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

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

CIRNAC reference
CIDM# 1262675

NWB reference
#2AM-MEL1631

September 24, 2019

Richard Dwyer
Manager of Licencing
Nunavut Water Board
Gjoa Haven, NU, X0E 1J0

Via email to: licensing@nwb-oen.ca

Re: Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) review of Agnico Eagle Mines Limited (AEM) 2018 Meliadine Gold Project 2AM-MEL1631 Annual Report.

Dear Mr. Dwyer,

Thank you for the email notice received on April 5, 2019, regarding the opportunity to comment on the 2018 Annual Report for the Meliadine Mine Property.

CIRNAC has reviewed the Annual Report documents provided by the Nunavut Water Board (NWB) located on the Nunavut Water Board FTP site as it relates to 2AM-MEL1631.

CIRNAC's comments are provided pursuant to its mandated responsibilities from the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act*.

If you have any questions or require further information with respect to this matter, contact me at (867) 222-9278 or by email at ian.parsons@canada.ca.

Sincerely,

Original signed by

Ian Parsons
Regional Coordinator, Water Resources Division

Memorandum

To: Richard Dwyer, Manager of Licensing, NWB

From: Ian Parsons, Regional Coordinator, Water Resources Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Nunavut Regional Office.

Date: September 24, 2019

Re: **CIRNAC's review of Agnico Eagle Mines Limited (AEM) 2018 Meliadine Gold Project Annual Report**

Applicant: Agnico Eagle Mines Limited
Project: Meliadine Mine Project
Region: Kivalliq

Background

The Meliadine Gold Project operated by Agnico Eagle Mines Limited - Meliadine Division (Agnico Eagle) is located approximately 25 kilometres (km) north of Rankin Inlet, and 80 km southwest of Chesterfield Inlet in the Kivalliq Region of Nunavut. The Project site is located on the western shore of Hudson's Bay, on a peninsula between the east, south, and west basins of Meliadine Lake (63°1'23.8''N, 92°13'6.42''W), on Inuit owned land.

The project components include the 28 km All Weather Access Road (AWAR) between Rankin Inlet and Meliadine, the Itivia fuel farm and laydown area, the mine site and the mines. The mine plan proposes open pit and underground mining methods for the development of the Tiriganiaq gold deposit, with two open pits (Tiriganiaq Pit 1 and Tiriganiaq Pit 2) and one underground mine. The mine will produce approximately 12.1 million tonnes (Mt) of ore, 31.8 Mt of waste rock, 7.4 Mt of overburden waste, and 12.1 Mt of tailings. There are four phases to the development of Tiriganiaq: just over 4 years of construction (Q4 Year -5 to Year -1), 8 years of mine operation (Year 1 to Year 8), 3 years of closure (Year 9 to Year 11), and post-closure (Year 11 forwards).

In 2018 the project was in the construction phase. The 2018 Meliadine Gold Project 2018 Annual Report was prepared for the site as part of the regulatory reporting requirements for the project. In 2018, the Project was still in the construction phase with activities related to mining limited to underground development of the Tiriganiaq underground mine. Waste rock from mine development was used for construction purposes.

The report provides information on activities associated with exploration, mine development and construction, water management, waste rock management, waste management, spill management, monitoring, progressive reclamation, studies, inspections and public consultation as carried out in 2018. The main body of 2018 annual report is supplemented by a series of

appendices (A to N) that provide additional details and supporting information on each of these topics as appropriate.

A series of management plans have been developed for the project that provide overall and site-specific guidance and direction for all aspects related to development and operation of the project in keeping with best practice and regulatory requirements and AEM's internal standards and commitments to sustainable development in the north. As verified in the document control section of each management plan, these plans are updated continuously as appropriate.

Based on the review by CIRNAC, the report structure and content are appropriate for comparison of predicated and actual impacts of the project, and for generally reporting on the status of the project in 2018 as required by the water licence license conditions.

The 2018 Annual Report and associated documents suggest that AEM is generally adhering to the project commitments associated with the nature and extent of the 2018 project activities.

At this stage, no operational activities other than initial mine development has occurred and as such it is too early to see if impacts from operational activities are in keeping with predictions.

Technical Review Comments/Questions

CIRNAC Comment #1

Subject:

2018 Geotechnical Inspection Recommendations

Reference:

Appendix B1 of the 2018 Annual Report

Background/Rationale:

The 2018 Geotechnical Inspection was carried out in September 2018 and covered the geotechnical aspects for water management infrastructure, roads, waste facilities, underground portals, infrastructure pads, fuel storage facilities for each of the following areas:

- Main site
- Exploration camp site
- All-Weather Access Road
- Itivia site and By-pass Road

The results of the inspection completed with associated recommendations were reported in the February 2019 Geotechnical Report, Appendix B-1 of the 2018 Annual Report. The report provided recommendations for AEM's consideration with respect to surveillance monitoring,

operational procedures, maintenance and repairs, for each of the areas as well as general comments on future construction considerations.

AEM's responses to these recommendations were as outlined in the table provided as Appendix B-2 of the 2018 Annual Report. As noted therein, for some cases, AEM's responses indicated that additional actions were still to be undertaken.

Recommendation to Address Issues:

CIRNAC requests that AEM provide and update of its Appendix B-2 responses to the Geotechnical Investigation Recommendations presented in Appendix B-1.

