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Prairie & Northern Region  
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ECCC File: 6100 000 009 /008  
NWB File: 2AM-LUP1520

November 20, 2017

Via email to: [licensing@nwb-oen.ca](mailto:licensing@nwb-oen.ca)

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

Dear Mr. Dwyer:

**RE: 2AM-LUP1520 – Lupin Mines Inc. – Lupin Mine – Interim Closure and Restoration Plans and Phase I/II Environmental Site Assessment Update**

Environment and Climate Change Canada (ECCC) has reviewed the information submitted to the Nunavut Water Board (NWB) as a requirement under 2AM-LUP1520 Part C, Item 4 regarding the above-mentioned Interim Closure and Restoration Plan (ICRP) and Phase I/II Environmental Site Assessment Update and is submitting the following comments via email as requested by the NWB. ECCC's specialist advice is provided based on our mandate, in the context of the *Canadian Environmental Protection Act*, the pollution prevention provisions of the *Fisheries Act*, the *Migratory Birds Convention Act*, and the *Species at Risk Act*.

**Interim Closure and Reclamation Plan**

1. Water Quality Monitoring, ICRP Section 7.1.2

ECCC notes that the ICRP references a water quality monitoring program, but Lupin Mines Inc. (the Proponent) does not provide monitoring program details.

ECCC recommends that the Proponent provide water quality monitoring details including discharge quality objectives in the ICRP.

2. Cover Performance, ICRP Section 3.3.1

The mine has remained on care and maintenance since 2005. There have been infrequent inspections and data collection to assess the performance of the soil covers during this period. The Proponent has discussed the inclusion of monitoring cover performance with the engineers responsible for the annual geotechnical inspections and it is their intention that this be included as part of the on-going annual inspections. Cover performance standards should be established and appropriate response measures identified in order to address potential cover performance issues. Runoff/water quality monitoring should be used to confirm cover performance over time.

ECCC recommends that the ICRP be updated to include a description of cover performance monitoring and relevant water quality monitoring, including but not limited to seepage and groundwater.

3. Tailings Containment Area, ICRP Section 6.5.3

Restoration of the Tailings Containment Area (TCA) will involve maintaining water cover over areas that are currently used for water retention and low elevation tailings deposition (ponds) and mechanical covering of the higher elevation areas containing tailings (cells) with esker material. The proposed closure concept for the restoration of the TCA is to encapsulate the tailings (which are potentially acid generating) within a water saturated esker material cover. All exposed tailings will be covered by a 1 m layer of non-reactive, highly durable, saturated esker material.

ECCC recommends that the performance of the water-saturated esker material cover in the TCA be monitored over time to confirm the predicted effectiveness of this closure approach.

4. Landfill, ICRP Section 3.4

Non-burnable waste, including residue from burning, was historically disposed of and buried with waste rock on a regular basis.

ECCC recommends that buried waste that contains residue from burning be covered to a depth that isolates it below the active layer.

5. Landfarm, ICRP Section 3.4 and Section 6.2.1

On-going progressive reclamation at the site is achieved with the operation of a landfarm. Following successful remediation of soil to the applicable environmental quality standards in the landfarm facility, the treated soil is to be reused for site maintenance and soil cover.

ECCC recommends that the ICRP be updated to include a description of treated-soil sampling and testing procedures and soil re-use criteria. Alternate management/disposal method(s) should be identified, in the event that treated soil does not meet re-use standards.

6. Hydrocarbon Contaminated Soils, ICRP Section 6.2

Materials (esker sands) that contain residual hydrocarbons will generally be subjected to treatment by volatilization through aeration and bioremediation with nutrient amendments of nitrogen and phosphorus or by burial on site. ECCC believes that remediation should be the preferred option and that burial should only be considered as contingency in the case that remediation is ineffective.

ECCC recommends remediating hydrocarbon contaminated esker sands. If landfarming does not successfully remediate hydrocarbon-contaminated esker sands to meet re-use criteria, burial on site (with sufficient encapsulation) could be considered as a contingency option.

7. Soil Remediation Objectives, ICRP Section 6.4

As per the ICRP, soil with elevated concentrations of metals (including arsenic) will be managed on a risk-based approach in accordance with the Nunavut Guideline for Contaminated Site Remediation (2009). The ICRP indicates that site-specific soil quality remediation objectives for metals and petroleum hydrocarbons will be considered.

ECCC supports the development of appropriate and protective site-specific soil quality remediation objectives for metals and petroleum hydrocarbons.

**Updated Phase I and II Environmental Site Assessment**

8. TCA Spill: The Updated Phase I and II Environmental Site Assessment states that *“the release of approximately 10,000 litres (L) of oil contaminated water from the tailings containment areas (TCAs) (Spill No. 2012306) in July 2012 represent an area of potential environmental concern (APEC). However, as this release is associated with the TCAs, which are outside the scope of this report, investigation of this APEC was not completed as part of the 2017 Phase II ESA Update.”*

ECCC recommends that the ICRP be updated to discuss the spill of oil-contaminated water from the TCAs in July 2012. The extent of the spill, remediation measures (completed and planned), sampling results, and the current condition and extent of the affected area should be discussed.

Should you require further information, please do not hesitate to contact me at (867) 669-4746 or [Gabriel.Bernard-Lacaille@canada.ca](mailto:Gabriel.Bernard-Lacaille@canada.ca).

Sincerely,

*[original signed by]*

Gabriel Bernard-Lacaille  
Environmental Assessment Coordinator

cc: Melissa Pinto, Senior Environmental Assessment Coordinator  
ECCC Review team