

August 31, 2021

Nick Michael  
Union Milling Company, LLC  
P.O. Box 620490  
Littleton, CO 80162-0490



1313 Sherman Street, Room 215  
Denver, CO 80203

***RE: Leadville Mill, Permit # M-1990-057 , 112d Conversion (CN-01) Application Adequacy Review***

Mr. Michael:

The Division of Reclamation, Mining and Safety (Division) is in the process of reviewing the above referenced application in order to ensure that it adequately satisfies the requirements of the Colorado Mined Land Reclamation Act (Act) and the associated Mineral Rules and Regulations of the Colorado Mined Land Reclamation Board for Hard Rock, Metal, and Designated Mining Operations (Rules).

Please note that pursuant to Rule 1.11.2 (3) the Operator shall provide all the information required by the Act and Rules for the 112(d) operation. The Operator need not supply any information required by the provisions of the Act which has been previously supplied unless such information is different from that in the original application. However, the Operator shall clearly describe where in the original application and supporting documents the information not included in the conversion application, but necessary to render the conversion application technically adequate, may be found.

During review of the material submitted, the Division determined that the following issue(s) of concern shall be adequately addressed before the application can be considered for approval.

1. Pursuant to Rule 1.6.2 (1)(g) provide proof of notices provided for in Rule 1.6.2 (1)(e).
2. Rule 6.4.1 Exhibit A – Legal Description

The application and legal description state the permit area is 20.7 acres. The map, produced by Backlund Land Surveys, included with Exhibit A shows a parcel area of 20.0 acres. Please address this discrepancy and state the correct affected area acreage. The affected area acreage should be consistent with the area shown on maps in Exhibit C.

3. Rule 6.4.4 Exhibit D – Mining Plan

On page 4-20 of Exhibit D the application states “The same 4.6 ac TSF is utilized”. Mine plan maps in Exhibit C show a TSF covering an area closer to 2 acres. Please address this



discrepancy and state the correct TSF area. The TSF description should be consistent with the TSF shown on maps in Exhibit C.

4. Rule 6.4.5 Exhibit E – Reclamation Plan

On page 5-1 of Exhibit E the application states that approximately 1,500 yds.<sup>3</sup> of topsoil is currently stockpiled on site. Please describe the Operator's plans to establish a vegetative cover over the stockpiled topsoil in order to prevent deterioration and to ensure it remains in a usable condition for reclamation pursuant to Rule 3.1.9 (1).

5. Rule 6.4.5 Exhibit E – Reclamation Plan

On page 5-1 of Exhibit E the application states that the above existing 1,500 yds.<sup>3</sup> topsoil stockpile will be used for reclamation of the entire affected area. On page 5-5 the application states that the stockpile will be used to provide 4" cover over the TSF. Please clarify.

6. Rule 6.4.5 Exhibit E – Reclamation Plan

On pages 5-4 and 5-5 of Exhibit E the application states that the TSF will be covered by 8" of embankment material, then 4" of topsoil and 4" of suitable plant growth material.

Please provide a description of the "suitable plant growth material" that will be used. In order to establish the quality of suitable plant growth material, please sample and provide analysis to the Division.

Additionally, please provide to the Division the amount and stockpile location of this suitable plant growth material that is available at the site.

7. Rule 6.4.5 Exhibit E – Reclamation Plan

On page 5-5 of Exhibit E the application states that the TSF will be capped with 18" of suitable material. The paragraph preceding this statement describes 16" of cover material. Please clarify this discrepancy.

8. Rule 6.4.7 Exhibit G – Water Information

Pursuant to Rule 6.4.7 (3) please provide an estimate of the project water requirements, including flow rates and annual volumes for the development, mining and reclamation phases of the project.

9. Rule 6.4.7 Exhibit G – Water Information

Pursuant to Rule 6.4.7 (4) please provide the projected amount from each of the sources of water to supply the project water requirements for the mining operation and reclamation.

10. Rule 6.4.12 Exhibit L – Reclamation Costs

Task 3 of the Reclamation Cost Estimate provided with your application shows removal cost for on-site reagents. Costs for two of the line items, Cyanide and Others were left blank. Please include these costs in your reclamation cost estimate.

