Crown-Indigenous Relations and Northern Affairs Canada
Relations Couronne-Autochtones et Affaires du Nord Canada

Water Resources Division
Nunavut Regional Office
Iqaluit, NU X0A 0H0

Your file - Votre référence
2AM-WTP1826

October 3, 2018

Our file - Notre référence
CIDM# 1227878

Richard Dwyer
Manager of Licensing
Nunavut Water Board
Gjoa Haven, NU X0B 1J0

Sent via email: licensing@nwb-oen.ca

Re: Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) review of Water Quality and Flow Monitoring Plan – Whale Tail Project under Agnico Eagle Mines Limited's Type "A" Water Licence No. 2AM-WTP1826.

Dear Mr. Dwyer,

Thank-you for the email notice, received on August 29, 2018, regarding the above mentioned plan for the Whale Tail Pit Project.

CIRNAC reviewed the plan and comments are provided pursuant to its mandated responsibilities from the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Indian Affairs and Northern Development Act*.

If you have any questions or require further information with respect to this matter, contact me at (867) 222-9278 or ian.parsons@canada.ca or Michelle Blade at (867) 975-3877 or michelle.blade@canada.ca

Regards,

Ian Parsons
Manager, Water Resource Division

Cc. Spencer Dewar, Director, Resource Management Directorate – CIRNAC, NRO
Justin Hack, Manager of Field Operations – CIRNAC, NRO

Canada

Memorandum

To: Richard Dwyer, Manager of Licensing, NWB

From: Ian Parsons, Manager, Water Resource Division – CIRNAC, NRO

Date: October 3, 2018

Re: **Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) review of Water Quality and Flow Monitoring Plan – Whale Tail Project under Agnico Eagle Mines Limited's Type "A" Water Licence No. 2AM-WTP1826.**

Applicant:	Agnico Eagle Mines Limited (AEM)
Representatives:	Jamie Quesnel and Ryan Vanengen
Project:	Whale Tail Pit Project
Region:	Kivalliq

A. BACKGROUND

On July 11, 2018, the Minister of Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) approved Agnico Eagle Mines Limited's Whale Tail Pit Project Type 'A' Water Licence No. 2AM-WTP1826 application. The Whale Tail Pit Project is a gold deposit located near Baker Lake, Nunavut.

This Plan is to be reviewed by interested parties and approved by the Board as per Part B Item 15 of Water Licence 2AM-WTP1826.

B. RESULTS OF REVIEW

CIRNAC has overall outstanding concerns regarding the Whale Tail Pit project pertaining to the absence of hydraulic gradient validation field data (i.e. groundwater field data). CIRNAC considers this data critical to better understanding the predicted risks for post-closure exceedance of arsenic in the flooded Whale Tail Pit. It is incumbent on AEM to alleviate these concerns by demonstrating that the project can be undertaken without the requirement for long-term treatment of arsenic post-closure.

The Water Quality and Flow Monitoring Plan summarizes the monitoring locations, sampling frequency, monitoring parameters, compliance discharge criteria and an adaptive management plan for water quality on site throughout the various life-cycle stages of the project. Table 3-1 of the Water Quality and Flow Monitoring Plan states that groundwater well installation is “to be determined” during operations and closure of the project CIRNAC insists groundwater monitoring wells are important as a means to obtain groundwater field data to validate the hydraulic gradient. Furthermore, these groundwater wells should be installed pre-disturbance of the water table (i.e. pre excavation and dewatering of the Whale Tail Pit area). CIRNAC recommends that AEM expand on the number of groundwater wells to be installed pre-disturbance of the water table (i.e. pre operation of the Whale Tail Pit area), along with the well locations, completion depths, and sampling frequency to measure the hydraulic gradient through the Whale Tail Pit area. This information should be captured in the Groundwater Monitoring Plan, and referenced in the Water Quality and Flow Monitoring Plan.

In addition, the Water Quality and Flow Monitoring Plan indicated a reference to the Groundwater Monitoring Plan (May 2018). CIRNAC has only recently received this information on October 3, 2018, which we are currently reviewing. CIRNAC has reviewed the Nunavut Water Board (NWB) approved Groundwater Monitoring Plan (June 2016) that mentions one Westbay multi-level groundwater monitoring well installed near Whale Tail Pit in 2016. Although one groundwater monitoring well is insufficient to measure the hydraulic gradient through the Whale Tail Pit area, CIRNAC would be interested to see the groundwater field data collected from the Westbay multi-level groundwater monitoring well, or any additional groundwater field data for the Whale Tail Pit project.

