

Environmental Protection Operations Directorate
Prairie & Northern Region
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ECCC File: 6100 000 012/012-015
NIRB File: 11MN034
NWB File: 2AM-MEL1631



June 30, 2023

via email at: info@nirb.ca and licensing@nwb-oen.ca

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Nunavut Water Board
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Dear Emily Koide and Richard Dwyer:

RE: 11MN034 / 2AM-MEL1631 – Agnico Eagle Mines – Meliadine Mine – 2022 Annual Report

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Impact Review Board (NIRB) regarding the above-mentioned annual report.

ECCC provides expert information and knowledge to project assessments on subjects within the department's mandate, including climate change, air quality, water quality, biodiversity, environmental preparedness and emergencies. This work includes reviewing proponent characterization of environmental effects and mitigation measures, and providing advice to decision makers on activities needed to mitigate these environmental effects. 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. Ammonia and total phosphorous predicted concentrations in CP1

Reference(s)

- Meliadine Gold Mine 2022 Annual Report, Section 3.2.4.2 (Agnico Eagle Mines Limited - Meliadine Division; March 2022)
- Meliadine Gold Mine 2022 Annual Report - Appendix 42: 2021 Annual Report Comments Concordance Table (Agnico Eagle Mines Limited - Meliadine Division; March 2022)



Comment

For the 2021 Annual Report, ECCC commented on the water quality model over-predicting ammonia and total phosphorous levels in water in Containment Pond 1 (CP1) and recommended identifying the source of discrepancy between observed and predicted concentrations, including consideration of validating under ice predictions. The 2022 water quality model results in the 2022 Annual Report still over-estimate ammonia and total phosphorous concentrations. The Proponent proposes that measured concentrations were lower because algal growth reduced these nutrient concentrations and the model concentrations do not include nutrient attenuation. They acknowledge further investigation is required to support the hypothesis. They were not able to validate cryo-concentrated water in 2022 because water in CP1 froze to the bottom due to low water levels.

ECCC Recommendation(s)

ECCC's recommendation from last year remains unchanged. When logistically feasible, ECCC recommends review of the modeling for ammonia and total phosphorus in CP1 to identify the source of the discrepancy in observed versus predicted concentrations and that consideration be given to validating under-ice predictions.

2. Tailings pore water salinity

Reference(s)

- Meliadine Gold Mine 2022 Annual Report, Sections 3.1.9, 4.1.10 & 4.2.4 (Agnico Eagle Mines Limited - Meliadine Division; March 2022)

Comment

The salinity of pore water in the tailings with respect to the tailings storage facility (TSF) design assumptions is not clear. Section 3.1.9 of the annual report includes both statements that the pore water salinity "*has been above the design assumptions for the TSF since initial deposition*" and "*is below the design assumptions*". These statements appear contradictory.

Section 4.1.10 states "*freezing point depression due to TDS within the pore water of the tailings is not expected to negatively affect the long-term physical performance of TSF*", without speaking to the effect of pore water salinity above design assumptions on chemical performance of the TSF. One of the assumptions to support the tailings not posing acid rock drainage (ARD) risk in section 4.2.4, is that "*tailings are being stored in a facility that will freeze back (i.e. re-develop permafrost) and inhibit water movement within a few years post-operations*".

ECCC Recommendation(s)

ECCC recommends the Proponent clarify what the tailings pore water salinity is in relation to the TSF design assumptions and how this will affect the chemical performance of the facility.

