Mosch Exploration and Mining, LLC
P.O. Box 1484
Idaho Springs, CO 80452

August 3, 2018

Mr. Michael Cunningham
Environmental Protection Specialist

RE: Poorman Mine Technical Revision; DRMS File No. M-1982-058

Dear Michael,

Thank you for providing the comments for the Technical Revision No.1 for the Poorman mine submitted to the Colorado Division of Reclamation, Mining, and Safety on May 1st, 2018 by Mosch Exploration & Mining, LLC. To answer each of the questions, a new Permit map exhibit is enclosed and an exhibit with a Slope Stability Analysis.

Each of the comments about the application as stated by the Division of Reclamation Mining and Safety (DRMS) Environmental Protection Specialist Technical Review, dated May 21st, 2018, are listed with corresponding answers by Mosch Exploration & Mining, LLC.

Comment 1

"*The Operator has indicated explosives are stored in underground magazines. As required by Rule 6.3.6, please list the permits, licenses, or approvals which the Operator has obtained in order to store and use explosives."*

Currently no explosives are stored underground at the Poorman mine. The statement in the original application was misleading. When explosives are required, a blasting contractor is utilized that transports and uses only the quantity of explosives needed for a particular task that can be completed in one day.

The current types of exploration and excavation taking place at the Poorman mine do not require much blasting. When the need arises, that explosives will be required in larger quantities, appropriate permits from the Bureau of Alcohol, Tobacco, Firearms and Explosives will be obtained.

Comment 2

"The permit boundary which is depicted on the Mining Plan Map and the Reclamation Plan Map encompass an area of 3.21 acres. The Poorman Mine is permitted for 1 acre of disturbance. Therefore, the permit boundary on the Mining Plan and Reclamation Plan Maps must be revised to encompass an area of 1 acre. Pursuant to Rule 6.3.5(2), the Division considers the area bounded by the permit boundary to be analogous to the affected area."

Please see the enclosed modified permit map, Exhibit E. The revised permit boundary has an area of 1.0 acres. Mosch Exploration and Mining, LLC was not aware that the permit boundary and disturbance boundary must be the same area.

Comment 3

"The Operator has stated there is a historic road located at the base of the waste rock pile. The Division located a historic road utilizing Google Earth aerial photography, which is approximately 460 ft. south of the portal. Please clarify if this is the abandoned road which is referred to in the Mining Plan. As required by Rule 6.3.5(2)(c), please revise the Mining Plan Map to include an outline and label for the historic road. In addition, please note that all storm water control features must be located within the defined permit boundary."

The road located by the DRMS Environmental Protection Specialist is not the historic road described in the Technical Revision. As depicted in the modified permit map, Exhibit E, the historic road is at the based of the historic waste rock pile. It provides a flat surface that stops the flow of rock or water from moving down from the waste rock containment and allows water to infiltrate into the ground. The infiltration basin has an area of 1,000 square feet and has 2-foot-high berms on all downslope sides. The berms are at least 3 feet wide at their base. The basin will have a porous surface, so water will slowly infiltrate into the soil. The boundary of the Infiltration Basin is depicted with a green line in the Mining Plan Map, Exhibit E, Mining Plan Map. In addition, a section profile of the Infiltration Basin is shown in Exhibit E-Infiltration Basin Design.

Comment 4

"The Operator has stated stormwater runoff from the waste rock pile will be contained by a historic road located at the base of the waste rock pile. Please describe how the road will contain stormwater runoff. If the road serves as a physical barrier to the downhill flow of water, how will the Operator ensure stormwater does not follow the preferential path of the road and discharge to offsite areas? In addition, the Operator shall submit a cross-sectional drawing of the road which adequately demonstrates how the road will capture stormwater runoff from the waste rock pile."

