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

Water Resources Division
Resource Management Directorate
Nunavut Regional Office
P.O. Box 100
Iqaluit, NU, X0A 0H0

Your file - Votre référence
2AM-LUP2032
Our file - Notre référence
GCdocs # 97936160

September 27, 2021

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

Re: Crown-Indigenous Relations and Northern Affairs Canada Review of the 2020 Annual Report for Lupin Mine Project, Type A Water Licence No. 2AM-LUP2032

Dear Mr. Dwyer,

Thank you for your June 28, 2021 invitation to review the Annual Report, submitted by Lupin Mine Incorporated (LMI) for Type A Water Licence No. 2AM-LUP2032 on June 26, 2021.

Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the application pursuant to its mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act* and the *Department of Crown-Indigenous Relations and Northern Affairs Act.* Please find CIRNAC comments and recommendations in the attached Technical Memorandum.

If there are any questions or concerns, please contact me at (867) 975-4738 or by e-mail at Vincent.okonkwo@canada.ca

Sincerely,

Vincent Okonkwo
Environmental Assessment Coordinator

GCDOCS # 97936160

Canada

Technical Review Memorandum

Date: September 27, 2021

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

From: Vincent Okonkwo, Environmental Assessment Coordinator, CIRNAC

Subject: Crown-Indigenous Relations and Northern Affairs Canada Review of the 2020 Annual Report for Lupin Mine Incorporated, Type A Water Licence No. 2AM-LUP2032

A. BACKGROUND

The Lupin gold mine is located on the shores of Contwoyto Lake approximately 285 km southeast of Kugluktuk, in the Kitikmeot Region of Nunavut and is owned by LMI, a subsidiary of Mandalay Resources Corporation. The Lupin gold mine is currently licensed under Nunavut Water Board (NWB) Water Licence No. 2AM-LUP2032, which was approved on April 9, 2020 by the Minister of Northern Affairs. The site had been in care and maintenance since 2005, and is presently undergoing final reclamation under the approved water licence.

In accordance with Part B, item 2 terms and condition of the type A Water Licence 2AM-LUP2032, the licensee is required to submit an Annual Report to the NWB for approval, no later than March 31st in the year following the calendar year being reported.

CIRNAC provides the following comments and recommendations pertaining to the 2020 Annual Report submitted by LMI. A summary of the subject of each recommendation can be found in Table 1. Table 2 contains a list of the documents reviewed as part of this submission and Section C contains the completed technical review comments.

Table 1: Summary of Recommendations

Recommendation Number	Subject
R-01	Geotechnical Inspection Findings, Recommendation and Actions
R-02	Seepage at the Divider Dykes
R-03	Instrumentation Installations
R-04	Incorrect/Estimated Information
R-05	Certification of Repair Work
R-06	2020 Annual Inspections of Water and Waste Management Structures
R-07	Late Submission of Reports

B. DOCUMENTS REVIEWED

The following table (Table 2) provides a summary of the documents reviewed under the submission.

Table 2: Documents Reviewed

Document Title	Author, File No., Rev., Date
Lupin Mine Water Licence No. 2AM-LUP2032 2020 Annual Report	LMI, 26 June 2021
Appendix A - Tabular Summaries of Monitoring Program Results	LMI, 26 June 2021
Appendix B – Water and Effluent Quality Certificates of Analysis and Chain of Custody Forms	ALS Environmental
Appendix C - 2020 Lupin Mine Tailings Area Inspection Report, Annual Geotechnical Inspection of the Tailings Containment Area	Stantec, 18 December 2020
Appendix D - 2020 Inspection Reports	CIRNAC
Appendix E - 2021 Care & Maintenance and Closure Phase Plan, Addendum with Appendices	LMI, 26 June 2021, Rev 4
Appendix F - 2021 Spill Contingency Plan, Addendum	LMI, 26 June 2021, Rev 4
Appendix G – Final Closure and Reclamation Plan Rev 2, Addendum	LMI, 26 June 2021, Rev 2
Appendix 1 - FCRP Table 14 – Summary of Measures for Final Closure (Revised June 2021)	LMI, June 2021
Appendix 2 – Technical Memorandum Re: Water Licence Condition Part E-25 – Design for the Waste Rock “Dome” at Lupin Mine	Golder, 8 June 2020

