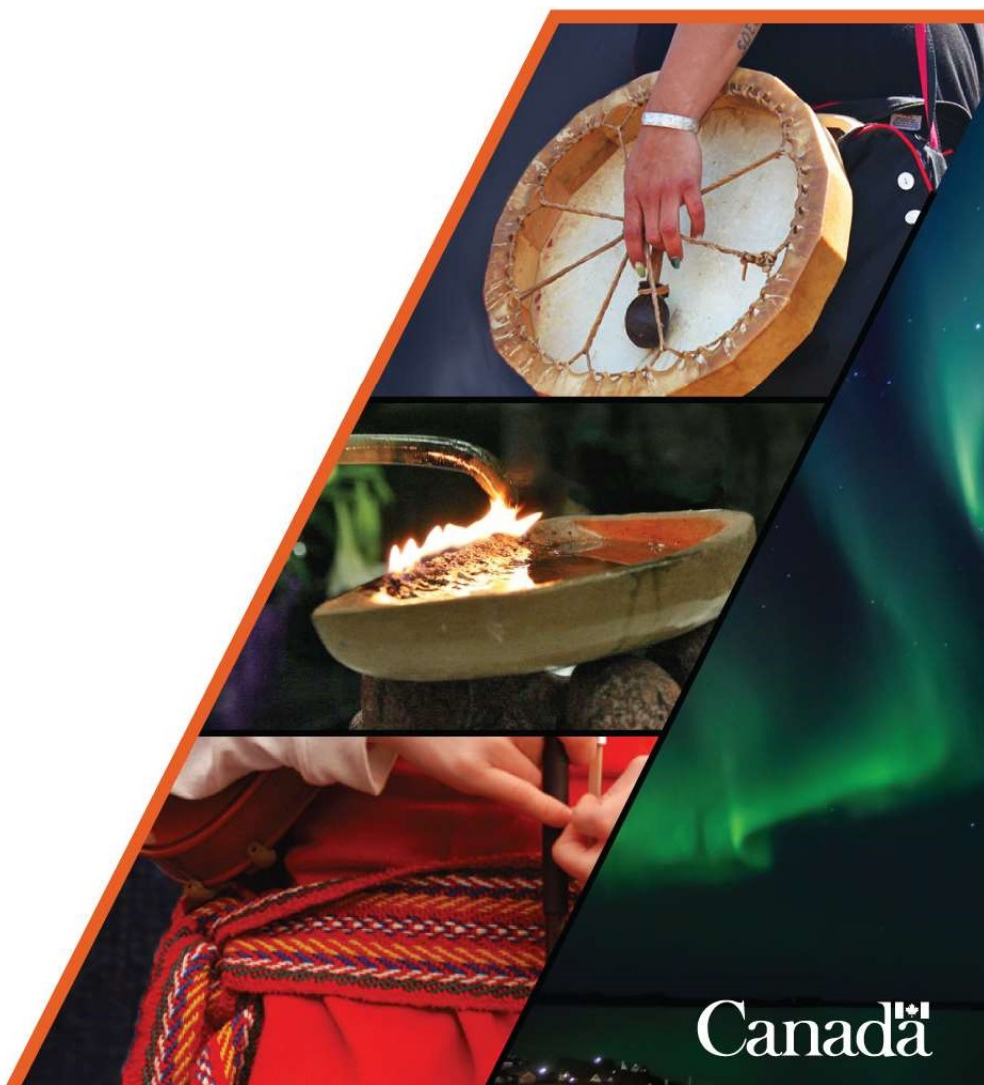


# **CIRNAC Comments to NIRB Re: Comment Request for Agnico Eagle Mines Limited's Meadowbank Complex 2022 Annual Report**



Canada

Nunavut Regional Office  
P.O. Box 100  
Iqaluit, NU, X0A 0H0

Your file - Votre référence  
03MN107 and 16MN056  
Our file - Notre référence  
GCDocs # 113673508

June 23, 2023

Leah Klaassen  
Technical Advisor II  
Nunavut Impact Review Board  
P.O. Box 1360  
Cambridge Bay, NU, X0B 0C0  
Via electronic mail to: [info@nirb.ca](mailto:info@nirb.ca)

Dear Leah Klaassen,

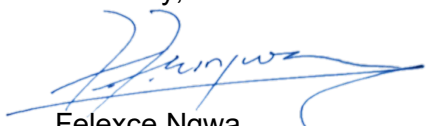
**Re: Comment Request for Agnico Eagle Mines Limited's Meadowbank Complex Project 2022 Annual Report**

On April 26, 2023, as per Section 12.7.3 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty The Queen in Right of Canada (Nunavut Agreement)*, s. 135(4) of the *Nunavut Planning and Project Assessment Act*, S.C. 2013, c. 14 (*NuPPAA*) and the amended Meadowbank Gold Mine Project Certificate No. 004 and the amended Whale Tail Pit Project Certificate No. 008, the Nunavut Impact Review Board (NIRB) requested parties to review Agnico Eagle Mines Limited's (AEM's) Meadowbank Complex 2022 Annual Report with respect to effects and compliance monitoring.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) has conducted a review of the Meadowbank Complex 2022 Annual Report and related documents in areas under its mandate pertaining to effects and compliance monitoring. On this basis, CIRNAC would like to provide the comments attached for the NIRB's consideration.

CIRNAC appreciates the opportunity to review AEM's Meadowbank Complex 2022 Annual Report and looks forward to working with the NIRB and AEM throughout future reviews for these projects. Should you have any questions, please do not hesitate to contact Richard Bingley by email at [richard.bingley2@rcaanc-cirnac.gc.ca](mailto:richard.bingley2@rcaanc-cirnac.gc.ca).

Sincerely,



Felexce Ngwa  
Manager, Impact Assessment



## 1. **Effects Monitoring**

The Meadowbank Complex 2022 Annual Report has been reviewed to assess the measurable changes to the valued components/indicators under CIRNAC's mandate and areas of interest, compared to the potential effects that were predicted to result from a proposed development of Meadowbank Gold Mine and Whale Tail Pit Projects, taking into account their respective Final Environmental Impact Statements (FEIS), previous years' monitoring reports and the requirements included in the Projects Certificates (as amended). The assessment considered the following:

- a. Whether the conclusions reached by Agnico Eagle in the 2022 Annual Report are valid; and**
- b. Any areas of significance requiring further supporting information or any changes to the monitoring program which may be required**

AEM's Meadowbank Complex 2022 Annual Report, for the Meadowbank Gold Mine and Whale Tail Pit Projects, presents an extensive and comprehensive summary of activities completed and data gathered from ongoing operations, inspections, monitoring programs, special studies, and modelling exercises in 2022.

Within the areas under its mandate, CIRNAC has identified no evidence to suggest that ongoing operations at the Meadowbank Gold Mine and Whale Tail Pit Projects are resulting in significant adverse environmental impacts. However, CIRNAC is providing eight Technical Review Comments (TRCs) on the following pages for the NIRB's consideration.

Technical Review Comment Number	CIRNAC #1
<b>Subject</b>	IVR Pit Geochemical Characterization
<b>References</b>	<ul style="list-style-type: none"><li>Meadowbank Complex 2022 Annual Report: Section 5.1.2; Table 5-3</li><li>NIRB Project Certificate No. 008, Terms and Conditions 7 and 8</li></ul>
<b>Issue/Rationale</b>	Table 5-3 of the 2022 Annual Report summarizes the geochemical Acid Rock Drainage (ARD) determination for the Whale Tail Project from 2018 to 2022. The table indicates that, for the IVR Pit, the proportion of Potentially Acid Generating (PAG) rock increased from 2% in 2021 to 82% in 2022. Based on a review of prior project documentation, it is unclear to CIRNAC whether the increase is consistent with design expectations at the time the Whale Tail Mine Expansion was approved.
<b>Recommendation to Address Issues:</b>	CIRNAC recommends that AEM: <ol style="list-style-type: none"><li>1. Indicate whether the 2022 PAG ratio for the IVR pit (i.e., 82%) is consistent with design expectations at the time the Whale Tail Mine Expansion was approved.</li><li>2. If the PAG ratio for the IVR pit is higher than originally predicted, indicate:<ol style="list-style-type: none"><li>a. How this will influence environmental performance and waste rock management practices during operations</li></ol></li></ol>



Technical Review Comment Number	CIRNAC #1
	and Waste Rock Storage Facilities closure strategies. b. How the higher PAG ratio has been incorporated into post-closure water quality predictions for the site.