The flat road that is currently just below the planned location of the future waste rock disposal will be converted to a 1,000 square foot infiltration basin. The basin will prevent

water from coming off of the waste pile by utilizing a berm of waste rock that will be at least 2 feet high and 3 feet wide at its base. This berm will be constructed on all sides where water might flow in a down hill direction. To accomplish this, the berm will be made on the south and east sides of the old road. In addition, the center area of the basin will be excavated so that it is at least 1 foot lower than the edges of the basin are. Please see the enclosed Exhibit E, Poorman Mine Infiltration Basin Design. The center of the berm shale also be 1 foot lower than the sides. The base of the berm will be left bare to allow water to infiltrate into the ground.

Comment 5

The Operator has stated the waste rock pile will be constructed at the angle of repose (1.3H:1V), since the historic waste rock pile has been stable at this slope. In addition, the Operator has indicated the current slope of the natural hill side is at 2.22H:1V. The approved Reclamation Plan states the new dump areas affected by the operation would be recontoured to conform with the immediate terrain. Therefore, the Division will require all newly constructed portions of the waste rock pile to be established at a slope no steeper than 2.2H:1V. Please revise the Reclamation Plan to reflect the waste rock pile will be constructed at 2.2H:1V. In addition, specify if the waste rock pile will be constructed at the approved final grade, or otherwise describe how the waste rock pile will be contoured during reclamation.

The request by the Division of Reclamation, Mining and Safety Environmental Protection Specialist to reclaim the waste rock pile at an angle of 2.22H:1V, the very same angle that the current hill side currently slopes at is impossible to accomplish. As soon as any rock is placed on the hill side, it must become stepper at least for a short duration to physically be there. The following diagram, Figure 1, shows why this statement of concern.

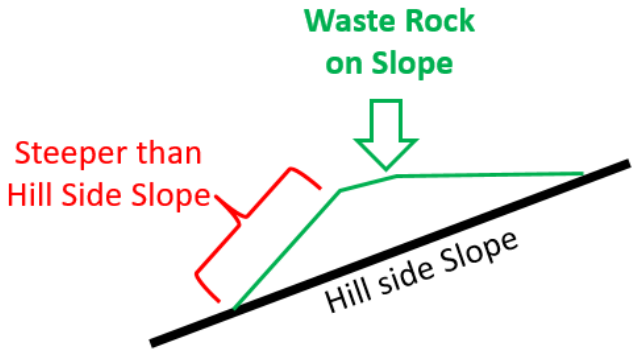


Figure 1, Waste Placement Diagram

The engineers of Mosch Exploration and Mining, LLC have completed a slope stability study, see Poorman Miine Waste Rock Geotechnical Stability Exhibit, that shows that with a 1.3 Factor of Safety that the waste rock will be stable at a slope angle of 32.7°. This is a slope of 1.56H:1V slope.

There are no buildings or any structures outside the permit area that could be affected by excavation activities. By the Mined Land Reclamation Board Policies, revised in May of 2018, Section 30.4, “Guidance for Stability Criteria and Use of Minimum Factor of Safety”, the appropriate Factor of Safety for this waste impoundment is 1.3. If a failure occurred at this operation, there would be no imminent danger to human life and have only minor environmental impacts. There are no critical structures that might be impacted by a failure of the Poorman Waste Pile.

Mosch Exploration and Mining, LLC request the Division of Reclamation, Mining and Safety allow the waste rock to be placed in the areas shown on Exhibit E, Mining Plan Map at an angle of 1.56H:1V or less. At this angle, the placement of waste rock has a Factor of Safety of 1.3.

Since the waste rock will have an angle of less than the angle of repose, 1.3H:1V, a Double Drum Slucher hoisting unit with an appropriate scrapper buck will be used to move the waste rock to attain the appropriate slope. This unit has a winch with two drums each containing steel cable. A smaller cable is use via a pully to move a scrapper bucket away from the hoisting unit. A larger diameter cable is used to case the scrapper bucket to fill and move a small amount of rock. Such a unit can move rock in any direction and attain any slope desired.

Comment 6

The Future Waste Disposal Area identified on the Mining Plan Map appears to be partially forested. Pursuant to Rule 3.1.9(2), woody vegetation at the site shall be removed from or appropriately incorporated into the existing topsoil. Please describe if the woody vegetation will be removed from the site or otherwise incorporated into the topsoil.