The Water Quality and Flow Monitoring Plan is one of three management plans that are to be updated prior to operation of the Starter Pit (Quarry 2) and construction of the Waste Rock Storage Facility (WRSF) Berm. This is stated in Part B Item 15 of the Whale Tail Pit Water Licence and during final submissions in Table 1 (INAC; March 19, 2018 and AEM subsequent March 26, 2018 submission agreeing to Table 1). In accordance with Table 1 the Water Quality and Flow Monitoring Plan was reviewed with particular attention paid to specific Waste Rock Storage Facility (WRSF) and Pit sump water quality triggers. These comments are captured in the Summary of Review Findings and Recommendations.

CIRNAC recommends the findings and recommendations be implemented, and that pre-water table disturbance hydraulic gradient field data be measured and provided to validate to predicted risks for post-closure exceedance of arsenic in the flooded Whale Tail Pit.

Summary of Review Findings and Recommendations

#	Reference	Finding / Recommendation
1	Figure 2-1	**Finding:** The current plan does not include sampling stations in Mammoth Lake immediately downstream of the drainage from the WRSF. As a consequence, there are no mechanisms to confirm that post-closure WRSF seepage discharges to the lake are environmentally protective. **Recommendation:** To address this deficiency, we recommend that at least two additional stations be added to the plan within the vicinity of the discharge point (e.g., at 30 m and 60 m from the location where the WRSF enters Mammoth Lake). Sampling of the stations should be consistent with other surface water receivers of effluent (sampling frequency, analytes, depths, etc.). The sampling should begin in Year 1 of operations (to provide adequate baseline) and continue throughout the post-closure monitoring phase.
2	Figure 2-1	**Finding:** The current plan does not include sample collection from ST-WT-1 (Whale Tail Lake North Basin) during Year 1. **Recommendation:** We recommend that sampling from Station ST-WT-1 begin in Year 1 to monitor the progression of water quality response while dewatering the North Basin.
3	Figure 2-2	**Finding:** With the exception of Figure 2-1, no water quality sampling stations are identified for the flooded South Basin of Whale Tail Lake. **Recommendation:** We recommend that two sampling stations be added to evaluate potential water quality impacts within the basin and that the monitoring continue throughout the operational life of the project, including post-closure.
4	S.2.3.4	**Finding:** The Plan states that post-closure monitoring to confirm physical and chemical stability is planned until 2046. **Recommendation:** We recommend that the text be expanded to clarify that, depending on the findings of the post-closure monitoring and other evidence, there may be a need to modify the duration of the post-closure monitoring until such time that site stability has been confirmed.
5	S.3.1	**Finding:** The Plan indicates that non-contact water discharged from diversion ditches and other surface water drainages will be sampled. However, no sampling stations are identified. **Recommendation:** While we appreciate that the exact locations of non-contact water sampling stations are subject to change, we recommend that the Plan identify the key drainage paths/catchments and approximate station locations that are likely to be incorporated into the sampling regime.

#	Reference	Finding / Recommendation
6	S.3.1	**Finding:** The Plan states that runoff from the Waste Rock Storage Pond will be sampled prior to discharge from Mammoth Lake. We assume this is in error and that sampling would occur prior to discharge to Mammoth Lake. **Recommendation:** The text should be revised accordingly.
7	Table 3-1	**Finding:** The table indicates groundwater wells will be sampled only once per year. **Recommendation:** Based on the importance of characterizing the groundwater regime during the short operational period of the mine, we recommend that the sampling frequency be increased such that wells are sampled and groundwater levels measured once per month during periods in which the wells are unfrozen. This is necessary to validate current assumptions regarding groundwater flows and quality in the vicinity of the pit.
8	Table 3-1	**Finding:** The Plan indicates sampling from the WRSF seepage pond (ST-WT-3) will occur four times per year, when water is present in the pond. **Recommendation:** We recommend that two of the annual sampling events at station ST-WT-3 coincide with: 1) the end of freshet; and 2) the timeframe in which the active zone has penetrated to its greatest depth (assumed to be August). In addition, each of the four sampling events should occur at least two weeks apart. Samples should also undergo toxicity testing during periods when the WRSF seepage pond discharges directly to Mammoth Lake without treatment (i.e., the post-closure phase).
9	Table 3-1	**Finding:** The Plan indicates that water collected in the Whale Tail Pit or pit sump (ST-WT-4) will be analyzed four times per year. Given the importance of accurately characterizing future pit water quality, more frequent sampling is justified. **Recommendation:** We recommend that sampling and analysis occur monthly whenever water is reporting to the pit (including flooding during closure). Further, all water volumes pumped from the pit should be measured.
10	Table 3-1	**Finding:** The title of the table indicates that the reported criteria are for water quality within Whale Tail Pit. However, we assume it is intended to apply to discharges to Mammoth Lake from the diffuser, as stated in the text. **Recommendation:** The title should be adjusted accordingly. Further a separate table summarizing the required post-closure water quality criteria for the flooded Whale Tail Pit should be provided. Where