Technical Review Comment Number:	CIRNAC #2
<b>Subject:</b>	Whale Tail Project Pit Sump Water Quality/Quantity
<b>Reference:</b>	<ul style="list-style-type: none"> <li>• Meadowbank Complex 2022 Annual Report: Sections 8.5.3.2.4 and 8.5.3.2.5</li> <li>• Appendix 6-H to the Whale Tail Project Expansion Environmental Assessment (Figure 6)</li> <li>• NIRB Project Certificate No. 008, Term and Conditions 8,15, and 16</li> </ul>
<b>Background/Rationale:</b>	<p>The quality and quantity of water reporting to the Whale Tail Project pit sumps during operations is relevant to the post-closure water quality of the pit lakes that will form during closure. This is particularly important for arsenic, which is considered to be a contaminant of potential concern in the flooded pit lakes. It is, therefore critical that the quality and quantity of water reporting to the pit sumps is consistent with Environmental Assessment (EA) predictions.</p> <p>In the case of the IVR pit, the Whale Tail Project Expansion Environmental Assessment predicted that the maximum concentration of arsenic in the IVR Pit sump in 2022 would be approximately 1.5 mg/L. But, the 2022 Annual Report indicates that arsenic concentrations in the IVR pit sump are roughly 3X greater, at 4.5 mg/L. Further, the volume of water reporting to the pit sump is greater than originally predicted. The combined increase of arsenic concentrations and water volumes will result in total arsenic loadings to the IVR pit that are well above EA predictions. Increases for these two parameters have also been noted for the Whale Tail Pit sump.</p> <p>It is unclear to CIRNAC what influence the increased arsenic loadings to the pit sumps will have on post-closure water quality in the flooded pit. CIRNAC was also unable to identify what factors resulted in the higher-than-anticipated arsenic loadings and whether any adjustments to the closure strategy may be necessary.</p>
<b>Recommendation to Address Issues:</b>	<p>CIRNAC recommends that AEM:</p> <ol style="list-style-type: none"> <li>1. Confirm if arsenic loadings to the Whale Tail and IVR pits, as indicated by sump monitoring, are greater than the predictions presented in the FEIS documents for the project.</li> <li>2. Investigate and describe the factors that are contributing to the pit sumps having arsenic loadings that are higher than predicted in the FEIS (e.g., pit wall seepage).</li> <li>3. Indicate any modifications that will be needed to the Whale Tail and IVR Pit closure strategy to ensure that water quality in the pit lakes will serve as viable aquatic habitat.</li> </ol>



Technical Review Comment Number:	CIRNAC #3
<b>Subject:</b>	Whale Tail Project Pit Sump and Attenuation Pond Water Quality Variability
<b>Reference:</b>	<ul style="list-style-type: none"> <li>Meadowbank Complex 2022 Annual Report: Section 8.5.3.2</li> <li>NIRB Project Certificate No. 008, Term and Conditions 8,15, and 16</li> </ul>
<b>Background/Rationale:</b>	<p>Section 8.5.3.2 of the 2022 Annual Report presents summaries of water quality monitoring data for the Whale Tail and IVR pit sumps and attenuation ponds. CIRNAC notes that there is a high degree of temporal variability between sampling events. To illustrate, the following arsenic concentrations were measured in the Whale Tail Pit sump (see Table 8-44):</p> <ul style="list-style-type: none"> <li>May 29, 2022 = 0.676 mg/L</li> <li>June 10, 2022 = 4.29 mg/L</li> <li>June 19, 2022 = 0.645 mg/L</li> </ul> <p>Based on this example, arsenic concentrations spiked by approximately 6X on June 10 (to levels above impact predictions) and then returned to baseline levels, all within several weeks. Similar concentration swings are observed for other parameters(e.g., aluminum and nutrients) and sampling locations in pits and attenuation ponds, without any explanation being provided</p> <p>It is unclear to CIRNAC what factors are causing the observed high temporal variability in water quality in pit sumps and attenuation ponds. Similarly, the potential implications of this substantial temporal variability to environmental management are unclear. For instance, it is unclear if these elevated arsenic concentrations in attenuation ponds were a factor in AEM's non-compliant discharges to Whale Tail South Lake in April of 2022.</p>
<b>Recommendation to Address Issues:</b>	<p>CIRNAC recommends that AEM:</p> <ol style="list-style-type: none"> <li>Investigate and explain the factors that are resulting in substantive temporal variability in the water quality of Whale Tail pit sumps and attenuation ponds.</li> <li>Discuss any potential implications that the temporal variability will have on the environmental performance of the site, both during operations and the post-closure phase.</li> </ol>

Technical Review Comment Number:	CIRNAC #4
<b>Subject:</b>	Meadowbank Landfill Burning
<b>Reference:</b>	<ul style="list-style-type: none"> <li>Meadowbank Complex 2022 Annual Report: Section 6.1.1.2</li> <li>NIRB Project Certificate No. 004, Amendment 003: Term and Condition 24</li> </ul>



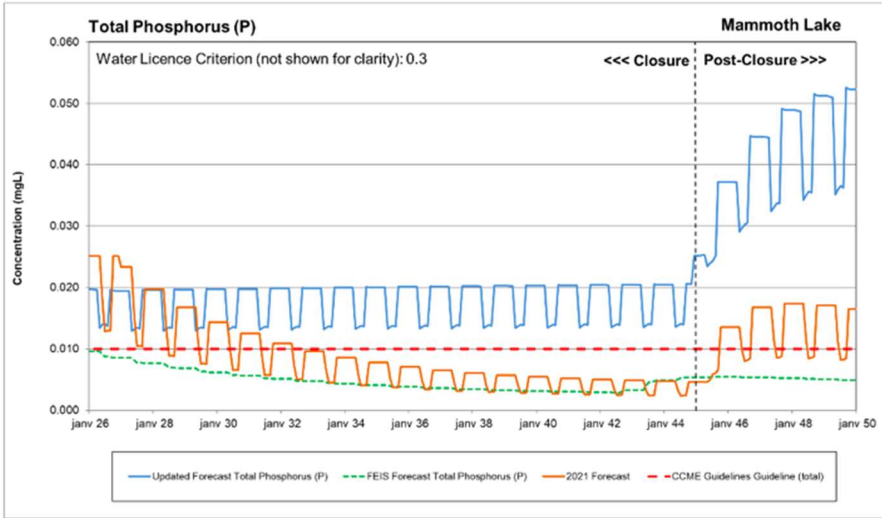
Technical Review Comment Number:	CIRNAC #4
<b>Background/Rationale:</b>	The 2022 Annual Report states: “ <i>In December 2021, the Meadowbank landfill burned from an undetermined cause</i> ”. CIRNAC was unable to identify any information in the Annual Report or supporting documents indicating the causes, environmental impacts and mitigations associated with the event.
<b>Recommendation to Address Issues:</b>	CIRNAC recommends that AEM provide a detailed description of the causes, environmental impacts, and mitigations associated with the burning of the Meadowbank landfill.

Technical Review Comment Number:	CIRNAC #5
<b>Subject:</b>	Spill Management Action Plan
<b>Reference:</b>	<ul style="list-style-type: none"> <li>• Meadowbank Complex 2022 Annual Report: Section 7.1</li> <li>• NIRB Project Certificate No. 004, Amendment 003: Term and Condition 26</li> </ul>
<b>Background/Rationale:</b>	<p>The 2022 Annual Report (Section 7.1) states that, in an effort to address rising significant environmental incidents, AEM developed a new action plan to identify and address root causes of spills, as well as raising environmental awareness across the site. As part of the action plan, AEM stated they reviewed spills which occurred in 2021 and the first half of 2022 to identify common causes. The maintenance department also launched an equipment spill root cause analysis, which included a Failure Mode and Effect Analysis (FMEA) on the equipment models with the highest spill frequency. AEM also stated that the identification of causes and rectifying actions will be completed in 2023. Furthermore, to identify and better address incident root causes, an investigation process was designed and launched in 2022. Corrective measures are reportedly tracked for completeness.</p> <p>The above-noted initiatives as described in the 2022 Annual Report, represent improvements in AEM’s spill management approach. However, the Annual Report does not include the detailed findings and recommendations related to these initiatives. For example, it does not describe the new spill action plan, the spill FMEA and the corrective measures that are being put in place.</p>
<b>Recommendation to Address Issues:</b>	CIRNAC recommends that AEM provide details of findings and recommendations for all new spill management initiatives in future Annual Reports. This should include, but not be limited to, the new spill action plan, the spill FMEA and any new corrective measures.

