



FW: 2AM-LUP2032 water licence commitment submissions

Richard Dwyer <richard.dwyer@nwb-oen.ca>

Tue, Aug 25, 2020 at 1:31 PM

Draft To: "Okonkwo, Godwin (AADNC/AANDC)" <godwin.okonkwo@canada.ca>

----- Original message -----

From: "Okonkwo, Godwin (AADNC/AANDC)" <godwin.okonkwo@canada.ca>

Date: 2020-08-25 12:57 a.m. (GMT-05:00)

To: Derek Donald <derek.donald@nwb-oen.ca>

Subject: RE: 2AM-LUP2032 water licence commitment submissions

Hello Derek,

Thanks for the opportunity to review the referenced documents submitted as per commitments of the water licence 2AM-LUP2032. Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) examined the submissions 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 the result of CIRNAC review below for your consideration.

REFERENCE: A.1 200608 2AM-LUP2032 19136158-Rev0-Condition E 25-TM-Dome Design_08 June 2020-IMLE

In response to this condition, Lupin Mines Incorporated (LMI) provided a 3-page Technical Memorandum from Golder dated 8 June 2020. The contents of the memo included:

- Section 1 Introduction – which provides reference to the Water Licence Condition 25 which requires that LMI provide *“design details on the Waste Rock Dome, including, but not limited to the following:*
 - a. *Cardinal direction cross sections and slopes;*
 - b. *Details on drainage systems and conceptual water features; and*
 - c. *Erosion control measures and cover stabilization of the dome.”*
- Section 2 Waste Rock Dome Design – which includes,
 - Section 2.1 Design Objectives – consolidate and cover waste rock
 - Section 2.2 Design Drawings – which comments on the 2 Drawings included with the memo.
- Section 3 Closure – closing sentence

The Golder Memo provides two cross-sections of the dome, a profile of a drainage chute and three “typical details”, one of perimeter berm, one profile and one cross section of the drainage chute. The drawings are stamped as Not for Construction. In addition to the typical details, the provision of contours on the Plan figure and the cross-section A-A provides additional information not previously presented.

CIRNAC Comments on Condition 25 Dome Design

COMMENT 1: Review of the information provided in the Golder memo indicated some new information in terms of design details and related design data to support the assessment of the long-term stability and performance of the proposed concept. No additional discussions were provided in the body of memo to support the civil design basis of the runoff control features or to support the long stability of the 10% slope surfaces against erosion. CIRNAC review of the plans and sections observed that the 10% slopes, about 300m of top edge in the north portion of the “dome” is as much as 10m high and this extends out about 100m to the toe. The west and southwest side of the dome has a height of between 5m and 6m and thus extends out some 50+/- meters in these areas. There was an indication that a berm will be constructed on the top edge of the dome to direct “dome surface” runoff to drainage chutes (see below). However, no erosion control measures are included to ensure erosion protection and stability of these long 10% esker slopes.

RECOMMENDATION 1: CIRNAC recommends that LMI include erosion control measures to ensure erosion protection and stability of these long 10% esker slopes.

COMMENT 2: The plans and sections indicate that surface water runoff from the 1.6% surface slope, is expected to be drained off the dome, down the 10% slopes, via 6 runoff “drainage chutes”. Surface runoff is to be directed to these “chutes” by a small perimeter berm along the edge of the dome surface (0.5m high, 0.5m crest width, 2:1 slopes) constructed with the same esker material as the 1m dome cover surface. Given the importance of this berm in preventing overland sheet flow to the 10% slopes, CIRNAC is concerned with the long-term stability of the berm design as presented.

No information was provided to support the designs of the top perimeter berm, the chutes, or the stilling basins. No drainage elevations were provided with respect to surface grading on the top of the dome edges, and no information is provided with respect to the drainage runoff flows leaving the “stilling basins” at the toe of the dome. No details were provided for the toe of the 10% slopes, nor for runoff from “stilling basins”, which in some locations could undercut the toe of the cover (see north central discharge). In the absence of these information we question the long-term erosion stability of the designs.