Document Title	Author, File No., Rev., Date
Appendix 3 – 2AM-LUP2032 Technical Memorandum on Additional Geotechnical Details on TCA Dam K and Dam M Cross Sections	Stantec, 8 June 2020
Appendix 3a - LMI Response Drawings 129500081 - TCA Closure Drawings Signed_20200706	Stantec, 06 July 2020
Appendix 3b - LMI Response Drawing 005 - Outflow_RevB_20200609b_Signed Stamped	Stantec, 04 August 2020
Appendix 4 - 2AM-LUP2032 Technical Memorandum on Exposed Tailings Preliminary Cover Design	Stantec, 8 June 2020
Appendix 5 - Cell 4 - Drawing 002 -Plan View_Rev_20210618	Stantec, 7 June 2020
Appendix 6 – Reclaim 7.0 Security Reduction Update	1 February 2021

C. RESULTS OF REVIEW

1. Geotechnical Inspection Findings, Recommendation and Actions

Comment

In section 4.2 of the 2019 Annual Geotechnical Inspection Report, Stantec geotechnical engineer recommended that the following repairs be given a priority attention in 2020:

- Repair of Dam K toe using compacted sand and gravel to restore original design configuration and armoring of the repaired toe with boulders/riprap for wave protection. Removal of the loose material from the crest of the dam and repair of the crest with compacted sand and gravel.
- Repair of the northern section of the Divider Dyke with compacted sand and gravel to restore the original design configuration, including side slopes and leveled crest and armoring up to the high-water mark. Finalizing the repair on the southern section to restore the original configuration. Fully and effectively plugging the malfunctioning gate valve to prevent the flow from Cell 4 into Pond 1 and maintain the intended Tailings Containment Area (TCA) water management.
- Monitoring of water level behind Dam N and lowering the water level to maintain a minimum 1 m freeboard.
- Monitoring of Dam 2 seepage and managing it as necessary by pumping the seepage back into Pond 2.

- Repairing of the sloughed section of the buttress to the original elevation and shape once Pond 2 is lowered. LMI is monitoring and managing the water in Cell 5 as part of maintenance work. This monitoring and water management should continue to prevent damage to Dam M.
- General repairs on surface and slope erosion at high water mark on various perimeter and internal dams.

The 2020 Annual Report did not provide specific details that identify the actions taken by licensee in 2020 to address these concerns raised in 2019 Annual Geotechnical Report. In section I of the 2020 annual report, the licensee provided a brief description of the work completed to address Stantec's geotechnical engineer prioritized repair recommendations. It is unclear to what extent those prioritized repairs were completed.

Also, in section 4.1 and 4.2 of the 2020 Annual Geotechnical Inspection Report, the inspection of the Tailings Management Facility (TMF) noted several concerns that needed to be addressed including a localised failure at Dam M.

CIRNAC notes that many of the observations and recommendations are repeats or similar to 2018 (per the 2019 Annual Geotechnical Inspection Report) and 2019 observations and recommendations. It is not clear if this means that the recommendations were not acted on by licensee or if similar issues have reoccurred for the same inspection item, but in either case there are outstanding concerns to address.

Part E, Item 7(d) of the Type A Water Licence 2AM-LUP2032 requires that: *"Erosion of constructed facilities is addressed immediately".*

In February 1, 2021 response to letter with plans to implement the geotechnical engineer's recommendations, the licensee stated that*: "Upon recommencement of closure activities in 2021, the localized failed section of Dam M should be repaired."*

CIRNAC is of the opinion that the licensee must provide specific details of work completed at the localized failure at Dam M to address concerns raised in both the 2019 and the 2020 geotechnical inspections.

Recommendation

(R-01) CIRNAC recommends that the licensee:

- Provide specific details and evidence that the 2019 geotechnical inspection priority repairs were completed in 2020;
- Clarify if previous recommendations were not acted upon or that similar issues reoccurred in 2018, 2019 and 2020 annual geotechnical inspections; and

- Clarify the extent of work completed if any action has been taken to address the failure at Dam M.