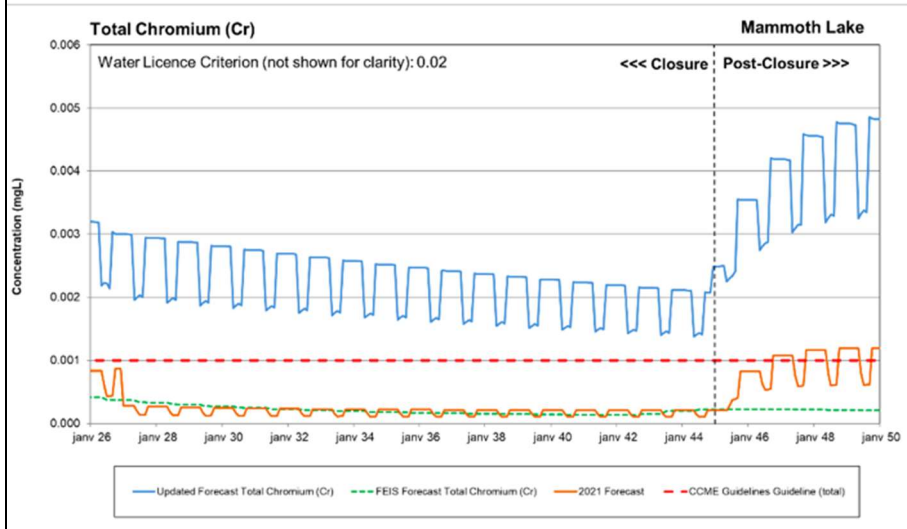


Technical Review Comment Number:	CIRNAC #6
<b>Subject:</b>	Annual Closure Planning Update Meetings
<b>Reference:</b>	<ul style="list-style-type: none"> <li>• Meadowbank Complex 2022 Annual Report: Section 9</li> <li>• NIRB Project Certificate No. 004, Amendment 003: Term and Conditions 78,79, and 80</li> <li>• NIRB Project Certificate No. 008, Amendment 001: Term and Conditions 7 and 13</li> </ul>
<b>Background/Rationale:</b>	<p>Section 9 of the 2022 Annual Report provides high-level discussions of the closure planning and implementation process: the section describes the state of the closure planning process, ongoing studies, information gaps and progressive reclamation. While CIRNAC appreciates receiving these descriptions, CIRNAC has a wide range of questions and comments regarding the closure planning process for the Meadowbank and Whale Tail sites. Many of these questions and comments have been submitted in prior annual report reviews conducted by CIRNAC, as summarized in Table A.</p> <p>While these questions and comments could be deferred until the submission of formal closure planning documents (e.g., periodic updated Interim Closure and Reclamation Plans and security estimates), CIRNAC is of the view that a more active dialogue on closure planning is justified. This is particularly important for the Meadowbank and Whale Tail Projects given that they are currently scheduled to begin active closure within three years (i.e., by 2026). Taking into consideration the relatively limited time remaining before the implementation of closure, additional and regular dialogue between AEM, regulators, and interested parties would be beneficial. This would help to facilitate reaching technically sound closure and reclamation decisions in a timely manner.</p>
<b>Recommendation to Address Issues:</b>	<p>CIRNAC recommends that AEM convene an annual workshop with regulators and interested parties to discuss the status of closure planning for the Meadowbank and Whale Tail Mines beginning in 2023. The overall goal of the workshop would be to ensure that all organizations (including Agnico Eagle Mines (AEM)) are fully informed of closure requirements and to proactively identify key issues that need to be resolved on a priority basis. This will facilitate the timely design, approval, and implementation of an appropriate closure strategy for the sites.</p> <p>CIRNAC has also appended Table A, which presents a list of CIRNAC's closure-related questions raised in previous Annual Report TRCs, for AEM's use as discussion points during the closure workshops.</p>



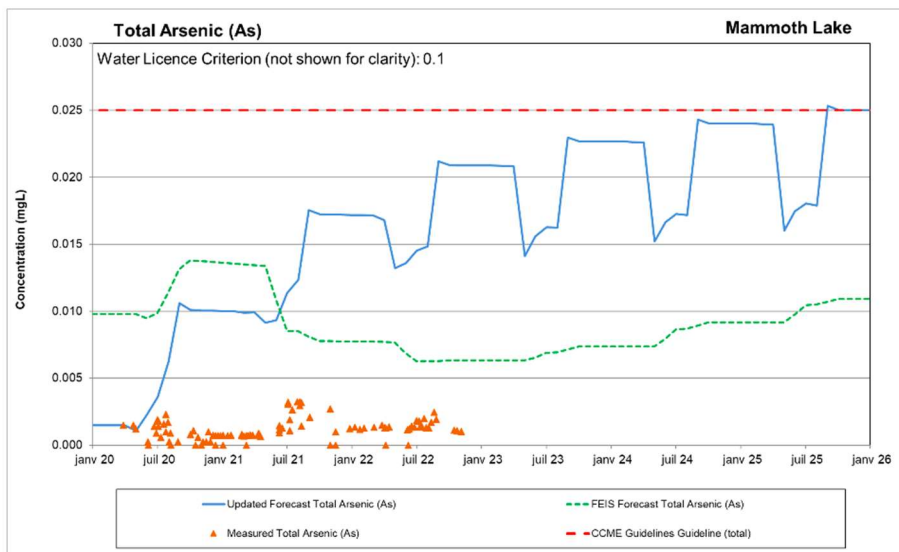
<b>Technical Review Comment Number:</b>	<b>CIRNAC #7</b>
<b>Subject:</b>	Whale Tail Revised Water Quality Predictions
<b>Reference:</b>	<ul style="list-style-type: none"> <li>• Meadowbank Complex 2022 Annual Report: Appendix 13, Appendix D</li> <li>• Meadowbank Complex 2021 Annual Report: Appendix 13, Appendix D</li> <li>• Final Environmental Impact Statement Addendum for the Whale Tail Pit Expansion Project (2018)</li> </ul>
<b>Background/Rationale:</b>	<p>Appendix 13 (Appendix D) of the 2022 Annual Report presents updated water quality predictions for the Whale Tail site. The predictions for some parameters are substantively different from predictions presented in the FEIS Addendum for the Whale Tail Pit Expansion Project. Notably, the following parameters are now predicted to exceed the FEIS values in Mammoth Lake during the post-closure phase: cadmium, chromium, copper, iron, manganese, nickel, selenium, zinc, phosphorous, nitrate and chloride.</p> <p>In addition to exceeding FEIS predictions, some parameters are also predicted to be above the predictions presented in the 2021 Annual Report and, in some instances, above the applicable environmental quality criteria (e.g., CCME criteria for the protection of freshwater aquatic life). This situation is demonstrated in the following two plots for total phosphorous and total cadmium. In both cases, revised predictions are well above: a) the FEIS predictions; b) the 2021 predictions; and, most importantly c) the applicable CCME criteria during the post-closure phase.</p>  <p>(As extracted from Figure 4-3 of Appendix 13, Appendix D of the 2022 Annual Report)</p>





(As extracted from Figure 4-4 of Appendix 13, Appendix D of the 2022 Annual Report)

In addition to the increases noted above, arsenic concentrations in Mammoth Lake (as shown in the following figure) are now predicted to be well above the FEIS Addendum predictions. They are also predicted to be approaching the applicable CCME effluent quality criterion (0.025 mg/L) at the time of closure (i.e., three years from now, in 2026).



(As extracted from Figure 4-1 of Appendix 13, Appendix D of the 2022 Annual Report)

Appendix 13 of the 2022 Annual Report acknowledges increases relative to FEIS predictions with the following statement: “The WQF



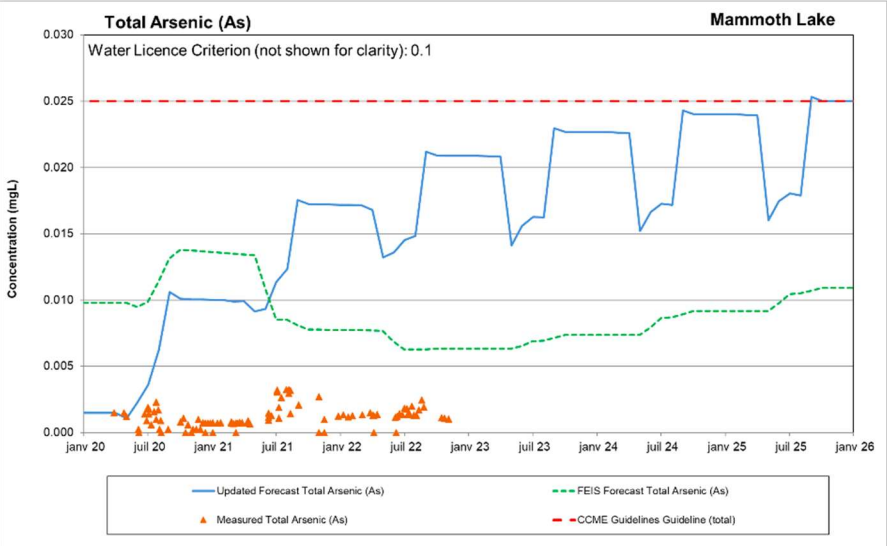
Technical Review Comment Number:	CIRNAC #7
	<p><i>model forecasted concentrations that are generally higher than the FEIS forecasted values.</i>” Despite this acknowledgement, the 2022 Annual Report presents limited information regarding the factors that are contributing to the predicted increases. For example, it is unclear whether the increases are attributable to revised modelling assumptions or site conditions that are worse than originally expected (e.g., elevated seepage loading rates).</p> <p>Furthermore, with regard to predictions that exceed the CCME criteria during post-closure (e.g., cadmium and phosphorous), the 2022 Annual Report presents limited information regarding the potential implications to the closure strategies for the site. To the contrary, the Annual Report states: “<i>At closure, no water treatment is forecasted to be required.</i>” This conclusion appears to be inconsistent with predicted water quality exceedances during the post-closure phase.</p>
<b>Recommendation to Address Issues:</b>	<p>Given the limited time prior to the initiation of closure (i.e., 2026), CIRNAC recommends that AEM respond to the following requests on a priority basis:</p> <ol style="list-style-type: none"> <li>1. Provide a detailed table describing the factors that contributed to 2022 water quality predictions being higher than one or more of the following: a) FEIS predictions; b) predictions from 2021; and c) predictions that exceed environmental quality criteria.</li> <li>2. Describe why there is a high-degree of variability between the 2021 and 2022 predictions;</li> <li>3. For any parameters that are predicted to exceed 75% of the environmental quality criteria during post-closure, describe the approaches that will be taken to ensure significant adverse impacts do not occur.</li> <li>4. Describe the studies that AEM will undertake between now and the finalization of the closure plan to verify the accuracy of water quality predictions.</li> <li>5. Describe if and how the higher than originally anticipated water quality predictions will affect closure strategies for the site.</li> </ol>

Technical Review Comment Number:	CIRNAC #8
<b>Subject:</b>	Water Quality Prediction Methods
<b>Reference:</b>	<ul style="list-style-type: none"> <li>• Meadowbank Complex 2022 Annual Report: Section 12</li> <li>• Meadowbank Complex 2022 Annual Report: Section 13</li> <li>• CIRNAC Technical Review Comments on the 2021 Annual Report to NWB (TRC #1)</li> <li>• CIRNAC Technical Review Comments on the Whale Tail Pit Project Expansion Environmental Assessment (TRC #3)</li> </ul>
<b>Background/Rationale:</b>	Updated water quality predictions for the Meadowbank and Whale Tail sites are presented in appendices 12 and 13 of the 2022 Annual Report. In both instances, the reports describe the general modelling