The woody vegetation shall be removed from the site before placement of waste rock is placed in the planned disposal area. It may be used as an incorporation in the topsoil or used as fire wood or, if appropriate, used in the underground openings as rock support.

Comment 7

The Operator has indicated the A and B soil horizons are 1” to 4” thick. Pursuant to Rule 3.1.9(1), topsoil shall be removed and segregated from other spoil. Please specify the estimated depth to which soil, suitable as a plant growth medium will be salvaged from the Future Waste Disposal Area.

The topsoil will be removed for a depth of 4 inches. This will be completed with a Scraper Hoist Slusher unit. All top soil will be stored uphill from the waste storage area just south of the access road to the mine. It will be stored as a berm next to the road. See Exhibit E, Mine Plan Map.

Comment 8

As required by Rule 6.3.4(1)(c)(i), state the thickness of plant growth medium which will be replaced over the top of the newly constructed portions of the waste rock pile.

The plant growth Medium which will be replaced over the waste rock pile during reclamation activities will be 4 inches.

Comment 9

The Operator has stated Aspen and Lodgepole Pine will be planted during reclamation. Please specify the total number of seedlings to be planted for each species or specify the number of each species to be planted on a per acre basis. This information is necessary to calculate the required financial warranty.

Aspen and Lodgepole Pine seedlings will be planted on the recontoured and soil covered reclaimed area. Seedlings types will be planted in the ratio of 50% Aspin and 50% Lodge Pole Pine. Either of the seedling will be planted approximately 10 feet apart both in the East-West in in the North-South directions or 100 trees for every 10,000 square feet. It is estimated that the area that will require revegetation is 8,100 square feet. This will require 81 tree seedlings. This assumes that the pre-existing flat areas near the portal will be needed for turning vehicles around since the mine is the end of the road.

Thank your for considering these responses on behalf of Mosch Exploration & Mining, LLC.

