APPENDIX E.13

Responses to 2023 Annual Report Comments

Table A.1: Response to QIA Comments on Baffinland's 2023 QIA-NWB Annual Report for Operations

f	Intervener Cmt. No.	Intervener Comment	Intervener Recommendation/Response	Baffinland's Response
			General Comments	
1	GC#1	A letter report is provided by LGL that gives an overview of the Inspectors' findings and the recommended actions. It also provides recommendations for additional action. Further to the text in this letter report, a table is presented that describes Project Location, Description of Concern, QIA Requested Action and Has the Concern Been Addressed from Previous Recommendations. While several of the Requested Actions have been undertaken successfully, in several instances no action has been observed, or attempts to repair have been unsuccessful.	QIA requests explanation for why no action has been taken to address the concerns as even in the March 5, 2024, General Site Inspection Findings and Recommendations document, items that were not addressed in the earlier report are still not resolved.	RESPONSE SUBMITTED November 15, 2024 to NWB: Baffinland sought clarification from QIA on August 28, 2024 on what was the gap in Baffinland's response to their inspection report under this intervener comment GC#1. Baffinland received clarification on September 9, 2024 from QIA which is paraphrased below *"The June and September 2023 inspections identified "The informal ditches are collecting road and hillslope runoff and is flowing downstream unchecked and with no controls for high flow periods"."* In QIA's original report it is stated *"As discussed, the ditches should be reconstructed and sized to convey high flows, and rock check dams should be installed per typical specifications to reduce velocities, allow for settling and to reduce erosion in the ditches."* Baffinland reiterates that the design basis for ditches is for the conveyance of water and not sediment control. Baffinland is focused on ditch stability and integrity being maintained and continues to monitor if additional work is required. Baffinland is reviewing the entire facility overall to ensure effective controls are implemented that will be successful with lessons learned to date from current remedial efforts and will continue to provide updates in the NWB QIA Annual Report for Operations.
2	GC#2	Erosion and sediment control mishaps such as escape of fines, overloading of coir logs and lack of maintenance of silt fence seems to be a recurring problem based on issues and concerns raised by QIA. Table 1 – Baffinland Responses to QIA September 2023 Site Inspection of the Mary River Mine reiterates the numerous episodes and requests action on each. While Baffinland has responded in kind with measures that will be implemented such as prioritizing the use of coir logs, implementing maintenance measures at erosion and sediment controls structures and certifying staff under CISEC, these measures must continue on an ongoing basis in order to maintain the site in good condition.	QIA requests assurances that the measures identified will be implemented on an ongoing basis in order to prevent rather than remedy such issues. QIA further requests Baffinland provide supporting documentation in the 2024 annual report.	As described in the SWAEMP, influences from climate, topography and permafrost ground conditions combine to create conditions of continuous, natural weathering and erosion and sedimentation throughout the region. These environmental conditions have a similar influence on site infrastructure, making erosion challenging to proactively control or even predict. Baffinland has observed natural sedimentation events since the outset of the Project. Typical Erosion and Sediment Control (ESC) Best Management Practices (BMPs) that are implemented in more southern regions tend not to perform as well at site due to these regional conditions. For example, installing an ESC BMP such as Insta-turf may be an effective hillside erosion solution in southern regions. The mat can be secured in consolidated soil capable of water infiltration and vegetation establishment is relatively quick. The same matting installed at site would be ineffective, as it cannot be sufficiently secured in the unconsolidated active layer, re-vegetation is slow and saturated conditions of the active layer during freshet or rain events is likely to dislodge the matting. A greater level of understanding of the unique site conditions that influence the selection of appropriate ESC measures has been achieved through the ongoing construction and operation of the Project. The ESC BMP inventory and implementation requires flexibility to assess the ever-changing ground conditions at site and respond accordingly such that a new

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				adverse condition is not introduced. For example, an In-Ground Sump is an ESC BMP listed in Table 6.1 of the Surface Water and Aquatic Ecosystem Management Plan. While a sump would collect/ contain water and prevent erosion, it would not be a good choice in locations where excavating a sump could expose permafrost or result in permafrost degradation. It is recognized that erosion and sediment control training is required for personnel involved with the planning, installation, and maintenance of ESC measures. The addition of CAN-CISEC personnel has been valuable in drawing awareness to and understanding of ESC requirements, supporting construction activities and daily operations. In-house Erosion and Sediment Control Awareness training is being developed for personnel involved in ESC activities and will be rolled-out in 2025. Topics covered will include: • Legislation that governs erosion and sediment control • Types of erosion • Factors that influence erosion • Erosion and Sediment control BMPs • Installation of BMPs BIM is encouraged by the receptiveness of various departments to the guidance provided by the CAN-CISEC's and will continue to build on this teamwork. The SWAEMP, along with additional Environmental Management Plans, is incorporated into the planning of proposed developments, including the rail, and their execution. Adaptive Management will be imperative during all stages of proposed developments including the construction phase. Environmental site inspections will provide real-time feedback on how work plans are executed and challenges encountered, for an effective response. Baffinland maintains records of ESC controls deployed, including maintenance activities, and invites QIA to review these records when onsite, but will not be providing this documentation as part of the Annual Report.
3	GC#3	In response to QIA-2 regarding the KM 105 sedimentation pond, Baffinland notes that a third-party Engineer of Record has identified two options to correct the issues identified at this location. Baffinland indicates that the selected remediation activity will be conducted when conditions and materials are no longer frozen. However, Baffinland has not indicated which approach will be implemented. This issue was identified as outstanding in both bi-annual geotechnical inspection reports (Appendix C.2.1 and C.2.2).	QIA requests that the NWB give consideration to this when screening the next water license renewal application for the Mary River Project.	The 2024 Geotechnical Inspection addresses this issue. This information was provided to the QIA and NWB on October 26, 2024, Recommendation 3.2 b): *Recommendation: It is likely that the rehabilitation of the slope will include the placement of sand cover and riprap in the upper (displaced) part of the cover layers, and the reconstruction of the safety berm at its original location adjacent to the anchor trench. It is also likely that placement of additional riprap along the toe of the south slope will be necessary (like a wide and heavy toe-berm) to provide additional support at the toe to prevent similar sliding of the cover layers in the future.*

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				Baffinland Action: Baffinland will continue to monitor the potential movement of the slope through future geotechnical inspections in 2025. Internal geotechnical monitoring of the structure will be utilized to support independent advice. The 2024 Geotechnical Inspection is included in its entirety as Appendix C.2 to the 2024 NWB QIA Annual Report for Operations.
Aquatic Effects Monitoring Plan (AEMP)				
4	AEMP#1	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." 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.	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.	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. 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. 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 sample are instructed to place cobble-gravel sampled for the survey back to the creek at the same location the sampler utilized to ensure that suitable substrate will be present in the creek the following year. After ten years of sampling, Baffinland can assure there are no "alternative sites" available for sampling at SDLT12 it is critical that monitoring sites stay consistent for ongoing temporal analyses and resultant conclusions. Baffinland has demonstrated commitment to sampling using the most up-to-date and scientifically justifiable standards, in addition to providing transparency over the years.
5	AEMP#2	The report states, "Additional site visits are recommended throughout future seasons to verify the operation of data loggers and perform flow measurements. It is recommended that future hydrometric monitoring continue to target low flow and/or high flow periods to maintain and further validate the rating relationships." Baffinland should provide an updated methodology to detail frequency of sites visits to verify the operation of data loggers so that data is not missing.	Baffinland should provide an updated methodology detailing the frequency of site visits to verify the operation of data loggers, ensuring that data is not missing.	Reconnaissance of the hydrometric stations is initiated in June to monitor the onset and progression of snow melt and associated freshet flow. Each of the stations were installed as early as possible in June, when the stream channels were ice-free. Additional site visits are planned to be conducted at all stations in July, August, and September, and at some of the stations in October. The majority of the stations are decommissioned for winter in anticipation of freeze-up in September. When possible, the additional flow measurements are made during

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				abnormally high or low flow periods to help validate the estimates of flow through the full range of recorded water levels. Accessing some of these areas in periods of high flow is unsafe, due to the nature of measuring water velocity on steep banks. Quality control and analysis of the data is performed by a third-party hydrologist who was the advisor to Baffinland on the design and implementation of the hydrology program and who performs an annual site visit during installation to verify station integrity and train staff on the monitoring protocols where required.
6	AEMP#3	When discussing the evaluation of water and sediment quality data in regard 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 using the various evaluation tools to qualitatively assess for changes based on a weight-of-evidence analysis." 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.	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.	Baffinland will update the AEMP to provide quantifiable triggers (e.g., exceedances of water quality guidelines or AEMP benchmark values) within the framework. These triggers will lead to specific adaptive management actions to be undertaken in response to exceedances. The management actions for these cases shall be initially investigative following a process defined in the AEMP, and if the investigation determines it, appropriate mitigative actions for the source or the cause of these exceedances will be implemented.
7	AEMP#4	In the TARP of the AEMP (see Table 5.2 below), low and moderate risk thresholds indicate "concentration(s) observed during baseline and at an applicable reference area". However, not all stations have baseline data (sediment quality in lotic systems), or the reference sites were not 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. 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, "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." 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 then reference sites currently being used by the proponent must defend the use of these sites as they are not performing as necessary. Another example of this includes discussions of sediment quality at CLT2 in the CREMP in Section 3.2.2 where the proponent states, "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).	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 part of the AEMP, as currently the proponent is excluding their 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.	The AEMP used for the reporting year was revision 1, as revision 2 has not yet been approved and as such, it did not incorporate the TARP. Baffinland continues to report through the adaptive response framework of revision 1. Baffinland will update and re-submit revision 2 upon timelines referenced in the renewed Water Licence. IT should be noted that the CREMP comprehensively evaluates change of all parameters that are monitored regardless of the parameters have reference data or benchmarks identified. Temporal comparisons, reference comparisons, Specific AEMP benchmarks, Water Quality Guidelines as well as interactions between different monitoring programs are all considered during the analysis stage of data. Professional judgement from independent experts is utilised in conjunction with the response framework to qualify and interpret results.

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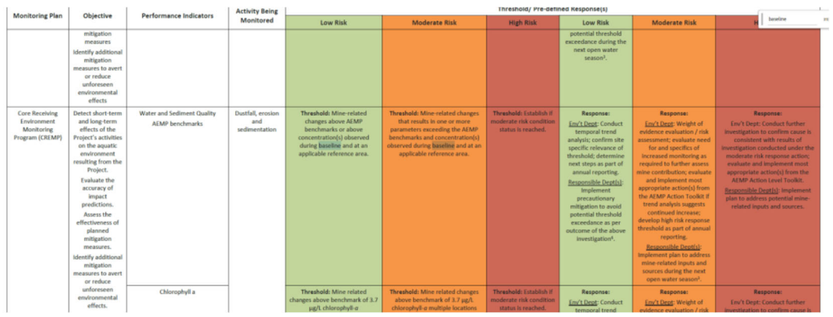
		Higher metal concentrations in sediment at CLT2 stations compared to average lotic reference conditions were observed in 2023 but the reason(s) for these results are unclear and potentially unrelated to mine activity. Further, because no baseline data are available, evaluation of whether these concentrations reflect a mine-related influence was not possible." Again, a lack of baseline data prevented proper evaluation of elevated contaminant concentrations in sediment and no management actions were recommended. 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. 		
Core Receiving Environment Monitoring Program (CREMP)				
8	CREMP#1	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)." 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." 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.	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 River Tributary F station F0-01 in 2023. Can Baffinland provide detailed explanations on the following points: 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.,	RESPONSE SUBMITTED November 15, 2024 to NWB: 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. 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 2020, 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.

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			proportion of the population comprised of EPT). 2. What specific factors led to the decision not to conduct benthic invertebrate sampling at station F0-01 in 2023? 3. How will the absence of this data impact the overall study and its conclusions? 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.	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. 1. Baffinland has not indicated that a single year of baseline data is sufficient for evaluating effects on sediment quality/benthic invertebrate communities. 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). 3. See above.
9	CREMP#2	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: • Sediment and benthic invertebrate sampling BL0-01 in Mary Lake • Gill netting at Reference Lake 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.	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.	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. Minnow has been leading the collection of sediment/biological samples to meet CREMP requirements since 2015. The Project has a strong understanding of the delays that may occur due to inclement weather and other factors and, indeed, has incorporated contingencies for weather delays to avoid failures to execute components of monitoring programs. With the exceptions 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 char 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 was completed by August 15th 2024. 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 inclement weather. This earlier start date is still within range of the sampling dates of the CREMP since 2015. The earlier initiation of the program resulted in required sampling being completed with the exception of all 100 fish were not collected on Reference Lake due to typically low rates compared to other lakes.
10	CREMP#3	The report states, "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-	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	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. The draft AEMP Rev.2 is planned to be re-updated following the issuance of 2025 water

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		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." 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. The Fisheries Act (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.	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.	licence as requested by QIA. Baffinland will consider the recommendation of the reviewer and will work with independent experts to validate the request. 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.
11	CREMP#4	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.	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.	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. 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. 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 fall 2015

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				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. 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.
12	CREMP#5	The report states, "Overall, the spatial and temporal analyses of chlorophyll-a concentrations suggested that mine operations may have contributed to slightly higher phytoplankton abundance at the CLT1 main stem during the summer 2023 sampling event relative to reference streams and generally higher phytoplankton abundance in the CLT1 main stem over the mine operational period relative to the baseline period. Higher chlorophyll-a concentrations within the CLT1 upper main stem was consistent with the occurrence of higher aqueous nutrient concentrations (i.e., nitrate) compared to the reference streams and to baseline conditions (Figure 3.2 and Appendix Figure C.2). The potential introduction of nutrients to the system is likely attributable to historical quarrying at the QMR2 pit, which has been inactive (i.e., no blasting) since 2019. Despite slightly greater chlorophyll-a concentrations at the uppermost CLT1 main stem station than at the reference streams in summer 2023, the CLT1 north branch and main stem have remained oligotrophic since the commencement of commercial mine operations in 2015." The report indicates that the higher concentration of nitrate observed during the summer sampling event may be attributed to the inactive QMR2 pit.	Has sampling been completed to confirm that the higher concentrations of nitrate are originating from the QMR2 pit? It is recommended that a summer trend analysis at this site is completed to see if this has been a consistent problem in relation to the QMR2, nitrate concentrations since operation. If the QMR2 pit is the source of the elevated nitrate, what steps are being taken to mitigate this runoff and prevent impacts to the receiving waterbody and aquatic biota?	The CLT1 upper main stem sampling station (L2-03) is located downstream of the QMR2 pit and seasonal sampling is completed annually as part of the CREMP. Temporal comparisons of water chemistry at CLT1 main stem stations over the mine baseline, construction, and operations periods indicate elevated average concentrations of nitrate compared to baseline and reference during the mine operations period, notably at the CLT1 upper main stem station (Figure C.2). However, nitrate concentrations at CLT1 main stem stations peaked in 2018 and 2019 and have since shown a decreasing trend consistent with the cessation of blasting at QMR2 in 2019. Seasonal average nitrate concentrations at CLT1 main stem stations in 2022 and 2023 were among the lowest measured over the mine construction and operations periods and were well below both the AEMP benchmark and water quality guideline (Figure C.2, Table C.14). While chlorophyll-a concentrations were elevated at the CLT1 upper main stem station relative to reference and baseline conditions in the summer of 2023, average CLT1 main stem chlorophyll-a concentrations in 2023 were below the AEMP benchmark, within the seasonal ranges previously observed (i.e., 2014 to 2022), and showed no consistent directional change over time (Figure 3.3). Baffinland has also conducted benthic invertebrate community monitoring at the main stem of CLT1 in the past, as well as in 2023, which showed no adverse effect on the benthic invertebrate community. Updated monitoring and potential associated actions are presented within the 2024 CREMP
13	CREMP#6	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 < 4.5 µg/L).	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.	This inference was not based on eutrophic or oligotrophic lake classification but rather relative concentrations of chlorophyll-a and relative fish densities. 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. 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 'ultra oligotrophic',

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				'oligotrophic', and 'oligo mesotrophic' 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
14	CREMP#7	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. Examples taken from CREMP: 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. 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. 11 Similar statistical evaluations were not possible in CREMP studies from 2015 to 2017 due to limited sample sizes. 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. 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.	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.	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.
15	CREMP#8	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." 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	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.	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 have been targeted 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

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		due to measurement error." 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 charr at Camp Lake are suggested since mine operations commenced in 2015." 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.		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). A difference in sample sizes does not violate the assumptions of ANOVA (i.e., homogeneity of variance, normality, independence of observations and group 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. 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.
16	CREMP#9	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: Benthic Invertebrates Critical Effects Sizes: Density: ± 2 SD of baseline or reference mean Simpson's Evenness Index: ± 2 SD of baseline or reference mean Taxa Richness: ± 2 SD of baseline or reference mean 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 ± two standard deviations (SDs) of the comparable reference area mean using an equal α and β of 0.10 (Environment Canada 2012) 8." Some examples where ecologically meaningful differences were identified in the benthic invertebrate data are as follows: • North Branch (CLT1-US)	QIA requests the proponent to 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 decisionmaking.	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. 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' 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. Baffinland already compares data to definitive objectives, 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

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		• Upper Main Stem (CLT1-L2) • Camp Lake • SDLT1 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.		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. Where professional judgement is applied in relation to TARPs, Baffinland will include supporting rationale. BIMC to further provide a clearer linkage of how exceedances of objective TARP thresholds will result in management actions of project effects pathways.
17	CREMP#10	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." 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?	What statistical analysis or criteria were used to assess the data for outliers?	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. 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.
18	CREMP#11	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)." After reviewing Figure 4.8. it appears that the text (underlined) above is incorrect and that summer concentrations are significantly higher than the winter.	Please correct the text in the report to accurately reflect the seasonal differences in chlorophyll-a concentrations at DL0-2. Does this have any implications for the evaluation of effects?	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 lower than concentrations in summer (Figure 4.8; Appendix Tables E.6 and E.12)." 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 Sheardown Lake SE and no exceedances of the AEMP Benchmark for chlorophyll-a that would trigger further investigations under the response framework.

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		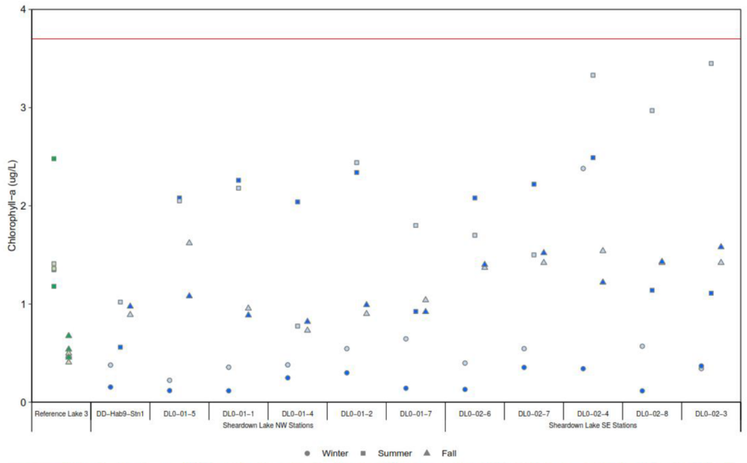 Figure 4.8: **Chlorophyll−a Concentrations at Sheardown Lake NW (DL0−1) and Sheardown Lake SE (DL0−2) Phytoplankton Monitoring Stations, Mary River Project CREMP, 2023**		
19	CREMP#12	The report states, "Factors unrelated to effluent exposure are likely to have contributed to significantly smaller size (i.e., length and weight) of arctic charr 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 charr 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 charr at the Mary River in 2023." 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.	What factors may have contributed to the significantly smaller size of Arctic Charr in the Mary River effluent-exposed areas compared to the reference area?	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. 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. 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. 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 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.

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				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.
20	CREMP#13	Within the CREMP discussing effects determination the Proponent states, "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." 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 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.	The QIA requests the Proponent update the effects determination of the CREMP to remove the requirement to have parameter concentrations to be consistently elevated at mine-exposed areas and to complete seasonal trend analysis.	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: "*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*." 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. Please note that Baffinland is working to complete seasonal trend analyses (where sample sizes are appropriate) as per the request of QIA and will provide it as part of QIA commitment 31 from the Water Licence Public hearing.
21	CREMP#14	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: Total copper concentrations in CLT1 north branch where the proponent states, "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)." Total and dissolved iron concentrations in CLT1 Upper main stem where the proponent states, "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	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.	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). 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

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		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)." 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 concentrations met the low-level threshold of the AEMP TARP in 2023. Therefore, trend analysis should be completed in 2024 using 2023 data.		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. Baffinland commits a development of a one-time memorandum including temporal and seasonal analyses for aquatic monitoring information as part of Water Licence hearing commitment 31.
22	CREMP#15	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. With regards to total aluminum concentrations at the CLT1 upper main stem the proponent states, "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 stream and to concentrations at the upper main stem during 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)." 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 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	QIA requests the proponent follow up with the appropriate AEMP TARP actions when the objective thresholds have been met.	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. With regards to the example provided by the intervener, 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. 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. 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 mine-related effect can thus be substantiated and,

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		action(s) from the AEMP Action Toolkit if trend analysis suggests continued increase; develop high risk response threshold as part of annual reporting. 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.		if confirmed, acted upon in an appropriate fashion. 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
23	CREMP#16	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, "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 <0.001)." 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.	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.	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. 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 also included comparison to available Water Quality Guidelines for the protection of aquatic life. 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.

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24	CREMP#17	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." 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 2014. They also indicated that last method change occurred in 2009 for digestion (Gayle Braun, Senior Project Manager, Environmental, ALS, May 7, 2024).	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.	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: 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. 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. 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 the mine-exposed lakes over the baseline period (i.e., 1.3 mg/kg in which only 44% of data were above laboratory MDL). 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. 5. Since 2015, mean concentrations of boron in sediment have not changed substantially at each of the mine-exposed lakes, nor the reference lake. 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. 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

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				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.
25	CREMP#18	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 proponent's 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 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 elevate conductivity should be discussed.	QIA requests the proponent: 1. Compare conductivity values with background values, 2. Conduct temporal trend analysis for all sites that have elevated specific conductivity values compared to their associated reference site and baseline values, and 3. Discuss potential sources (e.g. dust suppressants) of the elevated specific conductivity values.	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. Also, please note that Baffinland has consistently conducted spatial analysis of specific conductance between mine-exposed and reference areas since the 2015 CREMP. 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 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.
26	CREMP#19	With regards to turbidity and copper concentrations in water sampled at Sheardown Lake Tributary 1 the proponent states, "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)." 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.	QIA requests the proponent: 1. Provide data to back up the hypothesis presented, and 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.	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), "*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.*" 2. While copper concentrations at SDLT1 were above the AEMP benchmark in summer

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		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.		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 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 mineralogy of the bedrock/overburden in the SDLT1 catchment. 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.
27	CREMP#20	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)." 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	QIA requests the proponent complete the tasks associated with the high-level risks for total cadmium in Sheardown Lake Tributary 1.	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). 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 future CREMP monitoring will be used to monitor water quality of SDLT1 and as a basis for informing the potential need for further investigations.*".

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		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 implement most appropriate action(s) from the AEMP Action Level Toolkit."		Note that no metal sensitive taxa changes to phytoplankton or benthic invertebrate communities were indicated at SDLT1, indicating that despite elevation in cadmium above the AEMP benchmark, no biological effects were associated with the elevated concentrations.
28	CREMP#21	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: • 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." 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.	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.	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: 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. 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. 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. 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. 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.

