LUPIN MINES INCORPORATED

LAND LEASE 74E/14-1-12 – LUPIN MINE PART E, ITEM 25, ITEM 26 AND ITEM 27, FINAL CLOSURE AND RECLAMATION and POST CLOSURE MONITORING PLAN AND

Technical Responses

Submitted to:

Crown-Indigenous Relations and Northern Affairs Canada
Land Administration
PO Box 100
Iqaluit, NU X0A 0H0

Submitted by:

K. Lewis, Project Manager

On behalf of:
Lupin Mines Incorporated
c/o Mandalay Resources Corporation
Suite 330 – 76 Richmond Street
Toronto, ON M5C 1P1

July 7, 2021

Contents

1.0 INTRODUCTION

On June 7, 2021, Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), Lands Administration, requested that Lupin Mines Incorporated (LMI) update their Closure and Reclamation Plan, as a requirement under Surface Lease No. 76E/14-1-12, Section 20-28. (see Appendix A).

LMI was advised that "CIRNAC is requesting this update based on review of the Lessees submissions to the Nunavut Water Board (NWB): "2020 Updated Final Closure and Reclamation Plan" dated March 19, 2021, and long term monitoring plan submitted separately in the "Post Closure Monitoring Plan" dated April 9, 2021 (referenced collectively as: the plans). The plans have been submitted as part of the NWB regulatory processes. Through this process CIRNAC Lands and Waters Divisions have made submissions documenting concerns, requesting new, or more detailed information, and making recommendations to support the proponent in addressing these requests."

Below LMI has provided responses to address CIRNAC's June 7, 2021 comments (see Appendix A) that are relation to 2AM-LUP2032 – Part E, Item 25, Item 26 and Item 27 review process, which was completed to the NWB satisfaction on November 2, 2020, as well as the updated Final Closure and Reclamation (FCRP Rev 1) (Appendix B) review process approved by the NWB on March 26, 2021.

Below, LMI had included the full review process including all comments/response/commitments/approvals and commitment status up to July 7, 2021. LMI has also included a table of the full review process up to July 5, 2021 for ease of use (Appendix C). LMI has fulfilled all commitments made during the 2AM-LUP2032, Part E, Item 25 review process and commitments made during the FCRP Rev 1 review process. These commitments have been filed with the NWB and are currently under a review process. There were no commitments for 2AM-LUP2032, Part E, Item 26 and if LMI encounters any exposed tailings they will fulfil the commitment to provide design(s) under 2AM-LUP2032, Part G, Item 1 as committed under Part E, Item 27.

2.0 PART E, ITEM 25, ITEM 26, ITEM 27 – REGULATORY REVIEW

At the public hearing in January 2020, CIRANC and LMI resolved all items of concern with the exception of security and three remaining items where LMI committed to provide additional information to CIRNAC. The commitments made and accepted by CIRNAC were provided in writing during the public hearing and the document is filed on the NWB ftp site. CIRNAC advised the NWB at the public hearing, with these commitments LMI that CIRNAC considered all items resolved. These three items were then incorporated in the Type A Water Licence 2AM-LUP2032, approved by Minister Vandal on April 9, 2020, as Part E, Item 25, Item 26 and Item 27 as follows:

25. The Licensee shall, within sixty (60) days following the approval of the Licence, submit to the Board for review, a Technical Memorandum that provides 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.
26. The Licensee shall, within sixty (60) days following the approval of the Licence, submit to the Board for review, a Technical Memorandum that provides additional geotechnical details on TCA Dam K and Dam M cross sections, including but not limited to the following:
    a. Magnified image that clearly identifies the materials used for the re-sloping, the distance that the re-sloping materials will extend from the crest of these Dams (including a break line with minimums and maximums noted), and the distances to the closure water mark;
    b. Perpendicular/longitudinal cross section of the outflow structures for Cell 5 and Cell 3, with invert elevations from the cover to the ponds, and a note to clarify the storm return period that will be used for designing the features.
27. The Licensee shall, within sixty (60) days following the approval of the Licence, submit to the Board for review, 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.

On June 8-9, 2020, LMI submitted technical memorandums/designs to the NWB to satisfy conditions Part E, Items 25, Item 26, and Item 27. The review process ended on November 2, 2020 when the NWB advised (Appendix D),

…..”CIRNA confirmed on October 30, that they had no further comments.

By copy of this letter, the Board confirms that it has completed its review of the above mentioned Technical Memorandums and related submissions, and finds the information functional and generally satisfying Part E, Items 25, 26, and 27 of Water Licence 2AM-LUP2032.”

3.0 PART E, ITEM 25 – CIRNAC COMMENTS/LMI RESPONSES/NWB RESPONSE

Interested Party:	CIRNAC	**Technical Comment No:**	1, 2 & 3
Subject/Topic:	Part E, Item 25, Regulatory Review Comments, Responses & Commitments		

Reference:

- 2AM-LUP2032 – Part E, Item 25;

Detailed Review Comment by CIRNAC (August 25, 2020):

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.

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.

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 it 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

Request or Recommendation by CIRNAC (August 25, 2020):

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

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

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

LMI Response (September 30, 2020):

Response 1: The perimeter berm will prevent runoff from the top surface of the dome from "spilling over the edges"; rather all runoff from the top surface will be conducted down erosion protected drainage chutes to ground level. As a result, the only runoff that will flow over the 10% sloped edges will be runoff from precipitation that lands directly on those surfaces. About 49% of the annual precipitation will occur as snowfall. Snowmelt is expected to run off during the spring freshet during which time the dome slope will still be frozen. Runoff from rainfall during the summer season will occur as sheet flow.

The esker material which will form the cover is a well graded pit run gravelly sand material which typically comprises the following fractions: 38% gravel, 59% sand and 3% silt (Holubec, 2005)1. Under incipient erosion conditions, these types of materials tend to "self armour" (i.e., fines are removed leaving behind a matrix of coarser material, which is more resistant to erosion).

The FCRP (Section 4.3.2.3) includes a provision for post-closure inspection of the cover. It is stated that "Annual visual inspections will be completed and documented, and maintenance activities will be undertaken if and as needed (e.g., regrading or the placement of additional granular material to repair erosion)." Light construction equipment will be left on site to carry out such repair work if required.

Response 2: The two drawings that were attached to the Technical Memo are Revision A drawings that are labelled "Not for Construction". These Rev A drawings provide more detail than was required to meet commitment E-25. Additional design details will be provided on subsequent Rev 0 "Issued for Construction" drawings.

It is intended that the alignment of the perimeter berms will be angled such that runoff striking the inner toe of the berms will have a gentle but positive drainage path to the nearest chute. Details of the alignment and the toe elevations will be provided in the Rev 0 drawings.

The typical cross-section and typical profile shown on Drawing 2, show the configuration and erosion protection design of the drainage chutes. Drawing 1 Rev A shows the number and location of the chutes. More details (i.e., set out points and invert elevations) will be provided later in the Rev 0 drawings.

It is intended that runoff discharging from the stilling basins will flow away from the dome, rather than tangentially along the toe. The same is true of the sheet runoff off the 10% sideslopes. For the most part, this will happen naturally because the “dome” is sited on the top of a natural hill. If, after the adjacent waste rock is excavated from the toe, there remain any areas where flow would otherwise occur tangentially along the toe of the dome, this flow will be redirected away from the toe of the cover using ditches and or swales as necessary. If there are any areas where this cannot practicably be done, then erosion protection will be placed against the affected toe area to prevent erosion.

LMI looks forward to further discussion in the development of the Post Closure Monitoring Plan in accordance with Part J, Item 13 and Schedule J of the water licence 2AM-LUP2032.

Response 3: Note 1 was deliberately stated in general terms in order to require the Contractor to comply with any relevant terms in the water licence and the FCRP.

The Phase I and II ESA (Morrow, 2006)2 together with the ESA update (Golder, 2017)3 contain extensive information on the location, nature and estimated quantities of soil and rock requiring clean up. This information is publicly available on the NWB ftp site. Also, electronic copies of these reports have been made available to the Contractor along with a separate plan showing the known locations of planned clean up. LMI has also developed a protocol for the clean up activities, which uses a combination of field screening and confirmatory lab analysis techniques to establish the excavation limits. It should also be noted that, should contaminated soil or rock become evident at locations other than those shown in the existing documents, the affected soil and rock will be cleaned up according to the protocol.

Disposal of waste materials into the crown pillar openings and shafts has been described in the FCRP and approved under the water licence. WSCC Chief Inspector of Mines approval was granted on 29 June 2020.

The Technical Memo submitted on 8 June 2020 was intended to address the specific requirements Part E, Item 25 of water licence 2AM-LUP2032. Clean up activities began in 2020 and were undertaken following the cleanup protocol discussed above.

Reference(s):

[1] Holubec Consulting, 2005. Lupin Operation – Closure Plan for Tailings Containment Area; January 2005.
[2] Morrow Environmental. 2006. Environmental Site Assessment, Lupin Mine Site, Nunavut Territory, January 2006.
[3] Golder Associates. 2017. Updated Phase I and II Environmental Site Assessment, Lupin Mine, Nunavut; October 2017.

Detailed Review Comment by CIRNAC (October 9, 2020):

COMMENT 1: Lack of Erosion Controls on 10% slopes of esker cover - 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.

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.

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.

Request or Recommendation by CIRNAC (October 9, 2020):

Recommendation 1: 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.

Recommendation 2: CIRNAC recommends that the 'Subsequent Issued for Construction Drawings" be provided by LMI for review in advance of the dome construction work.

Recommendation 3: 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.

LMI Response (October 19, 2020):

Response 1: The NWB has provided the updated FCRP for interested parties to review and provide comments. As noted in the current security estimate, equipment will remain at site for various repairs as required until post closure monitoring is complete. Demobilization of this equipment is also included in the current security estimate.

Response 2: The NWB has provided the updated FCRP for interested parties to review and provide comments.

Response 3: The NWB has provided the updated FCRP for interested parties to review and provide comments. LMI will provide the NWB with construction drawings as required under water licence 2AM-LUP2032. Please find below, the WSCC Chief Inspector of Mines approval documentation.

Detailed Review Comment by CIRNAC (October 30, 2020):

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.

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.

CIRNAC appreciates the provision of the approval leer from WSCC Chief Inspector of Mines.

Request or Recommendation by CIRNAC (October 30, 2020): n/a

NWB RESPONSE (November 2, 2020):

(see Appendix D for the entire NWB letter)

…..”**CIRNA confirmed on October 30, that they had no further comments.**

By copy of this letter, the Board confirms that it has completed its review of the above mentioned Technical Memorandums and related submissions, and finds the information functional and generally satisfying Part E, Items 25, 26, and 27 of Water Licence 2AM-LUP2032.”

LMI Response (July 7, 2021):

LMI committed above to provide the construction designs under water licence condition Part G, Item 1. The construction designs and technical memorandum (see Appendix E) addressing CIRNAC’s request for additional information have been submitted to the NWB under Part G, Item 1 and are currently in the review process.

See CIRNAC TC NEW 9 under Section 6.0 below for LMI’s responses to CIRNAC comments requested on February 16, 2021 after Part E, Item 25 (Appendix I) was satisfied by CIRNAC and the NWB, which are included in the LMI technical memorandum referred to above. Also see CIRNAC TC 1A and CIRNAC TC 1B under Section 6.0 below to review LMI’s response to the NWB in regard to the CIRNAC’s February 16, 2021 comments.

Reference(s): 2AM-LUP2032 - Part G, Item 1; Section 6,0 - CIRNAC TC NEW 9 below

Attachment(s): Appendix D – NWB Letter – Part E, Item 25, Item 26 and Item 27 Satisfied; Appendix E – Waste Rock “Dome” Cover Construction Design and Technical Memorandum; Appendix I – Part E, Item 25 – Design for Waste Rock “Dome” Technical Memorandum and Drawings

4.0 PART E, ITEM 26 - CIRNAC COMMENTS/LMI RESPONSES/NWB RESPONSE

Interested Party:	CIRNAC	**Technical Comment No:**	No Comments
Subject/Topic:	Part E, Item 26, Regulatory Review Comments, Responses & Commitments		

Reference:

- 2AM-LUP2032 – Part E, Item 26;

Detailed Review Comment by CIRNAC (August 25, 2020):

No comments from CIRNAC

Request or Recommendation by CIRNAC (August 25, 2020):

No recommendations from CIRNAC

LMI Response (September 30, 2020):

No comments or recommendations to respond to.

Detailed Review Comment by CIRNAC (October 9, 2020):

No comments from CIRNAC

Request or Recommendation by CIRNAC (October 9, 2020):

No recommendations from CIRNAC

LMI Response (October 19, 2020):

No comments or recommendations to respond to.

Detailed Review Comment by CIRNAC (October 30, 2020):

No comments from CIRNAC

Request or Recommendation by CIRNAC (October 30, 2020): n/a

No recommendations from CIRNAC

NWB RESPONSE (November 2, 2020):

(see Appendix D for the entire NWB letter)

…..”**CIRNA confirmed on October 30, that they had no further comments.**

By copy of this letter, the Board confirms that it has completed its review of the above mentioned Technical Memorandums and related submissions, and finds the information functional and generally satisfying Part E, Items 25, 26, and 27 of Water Licence 2AM-LUP2032.”

LMI Response (July 7, 2021):

See CIRNAC TC NEW 10 under Section 6.0 below for LMI’s responses to CIRNAC comments requested on February 16, 2021, after water licence condition Part E, Item 26 (Appendix J, Appendix J1 and Appendix J2) was satisfied CIRNAC and the NWB, which are included in the LMI technical memorandum referred to above. Also see CIRNAC TC 1A and CIRNAC TC 1B under Section 6.0 below to review LMI’s response to the NWB in regard to the CIRNAC’s February 16, 2021 comments.

Reference(s): Section 6,0 - CIRNAC TC NEW 10 below

Attachment(s): Appendix D – NWB Letter – Part E, Item 25, Item 26 and Item 27; Appendix I – Part E, Item 25 – Design for Waste Rock “Dome” Technical Memorandum and Drawings; Appendix J – Part E, Item 26 – Technical Memorandum Geotechnical Details on Dam K and Dam M Cross Sections with Specifications and Designs; Appendix J2 – Part E, Item 26 – TCA Drawing 005 – Outflow RevB - Signed

5.0 PART E, ITEM 27 - CIRNAC COMMENTS/LMI RESPONSES/NWB RESPONSE

Interested Party:	CIRNAC	**Technical Comment No:**	1
Subject/Topic:	Part E, Item 27, Regulatory Review Comments, Responses & Commitments		

Reference:

- 2AM-LUP2032 – Part E, Item 27

Detailed Review Comment by CIRNAC (August 25, 2020):

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 clothe 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."*

Request or Recommendation by CIRNAC (August 25, 2020):

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.

LMI Response (September 30, 2020):

LMI has provided, through the regulatory process Public Hearing Exhibit No. 6, a technical memorandum dated 9 January 2020 regarding, supporting information to the contingency contaminants management decision matrix and an additional technical memorandum in response to Commitment No.8 from the Technical Meeting/Pre-hearing Conference regarding, exposed contaminants at closure water levels. Refer to Appendix H-1 and H-10, respectively, of the recently submitted updated FCRP for additional copy. Moving forward, LMI is committed to compliance with our Type A Water Licence and approved closure plans.

Detailed Review Comment by CIRNAC (October 9, 2020):

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.

Request or Recommendation by CIRNAC (October 9, 2020):

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.

LMI Response (October 19, 2020):

The NWB has provided the updated FCRP for interested parties to review and provide comments.

Detailed Review Comment by CIRNAC (October 30, 2020):

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.

Request or Recommendation by CIRNAC (October 30, 2020): n/a

NWB RESPONSE (November 2, 2020):

(see Appendix D for the entire NWB letter)

…..”**CIRNA confirmed on October 30, that they had no further comments.**

By copy of this letter, the Board confirms that it has completed its review of the above mentioned Technical Memorandums and related submissions, and finds the information functional and generally satisfying Part E, Items 25, 26, and 27 of Water Licence 2AM-LUP2032.”

Request or Recommendation by CIRNAC (February 16, 2021): n/a

LMI Response (July 7, 2021):

LMI committed to provide construction designs under water licence condition (Part G, Item 1), if any exposed tailings are encountered, which would include a review process. To date, LMI has not encountered any new exposed tailings.

The documentation provided with the updated FCRP Rev 1 (Appendix B, B1, B2 & B3) was reviewed by CIRNAC during the application process as stated in LMI’s September 30, 2020 response above.

See CIRNAC TC NEW 11 under Section 6.0 below for LMI's responses to CIRNAC additional comment requested after Part E, Item 26 (Appendix K) review process was satisfied by CIRNAC and the NWB, which are included in the LMI technical memorandum referred to above. Also see CIRNAC TC 1A and CIRNAC TC 1B under Section 6.0 below to review LMI's response to the NWB in regard to the CIRNAC's February 16, 2021 comments.

Reference(s): 2AM-LUP2032 – Part G, Item 1; Section 6,0 - CIRNAC TC NEW 10 below

Attachment(s): Appendix D – NWB Letter Satisfied; Appendix B – FCRP Rev 1;Appendix B1 – FCRP Rev 1 Appendices; Appendix B2 - FCRP Rev 1 AppH_05 Surface WQ Model; Appendix B2 – FCRP Rev 1 AppH_06 Couple Seepage Thermal Modelling; Appendix B3 – FCRP ReV 1 AppH_08 Conceptual Design of Waste Rock Cover; Appendix K – Part E, Item 27 – Technical Memorandum on Exposed Tailing Preliminary Cover Design

6.0 PART I, ITEM 2 - UPDATED FCRP REV 1 REGULATORY REVIEW

Under water licence 2AM-LUP2032, Part I, Item 2, LMI was required to submit an updated FCRP (Rev 1) to address **relevant comments and recommendations provided by intervening parties and the Board during the review process for the application.** LMI submitted the updated FCRP on September 28, 2020 and the review process ended on March 26, 2021 when the NWB advised (Appendix F):

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

7.0 PART I, ITEM 2 – UPDATED FCRP REV 1 CIRNAC COMMENTS/ LMI RESPONSES/NWB RESPONSE

Interested Party:	CIRNAC	**Technical Comment No:**	1A
Subject/Topic:	New Comments on February 16, 2021 – FCRP Rev 1 review process		

Reference:

- n/a

Detailed Review Comment by CIRNAC (February 16, 2020):

In general, LMI's responses do not address CIRNAC's comments and many defer integrating information until version 2 of the FCRP. Therefore, CIRNAC's general recommendation is for the Nunavut Water Board to defer approval of the plan until interveners have been able to review version 2 of the FCRP. Version 2 of the FCRP is expected to be submitted at the end of March 2021, with the 2020 Annual Report for water licence 2AMLUP2032.

CIRNAC is concerned with LMI's repeated deferral of our requests for information which would allow for the evaluation of the potential effectiveness of their proposed reclamation strategies. The remainder of this letter is separated into two sections, the first regarding information which CIRNAC has been requesting since the water licence renewal process and the second section contains specific replies to each of LMI's responses. Both sections have been developed with the support of Arcadis Canada Inc.

Request or Recommendation by CIRNAC (February 16, 2020):

LMI Response (March 19, 2021):

First, LMI would clarify with CIRNAC, the FCRP was approved by the Minister on approval of the Licence on April 9, 2020. The updated FCRP subject to "review" by the NWB to ensure it is updated to address relevant comments, recommendations provided by intervening parties and the Board during the review process for the Application. Given the licence was issued in February 2020 the updated FCRP for "review" would include comments, recommendations etc. from July 2018 to February 2020 and is not required to include comments/ recommendations following approval of the Licence to confirm compliance with Board direction and the condition of the water licence, Part I, Item 2 which states:

The Licensee shall, within ninety (90) days of approval of the Licence, submit to the Board for review, an updated *Final Closure and Reclamation Plan*, to address relevant comments and recommendations provided by intervening parties and the Board during the review process for the Application.

During the water licence amendment renewal/FCRP application approval process LMI responded to all information requests. LMI and CIRNAC resolved all issues prior to the end of the Public Hearing, with exception of security. LMI and CIRNAC resolved three items by way of an agreement on what additional information they would require and an agreed up statement was provided at the Public Hearing. These three items resulted in Part E, Items 25, 26 and 27 in the approved water licence. CIRNAC also made the

following statement at the public hearing: “At this time, I'd like to state that our presentation had been completed before the latest submissions by Lupin Mines and our discussions with them up until midnight yesterday, so some of the issues we're going to present, they have responded, and we have resolved them. There's only one issue that's not completely resolved.”

Secondly, LMI acknowledges that compliance is also required to other terms and conditions of the licence to address additional specific issues raised during the review process. The Licence is structured in such a way as to capture any updates to approved plans in subsequent Annual Reports as such any issued raised and resolved through acceptance or confirmation from the NWB in 2020 would be addressed in the 2020 annual report due to the NWB on March 31, 2021.

In conclusion, LMI is surprised to hear that CIRNAC’s believes that LMI has not been addressing their comments and LMI respectfully disagrees with this statement. LMI believes that CIRNAC and LMI have worked cooperatively and effectively during the application review process and subsequently following approval of the licence amendment/ renewal. The items CIRNAC is indicating they believe were deferred to be integrated into an updated version of the FCRP were in regards to Terms and Conditions in the water licence which were still being addressed when the updated FCRP was submitted to NWB for review and was not a part of the condition for the updated FCRP under Part I, Item 2.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> “On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board.”
>
> “The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type “A” Water Licence 2AM-LUP2032.”

LMI Response (July 7, 2021):

LMI has submitted an FCRP Rev 2 addendum (Appendix G) including Part E, Item 25, Item 26 and Item 27 with the 2020 Annual Report (Appendix H) which is currently in the review process.

Reference(s): **n/a**

Attachment(s): Appendix F – NWB Letter FCRP Rev 1 Approval; Appendix G – FCRP Rev 2 Addendum; Appendix H – 2020 Annual Report

Interested Party:	CIRNAC	**Technical Comment No:**	1B
Subject/Topic:	New Comment on February 16, 2021		

Reference:

- 2AM-LUP2032 – Part E, Item 25, Item 26 and Item 27

Detailed Review Comment by CIRNAC (February 16, 2021):

Specifics on reclamation methods and designs are necessary to evaluate if they will be adequate for long term physical and chemical stability of the site. CIRNAC has been requesting further details since the water licence renewal process initiated in 2019. As LMI did not provide the information during the renewal process, the renewed licence included three conditions to provide some of the missing information within 60 days of licence issuance. These are Part E, Item 25 for design details of the waste rock dome design, Part E, Item 26 for geotechnical details on TCA Dams K & M, and Part E, Item 27 for preliminary design cover for newly exposed tailings.

The Board provided CIRNAC with the opportunity to review three technical memos submitted by LMI covering these three topics. LMI's response to our comments was that the information requested would be integrated into the FCRP revision. The revision number was not specified, which has led to confusion. Our October 30, 2020 reply to the Board's question on whether these responses satisfactory was that we would review the FCRP, as at the time we believed it integrated the missing information. On November 2, 2020, the Board distributed a letter stating it had reviewed the memos and found: "*the information functional and generally satisfying Part E, Items 25, 26, and 27 of Water Licence 2AM-LUP2032.*"

Though the Board is generally satisfied, CIRNAC is seeking details on how the site will be reclaimed. Below is a summary on the information CIRNAC considers to be missing from what was to be provided under Part E Items 25, 26 and 27 of the water licence. The lists for Items 25 and 27 are a re-iteration of comments submitted on August 25, 2020, as well as comments regarding Item 26.

Request or Recommendation by CIRNAC (February 16, 2021):

I. Information provided for Item 25 "dome design" is insufficient to provide confidence in long term erosion protection and cover stability. Concerns include:
   a. lack of detailed grading information for top of "dome";
   b. lack of design information on storm / freshet flows;
   c. no protection against rill erosion on long 10% slope surfaces;
   d. lack of runoff channels from discharge chutes;
   e. potential for toe erosion from discharge chute runoff flows;
   f. lack of specific notes to address construction constraints that need to be addressed before cover can be placed;
   g. failure to show where materials to be removed prior to cover placement are located; and
   h. failure to show locations of shaft, crown pillar area, that will be buried under the dome.

II. Information provided for Item 26 “additional geotechnical details” includes a series of 15 drawings and our concerns are summarized as:

   a. no detailed information or specifications are provided with respect to the work to be performed on the embankment slopes;

   b. no information is provided with respect to the compacted fill” to be placed on the dams as shown on dam section drawings;

   c. section drawings show no erosion control measures related for the dam slopes and no armouring or rip rap for any dam work;

   d. it is unclear how the embankment fill will be placed in horizontal layers and adequately compacted to ensure long term stability;

   e. there is no information on the closure work on the west end of the M dam as extends beyond the N dam M dam intersection;

   f. f. the is no information on how any potential closure works on the N dam will be carried out if needed or how they will confirm that works are not needed; andg. there is no discussion of logistics of dewatering Pond 2 and impacts on schedule and work if water level is not lowered before work on the dams is scheduled.

III. Information provided for Item 27 “cover design for potential exposed tailings” is still insufficient to allow for general approval of approach. Based on information provided, LMI should be required to submit details on any new exposed tailings encountered (e.g. potential exposed tailings as may be encountered in Pond 2 between the 480 m contour and the toe of the M&N dams) and provide specific information on proposed approach prior to carrying out any work on the tailings. (Note that there is a potential logistical / timing issue with respect to covering future exposed tails after dewatering if dewatering is the last step of the reclamation of the reclamation.)