#	Reference	Finding / Recommendation
		applicable, those criteria should be based on compliance with the Site-Specific Water Quality Objectives (SSWQO) derived for the site (as opposed to MDMER).
11	Table 3-1	**Finding:** While the current plan includes sampling of water collected in the base of the pit (i.e., ST-WT-10), no stations are provided to differentiate between different sources of loadings to the pit. **Recommendation:** We recommend that monitoring of pit seep quality be incorporated into the plan, particularly in the vicinity of lithologies with high ARD/ML potential.
12	S.3.1.2.3	**Finding:** The current Plan states that discharge from Mammoth Lake shall not exceed effluent quality limits stipulated in Table 3.4 and based on criteria established in Whale Tail Pit Type A Water Licence 2AM-WTP1826. **Recommendation:** We assume the criteria are intended to apply to discharges to Mammoth Lake and recommend that the text be revised accordingly.
13	NA	**Finding:** The current Plan does not include Effluent Quality Criteria (EQC) for discharges to Mammoth Lake during the post-closure phase (e.g., passive discharge from the WRSF seepage pond). **Recommendation:** We recommend that post-closure EQC for the WWRSF be explicitly stated.
14	Table 3-6	**Finding:** The stated criteria are not consistent with the revised MDMER values. **Recommendation:** The criteria should be revised to be consistent with the applicable MDMER values.
15	S.3.3	**Finding:** The Plan states that results of the annual monitoring will be compared to the FEIS water quality predictions to determine if conditions are similar to predicted. Based on the important uncertainties related to surface water quality and the short duration of the proposed operation, annual comparisons are insufficient. **Recommendation:**, We recommend that the comparisons be performed and reported on a quarterly basis. This will facilitate a more rapid identification of potential emerging concerns and, where necessary, management plans can be implemented more expediently.
16	Figure 3-1 & S.5.3	**Finding:** The Plan indicates that the NWB, CIRNAC Inspector and KIA will be informed if water concentrations exceed applicable criteria (i.e., regulatory thresholds). However, no commitments are made to inform regulators if trigger levels have been reached. **Recommendation:** To ensure regulatory authorities are aware of emerging issues, we recommend that the same parties are also

#	Reference	Finding / Recommendation
		informed when trigger levels are reached.
17	S.3.3.2.1	**Finding:** The section indicates that water samples will be collected 3 m from the surface. Under some circumstances, there is a need to collect samples from additional depths (i.e., to characterize vertical profiles and potential water quality stratification). **Recommendation:** We recommend that depth profile samples be collected at additional intervals throughout the vertical water column. A minimum of four vertical interval samples should be collected from at least one station in the post-closure flooded pit. A minimum of two vertical interval samples should be collected in the vicinity of effluent discharge locations in Mammoth Lake (i.e., near the diffuser and post-closure WRSF seepage pond discharge locations). In addition, at least one sampling event at each of the vertical interval sampling stations should occur in open-water and under-ice conditions each year.
18	S.3.3.2.1	**Finding:** The section indicates that annual average concentrations (6-month mean) will be compared to trigger values to determine need for action (rather than results from individual sampling events). This approach could result in exceedances of the trigger values and associated environmental impacts without any actions being taken to rectify the situation. **Recommendation:** Given the short operational life of the mine and current uncertainties regarding water quality from the WRSF and the pit, we recommend that results from individual sampling events be compared to the applicable trigger values and reported when any exceedances occur.
19	General	**Finding:** Pages 15 to 19 of the PDF file are repeats of previously presented information. **Recommendation:** The Plan should be revised accordingly.