

Environmental Protection Operations Directorate  
Prairie & Northern Region  
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ECCC File: 6100 000 001/005  
NWB File: 1AR-NAN2030



June 13, 2022

via email at: [licensing@nwb-oen.ca](mailto: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: 1AR-NAN2030 – Canzinc Mines Ltd. – Nanisivik Mine – 2021 Annual Report**

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) regarding the above-mentioned annual 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. Total Dissolved Solids (TDS)**

Reference(s)

- 2021 Water Quality Monitoring Report, Table 4-6. Select data from 2021 NML-29 site investigation monitoring points.

Comment

Table 4-6 reports TDS concentrations below 1 mg/L for all stations shown. This is not possible given the measured sulphate concentrations at the stations. This parameter may have been mistakenly labeled when it should be Total Suspended Solids (TSS), or alternatively, results been mis-reported.

ECCC Recommendation(s)



ECCC recommends the Proponent provide clarification of the parameter labeled TDS in Table 4-6.

## 2. pH Readings

### Reference(s)

- 2021 Water Quality Monitoring Report, Section 4.1 QA/QC Results

### Comment

Field pH readings have been noted as being higher than laboratory readings over time, and following validation of field practices for pH measurement, BCG Engineering Inc. postulated that: *“This trend (of higher field pH values) may be associated with the presence of organic matter (e.g., humic acids) within the watercourses, that dissociates over time and contributes to lower measured pHs following transport to the laboratory. The source of the organic matter may be the surrounding hummocky landscape (typical of arctic regions), which can contain substantial amounts of organic matter (Schnitzer and Vendette, 1975) and be transported to watercourses following spring snow melt.”*

In follow-up, BGC recommends: *“To better assess the potential for organic matter to contribute to higher field pH values, relative to laboratory values, BGC recommends samples from a subset of the 2022 monitoring stations be analyzed for total organic carbon and/or humic acids.”*

Given the paucity of soils and organic matter at the mine site, this theory needs further investigation to see if organic matter could account for differences in pH. It would be helpful to have the chemical equations/stoichiometry noted for the suggested dissociation reaction to see if this could account for the drop in pH between field and lab readings. Alternative explanations should be explored if it is found that organic matter concentrations are minimal.

### ECCC Recommendation(s)

ECCC concurs with the recommendation to further investigate causes of apparent pH downward drift in samples from field to lab measurements.

If you need more information, please contact Melissa Pinto at (867) 445-5384 or [Melissa.Pinto@ec.gc.ca](mailto:Melissa.Pinto@ec.gc.ca).

Sincerely,

*[original signed by]*

Melissa Pinto  
Senior Environmental Assessment Officer

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