2. Seepage at the Divider Dykes

Comment

In section J of the 2020 Annual Report, the licensee stated that: "*There were no unauthorised discharges or spills reported in 2020.*"

The Geotechnical engineer, in section 3.4 of 2020 Annual Geotechnical Inspection Report stated that:

"The cracks and erosion observed in the divider dyke were repaired by the newly placed compacted fill. However, new zones of seepage were observed at the newly constructed downstream toe of the divider dyke. These seepages were not observed previously and were monitored during closure activities. The seepages will continue to be monitored until the proposed spillway is constructed in 2021. The seepages are expected to stop once the spillway is constructed to passively manage the water at the closure elevation, which is below the observed seepage zones."

It is not clear if pond was constructed to contain the seepage or what measures were taken by the licensee to mitigate unauthorized discharge to the environment.

Recommendation

(R-02) CIRNAC recommends that the licensee:

- Clarify if pond was built to contain the seepage; and
- Identify measures taken to mitigate the unauthorized discharge in the subsequent annual reports if no pond was built.

3. Instrumentation Installations

In section 3.2.1 of the 2020 geotechnical inspection report, findings states that:

"From the existing records, there were thirteen thermistors installed in the dams, but only five of them are currently functional. There were seven functional thermistor last year, but the one thermistor located on each Dam 1A (D1A-00-01s) and Dam 4 (D4-3) were damaged this year and cannot be readily repaired without specialized equipment and supplies. Of the five functioning thermistors, three are in the perimeter dams and two are in the internal dams. There are an additional seven thermistors installed in the reclaimed tailings cover, but three of them do not have calibration data on record to evaluate the results. This report focuses on the thermistor readings from dams, using the thermistor readings from the cover for reference and comparison."

Following the licensee's plan to have closure works completed in 2021, consideration should be given to upgrading the site monitoring instrumentation as it relates to thermistors and moisture sensors as the current installations are either damaged beyond repair or non-existent. The damaged thermistors should be replaced while additional moisture sensors installed such that there is at least one in each cell of the TCA.

Having a functional and adequate number of thermistors and moisture sensor installations will not only enhance performance monitoring of the dams and tailings covers but will also reduce room for reading errors.

Recommendation

(R-03) CIRNAC recommends that licensee replace damaged thermistors and install additional moisture sensors at least one in each cell at the TCA.

4. Incorrect/Estimated Information

CIRNAC notes that the licensee has improved in ensuring consistency of information. However, the 2020 Annual Report has few instances of incorrect information which includes:

- Licensee stated that in section C of the 2020 Annual Report that discharge at LUP-10 took place from July 29 to August 29, 2020. Appendix A, Table No 1 indicates that the last day of discharge was September 23, 2020.
- Documents provided include a file titled "Appendix 5 - Cell 4 - Drawing 002 -Plan View_Rev_20210618; On review it is a figure for Cell 5.
- Condition (g) "Sampling at East Lake and Boot Lake took place on July 21-22, 2020 and the results are included in Appendix A Certificate of Analysis Lab WO#: L2479238. The referenced Certificate is provided in Appendix B.
- Section 1 of the 2020 annual geotechnical inspection report appears to be referencing the previous water licence (2AM-LUP1520) and not the current 2020 Water Licence 2AM-LUP2032. While there are similarities between the two licences, it would have been expected that some of the newer conditions would have been reported on in the 2020 Annual Geotechnical Inspection Report (for example Part E Condition 25, 26 and 27).

Furthermore, in Appendix A, Table No 1, September 14 and 16, 2021, quantity of the effluent discharged was estimated to be 8632 m^3 and 5076 m^3 respectively. It is unclear if the estimate was triggered by a broken flow meter.

Inconsistencies in information provide misleading accounts of activities and discharge flow estimates could pose the risk of discharge exceedances.

Recommendation

(R-04) CIRNAC recommends that the licensee clarify:

- Information in the 2020 annual report and update accordingly in the subsequent reports; and
- Rational for the estimated discharge volumes of 8632 m^3 and 5076 m^3 on September 14 and 16, 2021 respectively.

