

Plan of Operations

Exploration Program
Crevice Mining Project

 **Crevice Mining Group LLC**

614 South 8th Street (P.O. Box 487)
Livingston, MT 59047

Prepared for:
Montana Department of Environmental Quality
Hard Rock Mining Program
Helena, MT 59601

October 16, 2015

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Appendix A.2 : Geology of the Crevice Mountain Gold Mine, Park County, MT by Alan Branham, CPG #10979 – July 16, 2015

Appendix B : Well and Water Data

Appendix B.1 : Laubach and Johnson Well Logs

Appendix B.2 : Surface Water Sample Data

Appendix B.3 : Rousseau Abstract

Appendix C : NRCS Custom Soils Report for Potential Land Application Discharge Area

1 INTRODUCTION

Crevice Mining Group LLC (Crevice) proposes to complete an exploration program at Crevice Mountain near Jardine, Montana located in Park County, Montana (**Figures 1 and 2**). All site Figures presenting the project are included in Section 5. This Exploration Plan of Operations outlines the proposed underground development, exploration and sampling program, and ore evaluation program to be conducted at Crevice Mountain. All development mining and diamond drilling will be conducted by qualified contractors or Crevice personnel.

The exploration program will be called the “Crevice Exploration Project” and although it is located approximately one-half mile to the east, the project is similar in scope to the “Upper Crevice Project,” which was permitted by TVX-Mineral Hill Mining under the authority of License No. 00559, but never fully implemented. Crevice intends this project as the first phase of exploration. Future exploration work will likely be required under separate exploration permit applications to complete additional characterization.

The Crevice Exploration Project is designed as a low-impact program expected to start in the early summer of 2016 and run continuously for 18 months, with 7.0 acres of new surface disturbance near the historic Snowshoe Mine (**Figure 2**). All disturbance areas will be fully bonded. In the first year of exploration, drilling will take place from surface locations and underground locations, totaling approximately 36,000 feet, and with a planned expenditure of approximately \$1.1 million. Surface drilling will be completed utilizing standard surface diamond drill and Reverse Circulation (RC) drills, on 100-foot centers along the alignment of the proposed exploration road and in selected secondary locations (**Figure 6**).

Additional evaluation of the mineralized zone will also be conducted, in conjunction with a permitted surface drilling program, by an underground diamond drilling program, and by sampling and metallurgical testing of selected mineralized rock. To facilitate the underground drilling program, underground access will be driven to the targeted mineralized zone via the portal and decline shown on **Figure 6**. The exploration decline will be completed as a separate development adjacent to the working under development per Crevice Mining Group’s Small Miner’s Exclusion Statement (SMES) currently permitted and as shown on the site figures. A ramp driven on a 15% decline will allow drilling access to develop and define the Crevice ore body. Alan Branham (CPG #10979) has recommended that underground drilling be completed on 50-foot centers to adequately characterize potential ore reserves. The ramp will continue on a decline, with supplemental development for ventilation, as shown on **Figure 6**.

Although Crevice holds an SMES on Crevice Mountain allowing 5 acres of disturbance associated with potential mining operations, the present plan for mining under the SMES targets material that does not meet the qualifications defined for reserves or resources. This exploration program is intended to determine the continuity of the potential ore body and attempt to delineate an economic ore reserve. If a mineral reserve is identified, Crevice Mining Group intends to mine under the SMES statute with limited disturbance. Should exploration characterization and

discovery justify the potential to apply for an operating permit as the project progresses, Crevice will apply for an operating permit.

To prepare for future mining activity, Crevice intends to invest in and construct mining and ancillary mine support facilities in the 5-acre exclusion area associated with the SMES so that mining may commence at the point in time when a mineral reserve is identified by this proposed exploration program.

Based upon historic mining and the development of the First Chance Portal by TVX/Mineral Hill Mining, it is anticipated that little, if any, underground water will be encountered. Any mine water encountered will be contained in a closed-loop circuit, held in temporary underground sumps, and recycled for use in drilling. Ditches and runoff control berms upslope from the disturbed area will be constructed to divert surface runoff, and downslope ditches will collect any runoff water from the disturbed area and route it to a sediment collection pond. Additional water management procedures (straw wattles, filter fence, stone check dams, etc.) will be installed where required and/or requested by Montana Department of Environmental Quality (DEQ) as discussed in Section 11, Water Management.

Topsoil will be salvaged, stockpiled, and seeded for use in site reclamation. Waste rock storage areas will be graded and reclaimed concurrently with exploration operations. Since a good portion of the area has been logged, a minimum number of trees will be removed. Crevice will take all appropriate measures to eliminate or mitigate environmental impacts. .

2 RESERVES

Although a significant amount of historic drilling has been completed on Crevice Mountain, the historic resource and reserves are not compliant under U.S. security laws, and/or 43-101, or Joint Ore Reserves Committee (JORC) geologic studies. Resource standards for defining an economic reserve have become more rigorous in terms of quality control, geologic definition, and metallurgical testing. Additional exploration work is required to support a feasibility study. **Appendix A-1** includes a letter report from American Innovative Minerals, LLC which validates that Crevice Mountain qualifies as an exploration property. **Appendix A-2** includes a geologic report discussing Crevice Mountain and historic production, exploration history, geochemistry, geophysical surveys, and the geology and potential ore zones.

3 LOCATION, ACCESS, AND SITE BACKGROUND

The Crevice deposit is located in Park County, Montana northeast of Gardiner and approximately 3 miles southeast of the town of Jardine in the SW $\frac{1}{4}$ of the NE $\frac{1}{4}$ of Section 22, T. 9S, R.9E (**Figure 1 and Figure 2**). The Crevice deposit is located on and under numerous patented claims over a number of sections in southern Park County. Appendix A-2 includes additional information on historic production. The exploration portal site near the Snowshoe Mine portal is accessible via public county and Forest Service roads from Jardine. Additional exploration roads required to access the project area will be fully bonded under the proposed exploration permit.

All surface disturbance will be limited to the Patented Claims listed below, which are owned or leased by the Crevice Mining Group, LLC as well as the unpatented claims shown on **Figure 3**:

| | |
|---------------------|----------------------|
| Snowshoe | Mineral Survey #4535 |
| Pratt | Mineral Survey #4902 |
| Venus | Mineral Survey #4538 |
| Kentucky | Mineral Survey #4899 |
| Little Bonanza | Mineral Survey #8869 |
| McCauley | Mineral Survey #5614 |
| George Washington | Mineral Survey #5613 |
| Granite | Mineral Survey #4557 |
| Summit | Mineral Survey #4558 |
| Consolidated Mizpah | Mineral Survey #4559 |

4 PROJECT DESCRIPTION

The exploration portal will be located on the west side of Crevice Mountain near the historic Showshoe Mine in the upper reaches of the Malin Creek drainage. The portal is located at an elevation of approximately 8350 feet, 100 feet below the surface of expression of the Conrad Zone.

The program consists of constructing the first 200 feet of the exploration adit to 12-foot wide by 14-foot high and driving an underground decline to the south (south 45 degrees east) to the 8056 feet elevation (**Figure 2 and Figure 6**). The decline ramp will spiral down through the mineralized zone for the purpose of characterizing the ore body. All development will be in the mineralized Conrad Zone of the Crevice deposit. Inert waste rock will be placed in a temporary waste rock storage area and/or utilized as road material to improve access roads. Waste rock characterization methods for rock/water chemistry and quality assurance are discussed in Section 11.3, Water Quality.

