interrelation between all environmental factors and mitigation methods and their effectiveness. Numerous trials are underway, collecting both qualitative and quantitative data and observations. This information will inform the operational details of the additional controls to be implemented, and will be communicated once finalized.</p> <p>Baffinland notes that it is important to control dust during all environmental conditions and is continuing to focus efforts on development of suitable, reliable, and consistent monitoring processes as well as mitigation methodologies in a unique Arctic environment. These trials and initiatives require full testing and evaluation before finalizing a program with these elements.</p>

INTER-ANNUAL TRENDS FOR AIR CONTAMINANTS

8	ECCC #10	<p>In the main report (page 245), it is mentioned that “Subsequent annual reports will include an explicit comparison of inter-annual trends determined by passive dustfall monitoring and satellite imagery analysis.”. Providing inter-annual mean annual concentrations of dust deposition enables detection of trends and readjustments when necessary. It may be beneficial to provide inter-annual concentrations for other relevant air contaminants.</p>	<p>ECCC recommends that the Proponent provide inter-annual concentrations trends for other relevant air contaminants (PM<sub>2.5</sub>, TSP, NO<sub>2</sub>, SO<sub>2</sub>).</p>	<ul style="list-style-type: none"> <li>• 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)             <ul style="list-style-type: none"> <li>○ Section 4: Performance on PC Terms and Conditions</li> </ul> </li> </ul>	<p>The 2023 Annual Air Quality, Dustfall and Meteorology Report (Nunami Stantec. April 30, 2024) provided a summary of the inter-annual trend analysis for NO<sub>2</sub> and SO<sub>2</sub> in the third paragraph in the Executive Summary. In addition, the inter-annual trends for NO<sub>2</sub> were discussed in Sections 2.2.1.2 and 2.2.2.2, and SO<sub>2</sub> in Sections 2.2.1.1 and 2.2.2.1. Official monitoring for TSP and PM<sub>2.5</sub> concentrations began in April 2022 following several months of calibrating and data review, therefore it was not possible to include the inter-annual concentration trend in the 2023 Annual Air Quality, Dustfall and Meteorology Report because two complete years of data were not available. The 2024 Annual Air Quality, Dustfall and Meteorology Report will be more explicit about the comparison of the 2024 monitoring results and the inter-annual trends for TSP and PM<sub>2.5</sub>.</p>
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INCINERATOR STACK TESTING

9	ECCC #11	<p>Stack testing was conducted for the two incinerators, one at the mine site and one at the port. At the port site incinerator, the average concentration of dioxins and furans (126 µg/DRm<sup>3</sup>) exceeded the Canadian Council of Ministers of the Environment Canada-wide Standard of 80 µg/DRm<sup>3</sup>, with a peak concentration of 242 µg/DRm<sup>3</sup>.</p> <p>In the Incinerator Stack Testing Report (Section 6.2, p.13), it is mentioned that oily rags were incinerated prior to the stack testing. Additionally, during testing, the quantity of waste was measured largely in descriptive terms, with no weight or details of the garbage bag contents available.</p> <p>Furthermore, in the Waste Management Plan (Section 4.5, p.24), it is mentioned that “Incinerator waste will be segregated according to the Incinerator Operation Procedure (BAF-PH1-320-PRO-0002) to ensure only suitable materials are incinerated to achieve a complete burn-cycle. Incineration of hazardous wastes, non-combustible materials, or treated wood products is prohibited. The incineration of plastics will be minimized to the maximum extent practicable. Incineration of some food-related and other plastics will be unavoidable; however, best efforts will be made to reduce/prevent incineration of plastics containing chlorine molecules, which can generate dioxins and furans.”</p> <p>To ensure minimization of incomplete combustions and of dioxins and furans emissions, it is important to follow the</p>	<p>ECCC recommends that segregation of incineration waste be conducted accordingly to the Incinerator Operation Procedure to limit the emissions of dioxins and furans.</p>	<ul style="list-style-type: none"> <li>• 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)             <ul style="list-style-type: none"> <li>○ Section 4: Performance on PC Terms and Conditions</li> </ul> </li> <li>• NIRB Appendix G.2.2 – Incinerator Stack Testing Report (WSP Canada Inc.; February 2023)             <ul style="list-style-type: none"> <li>○ Section 6.2: Observations and Comments</li> </ul> </li> <li>• NIRB Appendix G.8.2 – Waste Management Plan (Baffinland; April 15, 2024)             <ul style="list-style-type: none"> <li>○ Section 4.5: Incinerators</li> </ul> </li> </ul>	<p>Baffinland will continue to follow the Incinerator Operation Procedure during normal operations of Project incineration units, and will reemphasize to site personnel the importance of sorting garbage before it is incinerated. The annual review of the Incineration Operation Procedure was recently completed and updates were made to the procedure to reflect current operations and update criteria for waste load design, including maximum loading of oily rags and Waste Water Treatment Plant (WWTP) cakes, and criteria for their placement within the waste load.</p> <p>As recommended by the third-party consultant retained to conduct annual performance source testing for the incineration units, Baffinland will ensure 2024 test burn loads are designed according to Incinerator Operation Procedure criteria to meet operating manual specified quantities and ratios and reflect optimal burn conditions. The 2024 performance source testing is scheduled to be conducted in August, 2024.</p>
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		Incinerator Operation Procedure during testing or during normal operations.			
<b>OPEN BURNING</b>					
10	ECCC #12	In the Waste Management Plan (Table 2), it is mentioned that untreated wood and cardboard may either be incinerated or open burned. The Nunavut's Environmental Guideline for the Burning and Incineration of Solid Waste (page 9) discourage open burning as a method for disposing of unsegregated or mixed solid waste. ECCC also discourages the use of open burning and would prioritize other options such as incinerating cardboard and untreated wood.	ECCC recommends that cardboard and untreated wood be incinerated or disposed of in another cleaner way instead of being open burned.	<ul style="list-style-type: none"> <li>• NIRB Appendix G.8.2 – Waste Management Plan (Baffinland; April 15, 2024) <ul style="list-style-type: none"> <li>○ Table 2 Waste Disposal by Generation Location</li> </ul> </li> </ul>	<p>There is insufficient capacity in Project incinerators to dispose of all untreated wood and clean cardboard generated onsite through incineration. As per Baffinland's Waste Management Plan (WMP) (Rev 10) Table 2, untreated wood is to be disposed of by open burning. Note that only untreated wood waste that is not suitable for recycling/reuse (mainly scrap pallets and dunnage) is disposed of through open burning. Disposal of clean wood that cannot be recycled/reused via open burning reduces the volume of inert waste directed to the Project Landfill Facility. Also under the WMP Table 2, cardboard is suitable for open burning or incineration. Cardboard that has come into contact with food is incinerated, whereas, cardboard that is clean is disposed of by authorized open burning to ensure sufficient capacity within Project incinerators for waste requiring incineration, such as food waste and plastics.</p> <p>Open burning of untreated wood and clean cardboard is completed in accordance with Baffinland's Open Burning of Untreated Wood, Cardboard and Paper Products Procedure and by site personnel who are trained to operate Project open burn facilities. The Open Burning of Untreated Wood, Cardboard and Paper Products Procedure outlines the operational requirements for achieving a controlled burn and conditions for efficient combustion of untreated wood waste and clean cardboard material.</p> <p>This is consistent with Government of Nunavut's Environmental Guideline for the Burning and Incineration of Solid Waste.</p> <p>Reference <a href="https://www.gov.nu.ca/sites/default/files/publications/2022-01/guideline_-_burning_and_incineration_of_solid_waste_2012.pdf">https://www.gov.nu.ca/sites/default/files/publications/2022-01/guideline_-_burning_and_incineration_of_solid_waste_2012.pdf</a></p>
<b>CHANGE IN VESSEL TYPE</b>					
11	ECCC #13	In Appendix G.6.16 (Section 3.0), the use of a larger vessel (Capesize) is considered to reduce the number of vessels, transits, and berthing and loading events.  Using a larger vessel generally contributes to higher air quality contaminant concentrations over shorter periods (hourly, 24-hour), even if the annual average concentration may decrease. Upon analyzing future monitored results at the PSC monitoring station with the new vessels, further mitigation measures could be beneficial to reduce the impact during the shipping season.	ECCC recommends that the monitored concentrations at the PSC station be analyzed regularly during the shipping season for any changes in vessel type during onshore wind conditions to assess whether any changes in air contaminant concentrations occur for shorter periods. If an upward trend is observed, further mitigation measures should be considered.	<ul style="list-style-type: none"> <li>• Appendix G.6.16 - Comparative Assessment of Shipping Operations Along the Northern Shipping Route with and Without Capesize Ore Carriers (Baffinland; January 31, 2024) <ul style="list-style-type: none"> <li>○ Section 3: Summary</li> </ul> </li> <li>• 2023 Annual Report to the NIRB Main Document (Baffinland; May 3, 2024)</li> </ul>	Baffinland undertook this analysis in 2023 at the request of ECCC and sent a memo titled Ambient Air Quality Monitoring –July to October 2023. Dated December 18, 2023.

				<ul style="list-style-type: none"> <li>○ Section 4: Performance on PC Terms and Conditions</li> </ul>	
<b>EROSION AND SEDIMENTATION CONTROL MEASURES</b>					
12	<b>ECCC #14</b>	<p>Controlling erosion and sedimentation on site during freshet continues to be challenging. Uncontrolled seepage of 447 319 m3 from the KM105 Surface Water Management Pond resulted in release of water with elevated TSS. This release impacted water quality at downstream stations (MS-C-A, MS-C-B &amp; MS-C-F), and is potentially impacting sediment quality in Sheardown Lake NW. A prompt and permanent solution to managing water routed to this pond is necessary to prevent future releases.</p> <p>Several other total suspended solids (TSS) exceedances were noted, including at the snow stockpiles and quarries. At both locations, erosion and sedimentation control measures were installed and maintained including coir logs, silt fences and rock check dams. In the case of quarries, these measures were implemented after sampling indicated there was a problem. It is not clear if measures at the snow stockpiles were installed before or after sampling indicated TSS exceedances. Since both these areas can be expected to generate runoff with high TSS, mitigation measures should be proactive and installed prior to TSS exceedances.</p> <p>Elevated concentrations of suspended sediment degrade water quality and controlling releases are particularly important around the mine site as sediment will likely have high metal concentrations.</p>	<p>ECCC recommends the Proponent take proactive measures to prevent erosion and sedimentation in areas that are expected to generate runoff with high TSS.</p>	<ul style="list-style-type: none"> <li>● 2023 QIA-NWB Annual Report for Operations (Baffinland; March 31, 2024)               <ul style="list-style-type: none"> <li>○ Section 7.3.9: Snow Stockpile Monitoring</li> <li>○ Section 7.3.10: Freshet Monitoring</li> <li>○ Section 7.4: Surface Water Runoff Downstream of Project Areas and Quarries</li> </ul> </li> <li>● NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2023, Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2024)               <ul style="list-style-type: none"> <li>○ Section 4.4.2: Sediment Quality</li> </ul> </li> </ul>	<p>Baffinland acknowledges ECCC's comment and wishes to confirm that all measures are being made to remediate the uncontrolled release of seepage from the KM105 Pond. Furthermore, continuing water management strategies have been and will continue to be applied at other areas of high TSS release, including modifications to runoff diversion from the Site access roads, to encourage settling. Furthermore, the implementation of the Project's Long Term Water Management Plan (LTWMP), including the construction of a pond or sump upstream of Sheardown Lake Tributary 1 lower reach, will result in a significant improvement of the water quality reporting to Sheardown Lake.</p>
<b>INVESTIGATION ON QUALITY OF DISTILLED WATER</b>					
13	<b>ECCC #15</b>	<p>Field and travel blanks for both the Surveillance Network Program surface water samples and the groundwater monitoring samples had an anomalously high number of parameters detected. The annual report states: "<i>Quality of distilled water and/or laboratory analytical error is a likely explanation for these elevated parameter values. In 2024, Baffinland plans on testing the distilled water used to make field and travel blanks to determine if our assessments are correct.</i>" It is not clear if the results of the testing will be analyzed sufficiently early in 2024 to implement any</p>	<p>ECCC recommends the Proponent promptly determine the source of detectable concentrations in the field and travel blanks for water samples and bring the necessary corrections prior to field sampling in 2024. Test results and corrective measures should be described in the next annual report.</p>	<ul style="list-style-type: none"> <li>● 2023 QIA-NWB Annual Report for Operations (Baffinland; March 31, 2024)               <ul style="list-style-type: none"> <li>○ Section 7.8: Quality Assurance and Quality Control (QA/QC)</li> </ul> </li> <li>● NWB Appendix E.11.1/NIRB Appendix G.3.1 - 2023 Annual Groundwater Monitoring Program (Knight Piésold Consulting; March 28, 2024)</li> </ul>	<p>The suggested assessment has been initiated and a complete discussion will be included in the 2024 NIRB Annual Report.</p>

		necessary corrective actions, and if the results and follow-up will be shared with reviewers.  Quality Assurance and quality control are integral to water sampling as they qualify what confidence we can have in the results.		<ul style="list-style-type: none"> <li>○ Section 4.1: QA/QC and Laboratory Issues</li> </ul>	
<b>MITIGATION MEASURES FOR MINE RELATED INFLUENCES IDENTIFIED IN CORE RECEIVING ENVIRONMENT MONITORING PROGRAM</b>					
14	<b>ECCC #16</b>	<p>For three monitoring locations concentrations of certain water quality parameters in exceedance of Aquatic Effects Monitoring Plan benchmarks, are elevated relative to reference and baseline conditions, and show increasing trends. For these locations, recommendations include an investigation of potential sources. The parameters of interest are:</p> <ul style="list-style-type: none"> <li>○ Sheardown Lake Tributary 9: ammonia, nitrate and total Kjeldahl nitrogen (TKN)</li> <li>○ Sheardown Lake NW: nitrate, chloride, sulphate, total and dissolved molybdenum and uranium</li> <li>○ Sheardown Lake SE: nitrate, sulphate, and total and dissolved molybdenum and uranium</li> </ul> <p>In addition to identifying potential sources, further work should also include recommending mitigation measures to reduce mine impacts to water quality once potential sources have been identified.</p>	ECCC recommends the Proponent propose mitigation measures to reduce mine impacts following their investigations of potential sources impacting water quality at Sheardown Lake Tributary 9, Sheardown Lake NW, and Sheardown Lake SE, as applicable.	<ul style="list-style-type: none"> <li>• NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2023, Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2024)</li> <li>○ Table 6.1: Summary of AEMP Benchmark Exceedances and Effects Determination for the Mary River Project 2023 CREMP and Monitoring Recommendations Based on the Results</li> </ul>	The AEMP used for the reporting year was revision 1, as rev 2 has not yet been approved and as such it did not incorporate the TARP. Baffinland will use the approved version of the AEMP for the 2024 reporting year. Mitigation measures (TARP) are included in rev 2.
<b>SUITABILITY OF WELLS INSTALLED IN 2023 FOR GROUNDWATER MONITORING</b>					
15	<b>ECCC #17</b>	<p>Several issues with the groundwater monitoring well installation are identified. These issues include factors that can affect representatively of groundwater level measurements (such as the perforated casings) and groundwater quality (such as the lack of a bentonite seal). Results from the 2023 monitoring program were not discussed as "a result of the limitations that occurred during the 2023 monitoring program". Though there were also issues with Quality Assurance/Quality Control, sampling and well development, it is not clear if the wells installed in 2023 will be suitable for groundwater monitoring in the future.</p> <p>Groundwater monitoring at the landfill is necessary to identify if contaminants are migrating towards Sheardown</p>	ECCC recommends the Proponent discuss if groundwater wells installed in 2023 can be used to collect reliable data. If so, they should include a discussion of any corrective measures necessary on the wells and caveats that will be associated with the data. If wells are unsuitable for use, ECCC recommends the Proponent install new wells.	<ul style="list-style-type: none"> <li>• NWB Appendix E.11.1/NIRB Appendix G.3.1 - 2023 Annual Groundwater Monitoring Program (Knight Piesold Consulting; March 28, 2024)</li> <li>○ Section 4.2: Well Installation Issues</li> <li>○ Section 5.0: Conclusion and Recommendations</li> </ul>	<p>Baffinland is planning for additional well installations in 2024, with a focus on replacing any wells that do not provide reliable data, as well as installing new wells in areas previously identified as data gaps.</p> <p>New 2-inch PVC wells will be installed in the traditional manner using a drill this summer in the areas identified by Knight Piesold as information gaps in their 2023 groundwater assessment. Furthermore, current non-functional wells are scheduled to be replaced with drill-installed 2-inch PVC wells this summer. This is happening at both the Mary River Landfill and the Hazardous Waste Berms.</p> <p>In total 12-14 new wells are scheduled to be installed in August of 2024. These wells will be properly installed, protected against permafrost damage, properly developed and slug-tested to determine hydraulic conductivities, and then water quality</p>