RECOMMENDATION 2: CIRNAC recommends that LMI provide the information stated above to demonstrate the long-term erosion stability of the designs.

COMMENT 3: The notes on the site plan included:

- Drawing Note 1 which states that “*subgrade under the dome area is to be prepared in accordance with the Water Licence and FCRP before waste rock or cover materials are placed*”. While CIRNAC agrees with the intent of this statement it is not clear how LMI will ensure compliance with this note is achieved if these requirements are not specifically stated on the drawings.
- Drawing Note 2 provides a list of materials that are to be removed before waste rock is placed, but the drawing does not identify the locations of these materials. It is unclear how this will be achieved in the absence of specific references to the dome plan.
- Drawing Note 4 states that crown pillar and openings and mine shafts are to be filled before waste rock is placed on top. No details or specifications are provided with respect to these activities, and no reference is made to necessary approvals from the mines inspector.
- In addition to our specific concerns with the “dome” design concepts, CIRNAC is also concerned that the remedial requirements that need to be undertaken are not specifically identified or referenced on the plan provided. That LMI should provide specific cross reference to these works to ensure

RECOMMENDATION 3: CIRNAC recommends that all relevant requirements and works be specifically referenced.

REFERENCE: A.3 200608 2AM-LUP2032 129500081_Lupin LUP2032 Commitment Part E Item 27 Response 06082020-IMLE

In response to this condition, LMI provided a 7-page Technical Memorandum from Stantec dated 8 June 2020 entitled “Technical Memorandum on Exposed Tailings Preliminary Cover Design”.

The contents of the memo included:

- An Introduction - which provides reference to the Water Licence Condition 27 which requires that LMI provide the introduction noted that the memo that “... *a Technical Memorandum that provides rationale and detailed designs of cover construction for tailings that becomes exposed, including but not limited to the following:*
 - a. Further rationale supporting in-situ cover as a contingency measure;*
 - b. Preliminary detail designs;*
 - c. Typical cross sections; and,*
 - d. Long-term erosion control measures.”*
- A Design Rationale Section – which provides background information and seven rationale bullets to support in place covering of tailings
- A Preliminary Design Section – which provides information on capping approach proposed for the known exposed tailings in Cell 4.
- Closure – closing sentences which state that covering any potential exposed tailings in place is the prudent measure to mitigate ARD risks.

CIRNAC Comments on Condition 27 Exposed Tailings Preliminary Cover Design

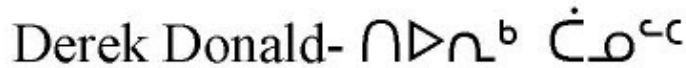
COMMENT 4: CIRNAC appreciates the information provided by this submission with respect to both the rationale and the design approach for the Cell 4 exposed tailings. In general, CIRNAC has no issues with this information or the plans sections and details provided. However, it is noted that Cell 4 exposed tailings are known exposed tailings. The Nunavut Water Board request was to provide details on how LMI would handle tailings that could potentially become exposed when drawing down the water levels in the ponds.

While it can be inferred that the approach to covering any newly exposed tailings that might result from drawing down Ponds 1 and 2 would be the same as that used for covering the Cell 4 tailings, no details or discussions have been presented on how such tailings covers would be placed and secured. It is important for LMI to indicate whether esker materials will be placed directly over the tailings or if a geotextile filter cloth be placed prior to placing esker materials over the tailings, and if the perimeters of the cover material will be stabilized with geotextile fabric and boulder materials? At this point in time, the Stantec’s comment on how any potentially exposed tailings materials would be handled is that “*If other exposed tailings are found, outside of the identified Cell 4 area, specific design will be done according to specific site conditions. The general criteria above will apply, along with specific design feature(s) as needed once site condition and specifics are identified.*”

RECOMMENDATION 4: CIRNAC recommends that LMI provides the necessary site specific design(s) for any such tailings area cover(s) for review before LMI can cover any exposed tailings.

