



5.0 RULE 6.4.5: EXHIBIT E-RECLAMATION PLAN

5.1 MILL SITE SOILS

A Natural Resource Conservation Service (NRCS) soil survey summary for the permit area (**Appendix 9-1, Exhibit I NRCS Soil Survey**, April 18, 1990) is as follows:

- ~~The soil is Leadville~~ Mill site soil is sandy loam.
- Slopes range from 3 to 35%.
- Topsoil salvaging activities may be difficult due to the shallow soil depths ~~and~~ ~~rock~~.
- Approximately ~~1,500yd³~~ ~~250st~~ of topsoil **and suitable plant growth material**²⁵ is currently stored on site for future reclamation purposes. The stored material will provide less than 1 inch of topsoil over existing disturbed areas.

5.2 RECLAMATION SEED MIX

Recommended (Arkansas Valley Seed) approved by CDRMS seed-mix-is shown-in

²⁵ A1AR1Q47



. includes. The seed mix as accepted by the Division in other reclamation projects was recommended by Arkansas Valley Seed.



TABLE 5-1: RECLAMATION SEED MIX

Species	Scientific Name	Variety	Pls lbs/Acre
Yarrow	Achillea lanulosa		0.1
Groundsel	Senecio atratus		0.1
Lupine	Lupinus perennial lupine		1.0
Slender wheatgrass	Elymus trachycaulus	San Luis	1.4
Nodding brome	Bromus anomalus		2.5
Sheep fescue	Festuca ovina	Covar	0.5
Hard fescue	Festuca ovina duriuscula	Durar	0.5
Red fescue	Festuca rubra	Penniawn	0.5
Tufted hairgrass	Deschampsia caespitosa		0.5
Redtop	Agrostis alba		0.1
Blue wildrye	Elymus glaucus		1.75
Muttongrass	Poa fendleriana		0.5
		TOTAL pls lbs/acre (drilled)	9.45

- Arizona Fescue, 4.5pounds live seed (PLS) per acre. 50% of seed mix- 2.25 lbs,
- Nodding Brome, 19 PLS per acre. 10% of seed mix-1.9 lbs,
- Junegrass, 10 PLS per acre. 20% of seed mix-3.8 lbs, and
- Western Wheatgrass, 16 PLS per acre. 20% of seed mix.²⁶-3.2 lbs

5.3 POST MILL LAN USE

The mill site area is zoned “Industrial/Mining” where future land use **will be Industrial.** ²⁷ ~~efforts will be designed to establish “wildlife habitat”.~~ The Mill does not have an active mine within the permit boundary. Final reclamation mill site grading topography is shown in **Figure 6-1 Exhibit F** and **Figure 6-2 Exhibit F**.

5.4 RECLAMATION PLAN

Upon cessation of the milling operation, the following site restoration and reclamation activities will be undertaken:

- Chemicals and petroleum hydrocarbons will be removed from the site and disposed or recycled in accordance with Federal and State regulations. ~~Designated~~ Chemicals or acid forming materials requiring detoxification or stabilization will be neutralized using lime prior to disposal. **Metallurgical test**

²⁶ A1AR1Q17

²⁷ A1AR3Q1



work indicates that ~~3.4kg~~ between 8-12lb of lime ($\text{Ca}(\text{OH})_2$) per ~~tonne~~ ton-RoM of ore would be required to neutralize acid forming material to a pH of about ~~9.0~~ 11. ~~This converts to approximately 6.4lb lime/ton-RoM.~~ For reclamation this amount will be doubled to ~~13.6~~ 16-24 lb-lime/ton-RoM as required. Given a maximum of ~~135~~ 400-tons of RoM that can be in the system and which is not neutralized, ~~approximately,~~ at maximum 2.4 ~~1~~ tons of lime will be required. Water is essentially the only fluid in the system and does not require neutralization as it goes through a cyanide detoxification process before reporting to the TSF. Reagents account for a small fraction of fluids, are generally neutral by nature, and also will not require neutralization. ~~1~~ 24 tons of lime (Table 4-9, page 4-11 in Exhibit D) will be kept on-site at all times²⁸;