5. Certification of Repair Work

Comment

In section I (Modification and Major Maintenance Work), the licensee stated that:

"Various earthwork was done in 2020 as part the closure activities and emergency water management. The divider dyke and Dam L were raised by 0.5m and 0.8m, respectively, for emergency water management to prevent overtopping. Prior to the emergency raise, Dam L was mechanically breached and backfilled by the contractor to dewater Cell 3 ***without the engineer-of-record (EOR) authorization or engineering oversight.*** *During repair of Dam M, earthwork equipment has caused a localized minor failure at the downstream face of the dam. Dam K received maintenance and repairs this year. The Pond 2 water level was lowered significantly by the water treatment and discharge operation, providing a freeboard upwards of 5m at the perimeter dams."*

The EOR did not report any concerns with raising the elevation of the respective structures as a means of ensuring the structures would not be overtopped. There was no explanation as to why licensee did not advise the EOR in advance of breaching Dam L to lower the water level in Cell 3 as the licensee mentioned that repair works were completed without the certification of an EOR.

The annual report also, did not discuss or confirm whether or not any observations or records from monitoring after 2020 inspection work or during any dam rehabilitation work was provided to Stantec or the EOR for review.

CIRNAC is concerned on the long term stability of the structural earthwork completed as it requires an EOR's supervision and endorsement to provide confidence and ensure quality assurance on the repair work performed.

Recommendation

(R-05) CIRNAC recommends that licensee:

- Clarify if observations and records from monitoring after 2020 inspection was sent to Stantec and EOR for review; and
- Ensure that an EOR is present to supervise and endorse structural earthworks in subsequent emergency repair works and that, signed and stamped As-Built drawings detailing the adequacy of those repairs are provided for review.

6. 2020 Annual Inspections of Water and Waste Management structures

Comment

Part D, Item 5 terms and condition of the Type A Water Licence states that:

"The Licensee shall, during the active Closure Phase and Care and Maintenance Phase of the Project, conduct inspections of Water and Waste management structures on a bi-weekly basis during freshet (approx. May and June), and on a monthly basis during the remainder of the open water period (approx. July to October). All records of the inspections and findings must be maintained for review, upon the request of the Board or an Inspector."

In regards to 2020 inspections of the water and waste management structures, it is unclear from the Annual Report, if the licensee completed bi-weekly inspection during the freshet (approximately May and June) and monthly during the remainder of the open water period (approximately July – October) and kept the records as required by the above Type A Water Licence terms and condition.

CIRNAC is of the opinion that the licensee provide summary record of inspections as an annex to the annual report for review in subsequent annual report submissions.

Recommendation

(R-06) CIRNAC recommends that the Licensee:

- Clarify if bi-weekly and monthly inspections were completed during the freshet and open water seasons respectively as specified in the Type A Water Licence 2AM-LUP2032; and
- Provide the summary record of the inspections for review in subsequent annual report submissions.

7. Late Submission of Reports

Comment

The 2020 Annual Geotechnical inspection was carried out September 17 through September 18, 2021 by Stantec's geotechnical engineer. CIRNAC notes that the Annual report states that geotechnical inspection report was submitted to the NWB on February 1, 2021. This is in contravention of the Part J, Item 12 of the Type A Water Licence which states that:

"The Licensee shall, during active Closure Phase and prior to Post Closure, undertake annual inspection of the Tailings Containment Area, during ice free, open-water conditions by a Geotechnical Engineer. The Engineer's report shall be submitted to the Board within sixty (60) days following the inspection, and shall include a cover letter from the Licensee outlining an implementation plan to respond to the Engineer's recommendations."

The 2020 Annual Report was submitted to the NWB on June 26, 2021, also in contravention of Part B, Item 2 of the Type A Water licence which requires that:

"The Licensee shall file an Annual Report with the Board no later than March the 31st in the year following the calendar year being reported. The Annual Report shall be developed and submitted in accordance with Schedule B of the Licence, unless otherwise approved by the Board in writing."

CIRNAC is of the view that licensee's timely delivery of reports is important to avoid delays and ensure it is possible for the licensee to carry out any remedial work needed immediately as required by the licence. Late delivery of reports is a constraint to the review process, making it difficult for interveners to assess the extent at which reclamation work has been done.

Recommendation

(R-07) CIRNAC recommends that the licensee ensure that all reports are submitted to the NWB in a timely fashion as per the terms and condition of the Type A Water Licence 2AM-LUP2032.

D. REFERENCES

Nunavut Waters and Nunavut Surface Rights Tribunal Act (2016)

Department of Crown-Indigenous Relations and Northern Affairs Act (2019)

Nunavut Water Board, February 2020: Amended and Renewed Type A Water Licence No: 2AM-LUP2032, P 5,11,12,19,26 and 29.