		Lake so that mitigation measures can be taken as appropriate to protect the aquatic environment.			<p>samples collected, with site QA/QC protocols carefully followed to ensure reliability of the data.</p> <p>Any corrective measures taken to remedy wells from 2023 will be taken under the direction of a qualified Engineer and any limitations for use of the data will be presented in the 2024 NIRB Annual Report.</p>
<b>MIGRATION OF CONTAMINANTS IN GROUNDWATER NEXT TO LANDFILL</b>					
16	<b>ECCC #18</b>	<p>Potential migration of contaminants through groundwater from the landfill to Sheardown Lake was identified as a pathway in the 2022 the Core Receiving Environment Monitoring Program Report and a conceptual contaminant transport model was outlined in a memorandum; however, there was insufficient data to populate the model.</p> <p>This issue from 2022 is not presented in the 2023 annual report. The 2023 Core Receiving Environment Monitoring Program Report no longer mentions the landfill as a potential source of contaminants, above 2023 groundwater monitoring results were not interpreted, and no reference to the contaminant transport model was found. The Proponent's response on ECCC's 2022 comment on this topic states they "will continue to collect sufficient additional groundwater data to complete the contaminant transport model." The response also proposed three potential mitigation measures "In the absence of the results of the contaminant transport model". It is not clear if any of these potential mitigation measures will be implemented and if so, on what timeline.</p>	<p>ECCC recommends the Proponent:</p> <ul style="list-style-type: none"> <li>• clarify why the landfill is no longer included as a potential source of contaminants to Sheardown Lake in the Core Receiving Environment Monitoring Program Report;</li> <li>• specify a timeline for completion of the contaminant transport model; and</li> <li>• clarify if any of the proposed potential mitigation measures for preventing contaminant migration through groundwater from the landfill to Sheardown Lake will be implemented, and if so, provide a timeline.</li> </ul>	<ul style="list-style-type: none"> <li>• NWB Appendix E.11.1/NIRB Appendix G.3.1 - 2023 Annual Groundwater Monitoring Program (Knight Piésold Consulting; March 28, 2024) <ul style="list-style-type: none"> <li>○ Section 5.0: Conclusion and Recommendations</li> </ul> </li> <li>• NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2023, Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2024)</li> <li>• NWB Appendix E.12 - Response to 2022 Annual Report Comments (Baffinland; March 2024) <ul style="list-style-type: none"> <li>○ Table E.12.2: Response to ECCC Comments on Baffinland's 2022 QIA-NWB Annual Report for Operations</li> </ul> </li> <li>• NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2022 Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2023)</li> <li>• NWB Appendix E.12.3/NIRB Appendix G.3.3 - Development of a Conceptual Contaminant Transport Model for the Landfill at the Mary River Mine Site (Knight Piésold Consulting; March 28, 2023)</li> </ul>	<p>Additional data is needed to inform potential source pathways into Sheardown lake. It can't be conclusively stated that groundwater contaminants are entering Sheardown lake. The CREMP and groundwater conceptual transport model will both be presented in 2024 annual reporting, pending suitable groundwater data is able to be collected.</p> <p>Future data collected during annual groundwater monitoring programs will be incorporated into the model to further refine model assumptions to improve certainty of model predictions quantifying contaminant transport at the Landfill Facility.</p> <p>Should monitoring indicate migration of contaminants to Sheardown Lake, the proposed mitigation measures will be revisited, and implemented strategically based on a full assessment of the model outcomes to ensure selection and implementation of suitable mitigation measure(s)</p>

Table A.4: Response to CIRNAC Comments on Baffinland's 2023 Annual Report to the NIRB

Cmt. #	CIRNAC Cmt. #	Reviewer's Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland's Response
<b>DUST MANAGEMENT AND MONITORING</b>					
1	CIRNAC #1	<p>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:</p> <p>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).</p> <p>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).</p> <p>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.</p> <p>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.</p>	<p>CIRNAC recommends that Baffinland consider improvements to the quality of monitoring activities, which could include the following measures:</p> <p>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.</p> <p>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.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>Project Certificate No. 005 (Amendment 05) (November 17, 2023) Terms and Conditions #10, 21</li> <li>Baffinland Iron Mines Corporation (Baffinland) 2023 Annual Report to the Nunavut Impact Review Board (NIRB) (May 03, 2024):             <ul style="list-style-type: none"> <li>Section 4.6.2 Air Quality</li> <li>Section 4.6.5 Groundwater &amp; Surface Water</li> <li>Section 4.6.6 Vegetation</li> </ul> </li> <li>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)</li> <li>EDI Environmental Dynamics Inc. (EDI) 2024. Mary River Project Terrestrial Environment 2023 Annual Monitoring Report (TEAMR) (March 2024)</li> <li>Nunami Stantec Limited (Nunami). 2023 Annual Air Quality, Dustfall and Meteorology Report. (April 30, 2024)</li> <li>Nunami Stantec Limited and Independent Dust Audit Committee Members (Dust Audit Committee). 2023. Baffinland Dust Audit Final Recommendations Report. (February 8, 2023)</li> </ul>	<p>a. Dustfall impacts and mitigations are already being overseen by the Dustfall Audit Committee. Further, dust deposition at the Project is already evaluated via dust isopleth modelling (revised/updated in 2023). Potential effects to the Terrestrial Environment are evaluated and interpreted in relation to trends from passive dustfall monitoring. It is not clear how a supplementary Conceptual Site Model (CSM) would further inform dust modelling at the Project beyond existing studies and monitoring programs.</p> <p>b. Evaluation of increasing trends in parameter concentrations in water and sediment into aquatic environments are considered, which would reflect potential effects from dustfall</p> <p>c. This CIRNAC Comment/Recommendation reiterates CIRNAC Comment #9 on the 2022 TEAMR, bullets (c) and (d).</p> <p>Baffinland already monitors and investigates potential trends in increased dustfall generation with soil contamination in the various mine site areas. A long-term vegetation and soil base metals monitoring program was initiated in 2012, as described in the Terrestrial Environment Mitigation and Monitoring Plan (TEMMP) (Baffinland, 2016). The objectives of the vegetation and soil base metals monitoring program are to monitor metal concentrations in vegetation and soil, particularly caribou forage (i.e., lichen), and verify that metal concentrations are within the acceptable range for established soil quality guidelines and relevant vegetation indicator values.</p> <p>The most recent soil-metal concentration data, collected in 2022 at the Project, predominantly indicated no significant change, or concentrations were significantly lower relative to baseline values. Concentrations were below or within an acceptable range for soil-metal concentrations. Further, it was noted that there was a significant negative relationship between metal concentrations in dustfall and metal concentrations in soil for all CoPCs except cadmium; for all CoPCs, this appeared to be mediated by a significant positive relationship with soil pH. No unifying trend has been drawn from the analysis (EDI, 2023).</p> <p>Undertaking leachability and geochemical testing is not presently warranted given that soil sampling data collected in 2022 predominantly indicated concentrations were below or within an acceptable range for soil-metal concentrations. The TEMMP/Trigger-Action Response Plan would guide</p>

Cmt. #	CIRNAC Cmt. #	Reviewer’s Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland’s Response
		<p>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.</p> <p>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.</p>			<p>future adaptive management response “If monitoring indicates increasing concentrations of metals over time”.</p> <p><b>References:</b></p> <p>Baffinland Iron Mines Corporation (Baffinland), 2023. Terrestrial Environment Mitigation and Monitoring Plan. Ref. No. BAF-PH1-830-P16-0027, DRAFT. May 15, 2023.</p> <p>EDI Environmental Dynamics Inc. (EDI). 2023. Mary River Project: 2022 Terrestrial Environment Annual Monitoring Report. Prepared for Baffinland Iron Mines Corporation, Oakville, Ontario, Canada. 426 pp.</p>
<b>WASTE ROCK FACILITY – IDENTIFICATION AND MANAGEMENT OF ACID ROCK DRAINAGE / METAL LEACHING WASTE ROCK MATERIALS AND PERMAFROST</b>					
2	CIRNAC #2	<p><u>Increased Waste Rock Volumes</u></p> <p>CIRNAC’s issues #1 and #2 raised in its 2021 review of the Annual Report remained relevant during the 2022 annual review cycle.</p> <p>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.</p> <p>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</p>	<p>CIRNAC recommends that Baffinland in the 2024 Annual report:</p> <p>a) Provide an updated LOM estimation of PAG tonnages and confirmation that the WRF design and contingencies for closure are still appropriate.</p> <p>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.</p>	<ul style="list-style-type: none"> <li>• Project Certificate No. 005 (Amendment 05) (November 17, 2023) Terms and Conditions #16, 17, 23, 24, 46</li> <li>• CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation’s 2021 Annual Report for the Mary River Project (June 15, 2022)</li> <li>• Baffinland 2022 Annual Report to NIRB. <ul style="list-style-type: none"> <li>○ Section 4.6.4 Hydrogeology and Hydrogeology</li> <li>○ Section 4.6.5 Groundwater &amp; Surface Water</li> <li>○ Section 4.6.7 Freshwater Environment</li> </ul> </li> </ul>	<p>a) Baffinland addressed this concern in its previous response to CIRNAC on the 2022 NIRB Annual Report, August 14, 2023 and in the PAG Waste Reconciliation Memo recently provided.</p> <p>b) The 2023 data are consistent with all previous data; therefore, there is no change in expectations with respect to NP of silicate minerals. As indicated in CIRNAC’s detailed comment, “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.” As part of the overall geochemistry evaluation for the Project, humidity cell testing and mineralogy has been completed as described in AMEC 2014 and other reference documents including the EIS and summary appendices. The humidity cell tests confirm that at room temperature release of acidity is not expected over the duration of testing (&gt;150 weeks). Results of the overall mineralogy show the presence of chlorite, mica, and amphibolite or ultramafic material that are considered intermediate weathering silicates with reaction rates as described in Karlsson et.al (2018).</p>

Cmt. #	CIRNAC Cmt. #	Reviewer's Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland's Response
		<p>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.</p> <p>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.</p> <p><u>Comparison of Field and Laboratory Measurements</u></p> <p>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.</p> <p>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.</p> <p>During the review of the 2023 material, it was identified that the field protocol included measurement of sulphur content (by Leco and XRF) and paste pH. The updated Waste Rock Facility (WRF) Management Plan provides a comparison of</p>		<ul style="list-style-type: none"> <li>• Baffinland 2022 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual Report for Operations (March 31, 2023)</li> <li>• Baffinland 2022 QIA and NWB Annual Report for Operations: <ul style="list-style-type: none"> <li>○ Appendix E.6. Waste Rock Geochemistry Analytical Sampling Results. (March 2023).</li> </ul> </li> <li>• Baffinland Response to Comments Received for Baffinland's Production Increase Proposal Extension 2020 Annual Monitoring Report (August 2021).</li> <li>• 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)</li> <li>• Baffinland 2023 Qikiqtani Inuit Association (QIA) and Nunavut Water Board (NWB) Annual report for Operations (March 31, 2024)</li> <li>• Baffinland Response to NIRB's Recommendations from the 2022-2023 Annual Report (March 20, 2024)</li> <li>• Waste Rock Management Plan – June 2023 through September 2026 (January 2024)</li> <li>• Appendix G.8.4 Aquatics Effects Management Plan (March 31, 2024)</li> <li>• 2023 QIA-NWB Annual Report (March 31, 2024)</li> </ul>	<p>When considering the thermal conditions of the pile, the presence of silicate minerals that are considered fast to intermediate weathering, the humidity cell observations from the EIS and follow-up work, and the observations on site that show water quality improvements following adjustments to the deposition strategy to enhance freezing in the pile and place any materials with soluble sulphate minerals near the center of the pile, the predictions of acid generation and water quality are considered reasonable and appropriate. As a result, considering the silicate buffering, there is not expected to be any impact to the practice of determining ARD potential based on paste pH and 0.2% sulfur content only.</p> <p>Reference: Teemu Karlsson, Marja Liisa Räisänen, Marja Lehtonen and Lena Alakanga. 2018. Comparison of static and mineralogical ARD prediction methods in the Nordic environment. Environ. Monit. Assess. (2018) 190: 719.</p>

Cmt. #	CIRNAC Cmt. #	Reviewer's Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland's Response
		<p>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.</p> <p>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.</p>		<ul style="list-style-type: none"> <li>Appendix G.8.3 Fresh Water Supply, Sewage and Wastewater Management Plan (April 20, 2024)</li> <li>Baffinland 2023 Annual Report to NIRB:               <ul style="list-style-type: none"> <li>Section 4.6.4 Hydrogeology and Hydrogeology</li> <li>Section 4.6.5 Groundwater &amp; Surface Water</li> <li>Section 4.6.7 Freshwater Environment</li> </ul> </li> <li>NIRB 2022-2023 Annual Monitoring Report – The Mary River Project (January 2024; NIRB File No. 08MN053)</li> <li>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)</li> </ul>	
<b>GROUNDWATER MONITORING AND MANAGEMENT PLAN</b>					
3	CIRNAC #3	<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). 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.</p> <p>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.</p> <p>Since its review of Baffinland's 2021 Annual Report, CIRNAC has consistently recommended that the program be</p>	<p>CIRNAC recommends that Baffinland:</p> <ol style="list-style-type: none"> <li>Provide the results of the 2023 groundwater monitoring program to confirm that sampling was done and impacts on groundwater quality have been identified.</li> <li>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</li> </ol>	<p>Project Certificate No. 005 (Amendment 05) (November 17, 2023) Term and Condition 23</p> <p>CIRNAC Comments to NIRB Re: Comment Request for Baffinland Iron Mines Corporation's 2021 Annual Report for the Mary River Project (June 15, 2022)</p> <p>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)</p>	<ol style="list-style-type: none"> <li>Due to the limitations that occurred during the 2023 groundwater monitoring program, as described in the 2023 Groundwater Monitoring Program Memorandum (KP, 2024), water quality and response testing results may not be representative of the actual water quality and hydraulic conductivity values at the Landfill Facility and HWB areas. As a result, a discussion of the results was not provided for 2023. Baffinland is planning for additional well installations in 2024, with a focus on replacing any wells that do not provide reliable data, as well as installing new wells in areas previously identified as data gaps. Further testing and monitoring is planned to be completed in during the program in 2024, following installation of the monitoring wells.</li> <li>New 2-inch PVC wells will be installed in the traditional manner using a drill this summer in the areas identified by Knight Piesold as information gaps in their 2023 groundwater assessment. Furthermore, current non-functional wells are scheduled to be replaced with drill-installed 2-inch PVC wells this</li> </ol>

