



Environmental Protection Operations Directorate
Prairie & Northern Region
5019 52nd Street, 4th Floor
P.O. Box 2310
Yellowknife, NT X1A 2P7

ECCC File: 6100 000 012/015
NWB File: 2AM-MEL1631

March 6, 2019

via email at: licensing@nwb-oen.ca

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Richard Dwyer:

RE: 2AM-MEL1631 – Agnico Eagle Mines Limited – Meliadine Gold Project – Water Management Plan and Environmental Management and Protection Plan (EMPP)

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) regarding the above-mentioned management plans and is submitting comments via email. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act* and the pollution prevention provisions of the *Fisheries Act*.

The following comments are provided:

1. Total Suspended Solids-Turbidity Correlation

Reference(s)

- Agnico Eagle Mines Limited. Meliadine Gold Project – Environmental Management and Protection Plan (EMPP), Version 8. Section 5, d. Thresholds for contaminant levels in CP1 and triggers for mitigation measures. January 2019.
- Agnico Eagle Mines Limited. Meliadine Gold Project – Water Management Plan, Version 5. Section 3.9.4 Effluent Water Treatment Plant (EWTP). January 2019.

Comment

Turbidity trigger limits have been identified based on a correlation determined for turbidity and total suspended solids (TSS) in CP1. The approach is conservative, but ECCC notes that the regression line is based on only eight data points, and recommends that ongoing/periodic calibration/confirmatory paired samples be done. This will also update

the relationship between turbidity and TSS if there are changes in particle sizes and characteristics over time, which would affect the correlation.

The TSS-turbidity approach is also referenced in Section 3.9.4 of the Water Management Plan (Effluent Water Treatment Plant [EWTP]).

ECCC Recommendation(s)

ECCC recommends that the Proponent include a provision for ongoing calibration of the TSS/turbidity correlation for CP1 discharges in the next updates of the EMPP and the Water Management Plan.

2. Clarity on Intent of Wording

Reference(s)

- Agnico Eagle Mines Limited. Meliadine Gold Project – Water Management Plan, Version 5. Section 3.2 Water Management Structures Design Criteria. January 2019.

Comment

Section 3.2 of the Water Management Plan states that:

- Water quality guidelines will meet regulatory criteria of the Licence (described in Appendix F).
- Design capacity for the EWTP will support various return periods: 1:100 wet year spring freshet; 1:2 mean year spring freshet, plus a 1:1000 return 24 hour extreme rainfall.
- Design capacity of pumping from CP5 to CP1 is sufficient to ensure that D-CP5 and CP5 will be able to manage the water from its catchment area for 3/7 of a 1:100 wet year spring freshet or a 1:1000 return 24-hour extreme rainfall.
- Design pumping capacity of each of the other water management dikes (D-CP3, D-CP4, and D-CP6) and associated ponds (CP3, CP4, and CP6, respectively) will be able to manage the water from their respective catchment area for 3/7 of a 1:100 wet year spring freshet or a 1:1000 return 24-hour extreme rainfall.

ECCC is unclear of the intent of some of the wording used in this section and clarification on the following would be helpful:

- Clarify that it is water quality that will meet regulatory criteria (i.e., delete “guidelines”).
- Clarify if 1:2 mean year spring freshet is correct. Designing for a 1:100 wet year should also accommodate a 1:2 mean year; but the reverse will not be true. Therefore, “or” should not be used between the two scenarios.
- Clarify the use of 3/7 and whether that is for a design standard.

ECCC Recommendation(s)

ECCC recommends that the Proponent provide the clarifications of the wording in Section 3.2 of the Water Management Plan that were specified above and include any necessary changes in the next update of the Water Management Plan.

3. Effluent Flow Path/Blending

Reference(s)

- Agnico Eagle Mines Limited. Meliadine Gold Project – Water Management Plan, Version 5. Section 3.9.4 Effluent Water Treatment Plant (EWTP), Appendix C: Water Management Schematic Flow Sheet and Appendix F: Water Quality and Flow Monitoring Plan. January 2019.