David Mosch
Mining Engineer
MMSA QP No. 01437QP
(775) 385-3638

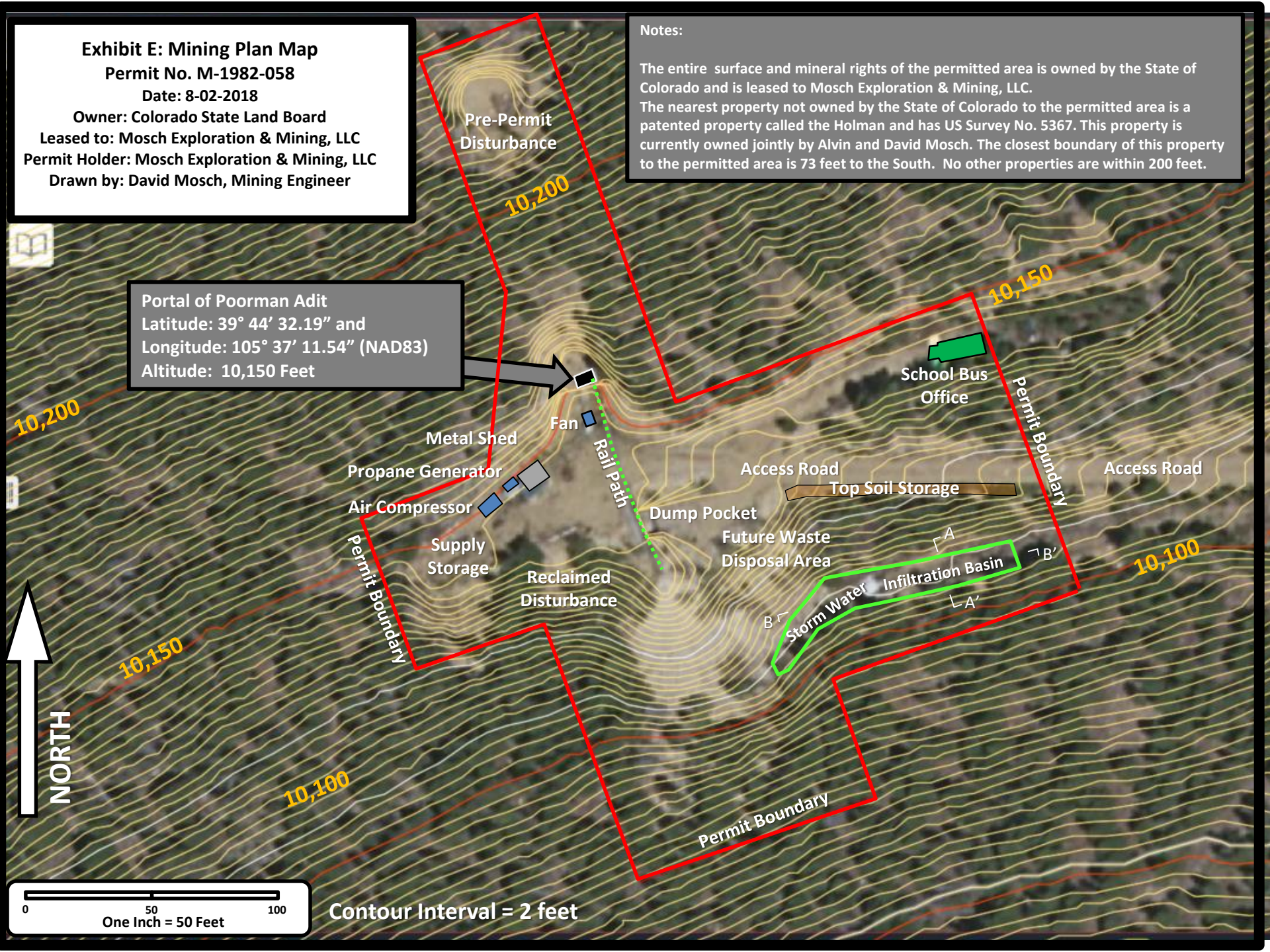


Exhibit E: Mining Plan Map
Permit No. M-1982-058
Date: 8-02-2018
Owner: Colorado State Land Board
Leased to: Mosch Exploration & Mining, LLC
Permit Holder: Mosch Exploration & Mining, LLC
Drawn by: David Mosch, Mining Engineer
Notes:
The entire surface and mineral rights of the permitted area is owned by the State of Colorado and is leased to Mosch Exploration & Mining, LLC.
The nearest property not owned by the State of Colorado to the permitted area is a patented property called the Holman and has US Survey No. 5367. This property is currently owned jointly by Alvin and David Mosch. The closest boundary of this property to the permitted area is 73 feet to the South. No other properties are within 200 feet.
Portal of Poorman Adit
Latitude: 39° 44' 32.19" and
Longitude: 105° 37' 11.54" (NAD83)
Altitude: 10,150 Feet
Pre-Permit Disturbance
10,200
10,150
10,100
School Bus Office
Permit Boundary
Fan
Metal Shed
Propane Generator
Air Compressor
Rail Path
Supply Storage
Reclaimed Disturbance
Dump Pocket
Future Waste Disposal Area
Access Road
Top Soil Storage
Infiltration Basin
Storm Water
A
A'
B
B'
NORTH
0
50
100
One Inch = 50 Feet
Contour Interval = 2 feet

Exhibit F: Reclamation Plan Map

Permit No. M-1982-058

Date: 8-2-2018

Owner:

Colorado State Land Board

Leased to:

Mosch Exploration & Mining, LLC

Permit Holder:

Mosch Exploration & Mining, LLC

Drawn by:

