

Environmental Protection Operations Directorate
Prairie & Northern Region
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ECCC File: 6100 000 115/002
NWB File: 2AM-BRP1831



October 12, 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-BRP1831 – Sabina Gold and Silver Corp. – Back River Project – Hydrodynamic and Water Quality Modelling of Goose Lake Report, Water and Load Balance Report, and Water Management Plan

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) regarding the above-mentioned Hydrodynamic and Water Quality Modelling of Goose Lake Report, and the Water and Load Balance Report. Furthermore, ECCC has reviewed the April 2022, Water Management Plan in conjunction with the Water and Load Balance Report for deferred comments due to the updated information in the report.

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. New Federal Environmental Quality Guideline for Iron

Reference(s)

- Back River Project, Hydrodynamic and Water Quality Modelling of Goose Lake, Table 1: Modelled Constituents and Surface Water Quality Effects Benchmarks for the Protection of Aquatic Life



Comment

A Federal Environmental Quality Guideline for iron has been published in draft, and may be useful for comparison purposes. Specifically, where there are seasonal exceedances of the Canadian Council of Ministers of the Environment (CCME) guideline, it may be useful to calculate and compare the Federal Environmental Quality Guideline (FEQG) value for iron, which takes into account pH and dissolved organic carbon, if that data is available.

ECCC Recommendation(s)

ECCC recommends that where there are seasonal exceedances of the CCME guideline, the Proponent calculate and compare the FEQG value for iron, which takes into account pH and dissolved organic carbon, if that data is available.

2. Hydrologic Inputs

Reference(s)

- Back River Project, Hydrodynamic and Water Quality Modelling of Goose Lake, Section 3.3 Hydrologic Inputs, Table 2: Annual Average Hydrological Inputs during Calibration and Forecast Periods

Comment

Section 3.3 states that inflows to Goose Lake were based on four years of flow data collected between 2011 to 2021, with daily averages of these years applied to the years with no observed data (2014 to 2020). However, Table 2 only shows three years of data used for the calibration period.

Given the range in water levels and flows seen in other parts of the North between 2014 and 2020, it is not clear if the use of limited inflow data has biased the results.

ECCC Recommendation(s)

ECCC ECCC requests:

- Clarification of the use of 2021 flow data; and
- Discussion of how representative the 3 years of inflow data (averaged) are for the full calibration period.

3. Sensitivity Analysis

Reference(s)

- Back River Project, Hydrodynamic and Water Quality Modelling of Goose Lake, Section 8.0 Sensitivity Analysis

Comment

Various sensitivity analyses were run to evaluate effects of changes to meteorological conditions, ice cover, and inflow quantity and quality for a 10-year period – extending five years into post-closure. As with the modeling completed, average climactic conditions were assumed, with the sensitivity analysis run for 96% and 4% of historical precipitation conditions. A longer ice cover period was also evaluated. It is not clear if these assumptions encompass conditions which would occur under a non-average set of climate conditions (i.e. would this be sufficiently representative of climate change scenarios which are potentially expected to affect conditions)?

ECCC Recommendation(s)

ECCC recommends that a discussion of climate change effects on the forecasts be provided, which includes an evaluation of the various scenarios.

4. Contact Water Sources

Reference(s)

- Back River Project, Water and Load Balance Report, Table 1: Summary of the Key Water Management Activities at the Goose Property

Comment

It is stated in Phase 1: Construction, that “contact water from the Plant Site is collected in the Plant Site Pond, then released to the tundra.”

Under the conditions of the Water Licence, there are land discharge limits for treated camp wastewater, as well as effluent from the Hazardous Waste Management Area, Landfarm, and the Fuel Tank Farm.

ECCC notes that the Plant Site Pond is close to the drainage to Goose Lake, and adjacent tundra discharges would flow almost directly to the stream going into the lake.

It is not clear which contact water sources, if any, will be directed to the Plant Site Pond (other than runoff, which could include runoff from the ore stockpile), and whether effluent quality criteria should be applied to this discharge.

ECCC Recommendation(s)

ECCC requests clarification on which contact water sources will report to the Plant Site Pond, and further discussion on whether effluent quality criteria are appropriate for this discharge.

5. Contaminant Concentrations

Reference(s)

- Back River Project, Water and Load Balance Report, Section 5.3 Water Treatment
- Back River Project, Water and Load Balance Report, Appendix G
- Back River Project, Water and Load Balance Report, Appendix H
- Back River Project, Water Management Plan, Section 7.4.2 Goose Property Water Treatment Plant and Disposal
- Back River Project, Water Management Plan, Section 8.3.3 Open Pit Closure

Comment

Section 7.4.2 of the Water Management Plan (WMP) states that "during the Closure Phase, overflow water from the Llama and Umwelt Reservoirs will be treated before arrival at PN04 to achieve MDMER limits at this location." Similarly, Section 5.3 of the Water and Load Balance Report (WLBR) notes that the Metal and Diamond Mining Effluent Regulations (MDMER) discharge limits are the basis for evaluating the treatment required for discharges to Goose Lake. This is to be achieved at the time of flooding.

The long-term objective is to meet CCME guidelines or Site-Specific Water Quality Objectives (SSWQOs) as appropriate, with water treatment continuing into the closure phase until these are met. The updated Water and Load Balance Report water quality predictions (Appendices G and H) include Goose Lake PN04 levels at closure that are well below MDMER criteria.

ECCC Recommendation(s)

ECCC recommends that the Proponent provide further discussion on whether contaminant concentrations in discharges to Goose Lake could be achieved earlier, and at the lower levels already depicted, through all remaining phases of the project.

6. Increased Tailings Volumes

Reference(s)

- Back River Project, Water and Load Balance Report
- Back River Project, Water Management Plan, Section 8.2.6 Tailings Management Facilities

Comment

Table 8.2-4 in section 8.2.6 provides the updated tailings volumes. There has been an increase in tailings storage up to 15.6 M-m³ (previously 10.3 M-m³); Llama TF was previously to store only 6.8 M-m³, and now is to store 8.14 M-m³. It is unclear if these increases affect the depth and/or quality of water cover proposed.

ECCC Recommendation(s)

ECCC requests clarification, including any consequences identified, that would be associated with the increase in tailings volume into the Llama TF.

7. Treatment Timeline

Reference(s)

- Back River Project, Water and Load Balance Report
- Back River Project, Water Management Plan, Section 8.3.9 Water Treatment Closure

Comment

Section 8.3.9 of the Water Management Plan states that “year round recirculation water treatment in Umwelt and Llama TF for metals, phosphorus, nitrogen species and suspended solids will occur starting in year 13 and into closure until all water quality objectives are met”.

ECCC Recommendation(s)

ECCC requests an estimate of the duration of treatment that may be required in closure.

If you need more information, please contact Stephinie Mallon at Stephinie.Mallon@ec.gc.ca.

Sincerely,

[original signed by]

Stephinie Mallon
Environmental Assessment Officer

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