- Mill equipment will be dismantled, sold, recycled or disposed off-site in approved facility.
- Debris, refuse, and other solid waste will be disposed in an approved ~~mono-fill~~ or-landfill;
- Utility infrastructure will be disposed, ~~sold~~, or recycled off site including poles, pumps, junction boxes, fences and ~~mill~~ power lines.
- Culverts and ~~monitoring wells~~ will be removed and ~~landfill~~ disposed, ~~off site~~;
- Drainage will be reclaimed and revegetated where necessary,
- ~~Wells will be abandoned in accordance with Colorado Division of Water Resources criteria;~~
- Monitoring wells will be plugged in accordance with Colorado Division of Water Resources (DWR) criteria and a well abandonment report will be filed.
- ~~Roads and other mill-disturbed areas (9.9ac) will be graded (4,000yd³) to blend with the approximate original contour.~~ Permit area is 20.7 acres where roads and other mill-disturbed areas (3.3 ac) will be graded (4,000yd³) to blend with the approximate original contour. **No constructed slopes within the permit area will exceed 3.0(H) to 1.0(V) unless approved by CDRMS;**²⁹
- Tailings in the TSF will be covered by up to 8 inches of embankment material. This material originates from the sides of the embankment and consists of an

²⁸ A1AR1Q43

²⁹ A1AR1Q32



estimated 3,600 yd³. Then, approximately 4 inches of topsoil - supplemented with up to 4 additional inches of suitable plant growth material, as available onsite³⁰ - will be placed over this material and seeded using the specified seed mix. Approximately 1,400yd³ of topsoil and suitable plant growth material will be required. This material was removed during TSF construction and exists at the site as shown in Figure 3-3, Exhibit C. No imported material will be required.³¹ TSF reclamation activities will geochemically characterize tailing prior to placing the cover, topsoil, or suitable alternative cover material. The geochemical characterization process is described in Section 5.5;³²

- The TSF will be capped with 18in of suitable material prior to initiating revegetation activities
- Reclaimed areas (excluding tailings discussed above) will be covered with 4in of topsoil and suitable plant growth material, which was recovered and restored during TSF embankment construction. Volumetric estimates indicate there is sufficient material stored on site to address reclamation requirements, so no salvaging of non-disturbed areas will be required.³³
- ~~• The tailings storage area reclamation activities will include geochemical characterization of surface tailings material prior to placing topsoil or suitable alternative cover material;~~
- ~~• Geochemical characterization will be conducted to demonstrate that the tailings are not toxic or hazardous and that the topsoil material will support vegetation.~~
- Disturbed or compacted areas will be ripped, scarified, topsoil placed, and seeded. Weed free straw mulch will be applied and crimped at a rate of **2.0st/ac** ~~1.0st/ac~~; ³⁴
- ~~• If necessary, soil amendments will be applied when soil tests indicate nutrient deficiencies for the plant species to be established. If soil or alternative media sample results deem it necessary, soil amendments will be applied;~~

³⁰ A1AR3Q4

³¹ A1AR1Q18

³² A1AR1Q20

³³ A1AR1Q22

³⁴ A1AR1Q20



- Storm Water control Best Management Practices (BMPs) will be installed to ~~convey water around or through disturbed areas to~~ minimize on and off-site erosion and sedimentation impacts, ~~and. A detailed description of the stormwater management is provided in Section 4.3.13, Drainage Control Appendix 21-1, Exhibit U.~~³⁵
- ~~Reclamation seed will be drilled at a rate of 9.45 pls lbs/acre as recommended by Arkansas Valley Seed. Should broadcast seeding methods be used instead, the seed application will be twice or 18.9 pls lbs/acre.~~
- ~~Seeds will be applied at a rate of approximately 50lbs per acre using drill seeding methods. If broadcast seeding methods are used, the seed application rates will be twice the amount recommended for drill seeding methods~~ **Seed drilling planting methods will be used, with an application rate of 9.45 pls lbs/acre. If broadcasting seeding methods are to be used, the seed application rate application will be 18.9 pls lbs/acre.**³⁶

Following the completion of ~~initial reclamation~~ Phase 1 reclamation activities, the mill site will be placed under a ~~post mill monitoring and a maintenance program.~~ Monitoring activities will identify areas requiring ~~fence or sign repair; the repair of eroded reclaimed lands; the control of noxious weeds and reclaiming areas were re-vegetated area have failed~~ site repair; including the repair of 6-inch rills formed on reclaimed lands; the control of noxious weeds and re-vegetated reclaimed area that have failed.