New surface disturbance associated with the exploration totaling 7.0 acres will be confined to the patented land listed herein and include the following disturbance areas:

- An exploration road totaling 2,800 linear feet and 1.6 acres (**Figure 7 and Figure 8**);
- A primary (west) waste rock storage area totaling 3.3 acres and a secondary (south) waste rock storage area totaling 1.6 acres (**Figure 11 and Figure 12**);
- Surface drilling pads totaling 0.3 acres (**Figure 7**).
- Topsoil Stockpile areas totaling 0.6 acres (**Figure 11 and Figure 12**);
- A proposed Land Application Discharge (LAD) area (if required) totaling 4.5 acres (**Figure 13**). Depending on actual groundwater volume encountered (if any), the LAD area may not be necessary. Surface water collected from waste rock storage areas to

manage nitrates may be evaporated from the storage pond, depending on actual runoff collected. Discussions with Orica USA indicate that if blasting is implemented correctly, nitrates should not be a problem. If analytical testing indicates nitrates levels exceed standard requirements, Crevice will switch to non-nitrate blasting compounds.

- Facilities, topsoil stockpiles, a sediment pond, and runoff control measures will be located within the limits of the Small Miner's Exclusion Statement (SMES).

This exploration and development program will include the following:

- Construct facilities (dry, office, and sample prep facilities) at the site currently authorized under the Crevice Mountain Mining, LLC Small Miners Exclusion Statement (SMES). The area is shown on **Figure 5**.
- Doze, stockpile, and seed all topsoil from areas to be disturbed.
- Establish the waste rock storage area.
- Grade, repair, install culverts, clear overgrown areas, and improve approximately 1.6 miles of Forest Service Road leading to the county roads. This work will be completed in cooperation with the USFS and approved under their authority;
- Grade, repair, install culverts, clear overgrown areas, and improve approximately 5.6 miles of county road leading to the Exploration Portal;
- Level the portal area and establish temporary surface facilities, including a sediment collection pond;
- Construct the portal;
- Construct 200 feet of underground drift (12 feet high x 12 feet wide).
- Drive a total of approximately 12,000 feet of underground decline starting at the 8350 feet elevation and descending to the 8056 elevation. Refer to Section 11.1, Underground Water, for a discussion on water management and expected groundwater input based on historic data.
- Drive drifts from the decline ramp to access and define the ore body.
- Conduct approximately 64,000 feet (128 drillholes at 500 feet each) of detailed underground diamond drilling by way of drilling from the surface along the exploration road alignment and underground along the decline alignment (See Section 10.1)

Portable powder and cap magazines (one each) will be temporarily located at a safe distance from all facilities in compliance with federal Mine Safety and Health Administration (MSHA) regulations. Within approximately four weeks of project startup, powder and caps will be placed in underground storage, eliminating the requirements for surface magazines.

5 SITE FIGURES

Site figures showing the exploration plan area as well as acres designated under the Small Miner's Exclusion Statement are included following Table 1, which lists the all figures in this document.

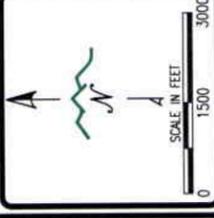
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| Figure 14 | Typical Details |

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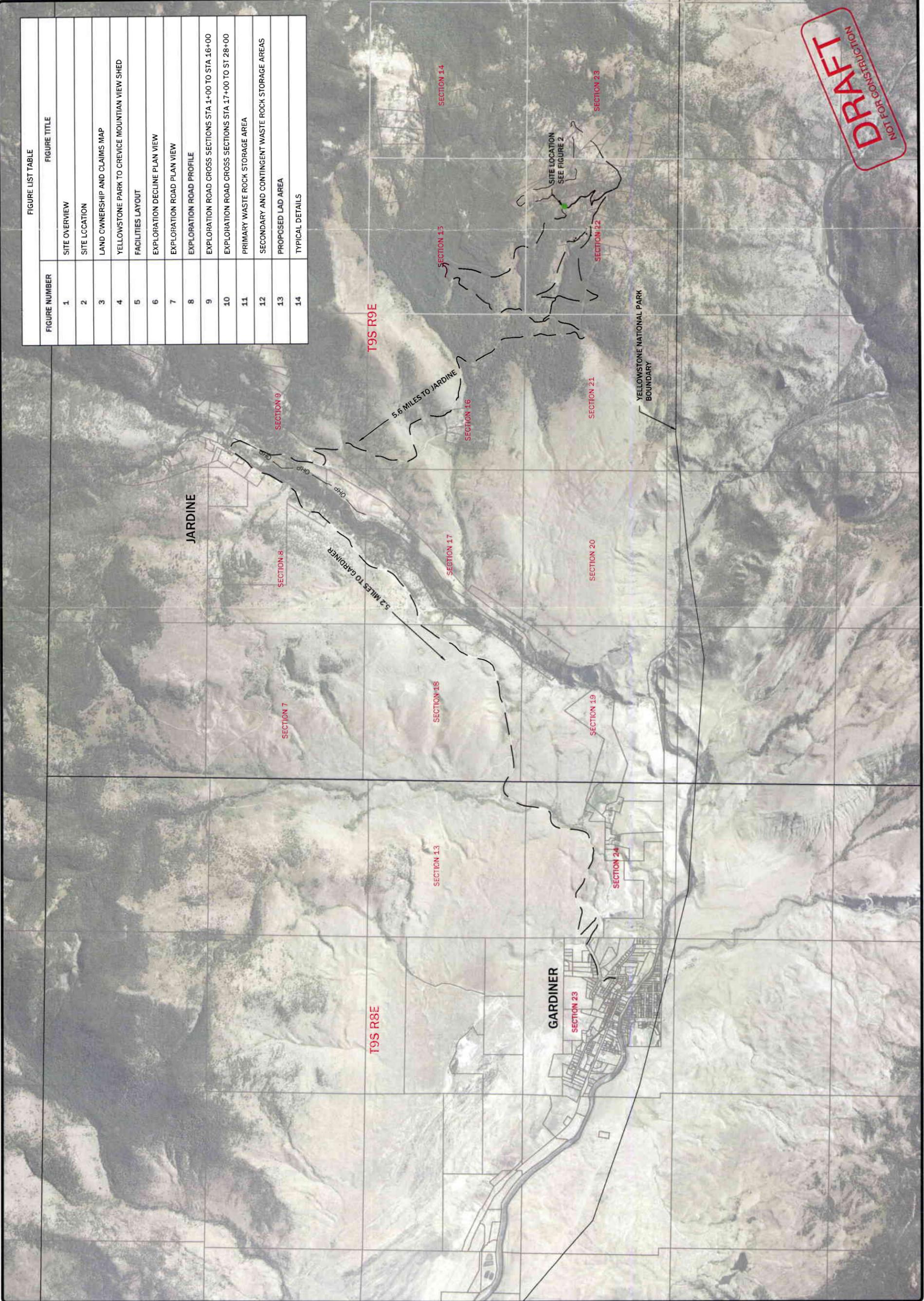