Cmt. #	CIRNAC Cmt. #	Reviewer's Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland's Response
		<p>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 groundwater levels, stratigraphy characterization, permeability, groundwater quality, and groundwater flow direction.</p> <p>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.</p>	<p>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.</p> <p>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.</p>	<p>Baffinland. 2022 Annual Report to NIRB (April 30, 2023):</p> <p>Section 4.6.5 Groundwater &amp; Surface Water</p> <p>Knight Piesold Consulting (Knight Piesold). 2023a. 2022 Groundwater Monitoring Program Report (March 2023)</p> <p>Knight Piesold. 2023b. 2022 Groundwater Monitoring Program Assessment (March 2023)</p> <p>Knight Piesold. 2024a. 2023 Annual Groundwater Monitoring Program (March 2024)</p> <p>Knight Piesold. 2024b. Mary River Project Groundwater Monitoring Program Review and Assessment</p> <p>Minnow Environmental Inc (Minnow). 2023. Mary River Project 2022 Core Receiving Environmental Monitoring Program (CREMP) Report (March 2023)</p> <p>Tetra Tech, 2021. 2021 Groundwater Monitoring Program Mary River Mine Project (March 24, 2022)</p>	<p>summer. This is happening at both the Mary River Landfill and the Hazardous Waste Berms.</p> <p>In total 12-14 new wells are scheduled to be installed in August of 2024. These wells will be properly installed and completed with a conventional sand pack and bentonite seal, protected against permafrost damage, properly developed and slug-tested to determine hydraulic conductivities, and then water quality samples collected, with site QA/QC protocols carefully followed to ensure reliability of the data.</p> <p>c. In 2022, Knight Piesold completed a comprehensive review of the groundwater monitoring program and developed risk-based screening criteria to determine when groundwater monitoring should be conducted at other mine facilities (in addition to the current program at the Landfill and HWB facilities).</p> <p>The risk-based approach to groundwater monitoring focuses on the facilities presenting the greatest potential risk to impacting surface water. This is a function of:</p> <ol style="list-style-type: none"> <li>1. Distance to a potential surface water receiver;</li> <li>2. Known or suspected issues (e.g., seepage);</li> <li>3. The age of the facility;</li> <li>4. Potential contaminants of concern; and</li> <li>5. Soil types (and attenuation potential).</li> </ol> <p>Based on screening criteria, the Waste Rock Facility (WRF) is a low risk area and therefore expansion of the current groundwater monitoring program to include the WRF area is not recommended. Additional information about the WRF risk rating is included in Table 3.1 Risk Based Screen Criteria on page 9 of the Groundwater Monitoring Program Review and Assessment (KP; 2023) and summarized below:</p> <ul style="list-style-type: none"> <li>• The 2021 Annual Groundwater Monitoring program included an investigation of the WRF, which included the advancement of two test pits within the area. Tetra Tech observed coarse grained soils, and large cobbles with moist soil, but no visible groundwater within the test pits.</li> </ul>

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					<ul style="list-style-type: none"> <li>• Diversion/collection ditches are situated downgradient of the WRF to collect seepage from the Facility and divert the water into a lined seepage collection pond. The water held within the seepage collection pond is subsequently pumped back to the WRF collection pond.</li> <li>• Due to the lack of groundwater observed in the Tetra Tech test pits and because seepage collection ditches are situated downgradient of the WRF, it is not recommended to include the WRF in the existing groundwater monitoring program.</li> </ul> <p>d. Baffinland will continue to apply the risk-based approach to groundwater monitoring, detailed in the Groundwater Monitoring Program Review and Assessment (KP; 2023)</p> <p>As part of the risk-based process, should the risk level of a Project facility increase in the future due to changing site conditions, groundwater monitoring at the facility may become warranted; therefore, the facility will undergo re-evaluation against the screening criteria should site conditions change.</p> <p>Reference Knight Piesold 2024. Mary River Project :2023 Annual Ground Water Monitoring Program. Prepared for Baffinland Iron Mines Corporation, Oakville, Ontario Canada. Knight Piesold 2023. Mary River Project: Ground Water Monitoring Program Review and Assessment. Prepared for Baffinland Iron Mines Corporation, Oakville, Ontario Canada.</p>
<b>AQUATIC EFFECTS MONITORING PLAN AND DUSTFALL MONITORING</b>					
4	<b>CIRNAC #4</b>	<p>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.”</p> <p>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</p>	<p>CIRNAC recommends that Baffinland:</p> <ol style="list-style-type: none"> <li>a) Provide the dustfall chemical composition data as required by Term and Condition 21; and,</li> <li>b) Update the CREMP and Lake Sedimentation Monitoring Program to clearly define the trends in dustfall with</li> </ol>	<p>Project Certificate 005 (Amendment 05) (November 17, 2023) Term and Condition (T&amp;C) 21</p> <p>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)</p>	<p>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>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.</p>

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		<p>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).</p> <p>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".</p> <p>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</p>	<p>the intent of informing the adaptive management of these activities.</p>	<p>Baffinland Iron Mines Corporation (Baffinland) 2023 Annual Report to the Nunavut Impact Review Board (NIRB) (May 03, 2024):</p> <ul style="list-style-type: none"> <li>○ Section 4.6.4 Hydrology and Hydrogeology</li> <li>○ Section 4.6.5 Groundwater &amp; Surface Water</li> </ul> <p>Appendix G.5. Terrestrial Environment Reports. EDI Environmental Dynamics Inc. (EDI) 2024. 2023 Terrestrial Environment Annual Monitoring Report (TEAMR). (March 2024).</p> <p>Appendix G.4.1 2023 Core Receiving Environment Monitoring Program (CREMP) Report. Minnow Environmental. 2024. Mary River Project 2023 CREMP (March 2024)</p> <p>Appendix G.4.3. 2023 Lake Sedimentation Monitoring Report. Minnow Environmental. 2024. Mary River Project - Lake Sedimentation Monitoring 2022/2023.</p> <p>Appendix. G.8.4. Aquatic Effects Monitoring Plan (AEMP) (Rev 2) Document # BIM-5200-PLA-0023 (March 31, 2024)</p>	
<b>PERFORMANCE OF NEW MS-11 SURFACE WATER MANAGEMENT POND AT KM105</b>					
5	<b>CIRNAC #5</b>	<p>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</p>	<p>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:</p>	<p>Project Certificate 005 (Amendment 05) (November 17, 2023) Term and Condition 16, 17, 22 and 24</p> <p>Baffinland. 2024. The NIRB's 2022-2023 Annual Monitoring Report for the</p>	<p>Baffinland will provide a full summary on activities related to the KM105 Pond in the 2024 NWB and QIA Annual Report for Operations, including details regarding the installation and commissioning of a water treatment system and a polishing step for TSS removal, and KM105 Pond monitoring results.</p>

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		<p>2021). KM105 pond collects surface water runoff from the main mine Deposit No.1 which was operational in 2022.</p> <p>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.</p> <p>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 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.</p> <p>Immediate response for seepage remediation included:</p> <ul style="list-style-type: none"> <li>Multiple bentonite plugs to seal the seepage in the base of the KM 105 Pond which were deemed to be unsuccessful.</li> <li>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.</li> <li>Mitigation measures of temporary check dam installations upstream and downstream of KM 105 and</li> </ul>	<p>a) Confirm installation and commissioning of a water treatment system as a polishing step for TSS removal; and,</p> <p>b) provide the results of MS-11/KM105 pond monitoring in the 2024 Annual Report as per Terms and Conditions 24.</p>	<p>Mary River Project – Updates to Parties Comments on the 2022-2023 Annual Report (NIRB File No. 08MN053)</p> <p>Baffinland Iron Mines Corporation (Baffinland) 2023 Annual Report to the Nunavut Impact Review Board (NIRB) (May 03, 2024):</p> <ul style="list-style-type: none"> <li>Section 3.1 Site Activities Completed in 2023</li> <li>Section 4.3 Summary of 2022 Compliance with Terms and Conditions</li> <li>Section 4.5.2 Unauthorized Discharges and Spills</li> <li>Appendix G.2.4 2023 .2.Geotechnical Inspection Reports</li> </ul> <p>NWB. 2013. NWB Type "A" Water Licence No. 2AM-MRY1325</p> <p>NWB. 2015. NWB Type "A" Water Licence No. 2AM-MRY1325, Amendment No. 1</p> <p>Baffinland 2023 QIA and NWB Annual Report for Operations:</p> <ul style="list-style-type: none"> <li>Mine Site KM105 Surface Water Management Pond</li> <li>Appendix E.8.2 - QIA Inspection Reports and Baffinland Response</li> </ul> <p>Knight Piesold. 2021. Mary River Project – Mine Site Water Management Plan. June 30. Ref: NB102-181/63/2, Rev 2.</p>	

Cmt. #	CIRNAC Cmt. #	Reviewer's Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland's Response
		<ul style="list-style-type: none"> <li>Ditch regrading in accordance with Baffinland's Surface Water and Aquatic Ecosystem Management Plan (SWAEMP; BAF-PH1-830-P16-0026) for sediment control.</li> </ul> <p>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.</p> <p>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.</p>			
<b>SURFACE WATER – ELEVATED NITRATE IN SURFACE WATER</b>					
6	CIRNAC #6	<p>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.</p> <p>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.</p>	<p>CIRNAC recommends that Baffinland:</p> <ol style="list-style-type: none"> <li>a) Conduct monitoring and source contaminant characterization along the Mary River Tributary to assess additional potential impacts of explosives; and,</li> <li>b) Provide additional details on how the trends for nitrogen parameters from mine-related influences will be investigated across the whole mine site.</li> </ol>	<p>Project Certificate 005 (Amendment 04) Term and Condition 17 and 20</p> <p>Baffinland. 2022 Annual Report to NIRB (April 30, 2023):</p> <ul style="list-style-type: none"> <li>o Section 4.6.5 Groundwater &amp; Surface Water</li> </ul> <p>Knight Piesold. 2023a. 2022 Groundwater Monitoring Program Report (March 2023)</p> <p>Knight Piesold. 2023b. 2022 Groundwater Monitoring Program Assessment (March 2023)</p> <p>Minnow. 2023. Mary River Project 2022 CREMP (March 2023)</p>	<p>a) Within Mary River Tributary, as stated within the 2023 CREMP report (Minnow 2024), the treated effluent discharge at Station MS-08 is identified as a point source of nitrate to this system. The identification of Station MS-08 discharge as a source of nitrate to Mary River Tributary was based on observations of higher nitrate concentrations in water of this tributary when the mine was discharging effluent, and general correlation of higher concentrations of nitrate proportionate to the relative contribution of flow to Mary River Tributary attributable to the Station MS-08 discharge. Surface runoff from portions of the Mine Tote Road adjacent to the Mary River Tributary is collected in ditches and directed to the KM105 Pond, thus mitigating a potential key source of nitrate that may enter Mary River Tributary. Concentrations of nitrate in water of Mary River Tributary at Station FO-01 have consistently remained well below (i.e., less than one tenth) the AEMP Benchmark/Water Quality Guideline of 3 mg/L, therefore presenting very limited risk, if any, to aquatic biota in this tributary. This has been corroborated by no effects shown to phytoplankton based on CREMP results, as well as no effects shown to the benthic invertebrate community based on EEM results, within the Mary River Tributary system. As a result, Baffinland contends that no additional monitoring or source contaminant characterization is currently warranted for Mary River Tributary given that i) the Station MS-08 discharge is a known source of nitrate to Mary River Tributary for which Baffinland has the ability to control (through management of the effluent discharge release), and ii) existing</p>

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				Minnow. 2024. Mary River Project 2023 CREMP (March 2024)  Okane 2024, Mary River Mine 2023 Environmental Audit	<p>monitoring has demonstrated no effects to aquatic biota within Mary River Tributary that is consistent with concentrations of nitrate well below the AEMP Benchmark/Water Quality Guideline for the protection of aquatic life in the system. Baffinland commits to continued monitoring of nitrate concentrations in water of Mary River Tributary at the same stations and frequency outlined under the existing AEMP program, as well as to continuing to track and/or assess changes in concentrations in nitrate within Mary River Tributary as part of due diligence under the existing CREMP and EEM programs.</p> <p>b) Baffinland commits to on-going monitoring of water quality of waterbodies at and adjacent to the mine site as outlined under the existing CREMP and EEM studies of the overall Project AEMP, which includes the analysis and tracking of concentrations of nitrogen-based substances typically associated with explosives residue (e.g., nitrate, ammonia). Within the existing AEMP Management Response Framework, criteria and mechanisms for the determination/confirmation of trends are identified which serve as the foundation for the CREMP and management actions. Based on application of this framework, and as stated in the 2023 CREMP (Minnow 2024), for waterbodies in which nitrate concentrations were shown to be mine-related, temporal trend analysis of nitrate concentrations will be conducted in 2024 to evaluate statistically significant temporal trends among years of mine operation and/or baseline that would be suggestive of a mine-related effect. In addition, upgrades and adjustments to facilities associated with water management for the KM105 surface water management infrastructure in the upper Sheardown Lake Tributary/Sheardown Lakes systems have continued since 2023, and therefore water quality information collected during the 2024 CREMP will be used to assess potential trends for nitrogen parameters in these systems and, pending these results, the need for further investigations and/or additional actions. No adverse effects to aquatic biota, including phytoplankton, benthic invertebrate communities, and/or fish, have been shown within the Sheardown Lake Tributaries or Sheardown Lakes. Thus Baffinland has continued to meet the requirements under Term and Condition 20, and specifically, has demonstrated that the effects associated with the manufacturing, storage, transportation, and use of explosives have not negatively impacted aquatic systems within or near the Project mine site.</p>
<b>THERMAL MONITORING OF WRF (NEW)</b>					
7	<b>CIRNAC #7</b>	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	CIRNAC requests that Baffinland complete the following: a) Install new temperature, oxygen, and soil moisture probes in the WRF.	2022 QIA-NWB Annual Report.  Baffinland. 2023 Annual Report to NIRB	a) Baffinland provided a WRF instrumentation update in its 2023 QIA-NWB Annual Report for Operations and will provide an update in its 2024 annual report, and subsequently include instrumentation updates annual in future annual report. The 2024 update will continue to include the plan for recovery of any "down" instrumentation, and whether or not new instrumentation is

Cmt. #	CIRNAC Cmt. #	Reviewer’s Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland’s Response
		<p>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.</p> <p>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.</p> <p>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.</p> <p><b>Calibration, validation, and sensitivity analysis of the model</b></p> <p>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</p>	<p>b) Present the available oxygen, barometric, and soil moisture data in the 2024 Annual report.</p> <p>c) Describe all the calibration steps performed for the thermal model, how the calibration was validated, and the kind of sensitivity analysis performed.</p> <p>d) Discuss its rationale for not incorporating heat generation from geochemical reaction and convection into the present thermal model.</p> <p>e) Investigate the cause of the elevated temperatures in the WRF and discuss the potential impact on future ML/ARD development within the WRF.</p> <p>f) Provide flow characteristics of the frozen waste rock mass and verify that it meets the design intent.</p> <p>g) Discuss the potential for ground subsidence to contribute to the negative elevation observations and install settlement plates to monitor ground elevation.</p>	<p>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.</p>	<p>planned for the coming year. This annual review and update to the WRF instrumentation and installation plan has been incorporated into the QIA-NWB Annual Report to ensure monitoring of the WRF performance is regularly communicated to regulators</p> <p>Baffinland has planned for the installation of additional thermistors in the WRF for 2024, as outlined in the 2023 QIA-NWB Annual Report, and installation has started. An installation update will be provided in the 2024 QIA-NWB Annual Report.</p> <p>Baffinland has not planned for installation of additional VWPs in the WRF for 2024, as outlined in the 2023 QIA-NWB Annual Report. The VWPs installed have been dry and in sub-zero temperatures at all times and after discussion with Baffinland’s third-party consultant, it was determined additional VWPs would not be necessary at this stage.</p> <p>Baffinland has not planned for installation of additional oxygen probes in the WRF for 2024, as outlined in the 2023 QIA-NWB Annual Report. Through discussion with Baffinland’s third-party consultant and subject matter expert on waste rock management, new oxygen sensors are not currently being considered for installation at the WRF given their poor success for continued operation. Thermistors installed in target locations at the WRF will provide the necessary monitoring to confirm the deposition strategy is promoting freezing as per the design intent.</p> <p>b) All available WRF instrumentation data will be reported in the 2024 QIA-NWB Annual Report.</p> <p>c) The 2D model cross-section has been defined to align with the locations of boreholes BH1, BH2 and BH3, which contain thermistor strings. The model calibration process consists of adjustments to the model inputs until the computed temperature profiles at different times are in reasonable agreement with trends measured in the reference strings. Because of the large-scale of the 2D model geometry, the model calibration focuses on replicating the pile’s general thermal regime rather than localized trends like the temperature variation observed in BH1, which must be assessed separately. Rockfill has been progressively placed on top of the pile in general and, specifically, on top and adjacent to BH2 and BH3 that affected the thermal regime measured along those strings, hence the model geometry had to be adjusted as part of the calibration process to account for placement of rockfill in those areas.</p>