Technical Review Comment Number:	CIRNAC #8
	<p>approaches. Key aspects of these approaches include the following statements which have been extracted directly from Appendix D of Appendix 13 (similar statements are also provided in Appendix 12):</p> <ol style="list-style-type: none"> <li>1. Table 3-1: <i>“Water quality for the different input streams to the model is based on the yearly average measured values and are assumed to be constant over a given year.”</i></li> </ol> <p>In the opinion of CIRNAC, the use of annual average input streams represents a potential underestimation of loadings at some points of time. For instance, loadings before, during, and after freshet often vary significantly. There is, therefore, a potential that the approach is missing intra-year peak events that are environmentally significant.</p> <ol style="list-style-type: none"> <li>2. Section 3.3: <i>“In order to simplify the model, the mass balance model assumes that the ponds, pits and lakes are completely mixed systems. <u>Consequently, the results from this model provide an indication of the concentrations in these areas and should not be considered as an absolute value at this time.</u>”</i> (emphasis added)</li> </ol> <p>CIRNAC agrees that this approach provides only an indication of concentrations and should not be relied on as a definitive indicator of potential environmental impacts. On multiple occasions CIRNAC has expressed a concern that the “fully mixed” modelling assumption fails to provide sufficient spatial resolution to identify localized areas with elevated concentrations (e.g., in the vicinity of effluent discharges). Recently (in a letter to NWB dated May 29, 2023), AEM stated that the modelling presented in the 2022 Annual Report had been modified to address this concern. However, the 2022 Annual Report and supporting documentation (e.g., Appendices 12 and 13) continue to use the fully mixed assumption in all modelling.</p> <ol style="list-style-type: none"> <li>3. Section 3.3: <i>“It should be noted at this point that the model should be used to evaluate <u>at a high level</u> the impact of operation and closure activities at the Whale Tail Mine site on the future water quality in the WT Pit / WTN Basin, the IVR Pit, Mammoth Lake and WTS Lake. <u>The forecasted concentration should be considered as an order of magnitude estimate only considering that the model uses monthly volumes that are transferred around the site and assumes a fixed water quality concentration for each input stream over time.</u>”</i> (emphasis added)</li> </ol> <p>CIRNAC agrees with AEM that the modelling approach is suitable for making high-level screening decisions, similar to</p>



Technical Review Comment Number:	CIRNAC #8
	<p>those that were reached for the FEIS. However, the “order of magnitude” approach is not sufficient for an operating mine that is approaching closure, particularly in instances where parameters are predicted to approach and exceed applicable environmental quality criteria. To illustrate, the following figure indicates that arsenic is predicted to approach the CCME effluent quality criterion (0.025 mg/L). Given that predictions are only accurate to within an order of magnitude, actual arsenic concentrations could reach levels that are ten-times the CCME criterion. The proximity of the current predictions to the criterion therefore represent a potential concern that warrants more detailed modelling.</p>  <p>(As extracted from Figure 4-1 of Appendix 13, Appendix D of the 2022 Annual Report)</p> <p>CIRNAC has cited this concern on multiple occasions, most recently in its submission on the 2021 Annual Report to the NWB (TRC #1). In response to that comment, AEM indicated (in a May 29, 2023 letter to NWB) that appropriate modifications would be made to the 2022 Annual Report. Based on our review of the 2022 Annual Reports submitted to NIRB and NWB, CIRNAC was unable to identify any evidence to demonstrate that the recommended changes had been made.</p> <p>4. Section 3.3: <i>“The present mass balance model cannot simulate the treated effluent plume discharged in Mammoth Lake or Whale Tail South Lake. A hydrodynamic model is required to simulate the discharge of treated effluent in these lakes, which is beyond the scope of this study.”</i></p> <p>CIRNAC agrees with AEM that their “fully mixed” approach is</p>



Technical Review Comment Number:	CIRNAC #8
	<p>insufficient to predict the localized effects of contaminant loadings from sources such as treated effluent plumes, seepage from Waste Rock Storage Facilities (WRSFs), seepage from pit walls, etc. Consequently, the modelling is unable to evaluate localized concentrations, some of which will be greater than those which have been predicted under AEM's fully mixed modelling approach. This is particularly important given the fact that some parameters are near, or above, applicable environmental quality criteria (see the arsenic figure presented above under the third point). CIRNAC therefore fully supports AEM's conclusion that a hydrodynamic model is required to simulate the discharge of treated effluent and predict potential project impacts. However, it is unclear to CIRNAC whether AEM is planning to perform hydrodynamic modelling in the future.</p> <p>5. From Recommendations in Section 5.2, SNC-Lavalin (AEM's technical advisor) provided the following recommendation: <i>"To better understand the loading of potential COCs from the exposed pit wall during Operation and following Closure, determine if it is possible to sample the pit wall runoff safely. Consider advancing the hydrogeological model and understanding of the pit wall lithology to assess the potential loading of COCs during Operation and Closure."</i></p> <p>On multiple occasions (e.g., CIRNAC TRC #3 during the FEIS for the Expansion Project), CIRNAC indicated that additional sampling and modelling of pit wall seepage would be beneficial. CIRNAC is, therefore, fully supportive of SNC-Lavalin's recommendation which would help to refine post-closure water quality predictions in the pit lakes. However, it is unclear how AEM intends to act on the recommendation. As noted in TRC #2, contaminant concentrations (e.g., arsenic) in the Whale Tail and IVR pit sumps are significantly higher than originally predicted. This justifies additional efforts to characterize the loadings associated with pit walls, including seepage.</p> <p>Collectively, the points noted above demonstrate there are multiple simplifying assumptions and approaches being used by AEM to predict water quality that warrant reconsideration. While CIRNAC supported using simplifying assumptions and approaches during project approval and the initial years of operation, the project is now at a stage that justifies the development of more refined and accurate water quality predictions.</p> <p>While the above-noted observations are related to the Whale Tail project, CIRNAC notes that updates to assumptions and approaches should be completed for the Meadowbank Mine as well.</p>



Technical Review Comment Number:	CIRNAC #8
<b>Recommendation to Address Issues:</b>	<p>Given the limited time prior to the initiation of closure (i.e., 2026), CIRNAC recommends that AEM, on a priority basis, revisit the water quality modelling assumptions and approaches used for both Meadowbank and Whale Tail to ensure all future project decisions (particularly closure) are informed by sufficiently accurate predictions. At minimum, factors to consider when revisiting the assumptions and approaches should include:</p> <ol style="list-style-type: none"> <li>1. using monthly (or smaller) time steps for all model inputs instead of the current one-year time step;</li> <li>2. performing hydrodynamic modelling of receivers instead of assuming fully mixed conditions;</li> <li>3. performing sensitivity analyses to accurately capture the range of uncertainty associated with water quality predictions; and,</li> <li>4. expanding efforts to characterize loadings from pit walls.</li> </ol>



Table A: Previous CIRNAC Closure and Reclamation Comments For Discussion during Interim Closure Planning Working Group

CIRNAC Closure and Reclamation Comment #	Topic	CIRNAC Recommendation (from prior Annual Report reviews)	AEM Response/Action (to CIRNAC's prior Annual Report review comments)
1	Freeze back and Capping Thickness	CIRNAC recommended that AEM include a meaningful discussion of the results from the thermal monitoring in the Annual Report. FEIS predictions should be compared with monitoring results and be clearly presented. AEM should present the updated modeling supporting their conclusions that the conceptual plans for thermal encapsulation of the Tailings Storage Facility (TSF) and the Waste Rock Storage Facility (WRSF) remain effective to prevent and control deleterious seepage over long term. Finally, if results show discrepancies from the predicted values, AEM should discuss the management actions that should be implemented to address the risk.	Agnico Eagle acknowledges CIRNAC's comment on thermal monitoring of the WRSF and will continue to report in the annual report the work and the data that are being gathered to assess the performance of the WRSF. These data will continue to be analysed to ensure they are aligned with closure prediction and the model will be revised periodically to ensure the goal of meeting closure objective. In 2020 instrumentation installation continued on both sites as per O'Kane recommendation. The data gathered at Meadowbank are aligned with the latest review of the thermal model performed in 2019. Agnico Eagle also acknowledges CIRNAC's comment on the progressive reclamation for the cover of the WRSF. Agnico Eagle will be submitting in due time the necessary documentation to support its claim of completion of the progressive reclamation work done on the WRSF.
2	Freeze back and Capping Thickness	CIRNAC recommended that AEM provide more information on the nature and extent of research efforts, results of the research and a discussion of how the proposed cover design has been influenced by these results.	Refer to response for 1
3	Progressive Reclamation – Mine Site	CIRNAC recommended that future updates to the ICRP include more details on progressive reclamation at Meadowbank such as areas of Tailings Storage Facility (TSF) and Waste Rock Storage Facility (WRSF) facilities covered in the prior year, total areas covered to date, along with the volumes associated with these areas.	In response to 2019-2020 NIRB recommendations, Agnico Eagle has committed to include more details on progressive closure in the 2020 Annual Report. Relevant information to progressive closure can be found in Section 9.1 of the 2020 Annual Report and will continue to be updated annually. Details related to work completed and schedules of progressive reclamation is also included in the closure schedule presented in Appendix P of the ICRP which was updated in March 2020 and provided in the 2019 Annual Report in Appendix 55. Agnico is of the opinion that the last update March 2020 version fulfills the current request. Agnico Eagle is nevertheless committed to providing more details on the progressive closure in the next iteration of the Meadowbank ICRP.