11. Rule 6.4.19 Exhibit S – Permanent Man-made Structures

Your application includes structure agreements that are not executed. Please provide fully executed structure agreements for the following structures located within 200 feet of the affected area:

- (1) Leadville Sanitation District sewer pipeline, polishing pond and fence
- (2) Benson, George A. and Elizabeth L. access road and residence
- (3) Phillips Revocable Trust, access road and concrete structure
- (4) Wood, Derrick and Christina access road
- (5) Fowler, Justin Brown and Anne Marie access road
- (6) Xcel Energy Gas Pipeline and Power Line.

12. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan - Designated Chemical(s) and Material(s) Handling

Pursuant to Rule 6.4.21 (6)(a) please fully describe the procedures for the disposal, decommissioning, detoxification or stabilization for all designated chemicals and toxic or acid-forming materials. Specifically describe measures to be taken to prevent any unauthorized release of pollutants to the environment. Include adequate reclamation and closure practices for such designated chemicals, toxic or acid-forming materials and how unauthorized discharge of acid mine drainage will be prevented.

Also, pursuant to Rule 6.4.21 (6)(b) please submit a narrative description or plan that:

- (i) describes how all designated chemicals used in the extractive metallurgical process will be handled during active mining operations, during periods of Temporary Cessation, and disposed or detoxified at the conclusion of operations so as to comply with all applicable environmental protection and reclamation standards and regulations;
- (ii) describes how materials that have the potential to produce acid mine drainage or are toxic or acid-forming will be handled to ensure that the affected lands will be reclaimed and returned to the approved post-mining land use; and
- (iii) describes how the Operator/Applicant will prevent adverse off-site impacts during periods of active mine site operations and periods of Temporary Cessation.

13. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan – Facilities Evaluation

The Division considers the mill and tailings storage facility to be “Environmental Protection Plan facilities”. Pursuant to Rule 6.4.21 (7) please provide a separate evaluation for each of these facilities, describing the expected effectiveness of each facility, taking into consideration the following:

- (a) site-specific conditions;
- (b) designated chemicals, acid mine drainage and toxic or acid-forming materials and associated by-products and sludges that will be retained, either temporarily or permanently, on site by each facility;
- (c) naturally occurring geological and geochemical conditions, and alterations of these conditions by the mining and metallurgical process.

- (d) Describe, with maps and narrative, the monitoring systems, monitoring site locations, sample designator, parameters sampled, frequency of sampling, report dates, media sampled, method of sampling and analysis employed or to be employed during mining and reclamation operations to evaluate the effectiveness of each Environmental Protection Plan facility and activity.
- (e) Taking into consideration the nature of the chemicals and the risk to human health, property and the environment, describe any release response procedures, redundancies, and "backup" measures necessary, appropriate, and economically reasonable, to control, prevent and mitigate releases of the designated chemicals and toxic or acid-forming materials from the containment facility outside the permit area during mining and reclamation operations.
- (f) Demonstrate that containment facilities shall be of adequate size to provide sufficient reserve capacity to prevent a release of designated chemicals or toxic or acid-forming materials from design storm events plus operational water volumes during worst case conditions as specified by the Office.

14. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan – Groundwater Information

Pursuant to Rule 6.4.21 (8)(b) please identify all known aquifers and related subsurface water-bearing fracture systems within two (2) miles of the affected lands. In addition, provide the general direction and rate of flow of groundwater in these aquifers and fracture systems.

15. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan – Groundwater Information

Pursuant to Rule 6.4.21 (8)(e) please describe and illustrate the hydrogeology of the area where surface or groundwater may be impacted by the Designated Mining Operation activities. Include in the description and illustration, those geologic strata and fracture systems that have the potential to transmit groundwater.

16. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan - Surface Water Control and Containment Facilities Information

Pursuant to Rule 6.4.21 (10)(a) please provide design specifications certified by a licensed professional engineer for all Environmental Protection Facilities (mill and TSF) intended to:

- (i) hold, convey, contain, or transport designated chemicals used in the extractive metallurgical process.

17. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan – Water Quality Monitoring Plan

Your application provides a water quality monitoring plan pursuant to Rule 6.4.21 (12) on page 21-24 of the application. The application describes two existing monitoring wells, MW-2 and MW-3. Figure 3-3 of Exhibit E shows MW-3 up-gradient of the existing 110 permit affected area and MW-2 as the point of compliance well at the southwest corner of the property. In order to monitor water quality potentially affected by the mill area the Division would like to see another down-gradient monitoring well installed southwest of the mill building and northwest of the TSF, near the west permit boundary at approximate coordinates

39.230008°, -106.333338°. Please commit to installation of this additional monitoring well and incorporation into the proposed water quality monitoring plan.

18. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan - Climate

Pursuant to Rule 6.4.21 (13)(a) provide adequate climatic data representative of the site to perform an acceptable "water balance" for all liquid containment systems open to the environment and intended to contain designated chemicals or acid mine drainage, and demonstrate that the amount of evaporation required to maintain reserve facility capacity will occur, or that there is sufficient reserve capacity to compensate for the uncertainty associated with the data.

19. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan - Climate

Pursuant to Rule 6.4.21 (13)(b) provide the following information regarding climatic factors (data may be provided from existing stations within the vicinity of the Permit area):

- (i) the mean annual precipitation for a minimum of five (5) years and, where available, one set of data for the wettest year on record for the area;
- (ii) the average direction and velocity of the prevailing winds;
- (iii) the mean monthly temperature and temperature ranges for a minimum of five (5) years;
- (iv) site-specific evaporation and sublimation rates for the proposed site.

20. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan - Geochemical Data and Analysis

Pursuant to Rule 6.4.21 (14) please submit geochemical evaluations of any material that will be placed in on-site solution containment systems or facilities, stockpiled, or disposed of on the affected land, and that has the potential to cause acid mine drainage or to release designated chemicals, or toxic or acid-forming materials.

(a) Such evaluations shall be site specific and appropriate for the types of materials exposed or to be exposed by the mining and reclamation operations.

(b) Such evaluations shall be conducted on materials that are representative of the composition of the mineral, rocks or materials that are exposed or to be exposed during the proposed life of the mining operations.

(c) Such evaluations shall be appropriate for the intended use or fate of the material exposed or to be exposed during the proposed life of the mining operations, and on a case-by-case basis shall include evaluation of weathering effects, shall simulate, to the extent reasonable, the conditions under which the material will be used, stockpiled or disposed and which shall reasonably be expected to prevail after mining and reclamation operations have ceased.

(d) Such evaluations shall be performed on both ore and overburden, and shall identify the most reasonable sources, probable fate, and transport mechanisms of metal and acid-producing minerals that may be mobilized by ordinary weathering reactions that are likely to prevail after mining and reclamation operations have ceased. Such analyses may include only those tests that are necessary to satisfy the conditions of Rule 6.4.21(14)(c), and such evaluations may be prioritized, in descending order of importance, as follows:

- (i) mineralogical analyses;

- (ii) trace element analyses;
- (iii) major element analyses;
- (iv) microprobe or other comparable analyses.

(e) Where a net neutralizing, metal adsorption or metal ion exchange potential over the long-term cannot be demonstrated, the Operator/Applicant shall fully describe measures to prevent unpermitted discharges, and how reclamation, sufficient to achieve the post-mine land use will be assured.

21. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan - Construction Schedule Information

Pursuant to Rule 6.4.21(15) please provide a detailed construction schedule for the following:

- (a) all facilities designed to contain or transport toxic or acid-forming materials or designated chemicals used in the extractive metallurgical process; and
- (b) all facilities proposed to contain, hold, or for disposal of material that has the potential to cause acid mine drainage.

22. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan – Quality Assurance and Control

Pursuant to Rule 6.4.21(16) please describe the Quality Assurance and Quality Control program and measures to be employed during construction of those Environmental Protection Facilities that typically warrant Quality Assurance and Quality Control.