CIRNAC Comment #2

Subject:

Surface Water Runoff

Reference:

Section 7.3.1.7 (p 40-41), Figure 7.1 (p 41), Section 5.4 (p 29) and Table 6.1 (p 28) of 2018 Annual Report

Section 7.2.2 Water Management Plan (p 42)

Background/Rationale:

In 2018, a few exceedances of the TSS limit stipulated in the Water Licence (100 mg/L) were reported at three surface runoff stations at the Itivia laydown area during freshet (MEL-SR-1, MEL-SR-9 and MEL-SR-11). To reduce TSS levels, a sediment trap was built to minimize TSS flow while silt fences and straw logs were installed upstream and downstream of the site and inspected weekly. A third-party consultant was also retained to inspect the area to recommend improvements to mitigate and reduce sediment erosion and sediment control.

AEM noted that visual assessment and upstream sampling indicated that the majority of TSS observed downstream was a result of sediment generated upstream of the lease boundary. With respect to MEL-SR-11, the cause for the exceedances and source of runoff was sediment-rich snow piles accumulated during construction of the Bypass Road. The snow piles were located to the Southwest of the Itivia fuel storage tanks. As construction of the Bypass Road is now complete, AEM indicated that snow will not be placed in this area over the 2018/2019 winter and based on 2018 runoff patterns snow will be managed strategically to prevent sediment rich snow piles and runoff with the potential to entrain TSS. The snow management plan has been revised accordingly.

CIRNAC has not been informed on the effectiveness of these mitigation measures in reducing TSS levels and exceedances of regulatory limits at the Itivia laydown area.

Recommendation to Address Issues:

CIRNAC recommends that AEM provides updates on the effectiveness of mitigation measures implemented in 2018/2019 at the Itivia Site to reduce TSS levels and exceedances of regulatory limits as data become available.

CIRNAC Comment #3

Subject:

Water Balance and Water Quality Forecasting Models

Reference:

Section 7 (p 40), Section 7.3 (p 43) Water Management Plan

Section 3.2 (p 11), Table 3.7 (p 13) 2018 Annual Report

Background/Rationale:

The water balance and water quality models were updated for the 2019 year, specifically for those water bodies that will be affected by the commencement of operations and operational activities taking place throughout the 2019 calendar year (i.e., CP1, CP3, CP5, Saline Pond, underground mine operation and P-Area). Also, the 2019 update forecasted TDS only and did not take into account discharge to Melvin Bay (because approval for discharge was received subsequent to the forecast update), additional saline storage at SP2 or winter (snow) inputs to CP1. AEM has indicated that “Pending the commissioning of additional treatment options, the water quality model will be updated to include all additional parameters outlined in Part F of the licence”.

The 2019 water quality forecast predicted “heightened instances of TDS loading across the containment ponds” (levels predicted as high as 193,116 mg/L in the P-Area; Table 3.7 2018 Annual Report). The high TDS concentrations predicted for 2019 have been attributed to overly conservative assumptions applied to the model, mainly regarding forecasted precipitation and runoff inflow volumes to all containment ponds (discussed in Section 7.3 of the Water Management Plan). AEM notes that “both the water balance and water quality models are undergoing revision in 2019 to address these deficiencies”.

It is important that AEM follows through on commitments noted above to resolve issues with and further update the water balance and water quality models to ensure reasonably accurate forecasts that can be used to inform water management decisions and treatment options.

Recommendation to Address Issues:

CIRNAC recommends that AEM provides any updates and improvements to the water balance and water quality models and to receive updated forecast results for review when available.

CIRNAC Comment #4

Subject:

Mine Impacts on Meliadine Lake

Reference:

Section 7.1 (p 35) 2018 Annual Report

Appendix G-1 2018 EEM/AEMP Report

Background/Rationale:

The nutrient enrichment effect noted in Meliadine Lake in prior AEMP monitoring years continued to be observed in some biological components in 2018. Nutrient enrichment in Meliadine Lake may have begun in 2016 with the expansion of the Mine population and increased sewage treatment plant (STP) nutrient loading into the lake. Effects observed in phytoplankton, benthos and fish biological components are consistent with mild nutrient enrichment. Although effects in benthos were not observed in 2018, effects on phytoplankton were evident in the Near-field area despite a reduction in sewage total phosphorous (TP) loadings relative to 2016/2017 loadings and relative to baseline (i.e., 2013 and 2015). Additionally in 2018, a stimulatory effect on freshwater algae growth (Pseudokirchneriella subcapitata) was observed during sublethal toxicity testing with effluent; this further supports the potential for nutrient enrichment in Meliadine Lake as a result of Mine effluent discharge (through the diffuser at CP1). Increased major ion and some total metal concentrations in lake water in the Near-field area indicative of Mine-related effects related to effluent discharge were also observed.

Parameter concentrations remained below CCME criteria, the effects were within the range of conditions predicted by the FEIS for the Mine and no Low Action Levels were triggered for toxicological impairment or nutrient enrichment; however, the increasing trend in major ion, select total metal and nutrient concentrations in the Near-field since pre-construction and the mild nutrient enrichment effect that has been observed over time in phytoplankton, benthos and fish biological components are concerning.

CIRNAC would like to be updated on Mine-related impacts on Meliadine Lake and whether the diversion of STP effluent to CP1 has resulted in decreased parameter concentrations and nutrient effects in Meliadine Lake as has been suggested.

Recommendation to Address Issues:

CIRNAC recommends that AEM provide updates on Mine-related impacts on Meliadine Lake, and the effects of diversion of STP effluent to CP1 on parameter concentrations and nutrient.