David Mosch, Mining Engineer

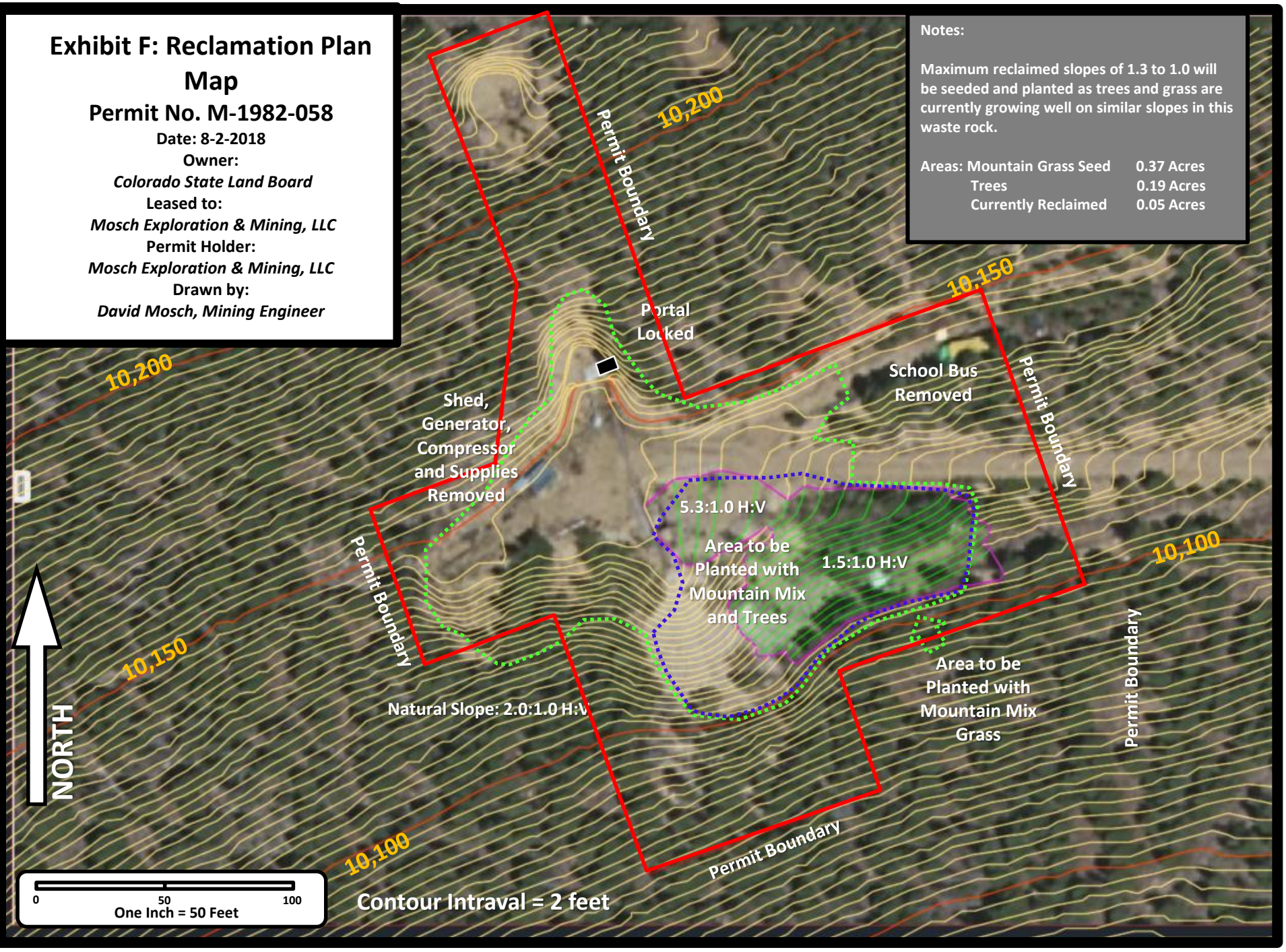


Exhibit E-Poorman Mine Infiltration Basin Design

Permit No. M-1982-058

Date: 8-2-2018

Owner:

Colorado State Land Board

Leased to:

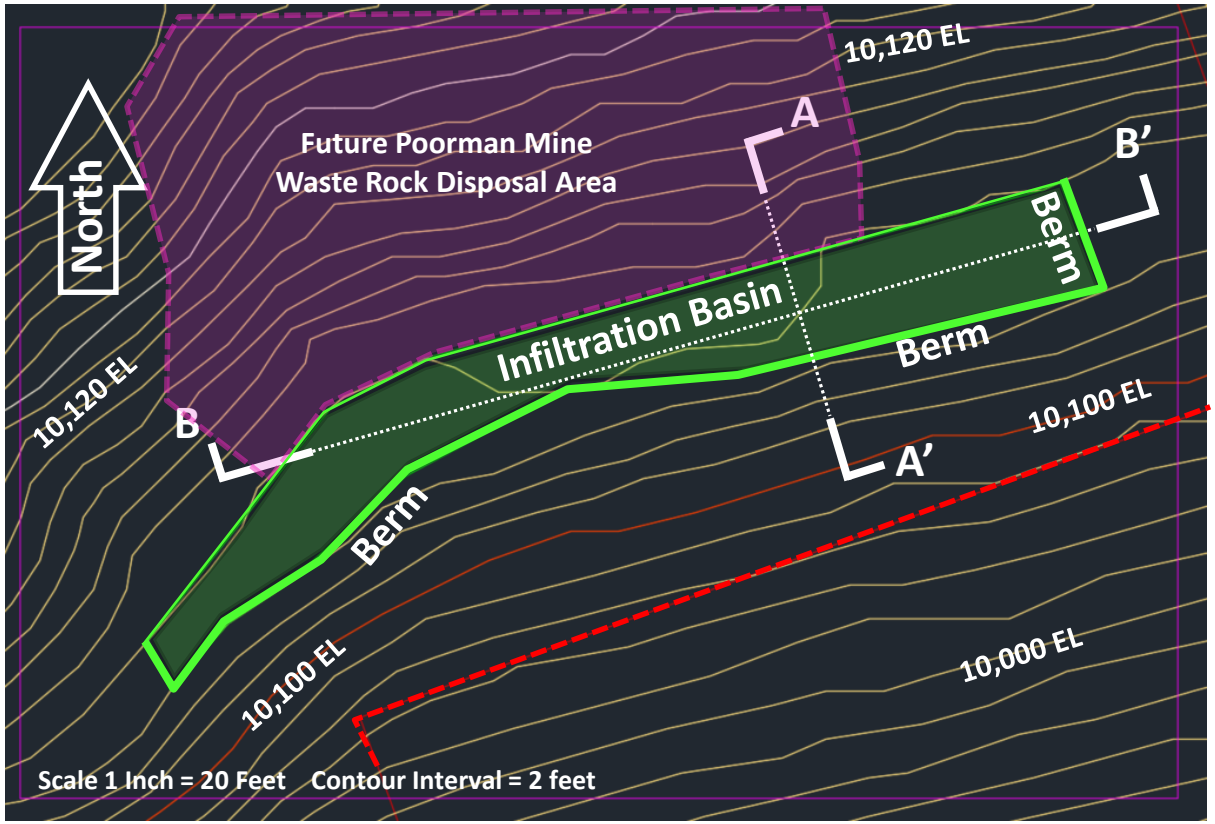
Mosch Exploration & Mining, LLC

Permit Holder:

Mosch Exploration & Mining, LLC

Drawn by:

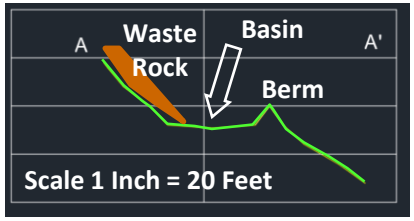
David Mosch, Mining Engineer



The Infiltration Basin will have an area of 1,000 square feet and will have a two foot tall berm with a three foot base on the South and East sides. The center of the Basin will be 1 foot lower than the sides.

This berm will be placed so runoff water from un-reclaimed waste rock is captured.

