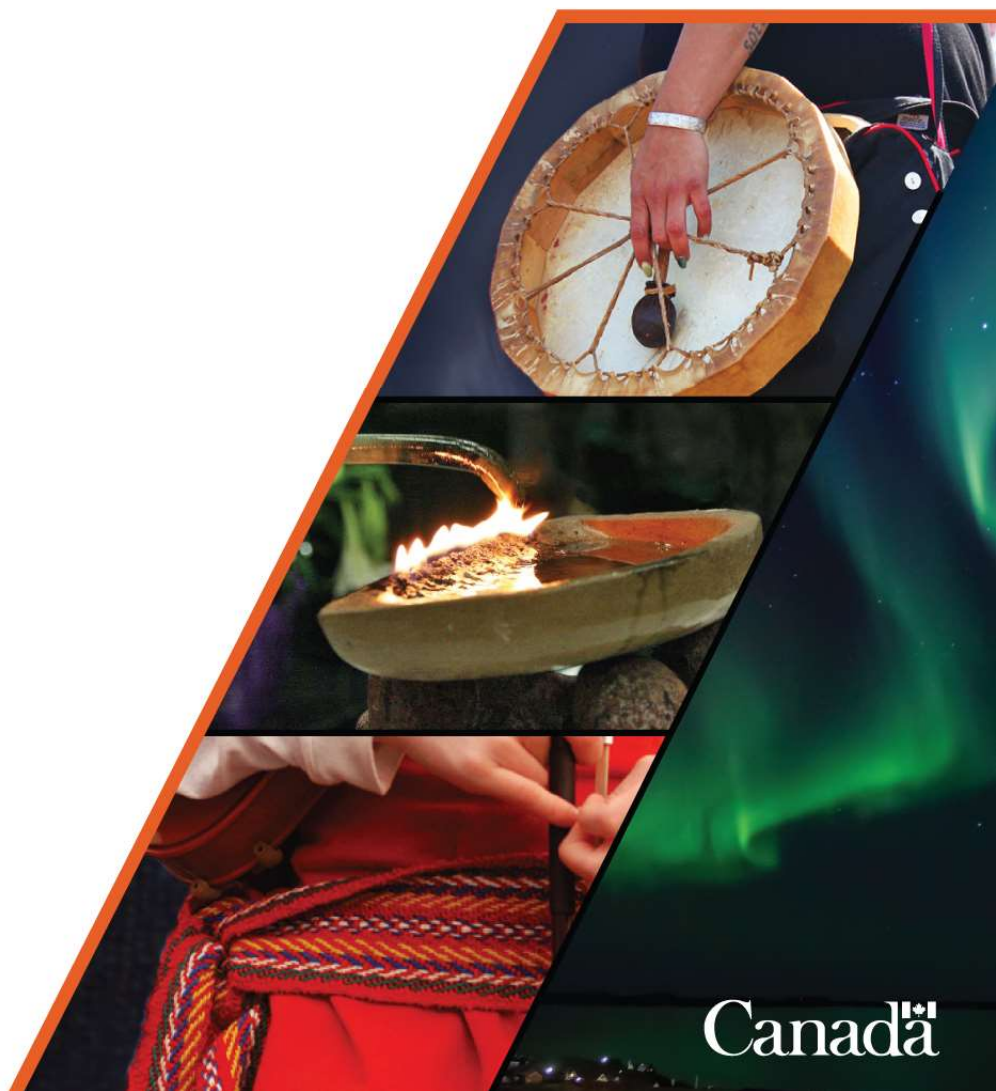




CIRNAC Comments to NIRB Re: Agnico Eagle Mines Limited's Meliadine Gold Mine Project 2021 Annual Report



GCDOCS # 103669196



Canada

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

Your file - Votre référence
11MN034
Our file - Notre référence
GCDOC #1286089

June 20, 2022

Emily Koide
Technical Advisor I
Nunavut Impact Review Board
P.O. Box 1360
Cambridge Bay, NU, X0B 0C0
Via electronic mail to: info@nirb.ca

Dear Emily Koide,

Re: Comment Request for Agnico Eagle Mines Limited's Meliadine Gold Mine Project 2021 Annual Report

On May 4, 2022, as per Section 12.7 of the *Agreement between the Inuit of the Nunavut Settlement Area and Her Majesty The Queen in Right of Canada* (Nunavut Agreement) and the amended Meliadine Gold Mine Project Certificate [No. 006], the Nunavut Impact Review Board (NIRB) requested parties to review Agnico Eagle Mines Limited (AEM)'s 2021 Annual Report with respect to effects and compliance monitoring.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) has conducted a review of the 2021 Annual Report and related documents in areas under its mandate and jurisdiction pertaining to effects and compliance monitoring. On this basis, CIRNAC would like to provide the comments below for NIRB's consideration.

CIRNAC appreciates the opportunity to review AEM's Meliadine Gold Mine Project 2021 Annual Report and looks forward to working with NIRB and AEM throughout any future reviews for this project. Should you have any questions, please do not hesitate to contact Amal Roy by email at amal.roy@rcaanc-cirnac.gc.ca or David Abernethy by email at david.abernethy@rcaanc-cirnac.gc.ca.

Sincerely,



Felexce Ngwa
Manager, Impact Assessment



1. Effects Monitoring

The Meliadine Gold Mine Project 2021 Annual Report has been evaluated to assess the measurable changes to the valued components, under CIRNAC areas of interest, compared to the potential effects that were predicted to result from development of the Meliadine Gold Mine Project, taking into account the Final Environmental Impact Statement (FEIS), previous years' Monitoring Reports and the requirements included in the Project Certificate (as amended). The assessment considered the following:

- a. ***Whether the conclusions reached by Agnico Eagle Mines Limited (AEM) in the Meliadine Gold Mine Project 2021 Annual Monitoring Report are valid; and,***
- b. ***Any areas of significance requiring further supporting information or any changes to the monitoring program which may be required***