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29	CREMP#22	"...elevation in metal concentrations in sediment in 2023 relative to reference conditions were observed at Sheardown Lake Tributaries SDLT1 and SDLT9 and were likely related to sediment characteristics (i.e., particle size and TOC content) but overall, the source of elevated sediment metal concentrations is unclear." (App. E.9.1 CREMP, Exec. Summ. p. v (9 of 307)). In response, Minnow Environmental Inc. has recommended "a temporal examination of available sediment iron concentration data" to determine whether iron concentrations in sediment of SDLT1 have changed since 2017, when initial stream sediment sampling began. Do these waterbodies offer sites with sediment traps that could be core-sampled to extend the temporal records of sediment quality?	QIA recommends Baffinland assess whether these waterbodies offer sites with sediment traps that could be core-sampled to extend the temporal records of sediment quality.	Sediment sampling stations at SDLT1 and SDLT9 are located in highly erosional stream environments with very limited sediment accumulation. In this case, sediment is defined as silt and clay particles of <63 µm as per the Wentworth particle size scale. Larger material (i.e., sand, gravel, etc.) is more geochemically inert and generally not a meaningful route of exposure to organisms. During routine CREMP sampling events occurring every three years, sediment sampling is focused on locations containing the finest grain sizes available and samples are collected with a spoon as composites of a variable number of spoonful's as needed to provide the minimum sample volume required by the laboratory for total organic carbon and total metals analyses. As noted in the 2023 CREMP report (Section 4.1.2, page 119), "Although the availability of sediments at the stream sampling stations prohibits the collection of sufficient sample amounts for quantitative particle size analysis, qualitative evaluation of the sediments collected in 2023 confirms previous observations that fine sediments in these erosional environments are very rare (Minnow 2018, 2023)…". Since the initiation of stream sediment sampling as part of the CREMP in 2017, locations with sufficient fine particle sediment accumulation for sampling with a spoon have been challenging to find, and no locations that would allow for core sampling have been present. Core sampling to extend temporal records of sediment quality is difficult to technically perform and will provide data that is not relevant due to the erosional sediment zone.
30	CREMP#23	RE: Sheardown Lake Northwest: "In 2024, an analysis of total compared to dissolved aqueous concentrations of molybdenum, and uranium will be completed to investigate biological availability and further determine potential for effects on aquatic biota. Potential sources of nitrate, chloride, sulphate, and total and dissolved molybdenum and uranium will be investigated to better define potential mine-related influence on water quality of Sheardown Lake NW." (App. 9.1 (CREMP), Table 6.1, pp. 267-271 (289 to 293 of 307) Is the investigation to better define potential mine-related influence on water of Sheardown Lake NW referring to the special investigation planned for Sheardown Lake Tributary 9 (SDLT9)? Will it involve additional sampling at other locations?	QIA requests Baffinland identify where details of the planned investigation are available or provide a summary of what additional sampling and/or analyses are planned.	Based on the identification of significant increasing trends in total and dissolved molybdenum and uranium in Sheardown Lake NW in the 2023 temporal trend analyses, and the resulting determination of a mine-related influence, further response was recommended under the AEMP Management Response Framework. This response included analysis of total compared to dissolved aqueous concentrations of molybdenum and uranium to investigate biological availability and further determine potential for effects on aquatic biota. Exploratory analyses were conducted by creating scatterplots of total compared to dissolved concentrations measured since the baseline period (starting in 2006) to identify any temporal or seasonal changes in the relative concentrations of the two fractions that may suggest greater bioavailability or increased risk of potential effects to biota. The results are presented in the 2024 CREMP.
31	CREMP#24	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 it was possible to access 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	QIA recommends that Baffinland increase the timing flexibility of its field sampling programs for Arctic char in the project and reference lakes and Tote Road streams.	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. 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

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		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).		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 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 char 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 completed on August 15th. The earlier initiation of the program supported 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 in 2024 resulted in all sampling being completed prior to freeze up. 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. 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. 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

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				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, sampling continued at each area until the target number of fish were collected, regardless of electrofishing duration. 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.
32	CREMP#25	Minnow Environmental Ltd. has made numerous recommendations in response to their CREMP monitoring data from the Mary River Mine area, which are summarized in Appendix E.9.1 (Table 6.1, p. 267-271; PDF p. 289 to 293 of 307) and the Executive Summary and discussed throughout the document. Key recommendations and QIA responses are provided below. Camp Lake, Sheardown Lake, Mary Lake: QIA continues to support recommendations to harmonize the lake sediment quality and benthic invertebrate monitoring stations in the project lakes, provided there is a 3-year overlap in sampling at both new and old stations to facilitate comparisons of past and future data. The purpose of this recommendation is to improve the ability of the CREMP to evaluate mine metal concentrations in sediment and benthic invertebrate responses. Any relocation of sampling sites requires revision of the AEMP, intervenor review, and NWB approval. Harmonization of the Reference Lake 3 sites should also be considered. Camp Lake Tributary 1 (Mainstem), and Sheardown Lake tributaries 1 and 12: QIA supports the recommendations to conduct temporal trend analyses to evaluate changes in the aqueous	QIA recommends Baffinland assess whether there are sites in Camp Lake Tributary 1 (North Branch), Sheardown Lake tributaries 1 and 9, and Sheardown Lake (Northwest and Southeast) with sediment traps that could be core-sampled to extend the temporal records of sediment quality.	There are no locations in Camp Lake Tributary 1 or Sheardown Lake Tributaries 1 and 9 that are appropriate for core sampling. For additional information related to extending the temporal sediment record in stream environments by core sampling see Intervener Comment no. CREMP#22. For Sheardown Lake Northwest and Southeast, the record of sediment quality extends to the baseline period allowing for comparisons between baseline and mine-operations periods and evaluation of temporal trends over the period from 2005 to present. Therefore, additional investigation of sampling methods to extend the temporal record of sediment quality is not warranted to meet the objectives of the AEMP. Baffinland commits to a one-time submission of usable, sorted data and metadata for statistical analyses by July 31, 2025. The submission will include all the sediment and water quality data collected from Sheardown and Camp catchment (e.g., lake and tributary). QIA's analysis of this data will be completed at their expense. The outcomes of QIA's analysis will be

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		concentrations of sulphate (CLT1, SDLT1, SDLT12); molybdenum, sodium, and uranium ((SLDT1, SLDT12); aluminum, nitrate, chloride, lithium, magnesium, manganese, potassium, and strontium (SLDT1) in these waterbodies and assess mine-related influence. Sheardown Lake Tributary 9: QIA supports the recommendation to conduct a special investigation in 2024 that includes implementation of an expanded spatial water quality sampling program to identify the source(s) of ammonia, nitrate, and TKN to SDLT9 (CREMP, s.2.1, Fig. 2.1, p. 6 (PDF p. 28 of 307). Camp Lake Tributary 1 (North Branch), Sheardown Lake tributaries 1 and 9, and Sheardown Lake (Northwest and Southeast): QIA supports the recommendations to conduct temporal trend analyses to evaluate changes (i.e., since 2017) in the sediment quality and metals of these waterbodies and assess mine-related influence. Given the temporal limitations of these sampling records, options for extending these temporal sediment records farther back in time should be assessed. Camp Lake Tributary 1 (Main Stem): QIA supports the recommendation to continue monitoring the benthic invertebrate community at CLT1-L2 in 2024 (and future CREMP studies) for potential effects on biota and to support evaluation of elevated water quality parameters at the CLT1 upper main stem using a weight-of-evidence approach. QIA does not support changes to the AEMP sediment quality benchmarks for Sheardown Lake NW.		shared with Baffinland in draft for review and to discuss in relation to any further action to be undertaken as part of the adaptive management framework.
Water Quality (WQ)				
33	WQ#1	The 2023 Groundwater Monitoring Report summarizes the recommendations that were provided as an outcome of the 2023 monitoring program, as well as the recommendations from 2022, which were used to inform the monitoring activities in 2023. In both 2022 and 2023, it was recommended that a waste audit be conducted to document the contents of the landfill. The purpose of this waste audit is to understand the landfill leachate composition. Baffinland has not commented on the status of the recommended waste audit in the main body of the Annual Report.	QIA requests that Baffinland provide an update on the recommended waste audit that is intended to contribute to landfill leachate characterization and the groundwater monitoring program.	Baffinland completed an audit of waste segregation and waste disposal in the inert non hazardous landfill in November 2024. The results of this audit are included within the 2024 NWB QIA Annual Report for Operations. Groundwater data is continuing to be collected and monitored.
34	WQ#2	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 insitu groundwater conditions.	QIA requests that the proponent 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	Baffinland has engaged a new consultant with advanced expertise in groundwater in permafrost environments. As reviewers will see in the 2024 Annual Groundwater Monitoring Report (to be submitted as an addendum to the 2024 NIRB Annual Report for Operations), a more refined understanding of groundwater and active layer mobilization is presented. This differs significantly from traditional understanding of "groundwater monitoring" at non-permafrost latitudes. Comparative analysis of historical and 2024 groundwater data supports that the perceived or inferred data limitations from the 2023 Groundwater Monitoring Program were not material in nature, and Baffinland is presenting that data in the referenced report for 2024.

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		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 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.	Consulting (2023), regarding the future groundwater monitoring program.	Due to these new understandings, Baffinland contends that replacement of wells installed in 2023 is not required, and intends to follow the advice of our qualified groundwater consultant moving forward, based on our refined understanding of the groundwater/active layer conditions on north Baffin Island.
35	WQ#3	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. 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.	a. QIA requests that Baffinland comment on the program limitations that resulted in nonrepresentative water quality results. b. Describe how these limitations will be rectified in 2024 to allow for representative water quality monitoring. It is unclear whether action will be taken to correct the limitations that were experienced in 2023 for groundwater quality monitoring. Thus, it is unclear whether sufficient effort will be taken to produce reliable groundwater quality results in future years, which are needed to understand groundwater contamination from the landfill. c. 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	RESPONSE SUBMITTED November 15, 2024 to NWB: a. There were several limitations identified by the consultant with the 2023 groundwater monitoring program including uncertainties of the impacts to data quality from perceived installation issues, development issues and sampling issues, all which lead to a level of uncertainty within the consultant's opinion that prevented them from being able to confidently draw conclusions from the data and sample results. b. Baffinland has contracted a new consultant to reassess the groundwater monitoring program limitations, investigate the influence of installation methods, sampling methods, and other variables on data reliability, and to develop suitable sampling protocols to monitor shallow subsurface "groundwater" monitoring wells at the landfill to obtain representative water quality data. c. Baffinland is committed to ensuring all samples collected during future groundwater sampling campaigns follow Baffinland's robust Sampling Program – Quality Assurance and Quality Control Plan, to ensure data reliability. d. While Baffinland agrees there would be value in bolstering the groundwater dataset, 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.

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			event that would render the data unusable (as occurred in 2023).	
36	WQ#4	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 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.	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 during the 2024 Groundwater Monitoring Program (as was not conducted in 2023 due to concerns with the dataset).	This question seems to be regarding a licence application with the NWB and not the NWB QIA Annual Report on Operations. Nevertheless, historically across the mining industry, groundwater is not a constituent of concern in high arctic permafrost environments, and was specifically excluded from the list of Valued Ecosystem Components during the Environmental Impact Review for the Project. The Final EIS states in Volume 7, Appendix 7A: *"… "water quality" has been identified as a VEC for this EIS. The water component of "water quality" refers to surface water (rivers, streams, lakes) and groundwater; however, groundwater quality is generally not considered to be at risk in the Project area because the extensive permafrost layer acts as an impermeable barrier eliminating/limiting potential migration of contaminants into the groundwater located below."* Therefore, no groundwater data was collected prior to 2017 and does not form part of the baseline data for Baffinland. Nevertheless, Baffinland and our consultant have completed a thorough data review as part of the 2024 Groundwater Monitoring Program, which will be presented in the forthcoming Annual Groundwater Monitoring Report, which will be submitted with the 2024 NIRB Annual Report.
37	WQ#5	In the Follow up Report to September 20 and 21 Environmental Inspection, the report identifies that spill reports were received and reviewed following completion of the first annual environmental inspection report in early August 2023., Erosion was noted at eight watercourse crossings at Tote Road on September 17, 2023, due to a significant rainfall event. High sediment concentrations entered the Ravn and Mary River watersheds. The report goes on to say that remedial actions were implemented immediately, and that sampling conducted one day later showed TSS concentrations were within applicable criteria at five of the eight locations. QIA questions what the TSS concentrations were at the remaining three locations. As these were not mentioned. We assume that these were non-compliant, but no information is provided.	QIA requests that BIMC provide discussion for the remaining three locations where presumably noncompliant water quality persisted.	The incident that is being referred to has been assigned Spill #2023-343, water quality results are available in the follow up report submitted to CIRNAC, QIA and ECCC on September 13, 2023.
38	WQ#6	The LGL letter provides an overview of the Inspectors' findings and requested actions. Information such as spill type, cause, location, clean up and other information is reviewed. Distance of the spill from the waterbody is also documented. The letter recommends TSS detail be provided and notes that the reports "do not provide any indication as to how Baffinland personnel confirmed the depth and extent of contaminated materials to be removed, or state exactly where contaminated materials were placed." In addition, QIA notes that although impacted soils were excavated, and apparently no spilled material entered the water body or watercourse through surface flow, there is no indication of whether the spilled material entered the shallow ground water system.	QIA requests that documentation of results from local groundwater monitoring in the vicinity of spill locations be included in Spill Reports to identify whether waterbodies or watercourses are being impacted through this path. Further, QIA requests Baffinland provide documentation to demonstrate that any residual contamination of the groundwater regime did not enter the proximal waterbodies	If the incident is near ongoing groundwater monitoring wells then applicable monitoring will be considered. Baffinland will ensure to consider the risk and potential for groundwater impacts during all reportable spill incidents. Generally, incidents are identified, responded to, and remediated within 24-hours. This expedited time will limit the risk and potential for any groundwater impacts as a result of spills. The impacts to water and groundwater will be considered on an incident by incident basis, however it is important to understand, as defined in the Final EIS for the Project (Volume 7, Appendix 7A): *"… "water quality" has been identified as a VEC for this EIS. The water component of "water quality" refers to surface water (rivers, streams, lakes) and groundwater; however, groundwater quality is generally not considered to be at risk in the Project area because the extensive permafrost layer acts as an impermeable barrier*

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			or watercourses as part of future spill responses.	*eliminating/limiting potential migration of contaminants into the groundwater located below."*
39	WQ#7	The proponent states, "In 2022, a third party consultant reviewed the dust suppression water withdrawals to assess the effects of the daily water withdrawal exceedances on instantaneous flows of streams and lake outflows at the five (5) locations where the daily water withdrawal limits were exceeded in 2022, which included the BG50 location, using estimated mean monthly and 10-year low flows, and concluded that the exceedances in 2022 were not environmentally significant and are not expected to adversely affect stream flows, lake flows, fish, or fish habitat (Knight Piésold, 2023)." We commend Baffinland's efforts to ensure no environmental damage occurred due to exceedances of water withdrawals. To understand the methods used to make these conclusions, and the flow in the streams under low flow conditions compared to water withdrawal, a review of the memo is needed.	QIA requests that the Proponent provide the QIA with the Knight Piésold, 2023 report.	RESPONSE SUBMITTED November 15, 2024 to NWB: Baffinland provided the memo as Appendix E.16. in the 2022 NWB QIA Annual Report for Operations, submitted to the regulatory agencies on March 31, 2023. This was submitted in the November 15 submission to the NWB.
40	WQ#8	"Laboratory results received on June 21 showed total lead concentration of 0.00292mg/L, exceeding water license criteria of 0.0010mg/L. 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, additional pre-discharge sampling was conducted to ensure compliance with the full suite of relevant water license criteria." It's concerning that water quality testing is not completed prior to discharge. This procedure poses a significant risk as it allows potentially noncompliant discharges (as was this case here) to enter the receiving environment. Prioritizing timely testing and verification of water quality before discharge is crucial for environmental protection.	QIA requests the Proponent sample discharge water quality with sufficient time to allow sample shipping, analysis and result acquisition prior to discharge to prevent contaminants of concern from entering the receiving environment.	Baffinland will continue to prioritize and consider climatic variables and logistical constraints associated with our unique operation, pre-discharge samples will be prioritized for analysis and review prior to initiating discharge from all facilities. This may not always be possible however, considering the afore-mentioned factors. It is worth noting that the limit for lead at this facility is not in line with discharge criteria for other facilities at site and was identified for standardisation during the water licence hearing process.
41	WQ#9	With regards to ECCC Inspections the proponent states, "On February 7, 2024, ECCC issued a warning letter to Baffinland for a TSS exceedance at MS-08 on September 3, 2023, and for an exceedance of the monthly mean concentration for September 2023." For other inspections, an inspection report along with Baffinland's responses are provided in an Appendix of the annual report, however details regarding the TSS exceedance at MS-08 is not included in the Appendix.	QIA request the Proponent indicate where the inspection report and Baffinland's response to the ECCC inspection on the TSS exceedance at MS-08 can be found or provide more information with regards to the TSS exceedance at MS-08, such as the TSS concentration and what the warning entailed.	RESPONSE SUBMITTED November 15, 2024 to NWB: ECCC does not issue inspection reports, therefore Baffinland cannot provide the requested report. The warning letter was issued as a result of the notification of the incident that occurred on September 3, 2023.. The incident was submitted to CIRNAC, QIA and ECCC on October 27, 2023 and assigned the Spill #2023-456. The follow up report was issued to CIRNAC, QIA and ECCC on November 21, 2023. Analytical results of the sample collected at MS-08 on September 3 indicated a TSS concentration of 33.3 mg/L. 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

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				limits, indicated that results were within acceptable limits; thus, this exceedance may have been the result of a sampling error. Environmental effects are anticipated to be minimal as the discharge length of noncompliant water was very brief and the discharge occurred to ground where it flows over land for 1.9 km before entering into Mary River tributary F.
42	WQ#10	Baffinland reports that dust control involved "[t]he continued application of chemical dust suppression treatment on the Tote Road (calcium chloride and water applications), and Milne Port stockpiles." (p. 5), but no mention was found of the use of other dust suppressants such as DustBlockr® or DusTreat. The 2023 Terrestrial Environment Annual Monitoring Report also mentions the use of water and calcium chloride on roads but then notes, "DustBlockr® was applied to the entire Tote Road in the summer of 2023. Continued use of the dust suppressant, DusTreat, was applied to ore stockpiles regularly in 2023." (TEAMR-Pt-1, p. xiii). These suppressant applications are significant mitigations that affect water usage and the environment. Baffinland has determined that DustBlockr®, when applied as per the manufacturer's recommendations, is not suitable for dust reduction along the Tote Road. It also caused rapid degradation of the road's running surface relative to the application of calcium chloride solution (TEAMR-Pt-1, p. 44). Baffinland plans to continue to investigate alternative methods for suppression of Tote Road dust. A switch from using DustBlokr® to using more calcium chloride solution for dust suppression along the Tote Road is a significant change in direction for Project dust mitigation. How much calcium chloride will be applied in 2024 cf. 2023 and what are the potential effects on Tote Road streams and other freshwater receiving environments?	QIA recommends Baffinland include summaries in the Annual Report to QIA and NWB on Operations for each dust suppressant, including quantities used, water withdrawals required, where and when they are applied, their efficacy, and potential impacts (positive and negative) on freshwater receiving environments.	In 2024, 609,000 kg of calcium chloride was applied to Project roadways for dust suppression purposes. The industry standard and recommended application rate for calcium chloride is 1.69 lbs/square yard, which equates to 14,040 kg/km when applied to the Tote Road with an average width of 13 meters. Baffinland has taken an extremely conservative approach and applied calcium chloride at an average rate of approximately 1000 kg/km, or less than one tenth of the industry standard application rate. Calcium Chloride was applied according to this conservative protocol that ensures optimal amounts of the product are used 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.
43	WQ#11	In Main Report s.7.3.9, p 38 (64 of 90), referring to the freshet monitoring program, Baffinland states "The program typically starts around mid-May, when increasing snowmelt causes elevated runoff flows, and stops around the end of June, after runoff flows have receded and the majority of the snowmelt has occurred." (p. 38) On June 23, 2023, Baffinland provided a brief plan for its Pilot Project to study the effects of aquatic dustfall. QIA responded that this was too late in the season as the work should already be ongoing, and recommended Baffinland provide the project results and plans for the 2-year study that incorporated lessons-learned in December 2023 for review. At writing neither the results nor the 2024 study plan have been provided to QIA or the Marine Environmental Working Group (MEWG) for review. The lack of information that this study is intended to gather is an important gap in knowledge of environmental effects of Project-generated dustfall and sediment on Tote Road stream ecology. When will the results of the Pilot Project and plans for the 2024 field study be provided for review?	QIA requests Baffinland provide an update on its plans for the 2024 aquatic dustfall study of the Tote Road streams.	RESPONSE SUBMITTED November 15, 2024 to NWB, below is an updated response: As per request from 2022 NIRB annual report QIA requested that Baffinland sample representative road dust and nearby stream sediment upstream and downstream to assess the potential risk to fish in Tote Road streams from metals and chemicals released by rubber particulates worn from the tires of vehicles travelling the Tote Road. 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. The sediment monitoring program trial continued in early-mid 2024, using a similar approach to last year, and included two (2) sediment trap deployment periods: a post freshet/open-water season period, and an overwintering/freshet period. Minor modifications to the trap height occurred between the two (2) periods to ensure collection of accurate data and/or to eliminate non-target bedload material from entering the deployed traps. Spring sediment trap analysis was not conducted as the original methodology did not account for large bedload

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				movements causing the material collected within the traps to accumulate non target material. Sediment traps for the 2024 early summer-late fall collection period were deployed and most were retrieved, however some of the traps were lost during the significant rainfall event on September 20-21 and could not be recovered or re-deployed. The 2024 late fall retrieval samples were not submitted for analysis as the retrieved traps downstream of CV-099 did not contain representative contents and the upstream samples were not recovered both due to the 1-1000yr rain event. Although traps were deployed in late 2024 for the overwintering period, analysis of the methodology employed and results received from this trial to date by our third party consultant has concluded: *"Based on the sampling results from the 2024 open-water (fall sample) period, it seems like implementing a sediment trap-type of program for the Tote Road streams may not be a feasible option."*
44	WQ#12	In 2022, twenty-six (26) parameters in the field and travel water chemistry blanks had values greater than their respective parameter lower detection limit (LDL), but all were within five (5) times the value of their respective LDLs (BIM 2022 AMR, s.7.8, p. 48). In response to QIA 2022 AMR comment WQ14, Baffinland stated that it "will continue to review its QA/QC program to ensure it is effective and work with its laboratory to improve all aspects of the analytical procedures, including ensuring high quality reagents." (BIM 2023 AMR, App. E.12, Table E.12.1, p. 15). This strategy was not successful as these quality control issues continued and increased. In 2023, forty-six (46) water quality parameters in the field and travel blanks had values greater than their respective LDLs, and twelve (12) of these were over five (5) times greater than their respective LDL (BIM 2023 AMR., s.7.8, p. 47-48). These elevated values were again attributed to the quality of the distilled water and/or laboratory error. Baffinland plans to test the distilled water used in these blanks in 2024. If distilled water quality is not the problem, how does Baffinland plan to reduce laboratory error in 2024?	QIA recommends Baffinland ensure that good quality distilled water is used in its travel and field blanks, and that proper field and laboratory protocols are followed to prevent further quality control and assurance issues.	In July 2024, Baffinland environmental staff created field blanks and trip blanks using our Water Sampling standard operating procedures. The blanks were then shipped to ALS Waterloo for analysis. The aim of the test was to audit our in-house DI water and our water sampling procedures. Results of the tests confirmed that the in-house DI water that was used to create blanks was not contaminated and the machine was not faulty. There were some instances of where the results for dissolved and total organic carbon (DOC/TOC) and some metals were over the detection limit. As a result of this investigation, it was determined the root causes of the hits above detection in blanks are equipment, workspace, and/or sampler influenced, i.e. introduced at the time of creating the blanks or during field sampling. Baffinland has increased training and awareness sessions for anyone creating field and travel blanks and taking water samplings in the field, especially QAQC sampling protocols. A more rigorous cleaning procedure was also implemented.
45	WQ#13	The bi-annual geotechnical inspection reports identified several maintenance items that BAffinland indicated would be actioned (see items below). In many cases, it is unclear what components of the recommended maintenance are complete or will be completed. Per Part D of the project water licence (condition 19), BAffinland is required to submit the geotechnical inspection of earthworks with a covering letter that outlines an implementation plan to respond to the Engineer's recommendations. Details regarding the implementation plan are insufficient to understand whether Baffinland is completing the necessary work to resolve maintenance items. Items identified as needing maintenance, include:	QIA requests that Baffinland provide an implementation plan for completion of all Geotechnical Inspection recommendations yet to be deemed complete. The implementation plan should include anticipated actions and a schedule for completion.	A geotechnical inspection was completed in 2024 and all recommendations and maintenance activities have been reviewed by Baffinland. High risk and priority items will be addressed as per the response document.