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		<p>mentioned in the report, a sensitivity analysis is briefly mentioned without providing details.</p> <p>The model has been calibrated with temperature data from three years, one of which was missing data for about six months. The 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.</p> <p><b>Thermistor data for BH1</b></p> <p><u>Temporary warming</u></p> <p>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.</p> <p>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.</p> <p><u>Rising temperatures at depth</u></p> <p>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.</p> <p>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.</p> <p><u>Negative surface elevation changes</u></p> <p>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</p>			<p>Changes in rockfill elevation in the pile is tracked through sequential surveys that are conducted routinely. The timing of rockfill placement in the model (i.e., date when the model geometry was adjusted), and the associated placed rockfill temperature were the model inputs that had the most impact on the model results. The calibration process tested rockfill placed at different dates between two (2) surveys and the final rockfill deposition schedule summarized in Table 3 of Appendix A2 of the Waste Rock Management Plan – June 2023 Through September 2026 Report (Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock Storage Facility at Mary River Mine Technical Memorandum) was the one that resulted in the best match with the measured data in BH1, BH2 and BH3. In addition to the timing of rockfill placement in the model geometry, sensitivity cases also tested variations in the constant temperature boundary condition at the base of the 2D model geometry, with the final value of -7.5°C resulting in a more balanced agreement between measured data in BH-1, BH-2, and BH-3.</p> <p>Validation of the calibrated parameters was through comparisons of model results with measured data from the reference thermistor strings. The comparison plots of predicted vs measured temperatures presented in Section 5.0 of Appendix A2 of the Waste Rock Management Plan – June 2023 Through September 2026 Report (Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock Storage Facility at Mary River Mine Technical Memorandum) are for calibrated parameters and, in general, demonstrate that the model has been able to follow general trends in the pile.</p> <p>d) Previous thermal assessments done in 2019 (Golder 2019) and 2021 (Golder 2021) discussed the potential effects of widespread internal heat generation in the pile, with the general conclusion that internal heat generation, while possible, was not a primary force governing the thermal regime of the pile, based on the model predictions and the available instrumentation data at that time. For the 2023 assessment, it was observed during the instrumentation data review that a prolonged period of warmer rockfill temperatures occurred between July 2020 and April 2021, but no such variation was observed along BH2 and BH3, suggesting that the warming event measured at certain depths along BH1 was localized, and not widespread.</p> <p>The primary objective of the thermal model is to predict the overall thermal regime of the pile to validate the operational concept of maintaining the pile in a frozen state (expect for the active zone subject to freezing and thawing).</p>

Cmt. #	CIRNAC Cmt. #	Reviewer's Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland's Response
		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.			<p>Due to the large scale of the 2D model geometry, and the localized nature of the warming event measured along BH1, it was not considered practical or necessary at that point to run separate and more complex thermal models to investigate the patterns measured along BH1, especially considering that rockfill temperature within the affected zones along BH1 remained well below the freezing point during the warming event.</p> <p>e) Data from thermistor strings show that the pile is sustaining freezing conditions during all times as per the design intent, even during temporary and localized events of warming temperatures, except for the upper active zone subject to seasonal freezing and thawing. The improvement in water quality demonstrates that localized variations in the waste rock temperature are not compromising the design and do not pose a risk of increasing ARD/ML.</p> <p>Earlier in 2024, two (2) additional thermistor strings were installed in target locations in the pile, with a third thermistor string still planned for installation in 2024, to supplement temperature monitoring within the pile, expand the extent of monitored areas, and allow for continuous monitoring as the pile is progressively constructed. Together with water quality monitoring, temperature data from the thermistor strings will continue to constitute the primary means for assessing the thermal behaviour of the pile, supporting calibration of thermal models, and guiding the planning and execution of mitigation options.</p> <p>Depending on variations in water quality and the evolution of temperatures in the pile, supplemental thermal models could be prepared specifically to investigate the impacts of such events on the thermal regime of the pile, and whether they could pose a risk on future ML/ARD development, and will be considered if future monitoring indicates it is warranted.</p> <p>f) The improvement in water quality over time demonstrates that seepage through the bulk of the pile is limited, consistent with the pile sustaining freezing conditions during all times, except for the upper active zone subject to seasonal freezing and thawing. This validates the design intent of minimising ARD/ML by limiting water flow through the pile and slowing the rate of sulphide oxidations due to freezing conditions.</p> <p>g) At instrumentation location T2, Baffinland assumes CIRNAC is referencing the apparent 4-5 m reduction in ground elevation observed in the June 2022 survey, as shown in Figure 5 Appendix A2 of the Waste Rock Management Plan – June 2023 Through September 2026 Report (Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock</p>

Cmt. #	CIRNAC Cmt. #	Reviewer's Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland's Response
					<p>Storage Facility at Mary River Mine Technical Memorandum) of WSPs June 2023 to Sept 2026 WRMP Report, where the reported ground surface elevation changes from ~ 581 m to ~ 576 m. This is a survey error, where the elevation is reported to be back to ~ 581 m in the later August 2022 survey. Further validation checks on more recent surveys completed in July, August and September of 2023 confirm this to be true with the ground elevation continuing to report ~ 581 m.</p> <p>Regarding the apparent negative surface elevation change for instrument location T3, Baffinland requests that CIRNAC provide the specific data reference they are referring to so that a response can be provided.</p>
<b>GROUNDWATER AND SURFACE WATER ML/ARD INVESTIGATIONS (NEW)</b>					
8	<b>CIRNAC #8</b>	<p><b><u>Sampling and analysis</u></b></p> <p>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.</p> <p>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 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.</p> <p>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.</p> <p>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</p>	<p>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 potential points sources for the project (e.g., open pit, quarries, WRF, ore stockpiling, and haulage routes).</p>	<p>NIRB 2022-2023 Annual Monitoring Report – The Mari River Project (January 2024; NIRB File No. 08MN053)</p> <p>2022 QIA-NWB Annual Report.</p> <p>Baffinland. 2023 Annual Report to NIRB</p> <p>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.</p> <p>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)</p>	<p>Aqueous concentrations of all parameters are assessed at waterbodies at and near the mine site and compared both spatially and temporally on an annual basis as part of the CREMP with the objective of evaluating overall impacts from Baffinland operations, including potential inputs from the WRF, on aquatic environments. Please refer to the 2023 CREMP report (Minnow; 2024) for the most recent results regarding the quality of water, and potential changes in water quality over time, within creeks, rivers, and lakes associated with the Project.</p> <p>Data from thermistor strings show that the pile is sustaining freezing conditions during all times as per the design intent, even during temporary and localized events of warming temperatures, except for the upper active zone subject to seasonal freezing and thawing. The improvement in water quality demonstrates that localized variations in the waste rock temperature are not compromising the design and do not pose a risk of increasing ARD/ML.</p> <p>Thermistor data from the WRF will be reviewed by the EOR on an annual basis and Baffinland will follow any recommendations provided by the EOR to ensure conditions within the WRF remain within design specifications so as not to pose a risk of increasing ARD/ML</p> <p>As part of the ongoing monitoring at the WRF water quality monitoring was conducted in 2023 at the east and west ditches where they inflow 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.</p> <p>Together with the water quality monitoring, temperature data from thermistor strings will continue to constitute the primary means for assessing the thermal</p>

Cmt. #	CIRNAC Cmt. #	Reviewer's Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland's Response
		<p>ARD/ML (pH, sulphate, aluminum, iron, manganese, cadmium, chromium, copper, lead, mercury, nickel, lead, selenium, and zinc) in the associated watershed.</p> <p>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.</p> <p>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.</p>			<p>behaviour of the pile, and if there is indication that the design intent could be compromised, a detailed investigation will be completed.</p>
<b>PERMAFROST AS MAIN ML/ARD MITIGATION STRATEGY (NEW)</b>					
9	CIRNAC #9	<p>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.</p> <p>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.</p> <p>The 955-221 Mary River Mine 2023 Environmental Audit states that "Thermal modelling of the WRF has not been</p>	<p>CIRNAC requests that Baffinland:</p> <ol style="list-style-type: none"> <li>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,</li> <li>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</li> </ol>	<p>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.</p>	<p>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 is currently being developed. A memo summarizing the results of this investigation will be provided in the next update to the ICRP.</p>

Cmt. #	CIRNAC Cmt. #	Reviewer’s Detailed Comment	CIRNAC Recommendation	Reference Section	Baffinland’s Response
		<p>completed to understand the thermal regime within the WRF under future conditions, or any climate change scenarios.”</p> <p>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.</p>	<p>include results from the climate change predictions and an evaluation of the increasing sub-surface temperatures at BH1 at about 19 m depth.</p>	<p>Tetra Tech 2019 Inspection of the Milne Inlet Tote Road and associated borrow sources</p> <p>Okane. 955-221 Mary River Mine 2023 Environmental Audit (November 17, 2023)</p>	
<b>ANTI-DISCRIMINATORY POLICIES AND MECHANISMS TO MINIMIZE ANY POTENTIAL CULTURAL CONFLICTS IN THE WORKPLACE</b>					
10	<b>CIRNAC #10</b>	<p>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&amp;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&amp;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.</p> <p>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&amp;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.”</p>	<p>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.</p>	<p>Baffinland’s 2023 Annual Report to the NIRB, Appendix F, Commitment No. 93</p> <p>Project Certificate 005 (Amendment 04), Term and Condition 135</p>	<p>Baffinland is committed to providing cross-cultural training to its employees and contractors. As such, they presently receive the following</p> <ul style="list-style-type: none"> <li>• Cultural awareness training provided as part of onboarding program;</li> <li>• Inuit Cultural Engagement Workshops: provided to all employees at the project and include information on Inuit history, customs and traditions, and language;</li> <li>• Respectful Workplace training, which covers EDI (Equity, Diversity and Inclusion), discrimination, bullying, and harassment.</li> </ul> <p>Baffinland has also instituted Workplace Harassment policy and a Workplace Harassment and Violence Program for reporting and investigating incidents and complaints. A Proactive Dispute Resolution Process has also been implemented as described in PC Condition 155.</p> <p>Baffinland is therefore in compliance with Commitment no. 93, as described in Appendix F.1 of the 2023 NIRB Annual Report. .</p>



Table A.5: Response to HC Comments on Baffinland's 2023 Annual Report to the NIRB

Cmt. #	HC Cmt. #	Reviewer's Detailed Comment	HC Recommendations	Reference Section	Baffinland's Response
<b>USE OF THE CANADIAN AMBIENT AIR QUALITY STANDARDS (CAAQS)</b>					
1	HC-01	<p><b>Ensure monitoring results are compared against current published CAAQS values to reduce potential health risks from exposure to project related emissions (e.g. SO<sub>2</sub> and NO<sub>2</sub>).</b></p> <p>The 2023 monitoring results for sulfur dioxide (SO<sub>2</sub>) and nitrogen dioxide (NO<sub>2</sub>) were reportedly compared against the CAAQS, as recommended in HC's comments on the 2022 Annual Monitoring Report (AMR)(NIRB Registry ID No. 346056). However, the cited NO<sub>2</sub> CAAQS values were not consistent with the 2020 or 2025 published values. Use of incorrect values could lead to the misinterpretation of monitoring results and underestimate potential health risks from project emissions.</p> <p>Sections 2.2.1.2 and 2.2.2.2 of the 2023 Air Quality, Dustfall and Meteorology Report incorrectly lists CAAQS values for 1-hour and annual NO<sub>2</sub> concentrations as 113 ppb and 32 ppb. The correct 2020 CAAQS values for 1-hour and annual NO<sub>2</sub> are 60 ppb and 17 ppb, respectively.</p> <p>The reported annual mean concentration for NO<sub>2</sub> was 15.4 ppb at the Mine Site Complex (MSC) and 13.5 ppb at the Port Site Complex (PSC). Both values are below the 2020 CAAQS value for average annual NO<sub>2</sub> concentration but exceed the 2025 CAAQS value of 12.0 ppb. While this does not affect the reported conclusions for the current year, it may prompt further consideration of future measures to reduce NO<sub>2</sub> emissions to improve air quality and "keep clean areas clean".</p> <p>Results in Tables 2.2 and 2.4 indicate that the concentrations of NO<sub>2</sub> trend higher during the winter months and fall during the summer months. These results also indicate that the 1-hour 2020 CAAQS value for NO<sub>2</sub> (60 ppb) was exceeded in 8 months of the year at the MSC and 6 months of the year at the PSC, which is greater than the 6 exceedances reported at the MSC using the incorrect values. Figures 2.2, 2.4, 2.9, and 2.11 provide some insights into the distribution of</p>	<p>HC recommends:</p> <ol style="list-style-type: none"> <li>1. Comparing monitoring results against the most stringent federal, provincial, or territorial air quality standards applicable to the given area. In many cases the CAAQS will be the most stringent levels for key air pollutants, especially for longer-term projects with emissions after 2025.</li> <li>2. Using the most recently published CAAQS values to update the current analysis to characterize the project's monitored emissions and potential health risks. For NO<sub>2</sub>, including the 3-year average of the annual 98<sup>th</sup> percentile of the daily maximum 1-hour average concentrations for MSC and PSC, or the 1-year average of the 98<sup>th</sup> percentile where 3 years of data are not available, to support a comparison with the CAAQS.</li> <li>3. Including additional information and details on efforts to reduce project related emissions when elevated concentrations of NO<sub>2</sub> are observed during monitoring. This could include details on anticipated changes or modifications to manage project related emissions and improve air quality.</li> <li>4. Adding additional detail on the comparison of monitoring results to those from previous years to further describe potential trends and help inform decisions related to</li> </ol>	<p>Appendix G.2.1: 2023 Air Quality, Dustfall, and Meteorology Report (AQDMR)</p> <ul style="list-style-type: none"> <li>• Sections 2.2.1.1 and 2.2.2.1: Sulphur Dioxide (SO<sub>2</sub>) (PDF pg., 36, 40)</li> <li>• Sections 2.2.1.2 and 2.2.2.2: Nitrogen Dioxide (NO<sub>2</sub>) (PDF pg., 38, 42)</li> <li>• Tables 2.2, 2.4 (PDF pg., 39, 43)</li> <li>• Figures 2.2, 2.4, 2.9, 2.11 (PDF pg., 40, 44, 49, 50)</li> </ul> <p>Health Canada (2023). HC's response to the Comment Request for Baffinland Iron Mines' Mary River Project 2022 Annual Monitoring Report (NIRB Registry ID No. 346056)</p> <p>Health Canada. (2023). Guidance for Evaluating Human Health Effects in Impact Assessment: Air Quality. Appendix B: Canadian Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Objectives (NAAQOs). (PDF pg., 38-42)</p>	<ol style="list-style-type: none"> <li>1. The 2024 Annual Air Quality, Dustfall and Meteorology Report will reflect the CAAQS values in the analysis, as recommended.</li> <li>2. Below is the updated current analysis for NO<sub>2</sub> and SO<sub>2</sub>, comparing the 3-year average of the annual 98<sup>th</sup> percentile of the daily maximum 1-hour average concentrations for the MSC and PSC to support a comparison to the CAAQS, as requested. <ul style="list-style-type: none"> <li>• The 3-year average of the annual 98<sup>th</sup> percentile of the daily maximum 1-hour average concentrations for MSC for NO<sub>2</sub> was 92.5 ppb as compared to the CAAQS 2020 numerical value of 60 ppb and the 2025 CAAQS numerical value of 42 ppb. The average over a single calendar year of all 1-hour average concentrations (highest yearly average for three years (2021 to 2023)), is 15.8 ppb, compared to the CAAQS 2020 numerical value of 17 ppb and the 2025 numerical value of 12 ppb.</li> <li>• The 3-year average of the annual 98<sup>th</sup> percentile of the daily maximum 1-hour average concentrations for MSC for SO<sub>2</sub> was 5.3 ppb compared to the CAAQS 2020 numerical value of 70 ppb and the 2025 CAAQS numerical value of 65 ppb. The average over a single calendar year of all 1-hour average concentrations (highest yearly average for three years (2021 to 2023)), is 1.0 ppb, as compared to the CAAQS 2020 numerical value of 5 ppb and the 2025 numerical value of 4 ppb.</li> <li>• The 3-year average of the annual 98<sup>th</sup> percentile of the daily maximum 1-hour average concentrations for PSC for NO<sub>2</sub> was 95.2 ppb as compared to the CAAQS 2020 numerical value of 60 ppb and the 2025 CAAQS numerical value of 42 ppb. The average over a single calendar year of all 1-hour average concentrations (highest yearly average for three years (2021 to 2023)), is 13.5 ppb, as compared to the CAAQS 2020 numerical value of 17 ppb and the 2025 numerical value of 12 ppb.</li> <li>• The 3-year average of the annual 98<sup>th</sup> percentile of the daily maximum 1-hour average concentrations for PSC for SO<sub>2</sub> was 5.1 ppb as compared to the CAAQS 2020 numerical value of 70 ppb and the 2025 CAAQS numerical value of 65 ppb. The average over a single calendar year of all 1-hour average concentrations (highest yearly average for three years (2021 to 2023)), is 0.66</li> </ul> </li> </ol>