 CREVICE MINING GROUP LLC
 CREVICE MOUNTAIN
 EXPLORATION PERMIT

SITE
 OVERVIEW


 PIONEER
 TECHNICAL SERVICES, INC.
 203 E. BROADWAY, SUITE C
 HELENNA, MT 59601
 (406) 487-8283

PAGE 6
 FIGURE 1

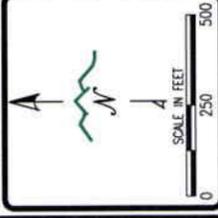
| FIGURE NUMBER | FIGURE TITLE |
|---------------|--|
| 1 | SITE OVERVIEW |
| 2 | SITE LOCATION |
| 3 | LAND OWNERSHIP AND CLAIMS MAP |
| 4 | YELLOWSTONE PARK TO CREVICE MOUNTAIN VIEW SHED |
| 5 | FACILITIES LAYOUT |
| 6 | EXPLORATION DECLINE PLAN VIEW |
| 7 | EXPLORATION ROAD PLAN VIEW |
| 8 | EXPLORATION ROAD PROFILE |
| 9 | EXPLORATION ROAD CROSS SECTIONS STA 11+00 TO STA 16+00 |
| 10 | EXPLORATION ROAD CROSS SECTIONS STA 17+00 TO ST 28+00 |
| 11 | PRIMARY WASTE ROCK STORAGE AREA |
| 12 | SECONDARY AND CONTINGENT WASTE ROCK STORAGE AREAS |
| 13 | PROPOSED LAD AREA |
| 14 | TYPICAL DETAILS |



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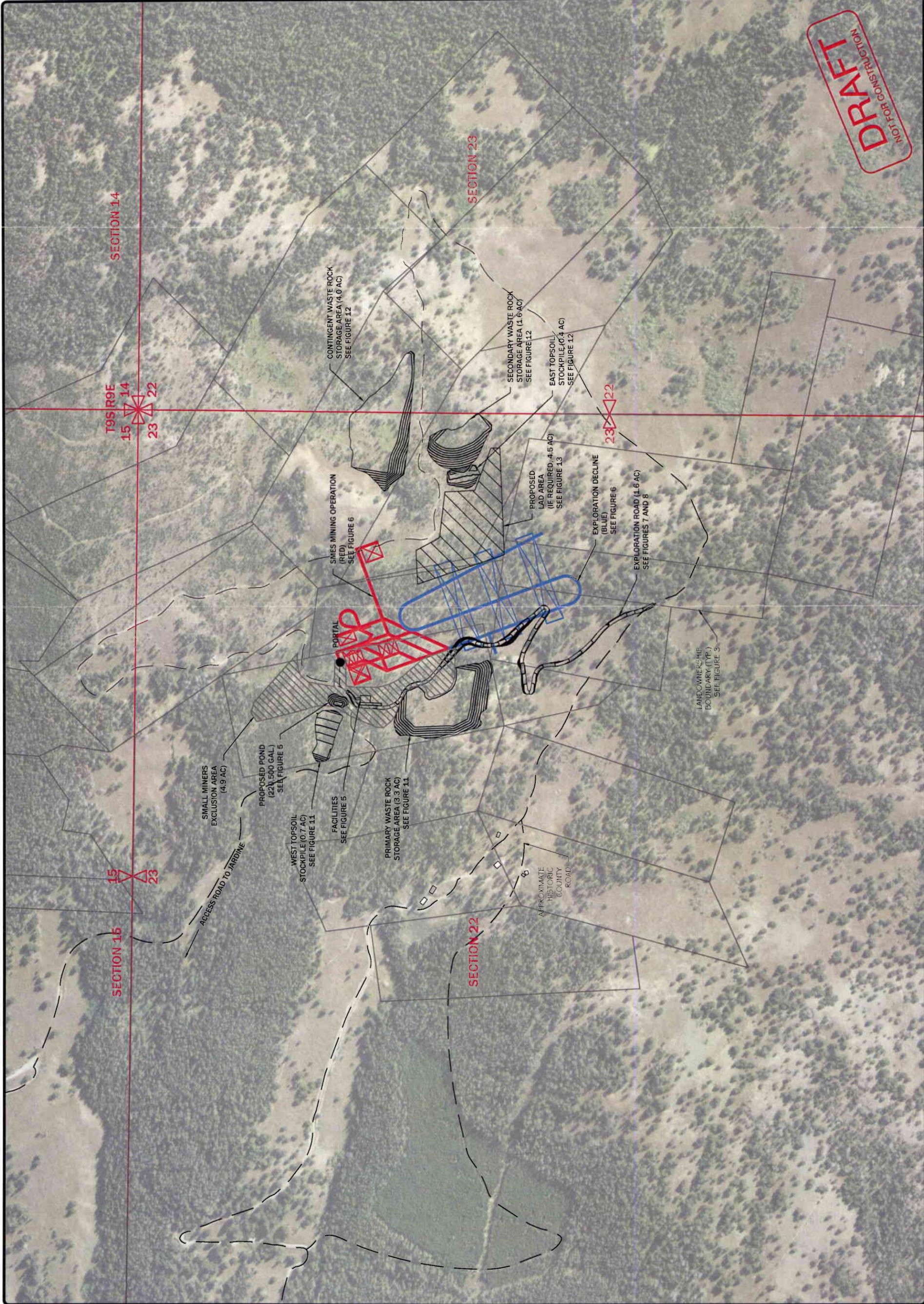
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 TECHNICAL SERVICES, INC.
 201 E. BROADWAY, SUITE C
 HELENA, MT 59601
 (406) 457-8252