3. Inconsistent wind directions for high Total Suspended Particulate (TSP) events

Reference(s)

- Meliadine Gold Mine 2022 Annual Report, Appendix 25: 2022 Air Quality Monitoring Report, Section 3.1 Monitoring Results, Suspended Particulates (Agnico Eagle Mines Limited - Meliadine Division; March 2022)
- Meliadine Gold Mine 2022 Annual Report, Appendix 25: 2022 Air Quality Monitoring Report, Appendix B: Daily Average Weather Data (Agnico Eagle Mines Limited - Meliadine Division; March 2022)

Comment

Section 3.1.1, Current Year TSP, PM₁₀ and PM_{2.5}, states that the wind directions on March 18 and 24 were 307° and 310° respectively, placing dust monitoring station DF-5 directly downwind of the Containment Pond 2 (CP2) construction area when high concentrations of TSP were sampled. However, Appendix B Table 1 shows average wind directions of 4° and 64° respectively for these dates. It is unclear whether the differences in directions are due to different time durations used for averaging, or whether a different averaging method (e.g., vector vs. scalar) was employed.

ECCC Recommendation(s)

ECCC requests that an explanation be provided to resolve the inconsistency in stated wind directions.

4. Compliance Monitoring

Comment

No authorizations from ECCC have been issued.

The Agnico Eagle Mines Meliadine Project is captured under several pieces of ECCC legislation such as subsection 36(3) of the *Fisheries Act* (FA), *Metal and Diamond Mining Effluent Regulations* (MDMER), *Canadian Environmental Protection Act* (CEPA), *Environmental Emergency Regulations* (E2 Regs), *Cross-border Movement of Hazardous Waste and Hazardous Recyclable Material Regulations* (CBX), *Storage Tank Systems for Petroleum Products and Allied Petroleum Products Regulations* (STSR), and *Greenhouse Gas Pollution Pricing Act/Output-Based Pricing System Regulations*.

In 2022, two on-site inspections were completed:

1. May 18-19, 2022:
 - onsite inspection and chemistry and toxicity sampling conducted with Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) under 36(3) of the FA on Lake A8 in response to Spill Report 2022-188.
 - File closed, no Enforcement Action Taken under FA 36(3)

2. Sept 23-24, 2022:

- Multi-Reg onsite inspection conducted under FA, MDMER, E2 Regs, CBX, and STSR at the Rankin Inlet Fuel facility, All weather Access Road, and mine site with CIRNAC.
- MDMER chemistry and toxicity sampling conducted at Final Discharge Point (FDP) MEL-14.
- On-Site inspections also conducted at 2022 spill sites 029,065,105,109,111,112,132,136,164,188, and 206.

MDMER

The Project is subject to the MDMER. The purpose of the MDMER is to authorize a deposit of certain deleterious substance(s) into water frequented by fish while monitoring the environmental effects of those deposits to ensure that deleterious substances are not released in quantities or concentrations that could result in harmful effects on waters frequented by fish. To do this, certain effluent deposit conditions (concentrations, limits and parameters) apply so that regulatees are exempted and protected from the more stringent prohibition of subsection 36(3) under the *Fisheries Act*. Samples of the effluent by the Proponent must be taken and tested at the identified FDP to ensure the above conditions are met on a scheduled basis and reported. The two current FDPs are as follows:

1. FDP MEL-14: Containment Pond 1 discharge into Meliadine Lake. Effluent gets treated at water treatment plant for total dissolved solids and total suspended solids then gets sampled after treatment prior to be discharged in Meliadine lake.
2. FDP MEL-26: Discharge from the Tiriganiaq underground mine into Melvin Bay, Hudson Bay, Arctic Ocean. Underground effluent gets treated at water treatment plant then transported via truck to discharge location.

The MDMER requires reports to be submitted in ECCC's online database (Mine Effluent Reporting System - MERS) which are reviewed by an assigned Enforcement Officer on a quarterly basis. The quarterly administrative regular report verifications are conducted to ensure that the sampling and testing has been conducted in accordance with the MDMER and to ensure the reports are submitted on time. Each Enforcement Activity includes an administrative report verification of each quarterly report which are due 45 days at the end of each quarter: 1st Quarter (due May 15), 2nd Quarter (due Aug 14), 3rd Quarter (due Nov 14) and 4th Quarter (due Feb 14), as well as an administrative report regular verification of the 2022 Annual Effluent Monitoring Summary Report (due March 31). Furthermore, an administrative report regular verification was completed on the Environmental Effects Monitoring (EEM) 2022 Annual Report (information related to effluent and water quality monitoring studies) and as part of this verification the officer submitted a copy of the report to the EEM Coordinator for review to also confirm compliance.