Comment Number:	CIRNAC #1
Subject:	Resolution of Comments on the 2020 and Previous Annual Reports
Reference:	<ul style="list-style-type: none"> AEM's Responses to CIRNAC Comments on 2020 Annual Report (letter provided to the NIRB dated July 28, 2021); Meliadine Gold Mine Project 2021 Annual Report NIRB Project Certificate 006, Amendment 002, Terms and Conditions (T&C)
Issue/Rationale:	<p>CIRNAC's review of the 2020 Annual Report generated 20 comments for AEM's consideration. Based on responses provided by AEM, 14 of these have been resolved while six remain unresolved. The following previous comments remain outstanding and are discussed below in sequence:</p> <p>CIRNAC #1.1 - Geochemical Monitoring, Acid Rock Drainage/Metal Leaching (ARD/ML) Testing (T&C 19)</p> <p>CIRNAC #1.8 - Site Water Management (T&C 27 and 28)</p> <p>CIRNAC #4 – Mill Use of Containment Pond 1 (CP-1) Water (T&C 28)</p> <p>CIRNAC #6.1 - Geotechnical Inspection Concerns/Issues – Permafrost Degradation (T&C 17 and 21)</p> <p>CIRNAC #10 – Consultation with Outfitters and Guides</p> <p>CIRNAC #11 - Hunter Harvest Survey</p>
Issue #1.1 (previously CIRNAC #1.1)	<p>Geochemical Monitoring, Acid Rock Drainage/Metal Leaching (ARD/ML) Testing (T&C 19):</p> <p>In 2020, the number of waste rock samples classified as having Uncertain Acid Rock Drainage (ARD) [i.e., Neutralizing Potential Ratio (NPR) between 1 and 2] or potentially acid generating (PAG; $\text{NPR} \leq 1$) increased compared to previous years. CIRNAC recommended that moving forward AEM:</p> <ol style="list-style-type: none"> a. Track volumes of waste rock classified as having PAG ($\text{NPR} \leq 1$) and Uncertain ARD potential ($1 < \text{NPR} < 2$) from the underground mine and open pits.



Comment Number:	CIRNAC #1
	<p>b. Provide information on where waste rock was used for construction, the amount of waste rock used for construction and confirm that the waste rock used was not PAG.</p> <p>The 2021 Annual Report provides information on corrections that were made to the measurement of neutralizing potential (NP) that was confirmed by the laboratory to underestimate the amount of NP in the sample, leading to lower than actual NPR values and an artificially greater number of samples being classified as Uncertain or PAG. Using the updated methodology, only two waste rock samples from the underground mine were classified as Uncertain, and none were classified as PAG in 2021.</p> <p>However, the information requested by CIRNAC as noted above was not found within the 2021 Annual Report or appendices.</p> <p>CIRNAC notes that tracking the quantities and distribution of Uncertain and PAG waste rock will help ensure the proper management of these materials to avoid ARD/ML issues and equally identify any emerging trends of increasing quantities of problematic waste rock requiring management.</p>
Recommendation to Address Issues:	<p>CIRNAC recommends that moving forward AEM:</p> <ul style="list-style-type: none"> a) Track volumes of waste rock classified as Uncertain and PAG from the underground mine and open pits; and b) Confirm that waste rock used for construction was not PAG.
Issue #1.2 (previously CIRNAC #1.8)	<p>Site Water Management (T&C 27 and 28):</p> <p>In the 2020 Annual Report, AEM provided the SNC Lavalin's (SNC 12 Nov. 2020) upper bound model predictions of surface water total dissolved solids (TDS) loads to CP-1, in which "rest of site" was predicted as the most significant contributor to 2020 TDS loads (i.e., 1,408 t of the 1,785 t) and much less so for 2021 loads (i.e., 373 t of the 857 t). During review of the 2020 Annual Report, CIRNAC requested that AEM provide information on the nature and make-up of "rest of site" areas/facilities that contributed significantly to the TDS loads to CP-1.</p> <p>In their response, AEM provided information generally describing the make-up and nature of the site but not the specific information requested for.</p> <p>Appendix 32-9 Ore Storage Management of the 2021 Annual Report provides information on the capacity of the ore storage area being approximately 1,260,000 t (~672,800 m³). Table 4-3 provides information on the Evolution of Ore Stockpiles at OP2 (Stage 1/Stage 2).</p> <p>From review of this information, it is unclear to CIRNAC:</p> <ul style="list-style-type: none"> • Whether the table values for years 2019, 2020, 2021 are actual or plan values?



Comment Number:	CIRNAC #1
	<ul style="list-style-type: none"> • What these values represent; are they quantities of material stored at a specific time, or total quantities stored during the year at these locations? • To what degree high-grade ores go directly to the mill. Some parts of the document state that all high-grade ores go directly to the mill while other parts of the document state that only a portion of these ores go directly to the mill? <p>It would be helpful to have a more definitive understanding of ore characteristics and quantities that were stored (compared to plan) during the period when higher TDS loads were noted in CP1, to limit similar events in the future.</p>
Recommendation to Address Issues:	<p>CIRNAC requests that AEM:</p> <ul style="list-style-type: none"> a) Clarify whether the values presented in Table 4-3 of Appendix 32-9 (Ore Storage Management) for years 2019, 2020 and 2021 are actual or plan values and indicate exactly what these values represent; b) Clarify whether all or only a portion of high-grade ore goes directly to the mill; c) Provide a description of ore storage operations and how much fresh ore (from underground and open pits) are placed on the ore pad in each year along with a description of ore retention times on the pad; and d) Update the SNC Lavalin load analysis and report on the actual vs. predicted trends of TDS loads to CP-1, especially the contribution from the “rest of site”.
Issue #1.3 (previously CIRNAC #4)	<p>Mill Use of Containment Pond 1 (CP-1) Water (T&C 28):</p> <p>During the 2020 Annual Report review, CIRNAC requested that AEM:</p> <ul style="list-style-type: none"> a. Provide details related to when and how much CP-1 water was used in the mill in 2020. b. Clarify AEM’s current position on the mill’s use of CP-1 water to maintain CP-1 water level at the low end of operating water levels, under normal operating conditions. c. Provide information on potential use of CP-1 water by the mill for adaptive management drawdown of the CP-1 water level. <p>In their response, AEM indicated that <i>“Agnico Eagle will maximize to the greatest practical extent, the use of Reclaim Water from Contact Water management facilities for use in the mill”. Agnico Eagle will apply this Licence condition to both normal operating conditions and adaptive management.”</i></p> <p>CIRNAC did not see any discussion in the 2021 Annual Report with respect to AEM’s commitment noted above. On the contrary, Section 4.2 states <i>“The lower concentrations for metals in 2021 may be explained by the fact the mill feed water came from Meliadine Lake</i></p>