PAGE 7
 FIGURE 2

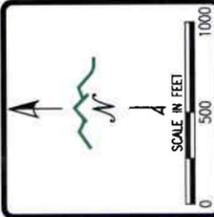
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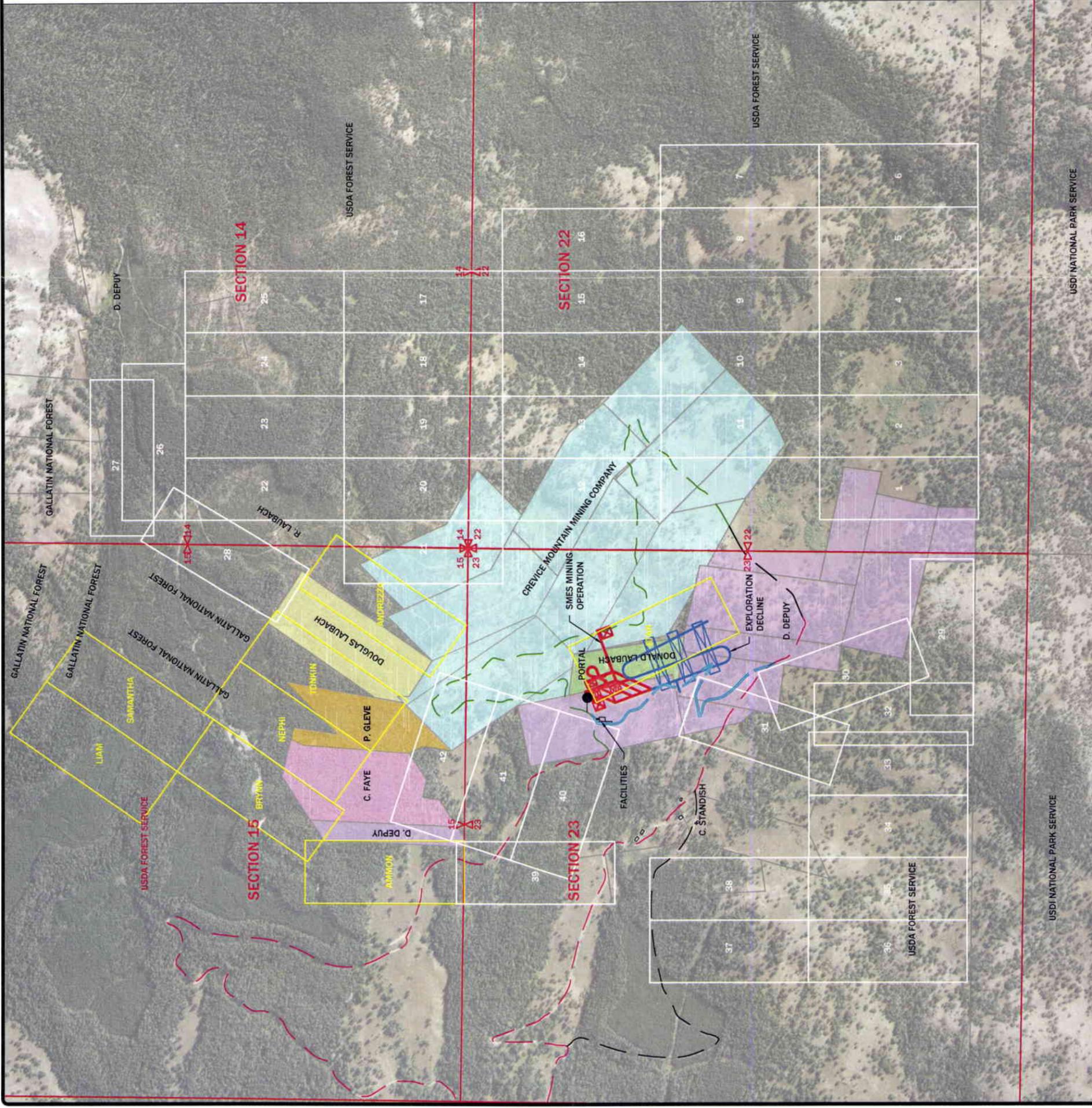
LAND OWNERSHIP
 AND CLAIMS MAP



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- LEGEND:**
- PORTAL
 - SMES MINING OPERATION
 - EXPLORATION DECLINE
 - SECTION
 - FACILITY
 - COUNTY ROAD
 - FOREST SERVICE/PRIVATE ROAD
 - PRIVATE ROAD
 - EXPLORATION ROAD
 - PARCEL BOUNDARY
 - COTHRAN, FAYE
 - DEPUY, DAVID AND SHIRLEY
 - GLEVA, PAUL
 - LAUBACH, DONALD AND DEE
 - LAUBACH, DOUGLAS AND MARILYN
 - CREVICE MOUNTAIN MINING COMPANY
 - 2014 UNPATENTED CLAIMS
 - 2015 UNPATENTED CLAIMS
 - ✠ SECTION CORNER
 - ✠ QUARTER CORNER

- NOTES:**
- UNPATENTED CLAIMS TO BE STAKED IN 2015
 PHASE 1: CLAIMS 39-42
 PHASE 2: CLAIMS 1-38



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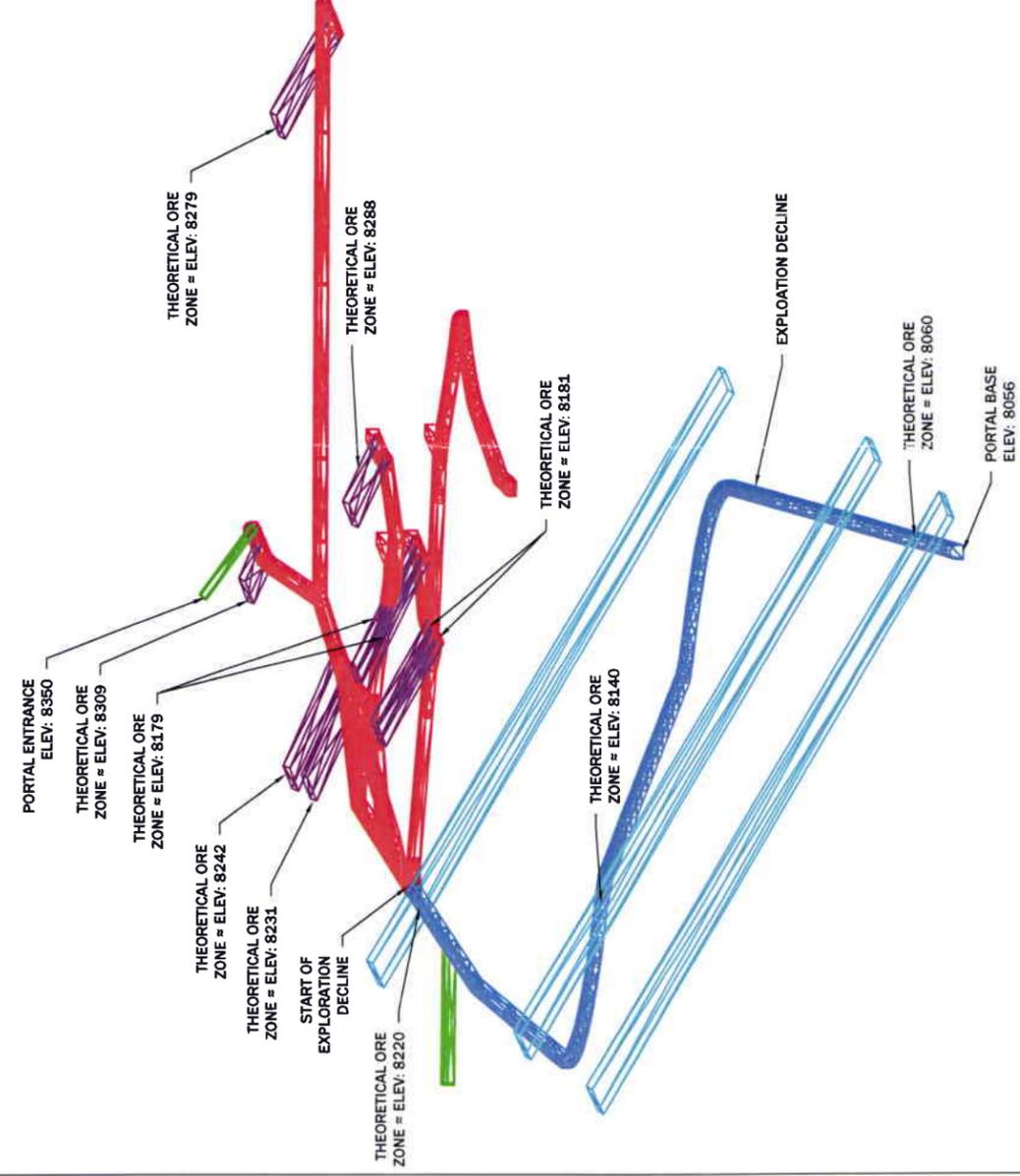