Further details on these concerns are presented in Annex A. CIRNAC’s general recommendation is for LMI to provide sufficient information to answer these questions in revision 2 of the FCRP.

LMI Response (March 19, 2021):

LMI refers CIRNAC to CIRNAC 1A (above) for LMI’s position and context applicable to issues raised in CIRNAC 1B.

In regards to Part E, Items 25, 26 and 27 and CIRNAC’s understanding that new information was integrated into the updated FCRP, LMI’s responses to CIRNAC did not advise that any new information was included in the updated FCRP during the reviewing process for Part E, Items 25, 26 and 27. Any reference to the FCRP was referring to information already provided in the approved FCRP (dated July 2018). LMI advised as a courtesy in their closing comments that they had submitted the updated FCRP to the NWB (and had been sent out by the NWB for review) specifically stating “as required under Part 1, Item 2 and that it was an update to the Final Closure and Reclamation Plan, to address relevant comments and recommendations provided by intervening parties and the Board during the review process for the Application.” LMI pointed out documents already reviewed by CIRNAC during the application review process and as a courtesy confirmed those documents were included with the updated FCRP as required. LMI committed to providing construction drawings, which is required by the water licence, for review as recommended by CIRNAC that would address their unresolved comments and CIRNAC advised that “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."

LMI considers Part E, Items 25, 26, 27 resolved as per CIRNAC's confirmation on Oct 30, 2020 and the NWB's letter on November 2, 2020. These items will be included in the updated FCRP addendum filed with the Annual Report as per the water licence.

LMI has an approved FCRP and they have fulfilled the required water licence conditions under Part E, Items 25, 26 and 27, so respectfully LMI will not be responding to the items above or presented in Annex A.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

Part E, Item 26 questions above were never submitted during the regulatory review process which was completed to the satisfaction of CIRNAC on October 30, 2020 and the NWB on of November 2, 2020.

CIRNAC submitted these comments during the updated FCRP Rev 1 review process which was to be updated to only include relevant comments and recommendations during the application process not terms and conditions as part of the Type A Water Licence 2AM-LUP0232.

LMI provides the following responses to the comments above:

I. Item 25 "dome design"

See Appendix I – Part E, Item 25 – Design for Waste Rock "Dome" Technical Memorandum and Drawings

a. Grading details for the top of the dome are provided on Dwg. 19136158-0002-CM-0001_Rev 1. The surface has been modelled in ACAD and layout points were provided for construction. As indicated in Note 7, the final elevation of the top surface will be varied to suit the actual volume of waste rock that is imported from elsewhere on the mill site; however, the design slopes of the surfaces will not be changed.

b. The six chutes were hydraulically designed to each accommodate conservative discharge flows in excess of 1 m^3/sec.

c. A berm and swale system will be constructed at the perimeter of the top surface to direct runoff into the six chute structures. This will prevent any runoff from the top surface from "spilling over" and running down over the 10% sideslopes. As a result, runoff from the 10% sideslopes will be limited to that generated from rainfall or meltwater from the slopes themselves. It is noted that the esker material is a well graded material that typically contains about 39% gravel. Should incipient rilling erosion occur on the sideslopes, the esker material will tend to exhibit "self-armouring".

d. The former mine and mill were located at the top of a gentle hill which reflected an underlying bedrock high. The dome is a gently sloped structure centred on the top of the hill. As a result, the discharge from each chute will flow radially away from the dome, mirroring the natural drainage pattern. Note 11 on Dwg. 19136158-0002-CM-0001_Rev 1 directs the Contractor to "construct berms or ditches as necessary to direct flow from drainage chutes away from the toe of dome fill." Such berms or ditches will be field fit to the ground surface that surrounds the dome after the waste rock is removed from the surrounding areas.

e. Each discharge chute will have a stilling basin at the toe to safely dissipate the flow energy. Flow exiting the stilling basins will be low velocity sub-critical flow which will flow over the cleaned natural ground surface, from which any existing waste rock has been removed. The natural ground surface is expected to comprise either bedrock or glacial till.

f. Notes 1 on Dwg. 19136158-0002-CM-0001_Rev 1 indicates that "the subgrade under the dome area is to be prepared in accordance with the water licence and the final closure and reclamation plan (FCRP) before imported waste rock or cover materials are placed." Note 2 indicates that "the following materials shall be removed from the existing subgrade before imported waste rock is placed: petroleum hydrocarbon contaminated soils, arsenic "hot spots", soil or waste rock contaminated with cyanide or lead nitrate and any hazardous waste." Cleanup of these areas is under the supervision of Golder technical staff following a protocol for field and laboratory testing that is documented in a written Soil Quality Assurance / Quality Control Plan (Lupin Mines Incorporated, 2021).

g. The areas where known soil contamination is present are shown on a separate drawing: Dwg. 19136158-0005-CM-0001 Rev. D.

h. The locations of the crown pillar area and shafts has been added to Dwg. 19136158-0002-CM-0001_Rev 1 for information.

II. *Item 26*

See Appendix J – Part E, Item 26 – Technical Memorandum Geotechnical Details on Dam K and Dam M Cross Sections with Specifications and Designs and Appendix J1 – Part E , Item 26 – TCA Closure Designs with Specifications – Signed; Appendix J2 – Part E, Item 26 – TCA Drawing 005 – Outflow RevB - Signed

Technical Memorandum

a. The cover fill material specifications provided in Drawing 001 are intended to be used as general fill for the embankment.

b. Note 7 on Drawing 10 and Note 8 on Drawing 13 specify the compaction requirement for the dam repairs.

c. No erosion control is intended along the dam slopes as surface water flow will be controlled by the surface water management as shown on the drawings. No armoring is required along the dam toes (Dam M, K, and L) as water levels are not projected to reach that high. Any damage to dam toes will be noted and addressed as part of the annual DSI

d. The embankment fill will be placed in lifts in an overbuilt buttress to be reshaped to the final configuration. The compaction in the top portion will be completed in lifts using an excavator as overseen by the engineer's representatives.

e. No M dam works are planned beyond the N dam/M dam intersection.

f. See LMI Response under Section 6.0 – CIRNAC TC NEW 10

g. See LMI Response under Section 6.0 – CIRNAC TC NEW 10

III. Item 27

See Appendix K – Part E, Item 27 – Technical Memorandum on Exposed Tailing Preliminary Cover Design

Part E, Item 27 was completed to the satisfaction of the NWB as of November 2, 2020. LMI committed to provide construction designs under water licence condition Part G, Item 1, if any exposed tailings are encountered, which would include a review process. To date, LMI has not encountered any new exposed tailings.

Reference(s): 2AM-LUP2032- Part E, Item 24, Item 26 and Item 27;

Attachment(s):

Appendix F – NWB FCRP Rev 1 Approval
Appendix I – Part E, Item 25 – Design for Waste Rock "Dome" Technical Memorandum and Drawings;
Appendix J – Part E, Item 26 – Technical Memorandum Geotechnical Details on Dam K and Dam M Cross Sections with Specifications and Designs
Appendix J1 – Part E, Item 26 – TCA Closure Designs with Specifications – Signed;
Appendix J2 – Part E, Item 26 – TCA Drawing 005 – Outflow RevB – Signed; and
Appendix K – Part E, Item 26 – Technical Memorandum on Exposed Tailing Preliminary Cover Design

Interested Party:	CIRNAC	**Technical Comment No:**	1
Subject/Topic:	Integration of Comments Responses to the FCRP		

Reference:

- 2AM-LUP2032 – Part I, Item 2; Part E, Item 25, Item 26 and Item 27

Detailed Review Comment by CIRNAC (November 17, 2020):

The R1 version of the FCRP has had editorial updates made throughout the document. In addition, various sections have been updated to provide comments and specific references and responses to questions from CIRNAC and other parties, as per commitments made to the NWB at the technical meeting and/or the public hearing.

The material R1 additions to the FCRP relate to references made to, and the inclusion of the Technical Memoranda provided by LMI in its various responses and commitments. CIRNAC has reviewed these documents previously and provided comments on them. While in some cases, LMl's responses have addressed CIRNAC's concerns, in other cases additional information was (is required) to address issues raised by CIRNAC with respect to these Technical Memoranda. CIRNAC also notes that the R1 FCRP does not include any references to the NWB Conditions 25, 26, 27 that resulted from the Public Hearing of January 2020 Type A 2AM-LUP2032 issued on 28 February 2020 and approved on 9 April 2020.

Request or Recommendation by CIRNAC (November 17, 2020):

CIRNAC recommends that:

i. LMI create a disposition table listing all issues raised by the lntervenors at the technical and management meetings, along with LMI commitments, responses and technical memos, plus intervenor review comments on LMl's submission and remaining concerns raised by lntervenors with respect to the LMI responses provided to date.

ii. LMI update the R1 FCRP to include information related to Conditions 25, 26, and 27 of the approved Water Licence 2AM-LUP2032.

LMI Response (February 1, 2021):

i. The Type A Water Licence Part I, Item 2 required LMI to incorporate commitment, responses and associated technical memos into an updated FCRP as provided by LMI through submission of FCRP Rev1, submitted on September 28, 2020. Technical Memorandum were submitted to the NWB in compliance with specific terms and conditions (i.e., Part E) are already a part of the NWB registry. LMI would refer CIRNAC to the NWB Reasons for Decision that provides a list of submissions and correspondence in Appendix D.

ii. LMI notes the technical review of information related to Water Licence 2AM-LUP2032 Part E, Item 25, 26 & 27 was only concluded by the NWB on 2 November 2020. LMI will provide an updated Rev2 of the FCRP in the 2020 Annual Report due 31 March 2021.

Detailed Review Comment by CIRNAC (February 16, 2020):

CIRNAC recommended the licensee incorporate to the FCRP I) a disposition table listing issues, commitments, and responses, II) information provided for Part E, Items 25, 26 & 27 of the water licence. LMI commits to the second request for revision 2 of the FCRP. CIRNAC recommends that both a disposition table and information pertaining to licence conditions Part E, Items 25, 26 & 27 be included in revision 2, and that interveners be an opportunity to review revision 2 when it is provided.

Request or Recommendation by CIRNAC (February 16, 2020):

LMI Response (March 19, 2021):

LMI will endeavour, time permitting to include a disposition table listing issues, commitments and responses in the 2020 Annual Report or in any event the 2021 Annual Report.

As required by the Licence, information from Part E, Items 25, 26 and 27 addressed in 2020 will be included as an addendum to the 2020 Annual Report.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

LMI has submitted an updated FCRP Rev 2 addendum (Appendix G) including Part E, Item 25, Item 26 and Item 27 with the Annual Report (Appendix H) which is currently in the review process. LMI has included a disposition table attached under Appendix C (attached) with this document which LMI will request the NWB to include as part of the FCRP Rev 2 addendum.

LMI would like to note that Part E, Item 25, Item 26 and Item 27, referenced by CIRNAC above, was outside of the scope for the updated FCRP Rev 1 review process as these items were not included as part of the application process but conditions issued in the Type 2 Water Licence 2AM-LUP2032.

Reference(s): 2AM-LUP2032- Part E, Item 25, Item 26 and Item 27; FCRP Rev 2 Addendum; FCRP Rev 1

Attachment(s): Appendix C – Table of Regulatory Review – Comments/Responses/Commitments/ Approvals/ Status; Appendix F – NWB Letter – Updated FCRP Rev 1 Approval; Appendix G – FCRP Rev 2 Addendum; Appendix H – 2020 Annual Report

Interested Party:	CIRNAC	**Technical Comment No:**	2
Subject/Topic:	Schedule Updates		

Reference:

- 2AM-LUP2032 – Part I, Item 2, FCRP Rev 1 – Table 14

Detailed Review Comment by CIRNAC (November 17, 2020):

The FCRP Rev 1 (August 2020) includes Table 14 which provides a schedule that was prepared on March 2019. This schedule needs to be updated to remove items that are no longer valid (e.g., includes line items that refer to work to be done under Care and Maintenance) and include all activities agreed to by LMI including such items/activities as follows:

- Construction of water management structures related to "dome";
- Stabilization and erosion protection of tailings dams (M, K, etc.);
- Removal for placement in tailings cells, or cover in place, existing or future exposed tailings (after dewatering); and,
- Construction of water management features (drainage swales and discharge structures) in tailings cells.

In addition to the above, the March 2019 schedule does not reflect the actual works carried out in 2019 or 2020. It would be helpful if LMI can provide a more detailed and updated schedule that includes all actions to be undertaken, links with LMl's RECLAIM estimate and milestones, and illustrates actual verses planned progress as well as any proposed future schedule revisions. This update to the FCRP will provide a better understanding of the state of the closure works and scheduled revisions/adjustments LMI may be proposing going forward.

Request or Recommendation by CIRNAC (November 17, 2020):

CIRNAC recommends that LMI provide a more detailed and updated schedule for the reclamation works consistent with the work completed as reflected in the Security Reduction requests of 2020. The updated schedule should include the original 2019 proposed project schedule timelines as shown in the R1 FCRP, the actual work carried out to the end of 2020, and any proposed revisions to the schedule going forward. The schedule should be updated to include line items for all activities committed to by LMI.

LMI Response (February 1, 2021):

LMI is committed to compliance and submission of the Annual Report on March 31, 2021 to reflect works completed in 2020 and will include in accordance with Schedule B, Item 1, Part m) a summary of any abandonment and reclamation work completed during the year and an outline of any work anticipated for the next year.

Detailed Review Comment by CIRNAC (February 16, 2020): n/a

Request or Recommendation by CIRNAC (February 16, 2020):

CIRNAC recommended the FCRP include a detailed and updated work schedule. LMI is committing to provide this information with the Annual Report. This does not address our concern, as the work schedule included in the current version of the FCRP is inaccurate and out of date. CIRNAC recommends version 2 of the FCRP include an updated and accurate work schedule.

LMI Response (March 19, 2021):

LMI will provide an updated 2021 proposed work schedule in the Annual Report or as soon as finalized for implementation.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

LMI committed to provide an updated schedule, listed as Table 14 – Summary of Measure for Closure in the approved FCRP and approved FCRP Rev 1 (Appendix B, B1, B2, B3 & B4). LMI submitted the updated Table 14 with the updated FCRP Rev 2 addendum (Appendix G) which was filed with the 2020 Annual Report (Appendix H) on June 26, 2021 (extension grant date). Table 14 was also provided to CIRNAC separately on June 15, 2020. LMI provided the Inspector and Manager of Field Operations with an earthworks schedule, which will continue to evolves as is normal with all reclamation programs, to assist with their inspection and engineering consultants site visits.

Reference(s): n/a

Attachment(s): Appendix B – FCRP Rev 1;Appendix B1 – FCRP Rev 1 Appendices; Appendix B2 - FCRP Rev 1 AppH_05 Surface WQ Model; Appendix B3 – FCRP Rev 1 AppH_06 Couple Seepage Thermal Modelling; Appendix B4 – FCRP ReV 1 AppH_08 Conceptual Design of Waste Rock Cover; Appendix F – NWB Letter – Updated FCRP Rev 1 Approval; Appendix H – 2020 Annual Report; Appendix G – FCRP Rev 2 Addendum

Interested Party:	CIRNAC	**Technical Comment No:**	3
Subject/Topic:	Removal of Contaminated Material from Mill Site Area Prior to Consolidated Waste Rock and Construction Dome Cover		

Reference:

- 2AM-LUP2032 – Part I, Item 2; FCRP Rev 1 - Section 4.3.2.3;

Detailed Review Comment by CIRNAC (November 17, 2020):

The R1 FCRP states that approximately 16,000 m3 heavily arsenic impacted soils and 35,200 m3 of PHC impacted soils (S4.3.2.3, p 4-6) exist on site that will require active management and disposal.

On page 4-9 in regard to arsenic impacted soils LMI states; *"The heavily arsenic impacted shallow material will be ex-situ remediated using conventional techniques (i.e., excavators, haul trucks, and dozers) and will be excavated and disposed of within the shafts or open crown pillars for isolation."*

On the same page in regard to the PHC impacted soils LMI states that; *"35,200 m3 of PHC impacted soil has been identified at 13 historical maintenance, fueling, and fuel storage locations across the Site (Golder 2017a). These locations include: the STF and Powerhouse, the Mill and Office Emergency Tanks, the Main Tank Farm Loaders, the Main Tank Farm Bedding Sand, the Emergency Powerhouse, the South Burn Pit, the Landfill, the RTL Shop, the North Burn Pit, the Incinerator, Cold Storage #1, the Former Airstrip Fuelling Area, and the former Ball Field. This material will be ex-situ remediated using conventional techniques (i.e., excavators, haul trucks, and dozers) and disposed of in the shafts or open crown pillars."*

No drawings were provided in the R1 FCRP document identifying the location and extent of the areas with heavily impacted arsenic or PHCs requiring excavation. In the absence of a drawing providing this information it is difficult to confirm that all of these impacted materials have been removed from these locations before consolidating the waste rock at the mill site.

Request or Recommendation by CIRNAC (November 17, 2020):

CIRNAC recommends that LMI provide a detailed site plan that identifies the location and estimated extent of heavily impacted arsenic soils, and PHC impacted soils that are expected to be excavated and placed underground. CIRNAC also requests that LMI clarify how it will confirm that these materials have been removed prior to waste rock regrading and cover placement.

LMI Response (February 1, 2021):

Further to the ESA completed in 2006 and updated in the 2017 Updated Phase 1 & II Environmental Site Assessment completed by Golder, a detailed site plan indicating the locations of heavily impacted arsenic soils and PHC impacted soils that will be excavated and disposed underground is attached (Figure 1). The extents of the excavations will be determined in the field through the completion of field screening and confirmatory soil sampling. LMI will confirm the removal of these materials through the implementation of the

contaminated soils quality assurance / quality control (QA/QC) plan outlined in Appendix C2 of the Post Closure Monitoring Plan due to the NWB on 9 April 2021 in accordance with Part J, Item 13 of the Licence.

Detailed Review Comment by CIRNAC (February 16, 2021):

Request or Recommendation by CIRNAC (February 16, 2021):

CIRNAC requested a detailed site plan with location and estimated extent of arsenic and petroleum hydrocarbon (PHC) impacted soils, as well as information on the method for confirming contaminated materials removal prior to further work. The licensee has provided a figure with test pit locations, indicating which ones have exceedances. This map does not estimate potential extents, does not indicate which exceedances are for arsenic or PHC, and has no indication of potential depth of contamination. Furthermore LMI deferred answering how they will confirm removal of contaminated materials until April 9, 2021, when the Quality Assurance/Quality Control (QA/QC) Plan of the Post Closure Monitoring Plan is to be submitted. To address CIRNAC's concerns, the location and extents of arsenic and PHC impacted soils need to be integrated in the closure plan as they will have to be remediated. We recommend this information be added to version 2 of the FCRP, as well as a method for confirming removal of contaminated materials, since it forms part of the reclamation work and needs to be completed prior to post closure monitoring.

LMI Response (March 19, 2021):

The two ESA's (Morrow, 2006 and Golder, 2017) provide a thorough compilation of all data known on the nature and extent of soil contamination in the mill area. Table 29 in the 2017 Updated Phase 1 & 2 Environmental Site Assessment completed by Golder provides an explicit estimate of the potential volumes, including the exceedances for arsenic and PHC, and indicates the potential areas and depths of contamination for PHCs. Remediation was carried out in 2020 or will be completed in 2021 at each of the exceedance test pits shown on the figure. The final extents and volumes of the excavations will be determined in the field through the completion of field screening and confirmatory soil sampling as per the approved FCRP.

The August 2020 QA/QC Plan, was intended to be filed with the updated FCRP but did not get placed on the NWB ftp site. (We can only assume the email did not go through as there were a large number of documents filed with the updated FCRP.) A copy of the August 2020 QA/QC Plan is attached to this document, and has been resubmitted to the NWB and is currently out for review by interested parties. An updated draft version, dated February 2021, has been provided to CIRNAC, and will be submitted with the PCMP on April 8, 2021.

Attachment(s): • Figure 1 – Locations of Contaminated Soils to be Excavated (19136158-0005-CM-0001-B-SIZE) (with February 1, 2021 responses) and August 2020 QA/QC (with March 17, 2021 response)

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

"On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan

and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."

"The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

The Phase 1 and Phase 2 ESA's (Morrow, 2006) (Appendix O and Appendix O2) and the Updated Phase 1 & II ESA (Golder 2017) (Appendix P) were included as reference documents in the 2018 FCRP and the updated FCRP Rev 1. These documents went through the NWB review process prior to the application process.

LMI submitted 2020 Water Quality Monitoring Plan and Water and Soil Quality Control and Quality Control Plan (Appendix L), as stated above. CIRNAC provided comments on the plan on April 8, 2021 (Appendix M) and LMI provided responses (Appendix N) on June 15, 2021, the review process is still underway. Once the review process is completed LMI will update any relevant plans as part of the Annual Report water licence conditions.

Reference(s): 2018 FCRP, FCRP Rev 1;

Attachment(s): Appendix F – NWB Letter – Updated FCRP Rev 1 Approval; Appendix L – 2020 Water Quality Monitoring Plan and Water and Soil Quality Control and Quality Assurance Plan; Appendix N- LMI PMCP and QA/QC Responses to CIRNAC, ECCC and KIA; Appendix O – Phase 1 Environmental Site Assessment – Morrow 2006; Appendix O2 – Phase 2 Environmental Site Assessment – Morrow 2006; Appendix P – Updated Phase 1 and Phase 2 Environmental Site Assessment – Golder 2017

Interested Party:	CIRNAC	**Technical Comment No:**	4
Subject/Topic:	Crown Pillar Stabilization and Disposal of Materials Underground		

Reference:

- 2AM-LUP2032 – Part I, Item 2, FCRP Rev 1 – Section 4.3.2.4, Figures 6, 13, 14

Detailed Review Comment by CIRNAC (November 17, 2020):

Discussion of closure of the underground and placement of material into the underground is found in the Executive Summary 5a) and Section 4.3.2.4 Underground Workings, and in Figures 6, 13, and 14. Review of these sections notes that on page 4- 14 LMI states the Preferred Reclamation activities will; *"modify the previous plan for the West Zone disposal as shown on Figure 14. The modified plan would address the void areas and increase the storage capacity. Instead of developing additional drop raises in the remaining crown pillar for disposal, the new plan would be to blast down the remaining crown pillar, creating an open slope trench approximately 260 m in length and approximately 72 m deep".*

Consistent with these statements, on page 4-15 Synthesis of Preferred Activities into a Reclamation Plan, LMI states that *"The remaining West Zone crown pillar will be collapsed to provide additional disposal capacity and to prevent future post-closure stability problems. The main haulage shaft, fresh air raise, and the exhaust raise will be completely backfilled to prevent access. Site materials and equipment, waste rock, and hydrocarbon contaminated soils will be disposed of in these areas".*

Upon review of the R1 FCRP Figures 6, 13, and 14, CIRNAC identified the following:

- Figure 6 notes that it provides a Site Plan showing the West Zone and provides some notes on open depths and a "ramp" in the areas referred to as WZ Crown Pillar Pit and WZ Underground Disposal Key Cross Section Locations (5).

Request or Recommendation by CIRNAC (November 17, 2020):

CIRNAC recommends that LMI provide more detailed discussions and plans related to the following:

- How surface openings and the open stope will be filled.
- How long-term subsidence of fill materials will be avoided.
- The information provided to the Mines Inspector with respect to final closure of surface openings.

LMI Response (February 1, 2021):

The updated FCRP Rev1 submitted on September 28, 2020, confirms that the surface openings and the open stope will be completely filled. Waste materials will be dumped beside the openings and then progressively dozed into the openings.

ii) As shown on Figure 10, the entire west zone crown pillar area will fall within the footprint of the waste rock "dome". As shown on Figure 6, the ground surface elevation along the open crown pillar generally varies

between Elev. 502 and 501 m, with lower elevations on the north end. Comparing this to the dome grading plan (TM of June 8, 2020 in response to condition E-25) shows that the total cover over the crown pillar (including the 1 m esker cover) will generally be about 4 m. It is expected that most of the fill subsidence will occur while the dome is being constructed and so it will be accommodated in the final grading. Any longterm subsidence can be corrected by placing additional esker material in the subsidence area to bring it back up to grade. A small volume of esker material will be stockpiled on the dome for this purpose.

iii) The information provided to the Mines Inspector on June 29 was confirmed and provided to the NWB in response to CIRNAC similar question related to the technical review of term and condition Part E, Item 25.

Detailed Review Comment by CIRNAC (February 16, 2021): n/a

Request or Recommendation by CIRNAC (February 16, 2021):

CIRNAC recommended the licensee include a more detailed discussion on how the surface openings and the open stope would be filled, and how long term subsidence of fill material would be avoided. The licensee has responded "*the surface openings and the open stope will be completely filled. Waste materials will be dumped beside the openings and then progressively dozed into the openings.*" As well, they state they expect subsidence to occur during construction, so that it could be accommodated during final grading. This information is not sufficiently detailed to evaluate the likelihood of its effectiveness. For example, does the "progressive dozing into the openings" involve pushing end-dumped material over the opening edge with the bulldozer, or will the fill be placed in lifts, allowing the bulldozer to track over and compact the material? The method used will have an incidence on the likelihood of subsidence. CIRNAC recommends LMI include the information requested in version 2 of the FCRP.

CIRNAC also recommended the documents provided to the Mines Inspector with respect to final closure of the surface openings be shared, as presently we only have a copy of the authorization letter. Documents referred to in the authorization letter which we would like to see are:

- x 2020-06-25 Drilling and Blasting Plan Approval;
- x West Zone Crown Pillar Blast Locations – Plan view; and
- x M8277 Break-Away Drill and Blast – Lupin Mine Closure – West Zone Pilla…[*sic*].

