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

May 29, 2020

via email at: licensing@nwb-oen.ca

Richard Dwyer
Manager Licensing
Nunavut Water Board
P.O. Box 119
Gjoa Haven, NU X0B 1J0

Dear Richard Dwyer:

RE: 1AR-NAN2030 –Nyrstar– Nanisivik 2019 Annual Report

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) by Nyrstar (the proponent) regarding the above-mentioned 2019 Annual Report for water licence 1AR-NAN2030.

ECCC provides specialist advice based on our mandate pursuant to the *Canadian Environmental Protection Act* and the pollution prevention provisions of the *Fisheries Act.*

ECCC is providing the following comments:

1. Zinc Action Levels – Station 159-6

Reference(s)

- Water Quality Monitoring 2019 at the former Nanisivik Mine, Nanisivik, Nunavut, Canada Final Report March 10, 2020 Tables 1.3 and 2.2
- 2020 Contingency Plan for Water Quality Exceedances, Former Nanisivik Mine. Prepared by Stantec Consulting Ltd. for Canzinco Mines Ltd., dated March 27, 2020.

Comment

Station 159-4, is the final discharge point, and has regulated discharge limits. All other water quality-monitoring stations have Action Levels (i. e., levels at which management actions occur). The 2020 Contingency Plan recommends the use of the 99th percentile as the basis for Action Levels for a specified list of parameters, and calculates this using the dataset from 1996 to 2019. Under the renewed water licence, only one sampling event per year will take place.

The Action Level for zinc at Station 159-6 was previously set at 4.6 mg/L, and is proposed to increase to 8.9 mg/L for 2020 onwards. This station is at the outflow of Twin Lakes Creek into Strathcona Sound. High zinc concentrations previously measured in the creek are related to inputs from water flow over mineralized zones, and this is reflected in the high zinc Action Level values. However, very low zinc concentrations measured at this station over the past 5 years suggest that the proposed Action Level value of 8.9 mg/L is too high. Re-calculation of the 2020 zinc 99th percentile using a more recent dataset may be more representative of closure conditions and provide a more relevant yardstick.

Recent zinc concentrations at Station 159-6 have been:

- In 2019, Zn concentrations ranged from 0.04 to 0.78 mg/L;
- In 2018, concentrations ranged from 0.03 to 0.16 mg/L;
- In 2017, concentrations ranged from 0.14 to 0.31 mg/L;
- In 2016, concentrations ranged from 0.09 to 0.13 mg/L; and
- In 2015, concentrations ranged from 0.04 to 0.19 mg/L.

Given the consistently low concentrations measured, the Action Level may be too high for the current closure configuration, and would not provide a meaningful trigger level.

ECCC Recommendation(s)

ECCC recommends that the Proponent revisit the Action Level for zinc at Station 159-6 (including 159-6 Temp), in order to reflect recent observed values for zinc concentrations.

2. Oceanview Open Pit Waste Rock Cover

Reference(s)

- Nanisivik Mine , Nunavut 2019 Annual Geotechnical Inspection Section 5.3.9 Oceanview Open Pit Waste Rock Cover

Comment

Under the heading Inspection Conditions, the proponent observed that there was some seepage at the toe of the cover, and observed some acid rock drainage staining on the east edge of the cover. The proponent made similar observations during previous inspections. The stained area appeared to originate upslope of the extent of the cover, and appeared to cover a similar extent to what had been observed in previous inspections.

The proponent then concluded that –"*In general, the Oceanview Open Pit cover appears to be in satisfactory condition. As such, no maintenance is recommended. The surficial erosion should continue to be visually monitored for additional progression*."

ECCC noted that Photo 59. Oceanview Pit – titled "*Seepage flowing into the cover system from upstream*" – shows a large extent of seepage.

ECCC Recommendation(s)

ECCC recommends that the proponent propose mitigation measures that would reduce or stop the seepage. ECCC also recommends that the proponent determine the sources of the observed acid rock drainage staining on the east edge of the cover, and then propose suitable mitigation measures..

3. Upper Dump Pond Tailings Cover

Reference(s)

- Nanisivik Mine , Nunavut 2019 Annual Geotechnical Inspection Section 5.3.11 Upper Dump Pond Tailings Cover

Comment

Under Section 5.3.11 Inspection Conditions, the proponent provided select photos from the inspection in Appendix I (Photos 60 through 62), and stated the main observations from the inspection to be:

- No erosion of the surface of the cover was observed.
- No seepage was noted at the toe of the cover.
- No areas of settlement or thermokarst features were observed on the surface of the cover.

The proponent then concluded that, in general, the Upper Dump Pond tailings cover appears to be in a physically stable state. As such, the proponent does not recommend any maintenance.

However, Photo 62 Appendix I, Upper Dump Pond, appears to indicate a breach in the road to the mill site. It is not clear whether the photo was mislabeled. If the photo is not mislabelled, then there is no indication that the proponent proposed any actions to fix the breach on the road that may affect the stability of the road.

ECCC Recommendation(s)

ECCC recommends that the proponent clarify if the photo refers to the correct site. If the photos does refer to the correct site, then ECCC recommends that the proponent provide a remediation plan for the breach on the road.

4. Oceanview East Raise

Reference(s)

- Nanisivik Mine , Nunavut 2019 Annual Geotechnical Inspection Section 5.4.10 Oceanview East Raise

Comment

In the Inspection Conditions section, the proponent provided a photo from the inspection (Photo 72), and stated that "*It was noted that periodic flows of groundwater seepage from*

upslope of the raise has caused acid rock drainage (ARD) staining of the ground surface around the raise. The source of the ARD is not known, but is likely related to near surface exposure of sulphidic soils and/or bedrock. This water is collecting in a disturbed area downslope of the raise. This low spot could be backfilled to prevent collection of this water."

ECCC notes that the *Photo 72. Oceanview East Raise – ARD staining around the plug and mound* shows seepage at the tow of the mound. The proponent did not know the source of the ARD seepage. Without determining the source of the ARD seepage, it not clear how the proponent will be able to mitigate or prevent the ARD from continuing.

ECCC Recommendation(s)

ECCC recommends that the proponent determine the source of the ARD seepage, and then propose appropriate mitigation.

If you need more information, please contact Eva Walker at (867) 669-4744 or Eva.Walker@Canada.ca.

Sincerely,

[original signed by]

Eva Walker
Senior Environmental Assessment Coordinator

Attachment(s):

cc: John Olyslager, Acting Head, Environmental Assessment North (NT and NU)