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EXPLORATION
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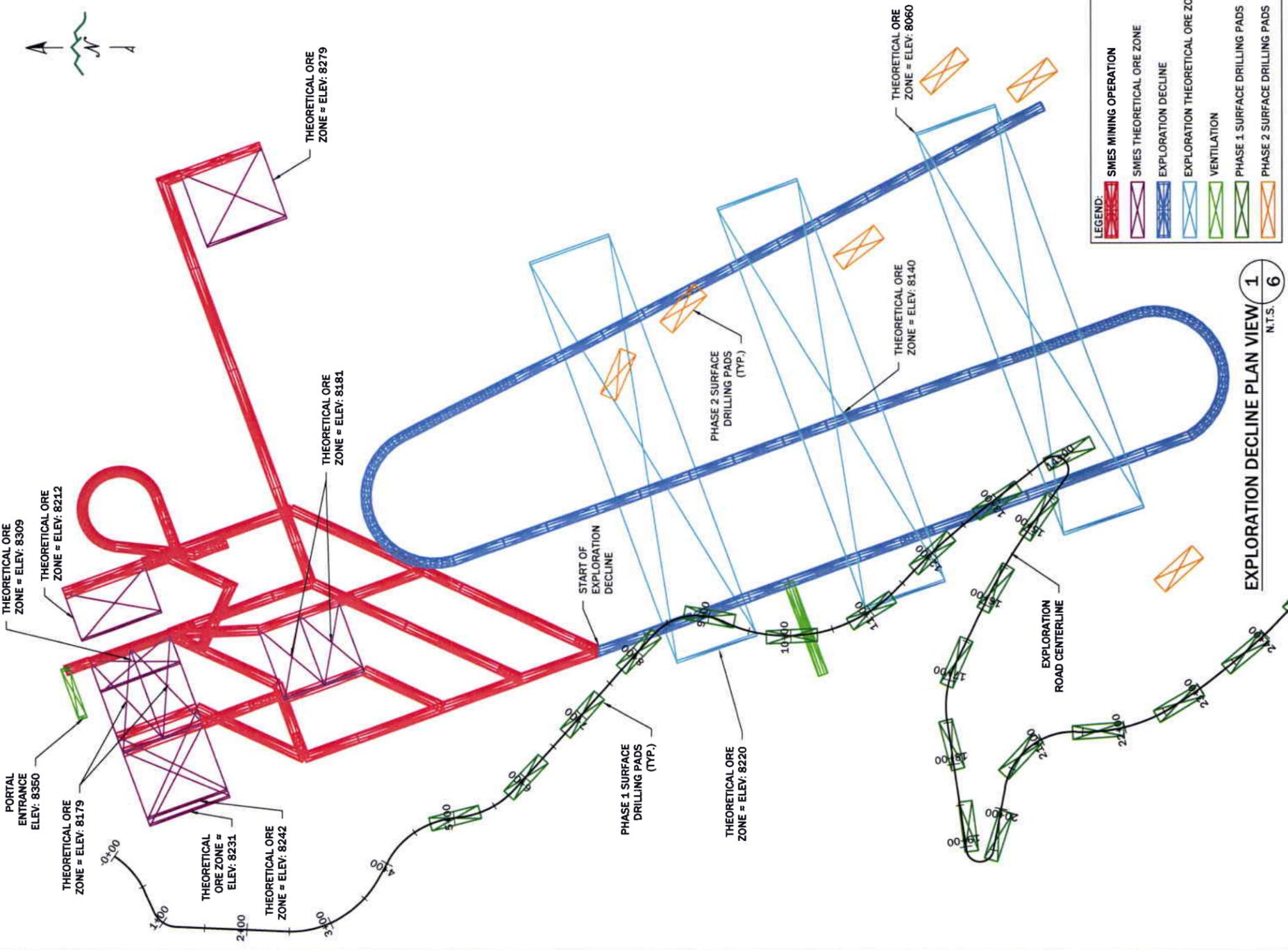


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EXPLORATION DECLINE ISOMETRIC VIEW 2
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- NOTES:
- AREAS INDICATED IN RED ARE ASSOCIATED WITH THE MINE PLAN PERMITTED UNDER THE SMALL MINERS EXCLUSION STATEMENT.
 - AREAS INDICATED IN BLUE ARE ASSOCIATED WITH THE PROPOSED EXPLORATION PLAN.
 - AS MEASUREMENT FROM OUTCROP, THEORETICAL ORE ZONES INDICATED ABOVE HAVE THE POTENTIAL DOWN DEPTH OF 1000' x 3200'.
 - YEAR ONE EXPLORATION DRILLING WILL INCLUDE APPROXIMATELY 14,000 FEET OF PRIMARY "EXPLORATION" DRILLING ON 100-FOOT CENTERS AND 22,200 FEET OF SECONDARY "DEFINITION" DRILLING ON 50-FOOT CENTERS. THE PLANNED DRILLING APPROACH INCLUDES THE FOLLOWING VARIABLES:
 - STRIKE LENGTH OF MINERALIZED ZONE = 3800'
 - EXPLORATION DRILL HOLES WILL INCLUDE 178 HOLES DRILLED ON 100-FOOT CENTERS AT AN AVERAGE DEPTH OF 78 FEET PER HOLE FOR A TOTAL OF 13,728 FEET.
 - DEFINITION DRILL HOLES WILL INCLUDE 74 SECTIONS DRILLED ON 50-FOOT CENTERS AT FOUR HOLES PER SECTION FOR A TOTAL OF 296 DEFINITION HOLES AND 300 FEET TOTAL PER SECTION FOR A TOTAL OF 22,200 FEET.
 - YEAR TWO EXPLORATION AND DEFINITION DRILLING IS BUDGETED FOR AN ADDITIONAL 28,000 FEET OF DRILLING WHICH WILL BE DEFINED BASED ON YEAR ONE DRILLING AND EXPLORATION RESULTS.



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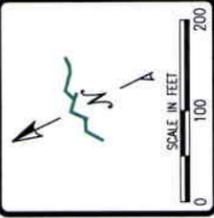
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| [Red Box] | SMES MINING OPERATION |
| [Purple Box] | SMES THEORETICAL ORE ZONE |
| [Blue Box] | EXPLORATION DECLINE |
| [Light Blue Box] | EXPLORATION THEORETICAL ORE ZONE |
| [Green Box] | VENTILATION |
| [Light Green Box] | PHASE 1 SURFACE DRILLING PADS |
| [Orange Box] | PHASE 2 SURFACE DRILLING PADS |