CIRNAC Closure and Reclamation Comment #	Topic	CIRNAC Recommendation (from prior Annual Report reviews)	AEM Response/Action (to CIRNAC's prior Annual Report review comments)
4	Results of Thermistor Measurements for Tailings and Waste Rock Storage Facilities	CIRNAC recommended that AEM analyze the thermistor monitoring results against early thermal modelling predictions and update its Waste Rock and Tailings Management Plans if large discrepancies are observed between the monitoring results and model predictions. While the 2020 Annual Report presents a high-level summary of the topic, the document contains insufficient detail to understand the status of thermal monitoring/modelling as it relates to final closure. CIRNAC expects that the next iteration of the Meadowbank ICRP will include a comprehensive analysis of all thermal monitoring data and modelling.	Agnico Eagle is monitoring freeze back in tailings and the waste rock and will continue to do so and expand the monitoring program as required. The data gathered will continue to be analyzed and compared to the FEIS prediction as more data becomes available to ensure that the closure strategy and concept still meet the closure prediction. Agnico Eagle acknowledges CIRNAC's comment and will evaluate this recommendation during the next updated of the Meadowbank ICRP.
5	Meadowbank Water Treatment Requirements	CIRNAC recommended that the next iteration of the Meadowbank ICRP identify and examine potential water treatment scenarios based on current and future water quality projections during the closure phase. Although final decisions are not required at this time, costs associated with implementing the most likely water treatment scenario should also be incorporated into security estimates.	Agnico Eagle acknowledges CIRNAC comments and intends to assess the requirement for treatment of the re-flooded pits within the next iteration of the ICRP.
6	Meadowbank WRSF Seepage Quality	CIRNAC recommended that AEM confirm whether long-term modelling of seepage from the Meadowbank Waste Rock Storage Facilities (WRSFs) is of sufficient duration to characterize seepage after breakthrough. If not, CIRNAC recommends that AEM extend the temporal scope of its WRSF seepage modelling to ensure that potential seepage impacts after breakthrough are accurately characterized.	Long term seepage from the Meadowbank WRSF was not identified as a concern during the FEIS and was not examined. For the next iteration of the Interim Closure & Reclamation Plan, Agnico Eagle will review if this mechanism can have an impact on the closure objectives and if so, will do the necessary analysis to characterize this impact and develop mitigation measure as required. However, it must be noted that, as opposed to Whale Tail WRSF, there is no metal leaching material in the Meadowbank WRSF and the pile is expected to remain in permafrost condition which would suggest that water seeping from the Meadowbank WRSF beyond the NAG capping is unlikely and would have little bearing on the water quality objective at closure.
7	Meadowbank Post-Closure In-Pit Water Quality	CIRNAC recommended that AEM:  a) Conduct a modelling exercise to predict post-closure water quality in the re-flooded Goose and Portage mine pits at the Meadowbank Gold Mine site.	a) Agnico Eagle acknowledges CIRNAC' comments. Agnico Eagle will integrate this recommendation during the next update of the Meadowbank ICRP.  b) Agnico Eagle acknowledges CIRNAC's comment. Findings of the modelling will be taken into consideration in a future update



CIRNAC Closure and Reclamation Comment #	Topic	CIRNAC Recommendation (from prior Annual Report reviews)	AEM Response/Action (to CIRNAC's prior Annual Report review comments)
		<p>b) Incorporate the findings of the modelling into the next iteration of the Meadowbank ICRP.</p> <p>c) Use the modelling results to inform the design of various other closure components, including but not limited to: capping of the in-pit tailings and post-closure water management, water treatment facility designs, sludge generation and disposal requirements, as well as expected treatment duration all of which should be included in the next iteration of the ICRP.</p>	<p>of the Meadowbank ICRP.</p> <p>c) Agnico Eagle acknowledges CIRNAC's comments. Agnico Eagle will integrate this recommendation during the next update of the Meadowbank ICRP.</p>
8	Meadowbank In-Pit Tailings Covers	<p>CIRNAC recommended that AEM:</p> <p>a) Describe the strategy they will use to evaluate cover requirements and methods for the in-pit tailings (e.g., water covers, coarse/fine granular covers, construction/leave a submerged berm at the connection to the pit).</p> <p>b) Provide the strategy and an update on progress towards the selection of a preferred closure concept in the next update to the Meadowbank Interim Closure and Reclamation Plan (ICRP).</p> <p>CIRNAC requested that this information be provided to assist in satisfying the New Commentary of Project Certificate 004 (Amendment 003) Term and Condition 19.</p>	<p>a) Agnico Eagle will present a timeline for further study to determine the requirement of a cover and possible construction strategy during the next update of the ICRP.</p> <p>b) Agnico Eagle will present this information in the next update of the ICRP.</p>
9	Thermal Performance of Meadowbank WRSF Covers	<p>CIRNAC recommended that AEM describe the technical rationale for using different WRSF cover thicknesses at the Meadowbank Gold Mine and Whale Tail Pit sites. Any notable differences in the design assumptions for the two sites should be provided in the rationale.</p>	<p>Waste rock covers are designed based on project specific attributes and will naturally have variables that differentiate between sites (i.e., the active layer depth in the region is variable). The freezing mechanism is impacted by the material characteristics, such as the grain size distribution. The attributes of the cover system at Whale Tail include low annual precipitation (less than 300 mm per year); high summer evapotranspiration; coarse-texture soil availability; high spring surface runoff; and creation of low permeability ice barriers. The development of the 4.7 m cover was based on an active layer depth in the WRSF of 4.2 m during operations and closure with an additional 0.5 m for contingency. The active layer was determined by preliminary 1D steady-state numerical modelling</p>



CIRNAC Closure and Reclamation Comment #	Topic	CIRNAC Recommendation (from prior Annual Report reviews)	AEM Response/Action (to CIRNAC's prior Annual Report review comments)
			and further confirmed by O'Kane's 2D transient model. Both simulations considered predicted effects of climate change. Material properties for the cover system and waste rock materials were calibrated based on observed ground temperature measurements obtained from thermistors in Meadowbank's WRSFs. Numerical modelling considered the effect of slope angle, slope aspect, wind exposure on thermal conditions within the WRSF. Modelling of the WRSF cover system indicates a greater thaw depth in the WRSF than observed regional data. Thus, the thaw depth simulated by numerical modelling, rather than the less conservative regional thaw depth, was used in support of the detailed design of the Whale Tail and IVR WRSF cover system. Agnico Eagle refers CIRNAC to the Whale Tail Project – Thermal Modelling of Whale Tail and IVR WRSFs (O'Kane 2019) report which was previously issued to address CIRNAC's comments under the Whale Tail Expansion Project.
10	Whale Tail Project Post-Closure Water Quality	<p>CIRNAC recommended that AEM address the following in the next iteration of the Whale Tail Interim Closure and Reclamation Plan (ICRP):</p> <p>a) Clearly indicate which modelling parameters have been adjusted since the last modelling run. In situations where the level of conservatism has reduced relative to FEIS predictions, appropriate justification should be provided.</p> <p>b) Future modelling results should explicitly and quantitatively report the range of predicted modelling outcomes based on AEM's assumptions regarding model prediction accuracy (i.e., +/- one order of magnitude). Any required mitigations should be based on a reasonable worst-case scenario. For example, what actions would be required if post-closure arsenic concentrations in Mammoth Lake are at the upper end of the potential prediction range?</p> <p>c) Water quality predictions should clearly indicate the spatial extent of post-closure water quality exceedances within surface water receivers.</p>	<p>a) Agnico Eagle agrees with CIRNAC to indicate which modelling parameters were adjusted since the last modelling run and to explain situations where the level of conservatism has reduced relative to FEIS predictions.</p> <p>b) Agnico Eagle agrees with CIRNAC for the next iteration of the water quality forecast model to explicitly report the range of predicted modelling outcomes based on model prediction accuracy.</p> <p>c) Agnico Eagle acknowledges CIRNAC's recommendation for the next iteration water quality forecast model to clearly indicate the spatial extent of post-closure water quality exceedances within surface water receivers.</p>



## **2. Compliance Monitoring**

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

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

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

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

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

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

CIRNAC issued the following Crown Land Leases for AEM's Meadowbank Gold Mine and Whale Tail Pit projects, respectively:

- 66A/8-71-3 (AWAR) and 66A/8-72-6 (AWAR Quarries); and
- 66H/8-02-1 (Whale Tail Haul Road) and 66H/8-01-4 (Whale Tail Haul Road Quarries).

CIRNAC has reviewed the Type A Water Licences associated with the Meadowbank Gold Mine and Whale Tail Pit Projects with respect to Project Certificate 004 (Amendment 003) and Project Certificate 008 (Amendment 001) and has included concordance tables (Appendix A and Appendix B) that outline how Project Certificates T&Cs have been incorporated in the Water Licences and Crown Land Leases.

In 2022, the projects activities and monitoring were conducted under the following NWB Water Licences:

- Type A Water Licence 2AM-MEA1530 (Meadowbank Gold Mine Project); and
- Type A Water Licence 2AM-WTP1830 (Whale Tail Pit Project).



**ii. A summary of any inspections conducted during the 2022 reporting period, and the results of these inspections;**

In 2022, CIRNAC's Resource Management Officers (Inspectors) conducted a total of six inspections of the Meadowbank Complex to ensure compliance with water licences 2AM-WTP1830 and 2AM-MEA1530, with three inspections occurring for each water licence.

A summary of the inspection reports and compliance-related activities is presented below.