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		Diversion Berm at the KM-106 Ore Storage Area (MS-07) Surface Water Management Pond Adjacent to the KM106 ROM Facility; W3/W14 ditch; Surface Water Drainage Ditch, P-SWD-3; Mary River Landfarm (Solid Waste Disposal Area and Two Landfarm Cells) and, Milne Port WWTP Effluent Discharge. Many items relate to recommendations from QIA's inspections which indicate QIA may have more awareness on the concerns and possible actions Baffinland intends to complete. Of note are concerns where Baffinland indicates they will follow guidance from their Engineer of Record (EOR) to accommodate recommendations from the geotechnical inspection – this does not provide certainty of what and if and/or when recommendations will be completed. The status of several maintenance items is unknown as sufficient information to understand whether maintenance items will be addressed or corrected by Baffinland is not provided. It is unknown whether Baffinland intends to complete maintenance items that are needed to prevent potential adverse impacts to the environment.		
46	WQ#14	In addition to comment 2 of Table 2 of this review, a specific concern is related to the MS-11 – Surface Water Management Pond and Dam at KM105 which had concerns and recommendations identified in both geotechnical inspection reports. Baffinland's responses have indicated that they will address the issues following the EOR's advice but have provided little detail regarding what that advice is and what action items have resulted from said advice.	QIA requests that Baffinland provide detailed actions and next steps as advised by Baffinland's EOR for the 2023 geotechnical inspection recommendations regarding the MS-11 – Surface Water Management Pond and Dam at KM105. Specifically: 1. How is topography of the south embankment being monitored and what would trigger corrective actions, and what would those corrective actions be? 2. How will Baffinland address the anchor trench cracks as per the Engineer of Record's advice?	1. The topography of the south embankment is being monitored year over year since construction by Baffinland's contracted Geotechnical Engineer. Details of this stability analysis are presented in the 2024 Geotechnical Report, on Page 18, Section 2.3. Advice on remedial measures for cosmetic reasons only are provided in the report, and detailed in 2, below. 2. The Geotechnical Engineer has provided the following recommendation to address the primarily cosmetic concern with the anchor trench cracks: *"It is likely that the rehabilitation of the slope will include the placement of sand cover and riprap in the upper (displaced) part of the cover layers, and the reconstruction of the safety berm at its original location adjacent to the anchor trench. It is also likely that placement of additional riprap along the toe of the south slope will be necessary (like a wide and heavy toe-berm) to provide additional support at the toe to prevent similar sliding of the cover layers in the future. The problem appears to be concentrated to the zone above the liner and the main body of the embankment beneath the liner appears to be stable."*
Waste Rock Management Plan (WRMP)				
47	WRMP#1	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	QIA requests that the proponent describe how shallow groundwater may interact with	Seasonal active layer thawing is encountered from 1.5 – 3 m of depth across the site, and is underlain by continuous permafrost to a depth of approximately 600-700 meters.

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		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)?	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.	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 (i.e. ditching and collection ponds).
48	WRMP#2	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 "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" (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. 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 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.	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.	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. 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. IFC designs for the next WRF expansion are planned to be completed and issued to regulators in alignment with construction timelines. The remaining capacity of the existing WRF footprint is 26 Mt as of this submittal.
49	WRMP#3	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.	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. 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.

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				Earlier in 2024, three new (additional) thermistor strings were installed in the WRF and a fourth thermistor string was installed to replace a previously "down" Thermistor string.
50	WRMP#4	The WRMP states that "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.", and, "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" (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 "the existence of possible localized internal heat could generate temporary changes in waste rock temperature patterns" (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 to be conducted to ensure this does not happen again in the future.	Previous 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. Earlier in 2024, three new (additional) thermistor strings were installed in the WRF and a fourth thermistor string was installed to replace a previously "down" Thermistor string. New thermistor strings will continue to be installed as the WRF expands. 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.
51	WRMP#5	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: • Misclassification of Non-AG, 0.5%: Assume that 0.5% of all Non-AG material is misclassified and provides mass loading as if it were PAG material. • Misclassification of Non-AG, 5.0%: Assume that 5.0 % of all Non-AG material is misclassified and provides mass loading as if it were PAG material. • Conservative Loading: 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 <4.5 and elevated metal loadings relative to median concentrations. 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.	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	As described in the PH1 WRMP, the uncertainty when using < 0.2 wt. % S and paste pH > 6 as an analogue for NPR of > 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.
52	WRMP#6	Baffinland's response to Table 1 Comment 6 states that a sample was taken from suspected seepage from the WRF and was determined not to be acutely toxic. Baffinland's response goes on to say that the seepage water observed during the audit is suspected to be ground water. No confirmation / evidence is provided to support the assertion.	QIA requests confirmation that the seepage is groundwater and if it is not, then identification of its origin. This could be accomplished through water chemistry comparison with a shallow groundwater site from an unimpacted area.	Water encountered at the toe of the WRF during the time of the referenced QIA Audit was consistent with surface runoff , active layer mobilization, or seasonal permafrost melting, as identified by Field Temperature, Colour, and Specific Conductivity field parameters. Additionally, dye tracer testing does not appear to indicate seepage or loss of containment from the WRF or pond themselves at the pond water elevations during the field visit. Further field investigations and sampling are planned for 2025.
53	WRMP#7	Water Balance Objectives for the Baffinland Water Balance model are stated as simulation of the following:	QIA requests Baffinland provide documentation to demonstrate that all	1. The WRF pond is drawn down prior to the winter period to prepare for the following freshet. Water is continually monitored, and is treated by the WRF water

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		1. The current and future water accumulation in the WRF Pond and water transfers 2. Climate/hydrologic variability to understand the risks to current and planned water management strategies at the WRF Pond 3. Potential site water quantity overflow to the receiving environment (if applicable) 4. Input to the WRF water quality model And yet, not all of these objectives are discussed in the report as follows: For objective 1, flows are discussed but not accumulation. For 2, variability is incorporated but risks are not stated. For 3, is site water quantity overflow the to receiving environment applicable? This should be stated.	objectives have been completed and ensure future iterations of the water balance continue to address all stated objectives.	treatment plant (WTP) if required to ensure the pond is maintained at a suitable freeboard, and that water quality discharge criteria. 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. 3. All modelling scenarios were successfully managed by the site infrastructure, however operational challenges contributed to an overflow event in 2024.
54	WRMP#8	The conclusions in the report state that "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." 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?	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.	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.
55	WRMP#9	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.	QIA requests that protocol or rationale be provided for determination of each of the performance indicators for low, medium and high-risk status.	Due to the unique characteristics of each activity, site, risks and objectives, guidelines exist for the determination of TARP thresholds based off of derived AEMP benchmarks. Thresholds were developed for each particular activity and objective based on Baffinland's understanding, in consultation with external expert advice, 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.
Environmental Effects Monitoring (EEM)				
56	EEM#1	The proponent stated the methods followed for effluent sublethal toxicity for the EEM study, "From 2015 to 2019, Baffinland conducted sublethal toxicity testing on the MS-08 effluent at the frequency stipulated under the metal mining effluent regulations/metal and diamond mining effluent regulations (MMER/MDMER) to meet	QIA requests the proponent add an additional (more representative toxicity tests subject) to their sublethal toxicity testing to ensure results obtained are applicable to	Baffinland has met EEM effluent monitoring obligations under the MDMER through assessment of the relative sensitivity of all 4 freshwater sub lethal toxicity tests prescribed under the MDMER (Fathead Minnow [fish], Ceriodaphnia dubia [invertebrate], Lemna minor [aquatic plant], Pseudokirchneriella subcapitata [algae]). After three years of sub lethal testing

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		EEM effluent monitoring obligations. Following the promulgation of the MDMER on June 1st, 2018, mines that had been conducting effluent sublethal toxicity sampling over the previous three years were required to conduct effluent sublethal toxicity sampling each calendar quarter using only the species that had produced the lowest geometric mean 25% inhibition concentration (IC25) over those previous three years (Government of Canada 2023). Based on this analysis, since 2020, effluent sublethal toxicity testing has been conducted using only duckweed (Lemna minor) as this species had been shown to be most sensitive based on previous testing." The proponent reported sublethal toxic effects to L. minor, ""Because the concentrations of effluent estimated in the effluent-exposed area of Mary River Tributary-F was greater than the minimum effluent effect concentration for L. minor (i.e., 5.13%), toxicity to representative macrophytes within the MS-08 receiving environment was possible on a periodic basis. No aquatic plants were observed at effluent-exposed and reference areas of both Mary River Tributary-F and Mary River during the current or past EEM field studies (Appendix B). Given the lack of aquatic plants at the biological study areas, the sensitivity of L. minor and potential for sublethal effects from MS-08 effluent exposure in the receiving environment is not representative of risks to the aquatic organisms that are present (i.e., benthic invertebrates and fish) at the Mary River Project site." While the proponent is following the direction of the Government of Canada, the sublethal toxicity tests being carried out by the proponent are not applicable to the area under investigation. To appropriately determine the potential toxic effects of effluent on Mary River Tributary-F a species more representative of the aquatic assemblage of Mary River should be used for toxicity testing in addition to L. minor.	the aquatic assemblage of Mary River Tributary F.	for all 4 organisms (i.e., 2017 to 2019), the most sensitive species was identified as Lemna minor and sub lethal toxicity testing of this species has been completed at an increased frequency (quarterly) as stipulated under the MDMER and agreed to by ECCC. Further, Baffinland monitors other organisms (i.e., benthic invertebrates and fish) in situ as part of the EEM biological studies. Therefore, as prescribed under the MDMER, Baffinland will continue monitoring of benthic invertebrates, fish and sub lethal and acute toxicity as per MDMER frequencies and requirements.
57	EEM#2	In 2023 the Third Environmental Effects Monitoring (EEM) program planned to study effects on the receiving environment of discharging treated surface water effluent from the mine pit at MS-11 into Sheardown Lake Tributary (SDLT1), and from the waste rock stockpile at MS-08 into Mary River Tributary-F (App. E.9.4 (EEM,) s.2.1, p. 5 (21 of 177). However, effluent was not discharged from MS-11 from mid-July 2022 through 2023, due to seepage from the KM105 dam structure. Instead, the EEM focused on studying the effects of effluent discharge from the stockpile surface water management pond at MS-08. Because the EEM study has a 3-year sampling interval this creates a 6-year gap in EEM sampling at MS-11 which has been identified as the final discharge point (FDP) with "potentially the most adverse environmental impact on the environment" (p. 95 of 177). "Temporal trend analyses found a significant increasing trend in total cadmium at both SDLT1 [Sheardown Lake Tributary 1] sampling stations over the years of mine operation (2015 to 2023; Appendix Table H.2), as well as a significant increasing trend in dissolved cadmium at the downstream station (D1-00) since the baseline period (Appendix Table H.1)." (App.9.1 (CREMP), s.4.1.1.2, p. 118 (140 of 307)).	QIA requests Baffinland clarify how it plans to address the need for an EEM biological study at MS-11 to avoid a 6-year gap in the data collection.	The requirement for an EEM biological study at a particular FDP is approved by ECCC through their review of the EEM Study Design for the EEM Phase of interest. Although the Mary River Mine Third EEM Study Design originally proposed a biological study at MS-11, operational conditions at the mine changed such that no effluent was discharged from MS-11 from mid-July 2022 through 2023 due to seepage from the km 105 dam. This operational change resulted in a change to the proposed biological study to focus on evaluating potential effects of the MS-08 FDP which was agreed upon by ECCC. Therefore, there has been no regulatory need for an EEM biological study at MS-11 that would indicate a 6-year gap in data collection at this location. Although there has been no regulatory requirement for an EEM biological study at MS-11, Baffinland's commitments under the AEMP require routine sampling as part of the CREMP to monitor for mine-related effects. One of the monitoring locations under the CREMP is at Sheardown Lake Tributary 1 (SDLT1) which is the immediate receiving environment for MS-11 effluent (when discharged). As part of the CREMP, the following aquatic components are sampled at SDLT1:

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		These trends were related primarily to cadmium concentrations in 2022 and 2023 that were elevated over the reference and AEMP, and suggest mine influence. Work to prevent further seepage will be ongoing in 2024 (p. 119; 141 of 307).		- In situ water quality (i.e., temperature, dissolved oxygen, pH, conductance, and turbidity; one measurement in each of three seasons per year at two sampling stations); - Water chemistry (one sample in each of three seasons per year at two sampling stations); - Sediment quality (three replicate samples, once every three years at one sampling reach); - Phytoplankton abundance as concentration of chlorophyll-a (one sample in each of three seasons per year at two sampling stations); and - Benthic invertebrate community (five replicate samples per year at one sampling reach). In situ measurements of water quality parameters (i.e., temperature, dissolved oxygen, pH, conductance, and turbidity), water depth, and velocity are also collected as supporting information concurrently with benthic invertebrate sampling. Although not sampled routinely directly in SDLT1 stream habitat, juvenile arctic charr are sampled annually from the shoreline of Sheardown Lake NW, with the target sampling location directly adjacent to the inflow of SDLT1 to the lake. For this sampling, 100 juvenile arctic char are non-lethally sampled for length and weight and a subsample of ten (10) individuals are sacrificed for age determination. Given robust sampling of water, sediment, and biological components (phytoplankton, benthic invertebrates, and fish), in SDLT1 and Sheardown Lake NW, downstream of the km 105 dam, adequate data are routinely collected for the assessment of mine-related influences on aquatic biota.
58	EEM#3	Water quality samples were collected by hand from mid-column directly into labelled sample bottles pre-dosed with required chemical preservatives..." (p. 13). This description of methodology does not provide sufficient information.	QIA requests clarification as to how water is being added to the bottles in such a way as to prevent contamination and retain the correct preservative doses to maintain quality control.	Water samples are collected as per Baffinland's standard operating procedures, checklists and the environmental management system that maintains all sampling work request summaries. Mid-column water samples and samples that have pre-dosed chemical preservatives are filled directly from a sampling device or using a unpreserved clean plastic sample bottle to fill any bottles that are pre-dosed with chemical preservative.
59	EEM#4	RE: App. E.9.4 (EEM), s.4.1, p. 40 (57 of 177) "In situ water temperature was significantly lower at the effluent-exposed area than at the reference area of Mary River Tributary-F at the time of the August 2023 EEM biological field study (Figure 4.1; Appendix Tables D.1 and D.2). The incremental difference between the mean temperatures was only 0.3°C and most likely resulted from the natural influence of warming ambient air temperature between earlier sampling at the effluent-exposed area and later sampling at the reference area sampling on the sampling date." QIA agrees with the above assessment, but there also appear to be strong positive linear correlations between time of day and both dissolved oxygen saturation (%) and pH, so the significance determination for pH (App. D, Tables D.1 and D.2, p. 140-141	QIA requests Baffinland clarify how EEM studies and other monitoring programs factor such interactions into their assessments of significance to ensure they are making appropriate comparisons.	As described in the methods of the Third EEM Interpretive Report (Section 2.3.3.1; page 12), "During biological monitoring, in situ water temperature, dissolved oxygen, pH, and specific conductance (i.e., temperature standardized measurement of conductivity) were measured near the bottom of the water column at all benthic invertebrate community (benthic) stations and at each of the fish population study areas." These measures are collected and statistically compared between study areas. Results of these comparisons are considered during interpretation of the results of statistical analyses of biological endpoints for invertebrates and fish. A similar approach is undertaken during the CREMP where in situ water quality measures are collected concurrently with biological sampling. Where significant differences are identified, the magnitude of the difference and its potential effects on the biological

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		of 177) may also be artefact of sampling effluent-exposed sites earlier in the day than the reference sites. Such variations in temperature, diurnal or over days or weeks, and their effects on related parameters such as oxygen saturation and pH have the potential to both magnify and obscure differences within and among sites over time.		component of interest are considered. For example, at Mary River Tributary-F, during the Third EEM biological study, the diurnal variations in temperature, dissolved oxygen saturation, and pH over the sampling period from 11:15 to 15:33 on August 14, 2023, were 0.7°C, 2.4%, and 0.49 pH units, respectively. These do not represent differences that would be expected to affect aquatic organisms. Differences in situ water quality measurements due to time of day or trending ambient temperatures will continue to be considered as described above, in light of factors that can be controlled (e.g., depth, substrate, water velocity), those that cannot (e.g., temperature, dissolved oxygen, pH), and the factor of interest (e.g., effluent or mine-related influences).
60	EEM#5	During the 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 6.1, p. 57). 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.	QIA requests Baffinland clarify how these 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 how the reach lengths and electrofishing durations compare with those of previous EEM CPUE studies.	With regards to electrofishing effort applied to the EEM fish survey, please consider that the objective of EEM is to determine whether effluent discharge effects 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. 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, sampling continued at each area until the target number of fish were collected, regardless of electrofishing duration. 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

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				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.
Lake Sediment Monitoring (LSM)				
61	LSM#1	"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. E.9.2, s.4, p. 22) 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. 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 thickness of sediment deposited 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. E.9.2, 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.	QIA recommends Baffinland take a precautionary approach to sediment deposition, given that the sediment thresholds for Arctic char have not been validated, and undertake studies to validate sediment thresholds for Arctic char egg survival prior to the planned production increase.	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. 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 throughout the Project as part of adaptive management.
Fish and Fish Habitat (FFH)				
62	FFH#1	Planning to address fish passage issues has been a long, drawn out process, with fish passage remediation to some culverts outstanding since at least 2021 (QIA 2022 AMR comment FH#2, p. 39ff) In spring 2023, Baffinland conducted electrofishing assessments of fish habitat use upstream and downstream of 44 fish bearing Tote Road crossings (BIM 2023 NIRB AMR, s.3.3, p. 7; 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 had managed to pass through more crossings to access important summering habitat upstream. In 2021, for example, spring electrofishing was only conducted at 28	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 culverts. QIA recommends Baffinland: a) consider adjusting the timing of its Tote Road surveys based on environmental variables to improve their interannual comparability,	Response submitted to NWB November 15, 2024: a) Historical experience gained from conducting fish surveys along the Tote Road has necessitated monitoring work being conducted at different times during the open water season. Given the significant variability of environmental and climatic conditions that can be encountered from year to year, some lower order and intermittent streams may not have sufficient flow to complete surveys if conducted later in the summer or fall. Sufficient flows to facilitate monitoring are required and the annual surveys generally correspond to the period following peak flows in the streams along the Tote Road. This ensures the best chance for sufficient water to be present in all streams, both higher and lower magnitude.

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		crossings, but Arctic char were caught downstream of 26 and upstream of 16 (BIM 2021 NWB AMR, Appendix C.3, Table 4, PDF p. 38-40 of 70). 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. This raises the question of whether the 2023 survey results are comparable with previous results, or whether stream conditions must be taken into greater account when timing these surveys to ensure their results are comparable. However, culverts at numerous crossings were either perched (n=9), blocked (7), perched and blocked (2), or had a high flow rate (1) (Table 6, p. 75 -77). Some of these issues have been outstanding since at least 2020 (QIA 2022 NWB AMR comment FH#2, PDF p. 39-41 of 42). If Baffinland considers the surveys comparable it raises the question of whether the delay in remediating fish passage issues is an important factor contributing to the low numbers of fish passing upstream. "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)." (BIM 2023 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. QIA understands that "Tote Road Culvert Upgrades work under the Type 'A' Water Licence (NWB, 2015) commenced in early 2024." (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?	b) assess how the fish passage issues have affected the abundance and condition of juvenile Arctic char in the affected streams, and complete Tote Road culvert remediation prior to the 2026 freshet to ensure unobstructed fish passage by juvenile Arctic char.	The timing of the Tote Road freshet is highly variable and can start as early as the first week of June, or as late as the first week of July. b) Baffinland continues to monitor fish passage issues and takes observational monitoring of fish presence on an annual basis. This requirement of the Project ended when the Fisheries Act Authorisation on the tote road expired however Baffinland maintained the program for due diligence. Fish population precence/absence surveys also occurred on the proposed rail route during the Phase 2 approval process. Under the current monitoring program, assessing potential effects on char abundance of stream crossings is challenging due to the variability of environmental factor(e.g., water temperature, flows, precise timing of ice-off and thermal conditions in conjunction with timing of the monitoring programs). The aforementioned environmental variables make meaningful interannual comparisons challenging. A lower catch in one year could be due to something unrelated to the Tote Road including natural variability in populations. 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 updated designs and approvals from required regulatory agencies. Remaining culverts are under engineering evaluations for future construction seasons.
Terrestrial Environment (TE)				
63	TE#1	Section 3.2 of the Revegetation Survey & Preliminary Reclamation Trial 2023 Project Update details two recommendations: 1. An increase in reclamation trial sites / increase range of reclamation endpoints. 2. Progressive reclamation trials of decommissioned Project features. These recommendations are consistent with the recommendations provided in the Revegetation Survey & Preliminary Reclamation Trial 2022 Project Update. Baffinland has not provided comments or a commitment to additional trials, or findings in the report. It is unclear whether Baffinland intends to complete the recommendations provided in the Revegetation Survey & Preliminary Reclamation Trial 2023 Project Update, or to report the findings of additional trials in future reports.	QIA requests Baffinland comment and commit to implementing the recommendations listed in Section 3.2 of the Revegetation Survey & Preliminary Reclamation Trial 2023 Project Update and report on findings in future Annual Reports. QIA notes this recommendation is the same as the previous year.	The Project Interim Closure and Reclamation Plan (ICRP) was submitted on November 1 2024, including updates to the Appendix D5 Reclamation Research Plan (D5-RRP). The D5-RRP has considered all recommendations from previous trial findings, and has integrated QIA comments where applicable, and will provide an updated schedule of tasks and objectives. Research objectives are being addressed over the life of the Project. It should be recognized that implementation of additional trials requires time for scoping.