LMI Response (March 19, 2021):

LMI will include the information requested as committed in Part E, Item 25, to provide the addition information with the construction drawings.

Please find attached the requested approved documents by the Mines Inspector.

Attachment(s): • Drill-Blast Execution Plan Crown Pillar Blasting June 2020 ; West Zone Crown Pillar Blast Locations – Plan view; and M8277 Break-Away Drill and Blast – Lupin Mine Closure – West Zone Pillar

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

On March 17, 2021, LMI advised CIRNAC that they will provide information requested as committed under Part E, Item 25 to submit construction drawings for the waste rock "dome" cover. LMI has submitted the construction designs and technical memorandum (Appendix E) to the NWB under Part G, Item 1 and they are currently in a review process. Once the review process is completed LMI will update any relevant plans as per the Annual Report water licence reporting conditions under Schedule B.

LMI provided the requested document approved by the Mines Inspector. CIRNAC advised on October 20, 2020 that they were satisfied LMI's response and documentation.

Reference(s): 2AM-LUP2032 - Part E, Item 25, Part G, Item 1, Schedule B

Attachment(s): Appendix F – NWB Letter – Updated FCRP Rev 1 Approval; Appendix E – Waste Rock "Dome" Cover Construction Designs (Signed) and Technical Memorandum

Interested Party:	CIRNAC	**Technical Comment No:**	5
Subject/Topic:	Long Term Stability of Dome Cover and Erosion Stopes		

Reference:

- 2AM-LUP2032 – Part I, Item 2

Detailed Review Comment by CIRNAC (November 17, 2020):

Since the development of the draft FCRP, CIRNAC has expressed concerns regarding the long-term effectiveness and erosion stability of the proposed dome cover and water management systems. Prior to the Public Hearing of January 2020, LMI replied through a series of discussions and the Technical Memos included in Appendix H-8 (Technical Memorandum in Appendix H-8 regarding Conceptual Design for the Waste Rock "Dome" at Lupin Mine for response to TM/PHC Commitment No.5 (Golder, 2019d).

Pursuant to the Public Hearing, in response to Condition 25 of the Water Licence, Golder provided a Technical Memorandum dated 8 June 2020 that included a brief discussion on the "Dome" Design Objective and two "Not for Construction" drawings; one provided a Plan View drawing of the proposed dome, and the other provided two cross sections through the proposed "dome" along with typical details of the proposed drainage chutes, and the crest perimeter berm.

CIRNAC appreciated LMI's submission of the additional information in the Technical Memorandum and subsequently provided review comments to the NWB for LMI consideration. CIRNAC notes that the 8 June 2020 memo and drawings from LMI were not included in the R1 FCRP document.

Request or Recommendation by CIRNAC (November 17, 2020):

CIRNAC recommends that the R1 FCRP be updated to include:

- The contents of the 8 June 2020 Golder Technical Memorandum responding to Condition 25 requirements.
- CIRNAC concerns on the "dome" design related to long term erosion, as expressed in CIRNAC comments on the Condition 25 Submissions as dated 25 August 2020.
- Any further design details that LMI may have generated since June 2020 with respect to the "dome" design.

LMI Response (February 1, 2021):

LMI notes the technical review of information related to Water Licence 2AM-LUP2032 Part E, Item 25, 26 & 27 was only concluded by the NWB on 2 November 2020 wherein, NWB confirms that it has completed its review of the above mentioned Technical Memorandums and related submissions, and finds the information functional and generally satisfying Part E, Items 25, 26, and 27 of Water Licence 2AM-LUP2032. Refer to document titled 201102 2AM0LUP2032 Part E, Item 25, 26, 27-ODDE.pdf at:

ftp://ftp.nwboen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AMLUP2032%20LMI/3%20TECH/E%20WASTE%20DISP/

LMI will provide an updated Rev2 of the FCRP in the 2020 Annual Report due 31 March 2021. The updated FCRP Rev1 was submitted to the NWB on September 28, 2020.

Detailed Review Comment by CIRNAC (February 16, 2021): n/a

Request or Recommendation by CIRNAC (February 16, 2021):

CIRNAC recommended information LMI submitted in a technical memo on June 8, 2020 regarding conceptual design for the waste rock "dome" be integrated into the FCRP. Furthermore CIRNAC requested that our concerns raised on August 25, 2020 be addressed and any further details or modifications for these reclamation works developed since June 2020 be provided. LMI has committed to doing so in revision 2 of the FCRP, which CIRNAC will review once received.

LMI Response (March 19, 2021):

LMI considers this item resolved.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

LMI included the June 8, 2020 technical memo as part of the updated FCRP Rev 2 addendum filed with the NWB and is currently under review. LMI did not commit to include additional information not included and satisfied by the NWB under the Part E, Item 25 review process. LMI commitment to provide the construction drawings and technical memorandum (Appendix E) to the NWB for the "dome" to address CIRNAC comments have been submitted to the NWB and are currently under a review process. Once the NWB advised LMI has satisfied Part G, Item 1, LMI will be able to incorporate the construction designs and technical memorandum into a future updated FCRP addendum but is not included in the updated FCRP Rev 2 addendum (Appendix G).

LMI would like to note that Part E, Item 25 was outside of the scope for the updated FCRP Rev 1 review process as these items were not included as part of the application process.

Reference(s): FCRP Rev 2 Addendum; 2AM-LUP2032 - Part E, Item 25 and Part G, Item 1

Attachment(s): Appendix F – NWB Letter – Updated FCRP Rev 1 Approval; Appendix E – Waste Rock "Dome" Cover Construction Designs (Signed) and Technical Memorandum; Appendix G – FCRP Rev 2 Addendum

Interested Party:	CIRNAC	**Technical Comment No:**	6
Subject/Topic:	TCA - Embankment Stabilization and Erosion		

Reference:

- 2AM-LUP2032 – Part I, Item 2; Part E, Item 26

Detailed Review Comment by CIRNAC (November 17, 2020):

Condition 26 is a Licence condition generated with respect to addressing the concerns expressed and the request for additional information by Intervenors to clarify the nature and extent of long term stabilization and closure works at the TCA, and in particular as related to K and M dam repairs and long term stability and erosion control.

By way of a Technical Memorandum from Stantec dated 8 June 2020, LMI provided a substantial information package that included design notes, specifications, and a series of drawings (plans, sections, profiles, and details) related to the proposed closure works for the TCA area. Specifically, the package included 15 drawings: 1 Design Specification drawing, 4 Cell 5 drawings; 4 Cell 3 drawings; 3M Dam drawings; and 3 K Dam drawings.

CIRNAC notes that the 8 June 2020 memo and drawings were not included in the R1 FCRP document.

Request or Recommendation by CIRNAC (November 17, 2020):

CIRNAC recommends that the R1 FCRP be updated to include:

- The contents of the 8 June 2020 Stantec Technical Memorandum responding to Condition 26 requirements.
- Any further revisions or details that LMI may have generated since June 2020 with respect to the closure works at the TCA.

LMI Response (February 1, 2021):

LMI notes the technical review of information related to Water Licence 2AM-LUP2032 Part E, Item 25, 26 & 27 was only concluded by the NWB on 2 November 2020. LMI will provide an updated Rev2 of the FCRP in the 2020 Annual Report due 31 March 2021. The updated FCRP Rev1 was submitted to the NWB on September 28, 2020.

Detailed Review Comment by CIRNAC (February 16, 2021): n/a

Request or Recommendation by CIRNAC (February 16, 2021):

CIRNAC recommended the design notes, specifications and drawings for long term stabilization and closure work at the tailings containment area including Dams K & M provided in a June 8, 2020 technical memo for Part E, Item 26 of the licence, be incorporated into the FCRP. Additionally CIRNAC requested any further

details or modifications for these reclamation works developed since June 2020. LMI has committed to doing so in revision 2 of the FCRP, which CIRNAC will review once received.

LMI Response (March 19, 2021):

LMI considers this item resolved.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

LMI's June 8, 2020 design notes, specification and drawings were included with the updated FCRP Rev 2 addendum filed with NWB and is currently in the review process. There are no further revisions or details generated since June 2020 with respect to the closure works at the TCA.

The details for Dam M and Dan K are provided, as intended for construction, in the submission(s) of the drawings. The specifications and intentions therein are communicated to and understood by the contractor, and they will be quality-controlled and assured by the engineer's representatives.

LMI would like to note that Part E, Item 26 was outside of the scope for the updated FCRP Rev 1 review process as these items were not included as part of the application process but LMI did respond to CIRNAC.

Reference(s): 2AM-LUP2032 – Part E, Item 26;

Attachment(s): n/a

Interested Party:	CIRNAC	**Technical Comment No:**	7
Subject/Topic:	TCA - N Dam and Potentially Exposed Tailings		

Reference:

- 2AM-LUP2032 – Part I, Item 2

Detailed Review Comment by CIRNAC (November 17, 2020):

Figure 11 of the R1 FCRP shows that a tailings cover is to be placed in the area contained by the N Dam. No other reference is made to work at the N Dam or covering of the N Dam tailings in the R1 FCRP document.

Appendix H-03 TCA Dam Stability Review Rev 0 dated 14 November 2020, includes modeled cross sections of the N Dam (Fig 30, 31, and 32) as part of the geotechnical stability analysis. Given that the downstream embankment of the N Dam was mostly underwater in 2019 it is unclear how the profile was generated.

LMI's provision of additional TCA details in the 8 June 2020 Stantec Technical Memorandum and drawing package addresses the N Dam tailings cover in Drawing 002 Cell 5 Closure, Plan View - in which Note 3 states that topographic and bathymetric surveys were not available due to ponded water, that dewatering is required before cover placement, and that the contractor is to adjust cover placement to ensure a 1 m cover thickness. The drawings do not clearly indicate water flow management in this area, e.g., will there be an outlet from this area, and if so where and how it will be constructed.

Request or Recommendation by CIRNAC (November 17, 2020):

CIRNAC recommends that LMI provide additional information with respect to the contour information used in the N Dam Safety analysis as well as on the final contour elevations and associated water management for the N Dam containment area.

LMI Response (February 1, 2021):

Dam N profiles were generated using the bathymetric survey information as outlined in the FCRP Technical Memorandum: 2AM-LUP2032 related Technical Meeting Commitment No.6 Response – Geotechnical Review on the long-term stability of the TCA Dams (Refer to Updated FCRP, Appendix H_03). Based on currently available information, Cell N cover will be shaped to shed water and does not require an outlet.

Detailed Review Comment by CIRNAC (February 16, 2021): n/a

Request or Recommendation by CIRNAC (February 16, 2021):

CIRNAC requested the contour information used in the N Dam Safety analysis and the final contour elevations and associated water management for the N Dam containment area be shared. The licensee indicated which contour information they used to generate N Dam profiles, and indicated "*Cell N cover will*

be shaped to shed water and does not require an outlet." Plans for the shape of the Cell N cover are not in the FCRP, and CIRNAC recommends they be included for future review.

LMI Response (March 19, 2021):

Cell N is included in the approved TCA Closure Plan, and will be covered as per the approved TCA Closure Plan with minimum 1 m of esker and sloped for passive drainage. LMI will provide the contour information in the updated FCRP addendum being submitted with the Annual Report on March 31, 2021.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

The contour of Cell N and intended cover was filed with the NWB as part of the FCRP Rev 2 addendum currently under the NWB review process.

LMI would like to note that this item was outside of the scope for the updated FCRP Rev 1 review process as this item was not updated in the FCRP Rev 1 to address relevant comments and recommendations by interveners and the NWB during the application process but LMI did respond to CIRNAC.

Reference(s): FCRP Rev 1; FCRP Rev 2 addendum

Attachment(s): Appendix G – FCRP Rev 2 Addendum

Interested Party:	CIRNAC	**Technical Comment No:**	8
Subject/Topic:	Financial Security – Section 7		

Reference:

- 2AM-LUP2032 – Part I, Item 2, Section 7

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Detailed Review Comment by CIRNAC (November 17, 2020):

In regard to Financial Security, Section 7 has been significantly altered to remove discussion of fonner liability estimate and other related information. The R1 FCRP makes reference to LMl's January 2020 RECLAIM estimate of $23,463,049; the release framework and milestones; states that $6,549,072 was released to LMI in April 2020, and that the new letter of credit approved 9 June 2020 is in the amount of $19,558,231. CIRNAC appreciates inclusion of this current detail, and observed no discussion on the difference in security held and LMl's RECLAIM estimate value less the released amount ($2,644,254). This may lead to confusion when parties review the RECLAIM model to evaluate reduction of security and the amount of security still being held.

Request or Recommendation by CIRNAC (November 17, 2020):

CIRNAC recommends that LMI provide a brief discussion on the difference in security held and LMl's RECLAIM estimate value less the released amount.

LMI Response (February 1, 2021):

In January of 2020, the security for 2AM-LUP1520 was $26,107,303. LMI's revised RECLAIM estimate submitted in January 2020 was in the amount of $23,463,049. The NWB decision when approving the renewed/FRCP water licence 2AM-LUP2032 was to keep the security the same, being $26,107,303. In April of 2020 LMI obtained a release in the amount of $6,549,072 leaving the total security at $19,558,231. In October of 2020 LMI obtaining another release in the amount of $4,984,477 leaving the total security of January 2021 at $14,573.754.

Detailed Review Comment by CIRNAC (February 16, 2021): n/a

Request or Recommendation by CIRNAC (February 16, 2021):

CIRNAC requested the licensee provide a discussion on the security estimate values. LMI has provided the requested information in their reply and CIRNAC recommends they incorporate these up to date figures in their FCRP.

LMI Response (March 19, 2021):

LMI will incorporate these figures in the updated FCRP addendum.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
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> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

LMI updated the financial section in the updated FCRP Rev 2 addendum (Appendix G) which includes an updated security estimate (Appendix G) to reflect the security reductions received from CIRNAC in 2020, filed with the NWB as part of the 2020 Annual Report which is currently in a review process.

Reference(s): FCRP Rev 2 addendum; 2020 Annual Report

Attachment(s): Appendix F – NWB Letter – Updated FCRP Rev 1 Approval; Appendix G – FCRP Rev 2 Addendum

Interested Party:	CIRNAC	**Technical Comment No:**	New 9
Subject/Topic:	Part I, Item 2 – Part E, Item 25 - Annex A		

Reference:

- 2AM-LUP2032 – Part E, Item 25; CIRNAC letter to the NWB during the review process of the updated FCRP Rev 1 dated February 16, 2021 – Annex A

Detailed Review Comment by CIRNAC (February 16, 2021):

a. Our 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. Other than indicating that a berm will be constructed on the top edge of the dome to direct "dome surface" runoff to drainage chutes, no erosion control measures are included for ensure erosion protection and stability of these long 10% esker slopes. 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, we question the long term stability of the berm design as presented.

   No information is provided to support the designs of the top perimeter berm, the chutes, or the stilling basins. No drainage elevations are 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 are 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 this information we do not have confidence that the design as shown will be stable in the long term. The proposed designs as shown reinforce our concerns that the 10% slopes will at a minimum be subject to long term rill erosion even if the upper berm controls runoff to the discharge chutes. We are concerned about the long term performance integrity of the up diversion berm if constructed as shown with esker material. We note that any failure along of the top berm would result in additional erosive forces on the 10% slopes. We are concerned that no toe stabilization / armouring measures are included to protect the toe of the 10% slope. Provide information listed in this paragraph to demonstrate how the long-term erosion stability of the designs is being ensured.

b. In reviewing the typical drainage chute details, it appears to us that they are inconsistent as the 0.5 m depth of the drainage chute as shown in cross section is shown as 0.5 m berm on the top of the chute drainage profile detail and the perimeter berm is not shown on this detail. A plan view detail of the top and bottom of the drainage chutes should be provided.

c. The notes on the site plan included:

- 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”.

The intent of this statement is correct, but it is not clear to us how LMI will ensure compliance with this note is achieved if it these requirements are not specifically stated on the drawings. Ensure all relevant requirements are specifically referenced.

d. - 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. Include location of materials to be removed before waste rock placement.

e. Drawing Note 4 states that crown pillar and openings and mine shafts are to be filled before waste rock is placed on top.

Provide plans shared with Inspector of Mines to obtain approvals.

f. Moreover, in addition to our specific concerns with the “dome” design concepts, we are also generally concerned that the remedial requirements that need to be undertaken are not specifically identified or referenced on the plan provided. We are concerned for example that in the absence of specific information on where contaminated soils to be removed are located, that confirmation that these soils have been remove may be not be considered prior to reworking of the waste rock and placement of the esker cover. Provide specific cross reference to these works to ensure that they are identified in the FCRP and noted as appropriate.

Request or Recommendation by CIRNAC (February 16, 2021):

LMI Response March 19, 2021:

See LMI responses to the NWB in regards to Annex A comments under CIRNAC TC 1A and CIRNAC TC 1B above.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

“On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board.”

“The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type “A” Water Licence 2AM-LUP2032.”

LMI Response (June 25, 2021):

LMI filed the final signed, stamped Dome Cover TM and IFC Designs, including a technical memorandum to satisfy Part G, Item 1 of their water licence and to address LMI's commitments to CIRNAC under Part E, Item 25. The designs and technical memorandum are currently under a review process with the NWB. The following responses are the same as the technical memorandum under review which addresses CIRNAC's comments from above. (see Appendix E)

a. The perimeter berm alignment has been designed to provide a gentle positive gradient towards the entrances to each of the chutes. This will prevent a buildup of deep water against the inside of the perimeter berm. Given the gentle gradient, the flow velocities along the swale towards the entrances to the chutes will be low, and as discussed above the esker material is expected to self-armour. In any case the presence of erosion protection at the entrance to the chutes will prevent erosion from cutting down below the grade of the sills at the top of the chutes.

   As discussed above, the discharge from each stilling basin will generally flow radially away from the dome, mirroring the natural drainage pattern. Note 11 on Dwg. 19136158-0002-CM-0001_Rev 1 directs the Contractor to "construct berms or ditches as necessary to direct flow from drainage chutes away from the toe of dome fill." Such berms or ditches will be field fit to the actual ground surface that remains after the waste rock is removed from the areas surrounding the dome.

b. This has been clarified on Dwg. 19136158-0002-CM-0002_Rev 1, which also includes a section detailing the erosion protection at the entrance to each chute.

c. As discussed above, the cleanup of these areas will be under the supervision of Golder technical staff following a field and laboratory testing protocol that is documented in a written Soil Quality Assurance / Quality Control Plan (Lupin Mines Incorporated, 2021).

d. As discussed above, the areas where known soil contamination is present are shown on a separate drawing: Dwg. 19136158-0005-CM-0001 Rev. D.

e. LMI provided the plans and approvals for the crown pillar with their responses to the NWB under Part E, Item 25 review process on October 20, 2020, and their responses to the NWB for the updated FCRP Rev 1 review process on March 19, 2021. CIRNAC advised they were satisfied on October 30, 2020, and the NWB approved the updated FCRP Rev 1 on March 26, 2021.

f. A copy of Dwg. 19136158-0005-CM-0001 Rev. D is attached. This shows the locations of all test pits where exceedances were identified in the two environmental site assessments (Morrow, 2006 and Golder, 2017). A copy of the August 2020 QA/QC Plan was provided to CIRNAC with LMI's technical responses to the updated FCRP on March 19, 2021. CIRNAC provided comments on the August 2020 QA/QC Plan to the NWB on April 8, 2021, and LMI responded to CIRNAC's comments on June 15, 2021. Furthermore, the QA/QC Plan (Lupin Mines Incorporated, 2021) was attached as Appendix C to the PCMP, which was submitted on April 8, 2021.

LMI would like to note that this item was outside of the scope for the updated FCRP Rev 1 review process as these items were not included as part of the application process but LMI did respond to CIRNAC.

Reference(s): n/a

Attachment(s): Appendix E – Waste Rock "Dome" Cover Construction Designs (Signed) and Technical Memorandum

Interested Party:	CIRNAC	**Technical Comment No:**	New 10
Subject/Topic:	Part I, Item 2 – Part E, Item 26 - Annex A		

Reference:

- 2AM-LUP2032 – Part E, Item 26; CIRNAC letter to the NWB during the review process of the updated FCRP Rev 1 dated February 16, 2021 – Annex A

Detailed Review Comment by CIRNAC (February 16, 2021):

Comments on Item 26 – Geotechnical details on TCA Dams M & K CIRNAC's comments are arranged by drawing.

Request or Recommendation by CIRNAC (February 16, 2021):

Specifications

Drawing 001 – Information is missing with respect to embankment stabilization as follows:

1. Table 1 is labelled "Foundation Preparation Specification"; Table 2 is labelled "Fill Placement Specifications" - Provide a table with specifications for "Tailings Dam Embankment Repair/Stabilization"
2. Table 1 has specifications under the headings of "General, Cover Foundation Preparation, and Dam Outfall Channel Area Foundation" - Include a section dealing with embankment placement and stabilization.
3. Table 2 has "fill specifications" for "cover" - Include specification for embankment placement and stabilization - Table 2 lists "fill types" as "cover fill, riprap, and geotextile filter fabric" - Include reference to "compacted fill" type material as shown in sections for M and K dams (drawings 11,12,14, and 15)

Cell 5

4. Dwg 002 –Plan View Plan does not indicate any flows from area between N & M dams. It is also unclear how surface water in the area between N &M dams will flow into the drainage channel. How will flows from area between N & M dams be treated, how will they flow into the drainage channel? In addition, the current design of the downstream side of the N Dam does not appear consistent with industry practice for long-term structures, how will long-term stability of this structure be ensured?
5. Dwg 003 –Profile Stations 510 to 880 shows 30m base width drainage channel flowing to east at 0% slope. Stations 120 to 400 are also shown as sloping at 0% to the outlet at J dam. How will flows be ensured at these locations?
6. What is the material above the Tailings Upper Limit comprised? If it is tailings it will need to be regraded such that the 1m profile is maintained above tailings or the cover needs to be raised and drainage paths modified accordingly.

7. Given the length of the profile it may be appropriate to have a series of check dams along the profile to slow water down during significant rain fall events. What is being done to ensure integrity during higher flow periods?

8. Dwg 004 - Cell 5 Cross Section We have difficulty in understanding these sections (i.e. the difference between the assumed tailings upper limit and the bottom of the esker fill cover.) Provide a discussion on how the slopes on the tailings cover will be adjusted once the elevation of the tailings is confirmed.

9. Also from the results of recent investigation work by LMI's consultant they have confirmed that the 1 m minimum cover has not been maintained in numerous locations across both Cell 5 and 3. How will the stability of the cover be maintained if wind erosion is the primary cause of the material losses assuming the original placement was at least 1m thick? Even with the relatively flat side slopes the nature of the esker material on side will likely experience erosion which would subsequently impact the performance of the channel. Vegetation would normally be used to stabilize the side slope but as we know this approach will not work at Lupin given the lack of vegetation observed to date on the TCA sections capped decades ago.

10. Dwg 005 - Outflow Channel The detail should show where the spillway ends in relation to final post water elevation. The spillway should be terminated before the elevation of the final post water elevation and it should be confirmed that there are no obstructions at the end of the spillway as a result of the ground elevations at that location (ie the ponding of water at the outflow of the channel should be avoided). Include information on final post water elevation.

11. How was the Freshet runoff dealt with in the calculation of the 100 year storm event? If the two happen concurrently, there is the potential the existing design will not accommodate the increased flow.

<u>Cell 3</u>

12. Dwg 006 –Plan View Detail the entire drainage channel (existing and new) to illustrate the watershed that could be reporting to the drainage channel. Provide design information as to how the size of the channel was derived, to help determine if the channel is appropriately sized.

13. How was the Freshet runoff dealt with in the calculation of the 100 year storm event? If the two happen concurrently, there is the potential the existing design will not accommodate the increased flow.

14. Dwg 007 –Profile Slope identifiers are missing from the profiles. Provide information to allow us to identify whether or not dead zones would exist along the profile.

15. Given the length of the profile it may be appropriate to have a series of check dams along the profile to slow water down during significant rain fall events. What is being done to ensure integrity during higher flow periods?

16. Dwg 008 - Cell 3 Cross Section Esker material on the side slopes of the drainage ditch will experience erosion if placed at a 40% slope which would subsequently impact the performance of the drainage channel. Vegetation would normally be used to stabilize the side slope but as we know this approach will not work at Lupin given the lack of vegetation observed to date on the TCA sections capped decades ago. How will erosion of the esker material be prevented?

17. The drawing notes specify that 1m minimum cover will maintained over the tailings, but it is not clearly shown that the 1m cover will be maintained over the invert of the drainage ditch. What is the depth of cover over the invert of the drainage ditch?

18. Dwg 009 - Outflow Channel We have no concerns with design provided the design event used to complete the design is reasonable and accounts for the Freshet. Has the 100 year event been added to the typical freshet run off?

M Dam

19. Dwg 010 –Plan View We have several concerns related to this drawing:

    1) Given the sequencing of the reclamation works as currently understood, it is unclear if the water level in Pond 2 will be lowered to below the toe of the M Dam prior to the initiation of the M Dam rehabilitation works. Clarify when Pond 2 water level will be lowered in relation to M Dam rehabilitation.

    2) No specific notes have been added to the drawing explicitly instructing the contractor to remove unstable soil from within the rehabilitation work area after the water level has been lowered. To avoid confusion or misinterpretation of the engineer's design intent, add explicit notes on this drawing confirming how the dam rehabilitation work is to proceed to ensure soft and/or saturated soils/tailings are removed from the work area.

