Environmental Protection Operations Directorate
Prairie & Northern Region
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ECCC File: 6100 000 012/015
NWB File: 2AM-MEL1631

March 25, 2022

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 Ltd. – Meliadine Gold Project – Design Reports & Operation and Maintenance Manual

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) regarding the above-mentioned design reports and manual.

ECCC is providing technical, science-based information and knowledge based on our mandate pursuant to the *Canadian Environmental Protection Act* and the pollution prevention provisions of the *Fisheries Act*. These comments are intended to inform the assessment of this project's potential effects in the receiving environment and on valued ecosystem components. Any comments received from ECCC in this context does not relieve the proponent of its obligations to respect all applicable federal legislation.

The following comments are provided:

1. Inclusion of marginal/low-grade ore in the ore pad

Reference(s)

- Ore Storage Pad 2 Stage 2 Design Report and Drawings (February 2022)
- Ore Storage Management Plan V3 (March 2021)
- Water Management Plan V10 (August 2020)
- Interim Closure and Reclamation Plan V2 (January 2021)

Comment

The Ore Storage Pad 2 Stage 2 Design Report Section 2.3 states:

> *"OP2 Stage 2 will consist of two pads with the main pad occupying an approximate area of 70,000 square metres (m2) that will provide sufficient temporary storage for approximately 580,000 m3 of ore and a smaller transition pad that will occupy an approximate area of 1,600 m2. The pads will be constructed of fill consisting of either waste rock, low grade ore, or marginal grade ore. The pads will be set back from the water management structures and will be in general two metres thick. The surfaces of the pads will be sloped towards CP1/water management structures to limit ponding of water on the surfaces.*
>
> *The main pad will be used to stockpile low and marginal grade ore, since they will continue to be stockpiled until they are processed in the final years of mill operations."*

It is stated that the pad will be sloped such that surface drainage will flow towards CP1 water management structure, and that permafrost will exist beneath the footprint of the ore storage pads and is anticipated to aggrade upwards to the top surface (section 3.4). The low-grade ore that will be stored in stockpiles and milled when needed and the marginal grade ore that will be milled during the last years of operations will be present on the ore pad for an extended period and may be subject to weathering and generate poor-quality seepage. Monitoring should be conducted periodically to confirm that seepage is reporting to Channel 1 as designed, including confirming permafrost aggradation, and identifying any seepage quality issues prior to closure of the pad.

ECCC notes that there does not appear to be monitoring for runoff or seepage from the ore storage pads. The Ore Storage Management Plan states:

> *"Surface runoff and seepage from the ore stockpiles will be monitored during the construction and operation phases monthly over the open water season. Additional inspections will be carried out after rainfall events and during freshet. The detailed information on the monitoring of surface runoff and seepage from the ore stockpiles is described in the Water Management Plan (Agnico Eagle, 2020a)."*

The Water Management Plan includes the Freshet Management Plan, which covers runoff and seepage monitoring. However, the ore storage pads are not included in the list of areas monitored, and they do not appear to be included elsewhere in the Water Management Plan.

Channel 1 is expected to intercept and collect any seepage from the ore storage pad, and will be maintained until water quality is demonstrated to be acceptable for release to the environment without treatment. According to the Interim Closure and Reclamation Plan (ICRP), the channel will be graded to surface elevation at closure and ore pad reclamation will be done by grading and contouring the pad. The potential for poor-quality seepage associated with the incorporation of marginal-grade ore into the ore pad should be identified for closure planning (e.g. determining whether there may be a need for cover at closure).

ECCC Recommendation(s)

ECCC recommends that:

1. AEM update monitoring plans to include water quality and confirming the capture of any seepage or runoff from the ore pad, given the presence of the low-grade ore and the marginal ore over an extended time period.
2. Permafrost aggradation and characteristics be measured to evaluate the potential for future poor-quality seepage from the pad.
3. Any implications for closure planning should be identified and included in updates to the ICRP.

2. Capacity and treatment thresholds

Reference(s)

- Saline Effluent Treatment Plant (SETP-WTC) Design Report (December 2021)

Comment

Section 2.3 of the SETP-WTC Design Report states that the new Saline Effluent Treatment Plant (SETP) located within the Water Treatment Complex (WTC) is designed for a maximum treatment flow rate of 20,000 m^3/d. However, Section 2.7 shows maximum flow limitations of 12,000 m^3/day in each of the breakpoint chlorination and TSS removal line components. It is not clear whether the SETP-WTC would have the capacity to treat flows of 20,000 m^3/d.

The existing SETP was upgraded to treat 1600 m^3/day in 2020. It is not clear if this SETP will be retained for system backup/redundancy.

The SETP-WTC is designed to remove ammonia down to 0.5 mg N/L unionized ammonia (Table 1), and ammonia levels in effluent will be manually analyzed periodically to assess treatment performance. The primary source of ammonia will be water from the Tiriganiaq pit, which will be piped to the Saline Pond 1 (SP1), along with contact water from Collection Pond 1 (CP1). CP1 is expected to have low ammonia levels, which may negate the need for ammonia treatment in the combined waste streams. Thresholds for triggering ammonia treatment have not been identified, nor has the maximum concentration which the plant is able to treat been noted (i.e. any upper limits to effective treatment).

Maintenance is described in Section 3.5 for cleaning the discfilter system, but it is not specified whether the rest of the system will have to be taken off-line for maintenance and how that might affect water management.

ECCC Recommendation(s)

ECCC requests clarification on the following:

1. When ammonia treatment is required, will the maximum treatment capacity be held at 12,000 m^3/d?
2. Will the existing SETP be used in addition to the SETP-WTC?
3. At what ammonia concentration would the SETP-WTC treatment be used?
4. Is there a maximum ammonia concentration that can be treated?

5. Will there be periods when the treatment system will be down for maintenance, and if so, how will any high-ammonia wastewater be managed during maintenance periods?

ECCC acknowledges that the information in the design report and drawings will inform the Water Management Plan updates, and that the requested information would be appropriately included there.

If you need more information, please contact Victoria Shore at Victoria.Shore@ec.gc.ca.

Sincerely,

[original signed by]

Victoria Shore
Senior Environmental Assessment Officer

cc: Jody Small, Acting Head, Environmental Assessment North (NT and NU)