Comment Number:	CIRNAC #1
	<p><i>which, in general, has lower metals than CP1 surface contact water, which was used for the mill feed water in 2020.</i></p> <p>No specific information was provided on use of reclaim water from CP-1 as mill makeup water. Based on AEM's above statement it can be inferred that CP-1 reclaim water use in 2021 was zero.</p> <p>CIRNAC note that maximizing the use of reclaim water in the mill will reduce discharges from CP1 to the environment (i.e., Meliadine Lake and marine discharges).</p>
Recommendation to Address Issues:	<p>CIRNAC recommends that AEM include a section in future annual reports that explicitly discusses uses of CP-1 water in the mill and how AEM is complying with the licence condition to <i>"maximize to the greatest practical extent, the use of Reclaim Water from Contact Water management facilities for use in the mill."</i></p>
Issue #1.4 (previously CIRNAC #6.1)	<p>Geotechnical Inspection Concerns/Issues – Permafrost Degradation (T&C 17 and 21):</p> <p>In both 2019 and 2020, AEM provided comprehensive geotechnical inspections carried out by Tetra Tech for all project facilities. Observations and recommendations were provided to AEM for consideration and AEM provided responses to Tetra Tech's recommendations. While information was provided on freeze back of tailings, waste rock dams and dikes, no information was provided on permafrost degradation of other aspects of the operation.</p> <p>For clarity, what CIRNAC is requesting is more general information on permafrost degradation that might be occurring across the site, in particular, within landforms / areas in between critical infrastructure areas, and areas affected by water channels. CIRNAC notes that permafrost is a valued environmental component and understanding the effects of operation on permafrost degradation is important to minimize any potential impacts.</p>
Recommendation to Address Issues:	<p>As per T&C 17 and T&C 21 of the NIRB Project Certificate for this project, CIRNAC recommends that AEM provides a discussion on the status of permafrost degradation that may be occurring as a result of AEM's construction and operation activities.</p>
Issue #1.5 (previously CIRNAC #10)	<p>Consultation with Outfitters and Guides:</p> <p>As part of its review of AEM's 2020 Annual Report, CIRNAC observed that no reference was made to consultation efforts with outfitting and guiding companies pursuant to T&C 104 of the Amended Project Certificate. Consequently, CIRNAC recommended that AEM:</p> <ul style="list-style-type: none"> a) Provide an update on the outcomes of any consultation efforts undertaken with outfitting and guiding companies that operate in the Local Study Area and Regional Study Area regarding use of the area, specifically as it relates to hunting, fishing and



Comment Number:	CIRNAC #1
	<p>guiding within proximity of the All Weather Access Road (AWAR).</p> <p>b) Report any updates to management plans based on consultation efforts.</p> <p>In its July 28, 2021 response to comments submitted by interested parties, AEM thanked CIRNAC for this recommendation and committed to accounting for these consultation efforts in its 2021 Annual Report. CIRNAC is unable to confirm whether AEM consulted with outfitter and guiding companies or made any updates to management plans based on such efforts in 2021 pursuant to Project Certificate requirements. The submitted Project Certificate Concordance Table (Appendix 41 to the 2021 Annual Report) makes reference to section 7.9.1 of the 2021 Annual Report and the 2021 Terrestrial Environment Management and Monitoring Plan Report (Appendix 26 to the 2021 Annual Report) to this T&C but neither source provides information related to consultation efforts. These references may have been provided in error. In fact, there is no section 7.9.1 in the 2021 Annual Report. The closest section is 7.9 which relates to vegetation.</p>
<p>Recommendation to Address Issues:</p>	<p>The recommendation provided in CIRNAC's review of the 2020 Annual Report remains outstanding.</p> <p>CIRNAC recommends that AEM:</p> <ul style="list-style-type: none"> a) Provide an update on the outcomes of any consultation efforts undertaken with outfitting and guiding companies that operate in the Local Study Area and Regional Study Area regarding use of the area, specifically as it relates to hunting, fishing and guiding within proximity of the AWAR. b) Report any updates to management plans based on consultation efforts. <p>Future Annual Report submissions should endeavour to satisfy the information requirements of T&C 104 of the Amended Project Certificate.</p>
<p>Issue #1.6 (previously CIRNAC #11)</p>	<p>Hunter Harvest Survey:</p> <p>Pursuant to T&C 105 of the Amended Project Certificate, <i>"The Proponent is strongly encouraged to consider incorporating information obtained from local outfitting and guiding businesses into its Hunter Harvest Survey where possible, and to include these organizations as potential respondents to surveys undertaken."</i></p> <p>Consistent with CIRNAC's review of the 2020 Annual Report and supporting documentation, it is observed that AEM's 2021 Annual Report, Terrestrial Environment Management and Monitoring Plan, and 2021 Terrestrial Environment Management and Monitoring Plan Report do not reference any communications with local outfitting and</p>



Comment Number:	CIRNAC #1
	<p>guiding businesses in the development and administration of a Hunter Harvest Survey.</p> <p>In its July 28, 2021 response to comments submitted by interested parties on the 2020 Annual Report, AEM did not respond to a similar comment that was made by CIRNAC.</p> <p>CIRNAC acknowledges that AEM is collaborating with the Kangiqliniq Hunters and Trappers Organization to develop and implement a Hunter Harvest Survey as communicated in section 4.8 of its Terrestrial Environment Management and Monitoring Plan.</p>
Recommendation to Address Issues:	<p>The recommendation provided in CIRNAC's review of the 2020 Annual Report remains outstanding.</p> <p>CIRNAC requests that future Annual Report submissions include summaries of any interactions with local outfitting and guiding companies regarding the administration of its Hunter Harvest Survey, should they occur.</p>