20. If the rehabilitation work is to be completed prior to the breach of the outfall dam to Pond 2, then there is the potential for water levels to be as high as they were observed in 2019 or at a level coincident with the elevation of the dam toe. As such there is the potential for wave action to undermine the toe of the M Dam, similar to what was observed at the K Dam. In order to mitigate this potential issue, consideration should be given to the placement of riprap armouring along the toe of the dam within the wave action zone thereby ensuring the long-term stability of the dam toe. How will the toe of M Dam be protected from potential wave action?

21. Furthermore, if esker material is to be used to rehabilitate the dam slopes instead of the rip rap as originally stated in the ICRP and as per the Kinross documents supporting the 2005 approval of TCA closure, then the final long-term slope for the downstream side of the M Dam should be designed in a manner consistent with industry practice for earth structures. Any surface water flow down the face of the slope would be retarded by the installation of a transect drainage swale or channel so as to minimize the potential for surface erosion. Again, in the absence of potential vegetation cover, other erosion control measures are required to ensure the long term stability of the dam structure particularly with the steepness of the downstream slope proposed in the current design. How will dam slopes be protected from erosion given that industry practise is not being followed?

22. Dwg 011 – Sections 1 Same comment as for Dwg 010 regarding protection of downstream slope from erosion.

23. Dwg 012 – Sections 2 Same comment as for Dwg 010 regarding protection of downstream slope from erosion.

K Dam

24. Dwg 013 –Plan View Same comment as discussed for the M Dam apply to the rehabilitation of the K Dam where there is current evidence of material erosion along the dam.

25. Dwg 014 – Sections 1 Same comment as for M Dam Dwg 010 regarding protection of downstream slope from erosion.

26. Furthermore, consideration should be given to stepping out or buttressing the downstream slope when the height of the rehabilitation work exceeds 5 m in the vertical dimension. This additional structure should be contoured so as to provide transect drainage across the face of the rehabilitated area thereby minimizing the potential for esker material erosion. In the absence of any potential to vegetate the downstream slope other erosion control measures are necessary to ensure the long-term stability of the slope.

27. Dwg 015 – Sections 2 Same comment as for M Dam Dwg 010 regarding protection of downstream slope from erosion.

LMI Response March 19, 2021:

See LMI responses to the NWB in regards to Annex A comments under CIRNAC TC 1A and CIRNAC TC 1B above.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

On February 16, 2021, CIRNAC requested new information under Part E, Item 26 which CIRNAC had not previously shared with LMI or the NWB, of which CIRNAC and the NWB advised this condition was satisfied in October and November of 2020, respectively. CIRNAC requested that LMI respond to these additional information requests in an updated FCRP Rev 2. FCRP Rev 2 addendum included Part E, Item as satisfied by the NWB. LMI commitments during the review process have all been fulfilled and are currently under a review process with the exception of Part E, Item 26 (Appendix J, Appendix J1 and Appendix J2) as CIRNAC did not provide any comments during the review process. However, LMI provides the following responses to the comments above:

1. The specifications for the dam repair are provided in the notes on the appropriate dam repair drawings (Drawing 10-15).

2. The foundation preparation for Dam K and Dam M repair is intended to be carried out following the same specifications outlined in General, Cover Foundation and Outfall Channel.
3. The cover fill is intended to be used as fill for Dam M and Dam K repair as there is only one esker source on site.
4. The area between N & M dams (Cell N) will be covered with esker sand and graded similar to the other TCA cells (Cell N figure attached). N Dam has been evaluated and does not pose any stability risks.
5. Although the slope in certain areas is 0%, higher hydraulic heads from the upstream side will drive flows in the appropriate direction. There are no areas with negative grade that would induce ponding.
6. It is assumed that the material above the Tailings Upper Limit is comprised of esker sand.
7. Given the previously indicated low grade (0%), check dams are not considered necessary to ensure integrity during higher flow periods.
8. It was assumed (and confirmed through test pitting) that Cell 5 and Cell 3 have appropriate esker cover thickness in all areas.
9. It was assumed (and confirmed through test pitting) that Cell 5 and Cell 3 have appropriate esker cover thickness in all areas. There have been no material losses (wind erosion or otherwise) indicated by the test pitting.
10. See attached Cell N figure. No obstructions are anticipated at the end of the outflow channel based on the bathymetric survey
11. A concurrent 100-year storm event and freshet were not accounted for in the design.
12. Dwg 006 is a design drawing, which do not include watersheds. The size of the channel was derived using the same methodology as the other water management features in the closure plan.
13. A concurrent 100-year storm event and freshet were not accounted for in the design.
14. The final slope will be field-fitted due to the limitations stated in Note 3. The intention therein is to ensure the minimum 1m cover thickness over tailings and ensure that general positive drainage is in place to limit ponding.
15. It is considered that check dams would introduce additional erosional concerns and there is no need for further modifications to the design to ensure integrity.
16. Surface water management features will be constructed to minimize the impact of erosion from upgradient drainage. Erosion caused by rainfall directly on the drainage ditch side slopes is considered minimal over the length of the slope (<1 m) and further stabilization is not required. This consideration is consistent with industry practice in the North.
17. The depth of cover over the invert of the drainage ditch will be 1 m.
18. A concurrent 100-year storm event and freshet were not accounted for in the design.
19. The water level in Pond 2 will be lowered to the toe of M Dam prior to the initiation of any rehabilitation works.

The foundation will be free of deteriorative material, to be inspected and approved by the engineer's representatives as specified in Table 1 of Drawing 001.

20. Preliminary freshet simulations indicate that water levels in the TCA will not reach the toes of Dam M or Dam K during the two-year observation period. Any damage to Dam M or Dam K will be noted and addressed as part of the annual DSI. Surface water management features will be constructed to minimize the impact of erosion from upgradient drainage. Erosion caused by rainfall directly on the dam slope is considered minimal over the length of the slope (<10 m) and further stabilization is not required. This consideration is consistent with industry practice in the North.

21. Surface water management features will be constructed to minimize the impact of erosion from upgradient drainage. Erosion caused by rainfall directly on the dam slope is considered minimal over the length of the slope (<10 m) and further stabilization is not required. This consideration is consistent with industry practice in the North.

22-27 See answer 21

LMI would like to note that Part E, Item 26 was outside of the scope for the updated FCRP Rev 1 review process as these items were not included as part of the application process. LMI noted this to the NWB in their final submission to the NWB on March 19, 2021 as per CIRNAC TC 1A and CIRNAC TC 1B above.

Reference(s): 2AM-LUP2032 – Part E, Item 26; FCRP Rev 1;

Attachment(s): Appendix F – NWB Letter – Updated FCRP Rev 1 Approval; Appendix J – Part E, Item 26 – Technical Memorandum Geotechnical Details on Dam K and Dam M Cross Sections with Specifications and Designs; Appendix J1 – Part E , Item 26 – TCA Closure Designs with Specifications – Signed; Appendix J2 – Part E, Item 26 – TCA Drawing 005 – Outflow RevB - Signed

Interested Party:	CIRNAC	**Technical Comment No:**	New 11
Subject/Topic:	Part I, Item 2 – Part E, Item 27 - Annex A		

Reference:

- 2AM-LUP2032 – Part E, Item 27; CIRNAC letter to the NWB during the review process of the updated FCRP Rev 1 dated February 16, 2021 – Annex A

Detailed Review Comment by CIRNAC (February 16, 2021):

Comments on Item 27 - Preliminary cover design for newly exposed tailings

In general, we have no issues with the rational and design approach for the Cell 4 exposed tailings 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. For example,

- Would esker materials be placed directly over the tailings or would a geotextile filter clothe be placed prior to placing esker materials over the tailings?
- Would the perimeters of the cover material 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." How will necessary site specific design(s) for any such tailings area cover(s) be provided for review before any exposed tailings are covered?

In Stantec's Closure section, they state that "… cover on any potentially exposed tailings within the dewatered former pond areas will be the most prudent measure to mitigate ARD risks". CIRNAC, as stated in the past, disagrees with the above statement. We note that the FCRP stated that any exposed tailings would either be covered in place or removed to the containment cells and covered. In our opinion, relocation and consolidation of any exposed tailings outside of the existing tailings cells into the existing cells is the most appropriate action which would also provide the most robust long term stability of the site and tailings areas. Our comment in this regard is also applicable to the existing Cell 4 exposed tailings, which we would have preferred that LMI relocate to Cell 5. How does LMI reconcile the FCRP and the closure section of the submitted document.

Request or Recommendation by CIRNAC (February 16, 2021): n/a

LMI Response March 19, 2021:

See LMI responses to the NWB in regards to Annex A comments under CIRNAC TC 1A and CIRNAC TC 1B above.

NWB RESPONSE (March 26, 2021):

(see Appendix F for the entire NWB letter)

> "On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board."
>
> "The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032."

LMI Response (July 7, 2021):

Any unknown exposed tailings will be covered using the same rational and design approach as the exposed tailings in Cell 4.

When the TCA reaches closure elevations, which should be accomplished in July/August 2021, a visual observation of the newly-exposed shoreline will be conducted to identify any unknown exposed tailings. If cover is required, any new construction design will be submitted to the NWB for approval under water licence condition Part G, Item 1.

It is considered that the relocation of slurried tailings in an environment such as Lupin has the potential to cause a larger environmental impact than covering tailings in place.

LMI would like to note that Part E, Item 27 (Appendix K) was outside of the scope for the updated FCRP Rev 1 review process as these items were not included as part of the application process. LMI noted this to the NWB in their final submission to the NWB on March 19, 2021 as per CIRNAC TC 1A and CIRNAC TC 1B above.

Reference(s): 2AM-LUP2032 – Part E, Item 27;

Attachment(s): Appendix F – NWB Letter – Updated FCRP Rev 1 Approval; Appendix K – Part E, Item 27 – Technical Memorandum on Exposed Tailing Preliminary Cover Design

8.0 PART J, ITEM 13 - PCMP REGULATORY REVIEW

On February 26, 2021, LMI and their consultants reached out to CIRNAC, Environment and Climate Change Canada (ECCC) and the Kitikmeot Inuit Association (KIA) to participate in a consultation process (see below) prior to submitting the draft Post Closure Monitoring Plan (PCMP) to the NWB on April 9, 2021. The PCMP (Appendix Q) was emailed to the interested parties later that same day.

The timeline for consultation, receipt of comments, and PCMP submissions was as follows:

- **9 March:** Conference call 2-4 pm ET
- **9 March :** Comments received from interested parties
- **16 March:** Feedback and comments incorporated and revised plan circulated for comment
- **25 March:** Second consultation session if needed to resolve final comments
- **9 April:** Submission of the PCMP to the Nunavut Water Board

The first consultation call/presentation, via Teams, was held on March 9, 2021 with CIRNAC, ECCC, the KIA and SteveJan Consultants Inc (SJCJ) on behalf of the KIA. CIRNAC did not provide any comments on this draft version of the PCMP.

On March 16, 2021, LMI emailed CIRNAC a draft PCMP, incorporating the relevant comments from the KIA/SJCJ, 2019 Annual Report, Water Quality Monitoring and QA/QC Plan August 2020, KIA/SJCJ Comments dated March 9, 2021 and LMI Response to KIA/SJCJ comments.

A second call was held on March 25, 2021 with CIRNAC, ECCC, the KIA/SJCJ. CIRNAC provided LMI with their written comments on the same date prior to the call, ECCC provided one verbal comment during the call and KIA/SJCJ provided their written comments after the call on March 26, 2021.

LMI did not provide a written response to the comments received on March 25/26, 2021 as all concerns were discussed during the call and relevant comments were incorporated into the draft PCMP prior to submission to the NWB for review and comment.

LMI submitted the PCMP to the NWB on April 9, 2021. The NWB sent out the PCMP to interested parties on April 21, 2021 to provide comments by May 26, 2021.

CIRNAC submitted two comments documents to the NWB and LMI submitted two response documents to address CIRNAC's comments to the NWB.

See below and attached Appendix A (table format for ease of use) for the ongoing review process including comments/response/commitments.

The review process is currently still in progress.

9.0 PART J, ITEM 13 – PCMP - CIRNAC COMMENTS/LMI RESPONSES/NWB RESPONSE

Interested Party:	CIRNAC	**Technical Comment No:**	1
Subject/Topic:	Water Quality in TCA		

Reference:

- Section 6.2.2

Detailed Review Comment by CIRNAC (June 1, 2021):

In section 6.2.2, LMI proposes a pH trigger to help determine when desired water quality conditions are achieved in the Tailings Containment Area (TCA) (Cell 4, Pond 1, Pond 2) that would allow for the transition from active to passive discharge and reduced TCA monitoring. It is questionable to use a pH trigger (5.5) which is lower than the acceptable Metal and Diamond Mining Effluent Regulations (MDMER) range (6.0-9.5) as a reference point. It is also not clear why the trigger is based on pH only and not any total metals that have been a concern associated with the tailings.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-01) CIRNAC recommends that, prior to transitioning from active to passive TCA discharge, the licensee justify why the trigger for the transition does not include criteria for concentrations of metals of concern.

LMI Response (June 15, 2021):

The trigger for the transition from active to passive closure does not include criteria for metals concentrations as the Lupin Mine site does not currently exceed metals criteria stipulated in the Water Licence. Further, discharge from Pond 2 has not previously required treatment for metals and has complied with MDMER limits for deleterious substances, including those established for arsenic, copper, lead, nickel, and zinc per Part 1 and Schedule 4 of the MDMER. There are no new sources for these metals in closure, and therefore no residual risk for metals contamination in the passive closure phase.

Reference(s): n/a

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

In comment R-01, CIRNAC recommended that prior to transitioning from active to passive TCA discharge, the licensee justify why the trigger for the transition does not include criteria for concentration of metals of concern.

In its response, the licensee stated that:

The trigger for the transition from active to passive closure does not include criteria for metals concentrations as the Lupin Mine site does not currently exceed metals criteria stipulated in the Water Licence. Further, discharge from Pond 2 has not previously required treatment for metals and has complied with MDMER limits for deleterious substances, including those established for arsenic, copper, lead, nickel, and zinc per Part 1 and Schedule 4 of the MDMER. There are no new sources for these metals in closure, and therefore no residual risk for metals contamination in the passive closure phase.

The licensee's response does not address CIRNAC's concern. The MDMER limits are for effluents from a mine, and according to the PCMP, the licensee hopes to achieve closed mine status in 2021. CCME protection of aquatic life water quality guidelines or site specific water quality objectives are more relevant for reclaimed sites that have reduced monitoring because there are no longer activities on site. CIRNAC continues to recommend the licensee justify why the trigger for the transition does not include criteria for concentration of metals of concern.

Request or Recommendation by CIRNAC (June 23, 2021): n/a

LMI Response (July 5, 2021):

LMI anticipates that MDMER closed mine status will be achieved in early 2022, any discharge from the TCA is still subject to the Water Licence requirements until such time that the Water Licence is amended. Discharge from the TCA has been consistently below the Water Licence effluent quality criteria for metals.

Reference(s): n/a

Attachment(s): n/a

Interested Party:	CIRNAC	**Technical Comment No:**	2
Subject/Topic:	Geotechnical Monitoring		

Reference:

- Section 6.1.1; Section 6.1.4; Section 6.2.1

Detailed Review Comment by CIRNAC (June 1, 2021):

Geotechnical monitoring is essential to check that structures are performing as planned and are physically stable. The executive summary speaks to "Inspections include seepage from the dams, water levels in ponds/cells, and general surface erosion, tension cracks, and/or anomalies on dams", however section 6.1.1 does not specify dams other than the TCA. During phase 1, structures still classified as dams should be inspected, including:

- Verifying slope stabilization and erosion control at the former "interior dams" (K,M,N) and L Dam Spillway;
- Monitoring potential exposed and covered tailings after water level is drawn down; and
- Monitoring of thermistors in the M and N dams.

Section 6.1.4 states "Some perimeters dams can be declassified as dam structure in Phase 2, as they will no longer contain water when the ponds are passively managed at a much lower post closure water levels", without specifying which dams are being referred to.

Additionally, section 6.2.1 states: "Any evidence of surficial settlement or erosion or settlement above the crown pillar or shafts will be documented with photographs and reported." The absence of settlement and erosion is also noteworthy. Photographic records of inspections over the years should be kept and reported to allow monitoring of any evolution.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-02) CIRNAC recommends that licensee include in the PCMP:

- the list of structures to be inspected in phase 1;
- specific dams which they intend to declassify for phase 2; and
- instructions to report on phase 2 site inspections regardless of the findings.

LMI Response (June 15, 2021):

The Executive Summary states, "Phase 1 (Active Closure) monitoring includes bi-weekly inspections during freshet per **Part J, Item 11** of the Water Licence. Inspections include seepage from the dams, water levels in ponds/cells, and general surface erosion, tension cracks, and/or anomalies on dams….."

Section 6.1.1 also refers to inspections as **Part J, Item 11 and Item 12.** Part J, Item 11 and Item 12, both refer and require inspections at the Tailings Containment Area not other areas at the Lupin Mine site. During Phase 1 – Active Closure Phase, which we are currently actively in this stage, structures are inspected as required under Part J, Item 11 and Item 12, filed annual with NWB located on the NWB ftp under

ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-LUP2032%20LMI/3%20TECH/J%20MONITORING/J12%20Annual%20Geotechnical%20Inspection/

LMI can agree to list the structures at the TCA which are required for Phase 1 inspections under Part J, Item 12 which form the annual geotechnical Engineer's report. These dams are also listed in the approved FCRP – Table 11: Perimeter and Internal Dams. During Phase 1 these reports will continue as per Part J, Item 12.

Under Section 6.2.4 Geotechnical Monitoring (Temperature/Thermistor) LMI has provided the list of dams they would request to declassify.

These reports verify slope stabilization and surface water management to limit erosion at Dam K, Dam M, Dam N and once we are in the Closure Phase the Dam L outlet structure, it should be noted that this is not a spillway as stated above by CIRNAC.

The PCMP states the during the TCA inspections, the geotechnical engineer will also carry out visual inspections of the condition of the esker cover at the TCA. There are no thermistors planned in Dam M or Dam N.

The PCMP states, "Reporting for the Phase 1 and Phase 2 monitoring programs will consist of an annual monitoring report per the Water Licence (Part J Item 10) submitted by 31 March each year, a final MDMER report for 2021, Phase 1 and 2 geotechnical monitoring reports, and a final soils remediation report."

Reference(s): 2AM-LUP2032 – Part J, Item 11 and Item 12; Section 6.2.4; Executive Summary; Section 6.1.1

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

CIRNAC concerns were addressed

Request or Recommendation by CIRNAC (June 23, 2021): n/a

LMI Response (June 15, 2021):

Thank you. As committed, LMI will provide a list of structures at the TCA required for Phase 1 inspections in a PCMP addendum.

LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	3
Subject/Topic:	Community Consultation		

Reference:

- Schedule J, Item1

Detailed Review Comment by CIRNAC (June 1, 2021):

Schedule J Item 1 requires the licensee to consult with the community of Kugluktuk during both development of PCMP and post closure monitoring, and the requirement remains outstanding.

In the executive summary, LMI states that consultation occurred via online calls and presentations on March 9 & 25, 2021. On March 9 and 25 2021, LMI held technical review sessions with government representatives, the Kitikmeot Inuit Association (KIA), and various hired consultants/technical representatives. The goal was to review the comments LMI received from these organizations about the PCMP. The nature of the calls were technical. It is recommended that LMI undertake additional measures to consult with the community of Kugluktuk.

In the executive summary, LMI references consultation that occurred with community members and organizations in the community of Kugluktuk in April 8, 2021. LMI stated during a call with CIRNAC on May 26, 2021 that the consultation was not well attended. CIRNAC would like to know details about how the community was notified of the event, engagement content, and a summary of dates, times, locations, attendees, concerns brought forward.

Schedule B, Item 1l describes information on public consultation to be included in annual reports. This should be reproduced in the PCMP to ensure required information is collected during consultation.

CIRNAC notes the submitted PCMP does not include a translated executive summary in Inuktitut or Inuinnaqtun. Translated material is essential so that consultations can include all potentially interested community members. Given the limited success of first consultation attempts, a more thorough plan must be developed and described in section 8 of the PCMP.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-03) CIRNAC recommends section 8 of the PCMP include a detailed plan for proposed community consultations including how the community will be notified, how materials understandable by the general public will be prepared, what times of year will be prioritized for maximum participation, as well as information contained in Schedule B, Item 1l.

LMI Response (June 15, 2021):

LMI will provide the information on community consultation as required under the Water Licence Condition Part B, Item 2 (Annual Report) Schedule B, Item 1. Wherein, LMI is required under its water licence to provide a summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions and the consultation efforts of the Licensee required under Part B, Item 20. LMI is not required to provide this information as part of the overall PCMP but has included an overview. LMI believes they have met the water licence condition and will continue to consult with the community members and community organizations.

Detailed Review Comment by CIRNAC (June 23, 2021):

In comment R-03, CIRNAC recommended that: Section 8 of the PCMP include a detailed plan for proposed community consultations including how the community will be notified, how materials understandable by the general public will be prepared, what times of year will be prioritized for maximum participation, as well as information contained in Schedule B, Item 1(i).

In its response, the licensee stated that they are not required to provide the summary of the consultation as part of the overall PCMP but has included an overview and believe they have met the water licence condition.

LMI has not yet provided the 2020 annual report, so CIRNAC is not able to determine if Part B, Item 20 of the water licence has been met. CIRNAC is expecting the following information as part of consultation summary referred in Schedule B, Item 1(i) and Schedule J, Item 1.

- List of community members and organizations in attendance;
- What concerns were raised by the community members;
- Which information was provided to the community members in attendance with regards to the status of reclamation and closure activities;
- How were the community notified about the meeting; and
- Schedule of upcoming events and information sessions.

CIRNAC's community consultation concern remains outstanding and CIRNAC recommends the consultation summary referred in the water licence be provided in the 2020 annual report.

Request or Recommendation by CIRNAC (June 23, 2021): n/a

LMI Response (July 5, 2021):

LMI provided a summary of community consultations as required under the Water Licence Condition Part B, Item 2 (2020 Annual Report), Schedule B, Item 1(l) filed with the NWB on June 26, 2021 (extension granted date). Under Schedule J, Item 1, development of the PCMP began in December 2020 and therefore community consultation took place in 2021 and has/will continue, with the outcomes to be summarized in future Annual Reports. To clarify, CIRNAC listed Schedule B, Item 1(i) above and we believe they meant to type Schedule B, Item 1(l).

For 2021, consultation with community members and community organizations was provided to the CIRNAC Manager of Land Operations on June 4, 2021. LMI held a second community conference call on June 24, 2021 with community members and community organizations providing an update and answer questions on the final closure and reclamation work program as well as provide information and answer questions on the

PCMP. LMI will include a summary in the 2021 Annual Report as required under Part B, Item 2. Also see LMI Response to KIA TC 5 below.

LMI would like to advise that the translations were provided to the NWB on June 23, 2021.

LMI considers this item resolved.

Reference(s): 2AM-LUP2032, Part B, Item 2, Schedule B, Item 1(l); Schedule J, Item 1, LMI Response to KIA TC 5 below (July 5, 2021)

Attachment(s): n/a

Interested Party:	CIRNAC	**Technical Comment No:**	4
Subject/Topic:	Visual Inspections of TCA Pond Perimeters		

Reference:

- n/a

Detailed Review Comment by CIRNAC (June 1, 2021):

Visual inspections along TCA pond perimeters looking for signs of active oxidation or seepage are currently included for phase 1, but not explicitly for phase 2. Absence of signs of active oxidation or seepage will be necessary to demonstrate long term chemical and physical stability, so these inspections should continue throughout phase 2.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-04) CIRNAC recommends that visual inspections for signs of active oxidation or seepage be included in the phase 2 monitoring.

LMI Response (June 15, 2021):

Visual inspections for signs of active oxidation and seepage will continue during Phase 2 site visits.

Reference(s): n/a

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

Licensee is committed to continue visual inspection for signs of active oxidation and seepage during phase 2 monitoring.

Request or Recommendation by CIRNAC (June 23, 2021):

This addresses CIRNAC's concern and we request this be added in a PCMP addendum.

LMI Response (July 5, 2021):

LMI will include this in a PCMP addendum.

LMI considers this item resolved.

Reference(s): n/a

Attachment(s): n/a

Interested Party:	CIRNAC	**Technical Comment No:**	5
Subject/Topic:	Schedule J Items Missing		

Reference:

- 2AM-LUP2032 - Schedule J, Item 2;

Detailed Review Comment by CIRNAC (June 1, 2021):

Schedule J, Item 2 of water licence 2AM-LUP2032 lists items that need to be included in PCMP. Certain items were not found in the plan submitted in April 2021, including:

a. A review of historical data and estimate of waste rock quantities use across the site for construction of dams and other permanent structures;

b. Thresholds for tailings cover performance that would trigger moving to reduced monitoring frequency or intensity;

CIRNAC notes that Item 2g, also includes the requirement for thresholds for water quality at the TCA, and these have been provided.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-05) CIRNAC recommends the PCMP include all items prescribed in Schedule J, Item 2 of the water licence, including an estimate of waste rock quantities used across the site from historical data and thresholds for tailings cover performance.

LMI Response (June 15, 2021):

As stated in the FCRP, the estimated volume of waste rock brought up from underground and placed on surface is about 1,000,000 m3. Review of historical documents, including two environmental site assessments, has not determined a more precise number.