f	Intervener Cmt. No.	Intervener Comment	Intervener Recommendation/Response	Baffinland's Response
64	TE#2	Within summary and discussions related to KM58, BIMC notes that "It will be necessary to determine (to the extent possible) initial site conditions and the levels of disturbance at this location before deriving recommendations on revegetation based on these observations." (p. 36). QIA agrees with this reasoning, but is concerned that similar necessary action to determine initial site conditions (presumed to be synonymous with baseline) do not appear to be clearly stated for the other locations. QIA previously noted concern with the proximity of control sites to the Project footprint. BIMC's response that the study objectives were to document opportunistic revegetation within the immediate disturbed environment, which QIA acknowledges. QIA is concerned that there appears to be a lack of information on initial site conditions/baseline at survey locations pre-disturbance (e.g. road construction, borrow site use), and that the adjacent control may be influenced by indirect effects of road use (e.g. dust), which could influence vegetation levels and thereby influence recommendations based on revegetation observations. QIA recognizes that while the current adjacent control provides useful inferences on adjacent conditions where borrow/air strip activities did not take place, a comparison of these observational data to baseline or reference site conditions could help to maximize the utility of these data and associated recommendations.	QIA requests that before deriving recommendations on revegetation based on observations that BIMC determine initial site conditions pre-project disturbance (i.e. before the road was built) or use a similar site reference site for comparisons (i.e. beyond the project's zone of influence). QIA recommends that this comparison be done for the reclamation trial as well.	Survey near the KM58 site coincides with an abandoned airstrip associated with Project exploration activities during the 1980s. QIA reference to 'road construction' is not relevant. Documentation of pre-disturbance conditions at the airfield is not available. This site is located outside the current approved PDA. No reclamation trials (i.e., involving land disturbance outside the PDA) were implemented. Moreover, the Reclamation Pilot Study is not part of Annual Effects Monitoring for the Terrestrial Environment. The QIA reference to 'zone of influence' is not applicable in this investigative context. Control plots further from the PDA is not consistent with the study objectives.
65	TE#3	Within the follow-up monitoring for the reclamation trials section, BIMC notes that both the rough-and-loose and track-packing treatments were washed out and were no longer apparent and trial locations, meaning that the potential benefits of surface heterogeneity and microtopography had been lost. BIMC continues to note that "…these surface preparations appear to provide a short-term mitigation and reclamation strategy." (p. 47). QIA appreciates that BIMC is undertaking these reclamation trials proactively to assist in progressive reclamation activities, but is concerned that BIMC has not outlined future directions for more long-term reclamation strategies.	QIA requests that BIMC explore long-term reclamation strategies that might avoid some of the setbacks that have been identified from the current reclamation methods (e.g. washout).	The Project Interim Closure and Reclamation Plan (ICRP) was submitted on November 1 2024, including updates to the Appendix D5 Reclamation Research Plan (D5-RRP). The D5-RRP has considered and integrated QIA comments (if/where applicable) and provides an updated schedule of tasks and objectives.
66	TE#4	Within the preliminary findings and future directions section, BIMC states that "During appropriate phases of the Life-of-Mine cycle, it would be beneficial … to evaluate Project features that could be decommissioned and/or reclaimed to reduce the Project's disturbance footprint. For example, discontinued laydown areas, access roads or other features associated with the Mine Site, the Milne Port and/or Tote Road should be evaluated as candidate sites for reclamation studies." (p. 55). QIA appreciates BIMC's proactive thinking to evaluate project features that could be reclaimed, but notes that BIMC has not included project components associated with the development of the Steensby Port and southern railway. These project features could provide an ideal scenario for testing reclamation activities as pre-disturbance baseline conditions can be assessed before project activities occur and be compared to the outcomes of reclamation trials.	QIA requests that BIMC consider trialing long term reclamation measures at temporary project features associated with the construction of the southern railway and Steensby Port (e.g. laydowns, temporary camps, temporary access roads, borrow sites). Further QIA recommends that BIMC engage in proactive planning by collecting baseline conditions at the locations before disturbance occurs to help provide a more fulsome set of data to compare the outcomes of reclamation trials.	The Project Interim Closure and Reclamation Plan (ICRP) was submitted on November 1 2024, including updates to the Appendix D5 Reclamation Research Plan (D5-RRP). The D5-RRP has considered all recommendations from previous trial findings, and has integrated QIA comments where applicable, and will provide an updated schedule of tasks and objectives. This current from the operation will be applied to Steensby.

f	Intervener Cmt. No.	Intervener Comment	Intervener Recommendation/Response	Baffinland's Response
67	TE#5	Baffinland concludes its delivery letter of the 2nd Geotechnical Inspection with "Comments in Connection with the Impacts of Roads on Permafrost". Several statements are included in this section, such as: "Although some of these hazards are present along the Tote Road between Mary River and Milne Inlet Port, the actual extent of such potential problems does not reach serious level since the impact on the permafrost along the road is limited." And "the impact of road construction on the permafrost between Mary River and Milne Inlet Port was relatively low and generally occurred during construction." The 2nd Geotechnical Inspection includes a brief literature review and assessment of permafrost impacts, general maintenance that Baffinland implements to manage the road's visible deficiencies and summarizes the two main visible deficiencies currently leading to impacts to permafrost along the Tote Road. It is understood that there will be construction on the Tote Road, and therefore there may be a risk of impacting permafrost. The connection of this literature review and additional content not typically included in the geotechnical inspection is unclear. Furthermore, it raises questions on some of the statements made, how impacts have been assessed and how they are monitored and managed.	QIA requests that Baffinland: 1. Clarify what would constitute a "serious level" as detailed in section 3.4 of Baffinland's delivery letter. 2. Provide the impact assessment that was used to support conclusions of limited impact on permafrost along the road. 3. Clarify if additional monitoring will be undertaken to understand impacts to permafrost along the Tote Road, such as monitoring of the active layer using thermistors.	1. Serious level, as described in section 3.4 of Baffinland's delivery letter is based on the professional opinion and extensive relevant experience of the geotechnical engineer performing the inspections and assessments for Baffinland in 2023 and 2024. Serious level effects would take into account multiple factors and site-specific conditions that cannot be simply described, but require extensive training and experience to interpret. 2. No detailed impact assessment was completed during the geotechnical inspections, simply because no such assessment was part of the scope for the inspection. The comments were based on visual observations during traveling on the road and during the inspection of selected culverts. Currently, impacts on the permafrost are generally greatest around culvert installation locations, which is why the permafrost assessment focusses on these areas. 3. As pointed out in the geotechnical report (Appendix C.2 of the 2024 QNWB QIA Annual Report for Operations), problematic areas are limited, and the problems are remedied by adjusting drainage control and by replacing problematic culverts. Monitoring the active layer along the Tote Road is not planned beyond geotechnical evaluations that occur during culvert constructions .
68	TE#6	The 2019 Tote Road Priority Action Schedule includes 17 comments that Baffinland is actioning on the Tote Road. Four of the 17 comments remain outstanding with the remaining comments marked as complete. Baffinland has committed to submit a full implementation plan by June 15, 2024. It is unknown what actions will be included in Baffinland's implementation plan and whether these actions will sufficiently address the four remaining action items identified in the Tote Road Priority Action Schedule.	QIA requests that the implementation plan be assessed to understand any proposed changes to the Tote Road, which may require a Tote Road Amendment Notice (TRAN) and/or changes to reclamation security.	Baffinland will ensure the implementation plan for the Tote Road Priority Action Schedule (Appendix C.4 of the 2024 NWB QIA Annual Report for Operations) considers all regulatory requirements associated with the Tote Road, including the TRAN process.

Table A.2: Response to ECCC Comments on Baffinland's 2022 QIA-NWB Annual Report for Operations

Cmt. #	Reviewer's Detailed Comment	ECCC Recommendations	Reference Section	Baffinland's Response
Lead exceedances in water discharged from berms				
1	Water discharged from bermed areas at Milne Port exceeded water licence criteria for total lead on two occasions in 2023; on June 12 from the bulk fuel storage facility and on September 5 from the contaminated snow containment berm. The discussion of discharge from the bulk fuel storage facility states that discharge was initiated following compliant results for total suspended solids (TSS) and Total Oil & Grease. Following results with the exceedances, discharge initiation sampling was increased, stating, "Prior to resumption of discharge from the facility, additional pre-discharge sampling was conducted to ensure compliance with the full suite of relevant water license criteria." It is not clear if this measure will be continued in the future or if it was only temporary. The description of discharge from the contaminated snow containment berm does not mention any testing prior to discharge, though it states the water "was treated using the mobile OWTS [oily water treatment system], coupled with polishing trains of metal removal media." No possible causes for the elevated lead concentrations are discussed, nor are measures provided for preventing re-occurrence. Discharge water quality criteria, including those for lead, are to prevent impacts to soil and eventually to the aquatic environment. It is important to take adequate measures to prevent discharge of water that does not meet criteria.	• describe measures that will be taken to prevent lead exceedances in water discharged from berms; and • clarify whether pre-discharge sampling for the full suite of relevant water license criteria will continue for future discharges.	• 2023 QIA-NWB Annual Report for Operations (Baffinland; March 31, 2024) Section 7.2: Stormwater from Containment Areas	Pre-discharge samples are planned from all facilities, prior to initiating a planned discharge from the facility. However at times, due to operational, environmental and logistical factors, it is not possible to obtain pre-discharge samples prior. All effluent discharges are sampled and analysed to ensure compliance with the effluent discharge criteria outlined in the Type 'A' Water Licence 2AM-MRY1325. However it is important to note that the total lead discharge criteria assigned to these facilities is expected to be updated upon Water licence renewal as the limit was not in line with other facilities at site.
Erosion and sedimentation control measures				
2	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 & MS-C-F), and is potentially impacting sediment quality in Sheardown Lake NW. A prompt and permanent solution to managing water routed to this pond is necessary to prevent future releases. Several other 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.	ECCC recommends the Proponent take proactive measures to prevent erosion and sedimentation in areas that are expected to generate runoff with high TSS.	• 2023 QIA-NWB Annual Report for Operations (Baffinland; March 31, 2024) Section 7.3.9: Snow Stockpile Monitoring; Section 7.3.10: Freshet Monitoring; Section 7.4: Surface Water Runoff Downstream of Project Areas and Quarries • NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2023, Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.;March	Baffinland submitted a comprehensive Km 105 Pond Seepage report on January 22 2025 which discussed current mitigation plans to address seepage from the KM105 Pond. Water management within the facility footprint below and above the dam is planned 2025. The discharge location is planned to be relocated once engineering for a new FDP is complete. Water management strategies have been and will continue to be applied at other areas of potentially impacted by TSS, including check dams in the catchment adjacent to crushing facilities as well as sump development at QMR2 as per the long term water management plan to encourage settlement and retention of sediments upstream of Sheardown Lake and Camp Lake tributaries. Snow stockpiles are monitored and mitigation measures from the SWAEMP are employed at potential runoff locations.

Cmt. #	Reviewer's Detailed Comment	ECCC Recommendations	Reference Section	Baffinland's Response
	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.		2024); Section 4.4.2: Sediment Quality	
Outfall monitoring locations missing from map				
3	Most monitoring locations are identified on Figures 3 to 5, which provides helpful context. Outfall monitoring locations CLSP-OUT, CLT-OUT, LDFG-OUT, and SDLT-OUT are not included on these figures.	ECCC recommends that in future reports the Proponent include outfall monitoring locations CLSP-OUT, CLT-OUT, LDFG-OUT, and SDLT-OUT on the appropriate figure.	• 2023 QIA-NWB Annual Report for Operations (Baffinland; March 31, 2024); Section 7.3.10: Freshet Monitoring; Figures 3,4,5: Milne Port Site Layout, Northern Corridor, Mine Site Layout	Acknowledged. Baffinland will ensure an appropriate figure is included that identifies monitoring locations CLSP-OUT, CLT-OUT, LDFG-OUT, and SDLT-OUT.
Investigation on quality of distilled water				
4	Field and travel blanks for both the Surveillance Network Program surface water samples and the groundwater monitoring samples had an anomalously high number of parameters detected. The annual report states: "Quality of distilled water and/or laboratory analytical error is a likely explanation for these elevated parameter values. In 2024, Baffinland plans on testing the distilled water used to make field and travel blanks to determine if our assessments are correct." It is not clear if the results of the testing will be analysed sufficiently early in 2024 to implement any necessary corrective actions, and if the results and follow-up will be shared with reviewers. Quality Assurance and quality control are integral to water sampling as they qualify what confidence we can have in the results.	ECCC 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.	• 2023 QIA-NWB Annual Report for Operations (Baffinland; March 31, 2024); Section 7.8: Quality Assurance and Quality Control (QA/QC) • NWB Appendix E.11.1/NIRB Appendix G.3.1 - 2023 Annual Groundwater Monitoring Program (Knight Piésold Consulting; March 28, 2024); Section 4.1: QA/QC and Laboratory Issues	The suggested assessment has been initiated and a complete discussion is included in section 7.8 of the 2024 NWB QIA Annual Report for Operations.
Mitigation measures for mine related influences identified in Core Receiving Environment Monitoring Program				
5	For three monitoring locations concentrations of certain water quality parameters in exceedance of Aquatic Effects Monitoring Plan benchmarks, are elevated relative to reference and baseline conditions, and show increasing trends. For these locations, recommendations include an investigation of potential sources. The parameters of interest are: Sheardown Lake Tributary 9: ammonia, nitrate and total Kjeldahl nitrogen (TKN) Sheardown Lake NW: nitrate, chloride, sulphate, total and dissolved molybdenum and uranium Sheardown Lake SE: nitrate, sulphate, and total and dissolved molybdenum and uranium	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.	• NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2023, Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2024); Table 6.1: Summary of AEMP Benchmark Exceedances and Effects Determination for the Mary River Project 2023 CREMP and Monitoring	A full review of this information is presented in Table 6.1 Summary of AEMP Benchmark Exceedances, Effects Determinations, and Management Response Framework Recommendations, of the 2024 CREMP report and includes descriptions of the additional analysis and proposed actions following investigations.

Cmt. #	Reviewer's Detailed Comment	ECCC Recommendations	Reference Section	Baffinland's Response
	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.		Recommendations Based on the Results	
Suitability of wells installed in 2023 for groundwater monitoring				
6	Several issues with the groundwater monitoring well installation are identified. These issues include factors that can affect representativity of groundwater level measurements (such as the perforated casings) and groundwater quality (such as the lack of a bentonite seal). Results from the 2023 monitoring program were not discussed as "a result of the limitations that occurred during the 2023 monitoring program". Though there were also issues with Quality Assurance/Quality Control, sampling and well development, it is not clear if the wells installed in 2023 will be suitable for groundwater monitoring in the future. Groundwater monitoring at the landfill is necessary to identify if contaminants are migrating towards Sheardown Lake so that mitigation measures can be taken as appropriate to protect the aquatic environment.	ECCC 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.	• NWB Appendix E.11.1/NIRB Appendix G.3.1 - 2023 Annual Groundwater Monitoring Program (Knight Piésold Consulting; March 28, 2024); Section 4.2: Well Installation Issues; Section 5.0: Conclusion and Recommendations	There were several limitations identified by the consultant with the 2023 groundwater monitoring program including uncertainties of the impacts to data quality from perceived installation issues, development issues and sampling issues, all which lead to a level of uncertainty within the consultant's opinion that prevented them from being able to confidently draw conclusions from the data and sample results. In 2024, Baffinland contracted a consultant to reassess the groundwater monitoring program limitations, investigate the influence of installation methods, sampling methods, and other variables on data reliability, and to develop suitable sampling protocols to monitor all groundwater monitoring wells at the landfill and near the HWBs to obtain the best and most representative water quality data possible. Preliminary results of this assessment are favourable for the inclusion of 2023 results in the forthcoming 2024 Groundwater Monitoring Report, planned to be submitted with the 2024 NIRB Annual Report.
Migration of contaminants in groundwater next to landfill				
7	Potential migration of contaminants through groundwater from the landfill to Sheardown Lake was identified as a pathway in the 2022 the Core Receiving Environment Monitoring Program Report and a conceptual contaminant transport model was outlined in a memorandum; however, there was insufficient data to populate the model. This issue from 2022 is not presented in the 2023 annual report. The 2023 Core Receiving Environment Monitoring Program Report no longer mentions the landfill as a potential source of contaminants, above 2023 groundwater monitoring results were not interpreted, and no reference to the contaminant transport model was found. The Proponent's response on ECCC's 2022 comment on this topic states they "will continue to collect sufficient additional groundwater data to complete the contaminant transport model." The response also proposed three potential mitigation measures "In the absence of the results of the contaminant transport model". It is not clear if any of these potential mitigation measures will be implemented and if so, on what timeline.	ECCC recommends the Proponent: a) 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; b) specify a timeline for completion of the contaminant transport model; and c) clarify if any of the proposed potential mitigation measures for preventing contaminant migration through groundwater from	• NWB Appendix E.11.1/NIRB Appendix G.3.1 - 2023 Annual Groundwater Monitoring Program (Knight Piésold Consulting; March 28, 2024); Section 5.0: Conclusion and Recommendations • NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2023, Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2024) • NWB Appendix E.12 - Response to 2022 Annual Report Comments (Baffinland; March	a) Additional data has been collected in 2024 to inform potential source pathways into Sheardown Lake. It could not be conclusively be stated from 2023 data that groundwater contaminants are entering Sheardown Lake, however continued sampling efforts and analysis are strengthening the database. b) Baffinland has hired a new groundwater consultant with significant experience with groundwater in permafrost environments, and is reviewing the development of a conceptual groundwater model to ensure a common understanding of site conditions. Development of this conceptual model is critical as a first step to ensure the correct inputs and assumptions are included in any contaminant transport model that is later developed. Continued research is required with ongoing monitoring and investigations to determine if a contaminant transport model can be developed. Baffinland is also working to determine if the water being evaluated is surface water that resides above the active layer. c) 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

Cmt. #	Reviewer's Detailed Comment	ECCC Recommendations	Reference Section	Baffinland's Response
		the landfill to Sheardown Lake will be implemented, and if so, provide a timeline.	2024); Table E.12.2: Response to ECCC Comments on Baffinland's 2022 QIA-NWB Annual Report for Operations • NWB Appendix E.9.1/NIRB Appendix G.4.1 - Mary River Project 2022 Core Receiving Environment Monitoring Program Report (Minnow Environmental Inc.; March 2023) • NWB Appendix E.12.3/NIRB Appendix G.3.3 - Development of a Conceptual Contaminant Transport Model for the Landfill at the Mary River Mine Site (Knight Piésold Consulting; March 28, 2023)	implementation of suitable mitigation measure(s). It is important to note that unlike traditional groundwater well installations in the south, where it is important to protect confined drinking water supply and continual recharge to lake bottoms from year-round active aquifers, the active layer shallow groundwater being monitored at the Project is only flowing for a short period of time (July to October). It is also important to note that the sub permafrost "true" groundwater that is always thawed and flowing regionally is confined beneath the permafrost layer which is typically greater than 600 meters thick in this area of Baffin Island. The groundwater wells installed across the site are approximately 3 meters in depth, so the confined groundwater is completely isolated from the lower aquifer.

Table A.3: Response to DFO Comments on Baffinland's 2023 QIA-NWB Annual Report for Operations

Cmt. #	Reviewer's Detailed Comment	Reference Section	Baffinland's Response
1	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. Fisheries and Oceans Canada (DFO) recommends that Baffinland Iron Mines Corporation (BIMC) follow DFO's Projects Near Water website that provides guidance for avoiding impacts to fish and fish habitat including Standards and codes of practice (dfompo.gc.ca) 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. 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.	Tote Road Monitoring Program	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.

Table A.4: Response to CIRNAC Comments on Baffinland's 2022 QIA-NWB Annual Report for Operations

	Subject	Reviewer's Detailed Comment	CIRNAC Recommendations	Baffinland's Response
R-01	Sedimentation Management During Freshet	In 2021, CIRNAC recommended that Baffinland implement a Long-Term Water Management Plan (LTWMP) to limit future sediment-laden water discharges to the project area. The LTWMP was developed in response to three spills of sediment-laden water in 2021. In 2022, a total of ten sediment/sediment-laden water spills were reported. Of these spills, the locations varied between the Mine Site (7), Tote Road (2) and Milne Port (1). The spill activity in 2022 represents an increasing trend of 71% compared to spills reported in 2021. The highest spill concentration more than 10 times higher than the Effluent Criteria for Total Suspended Solids, as stated in the Type A Water Licence (2AM-MRY1325 - Amend. 1). In 2023, a total of eleven sediment/sediment-laden water spills were reported. Of these spills, the locations followed a similar trend to that of 2022 with varied recordings at the Mine Site (7), Tote Road (2), and Milne Port (2). The trend shows a slight increase in incidents compared to 2022. Baffinland also acknowledged in Section 6.1 of the 2023 Annual Report that general analysis of non-reportable spill incidents was related to component malfunction and equipment failure, followed by procedural issues (inadequate procedure or training). The 2023 Annual Report further identified that eight (40%) of the reportable sediment/sediment-laden spills related to infrastructure deficiencies. In response to spill 2023-208, an engineered grout curtain barrier is currently being installed up-stream of the KM 105 dam structure to permanently address the seepage. Baffinland is also investigating adding a seepage collection system to capture any potential residual seepage at the toe of the dam scheduled to be completed prior to the 2024 freshet. Given the frequency of discharge reported events in 2022 and 2023, Baffinland should consider increasing storage capacities to allow for more storage at freshet. While CIRNAC understands that Baffinland is taking steps to improve surface water management through the LTWMP, CIRNAC suggests it would be beneficial to undertake a yearly discharge trend analysis to support an evaluation of the adequacy of storage capacities for the surface water management ponds. The outcomes of the evaluation would support the LTMWP, prioritization and identification of improvements to the surface water management infrastructure for the whole site.	a) Review water management planning and related site procedures to identify changes that are required to prevent future spills that address root causes associated with spills. Report on these updates in the 2024 Annual Report. b) Baffinland follow up and complete all mitigation measures that are not yet completed, and provide this information as a revision to the 2023 Annual Report. c) Update the Spill Contingency Plan with spill prevention actions to address the root causes associated with spills. d) Include more root cause and/or preventative follow up actions in subsequent annual reports and spill reports. e) Evaluate the adequacy of the storage capacities for the surface water management ponds based oncurrent site activity and topography, future planned activities and post-closure. f) Provide a yearly discharge trend analysis to support an evaluation of the adequacy of storage capacities for the surface water management ponds, as well as support the LTMWP.	a) The primary preventative measure for site sedimentation is the implementation of the Long Term Water Management Plan. The creation of the SDLT-1 Pond or alternatives, which are currently undergoing geotechnical investigation and feasibility design, will address mine-site based sedimentation issues. Alternatives are under investigation due to site constraints (topography and ground conditions), however temporary mitigations to assist in improving water quality from this area are planned for 2025 implementation. b) As described above, Baffinland will continue to implement short-term measures described in the SWAEMP. Baffinland is continuously evaluating, assessing and adapting its SWAEMP. Additional and more permanent erosion control measures have been implemented at site and will continue to be investigated, implemented as required, and added to the proactive measures in future versions of the SWAEMP. c) Baffinland has an internal investigative process for these incidents already in place. The root cause for exceedances of total suspended solids are a combination of freshet flows, infrastructure and operational requirements. The Spill Contingency Plan is a tool to identify and respond to incidents. The root cause of these incidents are addressed through the incident investigation process and subsequent corrective actions. d) The root causes for exceedances of total suspended solids are evaluated and discussed in follow-up spill reports, and submitted as per the requirements of the Water Licence or other applicable legislation. e) Project water management facilities have all been designed and constructed as per the approved project civil design criteria. These facilities have all been subject to regulatory review and approval through the Nunavut Water Board process. Operational and environmental factors influence how designs perform, therefore Baffinland mitigates these situations through the implementation of Management Plans . The project is working to improve our understanding of water balances associated with containment ponds through planned installations of instrumentation in 2025. This information will be utilized to refine site specific data to inform future water management activities. f) As described above, the Project is working to improve our understanding of containment pond water balances and associated discharge requirements. The adequacy of storage capacities of surface water management ponds is governed by multiple factors including environmental conditions, water quality, treatment and discharge rates, as well as pond capacities. All of