Comment Number:	CIRNAC #2
Subject:	Reducing Discharges to Meliadine Lake
Reference:	<ul style="list-style-type: none"> • Meliadine Gold Mine Project 2021 Annual Report, Section 3.1.4 • Water Management Plan Appendix 32-14 • NIRB Project Certificate 006, Amendment 002, Term and Condition 25
Issue/Rationale:	<p>Surface contact water at the Meliadine site is diverted and collected within various containment ponds (CP1, CP3, CP4, CP5 and CP6) and ultimately stored in CP1. From there, the contact water is treated at the Effluent Water Treatment Plant (EWTP) for total suspended solids (TSS) and subsequently discharged via a diffuser to Meliadine Lake provided that effluent quality meets discharge limits, including for total dissolved solids. In 2021, 851,126 m³ of treated water was discharged from CP1 to Meliadine Lake.</p> <p>As part of the Nunavut Water Board 2020 Water Licence Amendment process, as well as the NIRB Saline Water Line review process, the Kivalliq Inuit Association had requested that AEM commit to eliminating effluent discharge to Meliadine Lake. AEM responded that it could not make that commitment but would commit to minimizing discharge to Meliadine Lake. Review of the 2021 Annual Report and its appendices did not find any reference to this commitment.</p> <p>AEM has applied for and received approval to construct and operate a saline water pipeline system that can discharge up to 20,000 m³ per day (consisting of up to 12,000 m³/day saline water and 8,000 m³/d surface contact water) to Melvin Bay during the open water season. Once completed, this system will allow AEM to minimize discharge to Meliadine Lake.</p>



Comment Number:	CIRNAC #2
	Minimizing discharges to Meliadine Lake has been expressed as a critical objective by the Kivalliq Inuit Association and local communities. It is incumbent that AEM make effort to reduce discharging into Meliadine Lake.
Recommendation to Address Issues:	<p>CIRNAC recommends that AEM:</p> <ol style="list-style-type: none"> Update its management and operational plans to reflect the commitment to minimize discharges to Meliadine Lake. Describe what steps were taken in 2021 to minimize discharges to Meliadine Lake.

Comment Number:	CIRNAC #3
Subject:	Clarification of Modelling Assumptions
Reference:	<ul style="list-style-type: none"> Meliadine Gold Mine Project 2021 Annual Report, Sections 3.1.7, 3.2.2, 3.2.4, 4.2.4 Water Balance and Water Quality Model Results Appendix 5 2021 Annual Geochemical Report Appendix 10 NIRB Project Certificate 006, Amendment 002, Term and Condition 25
Issue/Rationale:	<p>In reviewing the 2021 Annual Report, CIRNAC notes the following:</p> <ol style="list-style-type: none"> Figure 12 of the Annual Report shows measured and predicted TDS concentrations in CP1 for life of mine and closure. The Water Balance and Water Quality Model predicts the mean TDS concentration in subsequent years to be very close to the updated discharge limit of 3,500 mg/L, with a very small margin. Section 3.2.4 of the Annual Report describes the results of the Saline Water Quality Model as follows: <i>“The model forecasted the TDS, Ammonia and Radium-226 concentrations well in TIRI02 (Tiriganiaq Open Pit #2), however; an increased observed concentration was noticed in the winter season of 2021 for all constituents compared to the model forecasted concentration (Figure 15 to Figure 17). This increased concentration may be attributed to cryo-concentration. It should be noted this trend is not confirmed for Radium-226, due to having only one data point.”</i> Section 3.2.1 of the Annual Report notes that cryo-concentration is already considered in the model with the implementation of a temperature-based ice algorithm. In the annual report, AEM does not provide any recommended actions to improve the accuracy of these saline water quality predictions in TIRI02, particularly with respect to ammonia (and possibly radium-226). Section 4.2.4 of the Annual Report on the metal leaching of filtered tailings notes that one water quality result of total



Comment Number:	CIRNAC #3
	<p>arsenic concentration in CP3 water was slightly above the Metal and Diamond Mining Effluent Regulations (MDMER) maximum authorized monthly mean concentration of 0.10 mg/L. While this might be acceptable during operations it will not be adequate for closure when passive drainage will need to meet a lower criterion. Long-term predictions of arsenic by the Water Balance and Water Quality Model in CP1 over time to 2028 are predicted to max out at about 0.07 to 0.08 mg/L each year (Figure 11, Appendix 5 WBWQM Results).</p> <p>d. Figure 8 of the Annual Report indicates that seepage from tailings and waste rock stored on surface has elevated TDS concentrations (ranging mainly between 10,000 to 25,000 mg/L for tailings). The high salinity (high ionic strength) has the potential to affect metal leaching rates and mobility from the tailings/waste rock in response to ion exchange and/or complex formation. In reviewing the 2021 Annual Report and supporting documentation, it is not clear whether the high salinity of waste materials (tailings and waste rock) was considered by AEM in their geochemical modelling and Acid Rock Drainage/Metal Leaching (ARD/ML) predictions.</p> <p>It is important to address the above items to facilitate planning and future actions to manage potential impacts on the environment.</p>
Recommendation to Address Issues:	<p>CIRNAC requests clarification on the following items pertaining to predictions of the Water Balance and Water Quality Model:</p> <ol style="list-style-type: none"> Based on predicted levels of TDS in CP1, if the TDS discharge limit of 3,500 mg/L is exceeded again, how will water stored in CP1 be managed? Will it continue to be stored in CP1 until the waterline is commissioned? As cryo-concentration is already considered in the model, could the underestimated ammonia concentrations be the result of blasting? How will AEM reduce the arsenic values at closure to meet stricter post closure passive discharge requirements? AEM should provide a discussion (e.g., effects of suppressing the freezing point; implications for ARD/ML) on whether the presence of elevated TDS in waste rock and tailings has the potential to affect the long-term performance of the WRSF and TSF.