The historical data and estimate of waste rock quantities used across the site for construction of dams was carried out during the FCRP review process under PHC Commitments #3 and #4. There was an estimated 100,000 m3 of waste rock used to build the TCA dams.

LMI has previously explained the requirement for a saturated zone above the tailings contact within the cover, which will be monitored by the volumetric water content (VWC) probes. The VWC trends will be used to trigger a reduction or increase in monitoring frequency, as required.

Reference(s): n/a

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

CIRNAC concerns were addressed.

Request or Recommendation by CIRNAC (June 23, 2021):

LMI Response (July 5, 2021):

Thank you.

LMI considered this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	6
Subject/Topic:	Duration of Passive Monitoring		

Reference:

- Section 6.0

Detailed Review Comment by CIRNAC (June 1, 2021):

Section 6.0 states that "The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (i.e. 2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. Phase 2 monitoring programs will be carried out during site visits under the supervision and direction of DMS [Discovery Mining Services].

The Federal Contaminated Sites Action Plan Long-Term Monitoring Planning Guidance recommends 25 years of monitoring to verify equilibrium conditions at landfills in northern regions. This matches the post closure monitoring period used to generate the reclamation estimate used for site is 25 years.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-06) CIRNAC recommends the PCMP support the proposed shorter passive monitoring period with evidence that permanent physical and chemical stability of the site could be determined in this timeframe.

LMI Response (June 15, 2021):

The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. The adaptive monitoring framework outlined in Section 6.2.6 allows for enhanced monitoring if closure objectives of physical stability, chemical stability, and future use and aesthetics are not met by the end of the passive closure period in 2026. In this case, an extended passive monitoring period would be considered depending on the magnitude and spatial extent of the concern. As per the response to KIA TC 2, 3, and 4 below, active monitoring will occur until the global closure objectives have been confirmed.

Reference(s): Section 6.2.6 Adaptive Monitoring; KIA TC 2, 3 and 4 below

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

In comment R-06, CIRNAC recommended that: The PCMP support the proposed shorter passive monitoring period with evidence that permanent physical and chemical stability of the site could be determined in this timeframe.

In its response, stated that:

The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. The adaptive monitoring framework outlined in Section 6.2.6 allows for enhanced monitoring if closure objectives of physical stability, chemical stability, and future use and aesthetics are not met by the end of the passive closure period in 2026. In this case, an extended passive monitoring period would be considered depending on the magnitude and spatial extent of the concern. As per the response to KIA TC 2, 3, and 4 below, active monitoring will occur until the global closure objectives have been confirmed.

This response does not address CIRNAC concern as CIRNAC wanted the licensee to provide any evidence that permanent physical and chemical stability of the site could be achieved in 5 years. CIRNAC is of the opinion that permanent physical and chemical stability in the arctic cannot be demonstrated in such a short timeframe and requests the licensee provides evidence on how they intend to do so.

Request or Recommendation by CIRNAC (June 23, 2021): n/a

LMI Response (July 5, 2021):

Physical stability of the TCA will be achieved at the completion of active reclamation work and annual DSIs will confirm that physical stability. Historical testing of the Lupin tailings (Klohn Leanoff, 1992) concluded that exposed tailings could become acid-generating within 5-10 years of exposure to weathering; as such it is considered that 5 years is adequate to provide evidence of TCA chemical stability or provide evidence that a longer monitoring period is required.

Reference(s): n/a

Attachment(s): n/a

Interested Party:	CIRNAC	**Technical Comment No:**	7
Subject/Topic:	Demolition Landfill Monitoring Wells		

Reference:

- Schedule J, Table 1; Table 9

Detailed Review Comment by CIRNAC (June 1, 2021):

Schedule J, Table 1 of the water licence prescribes three monitoring wells at the demolition landfill facility; one up gradient (LUP-36) and two down gradient (LUP-37a & LUP-37b).

The licensee's comments on these stations in Table 9 are: "Demolition landfill is not planned for construction".

CIRNAC agrees that there no longer is a demolition landfill planned. The material that was originally planned to placed in this landfill will instead be buried in the Waste Rock Dome.

In order to monitor possible leachate, wells originally planned for the demolition landfill should be moved to up gradient and down gradient of the Dome.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-07) CIRNAC recommends the licensee install monitoring wells upstream and downstream of the waste rock dome and include their monitoring in Table 9 of the PCMP.

LMI Response (June 15, 2021):

CIRNA's comment above in regard to material that was originally planned to be placed in this landfill will instead by buried in the Waste Rock Dome is an incorrect statement. Instead, the non-hazardous waste materials generated by demolition will be placed into the existing landfill facility, which has been raised to accommodate these materials. LMI has not stated and does not plan on placing anything other than waste rock into the Waste Rock Dome. As stated in the PCMP, per Water Licence requirements, seepage surveys and applicable sampling will be conducted twice yearly at the landfill facility (LUP-31 and LUP-35) and Waste Rock Dome (LUP-SP-01 to LUP-SP-XX) through the Phase 2 Passive Monitoring, as for Phase 1 Active Monitoring (Table 9). Surveys will be conducted once in late spring after complete melt and once in late summer (late August or September) before freeze-up. This monitoring requirement is consistent with response to CIRNAC TC No. 17 during the Water Licence review process, whereby LMI committed to monitor and sample seeps from the domed covered waste rock area.

Reference(s): CIRNAC TC No. 17 (water licence review process)

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

CIRNAC concerns were addressed.

Request or Recommendation by CIRNAC (June 23, 2021): n/a

LMI Response (July 5, 2021):

Thank you.

LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	8
Subject/Topic:	Activity Schedule Unclear		

Reference:

- Section 4.7.8

Detailed Review Comment by CIRNAC (June 1, 2021):

Much of the content of the document is dated, and in some instances, unclear. The document contains references made to events/activities to be done in future that have already been undertaken. In various cases, the document provides detailed descriptions of what has occurred in the past, without inclusion in discussions of what has happened to the end of 2020, and what if anything remains to be done. For example section 4.7.8 Fuel Storage, refers to 14 diesel tanks, 1 jet A tank and 9 individual tank, without mentioning that some have been removed and others are still standing.

The PCMP covers 2021, during which time it is important to have a clear schedule that illustrates the activities proposed to be carried out during the "active period" and the expected completion date for these activities. The schedule should include when the J and 1A dams will be breached and when final pond water elevations of 480 m for Pond 2 and 481 m for Pond 1 will be established.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-08) CIRNAC recommends the PCMP be modified to include a schedule of activities with expected completion dates.

LMI Response (June 15, 2021):

Section 4.0 Summary of Final Closure provides an overview of the FCRP. Under Section 4.0 it states, "The approved FCRP has been prepared on the assumption that all facilities and installations that comprise the Lupin Mine Operations will ultimately be decommissioned, removed, or reclaimed under the terms of the land lease and in accordance with the reclamation requirements set out in the Water Licence (LMI 2020a).

For complete and comprehensive details associated with final remediation and closure refer to the FCRP."

An updated schedule has been provided to CIRNAC and the schedule will also be provided with the FCRP addendum(s) as part of the Annual Report.

Reference(s): n/a

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

In comment R-08, CIRNAC recommended that:

The PCMP be modified to include a schedule of activities with expected completion dates.

In its response, the Licensee stated that an updated schedule has been provided to CIRNAC and the schedule will also be provided with the Final Closure and Reclamation Plan (FCRP) addendum (s) as part of the Annual Report.

The updated version of the schedule provided does not address CIRNAC's concern, as the following details are missing from the schedule:

- Extent or degree the items planned in the 2020 schedule have been completed;
- Details on the time lines of work planned for 2021; and
- Duration of each activities.

However, on June 21, 2021, the Licensee provided more detailed schedule for the 2021 earthworks reclamation activities to CIRNAC field inspectors. It will be helpful if the Licensee incorporate this amount of detail into the FCRP addendum that will be submitted alongside the annual report.

Request or Recommendation by CIRNAC (June 23, 2021): n/a

LMI Response (July 5, 2021):

As per LMI's original commitment above, LMI will provide an updated schedule (FCRP Table 14 – Summary of Measures for Final Closure) with the Rev 2 FCRP addendum as part of the Annual Report. The approved FCRP states, "Table 14 lists the measures that will need to be implemented to achieve permanent closure at both locations. The following subsections provide descriptions of the measures for each component." While there are years associated with each task, Table 14 was never intended to be a detailed schedule of activities but a summary of measures to achieve permanent closure.

To assist CIRNAC with planning for inspections/engineers to be on site and verify the work being carried out and completed, LMI provide a detailed schedule to CIRNAC in January 2020 for the 2020 work program. A revised schedule for 2021 was provided to the Inspector for the same purpose, to assist with inspection timelines etc and the Inspector was advised that this earthworks schedule would be fluid due for various factors. It would not be prudent to include an every evolving plan in the FCRP addendum as the FCRP Addendum's are revised and submitted with the Annual Report once a year. LMI is working with the Inspector and Manager of Field Operations to coordinate inspections and site visits for their consultant engineers (staying at site one to two weeks at a time) to ensure that the work is being carried out as planned and to timing of activities to ensure items are inspected for potential security requests.

LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	9
Subject/Topic:	Inadequate Figures		

Reference:

- Appendix A - Figure 4 and Figure 8

Detailed Review Comment by CIRNAC (June 1, 2021):

Figures presented in Appendix A do not illustrate the site as it is in 2021, or as it will be once closure activities are completed. As such, it is difficult to evaluate the location of sampling sites or to put the proposed monitoring in context. For example, Figure 4 shows the TCA pre-2020, but there is no illustration for after closure and no indication of where the spillway will be built and what the water levels will be.

Figure 8 shows 13 seepage surface water sampling locations, but it is not clear if these are LUP-SP-01 to LUP-SP-XX referred to in Table 9. There is also no figure for seeps from the TCA, identified as LUP-TCA-01 to LUP-TCA-XX in Table 9.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-09) CIRNAC recommends the PCMP include figures that show site conditions after planned closure works are completed, and include all the sampling stations.

LMI Response (June 15, 2021):

LMI commits to updating the PCMP figures once the closure and reclamation is complete.

Seeps from the waste rock dome (LUP-SP-01 to LUP-SP-XX) and TCA (LUP-TCA-01 to LUP-TCA-XX) are not shown on figures, as they have not yet been sampled. Surveys will be conducted in spring freshet 2021 at the TCA and at the waste rock dome after construction (if flowing water is observed). The location of these seeps cannot therefore be documented until after the 2021 sampling programs.

As stated in the PCMP for LUP-TCA01 to LUP-TCA-XX, seep sampling locations will be added to the post closure monitoring program as new seeps are documented.

Reference(s): n/a

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

Licensee is committed to updating the PCMP figures on completion of the closure and reclamation activities. CIRNAC will comment further once the drawings become available.

Request or Recommendation by CIRNAC (June 23, 2021): n/a

LMI Response (July 5, 2021):

Thank you. LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	10
Subject/Topic:	Changes to General Monitoring		

Reference:

- Section 1.4

Detailed Review Comment by CIRNAC (June 1, 2021):

Section 1.4 of the PCMP states "General monitoring is subject to change, as directed by an Inspector or by the Licensee, and is also subject to approval by the NWB[Nunavut Water Board]."

CIRNAC would like to clarify that an Inspector has the authority to request additional monitoring or changes to monitoring without approval by the Board. Should the licensee want to change general monitoring conditions, approval from the Nunavut Water Board would have to be sought beforehand.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-09) CIRNAC recommends the licensee clarify the text regarding changes to general monitoring in the next revision of the PCMP.

LMI Response (June 15, 2021):

LMI will update the wording to reflect the water licence wherein general monitoring is subject to change as per the water licence, Part J, Item 8, which states: Additional monitoring requirements may be requested by the Inspector (note: without approval of the Board); or Part J, Item 10, the Licensee shall submit to the Board for approval any requests for changes(s) to the Monitoring Program as outlined in Part J and Schedule J, including justification for the change(s). The NWB may modify the Monitoring Program under Schedule J without an Amendment to the Licence. Refer to Section 5.0 and Appendix D.

Reference(s): 2AM-LUP2032 – Part J, Item 8 and Schedule J; Section 5.0; Appendix D.

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

Licensee is committed to updating the wording in section 1.4 of the PCMP to reflect the water licence thus:

Wherein general monitoring is subject to change as per the water licence, Part J, Item 8, which states: Additional monitoring requirements may be requested by the Inspector (note: without approval of the Board); or Part J, Item 10, the Licensee shall submit to the Board for approval any requests for changes(s) to the Monitoring Program as outlined in Part J and Schedule J, including justification for the change(s). The NWB may modify the Monitoring Program under Schedule J without an Amendment to the Licence.

This addresses CIRNAC's concern and we request this be added in a PCMP addendum.

Request or Recommendation by CIRNAC (June 23, 2021): n/a

LMI Response (July 5, 2021):

LMI will update the wording in Section 1.4 as per above in a PCMP addendum.

LMI considers this item resolved.

Interested Party:	CIRNAC	**Technical Comment No:**	11
Subject/Topic:	Thermistor Repair		

Reference:

- Table 13

Detailed Review Comment by CIRNAC (June 1, 2021):

Table 13 reports one thermistor in Dam 1A and one thermistor in Dam 4 were damaged in 2020 and there will be an attempt to repair them. No plans or information on what the attempts will entail are provided.

Request or Recommendation by CIRNAC (June 1, 2021):

(R-09) CIRNAC recommends the licensee clarify the text regarding changes to general monitoring in the next revision of the PCMP.

LMI Response (June 15, 2021):

As noted in the approved FCRP and PCMP, a spillway will be constructed through Dam 1A after closure and Dam 4 will be declassified so while LMI will make an effort to repair the thermistors, they are not critical for post closure monitoring as they will no longer be water retaining structures. The results of any repairs will be included in the Annual Report.

Reference(s): FCRP

Attachment(s): n/a

Detailed Review Comment by CIRNAC (June 23, 2021):

The licensee is committed to repairing the damaged thermistors and including the results of the repairs in the annual report.

This addresses CIRNAC's concern and we request this be added in a PCMP addendum.

Request or Recommendation by CIRNAC (June 23, 2021): n/a

LMI Response (July 5, 2021):

Thank you, to clarify LMI committed to make every effort to repair the thermistors and LMI will provide any repair updates in the Annual DSI Report.

LMI considers this item resolved.

APPENDIX A – CIRNAC LANDS – UPDATED CRP REQUEST JUNE 2021

APPENDIX B – FCRP REV 1

APPENDIX B1 – FCRP REV 1 APPENDICES

APPENDIX B2 - FCRP REV 1 APPH_05 SURFACE WQ MODEL;

APPENDIX B3 – FCRP REV 1 APPH_06 COUPLE SEEPAGE THERMAL MODELLING

APPENDIX B4 – FCRP REV 1 APPH_08 CONCEPTUAL DESIGN OF WASTE ROCK COVER

APPENDIX C – TABLE OF REGULATORY REVIEW

Part E, Item 25, Item 26, Item 27; FCRP Rev 1; PCMP
(comments, responses, commitments and commitment status)

	PART E, ITEM 25, 26 27 Review Process							
Line#	**PART E, ITEM 25, Item 26 and Item 27 Review Process**	**LMI Submissions June 8-9, 2020**	**CIRNAC August 25, 2020 – Godwin Okonkwo – See Appendix R**	**LMI Response to Recommendations September 30, 2020 – See Appendix S**	**CIRNAC Comments October 9, 2020 - Godwin Okonkwo – See Appendix D**	**LMI Response October 19, 2020 – See Appendix E**	**CIRNAC Response to NWB October 30, 2020 - Godwin Okonkwo – See Appendix R**	**NWB Letter – Part E, Items 25, 26, 27 Conditions have been met - November 2, 2020 – See Appendix D**
1	NWB Emails	On June 10, 2020, the NWB emailed acknowledging LMI's submission and requested that interested parties submit comments by June 24, 2020.	On August 17, 2020, NWB emailed CIRNAC to double check if they will be providing comments on the LMI submissions. CIRNAC replied on August 18, 2020 that his entire team was on vacation and would have responses by end of the week but if the time had past to comment CIRNAC would accept it that way.	On August 26, 2020, NWB emailed LMI advising that CIRNA had missed the original deadline for comments, the NWB requests LMI provide response to comments by September 25, 2020.		The NWB requests LMI submit a response to CIRNA reply by October 19, 2020.	The NWB requests CIRNAC reply by October 22, 2020 whether or not LMI response addresses CIRNAC's comments.	The Nunavut Water Board (NWB or Board) received from Lupin Mines Incorporated (LMI or Applicant) on June 8, 2020, three Technical Memorandums for Board review addressing Part E, Items 25, 26, and 27, of Water Licence 2AM-LUP2032 (Licence), with respect to the final closure and reclamation of the Lupin Mine Project (Project), as outlined below. • *Water Licence Condition Part E-25 Design for the Waste Rock "Dome" at Lupin Mine,* addressing Part E, Item 25, of the Licence; • *2AM-LUP2032 Technical Memorandum on Additional Geotechnical Details on TCA Dam K, and Dam M Cross Sections,* addressing Part E, Item 26, of the Licence; and • *2AM-LUP2032 Technical Memorandum on Exposed Tailings Preliminary Cover Design,* addressing Part E, Item 27, of the Licence. The Technical Memorandums were submitted to provide final plans for the aforementioned aspects of the closure and reclamation of the Lupin Mine site. These documents were distributed for a public review on June 10, 2020, requesting comments be submitted from interested parties by June 24, 2020. Comments were received from the Kitikmeot Inuit Association (KIA) on June 24, 2020, and from Crown-Indigenous Relations and Northern Affairs (CIRNA), on August 25, 2020, following a request to extend the deadline for comments. Environment and Climate Change Canada (ECCC) advised the Board on June 24, 2020, that they reviewed the materials provided by LMI according to their mandate and have no comments at this time. Copies of all documents received during the review of the information can be accessed through the NWB's Public Registry and FTP site using the following link: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-LUP2032%20LMI/3%20TECH/E%20WASTE%20DISP/ In their submission dated June 24, 2020, the KIA noted a need for a good understanding of waste rock quality for optimal Waste Rock Dome construction, requested additional information regarding geotechnical aspects of dam construction, and invited additional rational for tailings cover plans. LMI provided a response to these comments on July 9, 2020, noting that some of the requested information was discussed during the recent renewal and amendment of the Licence, and that they are "*presently working on an update to the Final Closure and Reclamation Plan, to address relevant comments and recommendations provided by intervening parties and the Board during the review process for the Application"* which will address many of the comments raised. The KIA responded on July 20, 2020, requesting additional information related to waste rock volumes, Acid Rock Drainage/Metal Leaching (ARD/ML) considerations, and to clarify various closure and reclamation plans associated with the Project. LMI provided a final response

								on August 4, 2020, fully addressing comments and concerns brought up during the review, closing by stating that "*LMI looks forward to working with the KitIA on the development of a Post Closure Monitoring Plan (PCMP) in accordance with Schedule J of the Licence*." The KIA confirmed on August 12, 2020, their satisfaction with the information provided. In their submission dated August 25, 2020, CIRNA commented on erosion control measures planned for the waste rock dome, and site-specific designs for tailing's preliminary cover design. LMI provided a response on September 30, 2020, providing clarification regarding erosion controls for the waste rock dome, and site-specific designs for tailing's preliminary cover design. On October 9, 2020, CIRNA provided a response requesting additional information, that LMI responded to on October 19, 2020. **CIRNA confirmed on October 30, that they had no further comments.** **By copy of this letter, the Board confirms that it has completed its review of the above mentioned Technical Memorandums and related submissions, and finds the information functional and generally satisfying Part E, Items 25, 26, and 27 of Water Licence 2AM-LUP2032.**
2	**PART E – Conditions Applying to Waste Disposal and Management – ITEM 25**	**LMI Submissions June 8-9, 2020**	**CIRNAC August 25, 2020 – Godwin Okonkwo – See Appendix D**	**LMI Response to Recommendations September 30, 2020 – See Appendix E**	**CIRNAC Comments October 9, 2020 - Godwin Okonkwo – See Appendix D**	**LMI Response October 19, 2020 – See Appendix E**	**CIRNAC Response to NWB October 30, 2020 - Godwin Okonkwo – See Appendix D**	**LMI Commitments Status to the NWB to address CIRNAC's recommendations as of July 7, 2021**
3	**<u>LMI WATER LICENCE CONDITIONS:</u>** The Licensee shall, within sixty (60) days following the approval of the Licence, submit to the Board for review, a Technical Memorandum that provides 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.	See Appendix I for LMI's memo and designs fulfilling LMI's water licence term and condition Part E, Item 25						
4	**1 CIRNAC Comment**		**<u>CIRNAC COMMENT:</u>** 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		**<u>CIRNAC COMMENT:</u>** Lack of Erosion Controls on 10% slopes of esker cover - 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.		**<u>CIRNAC SATISFIED with LMI RESPONSES and COMMITMENTS:</u>** see below (Rows 5, 7 and 9)	

			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.		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.			
5	**1 CIRNAC Recommendations and LMI Responses**		**RECOMMENDATION 1:** CIRNAC recommends that LMI include erosion control measures to ensure erosion protection and stability of these long 10% esker slopes.	**LMI RESPONSE:** The perimeter berm will prevent runoff from the top surface of the dome from "spilling over the edges"; rather all runoff from the top surface will be conducted down erosion protected drainage chutes to ground level. As a result, the only runoff that will flow over the 10% sloped edges will be runoff from precipitation that lands directly on those surfaces. About 49% of the annual precipitation will occur as snowfall. Snowmelt is expected to run off during the spring freshet during which time the dome slope will still be frozen. Runoff from rainfall during the summer season will occur as sheet flow. The esker material which will form the cover is a well graded pit run gravelly sand material which typically comprises the following fractions: 38% gravel, 59% sand and 3% silt (Holubec, 2005)1. Under incipient erosion conditions, these types of materials tend to "self armour" (i.e., fines are removed leaving behind a matrix of coarser material, which is more resistant to erosion). The FCRP (Section 4.3.2.3) includes a provision for post-closure inspection of the cover. It is stated that "Annual visual inspections will be completed and documented, and maintenance activities will be undertaken if and as needed (e.g., regrading or the placement of additional granular material to repair erosion)." Light construction equipment will be left on site to carry out such repair work if	**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.	**LMI RESPONSE:** The NWB has provided the updated FCRP for interested parties to review and provide comments. As noted in the current security estimate, equipment will remain at site for various repairs as required until post closure monitoring is complete. Demobilization of this equipment is also included in the current security estimate.	**CIRNAC SATISFIED with LMI RESPONSES and COMMITMENTS:** 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.	**LMI COMMITMENT STATUS:** CIRNAC requested an opportunity to review the recently submitted updated FCRP. The updated FCRP Rev 1 (September 28, 2020) had been sent by the NWB for interested parties to review at the time LMI responded on to CIRNAC on Oct 19, 2020. This commit was fulfilled. (see Appendix B, B1, B2 and B3) LMI confirmed that the post closure work/equipment was included in the reclamation security estimate (January 16, 2020) approved by the Minister on April 9, 2020. This commitment was fulfilled. (see Appendix T) LMI's commitments to the NWB and CIRNAC have been fulfilled.

				required.				
6	**2 CIRNAC Comment**		**CIRNAC COMMENT:** 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.		**CIRNAC COMMENT:** 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.			
7	**2. CIRNAC Recommendations and LMI Responses**		**RECOMMENDATION 2:** CIRNAC recommends that LMI provide the information stated above to demonstrate the long-term erosion stability of the designs.	**LMI RESPONSE:** The two drawings that were attached to the Technical Memo are Revision A drawings that are labelled “Not for Construction”. These Rev A drawings provide more detail than was required to meet commitment E-25. Additional design details will be provided on subsequent Rev 0 “Issued for Construction” drawings. It is intended that the alignment of the perimeter berms will be angled such that runoff striking the inner toe of the berms will have a gentle but positive drainage path to the nearest chute. Details of the alignment and the toe elevations will be provided in the Rev 0 drawings. The typical cross-section and typical profile shown on Drawing 2, show the configuration and erosion protection design of the drainage chutes. Drawing 1 Rev A shows the number and location of the chutes. More details (i.e., set out points and invert elevations) will be provided later in the Rev 0 drawings. It is intended that runoff discharging from the stilling basins will flow away from the dome, rather than tangentially along the toe. The same is true of the sheet runoff off the 10% sideslopes. For the most part, this will happen naturally because the “dome” is sited on the top of a natural hill. If, after the adjacent waste rock is excavated from the toe, there remain any areas where flow would otherwise occur tangentially along the toe of the dome, this flow will be redirected away from the toe of the cover using ditches and or swales as necessary. If there are any areas where this cannot	**CIRNAC Recommendation:** CIRNAC recommends that the 'Subsequent Issued for Construction Drawings" be provided by LMI for review in advance of the dome construction work.	**LMI RESPONSE:** LMI will provide the NWB with construction drawings as required under water licence 2AM-LUP2032.	**CIRNAC SATISFIED with LMI RESPONSES and COMMITMENTS:** 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.	**LMI COMMITMENT STATUS:** LMI committed to provide construction drawings to be review as per their water licence, under Part G, Item 1. LMI has provided the construction drawings as required under Part G, Item 1 of the water licence. LMI believes they have addresses CIRNAC’s concerns and the construction drawings are under the NWB review process. (see Appendix E) LMI has fulfilled the commitment to the NWB and CIRNAC.