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				these factors are considered in annual discharge decisions. Discharge volumes are reported in Monthly and Annual Reports, and will be utilized to support ongoing water management improvements.
R-02	Sampling Errors and External Lab Errors	In 2021, CIRNAC recommended (2021 R-02) that Baffinland investigate and rectify the root cause of water quality exceedances and ensure that proper sampling and analytical procedures were being followed in the laboratory and in the field, to help reduce the number of observed exceedances resulting from error. Sampling errors and external lab errors have been ongoing and cited as a concern in CIRNAC's review of the 2020 and 2021 Annual Reports. Similarly, in the 2022 Annual Report, under Section 7.8, quality control / quality assurance data showed an increased number of parameters (26) where the concentrations were greater than the lowest detection limits (LDL) and lower than 5 times the LDL. Poor quality distilled water and/ or laboratory analytical error was reported as a likely explanation for these elevated parameter values. These data may suggest that sampling error and/or analytical laboratory error was still an issue and insufficient interpretation was provided in the report. In the 2023 Annual Report, under Section 7.8, quality control / quality assurance data shows an improvement from 2022; however, this was achieved by changing the way that the relative percent difference (RPD) was calculated in 2023. The RPD criteria was changed to identify a difference between field samples and field duplicates of greater than 20% where the report value was greater than ten (10) times the lowest detection limit (LDL). There were six (6) instances where the RPD was greater than 20% and where the reported value was greater than ten (10) times the LDL for lab measured turbidity. This was an improvement from 2022 where there were ten (10) instances where the RPD was greater than 30% and where the reported value was greater than five (5) times the LDL. In addition to ongoing concerns with field samples and field duplicates, a total of forty-six (46) parameters in the field and travel blanks with result values greater than their respective parameters LDL were identified in 2023 also. Twelve (12) of the forty-six (46) parameters had values greater than five (5) times the value of their respective LDLs. It was identified that the quality of distilled water and/or laboratory analytical error was a likely explanation for these elevated parameter values. Baffinland has committed to test the distilled water used to make field and travel blanks in 2024. Annual	a) Investigate the root cause of water quality exceedances for turbidity. b) Continue to ensure that proper sampling procedures in the field and analytical procedures in the laboratory are being followed to help reduce the number of observed exceedances resulting from error, focusing on obtaining and using properly distilled water. c) Issue an Annual Report revision with fulsome result interpretation regarding QA/QC samples and further detail regarding root causation for meaningful follow up actions.	Response Provided to NWB on November 15, 2024: a) In July 2024, Baffinland environmental staff created field blanks and trip blanks using our Water Sampling standard operating procedures. The blanks were then shipped to ALS Waterloo for analysis. The aim of the test was to audit our in-house DI water and our water sampling procedures. Results of the tests confirmed that the in-house DI water that was used to create blanks was not contaminated and the machine was not faulty. There were some instances where the results for dissolved and total organic carbon (DOC/TOC) and some metals were over the detection limit. However, further investigation into the sample results with the third party analytical lab indicated that in general DOC and TOC are challenging to completely remove in DI water, even when using ultra-pure DI (UPDI) and this is also generally the same for metals. With these results, we are confident that the DI water we use is sufficient for creating blanks and is uncontaminated. As a result of this investigation, we determined the root causes of the hits above detection in blanks are equipment, workspace, and/or sampler influenced, i.e. introduced at the time of creating the blanks or during field sampling. Baffinland has increased training and awareness sessions for staff creating field and travel blanks and taking water samplings in the field, especially QAQC sampling protocols. In 2023 we reported 46 instances where parameters in field and travel blank samples were over the detection limit, 12 of which were over five times the detection limit. In 2024 to date, we have observed a marked decrease in these numbers with 32 blank sample parameters being detected and only 3 occasions where the results were greater than five times the detection limit. Corrective actions that are currently being implemented and enforced through inclusion in SOP's are as follows: proper clean storage of water sampling containers, ensuring a clean workspace when making blanks in the laboratory, and using fresh nitrile or vinyl gloves when handling water sampling containers. b) Baffinland has begun and will continue to incorporate the corrective actions from the investigation described in a), and will continue to ensure that all sampling events follow appropriate and relevant updated procedures. Baffinland will also continue to review its QA/QC program to

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		Reporting requirements found in Schedule B e.iii. of the Water Licence requires tabular summaries of the results and interpretation of all data generated under the monitoring program in Part I Schedule I. Insufficient result interpretation was observed in prior reports and is again a concern for the 2023 Annual Report.		ensure it is effective and work with its laboratory to improve all aspects of the analytical procedures. *c)* The investigation mentioned in a) was completed in 2024, it would not be appropriate to revise the 2023 NWB/QIA Annual Report for Operations to reflect these new findings nor change the conclusions presented in the previous annual report.
R-03	Seepage of KM106 Run of Mine Stockpile and Swale Monitoring	During construction of the KM106 Run of Mine (ROM) Stockpile and Sedimentation Pond (Pond) in 2020, a swale was excavated to address a low-lying area identified in the northeast corner of the Sedimentation Pond. Subsequent settlement monitoring of the area and inspections of the swale would help mitigate potential water ponding concerns in the future. Baffinland provides discussion in Section 7.3.5 of the 2022 Annual Report regarding the monitoring of the KM106 ROM Stockpile and the KM106 Pond (MS-07). In Appendix C.2.1 (Wood, 2022) discusses the interim contingency measures to convey seepage from the KM 106 ROM Stockpile to the KM106 Pond. It is unclear if the contingency measures were implemented within the swale. In the 2022 Annual Report, there was no discussion about the condition, monitoring or inspection of the swale, which would have been a relevant on-going follow up action to report in 2022. Additionally, there was no discussion in the 2022 Annual Report or the geotechnical inspection reports (Appendix C.2.1 or C.2.2) about the swale or the implementation of permanent measures to address seepage of the KM106 ROM Stockpile. The 2023 Geotechnical Inspection Reports recommended covering the base and slopes of the temporary containment sump adjacent to the KM106 ROM Stockpile diversion berm with riprap. It is also suggested draining the collected water from the sump to the Pond by gravity if the area's topography allows. The June Geotechnical Inspection Report noted that Baffinland pumped the sump dry and prepared the berm for riprap placement prior to the end of Q3. As local topography does not allow for gravity drainage, Baffinland proposed to continue to manage this area via active pumping. In relation to the above-noted deficiencies, the Annual Report requirements in Schedule B of the Water Licence require reporting related to modifications and/or actions taken to support environmental safety, such as (below cited from Annual Report's	a) Implement permanent mitigations to effectively convey runoff from KM106 ROM Stockpile to MS-07 and/or the surrounding environment. b) Issue a 2023 Annual Report revision by September 30, 2024, with fulsome detail to understand modification, maintenance and/or follow up actions taken to effectively manage the seepage and runoff at KM106 ROM Stockpile to MS-07 and/or surrounding environment.	Response Provided to NWB on November 15, 2024: Baffinland has outlined some important clarifications in the below three points: 1. The low-lying area identified in the referenced 2020 Construction Summary report is illustrated by the polygon marked A below. Baffinland continues to monitor this area for potential settlement and no issues have been noted. 2. The features (base and slopes of a temporary containment sump) discussed in the 2022 and 2023 Geotechnical Inspection Reports are illustrated by the polygon marked "B" below. As was presented in the 2024 Geotechnical Inspection, the suggested actions have been completed. It is important to note that this feature conveys accumulated local runoff, and that contact water from the KM 106 stockpile reports to the MS-07 pond via the engineered diversion berm. 3. Minor maintenance (not reportable within the Annual Report under item 1.d.) was completed in 2023 to remove accumulated debris from within the diversion berm (illustrated as "C" in the below figure), to maintain the designed 3 meter width between the diversion berm and toe of stockpile.  a) Minor maintenance uphill of the KM 106 Stockpile diversion berm was completed in 2023 as described in clarification point 3 above. No other

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		Appendix A: Concordance Tables, Concordance Table Type 'A' Water Licence 2AM-MRY1325 – Amendment No.1): • Item 1.d. Modifications, Paragraph i.: A summary of modifications and/or major maintenance work carried out on all water and waste related structures and facilities; • Item 1.h. General, Paragraph i.: A summary of actions taken to address concerns or deficiencies listed in the inspection reports and/or compliance reports filed by an Inspector; • Item 6.4, Paragraph i.: Any and all information related to a finding of non-compliance or breach of environmental standards as discovered by any Governmental Authority; • Item 6.4, Paragraph k.: Information respecting the Tenant's compliance with the terms of this Lease and any permits or licenses required in respect of its Operations on the Property, together with details of any incidents of non-compliance, the results of any inspection reports or orders prepared or issued by or fines levied by any competent regulatory authority and any remedial action relating thereto. The Annual Report did not provide sufficient detail related to maintenance work and actions taken to address the ROM seepage issue. It is important to note that on-going work to mitigate or maintain water and waste related structures / facilities in 2022 (for any incident) may involve reporting on a past year's event(s) if those follow up actions are still on-going. The report is not limited to 'new' events of the reporting year.		maintenance work has been required, and all runoff from the ore stockpile is conveyed to the MS-07 pond. b) There has been no major maintenance work completed at the Km 106 Stockpile beyond those minor maintenance activities described above. All runoff is effectively managed, and no seepage has been observed during monitoring activities in 2023. Therefore, a revised 2023 Annual Report is not required. All reporting requirements of the Water Licence and Commercial Lease are summarized within the Concordance Tables (Appendix A.1 and A.2 to the 2023 NWB QIA Annual Report for Operations) regarding where the required information can be found within the Annual Report.
R-04	Addition of Mine Haul Road and Tote Road to Bi-Annual Inspections including Assessment of Potential Permafrost Degradation Along These Roads	CIRNAC previously recommended the addition of Mine Haul Road and Tote Road to the Bi-annual geotechnical inspections under Part D, Item 19 of Baffinland Type "A" Water License 2AM-MRY1325 Amendment No. 1, including an assessment of potential permafrost degradation along these roads. The recommendation stemmed from the observation of water management and erosional issues along the Mine Haul Road. Baffinland added these roads to the geotechnical inspections in response to CIRNAC	Close CIRNAC R-04 from the 2023 Annual Report review.	Acknowledged. This item is closed.

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		recommendation (a). The initial inspections were limited in nature and in response, Baffinland expanded the inspection to include 4 bridges, 4 borrow areas and 1 culvert along Tote Road, as well as the section of Mine Haul Road between the Crusher Pad and the open pit (Mary River). In response to CIRNAC recommendation (b) a status on the development of the Long-Term Water Management Plan was to be completed by Q3 of 2020. In the 2023 Annual Report, Baffinland provided an updated status, indicating that the LTWMP under Modification No. 13 (Mine Site Water Management Infrastructure) continues to be developed and implemented in a phased approach with a third-party consultant. The 2023 Annual Report provides an implementation schedule for Modification No. 13 which includes a total of six facilities to be constructed. Of those, three projects (Station MS-10, MS-14 and the Mine Haul Road Ditch Upgrades) are planned for construction in 2024 and 2025; two have been completed (MS-11, MS-12) and the Explosives Magazine Pond is no longer required. In response to CIRNAC recommendation (c), Baffinland has provided additional details of permafrost degradation locations along the Tote Road, as well as discussion on the impacts of roads on permafrost. The discussion identified deficiencies related to poor drainage along the road embankment and the use of short culverts. CIRNAC suggests that the installation of appropriate-sized culverts, as well as a condition survey along Tote Road to map the most critical locations, i.e., trapped surface water areas and short culverts, will help address the deficiencies. CIRNAC previously identified that the geotechnical inspection reports lacked detail on high priority locations for permafrost degradation on Tote Road. Conducting a condition survey would address this concern. Refer to CIRNAC (R-07) Confirmation of Permafrost Degradation/Remedial/Maintenance Activities.		
R-05	Omission of Thermal Monitoring Data in	As per Part B Item 4 and Part K Schedule B of the Type 'A' Water Licence 2AM- MRY1325-Amendment 1, the Annual Report for Operations, Part e) Monitoring ii) outlines the following:	a) Continue with additional instrumentation and monitoring and update thermal analysis including	Baffinland provided a WRF instrumentation update in its 2023 *QIA-NWB Annual Report for Operations* and plans to continue this process moving forward. This update includes the plan for recovery of any "down" instrumentation, and

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	2021 and 2022 Annual Reports	"Results of thermal monitoring and/or research carried out in conjunction with the Waste Rock Management Plan and disposal of potentially acid generating and metal leaching materials, permafrost integrity along the railway alignment and other project sites". The thermal data were not included for review anywhere within the 2021 or 2022 Annual Reports or supporting appendices. The 2021 and 2022 Annual Reports also did not discuss permafrost integrity along the railway alignment and other project related sites (e.g., Tote Road, Quarry Areas, Mine Site areas, etc.). For the 2022 Annual Report review, CIRNAC R-05 recommended that Baffinland provide a report which summarizes and interprets the thermal data collected by the end of July 2023. Data has been provided by Baffinland. Refer to CIRNAC R27 – Thermal Monitoring and Modelling.	the heat balance and oxygen balance across the WRF. b) Provide flow characteristics of the frozen waste rock mass and see it meets with the design intent. c) Restoration of oxygen probes, barometers and possibly flow meters should be considered (as opposed to abandoning these non-functioning instrumentation). d) Clearly describe all the calibration steps performed for the thermal model, how the calibration was validated, and the kind of sensitivity analysis performed. e) Calibrate the model only with actual historical data. f) Discuss the impact of the small calibration data on the validity of the model results. g) Explain the reason for the difference and if both documents are required as attachments.	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 for Operations* to ensure adequate monitoring of the WRF performance and consistent communication to regulators. a. Regarding the specific request for additional temperature monitoring, Baffinland has planned for installation of additional thermistors in the WRF for 2024, as outlined in the *2023 QIA-NWB Annual Report for Operations,* and installation has started. An installation update will be provided in the 2024 annual report. b. Regarding the specific request for provision of flow characteristics of frozen waste rock mass, Baffinland has not planned for installation of additional VWPs in the WRF for 2024, as outlined in the *2023 QIA-NWB Annual Report for Operations*. The VWPs installed have been dry and in sub-zero temperatures at all times and after discussion with Baffinland's consultant, it was determined additional VWPs would not be necessary at this stage. c. Regarding the specific request for additional monitoring of oxygen, barometric pressure, and flow, Baffinland has not planned for installation of additional oxygen probes in the WRF for 2024, as outlined in the *2023 QIA-NWB Annual Report for Operations.* Through discussion with BIM's 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. d. The 2D model cross-section has been defined to align with the locations of boreholes BH1, BH2 and BH3, that 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

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				model geometry had to be adjusted as part of the calibration process to account for placement of rock fill in those areas. Changes in rock fill elevation in the pile is tracked through sequential surveys that are conducted routinely. The timing of rock fill placement in the model (i.e., date when the model geometry was adjusted), and the associated placed rock fill temperature were the model inputs that had the most impact on the model results. The calibration process tested rock fill placed at different dates between two surveys and the final rock fill deposition schedule summarized in Table 3 of Appendix A2 was the one that resulted in the best match with the measured data in BH1, BH2 and BH3. In addition to the timing of rock fill 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. e. (f) 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 are for calibrated parameters and, in general, demonstrate that the model has been able to follow general trends in the pile. g. Both documents are not required, and BIM directs the reader to the latest issued report titled "Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock Storage Facility at Mary River Mine Technical Memorandum" from August 29, 2023. This is the required document and is the report found within Baffinland's last issued Phase 1 Waste Rock Management Plan.
R-06	Assessment of Impact Predictions	In 2021, CIRNAC noted that Section 7.6 of the 2021 Annual Report for Operations discusses the Aquatic Effects Monitoring Plan (AEMP), while reports of AEMP programs that were completed in 2021 were included in Appendix E.9. The discussion in Section 7.6 was limited to outlining the scope of the AEMP and did not provide an integrated interpretation of the data collected under the various AEMP programs. Furthermore, 2021 program reports (e.g., Core Receiving Environment Monitoring Program (CREMP), Lake Sedimentation Monitoring Report and Hydrometric Monitoring Program) generally lacked comparisons to Final Environmental Impact Statement (FEIS) predictions. A comparison between current monitoring and FEIS	(R-06) CIRNAC recommends that Baffinland complete the recommendations noted below, which expand upon its recommendations provided in 2021 and 2022. a) Provide interpretation of the results relative to impact predictions of individually monitored (but related) aquatic monitoring programs in Section 7 of the 2023 Annual Report. b) R-06 b of the 2022 Annual Report review can be closed. Refer to CIRNAC R-31: Spill Reporting.	Response Provided to NWB on November 15, 2024: a) **Results and interpretation related to impact predictions**: This is currently covered in the NIRB Annual Report. For example, Tables 4.12 and 4.13 of the 2023 NIRB Annual Report provide an evaluation of the Project's impacts on hydrology, hydrogeology, groundwater, and surface water quality based on monitoring activities completed in 2023, relative to the predictions presented in the FEIS. Furthermore, under the Adaptive Management Plan, Baffinland monitors against the specific thresholds that feed into the relevant Management Plan's TARP tables to drive adaptive management. It should be noted that in many cases, Baffinland uses updated regulatory guidance or research to use as a comparison against monitoring results. For example, the Core Receiving Environment Monitoring Program (CREMP)

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		predictions is needed to assess the ongoing environmental conditions and trends at the Project site to inform monitoring and mitigation programs and to confirm the accuracy of the impact predictions as per Project Certificate Condition 21 (Groundwater/Surface Waters - Aquatic Effects Monitoring Plan and Dustfall Monitoring) and the AEMP Framework Similarly, Section 7.6 of the 2022 Annual Report and the appended program reports also continued to lack integrated interpretations of the data collected under the various AEMP programs. In 2023, Section 3.5 Effects Predictions of the AEMP was updated to read "Effects predictions from the FEIS and addendums are thresholds that are appropriate for longer-term review and response cycles, such as the annual review of regulatory compliance and unexpected effects. The effects predictions from the FEIS and addendums are intended as the basis of comparison to the Project's performance as described in Section 6.1 Annual Review of Compliance and Unanticipated Effects". Section 6.1 of the Annual Report provides a description of the plan to compare Project performance to FEIS predictions but does not present any comparisons. In relation to Section 7.6 of the 2021, 2022 and 2023 Annual Reports (and the appended program reports), there is an ongoing information deficiency related to integrated interpretation of the AEMP monitoring data and other related monitoring programs, as it relates to understanding effective regulation of water resources. The Annual Report criteria found in the Water Licence under Schedule B e. i, ii, and iii require tabular summaries of all results and interpretation of the results. Fulsome result interpretation for these clauses requires discussion and comparison of the Project's environmental performance compared to FEIS predictions. Such information was not found in the Annual Report under Section 7 and/or in the related tables (as reported in the concordance table). No figures were found.	c) Include AEMP impact predictions made in the FEIS within Sections 6.1 and 7.6 of the 2023 Annual Report to confirm prediction accuracy and to aid with the ongoing assessment of environmental conditions and trends at the Project. It is further recommended that figures are used to present impact predictions and environmental performance related to the Water Licence over time in the Annual Report, as a way to aid result interpretation. d) A 2023 Annual Report revision is requested to include fulsome interpretation of results relative to impact predictions for the AEMP and other monitoring requirements, per Schedule B e. i, ii, and iii, so that the efficacy of the Water Licence and related monitoring can be tracked and evaluated.	compares to established water quality guidelines in addition to the FEIS predictions. b) Closed c) Comparisons to FEIS impact predictions will continue to be included in the CREMP, and reported under the Project Certificate in the NIRB report. d) A 2023 NWB QIA Annual Report for Operations revision is not warranted. Comparisons to FEIS impact predictions for programs under the AEMP will be included in the NIRB annual report under the Project Certificate where this is most appropriate.
R-07	Confirmation of Permafrost Degradation/Remedial/Maintenance Activities	Recommendation (R-07) from the 2022 Annual Report review are listed below in italics followed by comments from the 2023 Annual Report review. Comments from the 2022 Annual Report review are listed below together with the recommendations.	(R-07) CIRNAC recommends that Baffinland: a) Provide the overall action plan for all disturbed areas identified at the existing and historic borrowareas along Tote Road and for the Mine Haul Road, including any new areas identified as	Response provided to NWB November 15, 2024: a) A third-party re-assessment of the Tote Road borrow areas was completed and will inform the detailed action plan for addressing geotechnical risks associated with all identified borrow areas. The full detailed plan will be presented in the 2024 NWB QIA Annual Report for Operations, however in summary the plan will consist of the following actions.

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		a) Provide a copy of the Action Plan that includes the comprehensive list referencing back to the original Table 1 of the 2019 TetraTech report. *b) With the updated actions, include description on how the rehabilitation work was inspected to confirmcompleteness.* *c) Provide an overall action plan for all disturbed areas (including any new areas identified as part of Baffinland inspections of the respective roadways since the time of the 2019 Tetra Tech inspection) identified at the existing and historic borrow areas along Tote Road and for the Mine Haul Road.* In response to CIRNAC R-07 2022 Annual Report recommendation, Baffinland engaged Tetra Tech to complete this scope of work in 2023. This included a site visit by their engineer during the open water season in order to develop an action plan based off current site conditions along the Tote Road. Baffinland also completed a LiDAR survey by helicopter in 2023 to provide additional data to feed into this assessment. The third-party consultant is still developing this significant remedial plan and Baffinland commits to have the full implementation plan ready for submission by June 15, 2024. Furthermore, the 2nd 2023 Geotechnical Inspection Report (Appendix C.1.2) provided additional details of permafrost degradation locations along Tote Road, as well as discussion on the impacts of roads on permafrost. The discussion identified deficiencies related to poor drainage along the road embankment and the use of short culverts. The installation of appropriate-sized culverts, as well as a condition survey along Tote Road to map the most critical locations, i.e., trapped surface water areas and short culverts, are suggested to address the deficiencies. CIRNAC previously identified that the geotechnical inspection reports lacked detail on high priority locations for permafrost degradation on Tote Road. Conducting a condition survey would address this concern.	part of the roadways since the time of the 2019 Tetra Tech inspection by September 30, 2024. b) Include as part of the overall action plan: i. a condition survey (as per 2023 2nd Geotechnical Inspection Report) along Tote Road to map the most critical locations at risk for permafrost degradation, i.e., trapped surface water areas and short culverts. ii. Replace short culverts with appropriate-sized culverts to address deficiencies of poor drainage.	Of the 90 identified borrow areas along the tote road, there are 17 identified as having higher risk associated with them. These areas are targeted for remediation between 2025 and 2029. The planned remediation includes the following: i. Ensuring the disturbed area will not impact road stability through sufficient buttressing and/or slope flattening; ii. Proper water management to ensure standing water is diverted away from the Tote Road and volumes kept to a minimum; and iii. Allowing the shallow cut "back" slopes (on the tundra side) to seek their own long-term condition, rather than risk further permafrost impacts through additional disturbance. Borrow pit areas along the Tote Road will be monitored for changing conditions annually. b) i. The detailed plan will include the requested requirements. Please note the 2024 Geotechnical Inspection was completed on August 26 (report submitted October 26, 2024) and included a condition survey along the Tote Road. ii. Baffinland will continue to monitor the culverts identified in the reports and execute remedial measures as per Part D condition 18 of the Water Licence regarding geotechnical inspection recommendations.
R-08	Waste Rock Management	CIRNAC's Recommendation from the 2022 Annual Report review requested that Baffinland: *a) Provide* *i. Operational details and figures on waste rock placement (e.g., how and where, etc.) toallow for comparison of actual activities versus requirements of the Waste Rock Management Plan.*	(R-08) CIRNAC recommends the following numbered in relation to above section: a) In relation to item a) i in the Comments above, that Baffinland:	a) i. Corrective actions will be reported on in the 2024 Annual Report. ii. ABA and SFE data from 2022, 2023 and 2024 blast hole samples will be provided in the next annual report, and moving forward this data will be provided annually.