**Meadowbank Gold Mine**

CIRNAC's Resource Management Officers inspected the Meadowbank Gold Mine three times under water licence 2AM-MEA1530 in 2022. One inspection occurred between June 15, another between September 12 and 13, with the last inspection for 2022 between December 1 and 2.

**June 15, 2022**

CIRNAC's inspection included the following sites: Fresh water intake barge at Third Portage Lake, Saddle Dam 3, Saddle Dam 2, Saddle Dam 1, West Diversion Ditch, North Cell of the Tailings Storage Facility, East Diversion Ditch, site ST-30/WEP-1, site ST-31/WEP-2, Waste Rock Storage Facility Sump, West Diversion of NP-1, Phaser Attenuation Pond, Vault Pit, Central Dyke, Assay Road Spill 2013-379, East Dyke, and the Baker Lake Marshalling Facility.

The Inspector noted that there were no signs notifying the public of the water supply facilities, waste disposal facilities, and monitoring stations. The Inspector also noted that the Proponent failed to undertake corrective measures to mitigate impacts to surface drainage of the marshalling facility and culvert connection lake NP-2 and NP-1. The Inspector requested that the Proponent install signs for monitoring stations, freshwater facilities, and waste disposal facilities, as well as develop immediate and long-term plans for water flow through the Marshalling Facility to Baker Lake, with repairs to the NP-2 to NP-1 culvert.

**September 12 and 13, 2022**

CIRNAC's primary focus for this inspection was finalizing spill incident reports by confirming the remediation of spills reported to the Nunavut/Northwest Territories Spill Reporting Line, as well as a follow-up for the June inspections. This included inspections of various spill sites, the Marshalling Facility, and NP1 West Diversion Ditch.

Twenty-six spill incidence reports from various years were recommended for closure with no concerns noted. One spill file, 2021-387, was also inspected and no concerns were noted – however, the Proponent representative indicated that sampling of the spill site would be conducted to confirm the area is remediated.

CIRNAC noted that the total suspended solids in a small stream near the Marshalling Facility are still notable.

No instances of non-compliance were noted from this inspection report. The Inspector requested that the Proponent provide a long-term plan to address total suspended solids.

**December 1 and 2, 2022**

CIRNAC's primary focus for this inspection was Spill 2022-544, an estimated 29,000 liters of diesel fuel was spilled at 15:15 on November 28, 2022, and was reported at 21:06 that same day.

CIRNAC notes that the response to the spill was in line with the established spill contingency plan, and remediation activities are planned. CIRNAC's Resource Management Officer advised



that a new sample location be established downstream of Spill 2022-544, with the site to be determined by the inspector at a later date.

A new sampling location has since been established which will be sampled weekly for total petroleum between June 1 and July 15, and monthly during open water season, with this information to be included in monthly reporting.

### **Whale Tail Mine**

CIRNAC's Resource Management Officers inspected the Whale Tail Mine three times in 2022 under water licence 2AM-WTP1830, once on June 14, again on September 13, with the last inspection for 2022 on December 2.

#### **June 14, 2022**

CIRNAC's inspection included reviews of ST-WT-05 at Nemo Lake, IVR Rock Storage Facility, Whale Tail South Channel, Emulsion Plant Fuel Storage Secondary Containment Berm, Mammoth Lake Diffuser ST-WT-2, culvert east of the Emulsion Plant, Mammoth Dyke, Whale Tail Rock Storage Facility Pond, Whale Tale Rock Storage Facility, A49 Sump, Groundwater Storage Pond, Wastewater Treatment Plant ST-WT-23 and ST-WT-24, and the Whale Tail Pit Sump.

The Resource Management Officer noted that there was debris near the water intake pipe at Nemo Lake. Further, signs indicating monitoring stations were missing from Mammoth Lake Diffuser ST-WT-2, Nemo Lake, the IVR Rock Storage Facility, Whale Tale Rock Storage Facility Pond ST-WT-3, and Whale Tale Rock Storage Facility. No other major concerns were noted.

The Inspector requested that signs be installed at the sampling points, water intake facilities, and waste disposal facilities; and that the debris on the surface of Nemo Lake be removed as soon as practical.

#### **September 13, 2022**

CIRNAC's primary focus for this inspection was the closure of a spill incident reported to the Government of Nunavut Spill Reporting Line. Fifty spill incidence reports from various years were recommended for closure with no concerns noted. One spill file, 2020-152, was also inspected; this Spill Report required further remediation and will be followed up in future inspections.

No instances of non-compliance were noted from this inspection report. The CIRNAC inspector requested that the Proponent follow up on Spill 2022-152.

#### **December 2, 2022**

CIRNAC's primary focus for this inspection was the snow management within the area of operations, which included the inspection of snow management areas and the Sana Crusher Pad.

No instances of non-compliance were noted from this inspection report. No actions were recommended.

Detailed Water Licence inspection reports can be accessed through the NWB Public Registry:

Meadowbank Gold Mine:



<ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-MEA1530%20Agnico/3%20TECH/A%20SCOPE%20ENFORCE/1%20INSPECTION/>

Whale Tail Pit:

<ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-WTP1830%20Agnico/3%20TECH/A%20SCOPE%20ENFORCE/1%20INSPECTION/>

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

Although some issues have been identified in 2022, CIRNAC is generally satisfied with AEM's response to the concerns raised by the inspectors in 2022. CIRNAC will continue to work with AEM to ensure compliance with all water licence requirements associated with Meadowbank Gold Mine and Whale Tail Pit Projects.



**Appendix A: Meadowbank Gold Mine Project Certificate Terms and Conditions (T&C) incorporated into any permits, certificates, licenses or other approvals issued for the Project<sup>1</sup>**

<b>T&amp;C #</b>	<b>NIRB Project Certificate No. 004 Term &amp; Condition</b>	<b>Implemented in Licences or Permits?</b>
5	Cumberland shall meet with respective licensing authorities prior to the commencement of construction to discuss the posting of adequate performance bonding. Licensing authorities are encouraged to take every measure to require that sufficient security is posted before construction begins. This bonding should not duplicate other amounts of security required (e.g. the NWB).	All of Part C of NWB Water Licence (2AM-MEA1530).  Parts 16-19 of Lease No. 66A/8-71-3 (covers the sections of the all-weather access road (AWAR) located on Crown land).  Part 34-37 of Lease No. 66A/8-72-6 (covers the quarries located on Crown land).
9	Cumberland shall provide detailed plans for water treatment for the tailings (reclaim pond) discharge, and on a contingency basis for the attenuation pond discharge(s) and for the pits, including estimates of treatment efficiency for each parameter of concern and the description of pH adjustments in the water license application to the NWB.	Part B, Item 13 of NWB Water Licence (2AM-MEA1530).
13	Cumberland shall not permit the water discharged into Wally Lake and Third Portage Lake to exceed receiving environment discharge criteria established by the NWB or as otherwise required by law.	Partially, the portion referring to criteria established by the NWB is found in Part F, Items 3 and 4 within the NWB Water Licence (2AM-MEA1530).
14	Cumberland shall not remove dewatering dikes until the quality of water contained within them is of sufficient quality to meet receiving environment discharge criteria established by the NWB or as otherwise required by law.	Part E, Item 7 of NWB Water Licence (2AM-MEA1530).

<sup>1</sup> It is to note that the following Meadowbank Gold Mine Project Certificate 004 (Amendment 003) T&Cs continue to apply also to the Whale Tail Pit Project: 9, 13, 14, 18, 19, 23, 25-27, 35 and 79.



<b>T&amp;C #</b>	<b>NIRB Project Certificate No. 004 Term &amp; Condition</b>	<b>Implemented in Licences or Permits?</b>
15	Cumberland shall within two (2) years of commencing operations re-evaluate the characterization of mine waste materials, including the Vault area, for acid generating potential, metal leaching and non-metal constituents to confirm FEIS predictions, and re-evaluate rock disposal practices by conducting systematic sampling of the waste rock and tailings in order to incorporate preventive and control measures into the Waste Management Plan to enhance tailing management during operations and closure. The results of the re-evaluations shall be provided to the NWB and NIRB's Monitoring Officer.	Part B, Item 13 of NWB Water Licence (2AM-MEA1530).
18	Cumberland shall commit to a pro-active tailings management strategy through active monitoring, inspection, and mitigation. The tailings management strategy will include the review and evaluation of any future changes to the rate of global warming, compliance with regulatory changes, and the ongoing review and evaluation of relevant technology developments, and will respond to studies conducted during the mine operation.	Part B, Item 13 of NWB Water Licence (2AM-MEA1530).
19	Cumberland shall provide for a minimum of two (2) metres cover of tailings at closure, and shall install thermistor cables, temperature loggers, and core sampling technology as required to monitor tailing freezeback efficiency. Cumberland shall report to NIRB's Monitoring Officer for the annual reporting of freezeback effectiveness.	Schedule B, Item 18 and Part B, Item 13 of NWB Water Licence (2AM-MEA1530).
20	Prior to construction, Cumberland shall identify mitigation measures that can be taken if groundwater monitoring around the tailings facility demonstrates that contamination from tailings has occurred through the fault. Upon drawdown of the North arm of Second Portage Lake, Cumberland shall conduct further tests to assess the permeability of any faults and provide the results to regulators. If doubt remains Cumberland shall seal the fault and conduct further permeability testing and monitoring.	Part B, Item 13 of NWB Water Licence (2AM-MEA1530).