				practicably be done, then erosion protection will be placed against the affected toe area to prevent erosion. LMI looks forward to further discussion in the development of the Post Closure Monitoring Plan in accordance with Part J, Item 13 and Schedule J of the water licence 2AM-LUP2032.				
8	**3 Comment**		**CIRNAC COMMENT:** 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 it 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		**CIRNAC COMMENT:** 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.			
9	**3 CIRNAC Recommendation and LMI Responses**		**RECOMMENDATION 3:** CIRNAC recommends that all relevant requirements and works be specifically referenced.	**LMI RESPONSE:** Note 1 was deliberately stated in general terms in order to require the Contractor to comply with any relevant terms in the water licence and the FCRP. The Phase I and II ESA (Morrow, 2006)2 together with the ESA update (Golder, 2017)3 contain extensive information on the location, nature and	**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	**LMI RESPONSE:** The NWB has provided the updated FCRP for interested parties to review and provide comments. LMI will provide the NWB with construction drawings as required under water licence 2AM-LUP2032. Please find below, the WSCC Chief Inspector of Mines approval	**CIRNAC SATISFIED with LMI RESPONSES and COMMITMENTS:** 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*	**LMI COMMITMENT STATUS:** CIRNAC requested an opportunity to review the recently submitted updated FCRP Rev 1. The updated FCRP Rev 1 (September 28, 2020) had been sent by the NWB for interested parties to review at the time LMI responded on to CIRNAC on Oct 19, 2020. LMI's commitment has been fulfilled. (see Appendix B, B1,B2 & B3)

				estimated quantities of soil and rock requiring clean up. This information is publicly available on the NWB ftp site. Also, electronic copies of these reports have been made available to the Contractor along with a separate plan showing the known locations of planned clean up. LMI has also developed a protocol for the clean up activities, which uses a combination of field screening and confirmatory lab analysis techniques to establish the excavation limits. It should also be noted that, should contaminated soil or rock become evident at locations other than those shown in the existing documents, the affected soil and rock will be cleaned up according to the protocol. Disposal of waste materials into the crown pillar openings and shafts has been described in the FCRP and approved under the water licence. WSCC Chief Inspector of Mines approval was granted on 29 June 2020. The Technical Memo submitted on 8 June 2020 was intended to address the specific requirements Part E, Item 25 of water licence 2AM-LUP2032. Clean up activities began in 2020 and were undertaken following the cleanup protocol discussed above.	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.	documentation.	*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 leer from WSCC Chief Inspector of Mines.	LMI committed to provide construction drawings to address CIRNAC's comments and the construction drawings have been submitted under Part G, Item 1 of the water licence. The construction drawings are currently under the review process by the NWB. LMI commitment has been fulfilled. (see Appendix E) LMI provided the approval letter from WSCC as requested and CIRNAC advised that they appreciated the provision of the approval letter from WSCC Chief Inspector of Mines. This commit was fulfilled. (see Appendix S) LMI has fulfilled the commitments to the NWB and CIRNAC.
10	**PART E – Conditions Applying to Waste Disposal and Management – ITEM 26**	**LMI Submissions June 8-9, 2020**	**CIRNAC August 25, 2020**	**LMI Response to Recommendations September 30, 2020**	**CIRNAC Comments October 9, 2020 - Godwin Okonkwo**	**LMI Response October 19, 2020**	**CIRNAC Response to NWB October 30, 2020**	**LMI Commitments Status to the NWB to address CIRNAC's recommendations as of July 7, 2021**
	<u>LMI WATER LICENCE CONDITION:</u> The Licensee shall, within sixty (60) days following the approval of the Licence, submit to the Board for review, a Technical Memorandum that provides additional geotechnical details on TCA Dam K and Dam M cross sections, including but not limited to the following: a. Magnified image that clearly identifies the materials used for the re-sloping, the distance that the re-sloping materials will extend from the crest of these Dams (including a break line with minimums and maximums noted), and the distances to the closure water mark;	See Appendix J, J1 and J2 for LMI memo, designs and specifications fulfilling LMI's water licence term and condition Part E, Item 26 and Part G, Item 1	CIRNAC did not provide any comments/concerns on Item26	No comments/concerns to provide a response	CIRNAC did not provide any comments/concerns on Item26	No comments/concerns to provide a response	CIRNAC did not provide any comments/concerns on Item26	LMI considered this item resolved as CIRNAC did not provide any responses, comments on concerns in regard to Part E, Item 26 and Part G, Item 1. (see Appendix J, J1 and J2)

	b. Perpendicular/ longitudinal cross section of the outflow structures for Cell 5 and Cell 3, with invert elevations from the cover to the ponds, and a note to clarify the storm return period that will be used for designing the features.							
11	**PART E – Conditions Applying to Waste Disposal and Management – ITEM 27**	**LMI Submissions June 8-9, 2020**	**CIRNAC August 25, 2020 – Godwin Okonkwo – See Appendix R**	**LMI Response to Recommendations September 30, 2020 – See Appendix S**	**CIRNAC Comments October 9, 2020 - Godwin Okonkwo – See Appendix R**	**LMI Response October 19, 2020 – See Appendix S**	**CIRNAC Response to NWB October 30, 2020 - Godwin Okonkwo – See Appendix R**	**LMI Commitments Status to the NWB to address CIRNAC's recommendations as of July 7, 2021**
12	**<u>LMI WATER LICENCE CONDITION:</u>** The Licensee shall, within sixty (60) days following the approval of the Licence, submit to the Board for review, 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.	See Appendix K for LMI memo, Cell 4 designs fulfilling LMI's water licence term and condition Part E, Item 27						
13	4 CIRNAC Comment		**<u>CIRNAC COMMENT:</u>** 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		**<u>CIRNAC COMMENT:</u>** 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.		**<u>CIRNAC SATISFIED with LMI RESPONSES and COMMITMENTS:</u>** See below (Row 14)	

			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 clothe 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*."					
14	**4 CIRNAC Recommendation and LMI Responses**		**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.	**LMI RESPONSE** LMI has provided, through the regulatory process Public Hearing Exhibit No. 6, a technical memorandum dated 9 January 2020 regarding, supporting information to the contingency contaminants management decision matrix and an additional technical memorandum in response to Commitment No.8 from the Technical Meeting/Pre- hearing Conference regarding, exposed contaminants at closure water levels. Refer to Appendix H-1 and H-10, respectively, of the recently submitted updated FCRP for additional copy. Moving forward, LMI is committed to compliance with our Type A Water Licence and approved closure plans.	**CIRNAC Recommendation:** CIRNAC recommends that the recently submitted FCRP be provided for review by interested parties.	**LMI RESPONSE:** The NWB has provided the updated FCRP for interested parties to review and provide comments.	**CIRNAC SATISFIED with LMI RESPONSES and COMMITMENTS:** 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.	**LMI COMMITMENT STATUS:** CIRNAC requested an opportunity to review the recently submitted updated FCRP. The updated FCRP Rev 1 (September 28, 2020) had been sent by the NWB for interested parties to review at the time LMI responded on to CIRNAC on Oct 19, 2020. LMI's commitment has been fulfilled. (see Appendix B, B1,B2 & B3) LMI also committed compliance with our Type A Water Licence and approved closure plans which includes CIRNAC's request for site specific designs for any such tailings area cover(s) for review before LMI can cover any exposed tailings. This would be under Part G, Item 1 of the water licence should LMI encounter any exposed tailings. LMI has fulfilled the commitment to the NWB and CIRNAC.
	Part I, Item 2 - Updated FCRP Rev 1 Review Process							
15	**Part I, Item 2 - Updated FCRP Review Process**	**LMI Submission September 28, 2020**	**CIRNAC comments November 17, 2020 - Godwin Okonkwo – See Appendix U**	**LMI Response February 1, 2021 – See Appendix V**	**CIRNAC comments February 16, 2021 – Sarah Forte – See Appendix U**	**LMI Response March 19, 2021 – See Appendix V**	**NWB Letter – Approval of Updated FCRP - March 26, 2021 – See Appendix F**	**LMI Commitments Status to the NWB to address CIRNAC's recommendations as of July 7, 2021**
16	**LMI WATER LICENCE CONDITION:** The Licensee shall, within ninety (90) days of approval of the Licence, submit to the Board for review, an updated *Final Closure and Reclamation Plan*, to address relevant comments and recommendations provided by intervening parties and the Board during the review process for the Application.	See Appendix B, B1, B2 & B3 for LMI's updated FCRP with attachments submitted on September 28, 2020 to address relevant comments and recommendations provided by intervening parties and the Board during the review process of the Application. The Application process ended on February 28, 2020.	The NWB emailed the updated FCRP Rev 1 on October 13, 2020 inviting interested parties to comment by November 10, 2020.		The NWB emailed LMI's responses on Feb 2, 2021 requested that interested parties advise whether or not LMI's addressed their recommendations by February 16, 2021. CIRNAC requested an extension to February 17, 2021. +	The NWB emails LMI to response to interested parties comments by March 15, 2021	The Nunavut Water Board (NWB or Board) received from Lupin Mines Incorporated (LMI or Applicant) on September 28, 2020, a updated Final Closure and Reclamation Plan for the Lupin Mine Project, for Board approval as required under Part I, Item 2, of Type A Water Licence 2AM-LUP2032 (Licence). The Management Plan presents the final closure obligations and plans with the intention of "*ensuring that the site is returned to a condition that protects the health and safety of Nunavut residents and the environment around the Lupin Mine*." On October 13, 2020, the Plan was distributed for a one-month public review. By November 17, 2020, comments were received from the Kitikmeot Inuit Association (KIA), Crown-Indigenous Relations and Northern Affairs (CIRNA), and Environment and Climate Change Canada. On February 1, 2021, LMI provided a response to these comments that was	

							provided to parties for consideration. On February 17, 2021, parties provided a second round of review comments with respect to the Final Closure and Reclamation Plan. **On March 19, 2021, LMI provided a response to the second set of technical review comments that included additional information, a number of commitments, and a updated Water Quality Monitoring Plan and Water and Soil Quality Assurance/ Quality Control Plan, dated August 2020; and that fully addressed review comments to the satisfaction of the Board.** All information received in support of the Application as well as the submissions provided by intervening parties can be found at the following link: ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-LUP2032%20LMI/3%20TECH/I%20A%20and%20R/2020/ The NWB has reviewed the Lupin Mine Project, Final Closure and Reclamation Plan and related submissions, and finds the Plan functional and generally satisfying Licence requirements. **By copy of this letter, the Board approves the Lupin Mines Incorporated, Final Closure and Reclamation Plan, dated August 2020, through the Board Motion No. 2020-A1-009, dated March 25, 2021, in accordance with Part I, Item, 2 of Type "A" Water Licence 2AM-LUP2032.**	
17	**1 CIRNAC Comment**		**CIRNAC COMMENT:** The R1 version of the FCRP has had editorial updates made throughout the document. In addition, various sections have been updated to provide comments and specific references and responses to questions from CIRNAC and other parties, as per commitments made to the NWB at the technical meeting and/or the public hearing. The material R1 additions to the FCRP relate to references made to, and the inclusion of the Technical Memoranda provided by LMI in its various responses and commitments. CIRNAC has reviewed these documents previously and provided comments on them. While in some cases, LMI's responses have addressed CIRNAC's concerns, in other cases additional information was (is required) to address issues raised by CIRNAC with respect to these Technical Memoranda. CIRNAC also notes that the R1 FCRP does not include any references to the NWB Conditions 25, 26, 27 that resulted from the Public Hearing of January 2020 Type A 2AM-LUP2032 issued on 28 February 2020 and approved on 9 April 2020.					
18	**1 CIRNAC Recommendation and LMI Response**		**CIRNAC recommends that:** i) LMI create a disposition table listing all issues raised by the Intervenors at the technical and management meetings, along with LMI commitments, responses and technical memos,	**LMI Response:** The Type A Water Licence Part I, Item 2 required LMI to incorporate commitment, responses and associated technical memos into an updated FCRP as provided by LMI through submission of FCRP Rev1,	**CIRNAC recommended** the licensee incorporate to the FCRP I) a disposition table listing issues, commitments, and responses, II) information provided for Part E, Items 25, 26 & 27 of the water licence. LMI commits to the second	**LMI Response:** LMI will endeavour, time permitting to include a disposition table listing issues, commitments and responses in the 2020 Annual Report or in any event the 2021 Annual Report.		**LMI COMMITMENT STATUS:** LMI Part E, Item 25, 26 (no commitments) and 27 approved commitments as listed above have been included in the FCRP Rev 2 addendum as part of the Annual Report submitted to the NWB and is currently under review. (see Appendix H)

			plus intervenor review comments on LMI's submission and remaining concerns raised by Intervenors with respect to the LMI responses provided to date. ii) LMI update the R1 FCRP to include information related to Conditions 25, 26, and 27 of the approved Water Licence 2AM-LUP2032.	submitted on September 28, 2020. Technical Memorandum were submitted to the NWB in compliance with specific terms and conditions (i.e., Part E) are already a part of the NWB registry. LMI would refer CIRNAC to the NWB Reasons for Decision that provides a list of submissions and correspondence in Appendix D. iii) LMI notes the technical review of information related to Water Licence 2AM-LUP2032 Part E, Item 25, 26 & 27 was only concluded by the NWB on 2 November 2020. LMI will provide an updated Rev2 of the FCRP in the 2020 Annual Report due 31 March 2021.	request for revision 2 of the FCRP. CIRNAC recommends that both a disposition table and information pertaining to licence conditions Part E, Items 25, 26 & 27 be included in revision 2, and that interveners be an opportunity to review revision 2 when it is provided.	As required by the Licence, information from Part E, Items 25, 26 and 27 addressed in 2020 will be included as an addendum to the 2020 Annual Report.		Other commitments under Part E, Item 25, 26 (no commitments) and 27 involve construction drawings which are to be submitted to the NWB under Part G, Item 1 not the Annual Report. The Part E, Item 25 construction drawings have been submitted to the NWB and currently under review. (see Appendix E) LMI's commitments to the NWB and CIRNAC have been fulfilled.
19	**2 CIRNAC Comment**		**<u>CIRNAC COMMENT:</u>** The FCRP Rev 1 (August 2020) includes Table 14 which provides a schedule that was prepared on March 2019. This schedule needs to be updated to remove items that are no longer valid (e.g., includes line items that refer to work to be done under Care and Maintenance) and include all activities agreed to by LMI including such items/activities as follows: •Construction of water management structures related to "dome"; •Stabilization and erosion protection of tailings dams (M, K, etc.); •Removal for placement in tailings cells, or cover in place, existing or future exposed tailings (after dewatering); and, •Construction of water management features (drainage swales and discharge structures) in tailings cells. In addition to the above, the March 2019 schedule does not reflect the actual works carried out in 2019 or 2020. It would be helpful if LMI can provide a more detailed and updated schedule that includes all actions to be undertaken, links with LMI's RECLAIM estimate and milestones, and illustrates actual verses planned progress as well as any proposed future schedule revisions. This update to the FCRP will provide a better understanding of the state of the closure works and scheduled revisions/adjustments LMI may be proposing going forward.					
20	**2 CIRNAC Recommendation and LMI Responses**		**<u>CIRNAC recommends</u>** that LMI provide a more detailed and updated schedule for the reclamation works consistent with the work completed as reflected in the Security Reduction requests of 2020. The updated schedule should include the original 2019 proposed project schedule timelines as shown in the R1 FCRP, the actual work carried out to the end of 2020, and any proposed revisions to the schedule going forward. The schedule should be updated to include line items for all activities committed to by LMI.	**<u>LMI RESPONS:</u>** LMI is committed to compliance and submission of the Annual Report on March 31, 2021 to reflect works completed in 2020 and will include in accordance with Schedule B, Item 1, Part m) a summary of any abandonment and reclamation work completed during the year and an outline of any work anticipated for the next year.	**CIRNAC recommended** the FCRP include a detailed and updated work schedule. LMI is committing to provide this information with the Annual Report. This does not address our concern, as the work schedule included in the current version of the FCRP is inaccurate and out of date. CIRNAC recommends version 2 of the FCRP include an updated and accurate work schedule.	**<u>LMI RESPONSE:</u>** LMI will provide an updated 2021 proposed work schedule in the Annual Report or as soon as finalized for implementation.		**<u>LMI COMMITMENT STATUS:</u>** LMI has submitted the proposed 2021 work schedule – updated Table 14 to the Inspector on June 15, 2021 and LMI has also submitted the updated schedule (Table 14) as an addendum of the FCRP (Rev 2) (Appendix G) with the Annual Report (extension granted to file Annual Report on June 26, 2020 and accepted by CIRNAC) (Appendix H) to the NWB which is currently under review. LMI submitted a further detailed earthworks schedule to the CIRNAC inspector on June 20, 2021. LMI's commitments to the NWB and CIRNAC have been

								fulfilled.
21	**3 CIRNAC Comment**		**CIRNAC COMMENT:** The R1 FCRP states that approximately 16,000 m3 heavily arsenic impacted soils and 35,200 m3 of PHC impacted soils (S4.3.2.3, p 4-6) exist on site that will require active management and disposal. On page 4-9 in regard to arsenic impacted soils LMI states; *"The heavily arsenic impacted shallow material will be ex-situ remediated using conventional techniques (i.e., excavators, haul trucks, and dozers) and will be excavated and disposed of within the shafts or open crown pillars for isolation."* On the same page in regard to the PHC impacted soils LMI states that; *"35,200 m3 of PHC impacted soil has been identified at 13 historical maintenance, fueling, and fuel storage locations across the Site (Golder 2017a).* *These locations include: the STF and Powerhouse, the Mill and Office Emergency Tanks, the Main Tank Farm Loaders, the Main Tank Farm Bedding Sand, the Emergency Powerhouse, the South Burn Pit, the Landfill, the RTL Shop, the North Burn Pit, the Incinerator, Cold Storage #1, the Former Airstrip Fuelling Area, and the former Ball Field. This material will be ex-situ remediated using conventional techniques (i.e., excavators, haul trucks, and dozers) and disposed of in the shafts or open crown pillars."* No drawings were provided in the R1 FCRP document identifying the location and extent of the areas with heavily impacted arsenic or PHCs requiring excavation. In the absence of a drawing providing this information it is difficult to confirm that all of these impacted materials have been removed from these locations before consolidating the waste rock at the mill site.					
22	**3 CIRNAC Recommendation and LMI Responses**		**CIRNAC recommends** that LMI provide a detailed site plan that identifies the location and estimated extent of heavily impacted arsenic soils, and PHC impacted soils that are expected to be excavated and placed underground. CIRNAC also requests that LMI clarify how it will confirm that these materials have been removed prior to waste rock regrading and cover placement.	**LMI RESPONSE:** Further to the ESA completed in 2006 and updated in the 2017 Updated Phase 1 & II Environmental Site Assessment completed by Golder, a detailed site plan indicating the locations of heavily impacted arsenic soils and PHC impacted soils that will be excavated and disposed underground is attached (Figure 1). The extents of the excavations will be determined in the field through the completion of field screening and confirmatory soil sampling. LMI will confirm the removal of these materials through the implementation of the contaminated soils quality assurance / quality control (QA/QC) plan outlined in Appendix C2 of the Post Closure Monitoring Plan due to the NWB on 9 April 2021 in accordance with Part J, Item 13 of the Licence.	**CIRNAC requested** a detailed site plan with location and estimated extent of arsenic and petroleum hydrocarbon (PHC) impacted soils, as well as information on the method for confirming contaminated materials removal prior to further work. The licensee has provided a figure with test pit locations, indicating which ones have exceedances. This map does not estimate potential extents, does not indicate which exceedances are for arsenic or PHC, and has no indication of potential depth of contamination. Furthermore LMI deferred answering how they will confirm removal of contaminated materials until April 9, 2021, when the Quality Assurance/Quality Control (QA/QC) Plan of the Post Closure Monitoring Plan is to be submitted. To address CIRNAC's concerns, the location and extents of arsenic and PHC impacted soils need to be integrated in the closure plan as they will have to be remediated. We recommend this information be added to version 2 of the FCRP, as well as a method for confirming removal of	**LMI RESPONSE:** The two ESA's (Morrow, 2006 and Golder, 2017) provide a thorough compilation of all data known on the nature and extent of soil contamination in the mill area. Table 29 in the 2017 Updated Phase 1 & 2 Environmental Site Assessment completed by Golder provides an explicit estimate of the potential volumes, including the exceedances for arsenic and PHC, and indicates the potential areas and depths of contamination for PHCs. Remediation was carried out in 2020 or will be completed in 2021 at each of the exceedance test pits shown on the figure. The final extents and volumes of the excavations will be determined in the field through the completion of field screening and confirmatory soil sampling as per the approved FCRP. The August 2020 QA/QC Plan, was intended to be filed with the updated FCRP but did not get placed on the NWB ftp site. (We can only assume the email did not go through as there		**LMI COMMITMENT STATUS:** LMI provided the detailed site plan with locations as requested by CIRNAC and directed CIRNAC to the Phase 1, Phase 2 (Appendix O and O1) and updated Phase 1 and Phase 2 ESA (Appendix P) that show location and extents of arsenic and PHC impacted soils. The updated Phase 1 and Phase 2 ESA was reviewed by the NWB and interveners in Oct/Nov 2017 and was included with the FCRP's as supporting documentation. The QA/QC plan (August 2020) (Appendix L) was provided to CIRNAC and to the NWB. CIRNAC has provided comments to NWB on the QA/QC plan (Appendix M) and LMI has provided responses to the NWB (Appendix N). The review is still in process. LMI's commitments to the NWB and CIRNAC have been fulfilled.

					contaminated materials, since it forms part of the reclamation work and needs to be completed prior to post closure monitoring.	were a large number of documents filed with the updated FCRP.) A copy of the August 2020 QA/QC Plan is attached to this document, and has been resubmitted to the NWB and is currently out for review by interested parties. An updated draft version, dated February 2021, has been provided to CIRNAC, and will be submitted with the draft PCMP on April 8, 2021. **Attachment(s):** • Figure 1 – Locations of Contaminated Soils to be Excavated (19136158-0005-CM-0001-B-SIZE) (with February 1, 2021 responses) • August 2020 QA/QC (with March 17, 2021 response)		
23	**4 CIRNAC Comment**		**CIRNAC COMMENT:** Discussion of closure of the underground and placement of material into the underground is found in the Executive Summary 5a) and Section 4.3.2.4 Underground Workings, and in Figures 6, 13, and 14. Review of these sections notes that on page 4- 14 LMI states the Preferred Reclamation activities will; *"modify the previous plan for the West Zone disposal as shown on Figure 14. The modified plan would address the void areas and increase the storage capacity. Instead of developing additional drop raises in the remaining crown pillar for disposal, the new plan would be to blast down the remaining crown pillar, creating an open slope trench approximately 260 m in length and approximately 72 m deep".* Consistent with these statements, on page 4-15 Synthesis of Preferred Activities into a Reclamation Plan, LMI states that *"The remaining West Zone crown pillar will be collapsed to provide additional disposal capacity and to prevent future post-closure stability problems. The main haulage shaft, fresh air raise, and the exhaust raise will be completely backfilled to prevent access. Site materials and equipment, waste rock, and hydrocarbon contaminated soils will be disposed of in these areas".* Upon review of the R1 FCRP Figures 6, 13, and 14, CIRNAC identified the following: •Figure 6 notes that it provides a Site Plan showing the West Zone and provides some notes on open depths and a "ramp" in the areas referred to as WZ Crown Pillar Pit and WZ Underground Disposal Key Cross Section Locations (5).					
24	**4 CIRNAC Recommendation and LMI Responses**		**CIRNAC recommends** that LMI provide more detailed discussions and plans related to the following: •How surface openings and the open stope will be filled. •How long-term subsidence of fill materials will be avoided. •The information provided to the Mines Inspector with respect to final closure of surface openings.	**LMI Response:** The updated FCRP Rev1 submitted on September 28, 2020, confirms that the surface openings and the open stope will be completely filled. Waste materials will be dumped beside the openings and then progressively dozed into the openings. ii) As shown on Figure 10, the entire west zone crown pillar area will fall within the footprint of the waste rock "dome". As shown on Figure 6, the ground surface elevation along the open crown pillar	**CIRNAC recommended** the licensee include a more detailed discussion on how the surface openings and the open stope would be filled, and how long term subsidence of fill material would be avoided. The licensee has responded *"the surface openings and the open stope will be completely filled. Waste materials will be dumped beside the openings and then progressively dozed into the openings."* As well, they state they expect subsidence to occur during construction, so that it could be	**LMI Response:** LMI will include the information requested as committed in Part E, Item 25, to provide the addition information with the construction drawings. Please find attached the requested approved documents by the Mines Inspector. **Attachment(s):** • Drill-Blast Execution Plan Crown Pillar Blasting June 2020		**LMI COMMITMENT STATUS:** LMI committed to provide the additional information requested by CIRNAC for Part E, Item 25 with the construction drawings under Part G, Item 1 of the water licence. The construction drawings and technical memorandum have been submitted to the NWB are currently under review. (see Appendix E) LMI provided the requested drill/blast documentation with their submission on March 19, 2021. (see Appendix S) LMI's commitments to the NWB and CIRNAC have been

				generally varies between Elev. 502 and 501 m, with lower elevations on the north end. Comparing this to the dome grading plan (TM of June 8, 2020 in response to condition E-25) shows that the total cover over the crown pillar (including the 1 m esker cover) will generally be about 4 m. It is expected that most of the fill subsidence will occur while the dome is being constructed and so it will be accommodated in the final grading. Any longterm subsidence can be corrected by placing additional esker material in the subsidence area to bring it back up to grade. A small volume of esker material will be stockpiled on the dome for this purpose. iii) The information provided to the Mines Inspector on June 29 was confirmed and provided to the NWB in response to CIRNAC similar question related to the technical review of term and condition Part E, Item 25.	accommodated during final grading. This information is not sufficiently detailed to evaluate the likelihood of its effectiveness. For example, does the "progressive dozing into the openings" involve pushing end-dumped material over the opening edge with the bulldozer, or will the fill be placed in lifts, allowing the bulldozer to track over and compact the material? The method used will have an incidence on the likelihood of subsidence. CIRNAC recommends LMI include the information requested in version 2 of the FCRP. CIRNAC also recommended the documents provided to the Mines Inspector with respect to final closure of the surface openings be shared, as presently we only have a copy of the authorization letter. Documents referred to in the authorization letter which we would like to see are: x 2020-06-25 Drilling and Blasting Plan Approval; x West Zone Crown Pillar Blast Locations – Plan view; and x M8277 Break-Away Drill and Blast – Lupin Mine Closure – West Zone Pilla…[*sic*].	• West Zone Crown Pillar Blast Locations – Plan view; and • M8277 Break-Away Drill and Blast – Lupin Mine Closure – West Zone Pillar		fulfilled.
25	**5 CIRNAC Comment**		**CIRNAC COMMENT:** Since the development of the draft FCRP, CIRNAC has expressed concerns regarding the long-term effectiveness and erosion stability of the proposed dome cover and water management systems. Prior to the Public Hearing of January 2020, LMI replied through a series of discussions and the Technical Memos included in Appendix H-8 (Technical Memorandum in Appendix H-8 regarding Conceptual Design for the Waste Rock "Dome" at Lupin Mine for response to TM/PHC Commitment No.5 (Golder, 2019d). Pursuant to the Public Hearing, in response to Condition 25 of the Water Licence, Golder provided a Technical Memorandum dated 8 June 2020 that included a brief discussion on the "Dome" Design Objective and two "Not for Construction" drawings; one provided a Plan View drawing of the proposed dome, and the other provided two cross sections through the proposed "dome" along with typical details of the proposed drainage chutes, and the crest perimeter berm. CIRNAC appreciated LMI's submission of the additional information in the Technical Memorandum and subsequently provided review comments to the NWB for LMI consideration. CIRNAC notes that the 8 June 2020 memo and drawings from LMI were not included in the R1 FCRP document.					
26	**5 CIRNAC Recommendation and LMI Responses**		**CIRNAC recommends** that the R1 FCRP be updated to include: •The contents of the 8 June 2020 Golder Technical	**LMI RESPONSE:** LMI notes the technical review of information related to Water Licence 2AM-LUP2032 Part E, Item 25, 26 &	**CIRNAC recommended** information LMI submitted in a technical memo on June 8, 2020 regarding conceptual design for the waste rock "dome" be integrated into the FCRP.	**LMI RESPONSE:** LMI considers this item resolved.		**LMI COMMITMENT STATUS:** LMI has committed to provide an FCRP Rev 2 addendum including the approved information during the review process

