



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

Your file - Votre référence
2AM-MEA1526

September 17, 2018

Our file - Notre référence
CIDM#1227307

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)
Technical Review Comments of the Meadowbank Gold Project 2017 Annual
Report – under Agnico Eagle Mines Limited’s Type “A” Water Licence No.
2AM-MEA1526.**

Dear Mr. Dwyer,

CIRNAC reviewed the proponent's 2017 Annual Report for the Meadowbank Gold Project. The results of our review are presented in the enclosed memorandum for the Nunavut Water Board's consideration. CIRNAC receives 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 867-975-3877 or michelle.blade@canada.ca, or Ian Parsons at 819-953-8988 or ian.parsons@canada.ca.

Regards,
Michelle Blade
Regional Coordinator, Water Resource Division

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



Memorandum

To: Richard Dwyer, Manager of Licensing, NWB

From: Michelle Blade, Regional Coordinator, Water Resource Division – CIRNAC, NRO

Date: September 17, 2018

Re: CIRNAC's review of the proponent's 2017 Annual Report, Type "A" Water Licence No. 2AM-MEA1526, Meadowbank Gold Project.

Applicant:	Agnico Eagle Mines Limited (AEM)
Representatives:	Jamie Quesnel
Project:	Meadowbank Gold Project
Region:	Kivalliq

A. BACKGROUND

Agnico Eagle Mines Limited (AEM) provided the 2017 Annual Report to address all of the 2017 annual reporting requirements of the project under the Nunavut Water Board (NWB) Type A Water License 2AM-MEA1526, Part B, Item 2 and Schedule B. The annual report is submitted by March 31 of the following year.

B. RESULTS OF REVIEW

The following is CIRNAC's technical review of the proponent's 2017 Annual Report for the Meadowbank Gold Mine Project, Type 'A' Water Licence No. 2AM-MEA1526.

CONSTRUCTION

1 Central Dike

Comment:

Seepage issues have been reported from the Central Dike in 2014, 2015, 2016, and 2017, with 332,177 m³ pumped from the downstream area to Goose Pit. Seepage rates have not declined to the extent predicted. The Meadowbank Dikes Review Board recommended decreasing the water level in the Tailings Storage Facility (TSF) until tailings deposition have a blanketing effect. Geotechnical investigation revealed a void space at the interface of the embankment fill and the foundation. Reference was made to an Action Plan of mitigative measures, however the plan was not provided in the Appendix to the Annual Report. Piezometer readings were taken, but the values were not provided nor referenced in the text of the annual report.



Recommendation:

(R 1) CIRNAC recommends the proponent investigate further and provide explanation as to why seepage rates have not declined to the extent predicted. The proponent should confirm if the water level in the TSF was decreased in 2017, and if the desired blanketing effect was achieved with the tailings deposition. CIRNAC recommends that the Action Plan contain mitigative measures to address the void space revealed by the geotechnical investigation at the interface of the embankment fill and the foundation, as well as how to decrease the seepage rates. CIRNAC also recommends the piezometer reading data be provided for review.

2 Stormwater Dike

Comment:

Tension cracks were noted on the Stormwater Dike in August 2016 and August 2017. Originally frozen foundational soft sediments are now thawed.

Recommendation:

(R 2) CIRNAC recommends AEM demonstrate that the thawed foundation sediment is not a potential tailings water contaminant pathway in the 2018 Annual Report.

3 Quarry 22

Comment:

Remedial activities continue at Quarry 22 from a hydrocarbon spill. Contaminated material was removed in 2016. Scouring of the Quarry 22 land surface is taking place to address residual hydrocarbon impacts. Appendix B4 Quarry 22 Report provided no chart or data on the remedial activity progress.

Recommendation:

(R 3) CIRNAC recommends a delineation map be provided of all the sample point locations - highlighting the locations which still have exceedances compared to the locations that are below guidelines. Each sample location should be listed in a table or chart showing measured hydrocarbon level trends over time to evaluate if the chosen remediation strategy is working in the 2018 Annual Report in an effort to remediate the site quickly and avoid permanent environmental damage.

