Environmental Protection Operations Directorate
Prairie & Northern Region
5019 52nd Street, 4th Floor
P.O. Box 2310
Yellowknife, NT X1A 2P7

ECCC File: 6100 000 009/011
NWB File: 2AM-LUP2032

April 9, 2021

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: 2AM-LUP2032 – Lupin Mines Incorporated – Water Quality Monitoring Plan and Water And Soil Quality Assurance/Quality Control Plan

Environment and Climate Change Canada (ECCC) has reviewed the Water Quality Monitoring Plan and Water And Soil Quality Assurance/Quality Control Plan submitted to the Nunavut Water Board (NWB) for water license 2AM-LUP2032 by Lupin Mines Incorporated.

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

The following comments are provided:

1. **Topic: Sampling Parameters - Cyanide**

   Reference(s)

   Table 2.1: Sample Collection Requirements

   Water Licence No: 2AM-LUP2032

   - Schedule J: Conditions Applying to Monitoring, Item 3, Table 1

   Comment:

   The water licence requires daily monitoring of discharge from Pond 2 for cyanide and metals, as reflected in Table 1. Acknowledging this monitoring is a licence requirement, ECCC notes the requirement for cyanide to be analysed daily is not demonstrated by the data. Cyanide concentrations were below detection limits in the analyzed 2018 discharge,

and there is no ongoing source related to mining operations. The MDMER allows for quarterly testing:

13 (1) The owner or operator of a mine may reduce the frequency of conducting tests relating to the concentrations of arsenic, copper, cyanide, lead, nickel or zinc at a final discharge point to not less than once in each calendar quarter, each test being conducted at least one month apart, if that substance's monthly mean concentration at that final discharge point is less than 10% of the value set out in column 2 of Schedule 4 for 12 consecutive months. (Ammonia will be added to this section June 1, 2021)

The (MDMER) Schedule 4 limit for total cyanide is 1.0 mg/L MAC and 2.0 mg/L MGC. Monitoring results reported have been below the detection limit of 0.005 mg/L.

ECCC Recommendation(s):

ECCC recommends the NWB consider removing daily cyanide monitoring requirements, reducing them to quarterly monitoring during discharge as all of the 2018 monitoring results were below detection limits.

2. Topic: pH Discharge Standards

Reference(s)

Table 2.2: Sampling Event Schedule, Tailings Containment Facility

Comment:

The requirement for results to meet discharge criteria includes the caveat "expect pH" [sic], which relates to the request of not having to meet licence criteria regarding low pH levels. Further discussion of this approach is warranted; as noted by ECCC previously, there is concern with tailings cover performance in preventing acid generation in the tailings that are approximately 1 metre below the surface cover. Lower pH values would be an indication the saturation/cover closure system is not performing as designed, and should be examined. Accordingly, pH values that are below the current regulatory criteria of 6.0 would be important to flag.

ECCC Recommendation(s):

ECCC recommends further discussion and rationale regarding the pH discharge criteria.

3. Topic: QA/QC Sample Numbers

Reference(s)

Table 2.2: Sampling Event Schedule

Comment:

QA/QC samples shown in Table 2.2 include field duplicates or field blanks. It is not clear whether the quantity of QA/QC samples will comprise the recommended minimum 10% of samples, as noted in Footnote 1. Travel blanks should also be included in the suite of QA/QC analyses listed here. ECCC notes that travel blanks are included in Section 3.1 of the plan.

ECCC Recommendation(s):

ECCC recommends clarification in Table 2.2, where QA/QC samples should be randomly selected for different analyses, and comprise 10% of the samples. In addition, travel (trip) blanks should be included in the table for QA/QC samples. The footnotes could reference Section 3 - Water Field Quality Control.

4. Topic: Field Log Book Observations

Reference(s)

2.1.2: Field Measurements and Field Log Book

Comment:

Weather conditions and air temperature are listed as activities to be recorded in the Field Log Book; it may be useful to specify these conditions to include wind speed and direction, as well as precipitation (current, as well as the past 24 hours). These data can be useful in interpreting some of the results (e.g. TSS, turbidity).

ECCC Recommendation(s):

ECCC recommends specifying the recorded ambient conditions to include wind speed, wind direction and precipitation.

5. Topic: Detection Limits

Reference(s)

Water Quality Monitoring and QA/QC Plan – General

Appendix B: Scope of Accreditations

Comment:

The Scope of Accreditations (Appendix B) provides the list of tests and measurement capabilities of the analytical laboratories for parameters that could be analyzed. However, the document does not mention detection limits. It would be important to maintain consistent detection limits over time, or specify where ultra-low detection limits may be warranted.

ECCC Recommendation(s):

ECCC recommends that the QA/QC plan include a list of detection limits, or instructions for the users of the plan on communicating what detection limits are to be requested.

6. Topic: Soil Sample QA/QC

Reference(s):

Section 8: Duplicate Samples

Comment:

Duplicate samples are proposed for soil sampling QA/QC, at a 10% frequency. Other methods could include spiked samples and split samples, to assess accuracy and precision for the soil analyses.

ECCC Recommendation(s):

ECCC recommends reviewing additional soil QA/QC methods to be incorporated in the sampling program.

If you need more information, please contact Jennifer Sabourin at Jennifer.Sabourin@Canada.ca.

Sincerely,

Jennifer Sabourin
Environmental Assessment Officer
Environmental Protection Operations Directorate, Prairie Northern Region

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