Cmt. #	HC Cmt. #	Reviewer's Detailed Comment	HC Recommendations	Reference Section	Baffinland's Response
		<p>monitoring results, but a lack of detail limit their ability to describe observed NO2 emissions and their potential significance. Using the corrected CAAQS values for NO2 to update the current analysis, including the 3-year average of the annual 98th percentile of the daily maximum 1-hour average concentrations for the MSC and PSC, would provide a better representation of the project's NO2 emissions and potential associated human health risks.</p> <p>The AQDMR attributes the highest SO2 and NO2 results to emissions from diesel generators, heating systems and mine trucks, operating in and near the MSC and PSC ambient air quality monitoring station. The report also notes that signs are posted near the monitoring station to request that operators refrain from idling their diesel trucks, but it is unclear if these efforts to reduce idling are applied more broadly to the project sites. Also, there is no mention of other management or mitigation measures being employed to reduce SO2 and NO2 emissions (e.g., use of Tier 3 or 4 engines, regular engine maintenance and repair, etc.), to improve air quality and "keep clean areas clean".</p> <p>Additional detail comparing the 2023 monitoring results to previous years would allow a review of the summarised trends and support the evaluation of current management and mitigation measures.</p>	management and mitigation measures.		<p>ppb, compared to the CAAQS 2020 numerical value of 5 ppb and the 2025 numerical value of 4 ppb.</p> <p>3. Baffinland continues to work towards reducing ambient NO2 and SO2 concentrations through enforcement of idling times, more efficient bussing and route transfers, and ongoing efforts to reduce power consumption to reduce the emissions from diesel power generation systems.</p> <p>Future initiatives critical to Baffinland's emission reduction initiatives include implementation of the Climate Change Strategy (Stratos; 2023), and transition to rail based ore haulage.</p> <p>Additional detail on the comparison of monitoring results to those from previous years will be provided in the 2024 Annual Air Quality, Dustfall and Meteorology Report to further describe potential trends, as recommended.</p> <p>Reference</p> <p>Stratos Inc., (Stratos), 2023. Baffinland's Climate Change Strategy. Prepared by Stratos for Baffinland Iron Mines Corporation. March 8, 2023.</p>
<b>REPORTING ON NON-THRESHOLD AIR CONTAMINANTS</b>					
2	HC-02	<p><b>Use of CAAQS for particulate matter (PM2.5) and ongoing efforts to limit emissions of non-threshold air quality contaminants to the extent possible is recommended.</b></p> <p>NO2 and PM2.5 (particulate matter &lt;2.5 µm in diameter) are nonthreshold air contaminants, meaning that associations with different health outcomes have been demonstrated throughout the range of concentrations. Therefore, any increase in exposure will result in an increased health risk. Using the most stringent federal, provincial, or territorial air quality standards applicable to the given area is recommended, but they should not be considered as</p>	<p>1. HC recommends including the comparisons of PM2.5 measurement data to the CAAQS (referred to in the Report), along with the annual 98th percentile of the daily 24-hour average concentrations for the MSC and PSC, in the 2023 Annual Monitoring Report.</p> <p>2. HC supports implementing all economically and technologically feasible mitigation measures to limit emissions of non-threshold air contaminants to the extent possible.</p>	<p>2023 Annual Monitoring Report (AMR)</p> <ul style="list-style-type: none"> <li>Section 4.2.6: Air Quality (PDF pg. 92)</li> <li>Table 4.6: Air Quality Impact Evaluation (PDF pg., 93)</li> </ul> <p>Appendix G.2.1: 2023 Air Quality, Dustfall, and Meteorology Report (AQDMR)</p> <ul style="list-style-type: none"> <li>Section 2.1.2: Continuous Monitoring for Particulate Matter at Mary River and Milne Port (PDF pg. 34-36)</li> </ul>	<p>The annual CAAQS for PM2.5 (8.8 ug/m3) is the 3-year average of the annual average of the daily 24-hour average concentrations. The 24-hour CAAQS for PM2.5 (27 ug/m3) is the 3-year average of the annual 98th percentile of the daily 24-hour average concentrations. Both rely on 3 years of data. Since 2023 was the 2nd year of using the BAM 1020s to monitor PM2.5 at the MSC and PSC, a CAAQS PM2.5 comparison will be made in the 2024 Annual Air Quality, Dustfall and Meteorology Report. Below are PM2.5 CAAQS comparisons (annual and 24-hour) for monitoring data collected at MSC and PSC during 2023.</p> <ul style="list-style-type: none"> <li>The one-year average of the annual 98th percentile of the 2023 daily 24-hour average PM2.5 concentrations measured at MSC is 30.8 µg/m3. A direct comparison cannot be made with the CAAQS 2020 numerical value for the 24-</li> </ul>

Cmt. #	HC Cmt. #	Reviewer's Detailed Comment	HC Recommendations	Reference Section	Baffinland's Response
		<p>"pollute up-to" levels and the Proponent is encouraged to strive for continuous improvement.</p> <p>Section 2.1.2 of the 2023 Air Quality, Dustfall, and Meteorology Report indicates that concentration data for PM2.5 is collected and compared to the CAAQS, but that information was not included in the report. Reported results are only compared against project standards for 24-hour (30 µg/m3) and annual average (10 µg/m3) concentrations, both of which are less stringent than the 2020 CAAQS for 24-hour (27 µg/m3) and annual average (8.8 µg/m3) concentrations of PM2.5. Additionally, the report doesn't present the annual 98th percentile of daily 24-hour average concentrations for comparison to the CAAQS.</p>		<ul style="list-style-type: none"> <li>Sections 2.3.3: Respirable Particulates 2.5µm in Diameter and less (PM2.5) (PDF pg., 59-64)</li> <li>Tables 2.9, 2.10 (PDF pg., 60, 63)</li> <li>Figures 2.17, 2.19 (PDF pg., 61, 64)</li> </ul> <p>Health Canada. (2023). Guidance for Evaluating Human Health Effects in Impact Assessment: Air Quality. Appendix B: Canadian Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Objectives (NAAQOs). (PDF pg., 38-42)</p>	<p>hour averaging time (27 µg/m3) since the BAM 1020 particulate monitors have only been collecting data since April 2022.</p> <ul style="list-style-type: none"> <li>The average over a single calendar year (2023) of the daily 24-hour average PM2.5 concentrations measured at MSC is 6.2 µg/m3. A direct comparison cannot be made with the CAAQS 2020 numerical value for the annual averaging time (8.8 µg/m3) since the BAM 1020 particulate monitors have only been collecting data since April 2022.</li> <li>The one-year average of the annual 98th percentile of the 2023 daily 24-hour average PM2.5 concentrations measured at PSC is 23.3 µg/m3. A direct comparison cannot be made with the CAAQS 2020 numerical value (27 µg/m3) since the particulate monitors have only been collecting data since April 2022.</li> </ul> <p>The average over a single calendar year (2023) of the daily 24-hour average PM2.5 concentrations measured at PSC is 4.8 µg/m3. A direct comparison cannot be made with the CAAQS 2020 numerical value for the annual averaging time (8.8 µg/m3) since the BAM 1020 particulate monitors have only been collecting data since April 2022.</p>
<b>INAPPROPRIATE GUIDELINE USED TO ASSESS MERCURY LEVELS IN FISH TISSUES</b>					
3	HC-03	<p><b>Use of the provisional tolerable daily index (pTDI) values and consumption patterns consistent with subsistence harvesting by local Inuit communities to assess mercury in country foods, and specifically fish tissues.</b></p> <p>HC's comments on the 2022 AMR noted elevated concentrations of methylmercury (MeHg) and inorganic mercury were present under baseline conditions for some country foods described in the Phase 2 Development Proposal. Given the elevated baseline, assessing mercury monitoring data should be done using an approach that is protective of human health.</p> <p>In Sections 4.6.10 and 4.6.11 and Appendix G.6.8 of the 2023 AMR, all fish tissues sampled for mercury concentrations were compared to a guideline of 0.5 mg/kg wet weight. This guideline value is applicable to commercial foods only. For species consumed by local communities, it is more appropriate to use the pTDI value of 0.47 µg of MeHg per kg body weight per day (kg-bw/day) for adults and 0.2 µg MeHg per kg-bw/day for women of childbearing age and young</p>	<p>HC recommends:</p> <ol style="list-style-type: none"> <li>Using the pTDI values and local consumption patterns to assess potential human health risks from mercury in country foods, and specifically fish tissues, in future project reporting as an approach that is protective of human health.</li> <li>Describing the limitations and risks of comparing monitoring results to HC's guideline value for commercial foods (i.e., 0.5 mg/kg wet weight) in the MEEMP's guideline comparison (Chapter 7, Section 7.3.4).</li> </ol>	<p>2023 Annual Monitoring Report (AMR)</p> <ul style="list-style-type: none"> <li>Section 4.6.10: Marine Environment (PDF pg. 288-347)             <ul style="list-style-type: none"> <li>Table 4.22 Marine Environment Impact Evaluation (PDF pg. 292)</li> <li>PC T&amp;C No.76 (PDF pg., 295-298)</li> <li>PC T&amp;C No. 83(a) (PDF pg., 314-319)</li> </ul> </li> <li>Section 4.6.11: Marine Wildlife (PDF pg., 349-442)             <ul style="list-style-type: none"> <li>PC T&amp;C No. 113 (PDF pg., 407-412)</li> <li>PC T&amp;C No. 114 (PDF pg., 413)</li> </ul> </li> </ul> <p>Appendix G.6.8: 2023 Marine Environmental Effects Monitoring Report (MEEMP), Chapter 7.0: Fish Health and Tissue Chemistry</p>	<p>The objective of the MEEMP is to monitor for potential changes in the environment as a result of the Project and evaluate whether the marine environment is changing over time. It is not the objective of the MEEMP to assess human health risks associated with eating country foods (i.e., fish) from Milne Port. As such, Baffinland believes the guideline is appropriate to use for assessing annual MEEMP results; the use of the HC guideline for total mercury in commercially-sold fish of 0.5 mg/kg is intended (as stated in the last paragraph of Section 7.4.2.2.3) to provide consistent context for tissue chemistry results among the species monitored in the MEEMP. In future reports, this guideline will be clearly identified as a commercial sale guideline when referenced in the MEEMP. The MEEMP does not make statements or draw conclusions related to safe human consumption of fish, nor is the fish tissue chemistry assessment intended to be considered a risk assessment tool. The MEEMP is an environmental effects monitoring program used to assess effects of the Project on the marine environment and should not be considered equivalent to a risk assessment.</p>

Cmt. #	HC Cmt. #	Reviewer's Detailed Comment	HC Recommendations	Reference Section	Baffinland's Response
		<p>children up to 12 years of age (Health Canada, 2007) to assess potential risks to local consumers based on consumption patterns informed by community consultation.</p> <p>The exception may be monitoring related to the potential development of a commercial fishery in the Milne Inlet Eclipse Sound area, as required by Project Certificate Term and Condition 114; however, the 2023 AMR indicates that monitoring for this condition is not applicable, as no commercial fishery has been developed.</p> <p><i>Health Canada. 2007. Human Health Risk Assessment of Mercury in Fish and Health Benefits of Fish Consumption.</i></p>		<ul style="list-style-type: none"> <li>Section 7.3.4: Guideline Comparison (PDF pg., 22)</li> </ul> <p>Health Canada (2023). HC's response to the Comment Request for Baffinland Iron Mines' Mary River Project 2022 Annual Monitoring Report (NIRB Registry ID No. 346056)</p>	

Table A.6: Response to TC Comments on Baffinland's 2023 Annual Report to the NIRB

Cmt. #	TC Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
<b>INSPECTIONS – MARINE TRANSPORTATION; OIL HANDLING FACILITY</b>					
1	TC-01	<p>The Project's oil handling facility (OHF) is in compliance with regulatory requirements as per part 8 of the <i>Canada Shipping Act, 2001</i>.</p> <p>The Project's marine facility is in compliance with the Marine Transportation Security Regulations. The last inspection was carried out in 2023 along with the inspection of 4 vessels and all were found to be in compliance with the Marine Transportation Security Regulations.</p> <p>No enforcement activity was undertaken or required last year by Transport Canada for the OHF or marine facility.</p>	None	2023 Annual Report – Appendix G.8.5 2023 Oil Pollution Emergency Plan – Milne Inlet	Thank you for your comment.
<b>MARINE SAFETY VESSEL INSPECTION</b>					
2	TC-02	<ul style="list-style-type: none"> <li>Transport Canada's Marine Safety Branch inspected 9 vessels in 2023 and conducted ballast water inspections.</li> <li>No issues were found during the inspections and no enforcement actions were undertaken.</li> </ul>	None	General Inspection	Thank you for noting this.
<b>CANADIAN NAVIGABLE WATERS ACT</b>					
3	TC-03	<p>In September 2023, Transport Canada's Navigation Protection Program conducted an inspection all watercourse crossings on the Tote Road and the proposed railway to Steensby Port.</p> <p>No issues were found during the inspection and all crossings were constructed as approved under the Canadian Navigable Waters Act.</p>	None	General Inspection	Thank you for noting this.