WATER/WASTE/SPILLS/MONITORING

4 Vault Discharge Water Quality

Comment:

AEM stated that *“water from the Vault Attenuation Pond (contact water) was discharged from July 17, 2016 to October 11, 2017. This water was discharged into Wally Lake through the diffuser as effluent. No treatment of the water was required to date prior to discharge as the total suspended solids (TSS) were below the required limit. The Vault*



discharge is also subject to the MMER and all monitoring results met the appropriate criteria.” However, CIRNAC notes that no monitoring results were presented to support this claim.

Recommendation:

(R 4) CIRNAC recommends that AEM substantiate its claims that no treatment was required with data or evidence in the 2018 Annual Report.

5 Turn Lake Level Monitoring

Comment:

Water diversions associated with Phaser Lake dewatering could impact Turn Lake water level. However, CIRNAC notes that no monitoring results were presented in the 2017 Annual Report.

Recommendation:

(R 5) CIRNAC recommends that AEM present monitoring results on Turn Lake water level or explain the lack of monitoring data on Turn Lake water level in the 2018 Annual Report.

6 Vault Attenuation Pond Level Monitoring Results

Comment:

Table 4.2 presents lake level monitoring results. However, it is not clear how the results for Ponds B, C and D in the Vault Attenuation Pond were obtained as CIRNAC notes that there is only one monitoring station for the Vault Attenuation Pond (i.e., station VN-IN in Figure 3).

Recommendation:

(R 6) CIRNAC recommends that AEM clarify how lake level results were obtained for Ponds B, C, and D of the Vault Attenuation Pond in the 2018 Annual Report.

7 Pit Water Quality Monitoring

Comment:

The predicted and measured pit water quality results were compared against each other for the period 2012-2017 and summarized in the annual report. However, it is not clear how the pit water quality has varied with time.

Recommendation:

(R 7) CIRNAC recommends that AEM provide a summary of any observed temporal trends in water quality monitoring results in the 2018 Annual Report.



8 Results of Thermistor Measurements for Tailings and Waste Rock Storage Facilities

Comment:

The results of thermistor measurements were presented in the annual report without any discussion of these results and how they are integrated in the update of the Waste Rock and Tailings Management Plans. There is also no discussion on how the results compare with early thermal modelling predictions.

Recommendation:

(R 8) CIRNAC recommends 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 in the 2018 Annual Report.

9 Thermal Monitoring at Vault Waste Rock Storage Area

Comment:

Section 9 of the Waste Rock and Tailings Management Plan stated that “*no instruments are planned for the Vault Waste Rock Storage (VWRSF) area*”. It is not clear how AEM will confirm that the VWRSF will be frozen without instrumentation.

Recommendation:

(R 9) CIRNAC recommends that instrumentation be added to the VWRSF to confirm its freezeback predictions and to measure performance.

10 Seepage Through Central Dike

Comment:

CIRNAC notes that on the Central Dike seepage issue, the Meadowbank Dike Review Board (MDRB) expressed concerns and recommended that AEM consult with Ground Penetrating Radar (GPR) specialists to assess applicability of GPR surveys.

Recommendation:

(R 10) CIRNAC recommends that MDRB’s recommendation be implemented.

11 Sources of Groundwater

Comment:

The sources of groundwater were identified as “*reclaim water, waste rock PAG stockpiles, or natural surface*” water based on a geochemical signature (i.e., sulfate concentration vs calcium + magnesium concentrations). However, CIRNAC notes that among the three types (or sources) of groundwater, one type was marked as *waste rock PAG stockpiles* in the text, but as *NAG stockpile* in the corresponding figure (i.e., Figure 38).



Recommendation:

(R 11) CIRNAC recommends that AEM clarify how groundwater from either *waste rock PAG stockpiles* or *NAG stockpiles* are identified and differentiated.

12 Aquatic Effects Monitoring Program (AEMP)

Comment:

A text summary of the Aquatic Effects Monitoring Program (AEMP) was provided in the 2017 Annual Report with reference to the full reports in the appendix.

Recommendation:

(R 12) CIRNAC would appreciate if visuals such as sampling location maps and trend charts were included in future Annual Report summaries.

PLANS/REPORTS/STUDIES

13 Monitoring and Management Plans

Comment:

Eight monitoring and management plans were revised in 2017.

Recommendation:

(R 13) CIRNAC seeks clarification on which of the eight monitoring and management plans revised in 2017 were approved by the Nunavut Water Board (NWB).