Thanks,
Derek

Thanks,
Derek



NUNAVUT WATER BOARD - OFFICE DES EAUX DU NUNAVUT
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Richard

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

Your file - Votre référence
2AM-LUP2032
Our file - Notre référence
CIDM# 1290242

October 9, 2020

Mr. 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 Comments for
Lupin Mine Incorporated Response to CIRNAC Comments for Water Licence 2AM-
LUP2032 Conditions E 25-TM-Dome Design and Condition E-27 Exposed Tailings
Preliminary Cover Design**

Dear Mr. Dwyer,

Thank you for your October 6, 2020 invitation to review and comment on the response provided by Lupin Mines Incorporated (LMI) to Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) comments, submitted on August 25, 2020 for Water Licence 2AM-LUP2032 commitments regarding the conditions E 25-TM-Dome Design and condition E-27 Exposed Tailings Preliminary Cover Design.

CIRNAC conducted the review of the response pursuant to its mandated responsibilities under the *Nunavut Waters and Nunavut Surface Rights Tribunal Act*, the *Department of Crown-Indigenous Relations and Northern Affairs Act*, and associated policies. Please find below CIRNAC comments and recommendations to the Nunavut Water Board for consideration.

1. CIRNAC COMMENTS ON CONDITION 25 – Dome Design

CIRNAC COMMENT 1 – Lack of erosion controls on 10% slopes of esker cover

Comment: LMI's September 30, 2020 reply indicates that the nature of the cover material is such that it will seal armour as surface erosion removes fines and annual inspections and equipment will be on site to monitor and repair if erosion is an issue.



It is unclear as to what assumptions have been made with respect to the anticipated design flows during both the freshet and summer storm events. CIRNAC does not agree with LMI's indication that during the freshet the dome cover will remain frozen (ponding of water on top of the dome would result in thawing of the upper portions of the esker cover) and thus protect the esker cover from scour and/or erosion. Furthermore, the gradation of the esker material may be such that the fine-grained sands and silts could be easily removed during intense precipitation events, thus resulting in esker covers being compromised. There was also no information provided to confirm that the riprap to be used in the chutes is sufficiently sized to remain stable during the high intensity runoff events.

LMI's also references the FCRP (Section 4.3.2.3) in the response that indicates that annual inspections will identify areas of mitigation work and these maintenance activities can be done using light construction equipment has not been accounted for in the security estimate for the mine site. The cost of mobilizing equipment to complete the necessary repair work would be expensive and needs to be accounted for in the security if the current dome construction design plan is accepted. CIRNAC is not confident that the design provided is sufficient for a long-term walk away solution.

CIRNAC Recommendation: CIRNAC recommends that interested parties are provided the opportunity to review the recently submitted FCRP, and that the cost of this potential post-closure work is considered in the reclamation security.

CIRNAC COMMENT 2 – lack of information to demonstrate stability of designs

LMI's September 30, 2020 reply indicates that additional design details will be provided in their "Subsequent Issued for Construction Drawings" and provided additional comments on the intent of the designs. CIRNAC anticipates the opportunity to review the "Subsequent Issued for Construction Drawings" from LMI to confirm if it addresses CIRNAC's questions. More detailed topographic information is also required to ensure that water runoff is not allowed to migrate tangentially along the toe of the dome embankment. This work should be done in advance of the dome construction work so it is clear to all parties involved as to the work required to properly install the esker dome cap.

CIRNAC Recommendation: CIRNAC recommends that the 'Subsequent Issued for Construction Drawings' be provided by LMI for review in advance of the dome construction work.

CIRNAC COMMENT 3 - Notes on the design plan and lack of specific information on related underlying works

LMI's September 30, 2020 reply indicates that the intent of the 8 June 2020 Technical memo was to address the specific requirements of Part E Item 25 of the Water Licence 2AM-LUP2032. LMI notes that clean-up work began in 2020 and were undertaken in accordance with their clean-up protocol (as summarized below).