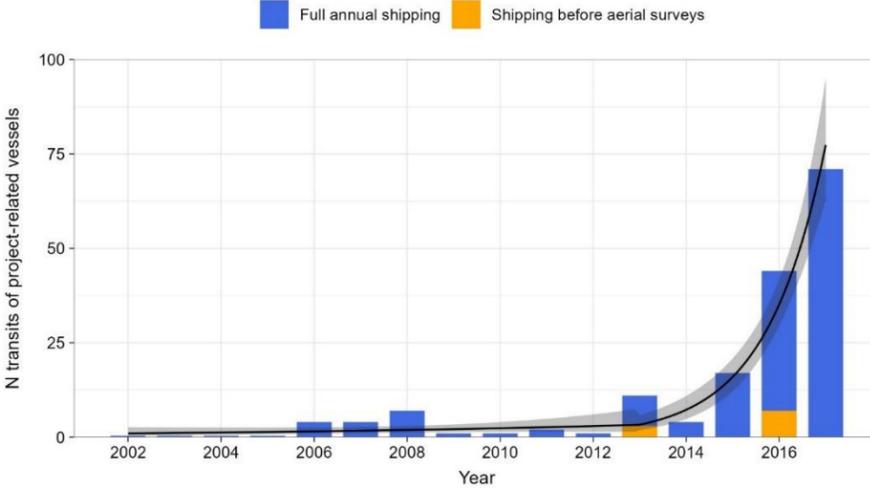
Table A.6: Response to DFO Comments on Baffinland's 2023 Annual Report to the NIRB

Cmt. #	DFO Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
<b>INTERPRETATION OF THE 2023 NARWHAL ABUNDANCE ESTIMATED IN A DELAYED SHIPPING SEASON</b>					
1	DFO-1	<p>The final recommendations of the MMASP include not continuing the summer (Legs 1 and 2) surveys in 2024 based on the results of the 2023 surveys.</p> <ul style="list-style-type: none"> <li>The BIM survey averaged abundances are compared to the 2013 abundance survey, after project related shipping began, not the 2004 abundance survey from before project related shipping.</li> <li>BIM's 2023 abundance estimates can be compared to DFO's 2023 estimates when DFO's estimates have been peer-reviewed.</li> </ul>	<p>DFO believes it is premature to reduce the survey frequency and recommends maintaining annual aerial surveys of the RSA during the open water season (leg 2) to identify longer-term trends that subsequent surveys during following years could detect and until the results of the 2023 DFO aerial survey of the Baffin Bay Narwhal population are published.</p>	<p>Appendix G.6.2 of 2023 monitoring report          - Mary River Project: 2023 Marine Mammal Aerial Survey Program (MMASP)          - Technical Report prepared by WSP Canada Inc</p>	<p>Baffinland plans to conduct narwhal aerial surveys during the open-water season (Leg 2) on a three-year cycle. The 2023 Eclipse Sound narwhal summer stock was estimated at 10,492 animals (CV= 0.05; CI = 9,578-11,494) which was not significantly different than the 2013 baseline condition (10,489 animals; CV = 0.24; CI = 6,342–17,347; Doniol-Valcroze et al. 2015a), the 2016 abundance estimate (12,039 animals; CV = 0.23; CI = 7,768-18,660; Marcoux et al. 2019) or the 2019 abundance estimate (9,931 animals, CV = 0.05, 95% CI of 9,009–10,946; Golder 2020a). The 2023 Eclipse Sound abundance estimate was significantly higher than the three preceding years (2020-2022; Golder 2021a, 2022a, WSP 2023a).</p> <p>A three-year cycle exceeds the frequency of DFO's regional narwhal aerial surveys, which are undertaken to monitor the population health of all narwhal stocks in the Eastern Canadian Arctic in order to inform annual hunting quotas, an activity known to result in direct mortality of narwhal and therefore with significantly more influence on the local narwhal population compared to impacts from ship noise which, would be limited to behavioural effects (i.e.,(temporary and localized disturbance).</p> <p>Further, narwhal in the Eastern Canadian Arctic were recently downlisted from Special Concern (SC) to Not at Risk (NAR) status by the Canadian Committee on the Status of Endangered Wildlife in Canada (COSEWIC), which includes expert opinion from DFO (e.g. Mike Hammill, DFO Emeritus Scientist, Co-chair of COSEWIC sub-committee for marine mammals; COSEWIC 2024c). COSEWIC has based this decision on the fact that narwhal populations in the Eastern Arctic are now considered stable with narwhals proving to be adaptable to existing stressors in their arctic environment. The overall population of this Arctic, ice-loving toothed whale is large (&gt; 161,000 total, 93,500 mature individuals) and, although there is uncertainty about population structure, stock numbers, and trends, there is no evidence for a decreasing trend in abundance (COSEWIC 2024a). In support of COSEWIC's decision, DFO's current frequency of population monitoring via aerial surveys (i.e., DFO aerial surveys are conducted once every 10 years) has been considered as adequate for 'closely monitoring and managing' the regional population (COSEWIC 2024b). Baffinland therefore assumes that monitoring a subset of the overall population (Eclipse Sound and Admiralty Inlet socks) once every three years should also be considered adequate for monitoring and managing this sub-population in light of Baffinland shipping operations, particularly given the</p>

Cmt. #	DFO Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
					<p>most recent aerial survey results that are based on five continuous years (2019-2023) of aerial survey monitoring of these stocks by Baffinland.</p> <p>References:</p> <p>Committee on the Status of Endangered Wildlife in Canada (COSEWIC). 2024a. COSEWIC Wildlife Species Assessments (detailed version), May 2024. <a href="https://cosewic.ca/images/cosewic/pdf/2024-Wildlife%20Species%20Assessments-detailed-May-en.pdf">https://cosewic.ca/images/cosewic/pdf/2024-Wildlife%20Species%20Assessments-detailed-May-en.pdf</a></p> <p>COSEWIC. 2024b. Press Release – May 2024. Narwhal and Salish Sucker highlight successes and setbacks for Canadian species. <a href="https://www.cosewic.ca/index.php/en/news-and-events/press-release-may-2024.html">https://www.cosewic.ca/index.php/en/news-and-events/press-release-may-2024.html</a>.</p> <p>COSEWIC. 2024c. CBC interview with Mike Hammill, Co-chair of COSEWIC sub-committee for marine mammals, on updated COSEWIC narwhal designation. Qulliq with Teresa Qiatsuk on CBC Nunavut. <a href="https://www.cbc.ca/listen/live-radio/1-390-qulliq">https://www.cbc.ca/listen/live-radio/1-390-qulliq</a>.</p> <p>Doniol-Valcroze, T, Gosselin, J.F., Pike, D., Lawson, J., Asselin, N., Hedges, K., and S. Ferguson. 2015a. Abundance estimates of narwhal stocks in the Canadian High Arctic in 2013. DFO Can. Sci. Advis. Sec. Res. Doc. 2015/060. v + 36 p.</p> <p>Marcoux, M., L.M., Montsion, J.B., Dunn, S.H., Ferguson, and C.J.D Matthews. 2019. Estimate of the abundance of the Eclipse Sound narwhal (Monodon Monoceros) summer stock from the 2016 photographic aerial survey. DFO Can. Sci. Advis. Sec. Res. Doc. 2019/028. iv + 16 p.</p> <p>Golder. 2020a. 2019 Marine Mammal Aerial Survey. Golder Report No.1663724-191-R-Rev0. Prepared by Golder Associates Ltd., Victoria, BC for Baffinland Iron Mines Corporation, Oakville, Ontario. 98 p.</p> <p>Golder. 2021a. 2020 Marine Mammal Aerial Survey. Golder Report No.1663724-270-R-Rev1. Prepared by Golder Associates Ltd., Victoria, BC for Baffinland Iron Mines Corporation, Oakville, Ontario. 79 p.+ appendices.</p> <p>Golder. 2022a. 2021 Marine Mammal Aerial Survey. Golder Report No.1663724-353-R-Rev0. Prepared by Golder Associates Ltd., Victoria, BC for Baffinland Iron Mines Corporation, Oakville, Ontario. 109 p.+ appendices.</p> <p>WSP. 2023a. 2022 Marine Mammal Aerial Survey Program (MMASP) – Final Report. Report No. 166372401-428-R-Rev0-59000. 27 April 2023.</p>

Cmt. #	DFO Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
<b>PRE-PROJECT RELATED IMPACT BASELINE</b>					
2	DFO-2	<p>Fisheries and Oceans Canada takes the position that the baseline for Narwhal populations in Eclipse Sound should be the abundance estimate completed over 2004, before there was Mary River Mine related shipping activity.</p> <p>Baffinland Iron Mines Corporation (Baffinland) is using the data from 2013 as the baseline for Narwhal abundance estimates for the Eclipse Sound Stock. Fisheries and Oceans Canada (DFO) and other Marine Environment Working Group (MEWG) members have identified that there has been consistent project related shipping in Eclipse Sound since 2006. DFO's understanding is that Baffinland is proposing the 2013 data date because it is before the start of commercial ore shipping in Eclipse Sound and that non-Baffinland ships were previously in the area. With regard to concerns that the Coefficient of Variance (CV) is too high in the 2004 Survey, the CV for the 2004 abundance survey was 0.36 (not 0.56 as stated in the WSP Technical Memo on Project Shipping Levels), which is within the range for typical marine mammal surveys. Taylor et al (2007) highlighted a number of abundance studies and respective CVs.</p> <p>Beginning in 2006, Mary River Project related shipping went farther into Eclipse Sound, into Milne Port, which is farther than other ships traveled into Eclipse Sound. Between 2005 and 2006, Baffinland related activities increased the ship traffic in the area by over 15%, nearly 20% from 2006 to 2007, and 25% from 2007 to 2008 including three (3) ore carriers .</p> <p>DFO used the data presented in NB102-00181/53-A.01, Memorandum - Mary River Project – Phase - Supplement to Technical Supporting Document 27 - Cumulative Effects Assessment (May 16, 2019). According to the memo, the data presented in the column <i>Milne Inlet</i> of Table 5 of the document represents project related vessel and is in the table below.</p> <p>DFO ran a Regression Models with Broken-Line Relationships (Muggeo 2003) using the package Segmented in R (Muggeo 2008) to the vessel data from 2002 to 2017. The model found a breakpoint at the year 2012.4 (S.E.= 0.548). We ran a Davis</p>	<p>DFO recommends that BIM use the 2004, pre-project, abundance survey as the baseline for the Narwhal population.</p>	<p>APPENDIX G.6.2 2023 Marine Mammal Aerial Survey Program Report</p> <p>Davies, R.B. 1987. Hypothesis testing when a nuisance parameter is present only under the alternative. <i>Biometrika</i>, 74:33–43, 1987.</p> <p>Davies, R. B. 2002. Hypothesis testing when a nuisance parameter is present only under the alternative: linear model case. <i>Biometrika</i>, 484-489.</p> <p>Muggeo VMR. 2003. Estimating regression models with unknown break-points. <i>Statistics in Medicine</i>, 22, 3055-3071.</p> <p>Muggeo, V. M. 2008. Segmented: an R package to fit regression models with broken-line relationships. <i>R news</i>, 8(1), 20-25.</p> <p>Taylor, B. L., M. Martinez, T. Gerrodette, J. Barlow, and Y. N. Hrovat. 2007. Lessons from monitoring trends in abundance of marine mammals. <i>Marine Mammal Science</i> 23(1):157–175.</p>	<p>DFO has not used the appropriate historical (2002-2017) shipping data in their analysis outlined in DFO-02. The analysis presented by DFO is based on shipping data presented in NB102-00181/53-A.01, Memorandum - Mary River Project – Phase - Supplement to Technical Supporting Document 27 - Cumulative Effects Assessment (May 16, 2019). The shipping data presented in this source are inaccurate.</p> <p>The shipping data presented in WSP's tech memo entitled 'Project Shipping Levels in RSA Prior to 2013' (WSP 2023) represents the most complete record of Project and non-Project shipping between 2002 and 2013, as Baffinland/WSP had indicated in their presentation at the Dec 2023 MEWG meeting. DFO had requested this shipping data package from Baffinland as part of SOP Technical Comment # DFO-TRC-01-1 (Baffinland 2023). Baffinland provided this information to DFO prior to the December 2023 MEWG meeting as part of WSP (2023). Further, Baffinland electronically provided the historical shipping data in tabular form to DFO on 9 Feb 2024. It is presently unclear why DFO based their analysis in DFO-02 on a different (and out-dated) shipping dataset when they were provided with the updated 2002-2013 shipping data from WSP (2023).</p> <p>The correct shipping data that should be used for the breakpoint analysis are provided in Table X below, which is the same data presented in WSP (2023) for the period 2002-2013, with additional ship data for 2014-2017 extracted from Fednav Ltd. records to include the additional years DFO presented in their analysis. In 2013 and 2016, when Project shipping was taking place and aerial surveys were performed, narwhal presence in the RSA would only be influenced by ships that would have transited through the RSA prior to the occurrence of the aerial survey that year. Therefore, WSP also calculated the number of transits that took place prior to the aerial survey in 2013 and 2016 to reflect the number of transits animals would have been exposed to prior to the survey period (right column in Table X). Note, corrections have only been applied to 2013 and 2016, as these were the only years in which aerial surveys occurred when Project vessels were active in the RSA.</p>

Cmt. #	DFO Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response																																																			
		<p>Test for a change in the slope value before and after the breakpoint (Davies 1987, 2002) and found that the change in slope and, as a consequence the breakpoint, were significant (p= 0.0001).</p> <p>Therefore, this data suggest that there is a break in the level of shipping before and after 2012. The year 2013 happen after the break and should not be used as a baseline.</p>			<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Year</th> <th style="text-align: center;">Project Vessel Transits in RSA (all season combined)</th> <th style="text-align: center;">Project Vessels Transits in RSA (prior to narwhal survey in that year)</th> </tr> </thead> <tbody> <tr><td>2002</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td>2003</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td>2004</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td>2005</td><td style="text-align: center;">0</td><td style="text-align: center;">0</td></tr> <tr><td>2006</td><td style="text-align: center;">8</td><td style="text-align: center;">8</td></tr> <tr><td>2007</td><td style="text-align: center;">8</td><td style="text-align: center;">8</td></tr> <tr><td>2008</td><td style="text-align: center;">14</td><td style="text-align: center;">14</td></tr> <tr><td>2009</td><td style="text-align: center;">2</td><td style="text-align: center;">2</td></tr> <tr><td>2010</td><td style="text-align: center;">2</td><td style="text-align: center;">2</td></tr> <tr><td>2011</td><td style="text-align: center;">4</td><td style="text-align: center;">4</td></tr> <tr><td>2012</td><td style="text-align: center;">2</td><td style="text-align: center;">2</td></tr> <tr><td>2013</td><td style="text-align: center;">22</td><td style="text-align: center;">6</td></tr> <tr><td>2014</td><td style="text-align: center;">16</td><td style="text-align: center;">16</td></tr> <tr><td>2015</td><td style="text-align: center;">34</td><td style="text-align: center;">34</td></tr> <tr><td>2016</td><td style="text-align: center;">88</td><td style="text-align: center;">14</td></tr> <tr><td>2017</td><td style="text-align: center;">142</td><td style="text-align: center;">142</td></tr> </tbody> </table> <p><b>Note:</b> Shipping data presented above for 2002-2013 are derived from the Vessel Traffic Reporting Arctic Canada Traffic Zone (commonly referred to as NORDREG) (CCG 2023). These data was processed and evaluated at the sub-regional level (e.g., Admiralty Inlet, Eclipse Sound), as presented in WSP (2023). Shipping data from 2003-2017 period was provided by Fednav Ltd.</p> <p>For the Board's benefit, WSP has conducted an equivalent analysis to that undertaken by DFO (regression model with broken-line relationships; Muggeo 2003) but using the appropriate shipping dataset as presented in Table X above. In addition, the model was run using generalized linear modeling, as opposed to linear modeling, to account for the non-normal data properties, thus avoiding predictions and confidence limit values below 0. This model was run for two scenarios; 'total # of ship transits in RSA during entire shipping season' (Table X, middle column), and 'total # of ship transits in RSA prior to narwhal aerial survey' (Table X, right column).</p> <p>The model for the 'full shipping year' identified a breakpoint at 2012.0 (SE = 0.91). The model for the 'number of Project vessel transits prior to the narwhal aerial survey' identified a breakpoint at the year 2014.0 (SE = 0.60). WSP ran a Davis Test for a change in the slope value before and after the breakpoint (Davies 1987; 2002) and found that the change in slope, and as a consequence, the breakpoint, was significant (p&lt;0.001 for both scenarios). Therefore, this analysis suggests that when accounting for narwhal only responding to shipping that occurred prior to the aerial surveys, the breakpoint at shipping levels is 2014.0. The narwhal survey in 2013 occurred prior the break and therefore is appropriate to be used as a baseline.</p>	Year	Project Vessel Transits in RSA (all season combined)	Project Vessels Transits in RSA (prior to narwhal survey in that year)	2002	0	0	2003	0	0	2004	0	0	2005	0	0	2006	8	8	2007	8	8	2008	14	14	2009	2	2	2010	2	2	2011	4	4	2012	2	2	2013	22	6	2014	16	16	2015	34	34	2016	88	14	2017	142	142
Year	Project Vessel Transits in RSA (all season combined)	Project Vessels Transits in RSA (prior to narwhal survey in that year)																																																						
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Cmt. #	DFO Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
					<p>Based on the above information, Baffinland takes the position that the baseline for Narwhal populations in Eclipse Sound should be the abundance estimate completed in 2013.</p>  <p>References:</p> <p>Canadian Coast Guard (CCG). 2023. Vessel Traffic Reporting Arctic Canada Traffic Zone (NORDREG). Available at: <a href="https://navigation-electronique.canada.ca/topics/traffic/cvms/nordreg-en">https://navigation-electronique.canada.ca/topics/traffic/cvms/nordreg-en</a>. Dataset provided by Xpert Solutions Technologiques Inc. (<a href="http://www.xst.ca">www.xst.ca</a>).</p> <p>Davies, R.B. 1987. Hypothesis testing when a nuisance parameter is present only under the alternative. <i>Biometrika</i>, 74:33–43, 1987.</p> <p>Davies, R. B. 2002. Hypothesis testing when a nuisance parameter is present only under the alternative: linear model case. <i>Biometrika</i>, 484-489.</p> <p>Muggeo VMR. 2003. Estimating regression models with unknown break-points. <i>Statistics in Medicine</i>, 22, 3055-3071.</p> <p>Baffinland. 2023. Meeting Minutes - Marine Environmental Working Group (MEWG) Meeting: 11-12 December 2023.</p> <p>WSP Canada Inc. (WSP). 2023. Project shipping levels in Eclipse Sound prior to 2013. Technical Memorandum. 1663724-488-TM-Rev0-77000. 30 November 2023.</p>