GENERAL

14 Effluent Quality at East Dike and Vault Road Crossing

Reference:

- Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Section 8.2.3
- Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Appendix C2 Water Management Plan, Sub-Appendix D 2017 Freshet Action Plan
- Water Licence Inspection Form, Follow-Up Report, Agnico Eagle Mines Ltd., Written by Water Resource Officer Christine Wilson, October 25 – 27, 2017

Comment:

On the October 2017 Inspection Form, a CIRNAC Water Resource Officer (WRO) notes three events of elevated total suspended solids (TSS) were recorded; two were at the east Dike and one was at the Vault Road Crossing. It was outlined in the above referenced documents that sedimentation during freshet was a likely cause of the elevated TSS values.



The WRO directed Agnico Eagle Mines Ltd. (AEM) to provide a compliance plan to represent AEM's due diligence and to provide an improved mitigation strategy to prevent further discharge of poor quality effluent. A reference to the compliance plan was not provided in the 2017 Annual Report, and could not be located by CIRNAC. The WRO also noted that the Freshet Action Plan was insufficient to prevent further spills.

In Section 8.2.3 of the 2017 Annual Report, CIRNAC notes that AEM has made efforts to mitigate spills; spill prevention training has been provided to employees, maintenance has been performed on equipment, and that Key Performance Indicators (KPI) were developed to monitor the reported spills. In addition, the Freshet Monitoring Plan has been updated.

Recommendation:

(R 14) CIRNAC recommends a reference to the compliance plan be provided in the 2018 Annual Report. The proponent should monitor/observe the effectiveness of the compliance plan in the 2018 Annual Report, and make necessary updates to the plan if necessary.

15 Improvements to the Landfarm

Reference:

- Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Section 8.3.3.17
- Water Licence Inspection Form, Follow-Up Report, Agnico Eagle Mines Ltd., Written by Water Resource Officer Christine Wilson, October 25 – 27, 2017

Comment:

CIRNAC recognizes that the original landfarm facility (Landfarm 1) was closed and moved to a new location (Landfarm 2) in 2016, and that no contaminated soil was added until 2017. In section 8.3.3.17 of the 2017 Annual Report, CIRNAC reads that some water runoff was identified at the landfarm in June 2017, but there was not enough water to sample. On the October 2017 Inspection Form, a Water Resource Officer (WRO) reported that improvements continue to be made at the landfarm, however the WRO expressed concern that Landfarm 2 does not capture runoff from the facility.

Recommendation:

(R 15) CIRNAC recommends that AEM provide the civil design report and as built drawings for Landfarm 2, along with the Landfarm Management Plan to clarify water management facilities and procedures at Landfarm 2.

16 Management Plans: Embedded Links

Reference:

- Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Appendix I1 – Management Plans



Comment:

Management Plans were provided in Appendix I1 of the 2017 Annual Review as a link to an online document. This link has either been removed or broken. CIRNAC was therefore unable to read and review these management plans, specifically the Spill Contingency plan and the Crisis Management Plan.

Recommendation:

(R 16) CIRNAC recommends providing the management plans in a different format to ensure CIRNAC receives them.

17 Runoff at East Side of Portage Waste Rock Storage Facility

Reference:

- Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Section 8.3.3
- Meadowbank Gold Project 2017 Annual Report, Agnico Eagle Mines Limited – Meadowbank Division, March 2017, Appendix C2 Water Management Report and Plan
- Water Licence Inspection Form, Follow-Up Report, Agnico Eagle Mines Ltd., Written by Water Resource Officer Christine Wilson, October 25 – 27, 2017

Comment:

On the October 2017 Inspection Form, a CIRNAC Water Resource Officer (WRO) expressed concern that runoff from the facility may not be adequately collected, and that elevated levels of TSS at Vault Road crossing may be affected by this runoff. CIRNAC reads in the 2017 Annual Report (section 8.3.3) that a mine site water collection system has been developed to control surface water. CIRNAC reads in the Water Management Report and Plan that the water which is collected, is managed. However, CIRNAC finds no mention of addressing the WRO's concern about contact water collection.

Recommendation:

(R 17) CIRNAC requests confirmation that all of the surface runoff from the Portage Waste Rock Storage Facility is now being collected, and if necessary treated, by the mine site water collection system in the 2018 Annual Report.