			Memorandum responding to Condition 25 requirements. •CIRNAC concerns on the "dome" design related to long term erosion, as expressed in CIRNAC comments on the Condition 25 Submissions as dated 25 August 2020. •Any further design details that LMI may have generated since June 2020 with respect to the "dome" design.	27 was only concluded by the NWB on 2 November 2020 wherein, NWB confirms that it has completed its review of the above mentioned Technical Memorandums and related submissions, and finds the information functional and generally satisfying Part E, Items 25, 26, and 27 of Water Licence 2AM-LUP2032. Refer to document titled 201102 2AM0LUP2032 Part E, Item 25, 26, 27-ODDE.pdf at ftp://ftp.nwboen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AMLUP2032%20LMI/3%20TECH/E%20WASTE%20DISP/ LMI will provide an updated Rev2 of the FCRP in the 2020 Annual Report due 31 March 2021. The updated FCRP Rev1 was submitted to the NWB on September 28, 2020.	Furthermore CIRNAC requested that our concerns raised on August 25, 2020 be addressed and any further details or modifications for these reclamation works developed since June 2020 be provided. LMI has committed to doing so in revision 2 of the FCRP, which CIRNAC will review once received.			of Part E, Item 25, 26 and 27. (see Appendix G) LMI committed to provide the additional information requested by CIRNAC for Part E, Item 25 with the construction drawings under Part G, Item 1 of the water licence. The construction drawings and technical memorandum have been submitted to the NWB are currently under review. (see Appendix E) LMI's commitments to the NWB and CIRNAC have been fulfilled.
27	**6 CIRNAC Comment**		**CIRNAC COMMENT:** Condition 26 is a Licence condition generated with respect to addressing the concerns expressed and the request for additional information by Intervenors to clarify the nature and extent of long term stabilization and closure works at the TCA, and in particular as related to K and M dam repairs and long term stability and erosion control. By way of a Technical Memorandum from Stantec dated 8 June 2020, LMI provided a substantial information package that included design notes, specifications, and a series of drawings (plans, sections, profiles, and details) related to the proposed closure works for the TCA area. Specifically, the package included 15 drawings: 1 Design Specification drawing, 4 Cell 5 drawings; 4 Cell 3 drawings; 3M Dam drawings; and 3 K Dam drawings. CIRNAC notes that the 8 June 2020 memo and drawings were not included in the R1 FCRP document.					
28	**6 CIRNAC Recommendation and LMI Responses**		**CIRNAC recommends** that the R1 FCRP be updated to include: •The contents of the 8 June 2020 Stantec Technical Memorandum responding to Condition 26 requirements. •Any further revisions or details that LMI may have generated since June 2020 with respect to the closure works at the TCA.	**LMI RESPONSE:** LMI notes the technical review of information related to Water Licence 2AM-LUP2032 Part E, Item 25, 26 & 27 was only concluded by the NWB on 2 November 2020. LMI will provide an updated Rev2 of the FCRP in the 2020 Annual Report due 31 March 2021. The updated FCRP Rev1 was submitted to the NWB on September 28, 2020.	**CIRNAC recommended** the design notes, specifications and drawings for long term stabilization and closure work at the tailings containment area including Dams K & M provided in a June 8, 2020 technical memo for Part E, Item 26 of the licence, be incorporated into the FCRP. Additionally CIRNAC requested any further details or modifications for these reclamation works developed since June 2020. LMI has committed to doing so in revision 2 of the FCRP, which CIRNAC will review once received.	**LMI RESPONSE:** LMI considers this item resolved.		**LMI COMMITMENT STATUS:** LMI has committed to provide FCRP Rev 2 addendum to include the approved information during the review process of Part E, Item 25, 26, 27. The FCRP Rev 2 addendum has been submitted the NWB is currently in the review process. (see Appendix G) There are no further details or modifications for these reclamation works since June 2020. LMI's commitments to the NWB and CIRNAC have been fulfilled.
29	**7 CIRNAC Comment**		**CIRNAC COMMENT:** Figure 11 of the R1 FCRP shows that a tailings cover is to be placed in the area contained by the N Dam. No other reference is made to work at the N Dam or covering of the N Dam tailings in the R1 FCRP document. Appendix H-03 TCA Dam Stability Review Rev 0 dated 14 November 2020, includes modeled cross sections of the N Dam (Fig 30, 31, and 32) as part of the geotechnical stability analysis. Given that					

			the downstream embankment of the N Dam was mostly underwater in 2019 it is unclear how the profile was generated. LMI's provision of additional TCA details in the 8 June 2020 Stantec Technical Memorandum and drawing package addresses the N Dam tailings cover in Drawing 002 Cell 5 Closure, Plan View - in which Note 3 states that topographic and bathymetric surveys were not available due to ponded water, that dewatering is required before cover placement, and that the contractor is to adjust cover placement to ensure a 1 m cover thickness. The drawings do not clearly indicate water flow management in this area, e.g., will there be an outlet from this area, and if so where and how it will be constructed.					
30	**7 CIRNAC Recommendation and LMI Responses**		**CIRNAC recommends** that LMI provide additional information with respect to the contour information used in the N Dam Safety analysis as well as on the final contour elevations and associated water management for the N Dam containment area.	**LMI RESPONSE:** Dam N profiles were generated using the bathymetric survey information as outlined in the FCRP Technical Memorandum: 2AM-LUP2032 related Technical Meeting Commitment No.6 Response – Geotechnical Review on the long-term stability of the TCA Dams (Refer to Updated FCRP, Appendix H_03). Based on currently available information, Cell N cover will be shaped to shed water and does not require an outlet.	**CIRNAC requested** the contour information used in the N Dam Safety analysis and the final contour elevations and associated water management for the N Dam containment area be shared. The licensee indicated which contour information they used to generate N Dam profiles, and indicated "*Cell N cover will be shaped to shed water and does not require an outlet.*" Plans for the shape of the Cell N cover are not in the FCRP, and CIRNAC recommends they be included for future review.	**LMI RESPONSE:** Cell N is included in the approved TCA Closure Plan, and will be covered as per the approved TCA Closure Plan with minimum 1 m of esker and sloped for passive drainage. LMI will provide the contour information in the updated FCRP addendum being submitted with the Annual Report on March 31, 2021.		**LMI COMMITMENT STATUS:** LMI committed to provide the Cell N contour information with the FCRP Rev 2 addendum (Appendix G) along with the Annual Report (Appendix H) which has been submitted to the NWB and in the review process. LMI's commitments to the NWB and CIRNAC have been fulfilled.
31	**8 CIRNAC Comment**		**CIRNAC COMMENT:** In regard to Financial Security, Section 7 has been significantly altered to remove discussion of former liability estimate and other related information. The R1 FCRP makes reference to LMI's January 2020 RECLAIM estimate of $23,463,049; the release framework and milestones; states that $6,549,072 was released to LMI in April 2020, and that the new letter of credit approved 9 June 2020 is in the amount of $19,558,231. CIRNAC appreciates inclusion of this current detail, and observed no discussion on the difference in security held and LMI's RECLAIM estimate value less the released amount ($2,644,254). This may lead to confusion when parties review the RECLAIM model to evaluate reduction of security and the amount of security still being held.					
32	**8 CIRANC Recommendation and LMI Responses**		**CIRNAC recommends** that LMI provide a brief discussion on the difference in security held and LMI's RECLAIM estimate value less the released amount.	**LMI Response:** In January of 2020, the security for 2AM-LUP1520 was $26,107,303. LMI's revised RECLAIM estimate submitted in January 2020 was in the amount of $23,463,049. The NWB decision when approving the renewed/FRCP water licence 2AM-LUP2032 was to keep the security the same, being $26,107,303. In April of 2020 LMI obtained a release in the amount of $6,549,072 leaving the total security at $19,558,231. In October of 2020 LMI obtaining another release in the amount of $4,984,477 leaving the total security of January 2021 at $14,573.754.	**CIRNAC requested** the licensee provide a discussion on the security estimate values. LMI has provided the requested information in their reply and CIRNAC recommends they incorporate these up to date figures in their FCRP.	**LMI Response:** LMI will incorporate these figures in the updated FCRP addendum.		**LMI COMMITMENT STATUS:** LMI committed to providing updated security estimate values in the FCRP Rev 2 addendum (Appendix H) with the Annual Report. (see Appendix G) The Annual Report has been submitted with the above stated Addendum with the NWB and is currently under review. LMI's commitments to the NWB and CIRNAC have been fulfilled.
33	**1A CIRNAC NEW Comment on February**		No Comment		**CIRNAC COMMENT:** In general, LMI's responses do not address			

	16, 2021				CIRNAC's comments and many defer integrating information until version 2 of the FCRP. Therefore, CIRNAC's general recommendation is for the Nunavut Water Board to defer approval of the plan until interveners have been able to review version 2 of the FCRP. Version 2 of the FCRP is expected to be submitted at the end of March 2021, with the 2020 Annual Report for water licence 2AMLUP2032. CIRNAC is concerned with LMI's repeated deferral of our requests for information which would allow for the evaluation of the potential effectiveness of their proposed reclamation strategies. The remainder of this letter is separated into two sections, the first regarding information which CIRNAC has been requesting since the water licence renewal process and the second section contains specific replies to each of LMI's responses. Both sections have been developed with the support of Arcadis Canada Inc.			
34	**1A NEW Recommendation on February 16, 2021**					**LMI RESPONSE:** First, LMI would clarify with CIRNAC, the FCRP was approved by the Minister on approval of the Licence on April 9, 2020. The updated FCRP subject to "review" by the NWB to ensure it is updated to address relevant comments, recommendations provided by intervening parties and the Board during the review process for the Application. Given the licence was issued in February 2020 the updated FCRP for "review" would include comments, recommendations etc. from July 2018 to February 2020 and is not required to include comments/ recommendations following approval of the Licence to confirm compliance with Board direction and the condition of the water licence, Part I, Item 2 which states: The Licensee shall, within ninety (90) days of approval of the Licence, submit to the Board for review, an updated *Final Closure and Reclamation Plan*, to address relevant comments and recommendations provided by intervening parties and the Board during the review process for the Application. During the water licence amendment renewal/FCRP application approval process LMI responded to all information requests. LMI and CIRNAC resolved all issues prior to the end of the Public Hearing, with exception of security. LMI and CIRNAC resolved three items by way of an agreement on what additional information they would require and an agreed up statement was provided at the Public Hearing. These three items resulted in Part E, Items 25, 26 and 27 in the approved water licence. CIRNAC also made the following statement at the public hearing: "At this time, I'd like to state that our presentation had been completed before the latest submissions by Lupin Mines and our discussions with them up until midnight yesterday, so some of the issues we're going to		**LMI COMMITMENT STATUS:** It should be noted that within the February 16, 2021 CIRNAC comments, CIRNAC is requesting new information that LMI is seeing for the first time in regard to Part E, Item 26 which was already reviewed and satisfied by CIRNAC on October 30, 2020 and the NWB on November 2, 2020. CIRNAC had the opportunity to provide comments on two occasions but did not provide any. CIRNAC is now stating that LMI has not addressed their comments/concerns of which they were not made aware of previously. No recommendation from CIRNAC so is no commitments for LMI to fulfill.

						present, they have responded, and we have resolved them. There's only one issue that's not completely resolved." Secondly, LMI acknowledges that compliance is also required to other terms and conditions of the licence to address additional specific issues raised during the review process. The Licence is structured in such a way as to capture any updates to approved plans in subsequent Annual Reports as such any issued raised and resolved through acceptance or confirmation from the NWB in 2020 would be addressed in the 2020 annual report due to the NWB on March 31, 2021. In conclusion, LMI is surprised to hear that CIRNAC's believes that LMI has not been addressing their comments and LMI respectfully disagrees with this statement. LMI believes that CIRNAC and LMI have worked cooperatively and effectively during the application review process and subsequently following approval of the licence amendment/ renewal. The items CIRNAC is indicating they believe were deferred to be integrated into an updated version of the FCRP were in regards to Terms and Conditions in the water licence which were still being addressed when the updated FCRP was submitted to NWB for review and was not a part of the condition for the updated FCRP under Part I, Item 2.		
35	**1B NEW CIRNAC Comment on February 16, 2021**	No comment			**<u>CIRNAC COMMENT:</u>** Specifics on reclamation methods and designs are necessary to evaluate if they will be adequate for long term physical and chemical stability of the site. CIRNAC has been requesting further details since the water licence renewal process initiated in 2019. As LMI did not provide the information during the renewal process, the renewed licence included three conditions to provide some of the missing information within 60 days of licence issuance. These are Part E, Item 25 for design details of the waste rock dome design, Part E, Item 26 for geotechnical details on TCA Dams K & M, and Part E, Item 27 for preliminary design cover for newly exposed tailings. The Board provided CIRNAC with the opportunity to review three technical memos submitted by LMI covering these three topics. LMI's response to our comments was that the information requested would be integrated into the FCRP revision. The revision number was not specified, which has led to confusion. Our October 30, 2020 reply to the Board's question on whether these responses satisfactory was that we would review the FCRP, as at the time we believed it integrated the missing information. On November 2, 2020, the Board distributed a letter stating it had reviewed the memos and found: "*the information functional and generally satisfying Part E, Items 25, 26, and 27 of Water Licence 2AM-LUP2032.*" Though the Board is generally satisfied, CIRNAC			

					is seeking details on how the site will be reclaimed. Below is a summary on the information CIRNAC considers to be missing from what was to be provided under Part E Items 25, 26 and 27 of the water licence. The lists for Items 25 and 27 are a re-iteration of comments submitted on August 25, 2020, as well as comments regarding Item 26.			
36	**1B NEW Recommendation on February 16, 2021 and LMI Responses**				**CIRNAC Recommendations:** Further details on these concerns are presented in Annex A. CIRNAC's general recommendation is for LMI to provide sufficient information to answer these questions in revision 2 of the FCRP. I. Information provided for Item 25 "dome design" is insufficient to provide confidence in long term erosion protection and cover stability. Concerns include: a. lack of detailed grading information for top of "dome"; b. lack of design information on storm / freshet flows; c. no protection against rill erosion on long 10% slope surfaces; d. lack of runoff channels from discharge chutes; e. potential for toe erosion from discharge chute runoff flows; f. lack of specific notes to address construction constraints that need to be addressed before cover can be placed; g. failure to show where materials to be removed prior to cover placement are located; and h. failure to show locations of shaft, crown pillar area, that will be buried under the dome. II. Information provided for Item 26 "additional geotechnical details" includes a series of 15 drawings and our concerns are summarized as: a. no detailed information or specifications are provided with respect to the work to be performed on the embankment slopes; b. no information is provided with respect to the compacted fill" to be placed on the dams as shown on dam section drawings; c. section drawings show no erosion control measures related for the dam slopes and no armouring or rip rap for any dam work; d. it is unclear how the embankment fill will be placed in horizontal layers and adequately compacted to ensure long term stability; e. there is no information on the closure work on the west end of the M dam as extends beyond the N dam M dam intersection; f. the is no information on how any potential closure works on the N dam will be carried out if needed or how they will confirm that works are	**LMI RESPONSE:** LMI refers CIRNAC to CIRNAC 1A (above) for LMI position and context applicable to issues raised in CIRNAC 1B. In regards to Part E, Items 25, 26 and 27 and CIRNAC's understanding that new information was integrated into the updated FCRP, LMI's responses to CIRNAC did not advise that any new information was included in the updated FCRP during the reviewing process for Part E, Items 25, 26 and 27. Any reference to the FCRP was referring to information already provided in the approved FCRP (dated July 2018). LMI advised as a courtesy in their closing comments that they had submitted the updated FCRP to the NWB (and had been sent out by the NWB for review) specifically stating "as required under Part 1, Item 2 and that it was an update to the Final Closure and Reclamation Plan, to address relevant comments and recommendations provided by intervening parties and the Board during the review process for the Application." LMI pointed out documents already reviewed by CIRNAC during the application review process and as a courtesy confirmed those documents were included with the updated FCRP as required. LMI committed to providing construction drawings, which is required by the water licence, for review as recommended by CIRNAC that would address their unresolved comments and CIRNAC advised that "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." LMI considers Part E, Items 25, 26, 27 resolved as per CIRNAC's confirmation on Oct 30, 2020 and the NWB's letter on November 2, 2020. These items will be included in the updated FCRP addendum filed with the Annual Report as per the water licence. LMI has an approved FCRP and they have fulfilled the required water licence conditions under Part E, Items 25, 26 and 27, so respectfully LMI will not be responding to the items above or presented in Annex A.		**LMI COMMITMENT STATUS:** The CIRNAC comments and recommendations are outside of the requirements for the updated FCRP Rev 1 in LMI's water licence under Part I, Item 2. CIRNAC's comments are not in relation to the updated FCRP Rev 1 but are in regard to separate term and conditions in LMI's water licence (Part E, Items 25, 26 and 27) which CIRNAC advised they were satisfied on October 30, 2002 and the NWB on November 2, 2020. (see above for Part E, Item 25, 26 and 27). It should be noted that within the February 16, 2021 CIRNAC comments, CIRNAC is requesting new information that LMI is seeing for the first time but CIRNAC advised they were satisfied with LMI's responses/commitments on October 30, 2020 and the NWB on November 2, 2020. CIRNAC had the opportunity to provide comments on two occasions but did not provide any. Under Part E, Item 25 LMI committed to provide construction drawings under Part G, Item 1 of the water licence which will address CIRNAC's comments. These construction designs and technical memorandum have been filed with the NWB and are currently in the review process. (see Appendix E) CIRNAC had no comments or concerns with Part E, Item 26 during the NWB review process in 2020 and within the same document only requested that the Stantec June 8, 2020 documents in relation to Part E, Item 26 be included in the updated FCRP Rev 2 addendum (see Row 27 above) (Appendix G) LMI's committed to provide construction drawings in relation to Part E, Item 27, if any exposed tailings are encountered, under Part G, Item 1 of the water licence. LMI has not encountered any new exposed tailings to date. LMI's commitments to the NWB and CIRNAC have been fulfilled.

					not needed; andg. there is no discussion of logistics of dewatering Pond 2 and impacts on schedule and work if water level is not lowered before work on the dams is scheduled. III. Information provided for Item 27 "cover design for potential exposed tailings" is still insufficient to allow for general approval of approach. Based on information provided, LMI should be required to submit details on any new exposed tailings encountered (e.g. potential exposed tailings as may be encountered in Pond 2 between the 480 m contour and the toe of the M&N dams) and provide specific information on proposed approach prior to carrying out any work on the tailings. (Note that there is a potential logistical / timing issue with respect to covering future exposed tails after dewatering if dewatering is the last step of the reclamation of the reclamation.) Further details on these concerns are presented in Annex A. CIRNAC's general recommendation is for LMI to provide sufficient information to answer these questions in revision 2 of the FCRP.			
37	**Part J, Item 13 - Post Closure Monitoring Plan – still under review**							
38	**Part J, Item 13 - Post Closure Monitoring Plan – still under review**	**LMI Submission April 9, 2021**	**CIRNAC comments June 1, 2021 – Sarah Forte – See Appendix W**	**LMI Response June 15, 2021 – See Appendix N**	**CIRNAC comments June 23, 2021 – Vincent Okonkwo – See Appendix W**	**LMI Response July 5, 2021 - See Appendix N**	**Still in Review Process**	**Still in Review Process**
39	**LMI WATER LICENCE CONDITION:** The Licensee shall, within one (1) year following the approval of the Licence, submit to the Board for approval a Post Closure	See Appendix Q for LMI's Post Closure Monitoring Plan including QA/QC Plan (April 2021) submitted to the NWB on April 9, 2021. The review process is currently underway and has not been completed.	The NWB emailed the updated FCRP on April 21, 2021 inviting interested parties to comment by May 26, 2021. On May 26, 2021 CIRNAC requested and was granted an extension to May 31, 2021.	On June 1, 2021, the NWB emailed and requested that LMI provide responses to comments by June 15, 2021.	On June 16, 2021, the NWB emailed and request a reply by June 23, 3032 whether or not LMI's responses addressed their comments.	On June 28, 2021, the NWB emailed LMI and requested that LMI provide responses to comments by July 5, 2021.		