Comment Number:	CIRNAC #4
Subject:	Cumulative Quantities of Ore and Waste Rock and Comparisons to FEIS Predictions
Reference:	<ul style="list-style-type: none"> Meliadine Gold Mine Project 2021 Annual Report, Section 4.3 Mine Waste Management Plan Appendix 32-7



Comment Number:	CIRNAC #4
	<ul style="list-style-type: none"> NIRB Project Certificate 006, Amendment 002, Term and Condition 19
Issue/Rationale:	<p>Table 12 of the 2021 Annual Report provides a monthly listing of excavated ore and waste rock by source along with respective quantities (tonnages). However, the annual report does not provide year-over-year or cumulative information on quantities and comparison to Final Environmental Impact Statement (FEIS) predictions as would be expected. Furthermore, the annual report lacks information on the deposition quantities and distribution of waste rock. For instance, there is no information on how much waste rock was utilized in construction works.</p> <p>In the Mine Waste Management Plan (Appendix 32-7), neither “Table 4.1 Schedule, Quantities, and Distribution of Waste Rock by Year” nor “Table 4.2 Schedule, Quantities, and Distribution of Overburden by Year” clearly state that the quantities provided therein are actual values for years 2019 to 2021 inclusive. By contrast “Table 5.1 Schedule, Quantities, and Distribution of Tailings by Year (V15_Mille)” clearly notes that the quantities shown for years 2019 to 2021 inclusive are as built quantities.</p> <p>CIRNAC notes that an understanding of cumulative values of waste materials stored on site is important for the assessment of the overall potential impacts of these materials to the environment and the mitigative measurements that may be required to manage them.</p>
Recommendation to Address Issues:	<p>CIRNAC recommends that AEM:</p> <ol style="list-style-type: none"> Provide the year-over-year or cumulative quantities of ore and waste rock with comparisons to FEIS predicted quantities . Provide information on the deposition and distribution quantities of waste rock (e.g. how much waste rock was used in construction works and locations, etc.). Clearly indicate waste rock quantities that are actual as opposed to planned and use the same approach for waste rock as used for tailings (i.e., use asterisk and notes to identify actual values in these tables).

Comment No:	CIRNAC #5
Subject	Analysis of the Temporary Mine Closure
Reference	<ul style="list-style-type: none"> Meliadine Gold Mine Project (February 1, 2019) - Analysis of the Risk of Temporary Mine Closure. Meliadine Gold Mine 2021 Annual Report, Appendix 41: NIRB Project Certificate Concordance Table. NIRB Project Certificate 006, Amendment 002
Issue/Rationale	Pursuant to T&C 90 of the amended Project Certificate, AEM was required to provide an analysis of the risk of temporary mine closure prior to the commencement of operations. AEM prepared a document



	<p>entitled, “<i>Meliadine Project – Analysis of the Risk of Temporary Mine Closure</i>” dated February 1, 2019, and submitted a copy to the NIRB to satisfy the requirements of the Amended Project Certificate.</p> <p>CIRNAC recognizes that AEM is compliant with this T&C, but would like to see the future Annual Report submissions be improved by providing more details as to the location of the document and a brief statement on whether updates are deemed necessary. The Project Certificate Concordance Table included as Appendix 41 to the 2021 Annual Report only states “<i>See: Analysis of the Risk of Temporary Mine Closure.</i>”</p>
Recommendation	CIRNAC recommends that AEM provide a full citation to its Analysis of the Risk of Temporary Mine Closure, the relevant NIRB Public Registry Identification Number, and a brief statement on whether updates are deemed necessary in future Annual Report submissions.

Comment No:	CIRNAC #6
Subject	Employee Origin
Reference	<ul style="list-style-type: none"> • Meliadine Gold Mine Project 2020 Annual Report • Meliadine Gold Mine Project 2021 Annual Report • Meliadine Gold Mine Project 2021 Annual Report, Appendix 41: NIRB Project Certificate Concordance Table • NIRB Project Certificate 006, Amendment 002
Issue/Rationale	<p>Pursuant to T&C 101 of the Amended Project Certificate, AEM is required to provide project-specific information regarding employee origin in its annual Socio-Economic Monitoring Report submissions. As stated in the T&C’s objective, such data will support “<i>the comparison in predictions of labour availability and employment opportunities with actual levels of employment from various demographic segments over different geographic areas.</i>”</p> <p>The Term and Condition states, “<i>The Proponent shall include with its annual reporting to the NIRB a summary of employee origin information as follows:</i></p> <ol style="list-style-type: none"> <i>The number of Inuit and non-Inuit employees hired from each of the Kivalliq communities, specifying the number from each;</i> <i>The number of Inuit and non-Inuit employees hired from each of the Kitikmeot and Qikiqtani regions, specifying the number from each;</i> <i>The number of Inuit and non-Inuit employees hired from a southern location or other province/territory outside of Nunavut, specifying the locations and the number from each; and</i> <i>The number of non-Canadian foreign employees hired, specifying the locations and number from each foreign point of hire.</i> <p>Unlike the 2020 Annual Report which contains the required information in the form of an appendix to the 2020 Socio-Economic</p>



	Monitoring Report, AEM's 2021 Annual Report does not provide some of the information requirements for this T&C. The Project Certificate Concordance Table included as Appendix 41 to the 2021 Annual Report makes reference to section 12 of the 2021 Annual Report and related appendices for further information on this topic. Section 12 of the 2021 Annual Report and the 2021 Socio-Economic Monitoring Report do not completely address the T&C's information requirements. The only information of value provided is the number of AEM Inuit employees hired by home community in the Kivalliq region. The Annual Report also includes the number of Inuit hired from the 'Kitikmeot', 'Qikiqtani' and 'Outside of Kivalliq' (p. 128). It is not clear if the 'Outside of Kivalliq' category includes the Kitikmeot and Qikiqtani regions or represents Inuit from other Canadian provinces, territories and countries.
Recommendation	<p>CIRNAC recommends:</p> <ul style="list-style-type: none"> a) AEM provide the employee origin information required under T&C 101 of the amended Project Certificate 006 and ensure this information is provided in future Annual Report submissions. b) AEM clarify how the "Outside of Kivalliq" category included in 'Table 29: Home communities of AEM Inuit employees (by headcount)' provided on page 128 of the 2021 Annual Report is defined. It should be clarified if this value includes Inuit employees hired from Nunavut's Kitikmeot and Kivalliq regions as well as other locations.

