Crown-Indigenous Relations and Northern Affairs Canada
Relations Couronne-Autochtones et Affaires du Nord Canada

Water Resources Division
Resource Management Directorate
Nunavut Regional Office
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Your file - Votre référence
(1AR-NAN2030)
Our file - Notre référence
GCDOCS#99152642

November 19, 2021

Richard Dwyer
Manager of Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU, X0B 1J0
E-mail: licensing@nwb-oen.ca

**Re: Crown-Indigenous Relations and Northern Affairs Canada's Review of Nyrstar's Response to CIRNAC Comments Regarding Canzinco Mines Annual Report for Nanisivik Mine Post-Closure Monitoring and Maintenance, Type A Water Licence No. 1AR-NAN2030**

Dear Mr. Dwyer,

Thank you for the November 3, 2021 invitation to review Nyrstar's response to CIRNAC comments regarding Canzinco Mines Ltd's Annual Report for Nanisivik Mine Post-Closure Monitoring and Maintenance, for Type A Water Licence No. 1AR-NAN2030.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the responses to our comments. Please find CIRNAC follow up comments in the attached Technical Memorandum.

If there are any questions or concerns, please contact me at (867) 975-3877 or miriame.giroux-paniloo@canada.ca and Andrew Keim at (867) 975-4550 or andrew.keim@canada.ca.

Sincerely,

Miriame Giroux

Miriame Giroux-Paniloo,
Water Resource Technician

Canada

# Technical Review Memorandum

**Date:** November 19, 2021

**To:** Richard Dwyer – Manager of Licensing, Nunavut Water Board

**From:** Miriame Giroux-Paniloo – Water Resource Technician, CIRNAC

**Subject:** **Crown-Indigenous Relations and Northern Affairs Canada's Review of Nyrstar's Response to CIRNAC Comments Regarding Canzinco Mines Annual Report for Nanisivik Mine Post-Closure Monitoring and Maintenance, Type A Water Licence No. 1AR-NAN2030**

**Region:** ☐ Kitikmeot ☐ Kivalliq ☑ Qikiqtani

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## A. RESULTS OF REVIEW

### 1. R-01 Investigation of elevated sulphate concentration sources

**CIRNAC Comment:**

Concentrations of sulphate at Station NML-29 in 2019 and 2020 were consistently above Action Level values defined in the Contingency Plan for Surface Water Quality Exceedances. An investigation was carried out in 2020 with a handheld meter at 9 sites upstream and within the same drainage channel along which NML-29 is situated. This included measurements in an area with localized seepage approximately 150 m upstream of NML-29. Elevated sulphate concentrations are hypothesized to come from potentially thawing conditions from the north side of the drainage channel, or areas other than the Landfill that discharge to the drainage channel.

The 2020 Nyrstar Water Quality Monitoring report concludes "a secondary investigation is recommended for Station NML-29, which should include additional baseline points as well as more detailed mapping of any observed seepage where elevated conductivities (i.e., > 1,000 µS/cm) are observed, including investigation of evidence accounting for these values (e.g., erosion of mineralized outcrops, erosion, sources of turbidity). Similar to 2020, measurement of field parameters along the water course and at defined intervals upstream of NML-29 should be conducted in 2021, with collection of samples for chemical analysis."

**CIRNAC Recommendation:**

(R-01) CIRNAC recommends that the proponent conduct a secondary investigation with chemical analysis testing recommended in the Appendix B 2020 Nystar Water Quality Monitoring report done for the proponent, and that the investigation include stations along

the drainage channel as far west as NML-30 to confirm the hypothesis that the landfill is not part of the source of high sulphate concentrations.

**Nyrstar Response to Recommendation:**
Secondary surface water investigations at station NML-29 were completed as part of the site inspection undertaken in August 2021. In addition to the measurement of field parameters, four water quality samples were taken in the area and sent for laboratory analysis. A drone survey was also completed to assess potential surface water contributions from the landfill to station NML-29. The results of the investigations are under evaluation and will be discussed in the 2021 Annual Report.

**CIRNAC's Comments 2021-11-10:**
CIRNAC asks for further clarification on whether the proponent completed sampling and chemical analysis testing and collected samples at station NML-30. CIRNAC would like to confirm samples were collected from station NML-30 to support the hypothesis that the landfill is not part of the source of high sulphate concentrations.

## 2. R-02 pH Quality Assurance and Quality Control Results

**CIRNAC Comment:**
Data quality objectives (DQOs) for quality assurance/quality control (QA/QC) of pH are presented in section 4.1 of Appendix B the 2020 Nystar Water Quality Monitoring report:

- Field pH versus laboratory pH: DQO of less than +/- 0.5 pH unit difference between field and laboratory measurements.

Only three of the eight pH measurements meet the data quality objectives and field measurements are consistently higher than laboratory results (7 of 8 samples). Both sections 4.1.1 and 4.1.5 on QA/QC conclude samples results are representative, even though there seems to be systematic error resulting in measurements above data quality objectives.

**CIRNAC Recommendation:**
(R-01) CIRNAC recommends that the licensee carefully calibrate equipment used to measure pH in the future, and look for ways to reach data quality objectives if exceedances persist.

**Nystar Response to Recommendation:**
Several measures have been taken to ensure accurate pH field readings. In preparation for the 2021 site inspection, the pH probe used for the field measurements was sent for routine maintenance and calibration at a third party laboratory. While in the field, the probe was

calibrated daily as per standard procedure. In addition, the field measurement procedures were reviewed to ensure their correct design and application.

**CIRNAC Comment 2021-11-10:**

Canzinco Mines Ltd has addressed our recommendation. Only three of the eight pH measurements meet the data quality objectives and field measurements are consistently higher than laboratory results (7 of 8 samples). We recommend the proponent continue monitoring for pH and note any exceedances in the next annual report..

### 3. R-03, R-04 and R-05

**Comment:**

Our recommendations R-03, R-04 and R-05 have been addressed to our satisfaction.