	Monitoring Plan in accordance with requirements in Schedule J.							
40	**1 CIRNAC Comment**		**CIRNAC COMMENT:** In section 6.2.2, LMI proposes a pH trigger to help determine when desired water quality conditions are achieved in the Tailings Containment Area (TCA) (Cell 4, Pond 1, Pond 2) that would allow for the transition from active to passive discharge and reduced TCA monitoring. It is questionable to use a pH trigger (5.5) which is lower than the acceptable Metal and Diamond Mining Effluent Regulations (MDMER) range (6.0-9.5) as a reference point. It is also not clear why the trigger is based on pH only and not any total metals that have been a concern associated with the tailings.		**CIRNAC COMMENT:** In comment R-01, CIRNAC recommended that prior to transitioning from active to passive TCA discharge, the licensee justify why the trigger for the transition does not include criteria for concentration of metals of concern. In its response, the licensee stated that: *The trigger for the transition from active to passive closure does not include criteria for metals concentrations as the Lupin Mine site does not currently exceed metals criteria stipulated in the Water Licence. Further, discharge from Pond 2 has not previously required treatment for metals and has complied with MDMER limits for deleterious substances, including those established for arsenic, copper, lead, nickel, and zinc per Part 1 and Schedule 4 of the MDMER. There are no new sources for these metals in closure, and therefore no residual risk for metals contamination in the passive closure phase.* The licensee's response does not address CIRNAC's concern. The MDMER limits are for effluents from a mine, and according to the PCMP, the licensee hopes to achieve closed mine status in 2021. CCME protection of aquatic life water quality guidelines or site specific water quality objectives are more relevant for reclaimed sites that have reduced monitoring because there are no longer activities on site. CIRNAC continues to recommend the licensee justify why the trigger for the transition does not include criteria for concentration of metals of concern.			
41	**1 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-01) CIRNAC recommends that, prior to transitioning from active to passive TCA discharge, the licensee justify why the trigger for the transition does not include criteria for concentrations of metals of concern.	**LMI RESPONSE:** The trigger for the transition from active to passive closure does not include criteria for metals concentrations as the Lupin Mine site does not currently exceed metals criteria stipulated in the Water Licence. Further, discharge from Pond 2 has not previously required treatment for metals and has complied with MDMER limits for deleterious substances, including those established for arsenic, copper, lead, nickel, and zinc per Part 1 and Schedule 4 of the MDMER. There are no new sources for these metals in closure, and therefore no residual risk for metals contamination in the passive closure phase.		**LMI RESPONSE:** LMI anticipates that MDMER closed mine status will be achieved in early 2022, any discharge from the TCA is still subject to the Water Licence requirements until such time that the Water Licence is amended. Discharge from the TCA has been consistently below the Water Licence effluent quality criteria for metals.		
42	**2 CIRNAC Comment**		**CIRNAC COMMENT:** Geotechnical monitoring is essential to check that structures are performing as planned and are physically stable. The executive summary speaks to "Inspections include seepage from the dams, water levels in ponds/cells, and general surface erosion, tension cracks, and/or anomalies on		**CIRNAC COMMENT:** CIRNAC concerns were addressed			

			dams", however section 6.1.1 does not specify dams other than the TCA. During phase 1, structures still classified as dams should be inspected, including: • Verifying slope stabilization and erosion control at the former "interior dams" (K,M,N) and L Dam Spillway; • Monitoring potential exposed and covered tailings after water level is drawn down; and • Monitoring of thermistors in the M and N dams. Section 6.1.4 states "Some perimeters dams can be declassified as dam structure in Phase 2, as they will no longer contain water when the ponds are passively managed at a much lower post closure water levels", without specifying which dams are being referred to. Additionally, section 6.2.1 states: "Any evidence of surficial settlement or erosion or settlement above the crown pillar or shafts will be documented with photographs and reported." The absence of settlement and erosion is also noteworthy. Photographic records of inspections over the years should be kept and reported to allow monitoring of any evolution.					
43	**2 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-02) CIRNAC recommends that licensee include in the PCMP: • the list of structures to be inspected in phase 1; • specific dams which they intend to declassify for phase 2; and • instructions to report on phase 2 site inspections regardless of the findings.	**LMI RESPONSE:** The Executive Summary states, "Phase 1 (Active Closure) monitoring includes bi-weekly inspections during freshet per **Part J, Item 11** of the Water Licence. Inspections include seepage from the dams, water levels in ponds/cells, and general surface erosion, tension cracks, and/or anomalies on dams….." Section 6.1.1 also refers to inspections as **Part J, Item 11 and Item 12.** Part J, Item 11 and Item 12, both refer and require inspections at the Tailings Containment Area not other areas at the Lupin Mine site. During Phase 1 – Active Closure Phase, which we are currently actively in this stage, structures are inspected as required under Part J, Item 11 and Item 12, filed annual with NWB located on the NWB ftp under ftp://ftp.nwb-oen.ca/registry/2%20MINING%20MILLING/2A/2AM%20-%20Mining/2AM-LUP2032%20LMI/3%20TECH/J%20MONITORING/J12%20Annual%20Geotechnical%20Inspection/ LMI can agree to list the structures at the TCA which are required for Phase 1 inspections under Part J, Item 12 which form the annual geotechnical Engineer's report. These dams are also listed in the approved FCRP – Table 11: Perimeter and Internal Dams. During Phase 1 these reports will continue as per Part J, Item 12. Under Section 6.2.4 Geotechnical Monitoring (Temperature/Thermistor) LMI has provided the list of dams they would request to declassify.		**LMI RESPONSE:** Thank you. As committed, LMI will provide a list of structures at the TCA required for Phase 1 inspections in a PCMP addendum. LMI considers this item resolved.		

				These reports verify slope stabilization and surface water management to limit erosion at Dam K, Dam M, Dam N and once we are in the Closure Phase the Dam L outlet structure, it should be noted that this is not a spillway as stated above by CIRNAC. The PCMP states the during the TCA inspections, the geotechnical engineer will also carry out visual inspections of the condition of the esker cover at the TCA. There are no thermistors planned in Dam M or Dam N. The PCMP states, "Reporting for the Phase 1 and Phase 2 monitoring programs will consist of an annual monitoring report per the Water Licence (Part J Item 10) submitted by 31 March each year, a final MDMER report for 2021, Phase 1 and 2 geotechnical monitoring reports, and a final soils remediation report." Reference(s): 2AM-LUP2032 – Part J, Item 11 and Item 12; Section 6.2.4; Executive Summary; Section 6.1.1				
44	**3 CIRNAC Comment**		**CIRNAC COMMENT:** Schedule J Item 1 requires the licensee to consult with the community of Kugluktuk during both development of PCMP and post closure monitoring, and the requirement remains outstanding. In the executive summary, LMI states that consultation occurred via online calls and presentations on March 9 & 25, 2021. On March 9 and 25 2021, LMI held technical review sessions with government representatives, the Kitikmeot Inuit Association (KIA), and various hired consultants/technical representatives. The goal was to review the comments LMI received from these organizations about the PCMP. The nature of the calls were technical. It is recommended that LMI undertake additional measures to consult with the community of Kugluktuk. In the executive summary, LMI references consultation that occurred with community members and organizations in the community of Kugluktuk in April 8, 2021. LMI stated during a call with CIRNAC on May 26, 2021 that the consultation was not well attended. CIRNAC would like to know details about how the community was notified of the event, engagement content, and a summary of dates, times, locations, attendees, concerns brought forward. Schedule B, Item 1l describes information on public consultation to be included in annual reports. This should be reproduced in the PCMP to ensure required information is collected during consultation. CIRNAC notes the submitted PCMP does not include a translated executive summary in Inuktitut or Inuinnaqtun. Translated material is essential so that consultations can include all potentially interested community members. Given		**CIRNAC COMMENT:** In comment R-03, CIRNAC recommended that: Section 8 of the PCMP include a detailed plan for proposed community consultations including how the community will be notified, how materials understandable by the general public will be prepared, what times of year will be prioritized for maximum participation, as well as information contained in Schedule B, Item 1(i). In its response, the licensee stated that they are not required to provide the summary of the consultation as part of the overall PCMP but has included an overview and believe they have met the water licence condition. LMI has not yet provided the 2020 annual report, so CIRNAC is not able to determine if Part B, Item 20 of the water licence has been met. CIRNAC is expecting the following information as part of consultation summary referred in Schedule B, Item 1(i) and Schedule J, Item 1. • List of community members and organizations in attendance; • What concerns were raised by the community members; ▪ Which information was provided to the community members in attendance with regards to the status of reclamation and closure activities; • How were the community notified about the meeting; and • Schedule of upcoming events and information sessions. CIRNAC's community consultation concern remains outstanding and CIRNAC recommends the consultation summary referred in the water licence be provided in the 2020 annual report.			

			the limited success of first consultation attempts, a more thorough plan must be developed and described in section 8 of the PCMP.					
45	**3 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-03) CIRNAC recommends section 8 of the PCMP include a detailed plan for proposed community consultations including how the community will be notified, how materials understandable by the general public will be prepared, what times of year will be prioritized for maximum participation, as well as information contained in Schedule B, Item 1l.	**LMI RESPONSE:** LMI will provide the information on community consultation as required under the Water Licence Condition Part B, Item 2 (Annual Report) Schedule B, Item 1. Wherein, LMI is required under its water licence to provide a summary of public consultation and participation with local organizations and the residents of the nearby communities, including a schedule of upcoming community events and information sessions and the consultation efforts of the Licensee required under Part B, Item 20. LMI is not required to provide this information as part of the overall PCMP but has included an overview. LMI believes they have met the water licence condition and will continue to consult with the community members and community organizations. LMI will ensure that the translations are submitted as soon as possible.		**LMI RESPONSE:** LMI provided a summary of community consultations as required under the Water Licence Condition Part B, Item 2 (2020 Annual Report), Schedule B, Item 1(l) filed with the NWB on June 26, 2021 (extension granted date). Under Schedule J, Item 1, development of the PCMP began in December 2020 and therefore community consultation took place in 2021 and has/will continue, with the outcomes to be summarized in future Annual Reports. To clarify, CIRNAC listed Schedule B, Item 1(i) above and we believe they meant to type Schedule B, Item 1(l). For 2021, consultation with community members and community organizations was provided to the CIRNAC Manager of Land Operations on June 4, 2021. LMI held a second community conference call on June 24, 2021 with community members and community organizations providing an update and answer questions on the final closure and reclamation work program as well as provide information and answer questions on the PCMP. LMI will include a summary in the 2021 Annual Report as required under Part B, Item 2. Also see LMI Response to KIA TC 5 below. LMI would like to advise that the translations were provided to the NWB on June 23, 2021. LMI considers this item resolved.		
46	**4 CIRNAC Comment**		**CIRNAC COMMENT:** Visual inspections along TCA pond perimeters looking for signs of active oxidation or seepage are currently included for phase 1, but not explicitly for phase 2. Absence of signs of active oxidation or seepage will be necessary to demonstrate long term chemical and physical stability, so these inspections should continue throughout phase 2.		**CIRNAC COMMENT:** Licensee is committed to continue visual inspection for signs of active oxidation and seepage during phase 2 monitoring. This addresses CIRNAC's concern and we request this be added in a PCMP addendum.			
47	**4 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-04) CIRNAC recommends that visual inspections for signs of active oxidation or seepage be included in the phase 2 monitoring.	**LMI RESPONSE:** Visual inspections for signs of active oxidation and seepage will continue during Phase 2 site visits.		**LMI RESPONSE:** LMI will include this in a PCMP addendum. LMI considers this item resolved.		
48	**5 CIRNAC Comment**		**CIRNAC COMMENT:** Schedule J, Item 2 of water licence 2AM-LUP2032 lists items that need to be included in PCMP. Certain items were not found in the plan submitted in April 2021, including: c. A review of historical data and estimate of waste rock quantities use across the site for construction of dams and other permanent structures; d. Thresholds for tailings cover performance that		**CIRNAC COMMENT:** CIRNAC concerns were addressed.			

			would trigger moving to reduced monitoring frequency or intensity; CIRNAC notes that Item 2g, also includes the requirement for thresholds for water quality at the TCA, and these have been provided.					
49	**5 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-05) CIRNAC recommends the PCMP include all items prescribed in Schedule J, Item 2 of the water licence, including an estimate of waste rock quantities used across the site from historical data and thresholds for tailings cover performance.	**LMI RESPONSE:** As stated in the FCRP, the estimated volume of waste rock brought up from underground and placed on surface is about 1,000,000 m3. Review of historical documents, including two environmental site assessments, has not determined a more precise number. The historical data and estimate of waste rock quantities used across the site for construction of dams was carried out during the FCRP review process under PHC Commitments #3 and #4. There was an estimated 100,000 m3 of waste rock used to build the TCA dams. LMI has previously explained the requirement for a saturated zone above the tailings contact within the cover, which will be monitored by the volumetric water content (VWC) probes. The VWC trends will be used to trigger a reduction or increase in monitoring frequency, as required.		**LMI RESPONSE:** Thank you. LMI considered this item resolved.		
50	**6 CIRNAC Comment**		**CIRNAC COMMENT:** Section 6.0 states that "The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (i.e. 2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. Phase 2 monitoring programs will be carried out during site visits under the supervision and direction of DMS [Discovery Mining Services]. The Federal Contaminated Sites Action Plan Long-Term Monitoring Planning Guidance recommends 25 years of monitoring to verify equilibrium conditions at landfills in northern regions. This matches the post closure monitoring period used to generate the reclamation estimate used for site is 25 years.		**CIRNAC COMMENT:** In comment R-06, CIRNAC recommended that: The PCMP support the proposed shorter passive monitoring period with evidence that permanent physical and chemical stability of the site could be determined in this timeframe. In its response, stated that: *The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. The adaptive monitoring framework outlined in Section 6.2.6 allows for enhanced monitoring if closure objectives of physical stability, chemical stability, and future use and aesthetics are not met by the end of the passive closure period in 2026. In this case, an extended passive monitoring period would be considered depending on the magnitude and spatial extent of the concern. As per the response to KIA TC 2, 3, and 4 below, active monitoring will occur until the global closure objectives have been confirmed.* This response does not address CIRNAC concern as CIRNAC wanted the licensee to provide an evidence that permanent physical and chemical stability of the site could be achieved in 5 years. CIRNAC is of the opinion that permanent physical and chemical stability in the arctic cannot be demonstrated in such a short timeframe and requests the licensee provides evidence on how they intend to do so.			

51	**6 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-06) CIRNAC recommends the PCMP support the proposed shorter passive monitoring period with evidence that permanent physical and chemical stability of the site could be determined in this timeframe.	**LMI RESPONSE:** The Passive Closure Period (Phase 2) refers to the 5-year period following the completion of active reclamation work (2022 to 2026). Environmental monitoring will be conducted through Phase 2 to determine the success of the reclamation measures and confirm that the closure objectives have been achieved. The adaptive monitoring framework outlined in Section 6.2.6 allows for enhanced monitoring if closure objectives of physical stability, chemical stability, and future use and aesthetics are not met by the end of the passive closure period in 2026. In this case, an extended passive monitoring period would be considered depending on the magnitude and spatial extent of the concern. As per the response to KIA TC 2, 3, and 4 below, active monitoring will occur until the global closure objectives have been confirmed.		**LMI RESPONSE:** Physical stability of the TCA will be achieved at the completion of active reclamation work and annual DSIs will confirm that physical stability. Historical testing of the Lupin tailings (Klohn Leanoff, 1992) concluded that exposed tailings could become acid-generating within 5-10 years of exposure to weathering; as such it is considered that 5 years is adequate to provide evidence of TCA chemical stability or provide evidence that a longer monitoring period is required.		
52	**7 CIRNAC Comment**		**CIRNAC COMMENT:** Schedule J, Table 1 of the water licence prescribes three monitoring wells at the demolition landfill facility; one up gradient (LUP-36) and two down gradient (LUP-37a & LUP-37b). The licensee's comments on these stations in Table 9 are: "Demolition landfill is not planned for construction". CIRNAC agrees that there no longer is a demolition landfill planned. The material that was originally planned to placed in this landfill will instead be buried in the Waste Rock Dome. In order to monitor possible leachate, wells originally planned for the demolition landfill should be moved to up gradient and down gradient of the Dome.		**CIRNAC COMMENT:** CIRNAC concerns were addressed.			
53	**7 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-07) CIRNAC recommends the licensee install monitoring wells upstream and downstream of the waste rock dome and include their monitoring in Table 9 of the PCMP.	**LMI RESPONSE:** CIRNA's comment above in regard to material that was originally planned to be placed in this landfill will instead by buried in the Waste Rock Dome is an incorrect statement. Instead, the non-hazardous waste materials generated by demolition will be placed into the existing landfill facility, which has been raised to accommodate these materials. LMI has not stated and does not plan on placing anything other than waste rock into the Waste Rock Dome. As stated in the PCMP, per Water Licence requirements, seepage surveys and applicable sampling will be conducted twice yearly at the landfill facility (LUP-31 and LUP-35) and Waste Rock Dome (LUP-SP-01 to LUP-SP-XX) through the Phase 2 Passive Monitoring, as for Phase 1 Active Monitoring (Table 9). Surveys will be conducted once in late spring after complete melt and once in late summer (late August or September) before freeze-up. This monitoring requirement is consistent with response to CIRNAC TC No. 17 during the Water Licence		**LMI RESPONSE:** Thank you. LMI considers this item resolved.		

				review process, whereby LMI committed to monitor and sample seeps from the domed covered waste rock area.				
54	**8 CIRNAC Comment**		**CIRNAC COMMENT:** Much of the content of the document is dated, and in some instances, unclear. The document contains references made to events/activities to be done in future that have already been undertaken. In various cases, the document provides detailed descriptions of what has occurred in the past, without inclusion in discussions of what has happened to the end of 2020, and what if anything remains to be done. For example section 4.7.8 Fuel Storage, refers to 14 diesel tanks, 1 jet A tank and 9 individual tank, without mentioning that some have been removed and others are still standing. The PCMP covers 2021, during which time it is important to have a clear schedule that illustrates the activities proposed to be carried out during the "active period" and the expected completion date for these activities. The schedule should include when the J and 1A dams will be breached and when final pond water elevations of 480 m for Pond 2 and 481 m for Pond 1 will be established.		**CIRNAC COMMENT:** In comment R-08, CIRNAC recommended that: The PCMP be modified to include a schedule of activities with expected completion dates. In its response, the Licensee stated that an updated schedule has been provided to CIRNAC and the schedule will also be provided with the Final Closure and Reclamation Plan (FCRP) addendum (s) as part of the Annual Report. The updated version of the schedule provided does not address CIRNAC's concern, as the following details are missing from the schedule: • Extent or degree the items planned in the 2020 schedule have been completed; • Details on the time lines of work planned for 2021; and • Duration of each activities. However, on June 21, 2021, the Licensee provided more detailed schedule for the 2021 earthworks reclamation activities to CIRNAC field inspectors. It will be helpful if the Licensee incorporate this amount of detail into the FCRP addendum that will be submitted alongside the annual report.			
55	**8 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-08) CIRNAC recommends the PCMP be modified to include a schedule of activities with expected completion dates.	**LMI RESPONSE:** Section 4.0 Summary of Final Closure provides an overview of the FCRP. Under Section 4.0 it states, "The approved FCRP has been prepared on the assumption that all facilities and installations that comprise the Lupin Mine Operations will ultimately be decommissioned, removed, or reclaimed under the terms of the land lease and in accordance with the reclamation requirements set out in the Water Licence (LMI 2020a). For complete and comprehensive details associated with final remediation and closure refer to the FCRP." An updated schedule has been provided to CIRNAC and the schedule will also be provided with the FCRP addendum(s) as part of the Annual Report.		**LMI RESPONSE:** As per LMI's original commitment above, LMI will provide an updated schedule (FCRP Table 14 – Summary of Measures for Final Closure) with the Rev 2 FCRP addendum as part of the Annual Report. The approved FCRP states, "Table 14 lists the measures that will need to be implemented to achieve permanent closure at both locations. The following subsections provide descriptions of the measures for each component." While there are years associated with each task, Table 14 was never intended to be a detailed schedule of activities but a summary of measures to achieve permanent closure. To assist CIRNAC with planning for inspections/engineers to be on site and verify the work being carried out and completed, LMI provide a detailed schedule to CIRNAC in January 2020 for the 2020 work program. A revised schedule for 2021 was provided to the Inspector for the same purpose, to assist with inspection timelines etc and the Inspector was advised that this earthworks schedule would be fluid due for various factors. It would not be prudent to include an every evolving plan in the FCRP addendum as the FCRP Addendum's are revised and submitted with the Annual Report once a year. LMI is working with the Inspector and Manager of Field Operations to coordinate inspections and site visits for their consultant engineers (staying at site one to two weeks at a		

						time) to ensure that the work is being carried out as planned and to timing of activities to ensure items are inspected for potential security requests. LMI considers this item resolved.		
56	**9 CIRNAC Comment**		**CIRNAC COMMENT:** Figures presented in Appendix A do not illustrate the site as it is in 2021, or as it will be once closure activities are completed. As such, it is difficult to evaluate the location of sampling sites or to put the proposed monitoring in context. For example, Figure 4 shows the TCA pre-2020, but there is no illustration for after closure and no indication of where the spillway will be built and what the water levels will be. Figure 8 shows 13 seepage surface water sampling locations, but it is not clear if these are LUP-SP-01 to LUP-SP-XX referred to in Table 9. There is also no figure for seeps from the TCA, identified as LUP-TCA-01 to LUP-TCA-XX in Table 9.		**CIRNAC COMMENT:** Licensee is committed to updating the PCMP figures on completion of the closure and reclamation activities. CIRNAC will comment further once the drawings become available.			
57	**9 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-09) CIRNAC recommends the PCMP include figures that show site conditions after planned closure works are completed, and include all the sampling stations.	**LMI RESPONSE:** LMI commits to updating the PCMP figures once the closure and reclamation is complete. Seeps from the waste rock dome (LUP-SP-01 to LUP-SP-XX) and TCA (LUP-TCA-01 to LUP-TCA-XX) are not shown on figures, as they have not yet been sampled. Surveys will be conducted in spring freshet 2021 at the TCA and at the waste rock dome after construction (if flowing water is observed). The location of these seeps cannot therefore be documented until after the 2021 sampling programs. As stated in the PCMP for LUP-TCA01 to LUP-TCA-XX, seep sampling locations will be added to the post closure monitoring program as new seeps are documented.		**LMI RESPONSE:** Thank you. LMI considers this item resolved.		
58	**10 CIRNAC Comment**		**CIRNAC COMMENT:** Section 1.4 of the PCMP states "General monitoring is subject to change, as directed by an Inspector or by the Licensee, and is also subject to approval by the NWB[Nunavut Water Board]." CIRNAC would like to clarify that an Inspector has the authority to request additional monitoring or changes to monitoring without approval by the Board. Should the licensee want to change general monitoring conditions, approval from the Nunavut Water Board would have to be sought beforehand.		**CIRNAC COMMENT:** Licensee is committed to updating the wording in section 1.4 of the PCMP to reflect the water licence thus: *Wherein general monitoring is subject to change as per the water licence, Part J, Item 8, which states: Additional monitoring requirements may be requested by the Inspector (note: without approval of the Board); or Part J, Item 10, the Licensee shall submit to the Board for approval any requests for changes(s) to the Monitoring Program as outlined in Part J and Schedule J, including justification for the change(s). The NWB may modify the Monitoring Program under Schedule J without an Amendment to the Licence.* This addresses CIRNAC's concern and we request this be added in a PCMP addendum.			
59	**10 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-09) CIRNAC recommends the licensee clarify the text regarding changes to general monitoring in the next revision of the PCMP.	**LMI RESPONSE:** LMI will update the wording to reflect the water licence wherein general monitoring is subject to change as per the water licence, Part J, Item 8,		**LMI RESPONSE:** LMI will update the wording in Section 1.4 as per above in a PCMP addendum.		

				which states: Additional monitoring requirements may be requested by the Inspector (note: without approval of the Board); or Part J, Item 10, the Licensee shall submit to the Board for approval any requests for changes(s) to the Monitoring Program as outlined in Part J and Schedule J, including justification for the change(s). The NWB may modify the Monitoring Program under Schedule J without an Amendment to the Licence. Refer to Section 5.0 and Appendix D.		LMI considers this item resolved.		
60	**11CIRNAC Comment**		**CIRNAC COMMENT:** Table 13 reports one thermistor in Dam 1A and one thermistor in Dam 4 were damaged in 2020 and there will be an attempt to repair them. No plans or information on what the attempts will entail are provided.		**CIRNAC COMMENT:** The licensee is committed to repairing the damaged thermistors and including the results of the repairs in the annual report. This addresses CIRNAC's concern and we request this be added in a PCMP addendum.			
61	**11 CIRNAC Recommendation and LMI Responses**		**CIRNAC Recommendations:** (R-09) CIRNAC recommends the licensee clarify the text regarding changes to general monitoring in the next revision of the PCMP.	**LMI RESPONSE:** As noted in the approved FCRP and PCMP, a spillway will be constructed through Dam 1A after closure and Dam 4 will be declassified so while LMI will make an effort to repair the thermistors, they are not critical for post closure monitoring as they will no longer be water retaining structures. The results of any repairs will be included in the Annual Report.		**LMI RESPONSE:** Thank you, to clarify LMI committed to make every effort to repair the thermistors and LMI will provide any repair updates in the Annual DSI Report. LMI considers this item resolved.		

APPENDIX C – TABLE OF REGULATORY REVIEW COMMENTS/RESPONSES/COMMITMENTS/APPROVALS/ STATUS

APPENDIX D – NWB LETTER – PART E, ITEM 25, ITEM 26 AND ITEM 27 SATISFIED

APPENDIX E – WASTE ROCK "DOME" COVER CONSTRUCTION DESIGNS (SIGNED) AND TECHNICAL MEMORANDUM

APPENDIX F – NWB LETTER – UPDATED FCRP REV 1 APPROVAL

APPENDIX G – FCRP REV 2 ADDENDUM

APPENDIX H – 2020 ANNUAL REPORT

APPENDIX I – PART E, ITEM 25 – DESIGN FOR WASTE ROCK "DOME" TECHNICAL MEMORANDUM AND DRAWINGS

APPENDIX J – PART E, ITEM 26 – TECHNICAL MEMORANDUM GEOTECHNICAL DETAILS ON DAM K AND DAM M CROSS SECTIONS WITH SPECIFICATIONS AND DESIGNS

APPENDIX J1 – PART E , ITEM 26 – TCA CLOSURE DESIGNS WITH SPECIFICATIONS – SIGNED

APPENDIX J2 – PART E, ITEM 26 – TCA DRAWING 005 – OUTFLOW REVB – SIGNED

APPENDIX K – PART E, ITEM 27 – TECHNICAL MEMORANDUM ON EXPOSED TAILING PRELIMINARY COVER DESIGN

APPENDIX L – 2020 WATER QUALITY MONITORING PLAN AND WATER AND SOIL QUALITY CONTROL AND QUALITY ASSURANCE PLAN

APPENDIX M – QA/QC PLAN CIRNAC COMMENTS

APPENDIX N- LMI PMCP AND QA/QC RESPONSES TO CIRNAC, ECCC AND KIA

APPENDIX O – PHASE 1 ENVIRONMENTAL SITE ASSESSMENT – MORROW 2006

APPENDIX O2 – PHASE 2 ENVIRONMENTAL SITE ASSESSMENT – MORROW 2006

APPENDIX P – UPDATED PHASE 1 AND PHASE 2 ENVIRONMENTAL SITE ASSESSMENT – GOLDER 2017

APPENDIX Q – 2021 POST CLOSURE MONITORING PLAN WITH APPENDICES

APPENDIX T – JAN 2020 RECLAIM ESTIMATE

APPENDIX U – CIRNAC COMMENTS FCRP REV 1

APPENDIX V – LMI RESPONSES FCRP REV 1