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		Appendix E.14.5 contains maps showing the placement of waste rock in 2022 and information on waste rock placement for 2023. For 2023 information is given on conformance of the waste rock placement and potential corrective actions. In two separate areas in the waste rock dump, the allowed placement thickness of 5 m was exceeded. Baffinland stated that the lift height control procedure will be reviewed, and thermistors installed in the northern non-conformance area (that included PAG placement) to identify potential negative effects of the increased lift height. No date was provided for the submission of this information to CIRNAC. Waste rock placement is based on onsite paste pH and sulphur-content measurements of blast hole cuttings to separate PAG from non-PAG waste rock. This categorization is validated through full Acid-Base Accounting and metal leaching analyses of randomly selected waste rock samples but no data on such analysis is provided. Neutral pH metal leaching is not discussed with respect to use of non-PAG waste rock for construction. The "Waste Rock Facility QAQC Monitoring Plan" outlines the methodology for placement and confirmation of PAG and non-PAG waste rock in the WRF. The QAQC plan describes the requirement for sampling, testing, and quarterly reporting. According to a new placement criterion implemented January 2024,PAG waste rock will be covered with at least 3 m of non-PAG waste rock within 24 months to minimize ML/ARD development during warmer summer months. *ii. Cumulative information on waste rock stored to date.* The 2023 Annual Report does not contain cumulative information on waste rock stored to date. *iii. Additional supporting information for Baffinland's conclusion that 17% of seepage samples from the WRF being acidic is not an issue for concern.* Baffinland refers only to Appendix E.14.5 for recommendations a) to c). This appendix does not contain adequate information on potentially acidic seepage from the WRF to respond to these recommendations *b) Consider the following as part of that process to better inform WRF performance:*	i. Provide information on timing of the corrective actions with respect to the waste rock placement thickness. ii. Provide data of waste rock testing for placement confirmation. iii. In addition to proposed analytical tests provided in the QAQC Plan, analyse for Shake Flask Extraction and total metals on 30% of all samples as part of the verification sampling, testing and quarterly reporting. b) In relation to item a) ii in the Comments above, that Baffinland: i. Provide cumulative information on waste rock stored to date to allow tracing of waste rock deposition. c) In relation to item a) iii in the Comments above, that Baffinland: i. Provide information on the conclusion that 17% of seepage samples from the WRF being acidic is not an issue for concern. d) In relation to item b) in the Comments above, that Baffinland: i. Present analytical results in a standard format for all locations covering all required analytes in a single location in the report. ii. Provide time resolved plots of other metals/COCs to support the conclusion that no discernible trends are observed. iii. Provide statistical analysis of trends for the concentrations of all analytes. e) In relation to item c) in the Comments above, that Baffinland:	iii. Baffinland completed SFE and total metal analysis testing on DDH samples collected throughout Deposit 1 during the initial geochemical characterization of the LOM waste rock. More recently, a 2019 geochemistry report from Golder (2019 GEOCHEMISTRY WASTE ROCK INVESTIGATION RESULTS) provides results and interpretation of SFE and total metal analysis testing completed on waste samples collected during a 2019 sampling program. The latest waste rock geochemical characterisation report is from WSP (2020 to 2022 Waste Rock Geochemistry) and provides results and interpretation of SFE test results from blast hole samples collected between 2020 and 2022. This data was considered during the development and validation of BIM's waste rock classification criteria for Non-AG and PAG waste rock, to manage both acid rock drainage and metal leaching. Baffinland's existing commitment to perform ABA and SFE testing on a subset of its blast hole samples (in addition to ongoing water quality sampling and thermal monitoring at the WRF), and ABA analysis on 30% of the waste dump samples collected as part of the verification sampling for progressive reclamation, will provide the means for continuous monitoring and validation of the existing waste rock screening criteria to manage both acid rock drainage and metal leaching. b) i. Baffinland can easily collate this information for review by CIRNAC representatives when onsite, but does not feel including this analysis within the Annual Report is appropriate. In the meantime, please refer to the previous annual reports for tonnages hauled and stored at the WRF in previous years. c) i. Baffinland notes that this recommendation originates from a comment to the 2021 annual report, which was to "provide additional supporting information for Baffinland's conclusion that 17% of seepage samples from the WRF being acidic is not an issue for concern", with the reviewer's detailed comment indicating the following: "While this drainage/seepage appears to be localized and appropriately managed during operations by redirecting to the WRF pond, the observed acidic seepage raises concerns regarding the placement of materials within the WRF and the long-term performance of the WRF during closure."

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		i. Measurement of dissolved concentrations in addition to total concentrations *ii. Examination of trends for metals and metalloids of environmental concern. Several of these metals and metalloids reported total concentrations greater than the detection limit and are possibly associated with neutral mine drainage from the WRF. These include: dissolved aluminium, iron, manganese, cadmium, chromium, copper, lead, mercury, nickel, selenium and zinc.* The NWB Type "A" Water License No. 2AM-MRY1325 specifies in schedule 1 table 12 that for monitoring group 7 total and dissolved metal concentrations need to be reported. Table 14 and 15 specify that the stations that need belong to group 7 require monthly reporting in the summer. Baffinland provided dissolved metal concentrations; however, chromium was not included as an analyte for all locations. Tables with analytical results for specific locations are found in different parts of the report. Time resolved sulphate and nickel concentrations are plotted in Figure 12 in the Waste Rock Geochemistry report, other metals are mentioned to have no discernible trends, with no graphs provided. The report suggests an increase in nickel concentration. While the corresponding graph clearly shows higher maximum concentration for the latter half of the timeline, no statistical testing was performed to determine whether the nickel concentration or the variability increased with time. *c) Investigation of total dissolved solids concentrations well above 1000 mg/L which in absence of explained alternate source of salinity suggests the waste rock may be a significant point source of salinity and potential adverse effects on revegetation of the final landform at closure and what mitigation measures need to be in place.* Baffinland refers to the Waste Rock Facility QAQC Monitoring Plan in Appendix B. This documents only contains information on TSS and some of the other water quality parameters, not on TDS. No discussion of the impact and source of TDS above 1000 mg/L is found in the annual report. Data suggest however, that concentrations have decreased. Sulphate concentrations up to 1000 mg/L were reported in 2020, while in 2022 maximum concentrations were 500mg/L (Figure 12 Waste Rock Geochemistry report). For 2023, TDS values are mostly below 100 mg/L. Maximum concentrations were reported for Sheardown Lake	i. Provide discussion on the impact and source of TDS concentrations above 1000 mg/L. ii. Check and correct the tables with errors in TDS (and other analyte) values. f) In relation to item d) in the Comments above, that Baffinland: i. Update the ICRP with information on the impact of the increased amount of PAG material on the WRF. Provide the updated ICRP with the next annual report.	To directly address the reviewers detailed comment regarding concern on placement of materials within the WRF and the long-term performance of the WRF during closure, the reader is directed to the latest waste rock geochemistry report from WSP (2020 to 2022 Waste Rock Geochemistry). A steady improvement in water quality at the WRF is clearly identified between 2018 and 2022, with a trend of increasing pH values and associated decreasing concentrations of key parameters (i.e. Zn, Ni, Cu, Fe, Sulphate). This steady improvement in water quality since 2018, ending with water quality in 2022 showing neutral pH values and no metals above MDMER criteria, demonstrates the positive impact of the existing waste placement practices within the WRF and provides the confidence for existing waste placement practices to mitigate ARD and ML at the WRF. d) i. Please see Appendix E.6, tables E.6.4 to E.6.7 ii. Please specify exactly where it is stated that "no discernible trends are identified", as it relates to metals as a function of time, so that BIM can properly respond. iii. Baffinland is working with Stantec to evaluate historical water quality trends including the metals and metalloids listed. This information will be used to develop a pit water quality model that will inform water quality predictions for WRF water management planning and closure. The aforementioned metals are all well below MDMER and Water Licence discharge criteria. e) i. Source TDS concentrations are very ephemeral and localized in nature, and do not result in an overall trend of increasing TDS either at the inflows to the WRF pond, or the general pond water quality itself. Due to the ephemeral nature of elevated TDS in a very small portion of the WRF, as well as the flows being contained within finite ditching, we do not anticipate any impacts to revegetation success at closure. ii. TDS results are reported based off analytical reporting from ALS Laboratories. f) i. The updated ICRP was submitted on November 1, 2024. Comments were received on February 28, 2025. Baffinland is currently working on responses to those comments.

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		with 350 mg/L during summer (Table C.33 Aquatic Effects Monitoring Reports). Some of the tables have either an analytical or reporting error with TDS smaller than the sum of contributing analytes (i.e., Mg and Ca in C.68 and C.72 Aquatic Effects Monitoring Reports). *d) Provide comment about the amount of PAG rock remains well above expected as this has potential WRF construction implications, particularly at closure (i.e., greater than anticipated volume may require significantly greater cover thickness, etc).* Baffinland refers to Appendix E.14.5 (assumed that E.16.5 is a typo) but a discussion of placement of increased amounts was not found in this document or in the annual report. Baffinland suggests that the Interim Closure and Reclamation Plan (ICRP BAF-PH1-830P16-0012) is a dynamic document that is regularly updated and contains the information; however, it has not been updated since October 2018 and the updated volumes have not been reflected in the plan.		
R-09	Performance of New Surface Water Management Pond MS-11 at KM105	The MS-11 Surface Water Management Pond at KM 105 (KM105 Pond) is part of the first phase of the implementation of the Mary River Project Mine Site Water Management Plan (Knight Piesold, 2021) to address erosion and sedimentation. The KM105 Pond collects surface water runoff from the main mine Deposit No. 1 that was put into operation in 2022. MS-11 at the KM105 Pond represents a monitoring station under Schedule I of the Type "A" Water Licence and Metal and Diamond Mining Effluent Regulations (MDMER). Effluent criteria for Total Suspended Solids (TSS) were expected to be met after a three-day retention period according to the pond design; however, TSS exceedances were reported in the 2022 Annual Report in relation to two June events that were the result of freshet conditions, prompting a warning letter from ECCC. As per Part F.27 of the Water Licence, all contact water and surface runoff from the site Drainage and Surface Water Management Systems where flow may directly or indirectly enter a water body, shall be sampled weekly during the operations phase of the project and must not exceed the following effluent quality limits for TSS: 15 mg/L (maximum average concentration; and 30 mg/L (maximum concentration of any grab sample). In response to the ECCC letter, a third-party design consultant, Knight Piesold, was contacted to evaluate remediation measures to address the containment failure of KM105 pond. Their analysis of data	(R-09) Based on its review of the 2023 Annual Report, and in consideration of comments provided on the 2022 Annual Report (R-11), CIRNAC recommends the following: a) Baffinland should provide details in the 2024 Annual Report concerning the findings of containment failure and remedial measures, including as-built details as per Part D.17, Part G.6 and Schedule D 1.c of the Water Licence. CIRNAC requests that the 2024 Annual Report include evidence that the Engineer of Record (EoR) of the KM105 Pond revisited the design of the seepage grout curtain to ensure it meets the design intent of containing of the surface runoff. CIRNAC requests that the 2024 Annual Report identify the party assigned with responsibility of the facility post seepage remedial work, as the containment embankment is classified as a high potential structure. b) In the 2024 Annual Report, confirm that the TSS removal was in place by freshet of 2024 and provide the results of MS-11 monitoring in the	The implementation of effective mitigation measures to address seepage from the KM105 facility was unsuccessful in 2024 due to additional seepage following remedial efforts at the facility over the winter. In Q1 and Q2 of 2024 Baffinland undertook to install a grout curtain upstream of the km 105 dam and km 104.5 sedimentation pond, in order to prevent flow beneath the pond liner and resulting seepage through the dam. The work was carried out in accordance with the Engineer of Record's (Tetratech) IFC design drawings. By May 14, 2024, a total of 500.36 m3 of grout had been injected in approximately 29 holes (18 holes completed per design and 11 holes partially filled), representing more than 10 times the planned grout volume consumed in 15% of the drill holes. The work had to stop because of the onset of freshet and the likelihood that further grout injection would be washed away by subsurface freshet water flow. A workshop was held between Baffinland and Tetratech on July 2, 2024, wherein it was determined that the best path forward was to cease the grout curtain approach and focus on water management measures within the km 105 infrastructure valley. Final as-builts on the project are not complete at this time. MS-11 is not an active monitoring location currently due to seepage experienced from the dam. Proxy sample locations were reported on a monthly basis as per required frequencies and are included within the 2024 Annual Report. An SNP modification request has been submitted with the 2024 Annual Report to relocate MS-11 to the identified monitoring location

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		provided from site investigations and observations indicated that the seepage likely originated immediately upstream of the northwest embankment geomembrane tie-in trench, at the area where the trench transitions from the upstream embankment to the abutment slope (Knight Piesold, 2022). A seepage remediation plan was developed and implemented in consultation with the third-party design engineer (Knight Piesold), which included the use of a bentonite mixture to fill voids. The remediation work was completed in October 2022. As stated in the 2023 Annual Report, the immediate response for seepage remediation included several actions. Multiple bentonite plugs were implemented to seal the seepage in the base of the KM105 Pond; however, this was unsuccessful. In 2023, Baffinland reported that annual pre-dosing of a coagulant/flocculent treatment for run-off inflow to the pond was initiated to accelerate settling along the flow path of the run-off through the structure, and to reduce seepage TSS levels. Mitigation measures were implemented upstream and downstream of KM105 Pond, including a temporary check dam installation and ditch regrading. A geotube 12 filtration system was also installed as a mitigation at the KM 105 Pond, which underwent testing in late 2023 prior to winter. The development of long-term remedial measures at the KM105 Pond is ongoing based on the 2023 Annual Report. Geotechnical drilling was undertaken to gather data on the subsurface conditions for a comprehensive remediation plan. An engineered grout curtain barrier is currently being installed up-stream of the dam structure to permanently address the seepage, in addition to an automated water treatment system, for which both are planned to be completed before freshet 2024. A seepage collection system at the toe of the dam is also being considered.	2024 Annual Report as per Part F.27 of the Water Licence. c) In the 2024 Annual Report, confirm that the installation of the seepage grout curtain, which is intended to reduce seepage through the dam foundation, was initiated and in place prior to freshet 2024.	downstream of all Km 105 water management infrastructure. Baffinland provided regulators with an update report on January 22, 2025, detailing the full summary of activities related to the KM105 Pond, and mitigation measures planned for 2025. This report is also included in the 2024 NWB and QIA Annual Report for Operations (Appendix E.8.3).
R-10	Performance of P-SWD-3 Surface Water Collection Ditch	The 2022 Annual Report presented several observations regarding the maintenance and performance of open surface drainage ditches, among them, that the open surface drainage ditches (P-SWD-3) were reported as not meeting the design objectives. The June 2023 Geotechnical Inspection Report (Appendix C.1.1) also stated sloughing at several locations along the ditch and recommended redesigning and reconstructing of the ditch to improve the drainage capability. The redesign must consider the large amount of snow stockpiled adjacent to this ditch. The June 2023 Geotechnical Inspection Report	(R-10) In consideration of the 2023 Annual Report and comments provided on the 2022 Annual Report (R-12), CIRNAC recommends that Baffinland: a) Continue to monitor the P-SWD-3 to ensure that the improvement work was effective (if it was reconstructed) and that it meets the required intent to convey surface runoff, as part of the follow up action. Provide a detailed update	a), b) The 2024 Geotechnical Inspection was completed (Appendix C.2 of the 2024 NWB QIA Annual Report for Operations), and the geotechnical engineer has provided new recommendations. Baffinland has committed to take the following action: Drainage improvement initiatives will be considered in 2025 with intent to improve the drainage capability of the P-SWD-3 ditch. Damaged or impacted culverts will be evaluated to consider if it still effectively passes water.

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		also recommended that a perimeter diversion berm be provided around the snow stockpile area and the surface water generated by the melting snow be conveyed to the P-SWD-3 ditch in a separate new drainage ditch. Based on Appendix E.12, Response to Annual Report Comments, the ditch improvement, reinstalling culvert to proper grade and relocation of the now stockpile is completed which contradicts both the June and September (Appendix C.1.2) Geotechnical Inspection Reports. Drainage ditches provide an important service in timely conveyance of surface runoff; any interruptions in their performance may result in unexpected ponding or leakages which may have continuous aggravating effects on disturbing the thermal regime and promoting either thaw or landmass wasting process. Drainage ditches should be maintained for all time ready operations.	regarding efficacy of the redesign in the 2024 Annual Report. b) Implement the recommendation in the 2023 Annual Geotechnical Inspection Reports which include: i. Redesign and reconstruct the ditch to drain the large amount of surface water arising from the snow stockpile located to the north-east. ii. A perimeter diversion berm be provided around the snow stockpile area and that the surface water generated by the melting snow be conveyed to the P-SWD-3 ditch in a separate new drainage ditch. iii. Ditch reconstruction should consider reinstalling a culvert beneath the access road to the snow stockpile to the correct invert levels. iv. A rock-fill check dam be installed at the discharge point of the upgraded ditch. c) Assess the thermal and freeze/thaw stability of all drainage ditches and its slopes to ensure the ditches meet the design intent of conveying surface runoff.	c) Baffinland will review this recommendation with the geotechnical engineer for assessment during the 2025 annual Geotechnical Inspection.
R-11	Unauthorized Discharge Events	Among the 2023 approved effluent discharges, the following four discharges were not compliant with the applicable discharge criteria: from Milne Port Bulk Fuel Storage Facility MP-03, at the Contaminated Snow Containment Berm (MP- 04A), at the Mine Site at the Waste Rock Facility Surface Water Management Pond (MS-08), and the KM 105 Surface Water Management Pond (MS-11). • On June 12, 2023, a controlled discharge from the MP-03 bulk fuel storage facility exceeded water license criteria for total lead. • On September 5, 2023, a controlled discharge from the MP-04A Contaminated Snow Containment Berm exceeded water license criteria for TSS and total lead. • 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.	(R-11) CIRNAC recommends that Baffinland: a) Review the timing of KM 105 Pond controlled discharge initiation to better manage the freshet flow. b) Review and evaluate the adequacy of the current storage capacities for MP-05, MS-06 and MS-11 ponds in consideration of current site activity and topography, future planned activities, and post closure. Additional storage capacity is likely required to allow for improved management of freshet events. c) Review and evaluate the adequacy of the current infrastructure deficiencies in ditches and culverts.	a) The uncontrolled discharge from the KM 105 pond in 2023 was due to unforeseen seepage, rather than a pond capacity limitation. b) The Project is working to improve our understanding of containment pond water balances and associated discharge requirements. The adequacy of storage capacities of surface water management ponds is governed by multiple factors including environmental conditions, water quality, treatment and discharge rates, as well as pond capacities. All of these factors are considered in annual discharge decisions. Discharge volumes are reported in Monthly and Annual Reports, and will be utilized to support ongoing water management improvements. It should be noted that the km 105 dam is no longer operating as designed and water storage capacities do not govern the performance of the facility c) Maintenance of ditch infrastructure associated with water management and containment ponds is performed on an annual basis,

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		• On May 20, 2023, prior to initiation of controlled discharge of effluent from the KM 105 Pond, an uncontrolled release from the KM 105 Surface Water Management Pond (KM 105 Pond) resulting in elevated TSS concentrations of 200 mg/L above the water licence limit of 30 mg/ for TSS grab sample concentrations. Most of the discharge events appear to be associated with snow melt in May and June causing sedimentladen water to enter the surface water management ponds and in some cases trigger the need to initiate a controlled discharge to lower the effluent level in the pond. Repeated need to discharge from containment facilities using the Emergency Response Plan indicates insufficient factor of safety in the containment facility capacity. In 2023, twenty (20) spills were reported. The most common causes of reportable spills (reported to the NTNU Spill Line) in 2023 were surface water management infrastructure deficiencies. Surface water infrastructure deficiencies resulted in the ten (10) reportable spills of sediment-laden water; accounting for 50% of all reportable spills. The 2023 Annual Report (Table 6.2) indicates that 500 m3 of sediment laden water was discharged on May 20, 2023, from KM 105 Surface Water Management Pond following collection of a discharge sample with TSS above the discharge criteria outlined in the Type "A" Water License. The initial event resulted in elevated TSS concentrations of 200 mg/L; above the water licence criteria of 30 mg/L for TSS concentrations in a grab 14 sample in water quality samples collected from a newly established water quality monitoring station. The uncontrolled release happened prior to initiation of controlled discharge effluent from KM 105 Pond.	d) Review of procedures and training to determine the reason for continued discharge and spills at the collection of a sample with parameters exceeding TSS discharge criteria outlined in the Type "A" Water License.	in efforts to reduce potential sedimentation sources. Riprap, check dams, and other mitigations listed in the SWAEMP are employed as required. d) It is important to note that the analysis of Total Suspended Solids takes some time to receive results, and there is no 100% accurate proxy for TSS. Turbidity is used as an estimate of TSS, however the relationship between field readings of turbidity and the lab results for TSS are complex and do not represent a linear relationship. Specifically for the MS-08 non-complaint discharge in September, the field turbidity readings did not indicate a potential TSS issue. Regardless, as this sample was collected specifically for Monthly reporting purposes and further discharge of the facility was not required based on Pond elevations, this discharge was stopped immediately following the sample collection. The km 105 pond seepage was ongoing during 2024 and there was no discharge of effluent through MS-11.
R-12	Inadequate Preventative Maintenance at the MSC Wastewater Treatment Plant	As part of the 2022 Annual Report review, CIRNAC recommended that a preventative maintenance plan be developed for the Mine Site Complex (MSC) Water Treatment Plant which experienced a spill of 1,761,000 L which contained elevated ammonia and phosphorus. Baffinland indicated that the preventative maintenance program for the Wastewater Treatment Plan operations had been automated to mitigate equipment failures, with automatic maintenance program including OEM maintenance recommendations, parts and schedules.	(R-12) Close recommendation CIRNAC R-14 from the 2023 Annual Report review.	
R-13	Discrepancies with the 2023 Groundwater	The methodology of the 2023 Annual Groundwater Monitoring Program is presented within Appendix E.11.1 (Knight Piesold, 2024a); however, no results are presented in the report due to several	(R-13) CIRNAC recommends that Baffinland provide the following no later than September 30, 2024:	Response Provided to NWB November 15, 2024: a) There were several limitations identified by the consultant with the 2023 groundwater monitoring program including uncertainties of the impacts