LMI's reply states that "Note 1 is deliberately stated in general terms in order to require the Contractor to comply with any relevant terms in the water licence and the PCRP". LMI further states that the relevant background documents are publicly available and contain extensive information on location and nature of various aspects of soil and rock requiring cleanup; that LMI has developed a protocol for cleanup activities (field screening and laboratory testing) to establish excavation limits; and that disposal of the materials into the crown pillar and openings and shafts has been described in the FCRP; and that WSCC Chief Inspector of Mines Approval was granted 29 June 2020. CIRNAC suggests that it is challenging to expect the general contractor responsible for the construction of the esker dome cover to read both the requirements of the NWB and FCRP in sufficient detail to ensure that all engineering aspects of the work are appropriately addressed. LMI should ensure that there is a sufficient level of detail provided on the Issued for Construction drawings that will provide clarity to all program stakeholders to fully understand the work to be done, and ensure inspectors have the means by which to ensure the work is being executed in accordance with the design documents.

CIRNAC has not seen the referenced approval document granted by the WSCC Chief Inspector of Mines approving the disposal of waste rock in the crown pillar opening. Furthermore, it is incumbent on LMI to provide more than a conceptual plan on how this material will be placed into the crown pillar opening and shafts.

CIRNAC Recommendation: CIRNAC recommends the following;

- i. The recently submitted FCRP be provided for review by interested parties.
- ii. LMI to ensure that there is a sufficient level of details provided on the Issued for Construction drawings that will provide clarity to all program stakeholders to fully understand the work to be done, and inspectors have the means by which to ensure the work is being executed in accordance with the design documents.

2. CIRNAC COMMENTS ON CONDITION 27 – Exposed Tailings Preliminary Cover Design

CIRNAC COMMENT 4 - Exposed Tailings Preliminary Cover Design

LMI's September 30, 2020 reply referred to the previously provided "decision matrix" and supporting information provided in response to Commitment No. 8 from the Technical Meeting/Pre-Hearing Conference and also referred to Appendix H-1 and H-10 of the recently submitted FCRP (28 September 2020). CIRNAC has not reviewed the referenced FCRP document. CIRNAC's design request emanated from review of LMI's previous submissions.

CIRNAC Recommendation: CIRNAC recommends that the recently submitted FCRP be provided for review by interested parties.



CIRNAC appreciates the opportunity to participate in this review. If there are any questions, please contact me at (867) 975-4550 or godwin.okonkwo@canada.ca

Sincerely,

Godwin Okonkwo
Manager, Water Resources



RE: 2AM-LUP2032 LMI Response E25 & E27:CIRNAC REPLY

Okonkwo, Godwin (AADNC/AANDC) <godwin.okonkwo@canada.ca>

Fri, Oct 30, 2020 at 9:38 AM

To: Richard Dwyer <richard.dwyer@nwb-oen.ca>, "Mike, Margaret (AADNC/AANDC)" <margaret.mike@canada.ca>

Cc: Derek Donald <derek.donald@nwb-oen.ca>, "Wiatzka, Gerd" <Gerd.Wiatzka@arcadis.com>

Hello Richard,

Thanks for the October 20, 2020 opportunity to review to the response from LMI on October 19, 2020, with respect to Water Licence 2AM-LUP2032 conditions E25 and E27. Please find Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC) response below;

CIRNAC comments:

1. CIRNAC will review the September 28, 2020 updated Final Closure and Reclamation Plan provided for review by the Nunavut Water Board on October 13, 2020. CIRNAC will review the updated FRCP and provide comments 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*, and other associated legislation and policies.
2. CIRNAC appreciates the commitment by LMI to provide the construction drawings to the Nunavut Water Board as required by the water licence. CIRNAC looks forward to reviewing these construction drawings.
3. CIRNAC appreciates the provision of the approval letter from WSCC Chief Inspector of Mines.

Thanks and please let me know if you have any questions.

Best Regards,

Godwin Okonkwo (M.Sc., P.Bio)

Manager, Water Resources

Crown-Indigenous Relations and Northern Affairs Canada

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