Comment No:	CIRNAC #7
Subject	Counselling and Treatment Programs
Reference	<ul style="list-style-type: none"> • Meliadine Gold Mine Project 2021 Annual Report • Meliadine Gold Mine Project 2021 Annual Report, Appendix 41: NIRB Project Certificate Concordance Table • NIRB Project Certificate 006, Amendment 002
Issue/Rationale	<p>To support access to necessary treatment and counselling services for employee and family wellbeing, T&C 108 of the Amended Project Certificate states: <i>"The Proponent is encouraged to consider providing access to counseling and treatment programs for substance and gambling addictions, and programs which address domestic, parenting, and marital issues that could affect employees and/or their families."</i></p> <p>The Project Certificate Concordance Table included as Appendix 41 to the 2021 Annual Report refers to section 12 of the Annual Report and related appendices for further information. CIRNAC has reviewed the referenced material and cannot find any mention of counseling and treatment programs specific to the topics identified in T&C 108.</p>
Recommendation	CIRNAC recommends that AEM confirm whether or not it is making available necessary treatment and counselling services for employee



	and family well-being as encouraged in T&C 108 of the amended Project Certificate.
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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, licences or other approvals issued for the Project, where applicable;

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

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

In terms of water management in Nunavut, CIRNAC has a number of different responsibilities. The Minister of Northern Affairs has a decision-making role with regards to the Nunavut Water Board (NWB)'s issuance of 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 (T&Cs) contained within any Water Licence associated with the project.

Although, CIRNAC is not responsible for implementing water related T&Cs, the Department has reviewed the Type 'A' Water Licence associated with the Meliadine Gold Mine Project with respect to amended Project Certificate [No. 006] and has included a concordance table (Appendix A) that outlines how these T&Cs have been incorporated in the Water Licence by the NWB.

In 2020, AEM's Meliadine Gold Mine Project activities and monitoring were conducted under the following Water Licences:

- Type B Water Licence 2BB-MEL1424, and
- Type A Water Licence 2AM-MEL1631

With respect to land authorizations, CIRNAC issued the surface lease (#055K16042) for the marine discharge pipe for the Meliadine Gold Mine Project in 2019.

ii. A summary of any inspections conducted during the 2021 reporting period, and the results of these inspections; and,

CIRNAC's Water Resource Officer (WRO) conducted four inspections during the 2021 reporting period. Due to restrictions imposed by COVID-19 pandemic, all site inspections were non-contact, with AEM personnel and CIRNAC inspectors in separate vehicles. CIRNAC WROs were not able to verify the project's compliance with all licence terms and conditions given that



some of the licence requirements would involve on-site inspection where close contact with other staff of the site is necessary.

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

February 1, 2021

Facilities inspected/observed during this inspection included tank farm (main fuel storage at Melvin Bay), CP1, and dry stack tailings. Spill at main camp complex could not be inspected due to COVID restrictions and snow cover. No concerns were noted during this visual observation/inspection.

May 18, 2021

The Meliadine Road from Melvin Bay (Itivia harbour) to the entrance of the Meliadine Mine site was inspected. During the inspection, bridges and culverts had snow shoveled out and culverts contained proper signages. No concerns were noted during the inspection.

June 11, 2021

This inspection included CP1, dry stack tailings and spill at the Meliadine mine site. The inspector was informed that between May 11 and June 20, 2021, approximately 488.5 m³ of water has been pumped from the trench located downstream of the diesel spill which occurred near the boiler emergency generator on main camp on September 22, 2020. The water in the trench has been sampled weekly since the week of May 10. The weekly sampling is still ongoing as it is the requirement to do so by the license T and Cs. There was no non-compliance issues recorded as the spill was reported to the emergency spill line and AEM did take appropriate measures to address the spill remediation.

October 21, 2021

The inspector completed an inspection of the site and no instances of non-compliance were noted during the inspection. Before that, on October 5, 2021, the Inspector collected samples at the Effluent Water Treatment Plant at sampling station MEL-14, which is a compliance point prior to discharge from CP1 to Meliadine Lake. The samples were tested for the following parameters: pH, Total Dissolve Solids, Total Suspended Solids, total ammonia, total phosphorous, total metals (including Al, As, Cu, Pb, Ni and Zn), total cyanide and Total Petroleum Hydrocarbons. Test results did not exceed the effluent quality limits found in Water Licence PART F item 3. No inspection of the site was done on this sample collection date.

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

No non-compliances to Water Licence conditions and *Nunavut Waters and Nunavut Surface Rights Tribunal Act S.C 2002, c. 10* were noted during the restricted visual 2021 inspections. CIRNAC will continue to work with AEM to ensure continued compliance with all water licence requirements associated with this project.

3. Other

CIRNAC is a participant in two forums that focus on socio-economic outcomes in the Kivalliq Region that have an interest in AEM's Meliadine Gold Mine Project:

- a) AEM's Kivalliq Projects Socio-Economic Monitoring Working Group which is project specific to the Meliadine Gold Mine as well as the Meadowbank Gold Mine and Whale Tail Pit Project. This working group is chaired by AEM. In addition to CIRNAC, it includes



the participation of the Kivalliq Inuit Association and the Government of Nunavut's Department of Economic Development and Transportation (GN-EDT). The working group met by teleconference on various occasions during the year to discuss the implementation of AEM's Kivalliq Projects Socio-Economic Monitoring Program.

- b) The Kivalliq Socio-Economic Monitoring Committee has a broader regional scope. This committee is chaired by the GN-EDT. In addition to CIRNAC, it includes the participation of the Kivalliq Inuit Association, other GN departments, community representatives, community organizations and mining proponents. Due to the implementation of measures to limit the spread of COVID-19, no committee meeting occurred in 2021.

Appendix A: Project Certificate Terms and Conditions (T&C) incorporated into any permits, certificates, licences or other approvals issued for the Project

NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
3	<p>Prior to commencing construction activities the Proponent shall update its dust management and monitoring plan to address and/or include the following additional items:</p> <ul style="list-style-type: none"> a. Align plan requirements with commitments made in the FEIS and during the Final Hearing to monitor dust along the all-weather access road and associated roads and trails. b. Verify commitments to the utilization of dust suppressants along the all-weather access road including and associated roads and trails, including a description of the type of suppressant to be utilized, the frequency and timing of applications to be made throughout the various seasons of road use. c. Outline the specific adaptive management measures to be considered should monitoring indicate that dust deposition is higher than predicted, specifically where traffic along the all-weather access road is greater than initially predicted. 	<ul style="list-style-type: none"> ▪ Part B: Item 12f ▪ Part E: Item 17 ▪ Part I: Item 9c ▪ Schedule B: Item 4 ▪ Schedule D: Item 1j
4	The Proponent shall develop and implement an Incineration Management Plan that takes into consideration the recommendations provided in Environment Canada's Technical Document for Batch Waste Incineration (2010).	<ul style="list-style-type: none"> ▪ Part B: Item 12f
6	The Proponent shall employ appropriate dust suppression measures when conducting activities in the landfill such as topping or capping.	<ul style="list-style-type: none"> ▪ Part B: Item 12o



NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
13	The Proponent shall undertake additional geotechnical investigations as required to identify sensitive landforms, modify engineering design for Project infrastructure (i.e., dikes, tailings storage facility, waste rock pile and landfill), and develop and implement preventative and/or mitigation and monitoring measures to minimize the impacts of the Project's activities and infrastructure on sensitive landforms. Plans for the investigations, mitigative and monitoring measures are to be included within an updated Environmental Protection Plan.	<ul style="list-style-type: none"> ▪ Part B: Item 12c ▪ Part I: Item 14 ▪ Part I: Item 15



14	<p>The Proponent is encouraged to conduct more detailed thermal analysis to support detailed design of the dikes and the tailings storage facility, including seepage and stability analysis, and shall incorporate the results of the analysis into Project design. Details of the thermal analyses undertaken are to be provided to the NIRB.</p>	<ul style="list-style-type: none"> ▪ Part D: Items 1b and 2 ▪ Part I: Item 13
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NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
15	<p>The Proponent shall assess the potential environmental effects of a post-closure failure of the geomembrane of the Tailings Storage Facility while tailings are in a thawed state. This assessment shall include, at a minimum:</p> <ol style="list-style-type: none"> A description of the potential environmental effects of such a failure; Identification of the monitoring measures employed to detect environmental changes that could result; Identification of proposed mitigation measures to address any changes identified during monitoring; and Updated Risk Management Plan and Closure and Reclamation Plan reflecting changes which result from the post-closure failure assessment. <p>A summary of the results from this assessment and implications to project infrastructure and operational plans shall be provided to the NIRB.</p>	<ul style="list-style-type: none"> ▪ Part B: Item 12L ▪ Part J: Item 5



NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
16	The Proponent shall finalize and implement a comprehensive erosion management plan to prevent or minimize the effects of destabilization and erosion resulting from Project activities.	<ul style="list-style-type: none"> ▪ Part B: Item 12o ▪ Part D: Items 2e, 8 and 21 ▪ Part E: Item 9
17	The Proponent shall monitor the effects of the Project on permafrost conditions relative to Project infrastructure, including along the all-weather access road and associated roads, waste rock stockpile, trails and quarries. Through its monitoring the Proponent must demonstrate that permafrost integrity is maintained with implementation of appropriate preventative measures should permafrost degradation be observed.	<ul style="list-style-type: none"> ▪ Part J: Item 5



NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
19	<p>The Proponent shall develop and implement a monitoring program for its Tailings Storage Facility and Waste Rock Storage Facility (including dikes). The monitoring program is to include, but shall not be limited to:</p> <ul style="list-style-type: none"> a. Plans for monitoring the thermal condition and stability of storage facilities (including deformation of the cover) and dikes, including the use of thermistor cables, temperature loggers, and core sampling technology as required to monitor dike stability and tailings freezeback efficiency, including for example, factors such as ice content and stability; and, b. Measures proposed to ensure the safe containment and structural integrity of Project infrastructure, and to prevent contamination of waterbodies. <p>Details of the monitoring program shall be provided to the NIRB.</p>	<ul style="list-style-type: none"> ▪ Part B: Item 12j ▪ Part F: Item 20
20	<p>The Proponent shall explore the feasibility and practicality of topsoil/organic matter salvage as part of phased approach to Project development, with updates to its Closure and Reclamation Plan to reflect any changes based on this investigation. The Closure and Reclamation Plan should be updated on an on-going basis as more information becomes available from similar reclamation projects, including experience with implementing closure and reclamation plans at the Meadowbank mine site, as applicable.</p>	<ul style="list-style-type: none"> ▪ Part B: Item 12l
21	<p>The Proponent shall update its Waste Management Plan to include details which explain how the design employed for Project landfills is expected to protect the integrity of the local environment, including permafrost integrity, and water quality for adjacent waterbodies. The Proponent shall demonstrate its consideration for the use of liners at waste management facilities, where feasible.</p>	<ul style="list-style-type: none"> ▪ Part B: Item 12h
22	<p>The Proponent shall report annually to the NIRB on the adaptations it has had made to the Mine Waste Management Plan and practices based on results obtained through monitoring.</p>	<ul style="list-style-type: none"> ▪ Part B: Item 12j



NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
23	Prior to the commencement of excavation at the Discovery deposit, the Proponent, in consultation with Natural Resources Canada, shall update its Mine Waste Management Plan to assess the potential for acid rock drainage and to identify any monitoring and mitigation measures that may be required in this development area.	<ul style="list-style-type: none"> ▪ Part B: Item 12j
24	The Proponent shall, reflecting any direction from the Nunavut Water Board during water licensing, collect new hydraulic data (e.g., from new monitoring wells) in key areas during the pre-development, construction and operation phases to better define vertical and horizontal ground flow in the project development area.	<ul style="list-style-type: none"> ▪ Part B: Item 12q ▪ Part E: Item 14
25	The Proponent shall provide to the NIRB, a saline water management plan which includes, but is not limited to, mitigation measures designed to address the potential for higher-than-predicted volumes of saline water inflows into the underground mine, treatment and disposal methods, and details of its plan to monitor saline water at site.	<ul style="list-style-type: none"> ▪ Part B: Item 12q ▪ Part B: Item 13d
26	The Proponent shall carry out continued analyses over time to confirm and update, accordingly, the approximate fill time for the mine pits as identified in the FEIS.	<ul style="list-style-type: none"> ▪ Part J: Item 1 and 5



NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
27	<p>The Proponent shall update its Aquatic Effects Monitoring Plan (AEMP) to include, at a minimum:</p> <ol style="list-style-type: none"> Details regarding the monitoring of non-point sources of discharge, selection of appropriate reference sites, measures to ensure the collection of adequate baseline data at Meliadine Lake prior to and during construction activities, including information on chemical loading in the snowpack, and the mechanisms proposed to monitor for and treat runoff and sediment; A description of measures to be undertaken as relate to dustfall monitoring, designed in accordance with the following: <ol style="list-style-type: none"> To establish Phase 1 all-weather access road baseline data and a description of plans for data collection during Project operations for comparison; To facilitate comparison with existing guidelines; To assess the seasonal deposition (rates, quantities) and chemical composition of dust entering aquatic systems along representative distance transects of the all-weather access road and Rankin Inlet by-pass road; A description of water quality monitoring to be conducted at Little Meliadine Lake; and Details regarding comparisons of results to be run against predicted values and the analysis of data to be undertaken on an annual basis, or as may be required. 	<ul style="list-style-type: none"> ▪ Part B: Item 12a ▪ Part B: Item 13 ▪ Part I: Item 3
28	<p>The Proponent shall develop and implement a sediment and erosion management plan to prevent or minimize the effects of destabilization and erosion that may occur due to Project activities. The plan should also detail sediment control plans to prevent and/or mitigate sediment loading into surface water within the Project area.</p>	<ul style="list-style-type: none"> ▪ Part B: Item 12q
29	<p>The Proponent shall develop and implement adequate monitoring and maintenance procedures to ensure that the culverts and other conduits that may be prone to blockage do not significantly hinder or alter the natural flow of water from areas associated with the proposed mine. In addition, the Proponent shall monitor, document and report the withdrawal rates for water removed and utilized for all domestic and industrial purposes.</p>	<ul style="list-style-type: none"> ▪ Part D: Item 1a and 24 ▪ Part E: Item 15



NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
30	The Proponent shall update its Aquatic Effects Monitoring Plan (AEMP) to include, at a minimum: <ul style="list-style-type: none"> a. Provide details for additional reference lakes to be included within its sampling and monitoring programs; b. Updates to include sedimentation within relevant monitoring programs; and c. Results from additional testing for mercury in fish tissue, and include test results in updated baseline data. 	<ul style="list-style-type: none"> ▪ Part B: Item 12a ▪ Part B: Item 13 ▪ Part I: Item 3
31	The Proponent shall maintain an appropriate setback distance between project quarries and fish-bearing or permanent water bodies as required to prevent acid rock drainage or metal leaching into such water bodies.	<ul style="list-style-type: none"> ▪ Part B: Item 12q
32	Prior to the commencement of construction, the Proponent shall submit to the NIRB, a Site Drainage and Silt Control Plan.	<ul style="list-style-type: none"> ▪ Part B: Item 12q
33	The Proponent shall meet or exceed the guidelines set by Fisheries and Oceans Canada for blasting thresholds and implement practical and effective measures to ensure that residue and by-products of blasting do not negatively affect fish and fish habitat.	<ul style="list-style-type: none"> ▪ Part B: Item 12d and 12q
34	Unless otherwise approved by regulatory authorities, the Proponent shall ensure that all Project infrastructure in watercourses is designed and constructed in such a manner that it does not obstruct unduly prevent or limit the natural movement of water in fish bearing streams and rivers.	<ul style="list-style-type: none"> ▪ Part B: Item 12q
41	Prior to the commencement of operations, the Proponent shall develop a progressive re-vegetation program for disturbed areas that are no longer required for operations, such program to incorporate measures for the use of test plots, reseeding and replanting of native plants as necessary. It is further recommended that this program be directly associated with the management plans for erosion control established for the Project and incorporate lessons learned at Meadowbank.	<ul style="list-style-type: none"> ▪ Part B: Item 12l ▪ Part J: Item 8
42	The Proponent shall include re-vegetation strategies in its Closure and Reclamation Plan that support progressive reclamation and that promote natural revegetation and recovery of disturbed areas compatible with the surrounding natural environment and incorporate lessons learned at Meadowbank.	<ul style="list-style-type: none"> ▪ Part B: Item 12l ▪ Part J: Item 8



NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
67	The Proponent shall submit an updated Oil Pollution Prevention Plan including measures to avoid adverse effects to species at risk and migratory birds from spills, as well as details regarding monitoring of effects of a spill on species at risk and migratory birds.	▪ Part B: Item 12p
77	The Proponent shall ensure that it maintains the necessary equipment and trained personnel to respond to all sizes of potential spills associated with the Project in a self-sufficient manner.	▪ Part B: Item 12p
78	Prior to the shipping of Project supplies, the Proponent shall conduct fuel spill dispersion modeling that will, at a minimum, consider: <ul style="list-style-type: none"> a. Modeling of oil spills in the following areas: <ul style="list-style-type: none"> i. Pinch points, including: Hudson Strait, Melvin Bay area including Itivia Harbour and Panorama Island; ii. Shallow water and shorelines; and, iii. Areas that have been identified as having high flows and/or high concentrations of marine mammals, marine fish or seabirds; b. Open water and ice-covered conditions; c. Spill volumes up to and including loss of a full tanker cargo; and, d. Differences in the quantity and properties of each type of bulk fuel transported by vessels when they are at, or in transit to, the port of Rankin Inlet. 	▪ Part B: Item 12p
117	Prior to construction Phase 2 of the all-weather access road and the Rankin Inlet bypass road, the Proponent shall consult applicable laws in Canada and Nunavut as well as meet with all regulatory agencies and the public as it finalizes its road operations plans.	▪ Part B: Item 12o
120	The Proponent shall contract only Transport Canada certified shippers to carry cargo for the Project, and will ensure shippers are aware of the requirements of the Shipping Management Plan, the Risk Management and Emergency Response Plan and the Oil Pollution Emergency Plan (OPEP).	▪ Part B: Item 12n
121	The Proponent shall monitor the ingress/egress of Project related ships at Rankin Inlet and report any accidents or spills immediately to the regulatory agencies as required by law and to NIRB's Monitoring Officer.	▪ Part B: Item 12n



NIRB Project Certificate No. 006 Term & Condition		Implemented in NWB Water Licence NO: 2AM- MEL1631
122	The Proponent shall ensure that best practices are used at all times during ship to shore and other marine-based fuel transfer events, including implementing measures specifically designed to prevent leaks and spills resulting from ice forming on the hoses during fuel transfers.	▪ Part B: Item 12n
124	Prior to construction, the Proponent shall update its Spill Contingency Plan specific to a major spill event occurring on the bypass road and within proximity to (and including potential spills into) Nipissar Lake.	▪ Part B: Item 12n