EXPLORATION DECLINE PLAN VIEW 1
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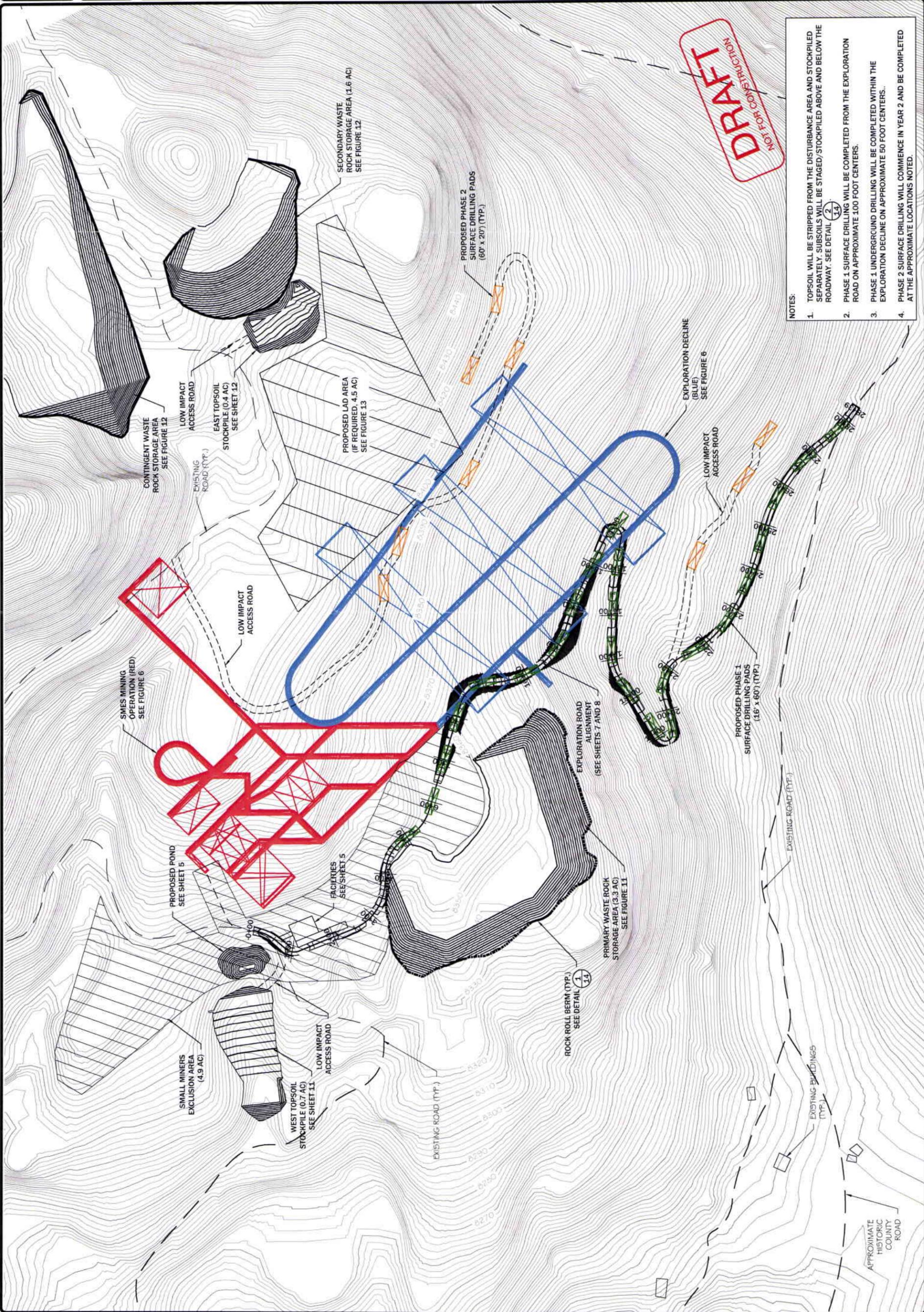


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EXPLORATION ROAD
 PLAN VIEW

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 201 E BROADWAY, SUITE C
 HELENA, MT 59601
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PAGE 12
 FIGURE 7



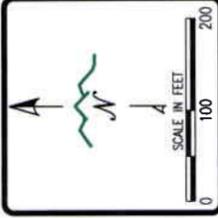
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- NOTES:
- TOPSOIL WILL BE STRIPPED FROM THE DISTURBANCE AREA AND STOCKPILED SEPARATELY. SUBSOILS WILL BE STAGED/STOCKPILED ABOVE AND BELOW THE ROADWAY. SEE DETAIL 1, 2, 11, 12
 - PHASE 1 SURFACE DRILLING WILL BE COMPLETED FROM THE EXPLORATION ROAD ON APPROXIMATE 100 FOOT CENTERS.
 - PHASE 1 UNDERGROUND DRILLING WILL BE COMPLETED WITHIN THE EXPLORATION DECLINE ON APPROXIMATE 50 FOOT CENTERS.
 - PHASE 2 SURFACE DRILLING WILL COMMENCE IN YEAR 2 AND BE COMPLETED AT THE APPROXIMATE LOCATIONS NOTED.