Cmt. #	DFO Cmt. #	Reviewer’s Detailed Comment	TC Recommendations	Reference Section	Baffinland’s Response
<b>CANADIAN NAVIGABLE WATERS ACT</b>					
3	DFO-3	<p>DFO appreciates the effort to sample and identify species that may be present around the ports. With robust baseline sampling (i.e. at Steensby), species presence before project related activities should be identified and species detected before project activities begin.</p> <p>Species are being removed from the Watch list based on presence in surrounding regions. For example, <i>Sosane wireni</i> was removed from the Watch List because the probable extension of the range into the Eastern Arctic from the western Canadian Arctic. It would be preferable to include ecoregions where taxa were previously found/known to be distributed. These could be included in brackets after written descriptions (e.g., Ellesmere Baffin Island area) or after the numbered references to help readers in evaluating what is being considered the “surrounding region” for previous occurrence records and to have a more precise understanding of the known distributions of each species. In addition, a review of ocean circulation patterns would provide improved criteria to define ‘surrounding region’ and distribution categories and better identify the natural distribution and range of a species from other areas to Milne or Steensby Ports.</p>	<ol style="list-style-type: none"> <li>DFO recommends the use of biogeographic information in combination with knowledge of circulation patterns to better develop criteria for “surrounding region” and distribution categories.</li> <li>DFO recommends that BIM continue to work with DFO to revise and improve detection of potential NIA/AIS as well as continued investigation into the long-term effects of the introduction of non-indigenous species and the cumulative effects on the biome, and the development of future mitigation and avoidance of introducing further non-indigenous taxa into Milne Port and Steensby Port.</li> </ol>	<p>APPENDIX G.6.8 2023 Marine Environmental Effects Monitoring Program Report</p> <p>2023 Milne Port Marine Environmental Effects Monitoring Program (MEEMP) and Non-Indigenous Species/Aquatic</p> <p>Invasive Species (NIS/AIS) Monitoring Program</p>	<p>The 2023 MEEMP/AIS report included a list of ecoregions where taxa were previously recorded, using the Marine Ecosystems of the World biogeographic classifications (Spalding et al., 2007), as previously recommended by DFO. Baffinland is currently collaborating with the University of New Brunswick to conduct a taxonomic study of macroalgae at Milne Inlet, which is expected to advance the understanding of biogeographic relationships in the Canadian Arctic.</p> <p>New information on taxonomic records, biogeography and circulation patterns is considered each year in relation to all Watch List and other taxa recorded at Milne Inlet. The presence of taxa on the Watch List is reassessed annually in this context.</p> <p>Baffinland welcomes ongoing collaboration with DFO to continue to improve NIS/AIS management at Milne Port and the future Steensby Port.</p> <p>Reference:</p> <p>Spalding MD, Fox HE, Allen GR, Davidson N, Ferdaña ZA, Finlayson M, Halpern BS, Jorge MA, Lombana A, Lourie SA, Martin KD, McManus E, Molnar J, Recchia CA, Robertson J (2017) Marine Ecoregions of the World: A bioregionalization of coastal and shelf areas. <i>BioScience</i> 57(7): 573-583.</p>
<b>NOISE</b>					
4	DFO-4	<p>BIM is using 120 dB as the general marine noise threshold as defined by the US National Marine Fisheries (NMFS 2013) in the absence of species-specific thresholds.</p> <p>As part of an adaptive management approach, potential impacts that might be observed below previously set threshold levels should be identified and the threshold re-assessed in a precautionary approach to protect the resource.</p>	<p>DFO would like to see the 100dB level included in reporting to provide a comparison of marine mammal reactions and behaviour at 100dB to provide a precautionary approach and potentially develop a more species-specific noise threshold.</p>	<p>APPENDIX G.6.5. 2023 Underwater Acoustic Monitoring. Program (Open-Water Season) Report. Austin, M.E., K.A. Kowarski, and C.C. Wilson. 2024. Baffinland Iron Mines Corporation — Mary River Project: 2023 Underwater Acoustic Monitoring Program (Open-Water Season). Document 03260, Version 1.0. Technical report by JASCO Applied Sciences for WSP Canada.</p> <p>National Marine Fisheries Service (NMFS). 2013. <i>Marine Mammals: Interim Sound Threshold Guidance</i> (webpage). National</p>	<p>The threshold used for assessing behavioural disturbance in Baffinland’s marine mammal effects assessments, and corresponding monitoring programs, is based on the most up-to-date regulatory threshold. The applied threshold is adopted by the U.S. National Marine Fisheries Service (NMFS) (NOAA 2014), such to comply with marine mammal protection provisions under the federal Marine Mammal Protection Act (MMPA), which prohibits the killing, injury and harassment (i.e., disturbance) of marine mammals. Based on what has been demonstrated through best available science, combined with the practical need to use a threshold based on a factor that is both predictable and measurable for most activities, NMFS uses a generalized acoustic threshold based on received sound pressure level to estimate the onset of behavioral disturbance as observed in 50% of marine mammals. For continuous sound sources such as ships, the NMFS disturbance criteria predicts that marine mammals are likely to be behaviorally disturbed (categorized as Level B</p>

Cmt. #	DFO Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
				<p>Marine Fisheries Service, National Oceanic and Atmospheric Administration, U.S. Department of Commerce.</p>	<p>harassment) when exposed to underwater anthropogenic noise above received sound pressure levels of 120 decibels (dB) re 1 microPascal (<math>\mu\text{Pa}</math>). The Canadian Department of Fisheries and Oceans does not have established numeric thresholds for hearing injury, disturbance or any other noise-related impacts in marine mammals (Wright and Moors-Murphy 2022). In the absence of such, the science-based NMFS acoustic threshold is commonly applied as part of the assessment of potential effects from marine industrial projects within Canada.</p> <p>In the context of narwhal, the 120 dB threshold is considered precautionary given that it is based on the minimum sound levels required to cause disturbance responses in baleen whales (i.e., deflection of migratory movements in bowhead and grey whales following exposure to industrial noise in the Arctic); which have a greater hearing sensitivity in the frequency range of vessel noise than do narwhal (who belong to the toothed whale family and have greater hearing acuity at higher frequencies than do baleen whales). As the majority of underwater sound generated by vessel traffic is concentrated below 200 Hz (Veirs et al. 2016), which is well below the assumed sensitive hearing range of narwhal (&gt;1 kHz) and all mid-frequency cetaceans (MFC), the 120 dB threshold is considered to be conservative for MFC such as narwhal in the context of predicting vessel noise disturbance impacts. The 120 dB threshold is consistent with that used in the original FEIS for the approved Mary River Project and has been carried through in the monitoring programs for that reason. Currently, there is no regulatory guidance from the Canadian Government (including from DFO) defining an alternate threshold that would be more appropriate than the 120 dB SPL threshold that has been used for narwhal in this analysis. Acoustic monitoring and behavioural response data collected to date as part of Baffinland's annual monitoring programs has not provided any evidence for a more appropriate threshold for narwhal than the one currently in place.</p> <p>New guidance on methods for assessing behavioural disturbance to marine mammals from underwater noise have been published (Southall et al. 2021); however, no new thresholds or species-specific thresholds for acoustic disturbance have been defined. What has become clear from recent research in this field is that marine mammal behavioural responses are difficult to predict based on received sound levels, due to the variability of responses across individual animals and variability based on the context of the exposure. This is an active area of research and Baffinland continues to consider the results of its monitoring programs in the context of the most up-to-date research in this field. We understand that NMFS is in the process of revising their acoustic guidance for assessing the potential for marine mammal behavioural disturbance due to underwater noise based on</p>

Cmt. #	DFO Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
					<p>available peer-reviewed research conducted since the establishment of the 120 dB re 1 µPa threshold.</p> <p>DFO has not provided rationale for their request that a sound level of 100 dB re 1 µPa be included in reporting, nor is it clear specifically what results DFO is requesting and how those results would allow a comparison of marine mammal reactions and behaviour at 100 dB. Background (i.e. non-Project related) sound levels within the Regional Study Area (RSA) often exceed 100 dB re 1 µPa. Median broadband sound levels measured in Milne Inlet during Baffinland's acoustic monitoring programs from 2014 and 2023 were between 96 and 102 dB re 1 µPa and the median sound level recorded near Pond Inlet in 2021 was 101.7 dB re 1 µPa. It is unreasonable to assess narwhal behavioural responses compared to a level near or below the median background noise level - a level at which Project vessel noise would often be indistinguishable from natural background noise. At this, there is no justification for providing results different from those that have been provided. Baffinland will continue to apply the best available regulatory guidance, including any revised guidance that becomes publicly available, and will continue to examine monitoring data results along with the best available scientific information for any indication that a different threshold would be more suitable for assessing potential impacts to marine mammals, notably narwhal.</p>
<b>WORKS IMPACTING FRESHWATER</b>					
5	<b>DFO-5</b>	<p>Works including the replacement and maintenance of crossing structures, the removal of material from waterbodies/watercourses such as abutments, and armour around waterbodies have the potential to impact fish and fish habitat.</p> <p>Fisheries and Oceans Canada recommends that Baffinland Iron Mines Corporation (BIM) review and follow DFO's Projects Near Water website that provides current guidance for avoiding impacts to fish and fish habitat including <a href="https://www.dfo-mpo.gc.ca/standards-codes-practice-pratiques-codes-pratiques">Standards and codes of practice (dfo-mpo.gc.ca)</a> with Codes of Practice containing conditions and measures for managing risks to fish and fish habitat or Standards outlining how a specific management measure should be designed and implemented to achieve the objective.</p>	<p>If the Standards and Codes of Practice can not be followed, work in fish habitat or on watercourses that contribute to fish habitat should be submitted to DFO for review.</p>	<p>APPENDIX G.2.4.2 2nd 2023 Geotechnical Inspection Report (August 30 – September 5, 2023)</p> <p>APPENDIX G.2.6 Tote Road Fish Habitat Monitoring Annual Report</p>	<p>Baffinland acknowledges DFO's recommendation and will continue to submit plans to DFO for review if DFO Standards and Codes of Practice cannot be followed for in-stream work in fish habitat.</p>
<b>ALLUVIAL DELTA COMPLEXES AND SHORELINE SENSITIVITY</b>					

Cmt. #	DFO Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
6	DFO-6	Information is required to fully understand the alluvial delta complexes and shoreline sensitivity analysis.	<p>DFO requests that BIM respond to questions below regarding the small percentage (1%) of alluvial delta complexes present (p 16 of 68)</p> <ol style="list-style-type: none"> <li>1. What is BIM's definition of alluvial delta complex?</li> <li>2. Please confirm whether there are other delta complexes other than Phillips Creek within the study area, and</li> <li>3. Has spill trajectory modelling been undertaken in the study area? If so, what wave, tide and current parameters were used? What were the results? Were they incorporated into the sensitivity analysis? See also Section 8.</li> </ol>	<p>BIM 2024. 2023 NIRB Annual Report APPENDIX G.8.5 2023 Oil Pollution Emergency Plan – Milne Inlet Section 5.3.1 Shoreline Characteristics and Sensitive Zones p 16 of 68</p> <p>BIM 2024. 2023 NIRB Annual Report APPENDIX G.8.5 2023 Oil Pollution Prevention Plan – Milne Inlet Section 5.1.3 Meteorological Data p 14 of 39</p> <p>BIM 2024. 2023 NIRB Annual Report APPENDIX G.8.5 2023 Oil Pollution Prevention Plan – Milne Inlet, Section 5 p 11 of 39</p>	<ol style="list-style-type: none"> <li>1. The OPEP shoreline characteristics and sensitive zones and meteorological data were derived from baseline information. Shoreline habitat classifications applied in the 2010 Milne Inlet spill modelling are from the Coastal and Ocean Resources Inc. (CORI) surveys (CORI 2007). The selection of which shore types to use for Milne Inlet was based on the shoreline habitat classification work completed by CORI (2007). In that work, six (6) primary shore types were identified for Milne Inlet: Rock Cliff, Rock Cliff with Beach, Alluvial Fan, Beach Ridge Complex, Alluvial Delta Complexes, and Delta Flats. The proportion of each shore type for each shoreline section was then classified (CORI, 2007). Shoreline sensitivity mapping information for the Northern Shipping Route was available from Environment Canada (Arctic Environmental Sensitivity Atlas System, AESAS) (Environment Canada 2000). Baffinland is reviewing this information and will provide an update. Previous consultants no longer with the company completed this work. Baffinland has retained a third-party consultant to review and update the Spill at Sea Response Plan (SSRP).</li> <li>2. Baffinland is reviewing this information and will provide an update. Previous consultants no longer with the company completed this work. Baffinland has retained a third-party consultant to review and update the SSRP.</li> <li>3. Fuel spill trajectory modelling was completed for the Northern Shipping Route. Waves were not used in the model; winds and currents are the primary physical environmental drivers. Currents were from the high resolution ocean circulation model HYCOM (HYbrid Coordinate Ocean Model). Tidal currents are small, on the order of less than 5 cm/s, and were not considered in the model. Results of the model include spill probability maps and statistics of the percent of trajectories ashore, and minimum and maximum times to shore.</li> </ol>
NET ENVIRONMENTAL BENEFIT ANALYSIS					
7	DFO-7	There is no support information to fully understand why the net environment benefit for attempted restoration of these shores would be detrimental (p 18 of 68)	DFO requests support document documents to be provided to fully understand why the net environment benefit for attempted restoration of these shores would be detrimental.	<p>BIM 2024. 2023 NIRB Annual Report APPENDIX G.8.5 2023 Oil Pollution Emergency Plan – Milne Inlet Section 5.3.1 Shoreline Characteristics and Sensitive Zones p 16 of 68</p> <p>BIM 2024. 2023 NIRB Annual Report APPENDIX G.8.5 2023 Oil Pollution Prevention Plan – Milne Inlet Section 5 p 12 of 39</p>	<p>This comment is referring to shorelines largely characterized by higher relief fiord shorelines, primarily constituted of rock. The Shoreline Cleanup Assessment Technique (SCAT) released by Environment and Climate Change Canada (ECCC) in 2018, provides that the best practice in most cases for this type of shoreline is a natural recovery.</p> <p>Reference: Environment and Climate Change Canada (ECCC), Shoreline Cleanup Assessment Technique (SCAT) manual, Third edition, prepared and provided by</p>

Cmt. #	DFO Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
					Triox Environmental Emergencies, Owens Coastal Consultants, Environmental Mapping Ltd, Ottawa, ON, 2018.
<b>CONSISTENCY IN WIND SPEED DESCRIPTION</b>					
8	DFO-8	Wind speed description is not consistent throughout the Oil Pollution Emergency Plan. Average winds of 30 km/h were referenced. Elsewhere in this document, wind speeds are described in m/s	DFO requests that wind speeds are described in a consistent manner	BIM 2024. 2023 NIRB Annual Report APPENDIX G.8.5 2023 Oil Pollution Emergency Plan – Milne Inlet Section 5.3.2 Bathymetric and Marine Data p 18 of 68	Baffinland will make this revision to reflect DFO's recommendation in the next update to the Oil Pollution Emergency Plan (OPEP). The OPEP is reviewed annually and updated as required.
<b>SPILL AT SEA RESPONSE PLAN (SSRP) – CAPE SIZED VESSEL</b>					
9	DFO-9	Update table and risk assessment to capture current regime of ship size being used. Plan was developed in 2015 Cape Sized vessel have increased fuel capacity. Approx. 4000m3	DFO requests an update to include current shipping regime requirements	Spill at Sea Response Plan (SSRP)-Table 11-1	Baffinland will make this revision to reflect DFO's recommendation in the next update to the Spill at Sea Response Plan (SSRP).
<b>SPILL AT SEA RESPONSE PLAN (SSRP) - STEENSBY</b>					
10	DFO-10	The SSRP only refers to a response in the northern shipping route. DFO is aware of BIMs intention to start construction at the Steensby site during the 2024-25 reporting cycle. If this is the case a response plan should be developed for the southern route and ensure capacity is in place for spills at sea regarding Steensby operations.	DFO notes that a Spill at Sea Response Plan for the Southern Shipping Route should be developed in the context of Steensby port operations.	Steensby Development Plans	Baffinland will develop a Spill at Sea Response Plan for the Southern Shipping Route prior to the beginning of construction of the Steensby Component of the Project.
<b>SPILL AT SEA RESPONSE PLANN (SSRP) – COAST GUARD (CCG) CONTACTS</b>					
11	DFO-11	Update contact list for CCG and update region to Canadian Coast Guard Arctic Region.	DFO suggests that spill at sea response plan contact list should be updated with the following: <ul style="list-style-type: none"> <li>Reporting a marine spill in Nunavut goes through the MCTS in Iqaluit: Toll-free: 1-867-979-5269 E-mail: DFO CCG Arctic <a href="mailto:ERDO@innav.gc.ca">ERDO or IqaNordreg@innav.gc.ca</a></li> <li>Update Region to Arctic Region. <a href="https://www.ccg-gcc.gc.ca/contact/emergency-urgence/marine-pollution-marine-eng.html">https://www.ccg-gcc.gc.ca/contact/emergency-urgence/marine-pollution-marine-eng.html</a></li> </ul>	Appendix 1	Baffinland thanks DFO for the updated information. Baffinland will make this revision to reflect DFO's recommendation in the next update to the Spill at Sea Response Plan (SSRP).