Comment

Beginning July 2018, water stored in pond CP5 was treated through a Reverse Osmosis (RO) system and then pumped through the EWTP for treatment (prior to discharge into Meliadine Lake). It is unclear if the flow from the RO Plant is routinely treated through the EWTP, or if there are circumstances when it would be blended or directly discharged downstream of the EWTP (as implied in Section 3.3 of Appendix F: Water Quality and Flow Monitoring Plan).

ECCC Recommendation(s)

ECCC recommends that the Proponent provide clarification of the effluent flow path(s) from the RO Plant to/through the EWTP.

4. Monitoring Data

Reference(s)

- Agnico Eagle Mines Limited. Meliadine Gold Project – Water Management Plan, Version 5. Section 3.9 Water Treatment, Appendix F: Water Quality and Flow Monitoring Plan – Section 5 Reporting and Appendix H: 2019 Water Balance and Quality Forecast Results. January 2019.

Comment

Under the water licence, the Proponent is required to provide monthly monitoring reports, which include all the data collected for the general monitoring specified in the licence. This data would be useful in evaluating the quality of effluent and other water flows at site on an ongoing basis; however, the monthly reports have not included analytical results.

Monthly reporting is not described under Section 5 of Appendix F: Water Quality and Flow Monitoring Plan. Appendix H: 2019 Water Balance and Quality Forecast Results does not include water quality information beyond limited total dissolved solids (TDS) values at selected sites.

ECCC Recommendation(s)

ECCC acknowledges that data will be available in the Annual Report to be submitted March 31, 2019 so is not requesting past data at this time. However, ECCC recommends that going forward, analytical data be included in the monthly monitoring reports as

required by the water licence. This requirement should be included in the Reporting section of the Water Quality and Flow Monitoring Plan.

5. Disposal of Wastewater Treatment Sludges

Reference(s)

- Agnico Eagle Mines Limited. Meliadine Gold Project – Water Management Plan, Version 5. Section 4.3 Discharge Diffuser Effluent Flow Rates and Table 16: Key Water Management Activities During Mine Closure. January 2019.

Comment

Water treatment will be done at a rate of 12,000 m³/day, less the 312 m³/day of sludge returned back to CP1. It is not clear what parameters the treatment sludges will contain in addition to TSS and treatment residuals.

Table 16 states that at closure, the Proponent will breach water retention dikes D-CP1, D-CP3, D-CP4, D-CP5, and D-CP6 once water quality monitoring results meet discharge criteria to allow water to naturally flow to the outside environment. It is unclear if the sludge quality has been characterized to evaluate any issues with sediment quality once the pond is again connected to surface waters (noting that there will be the potential for seasonal fish use).

ECCC Recommendation(s)

ECCC recommends that the Proponent complete a characterization of treatment sludges to identify potential closure concerns with sediment quality in the sludge disposal area.

6. Groundwater Quality Averages

Reference(s)

- Agnico Eagle Mines Limited. Meliadine Gold Project – Water Management Plan, Version 5. Appendix A: Groundwater Management Plan and Table 3: Average Saline Groundwater Quality – from Diamond Drill Holes (DDH) January 2019.

Comment

Several parameters are at levels that appear to be anomalous:

- The August 2018 monthly average cyanide concentration is shown as 25.003 mg/L. The next highest concentration is 0.19 mg/L and most results were in the 0.005 – 0.033 mg/L range.
- In August 2018 phosphorus was reported to be 59 mg/L, which is 1-2 orders of magnitude higher than the other averages reported.
- Nitrogen compounds were elevated in Feb. 2017, with nitrate at 116.39 mg/L, ammonia at 7.9 mg/L, and nitrite at 8.01 mg/L. Levels since that time have been considerably lower.

ECCC Recommendation(s)

ECCC recommends that the Proponent provide clarification on the cause of the elevated parameter concentrations, and in particular:

- Clarify whether the anomalous cyanide result is a real value, or if there was a transcription or other error. If there was a sample with this level of cyanide, the source should be identified.
- Verify the phosphorus value reported for August 2018.
- Identify the reason for elevated nitrate, nitrite and ammonia for Feb. 2017.

Should you require further information, please do not hesitate to contact me at (867) 669-4732 or Emily.Nichol@Canada.ca.

Sincerely,

[original signed by]

Emily Nichol
A/Senior Environmental Assessment Coordinator

cc: Bradley Summerfield, A/Head, Environmental Assessment North (NT and NU)