T&C #	NIRB Project Certificate No. 004 Term & Condition	Implemented in Licences or Permits?
22	Prior to the commencement of the Project, Cumberland shall fund and install an onsite lab that has the capability to monitor parameters at a type and at a frequency acceptable to the NWB and EC at all site discharge points. The results of these analyses, as well as any other water quality monitoring required by regulatory authorities shall be used in the submission of a receiving water assimilative capacity water quality assessment study of concern to regulators. The lab shall be certified for environmental water quality analysis purposes with standards to include the calibration of water quality monitoring instruments. Cumberland shall file proof of application to become accredited upon the request of the NWB.	Partially, Part I, Items 16, 17, 18, 19 and 20 of NWB Water Licence (2AM-MEA1530) relate to this condition, but not to the installation of an onsite lab prior to construction.
23	For the purposes of monitoring quality assurance and quality control ("QA/QC"), Cumberland shall ensure that water quality monitoring performed at locations within receiving waters that allow for an assimilative capacity assessment of concern to regulators, be carried out by an independent contractor and submitted to an independent accredited lab for analysis, on a type and frequency basis as determined by the NWB. Results of analysis shall be provided to the NWB and NIRB's Monitoring Officer.	Part I, Item 16 of NWB Water Licence (2AM-MEA1530).
24	Cumberland shall identify an area and design for a landfill for disposal of operational and closure non-salvageable materials, including a list of any non-salvageable materials, and a procedural manual for preparation of location and placements of these materials, and incorporate the design into the final Waste Management Plan as instructed by the NWB.	Part B, Item 13 of NWB Water Licence (2AM- MEA1530).
25	Cumberland shall manage and control waste in a manner that reduces or eliminates the attraction to carnivores and/or raptors. Cumberland shall employ legal deterrents to carnivores and/or raptors at all landfill and waste storage areas. The deterrents are to be developed taking into consideration Traditional Knowledge and in consultation with the HTO, EC and CIRNAC and incorporated into the final Waste Management Plan prior to filing the Plan with the NWB.	Partially, this was not captured within the NWB Water Licence as it was already completed prior to licence approval. AEM's NWB Water Licence (2AM-MEA1530) does however require adherence to the Waste Management Plan under Part B, Item 13.



T&C #	NIRB Project Certificate No. 004 Term & Condition	Implemented in Licences or Permits?
26	Cumberland shall ensure that spills, if any, are cleaned up immediately and that the site is kept clean of debris, including wind-blown debris.	<p>Part H, Items 1 and 2 of NWB Water Licence (2AM- MEA1530).</p> <p>Partially, Conditions 45-47 of Lease No. 66A/8-71-3 (covers the sections of the AWAR located on Crown land).</p> <p>Partially, Conditions 47, 52-56 and 55 of Lease No. 66A/8-72-6 (covers the quarries located on Crown land).</p>
27	Cumberland shall ensure that the areas used to store fuel or hazardous materials are contained using safe, environmentally protective methods based on practical, best engineering practices.	<p>Part H, Item 3 of NWB Water Licence (2AM-MEA1530).</p> <p>Partially, Conditions 45-47 of Lease No. 66A/8-71-3 (covers the sections of the AWAR located on Crown land).</p> <p>Partially, Conditions 52-56 of Lease No. 66A/8-72-6 (covers the quarries located on Crown land).</p>
33	<p>Cumberland shall update the Access and Air Traffic Management Plan to:</p> <ol style="list-style-type: none"> <li>1. include an All-weather Private Access Road Management Plan, including a right-of-way policy developed in consultation with the KivIA, GN, CIRNAC and the Hamlet of Baker Lake, for the safe operation of the all-weather private access road; and</li> <li>2. to facilitate monitoring of the environmental and socio-economic impacts of the private road and undertake adaptive management practices as required, including responding to any concerns regarding the locked gates.</li> </ol>	Partially, item 1 is addressed under Condition 54 of Lease No. 66A/8-71-3 (covers the sections of the AWAR located on Crown land).
35	Cumberland shall reclaim the all-weather private access road at the end of the mine life to prevent any future use of the road, including scarification of the road and restoration of the natural hydrology, topography, and vegetation, subject only to Cumberland and/or its successor seeking NIRB Article 12 approval for the road to be maintained and operated beyond the life of the mine.	Partially, Conditions 12 and 15 of Lease No. 66A/8-71-3 (covers the sections of the AWAR located on Crown land).



T&C #	NIRB Project Certificate No. 004 Term & Condition	Implemented in Licences or Permits?
78	Cumberland shall file a complete Closure and Reclamation Plan developed to comply with CIRNAC's policy of full cost of restoration and any related NWB requirements such that the Inuit and taxpayers are not liable for any cost associated with the cleanup, modification, decommission, or abandonment.	<p>Partially, Part B, Item 13 of NWB Water Licence (2AM- MEA1530).</p> <p>Partially, Conditions 12, 15, 16-19, 26 of Lease No. 66A/8-71-3 (covers the sections of the AWAR located on Crown land).</p> <p>Partially, Conditions 14, 17, 26, 34-38 of Lease No. 66A/8-72-6 (covers the quarries located on Crown land).</p>
79	<p>In addition to the NWB's requirements, the final Closure and Reclamation Plan shall require Cumberland to:</p> <ul style="list-style-type: none"> <li>a. Ensure that mine facilities and infrastructure are abandoned in such a manner that: <ul style="list-style-type: none"> <li>i. The Project site is physically stable and any requirements for long term maintenance and monitoring are minimized;</li> <li>ii. Threats to public safety and wildlife are eliminated; and</li> <li>iii. Affected areas are returned to the original undisturbed conditions to the fullest extent possible.</li> </ul> </li> <li>b. Prevent continuing impacts from contaminants and wastes on the environment including those associated with acid rock drainage;</li> <li>c. Remove all hazardous materials and waste and as much salvageable waste as practicable from the Project area; and</li> <li>d. Enter into written arrangements with its abandonment and reclamation contractors to ensure all site debris is cleaned up off the lands, including wind-blown debris.</li> </ul>	<p>Partially, Part B, Item 13 of NWB Water Licence (2AM- MEA1530).</p> <p>Partially, Conditions 12, 15, 16-19, 26 of Lease No. 66A/8-71-3 (covers the sections of the AWAR located on Crown land).</p> <p>Partially, Conditions 14, 17, 26, 34-38 of Lease No. 66A/8-72-6 (covers the quarries located on Crown land).</p>
80	Cumberland shall file annually with NIRB's Monitoring Officer an updated report on progressive reclamation and the amount of security posted, as required by KivIA, CIRNAC, and/or the NWB.	<p>Does not incorporate filing to the NIRB's Monitoring Officer, but does refer to reporting on progressive reclamation and security:</p> <p>Partially, Conditions 19 (bi-annual reporting requirement), 20, and 33 of Lease No. 66A/8-71-3 (covers the sections of the AWAR located on Crown land).</p> <p>Partially, Conditions 24 and 38 of Lease No. 66A/8-72-6 (covers the quarries located on Crown land).</p>



**Appendix B: Whale Tail Pit Project Certificate Terms and Conditions (T&C) incorporated into any permits, certificates, licenses or other approvals issued for the Project**

<b>T&amp;C #</b>	<b>NIRB Project Certificate No. 008 Term &amp; Condition</b>	<b>Implemented in Licences or Permits?</b>
2	<p>Prior to commencing construction activities the Proponent shall update the existing Dust Management and Monitoring Plan for the Meadowbank Mine site to address and/or include the following additional items:</p> <ul style="list-style-type: none"> <li>Align plan requirements with commitments made in the Final Environmental Impact Statement and during the Final Hearing to monitor dust along the existing all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project.</li> <li>Verify commitments to the utilization of dust suppressants along the all-weather access road, the Amaruq haul road and any other roads and trails associated with the Project, including a description of the type of suppressant to be utilized and the frequency and timing of applications to be made throughout the various seasons of road use.</li> </ul> <p>Outline the specific triggers, thresholds, and adaptive management measures that will apply if monitoring indicates that dust deposition is higher than predicted.</p>	Part F, Item 12 of NWB Water Licence (2AM-WTP1830)
6	The Proponent shall conduct detailed hydrodynamic modelling during operations and closure to evaluate the mixing of the Waste Rock Storage Facility seepage into Mammoth Lake post-closure; and Based on the results of the modelling implement monitoring programs and adaptive management strategies that minimize the need for active intervention, including long-term treatment of mine contact water.	Part E, Item 8 of NWB Water Licence (2AM-WTP1830)
9	The Proponent shall undertake the additional site-specific geotechnical investigations required to identify sensitive land features and to inform final engineering design prior to the construction of project components such as the waste rock storage facility and quarries.	Part D, Item 2 of NWB Water Licence (2AM-WTP 1830)
11	The Proponent shall develop and implement an Erosion Management Plan to prevent or minimize erosion and its resulting effects from project-related land disturbance.	Lease 66H/8-02-2 Whale Tail Haul Road (lease clauses 32 and 33) Lease 66H/8-01-4 Whale Tail Haul Road Quarries (lease clause 41)