Table A.6: Response to PC Comments on Baffinland's 2023 Annual Report to the NIRB

Cmt. #	PC Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
<b>INSPECTIONS – MARINE TRANSPORTATION; OIL HANDLING FACILITY</b>					
1	PC-01	<ul style="list-style-type: none"> <li>The proponent repeated on several occasions that the results of 2023 aerial survey which indicated that: "narwhal abundance in Eclipse Sound in 2023 has returned to baseline levels following lower narwhal numbers observed in the RSA in 2020, 2021, and 2022. The increase in 2023 was observed despite the use of larger Capesize ore carriers in the RSA during 2023, and higher shipping levels in the RSA than all previous years since the start of shipping operations. The results collectively show a lack of correlation between shipping levels in the RSA and narwhal numbers in Eclipse Sound."</li> <li>The final recommendations of the MMASP includes not continuing the summer (Legs 1 and 2) surveys in 2024 based on the results of the 2023 surveys.</li> <li>During the May 2024 MEWG meeting, the proponent announced there will be no leg 1 and 2 aerial survey for summer 2024 and 2025.</li> <li>The summer 2023 aerial survey (leg 2), survey #1 was conducted on August 12-13 and survey #2 on August 23-25 in Eclipse Sound.</li> <li>Survey #1 (August 12-13) was selected as the peak abundance estimate for the Eclipse Sound stock because the length of time between the two surveys was too long to recommend an average of the two estimates.</li> </ul> <p>Parks Canada would like to highlight that the annual report indicated that in 2023, the land fast ice was late to melt and this condition delayed the start of shipping by almost two weeks.</p> <p>The annual report details the shipping season:</p> <ul style="list-style-type: none"> <li>- Between mid-July and August 9: no project-related vessels arrived in Milne Port</li> <li>- On August 10: First convoy reached Milne Port (3 vessels)</li> <li>- On August 11: Second convoy reached Milne Port (4 vessels)</li> </ul>	<p>Parks Canada welcomes the decision to delay the start of the shipping season until ice breaking could be avoided along the shipping route and acknowledges the situation where flights are reserved months in advance and the survey dates could not be changed to adjust for the late start to shipping.</p> <ol style="list-style-type: none"> <li>However, we do not agree with the report statement that "the increase [of narwhals] in 2023 was observed despite the use of larger Capesize ore carriers in the RSA during 2023, and higher shipping levels in the RSA [82 vessels] than all previous years since the start of shipping operations" because of the delay in the shipping season. This statement is misleading as both 2023 abundance estimate surveys were completed early in the shipping season, only after 7 vessels for survey #1 and 17 vessels for survey #2 and before any capsized arrived in Milne Port.</li> <li>Additionally, 2023 coincides with the latest start of the shipping season and the</li> </ol>	<ul style="list-style-type: none"> <li>Thomas, T., Firman, M., Abrall, P. and Rouget, P. 2024. Baffinland Iron Mines Corporation — Mary River Project: 2023 Marine Mammal Aerial Survey Program (MMASP) - Technical Report prepared by WSP Canada Inc. (Appendix G.6.2 of 2023 monitoring report)</li> <li>Mary River Project 2023 Annual Report.</li> <li>Mary River Project 2022 Annual Report.</li> <li>Mary River Project 2021 Annual Report.</li> <li>Mary River Project 2020 Annual Report.</li> <li>Mary River Project 2019 Annual Report.</li> <li>Mary River Project 2016 Annual Report</li> <li>May 2024. WSP presentation to the MEWG.</li> </ul>	<ol style="list-style-type: none"> <li>It was clarified during the 5-6 June 2024 MEWG Meeting in Ottawa that the wording in the report would have been better served by indicating a general increase in the number and size of vessels since the start of iron ore shipping.</li> <li>The intent of the marine mammal aerial survey program (MMASP) is to monitor changes in population abundance estimates and not to inform on in-year narwhal behavioural changes as a result of shipping operations. All of the monitoring data collected to date clearly indicates that when narwhal react to vessels, this occurs at close range to the vessels (1-5 km). Narwhal have not been observed leaving the RSA as a result of in-year shipping operations. This was demonstrated through the narwhal tagging program (Golder 2020) that was conducted in collaboration with DFO. The MMASP is used to monitor for changes in population abundance and/or potential habitat abandonment; none of which appear to be occurring based on the results of the 2023 MMASP (WSP 2024).</li> <li>The open-water aerial surveys used to determine narwhal abundance need to be conducted in mid-August as per existing DFO survey methodology (Watt et al. 2015). Baffinland's 2023 aerial surveys in Eclipse Sound were flown between 12-25 August. DFO's 2023 aerial surveys in Eclipse Sound were flown between 18-23 August. We do not recommend delaying the open-water surveys to later in the year as this would capture narwhal numbers outside of their summer resident period (i.e, some animals from Eclipse Stock may have already started their out-migration to Baffin Bay and some animals from adjacent stock areas may be in the process of migrating through the RSA). Also, see response above to PC-01 (3).</li> <li>See DFO-1 response</li> </ol> <p>References:</p> <p>Golder. 2020. 2017 – 2018 Integrated narwhal tagging study. Technical Data Report. Prepared by Golder Associates Ltd., Victoria BC for Baffinland Iron Mines Corporation, Oakville, Ontario.</p> <p>Watt, C.A., Marcoux, M., Asselin, N.C., Orr, J.R., and Ferguson, S.H. 2015. Instantaneous availability bias correction for calculating aerial survey abundance estimates for narwhal</p>

Cmt. #	PC Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
		<p>- On August 12-13: 2023 aerial survey #1 (selected as the peak abundance estimate for the Eclipse Sound)</p> <p>- On August 23-25: second survey in Eclipse Sound but estimate was not included in final abundance estimate.</p> <p>- On August 29: first capsize vessel arrived at Milne Port</p> <ul style="list-style-type: none"> <li>• Summery survey #1 was selected as the peak abundance estimate for the Eclipse Sound and it was conducted on August 12-13 in Eclipse Sound. This is only a day after the second convoy arrived to Milne Port. By this time, no capsize vessel had arrived in Milne inlet and a fewer than 10 project vessels had transited through Eclipse Sound. Even if the summer #2 survey estimates were used, only 17 vessels and no capsize had arrived on Milne Port before August 23.</li> <li>• Since the beginning of the summer aerial survey, the dates of arrival of the first vessels varied by 23 days (July 17 to August 9, see the table below).</li> <li>• The date of the summer aerial survey varied by 17 days (August 12 to August 29, see table below)</li> <li>• Consequently, there is a great variability between the number of vessels that arrived in Milne Port and the timing of the narwhal estimated abundance survey. In 2020. There were 39 days between the first Bessel in Milne Port and the aerial survey, compared to 2 days in 2023.</li> </ul>	<p>earliest summer survey. As a result, only 2 days of shipping had occurred in 2023 compared to 39 in 2020 (see table above). Although not statistically significant, the slope of the relationship between narwhal abundance and the time elapsed between the first vessels and the first day of aerial surveys was negative. Parks Canada requests that the proponent provide the number of project vessels that arrived at Milne Port prior to conducting aerial surveys (leg 2) in each year between 2015 and 2023.</p> <p>3. As a result, based on the timing of the surveys in relation to the shipping activities, Parks Canada believes that the potential shipping impacts of "the use of larger Capesize ore carriers and higher shipping levels" may not be fully captured during the 2023 narwhal abundance estimates. Timing of subsequent open water surveys should account for potential delays in the shipping season as well as capture potential effects of Capesize class vessels within the RSA.</p> <p>4. Following the precautionary approach and to better inform</p>		<p>(Monodon monoceros) in the Canadian High Arctic. DFO Can. Sci. Advis. Sec. Res. Doc. 2015/044. v + 13 p.</p> <p>WSP. 2024. 2023 Marine Mammal Aerial Survey Program (MMASP) – Final Report. Report No. 166372402-498-R-Rev0-78000. 15 March 2024.</p>

Cmt. #	PC Cmt. #	Reviewer’s Detailed Comment	TC Recommendations	Reference Section	Baffinland’s Response
			<p>the SOP2 assessment with regards to narwhal abundance estimates and related project effects, Parks Canada recommends maintaining annual aerial surveys of the RSA during the open water season (leg 2) to see if there may be longer-term trends that subsequent surveys during following years could detect and until the results of the 2023 DFO aerial survey of the Baffin Bay Narwhal population are published.</p>		
<b>MARINE ENVIRONMENT WORKING GROUPS (MEWG) DECISION-MAKING PROCESS</b>					
2	PC-02	<ul style="list-style-type: none"> <li>Annual Report: 2.5.2.1 Looking Ahead. “The Working Groups’ decision-making process is being amended so that decisions are consensus-based and recorded in writing by the independent chair. Recommendations brought forward by the Working Group that are not seen as enforceable will go to the independent chair for dispute resolution to ensure a fair outcome.”</li> <li>The final recommendations of the MMASP includes not conducting the summer open water aerial surveys (leg 2) in 2024 based on the results of 2023 aerial surveys.</li> <li>T&amp;C 101 in the Project Certificate states that the proponent is to “Schedule for periodic surveys as recommended by the Marine Environment Working Group.”</li> <li>During the May 2024 MEWG meeting, the proponent announced for the first time there will be no leg 1 and 2 aerial survey for summer 2024 or 2025 with the next open water aerial survey planned for 2026.</li> <li>The proponent also indicated that flights could not be secured for the 2024 season during the May MEWG meeting. This</li> </ul>	<p>Parks Canada acknowledges that the terms of reference are not yet finalized, and the independent chair is not in place.</p> <p>However, the decision of changing the program frequency for marine monitoring programs in Milne Port and along the Northern shipping route was not consensus-based involving other members of the MEWG. This is not in compliance with part e of T&amp;C 101 of the Project Certificate, nor does it adhere to the decision-making process of the MEWG.</p> <p>Parks Canada recommends that the proponent follows the same term of reference process and dispute resolution established for the MEWG before modifying/stopping the currently</p>	<ul style="list-style-type: none"> <li>Thomas, T., Firman, M., Abrall, P. and Rouget, P. 2024. Baffinland Iron Mines Corporation — Mary River Project: 2023 Marine Mammal Aerial Survey Program (MMASP) - Technical Report prepared by WSP Canada Inc. (Appendix G.6.2 of 2023 monitoring report)</li> <li>Mary River Project 2023 Annual Report.</li> <li>MEWG Terms of Reference, April 2024 version</li> <li>May 2024 MEWG document. 0524 Program Frequency_Milne_2024_2029 (1)</li> <li>December and spring 2024 MEWG meeting minutes</li> </ul>	<p>Baffinland provided the MEWG with a draft 5 year monitoring plan at the May MEWG meeting for discussion. Baffinland heard the initial concerns raised by members and scheduled a subsequent discussion at the June MEWG meeting to further discuss the proposed plan. In this respect, the MEWG received notice in May about Baffinland’s draft plan with opportunity to discuss it further at the June meeting. With respect to T&amp;C 101 e., Baffinland notes the deliberate use of the term “periodic”, which suggests that Baffinland is well within a schedule aligned with this. While there isn’t an opportunity to conduct Leg 1 or Leg 2 aerial surveys in 2024 (due to plane availability), Baffinland is open to working with the MEWG should they wish to put forward a formal recommendation grounded in sound rationale for why Baffinland should continue annual aerial surveys. As noted in response to DFO-1, it is not expected that the Government of Canada to run aerial surveys annually nor an industry standard in which Baffinland is deviating. Changing to a three-year frequency will also enable Baffinland to prioritize other monitoring work for the Steensby component of the Mary River Project.</p>

Cmt. #	PC Cmt. #	Reviewer's Detailed Comment	TC Recommendations	Reference Section	Baffinland's Response
		<p>information was known by the proponent for several months but did not inform MEWG members or seek an alternative.</p> <ul style="list-style-type: none"> <li>The proponent's changes in the program frequency for marine monitoring programs in Milne Port and along the Northern shipping route were not discussed with the MEWG at a point in time to allow for meaningful input from other MEWG members.</li> <li>When MEWG members indicated that they did not agree with the changes, BIM requested the MEWG members follow the draft Term of Reference process and dispute resolution.</li> </ul>	<p>accepted mitigations/monitoring programs. Consequently, the proponent should have informed and proposed the modification of the program frequency for marine monitoring programs in Milne Port and along the Northern shipping with the MEGW members before making this decision.</p>		
<b>AERIAL SURVEYS FOR MARINE MONITORING, EMERGENCY RESPONSE OR SEARCH AND RESCUE PURPOSES ARE NOT SUBJECT TO THE FLIGHT RESTRICTIONS SET OUT IN TERM AND CONDITION 150</b>					
3	TC-03	<ul style="list-style-type: none"> <li>In NIRB Annual Report, Baffinland wrote that they "will ensure that pilots are informed of altitude restrictions associated with Tallurutiup Imanga National Marine Conservation Area and Sirmilik National Park. Baffinland will continue to conduct EWI surveys at 1,000 ft above Tallurutiup Imanga National Marine Conservation Area, as needed, which will remain exempt from this Term and Condition."</li> <li>During the MEWG presentation in May 2024, WSP mentioned that "the TC150 (minimum flying altitude of 2,000 feet over Sirmilik Park and Tallurutiup Imanga National Marine Conservation Area) were limiting the EWI surveys that need to be done at 1,000 ft." This is a misunderstanding by WSP because the aerial surveys are not subject to the flight restrictions set out in Term and Condition 150.</li> </ul>	<p>Narwhals' aerial surveys are not subject to the flight restrictions set out in Term and Condition 150.</p> <p>Parks Canada would like to reinforce its support of aerial surveys and appropriate protocols and recommends that WSP correct their misunderstanding.</p>	<ul style="list-style-type: none"> <li>Mary River Project 2023 Annual Report. TC 150</li> <li>May 2024. WSP presentation to the MEWG.</li> <li>231117-08MN053-NIRB Project Certificate No 005 Amendment 5-OT4E</li> </ul>	<p>Thank you for confirming that aerial surveys are not subject to the flight restrictions set out in Term and Condition 150. Baffinland notes that the language used by the Government of Canada (PC) to advise the public of flight altitude restrictions in the Tallurutiup Imanga National Marine Conservation Area and in Sirmilik National Park do not clearly indicate that certain parties (or industry) are exempt from these restrictions (and how this is determined).</p>