Section A to A'



Section B to B'

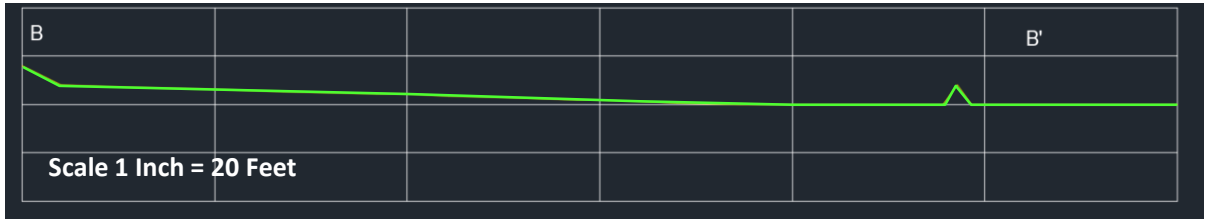


EXHIBIT C – MING PLAN GEOTECHNICAL STABILITY EXHIBIT

This Geotechnical Stability report is for the Poorman mine. The Poorman mine I located in Clear Creek County, Colorado and is in Section 36, Township 3 South, Range 74 West of the 6th Principle Meridian. It has DRMS File No. M1982058 110(2).

Samples of waste rock from the Poorman mine were combined and subjected to a Sieve analysis. The and screened products of each size fraction was examined to determine the contained rock type and general characteristics. The Sieve Analysis, Figure 1, showed that only ½ of a percent of the waste rock was smaller than 74 microns (-200 Mesh) and only 2.1% was smaller than 149 micron (-100 mesh) in minimum diameter. All the particles within each of the size fractions were angular with sharp edges as seen in Figures 2 through 4. The waste rock samples observed in the samples was either metamorphosed granite, migmatite or biotite gneiss. The expected compressive strength of the rock comprising these sample is in the 170 to 180 MPa range. This waste material will have no cohesion characteristics and failure estimation must be based upon the angle of internal friction.

Field observations were made of the historic waste rock piles from the mine to determine the angle of repose of the same waste rock. Multiple measurements provided an angle of repose of 39.9 degrees. This angle is in agreement with Table 2.1 of the SME Mining Engineering Reference Handbook, Page 12.

There are no buildings or any structures outside the permit area that could be affected by excavation activities. By the Mined Land Reclamation Board Policies, revised in May of 2018, Section 30.4, "Guidance for Stability Criteria and Use of Minimum Factor of Safety", the appropriate Factor of Safety for this waste impoundment is 1.3. If a failure occurred at this operation, there would be no imminent danger to human life and have only minor environmental impacts. There are no critical structures that might be impacted by a failure of the Poorman Waste Pile.

To maintain a Safety Factor of 1.3, the maximum slope angle that waste may have may be calculated as follows:

$$\text{Maximum Slope Angle} = \text{ArcTangent}\left(\frac{\text{Tangent(Internal Friction Angle)}}{\text{Factor of Safety}}\right)$$

$$\text{Maximum Slope Angle} = \text{ArcTangent}\left(\frac{\text{Tangent(} 39.8^\circ\text{)}}{1.3}\right)$$

$$\text{Maximum Slope Angle} = 32.7^\circ$$

The maximum Slope angle to maintain a safety Factor of 1.3 is 32.7°.

David Mosch

David Mosch
Mining Engineer, MMSA QP No. 01437QP

Date: 7-31-2018

Size		Mass	Percent Distribution	Cumlative Precent Passing
From (mm)	To (mm)	(grams)	(%)	(%)
> 50.8		10,795	33.65%	33.65%
25.4	50.8	6,622	20.64%	54.29%
15.24	25.4	5,080	15.84%	70.13%
10.16	15.24	1,040	3.24%	73.37%
1.68	10.16	5,534	17.25%	90.62%
0.595	1.68	1,502	4.68%	95.30%
0.297	0.595	674	2.10%	97.40%
0.149	0.297	157	0.49%	97.89%
0.105	0.149	244	0.76%	98.65%
0.088	0.105	177	0.55%	99.20%
0.074	0.088	87	0.27%	99.47%
< 0.074		170	0.53%	100.00%

Figure 1, Size Analysis of Waste Rock form the Poorman Mine

Figure 2, The Greater than 50.8 Millimeters Size Fraction

Figure 3, The 15.2 mm to 25.4 mm Size Fraction.

Figure 4, The 0.3 mm to 0.6 mm Size Fraction.