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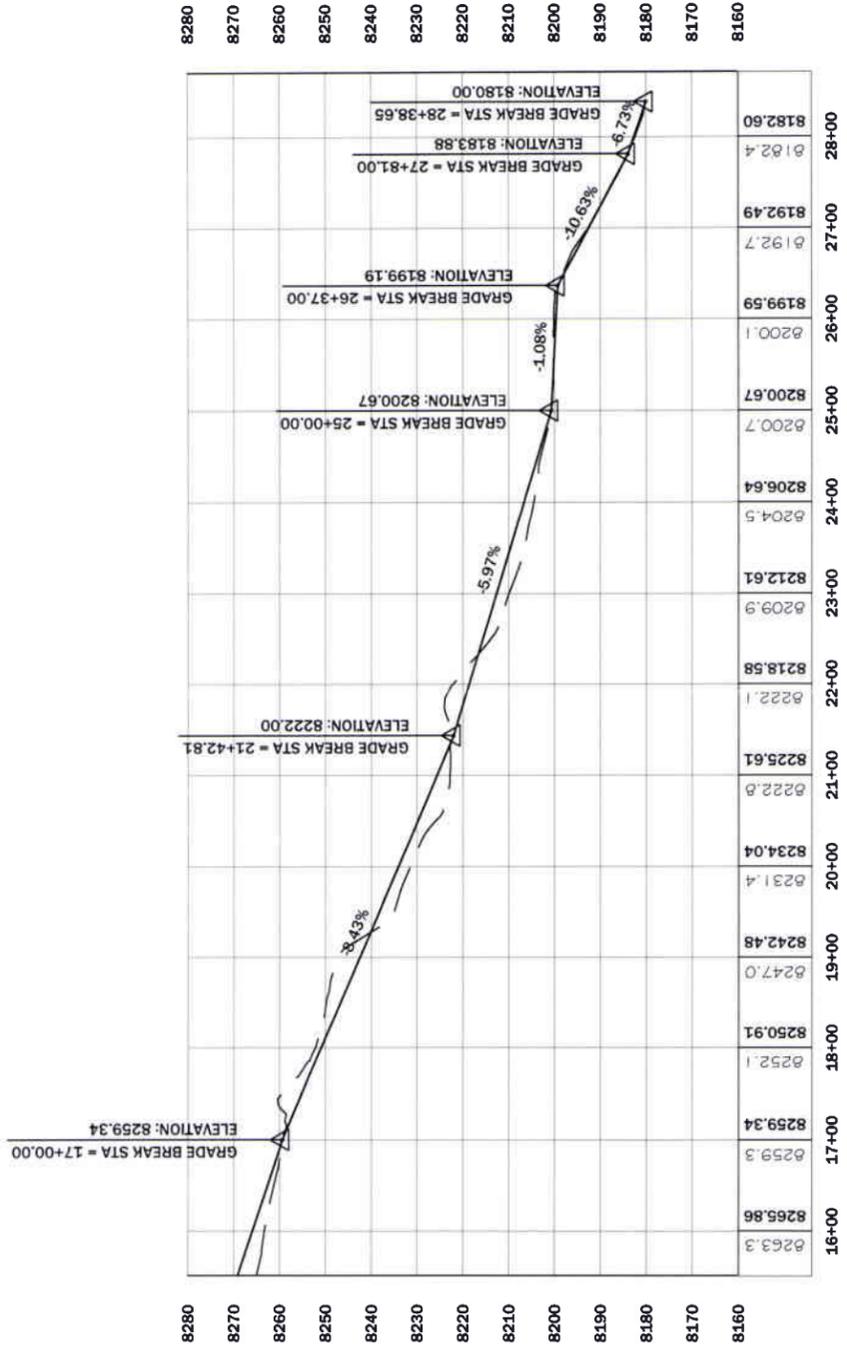
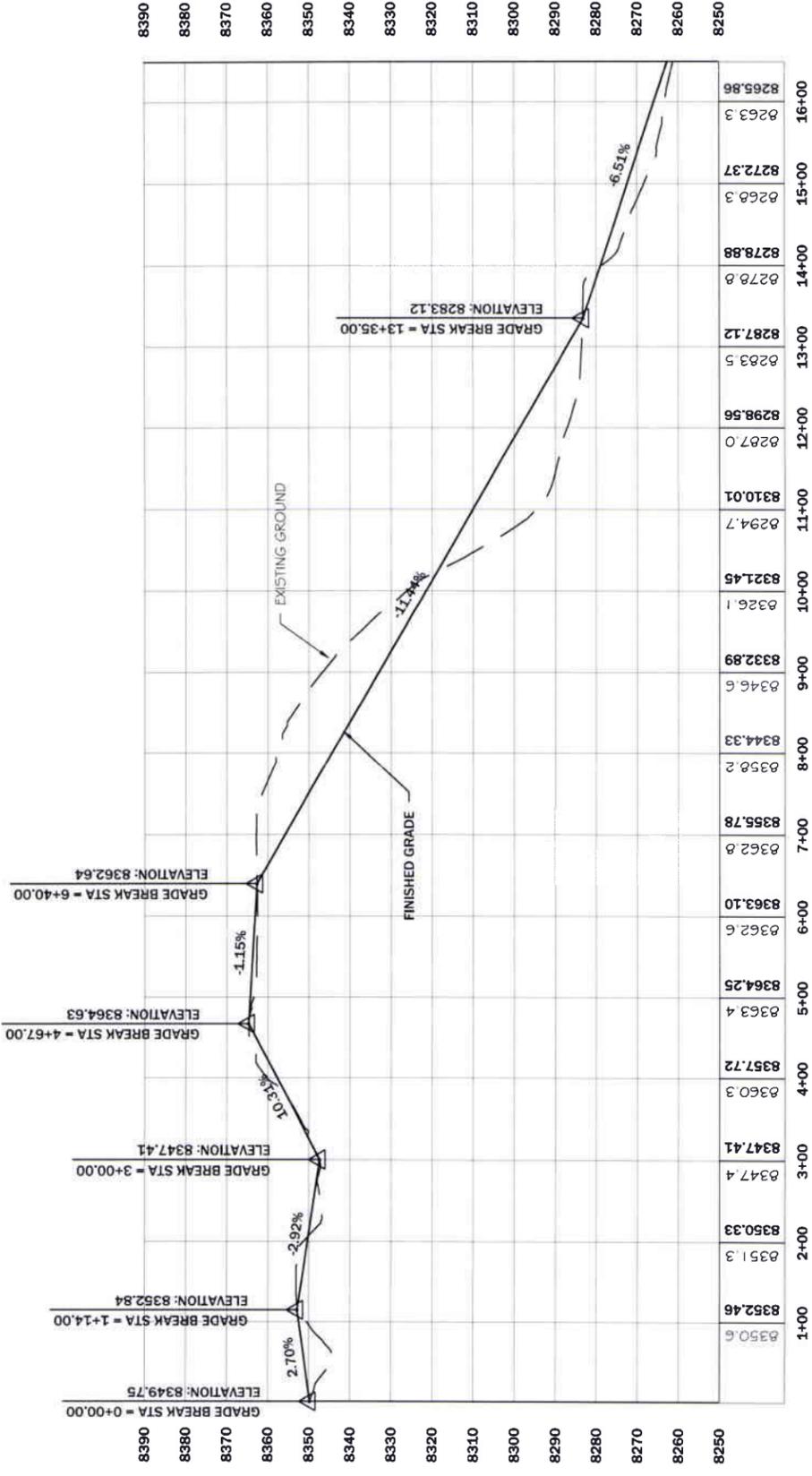
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EXPLORATION ROAD PROFILE



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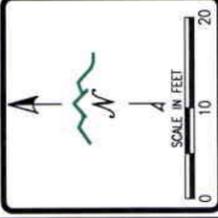
NOTE:
 1. 5' VERTICAL EXAGGERATION



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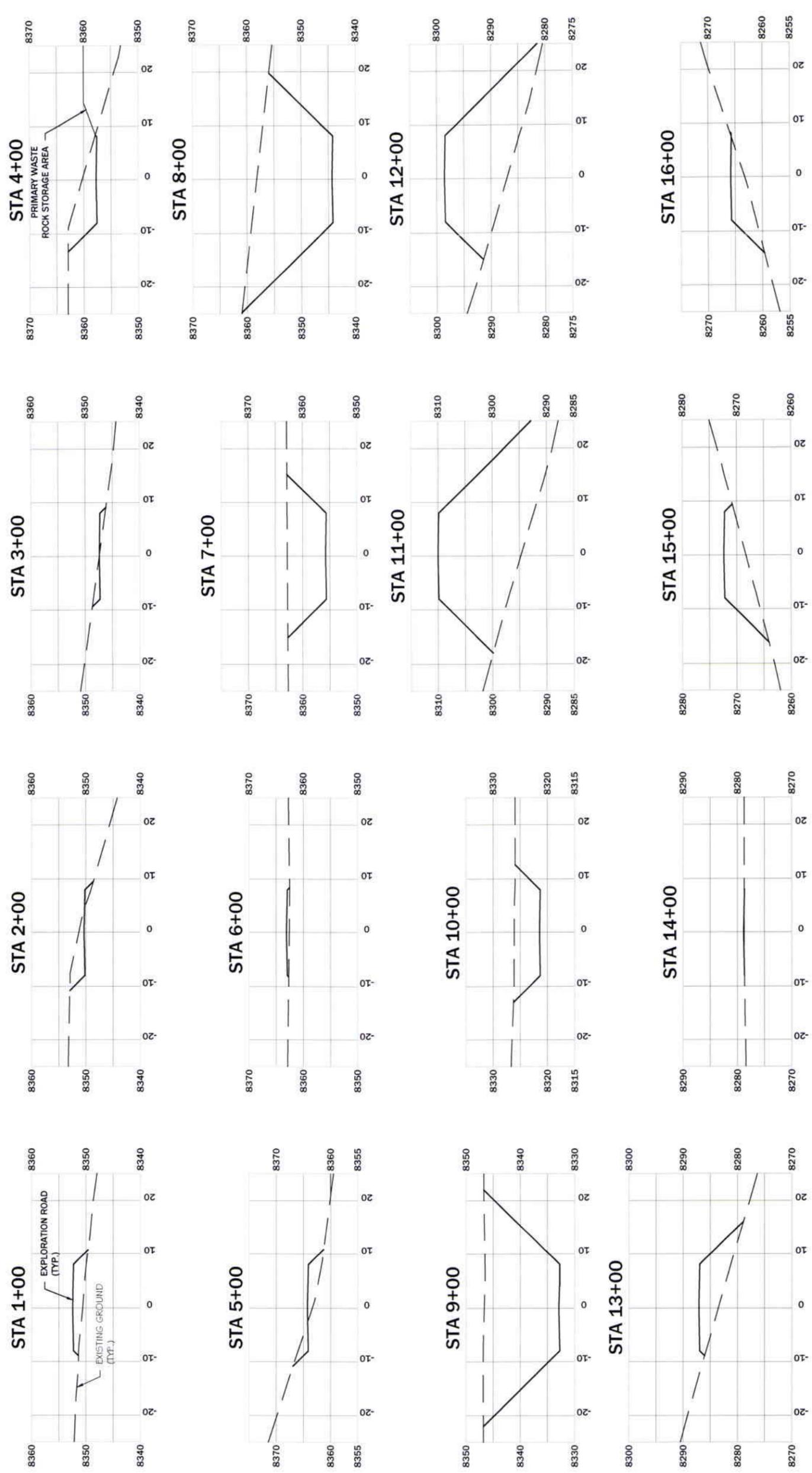
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CREVICE MINING GROUP, LLC
 CREVICE MOUNTAIN
 EXPLORATION PERMIT