In 2022, the Proponent submitted all required MDMER reports:

1. First Quarter:

- Report submitted on time.
- FDP MEL-14: Administrative verification not conducted as no effluent was discharged through this FDP during Q1 therefore no compliance issues.
- FDP MEL-26: Administrative verification not conducted as no effluent was discharged through this FDP during Q1 therefore no compliance issues.

2. Second Quarter:
 - Report submitted on time
 - FDP MEL-14: Administrative verification not conducted as no effluent was discharged through this FDP during Q2 therefore no compliance issues.
 - FDP MEL-26: Administrative verification not conducted as no effluent was discharged through this FDP during Q2 therefore no compliance issues.
3. Third Quarter:
 - Report submitted on time
 - FDP MEL-14: Effluent was discharged in Q3 with no exceedances.
 - FDP MEL-26: Administrative verification not conducted as no effluent was discharged through this FDP during Q3 therefore no compliance issues.
 - No non-compliance was determined.
4. Fourth Quarter:
 - Report submitted on time.
 - FDP MEL-14: Administrative verification not conducted as no effluent was discharged through this FDP during Q4 therefore no compliance issues.
 - FDP MEL-26: Administrative verification not conducted as no effluent was discharged through this FDP during Q4 therefore no compliance issues.
5. 2022 Annual Effluent Monitoring Report:
 - Report was submitted on time and no compliance issues noted.
6. 2022 Annual EEM Report:
 - Report was submitted on time and no compliance issues noted.

ECCC Files Regarding Reported 2022 Spills:

1. 2022-029 – Lead agency CIRNAC – Spill 15L of Engine Oil on Lake B38 ice surface from drilling activity - File closed – No Enforcement Action Taken under Fisheries Act 36(3)
2. 2022-065 – Lead Agency CIRNAC – Spill 10L of Diesel Fuel on Lake A8 ice surface from drilling activity – No Enforcement Action Taken under Fisheries Act 36(3)
3. 2022-084 – Lead Agency CIRNAC – Spill 15L of Drill Cuttings on Lake A8 ice surface from drilling activity – No Enforcement Action Taken under Fisheries Act 36(3)
4. 2022-089 – Lead Agency CIRNAC – Spill 10L of Diesel Fuel on Lake A8 ice surface from drilling activity – No Enforcement Action Taken under Fisheries Act 36(3)
5. 2022-102 - Lead agency CIRNAC – Spill 20L of Drill Recirculation water on Lake A8 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)
6. 2022-105 Lead agency CIRNAC – Spill 20L of Drilling Recirculation Water on Lake A8 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)
7. 2022-109 Lead agency CIRNAC – Spill 100L of Drilling Recirculation Water on Lake A8 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)

8. 2022-111 Lead agency CIRNAC - Spill 6L of Contaminated Water on Lake A8 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)
9. 2022-112 Lead agency CIRNAC – Spill 150L of Drilling Recirculation Water on Lake A8 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)
10. 2022-132 Lead agency CIRNAC - Spill 0.5L of Diesel Fuel on Lake A8 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)
11. 2022-136 Lead agency CIRNAC – Spill 0.5 L of Engine Oil on Lake A8 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)
12. 2022-164 Lead agency CIRNAC - Spill 75L of Drilling Recirculation Water on Lake B38 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)
13. 2022-188 Lead agency CIRNAC – Spill Drill Cuttings/hydrocarbons at different locations on Lake A8 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)
14. 2022-206 Lead agency CIRNAC - Spill Drilling waste (Cuttings/casings) on Lake B38 ice surface from drilling activity - File closed- – No Enforcement Action Taken under Fisheries Act 36(3)

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: Melissa Pinto, Acting Head, Environmental Assessment North (NT and NU)