23. Rule 6.4.21 EXHIBIT U – Environmental Protection Plan – Plant Growth Medium

In order to assure that acceptable plant growth medium is preserved, and to determine what soil amendments may be necessary to promote reclamation, pursuant to Rule 6.4.21(17) please:

- (a) provide a soil survey map of the proposed affected area that delineates soil units, soil texture, estimated cubic yards of soil and subsoils available for reclamation and if saved, where such material will be stockpiled for reclamation;
- (b) such map shall be based on site specific soils investigations and shall be on such a scale as to provide a basis for soil management recommendations and be the same scale as the reclamation map; and
- (c) provide, for each soil map unit, in tabular form, all data from analyses of representative samples of surface and subsurface soil units as to:
  - (i) soil pH, texture, electrical conductivity, sodium adsorption ratio and any other parameters that the Operator/Applicant or Office deems necessary for proper soils characterization;
  - (ii) indicate on a map, or in the soils narrative the location of each soil unit on the affected area where the above soil characteristics may be problematic as to suitability for a plant growth medium; and
  - (iii) type, form and amounts of any soil amendments that may be necessary or recommended by the local Soil Conservation Service, Conservation District, or other

qualified special district, and standard soil laboratory analyses and fertilizer recommendations (if available) for the types of plant species proposed to be established; or

(iv) provide, as an alternative to Rule 6.4.21(17)(c), a plan of experiments to determine the type, form and amount of any soil amendments that may be necessary to fulfill the requirements of the Reclamation Plan.

24. Domestic water wells, Derrick Wood permit # 83329 (Constructed 8/8/1976) and Harry Hodson permit # 6616 (Constructed 8/15/1960), exist approximately 500 feet west and hydrologically down-gradient from the TSF and mill facility. Any failure of the TSF or mill containments pose serious risk to the wells and human health and safety. Please describe how the proposed operation can operate in a manner that will be protective of water quality and human health and safety.
25. The TSF will be constructed with a leak detection system. What backup protective measures will be in place to prevent migration of contaminants into the ground water system should a leak be detected?

### **Mill Facility**

The Division considers the mill facility to be an Environmental Protection Facility (EPF). As such, the application will need to address all sections of Rule 6.4.21 applicable to the mill. Please provide the following:

1. Mill Facility Construction Details – should include:
  - a. General Design Summary
  - b. Details regarding how the concrete foundation and containment structures were designed and built, including any coatings applied to the floor and or walls.
  - c. If available, provide any QA/QC documentation for the construction.
  - d. Drawings and narrative of piping and delivery systems of designated chemicals, verification that the entire length of delivery lines exist within a form of secondary containment.
2. Secondary and tertiary containment structures
  - a. Details regarding the secondary containment structures. This should include calculations demonstrating maximum containment volumes of each area, as well as details regarding sump systems and where they report to.
  - b. Details regarding tertiary containment if any.
3. Milling Process
  - a. A detailed narrative of the milling process, including the use and application of designated chemicals in the milling process. The narrative should also include the nature

- of the chemicals used, their hazards, SDS sheets, and all storage locations within the Mill Facility, delivery of reagents into the milling process, piping systems etc.
- b. Diagrams and drawings demonstrating the flow of material from source to sink including crusher circuit, flotation circuit, drying and packaging as well as tailings flow path.
  - c. Tailings Chemistry
  - d. Milling capacity, including maximum output and an average range of material processed.
4. As Built Certifications
- a. Engineering evaluations and stamped certified as-built documentation should be submitted for the Mill building foundation, secondary containment structures, and for the milling and tailings handling equipment. The certifications should also include the credentials of the individual or team certifying the review.

**Tailings Storage Facility (TSF)**

The application proposes doubling the operating capacity of the mill, from 200 tons per day to 400 tons per day and adding a cyanide circuit to the milling process. Under the current 110d permit, through AM-01 and TR-04, a TSF design was approved by the Division. The current application proposes operations that would result in significant changes in the tailings volume and tailings composition (i.e. doubling the production rate and addition of cyanide to the system). The Division considers the TSF to be an Environmental Protection Facility (EPF). As such, the application will need include TSF design plans and construction details adequate to address all sections of Rule 6.4.21 applicable to the TSF, that are based on the mining plan proposed in this application.

Please submit your response(s) to the above listed issue(s) by Friday, September 24, 2021 in order to allow the Division sufficient time for review.

The Division will continue to review your application and will contact you if additional information is needed.

If you require additional information, or have questions or concerns, please contact me.

Sincerely,



***Dustin Czapla***

Environmental Protection Specialist

Division of Reclamation, Mining and Safety

Phone: (303) 866-3567, ext. 8188