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	Monitoring Program Report	omissions and obstructions that occurred which may impact the results and interpretations as stated by Knight Piesold. Additionally, all wells installed in 2023 were not installed as recommended with a bentonite seal which is considered "standard practice" to mitigate the risk of groundwater contamination from well installation. The installation of wells without the use of a bentonite seal allows "surface water to enter into the well" providing a preferential pathway for surface contaminants to enter groundwater.	a) Results of the 2023 groundwater sampling program and provide interpretation of the results. b) Complete a review of all issues which resulted in a years' worth of data being deemed potentially not representative of actual water quality. c) Develop a corrective action plan to address the issues identified in recommendation (b) above. d) Provide rationale for not using a bentonite seal for the wells installed in 2023. e) Provide a plan for addressing the risk of groundwater contamination from installing wells without a bentonite seal.	to data quality from perceived installation issues, development issues and sampling issues, all which lead to a level of uncertainty within the consultant's opinion that prevented them from being able to confidently draw conclusions from the data and sample results. In 2024, Baffinland contracted a new consultant to reassess the groundwater monitoring program limitations, investigate the influence of installation methods, sampling methods, and other variables on data reliability, and to develop suitable sampling protocols to monitor shallow subsurface "groundwater" monitoring wells at the landfill to obtain representative water quality data. Baffinland continues to work with our third party groundwater consultant to review 2023 and 2024 data and monitoring program to determine whether the data is representative and develop path forward in regards to future reporting. A Groundwater Monitoring Report with these findings will be submitted with the 2024 NWB/QIA Annual Report for Operations on March 31, 2025. b) The assessment completed above encompasses the requested review, the results of which will be presented in the 2024 Annual Groundwater Monitoring Report. c) Corrective actions from the above noted review in a) response will be addressed in the 2025 groundwater monitoring program. d) At the time of installation, we did not have the required supplies, or well design sufficient to install a bentonite seal on the wells installed in 2023. e) The seasonal thawing of the active layer system at Mary River creates a shallow unconfined zone of flowing water that consists of surface water infiltration and seasonal thawing of saturated soil, with some inputs from shallow seasonal thawing of permafrost. The current condition of the wells and representative water quality data is under review by Baffinland and it's third party consultant. Findings will be presented in the 2024 Groundwater Monitoring Report.
R-14	Risk-Based Screening Criteria for Groundwater Monitoring	Within Appendix E.11.2, the Milne Port Groundwater Assessment (Knight Piesold 2024b) presents the riskbased screening criteria to determine the need for groundwater monitoring. There are some discrepancies between what was considered high risk in Knight Piesold, 2023b compared to the ranking used for Milne Port. Knight	(R-14) CIRNAC recommends that Baffinland: a) Provide additional rationale as to how facilities are scored and how the levels of classification are chosen. If based on the ranking criteria used in Knight Piesold 2024b the landfill facility and	a) The groundwater risk assessment criteria were developed to guide Baffinland as to under what conditions it was appropriate to conduct groundwater monitoring of a given facility/area, when to continue or stop groundwater monitoring, and when to remediate or mitigate groundwater contamination or mobilization. The scoring system

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		Piesold, 2023b considered a high-risk site to be anything greater than a score of 12, which was later stated in R16 to have been incorrect, and a clarification stated that the correct interpretation was that anything that scored over 13 was considered high risk. In Knight Piesold 2024b, the "Contaminant Present Above Guideline" score was removed, reducing the maximum potential scoring system by 5 points (so the total score potential decreased from 21 to 16) However, the high-risk ranking criteria was only reduced from 13 to 12, which is not an accurate proportional reduction in comparison to the overall change in the ranking system. If the results from Knight Piesold 2023b were updated to remove the "Contaminant Present Above Guideline" category and use an updated high-risk criteria of 12 or greater, as in Knight Piesold 2024b, then neither the Hazardous Waste Berm Facility nor the Landfill Facility would be considered high risk, even though groundwater in the vicinity of these facilities has been found to have parameters exceeding the guidelines and increasing trends for several parameters. Therefore, groundwater impacts have been observed in facilities that are classified as "medium risk" based on the updated ranking criteria. In Knight Piesold 2024b, the contaminant mobility score varies depending on the location for the same contaminant. For example, the Port Site Complex and Hazardous Waste Berms both have PHCs listed as source material, but the Port Site Complex has the contaminant mobility listed as high while the Hazardous Waste Berms has the contaminant mobility listed as moderate. In Knight Piesold 2024b, there are only select locations within the Milne Port. One location of note that is not included within the risk ranking is the B1 pad. It is located adjacent to the Port Site Complex, so would score the same on most criteria, but as indicated by the spill report 2023-353, there was waste oil stored outside of secondary containment that resulted in a release of 500 L of waste oil within 74 m of a waterbody. Adding in the "no secondary containment" score to the PSC would result in a score of 12, which is considered high risk. In 2023, CIRNAC recommended that the WRF be included within the groundwater monitoring program. In Table E.12.3, Baffinland responded, stating that "during the 2021 groundwater monitoring program, a thirdparty consultant completed test pits within the WRF area, and no groundwater was observed". In Tetra Tech 2022, there is little information provided about the test pit program. Missing	hazardous waste berm facility are considered medium risk, then groundwater monitoring should be implemented at all medium risk facilities. b) Provide a rationale as to why select locations (e.g., B1) were excluded from the review. A waste oil spill of 500L occurred outside of secondary containment within 74 m of a water body. Using the nearby Port Site Complex as a reference with the upgraded proximity to receptor (<100m) and no containment present score, would score the site at 14 and rank it as high risk. c) Provide additional detail regarding the 2021 test pit program, including test pit locations, test pit logs and rationale on why two test pits are deemed to be sufficient for assessing the presence of groundwater in an area over 50 hectares. Rationale should also be provided for why the use of a drill rig for monitoring well installation within the WRF was not followed.	recognizes that there are no groundwater users in a permafrost environment, and thus no established regulatory criteria for groundwater quality. The main risk of groundwater impacts is the potential to seep into nearby surface water bodies and potentially affect aquatic life. It considers multiple inputs to assist in determining the risk at each facility/location. The method to determine the scoring risk was to assess factors that may contribute to groundwater impacts such as source material toxicity and secondary containment. Factors that influence the transport of contaminants were also considered including hydraulic gradient, soil type and proximity to receptors. It is believed that the methods in assessing the risk at each are representative for the facilities/areas at the Mary River site. Although the landfill facility and the hazardous waste berms are considered a medium risk, they are identified as the highest risk for groundwater impacts within the Mine Site, therefore Baffinland has initiated a groundwater monitoring program at these facilities. b) If a spill happens to be in proximity of ongoing groundwater monitoring wells or there is a significant risk to groundwater, then applicable monitoring will be considered. Generally, incidents are identified, responded to, and remediated within 24-hours. This expedited time will limit the risk and potential for any groundwater impacts as a result of spills. It is important to note that the active layer at the Project is completely frozen for the majority of the year (October to June) and that main groundwater aquifer is sealed below significant permafrost depth. Historically across the mining industry, groundwater is not a constituent of concern in high arctic permafrost environments, and was specifically excluded from the list of Valued Ecosystem Components during the Environmental Impact Review for the Project. The Final EIS states in Volume 7, Appendix 7A: *"… "water quality" has been identified as a VEC for this EIS. The water component of "water quality" refers to surface water (rivers, streams, lakes) and groundwater; however, groundwater quality is generally not considered to be at risk in the Project area because the extensive permafrost layer acts as an impermeable barrier eliminating/limiting potential migration of contaminants into the groundwater located below."* c) The Mary River Project is in a zone of continuous permafrost with a total depth of Permafrost extending to depths in excess of 600 meters. Due to

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		information includes the location of the two test pits, test pit logs and photos. Additionally in Tetra Tech 2022, it states that no groundwater was found, but one location had higher moisture content, and that a drilling rig is recommended for monitoring well installation in this area.		this fact, there are no areas of discontinuous permafrost that would require an additional test pits to prove the presence of permafrost over a larger area like the WRF. Because the permafrost has effectively aggregated into the Waste Rock Mass itself, there will be no mobilization of active layer below the original ground surface, and therefore no benefit to installing groundwater wells. Further details will be provided in a conceptual groundwater model in the 2024 Groundwater Monitoring Report, expected to be submitted with the 2024 NIRB Annual Report.
R-15	Preliminary Containment Transport Model	Recommendations (R-17) from the previous review, followed by Baffinland's Response (from Appendix E.12 of the 2023 Annual Report) are listed in italics below. Comments and recommendations from the 2024 review are then provided in non-italic font. (R-17) CIRNAC recommends that Baffinland expand the groundwater contaminant transport model to assess the potential impacts to receptors from all active facilities. ***Baffinland's Response:*** *The contaminant transport model for the landfill and hazardous waste berm facilities continues to undergo further refinement. In order to develop a contaminant transport model for the other facilities, groundwater and soil data would be required; however, the medium risk facilities are not anticipated to have groundwater impacts. It is believed that the investigations required to develop a contaminant transport model for each of the medium risk locations is not warranted. Additional well installations, monitoring, and data collection occurred over the 2023 season to increase the accuracy of the landfill and hazardous waste berm contaminant transport model. Due to some unforeseeable issues, Baffinland intends to make further enhancements to the groundwater monitoring program and well installations to improve data reliability and complete necessary refinements to the landfill and hazardous waste berm contaminant transport model following the 2024 sampling campaign.* **2024 Comment:** CIRNAC notes that the risk classification system developed for groundwater relies on the assumption that there are no groundwater impacts at a site and that anything lower than a high risk site is not anticipated to have any groundwater impacts present; however, there is no supporting evidence to validate this assumption,. Baffinland assumes no groundwater impacts if there is no indication	(R-15) CIRNAC recommends that Baffinland: a) Expand its groundwater contaminant transport model to assess potential impacts to water features from all areas where mine wastes used for construction purposes are not contained behind a storage pond or treatment plant. This includes other non-lined waste rock storage areas where groundwater active zones may be present. b) Include leachability studies as a response option for adaptive management action toolkit if soil metal concentrations are higher than baseline or CCME guideline values over two consecutive years. Baffinland include this amendment in the next update to the Terrestrial Environment Mitigation and Monitoring Plans as per Baffinland's Project Commitments B2, 20 in Appendix F of the NIRB report (Commitment 20 from the Sustaining Operations Proposal, also Commitment #1 in Table #.12.2: Response to ECCC Comments on Baffinland's 2022 QIA-NWB Annual Report for Operations in Appendix E.12 of the 2023 Annual Report).	a) As discussed in the 2022 NWB QIA Annual Report for Operations (Appendix E.12.2, Table 3.1), the waste rock facility is not recommended for groundwater monitoring for the following reasons: i. Due to the lack of groundwater observed in the Tetra Tech test pits (in 2021) and because seepage collection ditches are situated down gradient of the WRF, it is not recommended to include the WRF in the existing groundwater monitoring program. Also as assessed in Volume 7 of the Final EIS for the Project (Appendix 7A): *"… "water quality" has been identified as a VEC for this EIS. The water component of "water quality" refers to surface water (rivers, streams, lakes) and groundwater; however, groundwater quality is generally not considered to be at risk in the Project area because the extensive permafrost layer acts as an impermeable barrier eliminating/limiting potential migration of contaminants into the groundwater located below."* b) Baffinland will take this recommendation into consideration.

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		of activities that may contribute to groundwater impacts. Evidence suggests that there are several instances which provide indication of activities that may contribute to groundwater impacts, including documented spills to ground outside of lined facilities and ARD conditions at the WRF where water flows through unlined ditches. It doesn't appear that Baffinland considers spills or uncontained mine-impacted water to be considered an indication of activities that may contribute to groundwater impacts. Baffinland acknowledges the presence of a groundwater active zone at the Mine Site. WSP's 2023 Water Quality Model Update identifies source terms for the different types of waste rock, a conceptual site model for the WRF and seepages and interflow losses from the WRF Pond. It is noted that under WSP's "conservative case" water quality model, the non-PAG waste rock seepage concentrations are approaching the Type A Water Licence limits and are greater than the CCME AW guidelines for several parameters, including copper, which is known to cause sublethal effect to fish at lower than the modelled concentrations. The location of placement, metal concentrations and leachability data for the PAG, Non-PAG and waste rock used for construction purposes was not provided to the review team. As demonstrated by the WSP model, non-PAG waste rock can be considered leachable under neutral conditions, and in the absence of the data, CIRNAC assumes that this material is not suitable for use within 100 m of water features, as per Project Commitment Number 65 in Appendix A of the NIRB Report. Conceptually, non-PAG waste rock placed along road surfaces, in the 105 KM dam, etc. have the potential to leach dissolved constituents (i.e., copper or arsenic) into the groundwater active zone, which can then migrate to water features such as the Mary River or Camp Lake.		
R-16	Waste Rock Storage	Comments and recommendations (R-18) from the 2022 Annual Report review are listed in italics below, followed by comments from the 2023 Annual Report review. *a) Provide additional information on where waste rock material was used for construction purposes.* Baffinland reported several locations where mine waste rock was used for construction purposes in the responses to this comment made in 2022; however, the 2023 Annual Report does not contain	(R-16) CIRNAC requests that Baffinland: a) Ensure, moving forward, that Annual Reports contain a clear overview of those locations in form of a table, map, or similar. i. Provide an overview of the locations where waste rock material has been used as construction material for the 2023 season and include in all future annual reports. We also recommend Baffinland provide the details on waste rock placement by area, rock type and	a) Moving forward, a new table will be provided in annual reports summarizing the locations where Deposit 1 waste was used for construction purposes, as well as the relevant chemistry of that waste rock to validate its material type (i.e. % S and paste pH). The 2024 annual report will also provide a summary of the 2024 Deposit 1 waste used for construction purposes. Additional monitoring and testing of waste material, on top of what is already committed to in the QAQC plan, is not currently being considered. Baffinland completed ABA, SFE and total metal analysis testing on DDH samples collected throughout Deposit 1 during the initial geochemical

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		information on the locations where waste rock was used for construction purposes in 2023. *b) Provide additional information for why waste rock material was not placed in the Waste Rock Facility as per the Waste Rock Management Plan.* Baffinland pointed out that their WRMP allows for the use of non-PAG waste rock to be used as construction material but does not provide clear data that the rock is not metal leaching (see subsequent comments below). *c) Provide testing results of the waste rock material that was used for construction purposes to confirm the waste rock is Non-PAG.* Baffinland's response was that this information was "detailed in Appendix E.6 of 2022 NWB QIA Annual Report for Operations". While Appendix E.6 lists all the samples that were analyzed for on-site paste pH and Sulphurcontent, it does not identify which of those samples correspond to waste rock material used for construction purposes. *d) Provide detailed figures showing the location of the deposited PAG and non-PAG waste rock, as well as waste rock used as construction material.* Appendix E.14 contains figures identifying the location of PAG and non-PAG material placement in the WRF but does not contain figures showing placement in construction material. The 2022 Annual Report does not provide all the locations of waste rock used as construction purposes on drawings, instead it provides a written description as stored at the Viper Pit Laydown, Mine Haul Road, 560 Hill Side Road, KM104.5 Pad, Camp Lake ESC, Land Farm, KM 105 Water Treatment Plant and KM 105 Dam Structure. Without information regarding specific placement locations there is limited ability to assess potential impacts to water quality resulting from placement of the material. *e) Provide a discussion for ceasing using waste rock as a construction material until it can be demonstrated that it does not exceed Canadian Council of Ministers of the Environment (CCME) agricultural land use standards and is non- acid generating. These test results should be made available in the annual reports going forward and provided to an inspector upon request.*	geochemical testing to include modified Sobek ABA, shake flask extractions and total metals. b) Provide additional information for why waste rock material was not placed in the Waste Rock Facility as per the Waste Rock Management Plan c) Add information to the analytical tables in order to identify which material has been used as construction material. d) Provide figures showing the location where waste rock was used as construction material. e) Include a discussion on non-acid or neutral metal leaching of waste rock used for construction material.	characterization of the LOM waste rock. More recently, a 2019 geochemistry report from Golder (2019 GEOCHEMISTRY WASTE ROCK INVESTIGATION RESULTS) provides results and interpretation of ABA, SFE and total metal analysis testing completed on waste samples collected during a 2019 sampling program. The latest waste rock geochemical characterisation report is from WSP (2020 to 2022 Waste Rock Geochemistry) and provides results and interpretation of ABA and SFE test results from blast hole samples collected between 2020 and 2022. This data was considered during the development and validation of BIM's waste rock classification criteria for Non-AG and PAG waste rock, to manage both acid rock drainage and metal leaching. Baffinland's existing commitment to perform ABA and SFE testing on a subset of its blast hole samples (in addition to ongoing water quality sampling and thermal monitoring at the WRF), and ABA analysis on 30% of the waste dump samples collected as part of the verification sampling for progressive reclamation, will provide the means for continuous monitoring and validation of the existing screening criteria to manage both acid rock drainage and metal leaching. b) The use of mining waste rock for construction is standard practice across the mining industry to minimize waste and extraneous land disturbance. c) Refer to response "a)" above. d) Refer to response "a)" above - this table will also include approximate coordinates for the various construction activities, similar to what Baffinland provides in its Annual Work Plan table. e) The screening criteria outlined in the Phase 1 Waste Rock Management Plan is used to confirm Non-AG or PAG and criteria has been developed to mitigate both acid rock drainage and metal leaching. The reviewer is directed to the WSP 2023 report (2020 to 2022 Waste Rock Geochemistry), the Golder 2019 report (2019 GEOCHEMISTRY WASTE ROCK INVESTIGATION RESULTS), and the AMEC 2014 report (MINE ROCK ML/ARD CHARACTERIZATION REPORT), for available data as well as discussion surrounding the justification for the existing waste rock screening criteria.

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		The NWB Type "A" Water License No. 2AM-MRY1325 specifies under Part D Conditions applying to construction and operations in Section 13 "The Licensee shall use fill material for construction from approved sources that been demonstrated by appropriate geochemical analysis to not produce acid rock drainage and to be metal leaching properties". While material was tested for potential acid generation, metal leaching at non-acidic pH was only tested on a subset via Shake Flask Extraction. A discussion whether these results demonstrate the non-metal leaching properties of the material is not provided.		
R-17	Leachate at the Landfill Facility and Waste Management	In the 2022 Annual Report, leachate was identified as an issue at the Mine Site Landfill Facility. Documentation from inspection reports identified that that non-inert materials were entering the facility. In 2022, groundwater monitoring identified leachate in all test pits (4) within the landfill. Inspection reports detailed corrective actions and characterization of waste composition within the Landfill Facility. For example, Section 9.4 of the 2022 Annual Report stated that incinerator ash sampled on March 15, 2022, and August 2, 2022, had chromium exceeding the criteria for process residuals from Environmental Guideline for Industrial Waste Discharges into Municipal Solid Waste and Sewage Treatment Facilities (Government of Nunavut, 2011) for non-hazardous solid waste. The ash was then placed in bags and resampled and deemed to pass. This ash was then placed in the Landfill Facility where contaminant leaching was later identified as an issue. In the 2023 Annual Report under Appendix E.12 - Response to 2022 Annual Report, Baffinland provided rationale regarding their retesting, and agreed to determine if elevated concentrations in incinerator ash could be a meaningful landfill leachate source. Furthermore, Baffinland also provided a commitment related to the monitoring of wastes and a waste audit between the 2024-2025 operating season to confirm what wastes and relative quantities are disposed of in the facility and to confirm that noncompliant wastes are not placed in the facility. • Incinerator ash remains an issue with one (1) ash sample from the Mine Site on January 10, 2023, and four (4) ash samples from Milne Port on January 25, March 4, June 19, and December 10, 2023, above the applicable criteria of 5 mg/L for chromium. Retesting showed	(R-17) CIRNAC recommends that Baffinland: a) Provide additional rationale for re-testing of failed incinerator ash and requests that the parameters included in the Toxicity Characteristic Leaching Procedure (TCLP) analysis be expanded to include the dissolved parameters identified within Landfill Facility leachate: chloride, fluoride, sulphate, boron, iron, manganese, zinc and uranium. b) Provide the inspection reports from the Landfill Facility and inventory of materials entering the landfill (i.e., incinerator ash, open burning ash, etc.) in the 2024 Annual Report to verify leachable materials are not entering the Landfill Facility. c) CIRNAC requests that waste auditing results planned for 2024/2025 be provided for detailed review in subsequent annual reports. d) Ensure that future reporting characterizes incinerator ash as non-hazardous only if certified lab testing demonstrates compliance with the criteria for process residuals.	a) Re-testing was conducted as part of a follow-up investigation, as per the Waste Management Plan, which states, "If monitoring indicates ash exceeds applicable guidelines and is not suitable for landfilling, an investigation will be undertaken to identify the cause and identify a solution." Re-testing was used to confirm if the previous result was representative or anomalous. If testing confirmed ash contained contaminants above thresholds, ash was packaged up and backhauled for disposal off site. Of the additional parameters listed by CIRNAC, zinc and uranium are part of the existing sampling program. Baffinland will review the other parameters (for which there is no threshold) to determine if TCLP testing is warranted in in future years to determine if elevated concentrations are present that could suggest the incinerator bottom ash is a potentially meaningful source of landfill leachate. b) The Waste Audit completed in 2024 is included in Section 5.2.3 of the 2025 NWB QIA Annual Report for Operations. c) The Waste Audit completed in 2024 is included in Section 5.2.3 of the 2025 NWB QIA Annual Report for Operations. d) Ash will be continued to characterized and will only be disposed of in the landfill if it meets applicable criteria, as per Baffinland's Waste Management Plan.

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		compliance for most of the ash and that non-conforming ash was segregated and will be shipped offsite as hazardous waste in 2024. • Section 5.2.3 indicates that non-hazardous wastes include incinerator ash. There was no qualifying statement to indicate that ash is only considered non-hazardous following certified lab testing for compliance with the criteria for process residuals.		
R-18	Alternative Remediation Methods for Hydrocarbon-Impacted Soils	The 2022 Annual Report in Section 5.2.4 discussed the need for alternate remediation methods for hydrocarbon impacted soils. CIRNAC recommended that finding a successful remediation method for hydrocarbon contaminated soils should be prioritized and the development of additional Landfarm facilities should be avoided beyond the ones currently planned or under construction. Long term storage of hydrocarbon contaminated soils should be avoided. If continued remediation efforts remain unsuccessful, then the option of offsite shipping should be considered, followed by expanding the onsite storage area. The 2023 Annual Report in Section 8.1 Progressive and Final Reclamation, in addition to Table 8.1, does not provide further details regarding alternate remediation methods.	(R-18) CIRNAC recommends that Baffinland: a) Prioritize examining alternative remediation methods over the development of additional Landfarm facilities beyond the ones under construction or already planned. b) That the 2024 Annual Report provide further detail related to this initiative.	a) Acknowledged. Baffinland has attempted a number of treatment options with limited success due to the short frost-free season, but will continue to prioritize the investigation of alternative remediation methods for the treatment and disposal of hydrocarbon impacted soils. b) Due to various operational issues, sufficient details are not yet available for inclusion in the 2024 Annual Report.
R-19	Waste Rock Facility QAQC Monitoring Plan	The Waste Rock Facility QAQC Monitoring Plan provided as Appendix B of the Annual Report lists the objectives for this scope of work, which includes assessing the chemical stability of the WRF to ensure that the processes outlined as part of the WRMP are adequate with respect to limiting ML/ARD and support future updates to the water quality model. The details of the selected water quality sampling parameters provided in the Waste Rock Facility QAQC Monitoring Plan are unclear to CIRNAC and additional parameters should be included to support the objectives.	(R-19) CIRNAC recommends that: 20 a) Water quality samples should be analyzed per the Group 7 parameters listed in Schedule I, Table 12 of the WATER LICENCE NO: 2AM-MRY1325, which includes both total and dissolved parameters. b) Flow rates should be measured from seepages and collection ditches to refine the water balance and support the geochemical review of the WRF performance.	a) Baffinland will review the request to monitor for dissolved metals b) Flow rates are extremely difficult to measure in the field when there is an undefined flow as there is in the seepages and water collection ditches around the WRF. Baffinland will investigate the opportunity and potential for accurately measuring the flow rates of these areas.
R-20	Reported Spills	As follow-up to feedback shared in the 2021 Annual Report (2021 R-06), information deficiency was identified in relation to the root cause analysis of spill incidents. In Section 6.1, Spills of the 2022 Annual Report, Baffinland continued to indicate that they conduct incident investigations to identify root causes of reportable incidents so that effective long-term corrective actions can be developed and implemented. Incident investigations were conducted for reportable spill events in 2022; however, root cause findings were not provided in Section 6.1 or Table 6.1. It was unclear if follow-up actions were	(R-20) CIRNAC recommends that Baffinland: a) Continue to report on and address root causes and related corrective actions for spills in future reports. b) Update the Spill Contingency Plan to include root cause findings as a key aspect of the Plan (including methodology for site staff to follow),	a) Baffinland will continue to investigate and report the root causes of all reportable incidents, as well as corrective actions. b) Baffinland has an internal process for the investigation of all incidents, including reportable spills, that includes a root cause analysis. It would not be appropriate to duplicate the requirement for the SCP, but we can refer to this process in the next edit of the SCP.