5.5 OPERATING SAMPLING & ANALYSIS PROGRAM³⁷

Geochemical characterization will be as follows:

5.5.1 INITIAL TESTING

Geochemical characterization will be as follows. Ore geochemical CDRMS acceptance criteria will be met prior to processing. Sampling operating procedures (SOPS) and analysis will include:

- **Completing a chain of custody form,**

³⁵ A1AR1Q21

³⁶ A1AR1Q23

³⁷ A1AR1Q24/Q45/Q46/Q48



- Obtaining representative samples
- Analyzing and rejecting ore that exceeds the following geochemical

Prior to accepting each production run ("Batch") of toll ore ("RoM") to be treated at the mill, it will be required that it be tested to assure it meets pre-specified Acceptance Criteria. For each Batch, Acceptance Criteria will include testing to assure that RoM:

- A. Can be economically processed within the operating limits of the mill; and
- B. Meets mill facility permitted conditions.

Acceptance testing will be performed by an independent laboratory before the RoM arrives on-site. The process will be as follows:

1. Seller and Buyer agree to "Economic Terms". E.g. payment based on RoM grade, process recovery, market prices, treatment costs, etc.
2. Batch of RoM to be processed is identified. This may, for example, be a specific stope in a mine, or a stockpile of RoM on the surface.
3. The Batch is surveyed to determine quantity and to collect a Representative Sample.
4. The Representative Sample is collected and sent to the Laboratory for testing using proper chain of custody procedures.
5. Economic Performance testing is completed to test Economic Terms (per Purchase or Milling Agreement) and determines the RoM Purchase Price.
6. Tailings Characterization testing is performed using SPLP for RoM and pH for leachates in tailings produced in the laboratory.

Only RoM passing the Acceptance Criteria will be allowed onto the mill property. Material failing the Acceptance Criteria will be rejected and will not be allowed onto the property.

5.5.2 TAILINGS CHARACTERIZATION TESTS

Tailings Characterization Testing will include SPLP, XRF and pH testing. [Table 5-2, Exhibit E](#) will be submitted quarterly to the Division for each new ore body, waste dump, or mine.



TABLE 5-2: ANALYTE REPORT (FORM)

Analyte	Detection Limit ¹ (mg/L)	Observed Value ² (mg/L)	XRF Baseline ³ (ppm)
Antimony (Sb)			
Aluminum (Al)		"	"
Arsenic (As)		"	"
Barium (Ba)		"	"
Beryllium (Be)		"	"
Boron (B)		"	"
Cadmium (Cd)		"	"
Chromium (Cr)		"	"
Cobalt (Co)		"	"
Copper (Cu)		"	"
Cyanide [Free] (CN)		"	"
Fluoride F)		"	"
Iron (Fe)		"	"
Lead (Pb)		"	"
Lithium (Li)		"	"
Mercury (Hg)		"	"
Manganese (Mn)		"	"
Molybdenum (Mo)		"	"
Nickel (Ni)		"	"
Total Nitrate+Nitrite		"	"
Selenium (Se)		"	"
Silver (Ag)		"	"
Zinc (Zn)		"	"

1. Denotes Detection Limit of SPLP test method.
2. Observed Value of tailings. From laboratory test work.
3. Grade of analyte in tailings using XRF to establish bounds of representative sample.

The SPLP will be the basis for determining acceptance/rejection of the Batch. SPLP tests will be conducted at a pH range of 6.5 – 9. XRF analysis will be used to determine the Representative Sample baseline of the Batch, as tested in the laboratory.