T&C #	NIRB Project Certificate No. 008 Term & Condition	Implemented in Licences or Permits?
12	<p>As part of the Closure and Reclamation Plan, the Proponent shall develop and implement a program to:</p> <p>a) Progressively reclaim disturbed areas within the project footprint, with an emphasis on restoring the natural aesthetics of the area through re-contouring to the extent practicable; and</p> <p>b) In a manner that demonstrates that the Proponent has considered the aesthetic values of local communities (e.g. information regarding the acceptability of the topography and landscape of the project areas following progressive reclamation efforts).</p>	<p>Part J, Item 2 of NWB Water Licence (2AM-WTP 1830)</p> <p>Lease 66H/8-02-2 Whale Tail Haul Road (lease clause 23)</p> <p>Lease 66H/8-01-4 Whale Tail Haul Road Quarries (lease clause 33)</p>
13	<p>The Proponent shall explore the feasibility of topsoil/organic matter salvage as part of project development and provide updates to the Closure and Reclamation Plan based on this investigation.</p>	<p>Part J, Item 3 of NWB Water Licence (2AM-WTP 1830)</p>
15	<p>Subject to the additional direction and requirements of the Nunavut Water Board, the Proponent shall prepare and implement a Groundwater Monitoring Plan that, at a minimum includes:</p> <ul style="list-style-type: none"> <li>• The collection of additional site-specific hydraulic data (e.g., from new monitoring wells) in key areas during the pre-development, Nunavut Impact Review Board Page 23 of 49 Project Certificate No. 008 construction and operation phases;</li> <li>• Definition of vertical and horizontal groundwater flows in the project development areas;</li> <li>• Delineates monitoring plans for both vertical and horizontal ground water; and</li> </ul> <p>Thresholds that will trigger the implementation of adaptive management strategies that reflect site- specific conditions encountered at the project site.</p>	<p>Part I, Item 1e of NWB Water Licence (2AM-WTP 1830)</p>



T&C #	NIRB Project Certificate No. 008 Term & Condition	Implemented in Licences or Permits?
16	<p>Within two years of commencing operations, the Proponent shall:</p> <ul style="list-style-type: none"> <li>a) Conduct additional analyses to determine the approximate fill time for the Whale Tail Pit at closure;</li> <li>b) Undertake a hydrogeological characterization study to assess the potential for arsenic and phosphorous diffusion from submerged Whale Tail pit walls;</li> <li>c) If the results of the characterization study indicate a moderate to high potential for arsenic and/or phosphorous diffusion, perform detailed hydrodynamic modelling of the flooded pit lake prior to closure to evaluate meromictic conditions and flooded pit water quality; and</li> <li>d) Add these required activities to the site Groundwater Monitoring Plan.</li> </ul>	Part E, Item 7 of NWB Water Licence (2AM-WTP1830)
17	<p>The Proponent shall:</p> <ul style="list-style-type: none"> <li>a) Monitor the effects of project activities and infrastructure on surface water quality conditions;</li> <li>b) Ensure the monitoring data is sufficient to compare the impact predictions in the Environmental Impact Statement (EIS) for the Project with actual monitoring results;</li> <li>c) Ensure that the sampling locations and frequency of monitoring is consistent with and reflects the requirements of the Water Quality and Flow Plan and the Core Receiving Environmental Monitoring Program; and</li> <li>d) On an annual basis, the Proponent will compare monitoring results with the impact assessment predictions in the EIS and will identify any significant discrepancies between impact predictions and monitoring results.</li> </ul>	Part D, Items 10-14 of NWB Water Licence (2AM-WTP1830)



T&C #	NIRB Project Certificate No. 008 Term & Condition	Implemented in Licences or Permits?
18	<p>The Proponent shall, reflecting any direction from the Nunavut Water Board, maintain a Site Water Monitoring and Management Plan designed to:</p> <ul style="list-style-type: none"> <li>• Minimize the amount of water that contacts mine ore and wastes;</li> <li>• Appropriately manage all contact water and discharges to protect local aquatic resources; and</li> <li>• Implement water conservation and recycling to maximize water reuse and minimize the use of natural waters.</li> </ul> <p>The Plan should include monitoring that demonstrates contact water (runoff and shallow groundwater) from the ore storage and waste rock storage areas is captured and managed, as per the Waste Rock Facility Management Plan.</p>	Part E, Items 7-11 of NWB Water Licence (2AM-WTP1830)
19	<p>The Proponent shall, reflecting any direction from responsible authorities such as the Nunavut Water Board, Fisheries and Oceans Canada and Environment and Climate Change Canada, maintain a Core Receiving Environment Monitoring Program (CREMP) designed to:</p> <ul style="list-style-type: none"> <li>• Determine the short and long-term effects in the aquatic environment resulting from the Project;</li> <li>• Evaluate the accuracy of Project effect predictions;</li> <li>• Assess the effectiveness of mitigation and management measures on Project effects;</li> <li>• Identify additional mitigation measures to avert or reduce environmental effects due to Project activities;</li> <li>• Comply with Metal Mining Effluent Regulations requirements, should an Environmental Effects Monitoring program be triggered;</li> <li>• Reflect site-specific water quality conditions; Include details comparing the watershed features in the Whale Tail watershed to those watersheds used as reference lakes; and</li> <li>• Evaluate the mixing and non-mixing portion of the pit.</li> </ul> <p>The CREMP should include sufficient sampling and monitoring programs to appropriately characterize the receiving environment to ensure that adequate data is available to assess impact predictions made within the Environmental Impact Statement for the Whale Tail Pit Project.</p>	Part E, Items 7-11 of NWB Water Licence (2AM-WTP1830)



<b>T&amp;C #</b>	<b>NIRB Project Certificate No. 008 Term &amp; Condition</b>	<b>Implemented in Licences or Permits?</b>
20	Unless otherwise authorized, the Proponent shall maintain an appropriate setback distance between project quarries and borrow pits from fish-bearing or permanent waterbodies as required to prevent acid rock drainage or metal leaching into such waterbodies.	Part I, Item 1 of NWB Water Licence (2AM-WTP1830)  Lease 66H/8-01-4 Whale Tail Haul Road Quarries (lease clause 54)
21	The Proponent shall ensure that all project infrastructures in watercourses are designed and constructed in such a manner that they do not unduly prevent or limit the movement of water or fish species in fish bearing streams and rivers, unless otherwise authorized by Fisheries and Oceans Canada.	Part E, Item 25 of NWB Water Licence (2AM-WTP1830)
22	The Proponent shall engage with Fisheries and Oceans Canada to develop project specific thresholds, mitigation and monitoring for any blasting activities that would exceed the requirements of Fisheries and Oceans Canada's Guidelines for the Use of Explosives In or Near Canadian Fisheries Waters.	Part I, Item 1 of NWB Water Licence (2AM-WTP1830)
24	The Proponent shall engage Fisheries and Oceans Canada, and other interested parties to further assess: <ul style="list-style-type: none"> <li>• Whether the increased surface area of Whale Tail Lake is a viable offset to habitat losses resulting from development of the Project; and</li> <li>• Whether Whale Tail end pit would support fish in the post closure scenario.</li> </ul> Results of this assessment should be incorporated into the Habitat Compensation Plan and/or the Conceptual Fisheries Offsetting Plan as appropriate.	Part I, Item 1 of NWB Water Licence (2AM-WTP1830)
26	The Proponent shall include revegetation strategies within its Mine Closure and Reclamation Plan that support progressive reclamation, and promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment. These strategies should include exploration of the feasibility and practicality of topsoil/organic matter salvage through Project development. Consideration for the results of similar reclamation efforts at other northern projects, including the Meadowbank Gold Mine Project, must be demonstrated.	Part J, Item 8 of NWB Water Licence (2AM-WTP1830)



T&C #	NIRB Project Certificate No. 008 Term & Condition	Implemented in Licences or Permits?
31	The Proponent shall develop and implement a Road Access Management Plan and maintain traffic monitoring logs along the haul road between the Whale Tail Pit project and the Meadowbank mine. Where traffic exceeds levels predicted within the Environmental Impact Statement, the Proponent shall develop and implement appropriate modifications to its wildlife protection measures.	Lease 66H/8-02-2 Whale Tail Haul Road (lease clauses 54 and 60)
56	<p>The Proponent shall report any archaeological site discovered during the construction, operation, and closure phases to the Government of Nunavut – Department of Culture and Heritage and the Kivalliq Inuit Association.</p> <p>Upon discovering an archeological site, the Proponent shall:</p> <ol style="list-style-type: none"> <li>Take all reasonable precautions necessary to protect the site until further direction is received from the Government of Nunavut – Department of Culture and Heritage; and</li> <li>If it becomes necessary to disturb an archaeological site, the Proponent shall consult with the Government of Nunavut – Department of Culture and Heritage, the Kivalliq Inuit Association, and potential impacted communities to establish a site specific mitigation plan, and obtain all necessary authorizations and comply with all applicable laws.</li> </ol>	<p>Lease 66H/8-02-2 Whale Tail Haul Road (lease clause 74)</p> <p>Lease 66H/8-01-4 Whale Tail Haul Road Quarries (lease clause 66)</p>
66	<p>The Proponent shall operate the Whale Tail haul road as a private access road, implement any reasonable measures to limit public access to the road, and develop strategies that account for unauthorized use. These measures must include, but are not limited to, the following:</p> <ol style="list-style-type: none"> <li>The posting of signs in English and Inuktitut at the gate, each major bridge crossing, and each 10 kilometres of road, stating that public use of the road is prohibited;</li> <li>Annually advertise and hold at least one community meeting in the Hamlet of Baker Lake to explain to the community that the road is restricted to mine use only;</li> <li>Place local notices (e.g., radio, television, social media) at least quarterly to explain to the community that the road is restricted to mine use only;</li> <li>Record all unauthorized non-mine use of the road, and require all mine personnel using the road to monitor and report unauthorized non-mine use of the road; and,</li> <li>Develop management strategies to ensure public and operator safety in the event of unauthorized public use.</li> </ol>	Lease 66H/8-02-2 Whale Tail Haul Road (lease clauses 61, 62, 63 and 64)