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		undertaken to address root causes. Baffinland noted that preventative maintenance plans and prescribed training sessions were conducted in 2022, and these initiatives may address root causation related to spills; however, these initiatives were not connected to a spill incident's corrective measures related to root causation in Section 6.1 or Table 6.1. In Section 6.1 Spills of the Annual Report, Baffinland indicated that they continued to conduct robust incident investigations to identify root causes of reportable incidents so that effective long-term corrective actions can be developed and implemented. An incident investigation was conducted for all reportable spills to assist in determining the root cause and in identifying effective corrective actions. This addresses part of the recommendation R-06 b provided in CIRNAC's 2022 review. Additionally, within the reported spills (Section 6) of the Annual Report, it is noted that the most common causes of reportable spills (reported to the NT-NU Spill Line) in 2023 were surface water management infrastructure deficiencies, which resulted in eight (8) reportable spills of sediment-laden water in 2023; accounting for 40% of all reportable spills. Corrective actions addressing these deficiencies were not located by CIRNAC in this case.	and to consider staff training to undertake root cause spill investigations. c) Provide information on what measures are being taken to improve the surface water management infrastructure deficiencies as well as any immediate effective corrective actions taken to mitigate reoccurring spills.	c) Corrective actions for each incident are outlined in the spill follow up report that is submitted to CIRNAC and QIA.
R-21	Stormwater from Containment Areas	In Section 7.2 of the annual report Baffinland stated "There was one (1) indicated exceedance of the applicable water quality discharge criteria during the 2023 discharge from MP-03 from external laboratory results or in field monitoring. On June 12, 2023, a controlled discharge from the MP-03 bulk fuel storage facility exceeded water license criteria for total lead. On September 5, 2023, a controlled discharge from the MP-04A Contaminated Snow Containment Berm exceeded water license criteria for TSS and total lead. Following internal water quality analysis indicating compliant results for pH, ammonia (NH3), TSS and total oil and grease, discharge from the MP-04A Contaminated Snow Containment Berm was initiated on September 5, 2023. Laboratory results for the discharge sample collected on September 5 showed a TSS concentration of 141 mg/L and a total lead concentration of 0.014 mg/L, exceeding water license criteria of 15 mg/L and 0.001 mg/L respectively, for parameter grab sample concentrations."	(R-21) CIRNAC recommends that: a) Water quality monitoring and sampling for metals, total oil and grease and TSS and that a review of the analytical results of the stormwater be carried out before discharging to the environment in order to prevent the release of contaminants into the environment. b) Stormwater only be discharged after receipt of all laboratory results to confirm compliance with the Water Licence.	a) Acknowledged. Whenever possible, considering seasonal conditions and logistical limitations, pre-discharge samples were collected and the results confirmed as compliant in 2024, prior to initiating discharge from the facilities. b) Acknowledged. Whenever possible, considering seasonal conditions and logistical limitations, discharge only occurs once the analytical results are received and effluent criteria as outlined in Schedule 1 of the WATER LICENCE NO: 2AM-MRY1325 are met.

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		Initial approval for discharge appears to base on select parameters and in advance of the receipt of all laboratory results.		
R-22	Missing Schedule I Monitoring Parameters for Surface Water Quality	Condition 5 of Part I – Conditions applying to General and Aquatics Effects Monitoring requires that Baffinland *"undertake a Monitoring Program as provided in Schedule I – Conditions Applying to General and Aquatics Effects Monitoring"*. Under Condition 21, Baffinland "shall submit to the Board a Monthly Monitoring Report which includes: a. All data and information required….in the tables of Schedule I. " Schedule B. General Conditions "The Annual Report….shall include 1(e)(iii) tabular summaries of the results and interpretation of all data generated under the Monitoring Program in Part I and Schedule I." On review of attached tables which present the water quality results for water license monitoring locations, CIRNAC notes Baffinland have not met the above conditions, where the 2023 results of the Group 7 monitoring parameters for field parameters pH, temperature, turbidity and specific conductance are not presented in the Annual Report.	(R-22) CIRNAC requests that Baffinland provide all results of the Schedule I monitoring parameters required by the Water License no later than September 30, 2024, and in all future Annual Reports.	Response provided to NWB November 15, 2024: See Appendix 2 with the requested updated tables 7.2.6, 7.2.7, 7.3.3, 7.3.4, 7.3.5 and 7.3.8. This information will be included in future annual reports filed with the NWB.
R-23	Missing Sediment Quality Assurance and Quality Control Results	Section 3.9 of Appendix E.5.3 - Aquatic Effects Monitoring Plan (AEMP) states that a strict QA/QC program is in place which includes the collection of duplicates, blank and travel blank samples to be submitted for analysis with routine samples at a rate of approximately 10% of overall number of samples. Within Appendix E.9.1 the 2023 Core Receiving Environment Monitoring Program (CREMP) Report, intended to meet the objectives of the AEMP. CREMP Appendix A presents the Data Quality Review. On review of CREMP Appendix A, CIRNAC notes that no QA/QC results for sediment quality are presented or discussed in the CREMP (including Appendix A). Appendix E.9.1, Section 2 Methods explicitly states *"the 2023 study included field sampling and standard laboratory QA/QC for water quality, phytoplankton (chlorophyll-a), benthic invertebrate community and fish age analysis study…"* but omits mention of QA/QC for sediment quality. The absence of the data reporting for sediment quality QA/QC contradicts Baffinland's statement that the overall the data associated with the 2023 CREMP are considered defensible and acceptable for interpretation and derivation of conclusions with a good level of confidence.	(R-23) CIRNAC recommends that Baffinland complete the following no later than September 30, 2024: a) Revise the 2023 Annual Report to include rationale for the absence of a data quality review (CREMP Appendix A) for sediment quality. The absence contradicts Baffinland's strict QA/QC program. b) Revise the 2023 Annual Report to include a corrective action plan to address the sediment data quality reporting deficiency. c) Revise the 2023 Annual Report to include a comment on the defensibility and acceptability of the sediment quality results interpretation of the 2023 CREMP report in the absence of a data quality review for sediment quality,	Response Provided to NWB November 15, 2024: a) The absence of a data quality review in CREMP Appendix A for sediment quality was an oversight. See response to (c) below for this information. b) A data quality review for sediment quality will be included in all future versions of the CREMP report. c) Analytical results from ALS Environmental were used in review of data quality for sediment quality samples collected as part of the 2023 CREMP. Laboratory Blanks - Method blank (MB) samples for metals (n=12), total organic carbon (n=12), and % moisture (n=4) were analysed and all 401 MB analyte results met the laboratory data quality objective (DQO), indicating no inadvertent contamination within the laboratory. Data Precision - Laboratory duplicate samples for metals (n=11), total organic carbon (n=12), % moisture (n=4), and particle size (n=4) were used to evaluate precision of laboratory analyses. All of the 288 analyte results for laboratory duplicates met the laboratory DQO, and thus the laboratory precision was considered excellent and acceptable for this study. Data accuracy – Laboratory control samples (LCS; created in the lab to have a known analyte concentration in a matrix free of interferences, such as reference sand) for metals (n=9), total organic carbon (n=10), and %

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				moisture (n=4) and reference material (RM) samples for metals (n=9), total organic carbon (n=10), and particle size (n=4) were used to evaluate accuracy of laboratory analyses. Of 1,017 analyte results only four did not meet the laboratory DQO. Thus, the laboratory accuracy was considered excellent and acceptable for this study. Sediment quality data collected for the 2023 CREMP were considered acceptable for this study as characterized by negligible concentrations in MB samples and excellent laboratory precision and accuracy. All quality control samples generally met the laboratory DQOs, and overall, the associated data can be used with a high level of confidence in the derivation of conclusions. d) With the information provided above, a revision to the 2023 NWB QIA Annual Report for Operations is not required.
R-24	Thermal Monitoring and Modeling	A thermal assessment was undertaken by Baffinland to characterize the freezing patterns of deposited waste rock. The instrumentation program implemented for the thermal assessment included thermistors, oxygen sensors, fluid pressure sensors (to measure fluid held within the waste deposit voids), barometers, and piezometers. Review of the 2024 Waste Rock Management Plan shows that, among the installed instrumentation, only thermistors have performed well. No data has been reported from oxygen sensors, barometers and Vibrating Wire Piezometers (VWPs). Most of these instruments were reported as non-functional. The thermal data of the waste rock is important to confirm the freezing of the waste rock. This is the only mitigation strategy to prevent ML/ARD production within the waste rock. The oxygen and barometer data are important to determine the source of heat anomalies in the WRF (e.g., ARD, influx of warmer air). The data from the flow meter and VWPs inform about the presence of liquid water, a requirement for ARD to occur. **Calibration, Validation, and Sensitivity Analysis** Section 4 and 5 of "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 waste rock facility. The standard procedure for the calibration of a model such as this is that the model is calibrated based on a set of historic data and the calibration validated	(R-24) CIRNAC recommends that Baffinland: a) Continue with additional instrumentation and monitoring and update its thermal analysis to include the heat balance and oxygen balance across the WRF. b) Provide flow characteristics of the frozen waste rock mass and ensure that it meets the design intent. c) Consider restoring oxygen probes, barometers and possibly flow meters (as opposed to abandoning these non-functioning instrumentation). d) Clearly describe all the calibration steps performed for the thermal model, how the calibration was validated, and the kind of sensitivity analysis performed. e) Calibrate the model only with verifiable historical data. f) Discuss the impact of the small amount of calibration data used on the validity of the model results.	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" thermistors, 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 is regularly communicated to regulators Baffinland has completed the installation of three (3) additional thermistors, plus has replaced one thermistor that was previously down. An installation update will be provided in the 2024 QIA-NWB Annual Report. 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. b) 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 minimizing ARD/ML by limiting water flow through the pile and slowing the rate of sulphide oxidations due to freezing conditions.

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		based on a second, independent set of data. Following the validation, a sensitivity analysis is performed. The validation step is important to confirm that during the model calibration parameters have not been adjustedto fit the calibration data set leading to unnatural results when using a different data set. A sensitivity analysis is important to determine how sensitive the model is to changes in certain parameters, and thus to the potential impact of erroneous measurements, extreme conditions, or changes in conditions. A validation and sensitivity analysis were not described in the report. Additionally, the model has been calibrated with temperature data from three years, one of which was missing for about six months. The gap was filled with data from the previous year (2020-2021). The data from the two previous years are distinctively different, especially the 2020-2021 data set shows some elevated temperatures in late winter, that might not represent baseline conditions. Choosing the 2020-2021 over the 2019-2020 data set or an average of the two years seems unwarranted. On the other hand, using data that is incorrect (since it was taken from a totally different year) for the calibration of a model will undermine the validity of the calibration, independent of the source of the non-real data. Three years of temperature data is a fairly small data set for a model validation. **Thermal Model Reports** The report contains "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" from August 29, 2023, Reference No. 22572750-004-2000-Rev0, and "Appendix E.14.2 – Technical Memorandum: Assessment of Instrumentation Data and the Thermal Regime of the Waste Rock Storage Facility at Mary River Mine" from June 27, 2023, Reference N° 22572750_002_Rev0-TM". While most of the data and text in the two documents are the same, there are still some differences, for example in the two versions of Table 1 and differences in waste rock heights in the text in both of the above-mentioned documents.	g) Explain the reason for the differences in the documents presented and if both documents are required as attachments.	c) 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. d) 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. Rock fill 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 rock fill in those areas. Changes in rock fill elevation in the pile is tracked through sequential surveys that are conducted routinely. The timing of rock fill placement in the model (i.e., date when the model geometry was adjusted), and the associated placed rock fill temperature were the model inputs that had the most impact on the model results. The calibration process tested rock fill placed at different dates between two (2) surveys and the final rock fill 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 rock fill 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. e) Validation of the calibrated parameters was through comparisons of model results with measured data from the reference thermistor

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				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. f) See above answer to e). g) Both documents are not required, and BIM directs the reader to the latest issued report titled "Thermal Model and Assessment of Conceptual Summer Deposition Strategies for the Waste Rock Storage Facility at Mary River Mine Technical Memorandum" from August 29, 2023. This is the required document and is the report found within Baffinland's last issued Phase 1 Waste Rock Management Plan.
R-25	Thermistor Data	The main mitigation method used in the waste rock dump to prevent ML/ARD is the freezing of waste rock and placing the PAG waste rock away from the edge/active zone of the dump that experiences seasonal thawing (also see comment #5). 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. The temperature increase in the waste rock follows the air temperature increase with a delay of ~10 days. The elevated temperatures stabilize after two to three months and remain elevated for six to nine months (depending on depth) and up to approximately 4 months after the air temperature has dropped again due to winter conditions. The inflow of warmer air is used as explanation for the long-lasting elevated temperatures between 4.8 m and 10 m, the increase in temperatures in deeper layers, and deviation of modeled vs measured temperatures along the thermistor string. The thermal model is based on conductive heat transfer, and no inputs of heat generation from geochemical changes or convective air flow have been incorporated into the model. Deviations from the expected waste rock temperatures have been attributed to geochemical changes and/or convective air flow. No analytical basis or discussion of the impact on the chemical stability of the waste rock	(R-25) CIRNAC recommends that Baffinland: a) Evaluate other potential causes of the elevated temperatures in the waste rock dump and discuss the potential impact on future ML/ARD development within the waste rock. b) Evaluate other potential causes for the warming trend in the deep layers throughout the measurement period. c) Report on the limitations of the present thermal model by not incorporating heat generation from geochemical reaction and convection. d) Revise modelling to determine potential effects resulting from inflow of warmer air and temperature increases from 5 to 10 m depth in the waste rock dump. e) Consider and examine the potential for the contribution of ground subsidence to the negative elevation observations. The installation of some settlement plates should be considered.	a) 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. Earlier in 2024, three (3) additional thermistor strings were installed in target locations in the pile, with a fourth thermistor string installed to replace a damaged and previously "down" Thermistor. These installations will 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 behavior of the pile, supporting calibration of thermal models, and guiding the planning and execution of mitigation options. 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

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		was presented. Other influences besides the inflow of warm air are briefly mentioned, but the potential impact was not discussed. Increasing temperatures in the deepest layer are explained by the same mechanism, however, the deeper layers show increasing temperatures prior to the inflow of warm air requiring a different explanation of the trend. At instrumentation locations T2 and T3, negative elevations of 2 to 4 m have been reported, and these have been attributed to factors such as seasonal snow-pack accumulation, survey errors, pile consolidation, and excavation, but there was no mention of any ground subsidence. Verification of potential ground subsidence should be examined, especially since, at these two locations, very little or no rockfill was placed during the period where negative elevations were observed.		warranted. b) Temperatures greater than 0 °C have only been associated with the top 3 nodes of thermistor strings, which correspond to the seasonally thawed active layer every summer. There is a minor warming at depth just slightly above 0 °C (0.1-0.2°C) per year between the 560-570 elevations. This warming trend appears to be correlated with seasonal air temperatures, and does not appear to be geochemical in origin. c) Because of the effects of permafrost heat loss through convection, the modeled and measured thermal results are indicative of no geochemical reactions taking place at below freezing temperatures. d) 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 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. e) An overall review of the 2024 WRF settlement map indicates no significant settlement at the thermistor locations from summer to summer. Apparent elevation changes in areas of no activity (active dumping or aggregate removal) may be attributed to snow accumulation and melting on subsequent surveys.
R-26	Permafrost Storage as Main Mitigation Strategy	The main proposed mitigation method used in the WRF to prevent ML/ARD is the freezing of waste rock and placement of PAG waste rock away from the edge/active zone of the dump that experiences seasonal thawing. Substantial investigations were undertaken to determine if the PAG waste rock is frozen within a reasonable amount of time to prevent ML/ARD. Temperatures below the active zone in the waste rock dump ranged from -5°C to -7°C.	(R-26) CIRNAC recommends that Baffinland: a) Evaluate the predicted ground surface temperatures and permafrost development in light of the effects of climate change on the waste rock pile using recent climate change predictions. b) Examine and explain the reasons behind a trend of increasing surface temperature at BH1 at	a) 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. b) 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

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		Global warming leads to increasing temperatures, with Arctic regions observing higher than average warming trends. This warming will ultimately lead to the degradation of permafrost. The 2023 Annual Report is missing a discussion of the effect of this warming on Baffinland's permafrost mitigation strategy. The 955-221 Mary River Mine 2023 Environmental Audit states that "Thermal modelling of the WRF has not been completed to understand the thermal regime within the WRF under future conditions, or under any climate change scenarios." Additionally, in 2022, NIRB Monitoring Officers identified issues with permafrost degradation along the Tote Road showing that permafrost instability is already occurring. The thermistors at BH1 show an increasing temperature trend throughout the WRF (down to 19 m). This trend started before the inflow of warm air to shallower depth, thus, this inflow cannot explain the trend. This observation underpins the need of an understanding of impacts of the long-term climatic trends in the region.	about 19 m depth , as well as what implications it may have to the thermal/physical stability of the pile.	instrumentation data at that time. For the 2023 assessment, it was observed during the instrumentation data review that a prolonged period of warmer rock fill temperatures occurred at BH1 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. c) 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). 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 rock fill temperature within the affected zones along BH1 remained well below the freezing point during the warming event.
R-27	Sulphur-Independent Acidification in ML/ARD Samples	A small fraction of the ML/ARD rock samples from the drill cores had a low paste pH (i.e., pH < 6). Due to the protocol for the paste pH measurement, low pH cannot be attributed to sulfide oxidation, the most common reason for acid generation in mining related rocks. Baffinland argues that the low paste pH is due to dissolution of soluble sulphate minerals such as melanterite. The only reference to melanterite presence in the rocks states that it is present in "very minor quantities". It is unclear what the relative abundance of these "very minor quantities" are and whether they are sufficiently abundant to lower the paste pH to the observed values. Some ML/ARD waste rock samples had elevated iron concentrations after Shake Flask Extraction (SFE), which could confirm the presence of melanterite and increased soluble sulphate. The data and information presented in the report is insufficient to evaluate if those issues are linked and support Baffinland's hypothesis regarding low paste pH.	(R-27) CIRNAC recommends that Baffinland: a) List the concentration range of the melanterite measured in the waste rock samples. b) Correlate SFE iron and sulphate concentrations for waste rock samples with low paste pH. c) Evaluate if melanterite dissolution could provide the required acidity.	Baffinland has engaged Stantec to develop a comprehensive Pit Water Quality Model that will take into consideration all aspects of the listed recommendation, including modelled Melanterite concentrations and potential dissolution mechanisms. The Pit Water Quality Model will evaluate all inputs and considerations affecting ARD potential and other mechanisms that could contribute to the dissolution of metals from the mine ore and wastes and the resulting short and long term effects on water quality.
R-28	Dustfall Waste Deposit to Water	With reference to the Water License Annual Report requirements found under Schedule B e. i., Baffinland is required to report on monitoring under the AEMP Framework and other monitoring requirements, which includes any program, regime or plan authorized by the Board in writing. Furthermore, the Nunavut Waters	(R-28) Regarding insufficient dust data reporting regarding Schedule B e. i., CIRNAC recommends that: a) The 2023 Annual Report is deemed unsatisfactory for the purpose of adequately	Response Provided to NWB November 15, 2024: Dust is not a "waste" under the NWNSRTA and its regulations, and is not regulated as a waste under Water Licences issued by the NWB. Instead, dust associated with the Project is an air emission addressed under the Project Certificate terms and conditions. Accordingly, Baffinland reports on dust

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		Regulations under Prohibitions sc. 12 (3) Deposit of Waste, Duty to Report Deposits, states that "every person who owns or has the charge, management or control of the waste, or who cause or contributed to the deposit, shall, subject to the regulations, without delay report the deposit to an Inspector. The 2023 Annual Report provides insufficient data related to Project dust emissions as a waste deposit to water. Dust emission data is a requirement of the AEMP Framework. Furthermore, the results presented in the AEMP report are also insufficient for the aforementioned purposes. In the absence of sufficient air quality data, dust related waste deposition to water cannot be effectively understood, monitored or evaluated. The AEMP states dust samples were analyzed for total metals, but the analytical results are not provided or discussed. The AEMP identifies several mine-related influences in surface water and/or sediment within the Sheardown Lakes, Sheardown Lake Tributaries, Mary River Tributaries and Camp Lake Tributaries	regulating water related to dust source inputs, and that a 2023 report revision addendum is shared for review by September 30, 2024. b) Baffinland provide the dust analytical data that was obtained in 2023. c) Baffinland provide discussion on the potential of dust deposition being a potential cause of mine related influences being observed within surface water and sediment. d) That the Board consider asking Baffinland to provide a study (including data, results and discussion) related to dustfall effects arising from dust deposition to water per the authority outlined in Schedule B g. i, or Schedule B i. i. Alternatively, the Board can consider the adequacy of data capture under existing plans to ensure that future reporting is complete.	emissions in its NIRB Annual Report, and has been reporting biannually to NIRB since April 2023 on the implementation status of Baffinland and QIA's commitments relating to dust mitigations under Appendix B of the Project Certificate. Dust is also regulated at mine sites under the Mine Health and Safety Regulations, and generally by the Government of Nunavut under the Environmental Protection Act (NU). The Environmental Guideline for Ambient Air Quality has been adopted by the Minister of Environment under s. 2(2) of the EPA (NU). In response to CIRNAC's specific recommendations: a) As indicated in Baffinland's response to R-06 (c), Baffinland has included in Section 7.6 and Appendices E.9.1 (CREMP) and E.9.2 (Lake Sedimentation Monitoring Program), information integrating various monitoring program elements such as dust fall monitoring, sedimentation rates, and sediment chemistry. In 2023, AEMP individual program reports were updated/modified to include a section (or sections) designated to specifically address CIRNAC's recommendations regarding integration and interpretation of data collected from individual but related programs under the AEMP, as well as comparisons of recently collected data to applicable FEIS components including dust fall. Specifically: - The 2023 Core Receiving Environment Monitoring Program (CREMP) Report includes summaries of results from the Third Environmental Effects Monitoring Biological Study (conducted in 2023) for waterbodies and study components that are part of both programs under the AEMP. - The 2023 CREMP Report includes specific sections comparing applicable results of the 2023 monitoring program to effects predictions from the FEIS, covering potential inputs from airborne emissions (dust). - The 2023 Lake Sedimentation Monitoring Program report includes comparison of applicable results to effects predictions from the FEIS, covering potential inputs from airborne emissions (dust). b) All dust fall analytical data has been presented in Section 7 of the 2023 Terrestrial Environmental Annual Monitoring Report submitted with the 2023 NIRB Annual Report (Appendix G.5.1). c) This assessment is included in Appendix E.9.1 (Mary River Project CREMP)and E.9.2 (Lake Sedimentation Monitoring Program) of the 2023 NWB/QIA Annual Report for Operations. Specifically Appendix E.9.1, Section 2.5.1.1 (2023 Effects Determination) states the following: *"The 2023 CREMP incorporated an effects-based approach that included standard EEM methods to provide rigorous evaluation of potential mine-*

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				related effects at key waterbodies that receive mine-related deposits from various mine effluents, surface runoff, and aerial deposition of dust originating from mine operations." All conclusions within these reports assessing potential mine-related impacts to both water and sediment quality have considered inputs from fugitive dust. d) The AEMP and subsequent reporting are robust and cover this item by linking dust fall as a potential source and execute extensive monitoring in the freshwater receiving environment under components of that plan; Lake Sedimentation Program and the CREMP. See above example referenced in Appendix E.9.1, Section 2.5.1.1 of the 2023 NWB QIA Annual Report for Operations where dust is considered a potential input for effects determination following standard methods.