**EXPLORATION ROAD
 CROSS SECTIONS
 STA 1+00 TO STA 16+00**

PIONEER
 TECHNICAL SERVICES, INC.
 201 E. BROADWAY, SUITE C
 HELENA, MT 59601
 (406) 457-8252



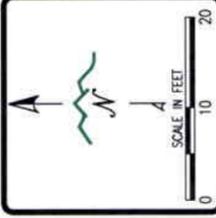
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- NOTES:
1. SEE DETAIL 13 FOR EXPLORATION ROAD DETAILS.
 2. TOTAL CUT AND FILL VOLUME BALANCE (ARE EQUAL) FOR THE PROPOSED EXPLORATION ROAD CONSTRUCTION.

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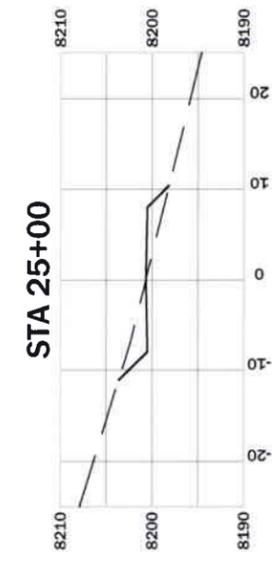
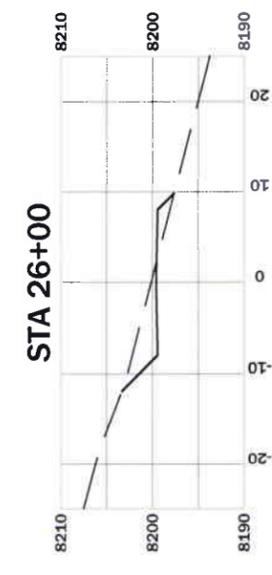
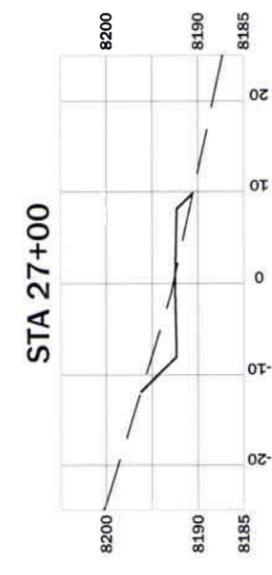
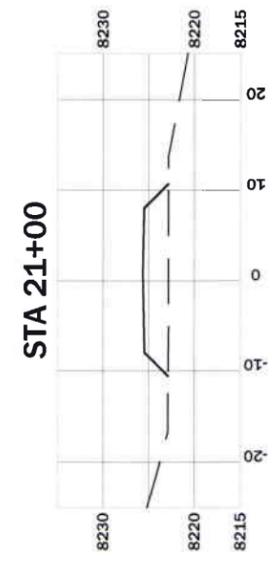
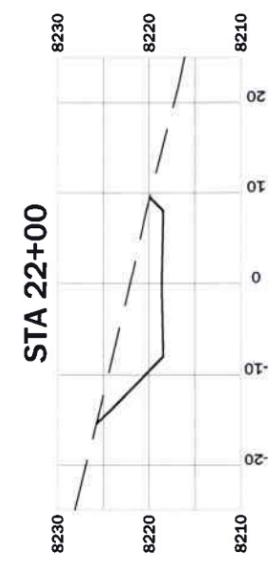
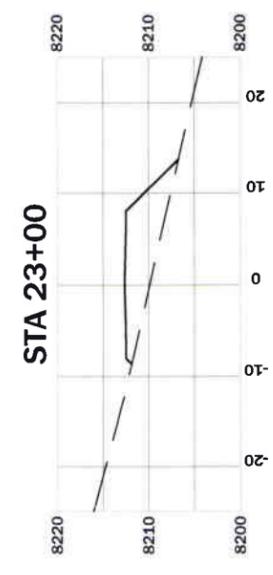
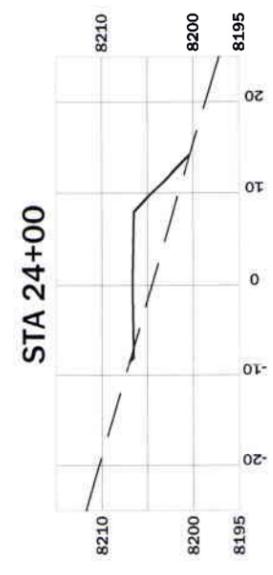
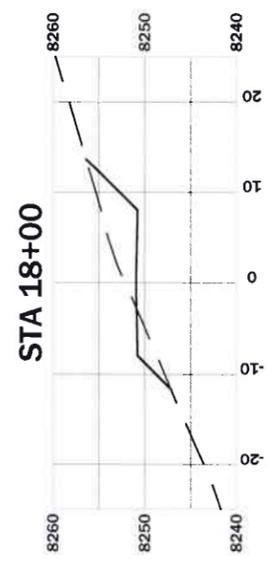
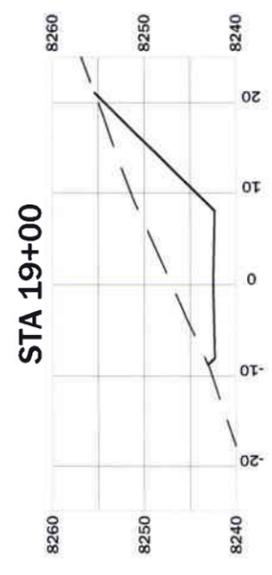
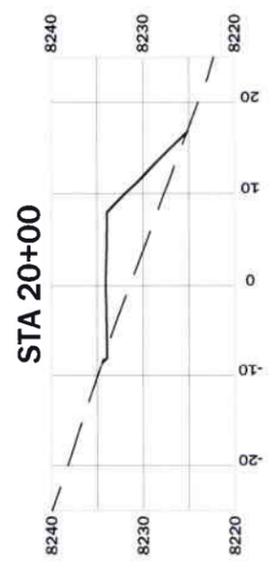
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 EXPLORATION PERMIT

**EXPLORATION ROAD
 CROSS SECTIONS
 STA 17+00 TO STA 28+00**



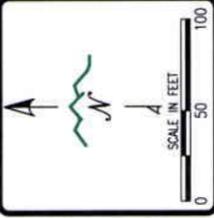
- NOTES:
- SEE DETAIL 14 FOR EXPLORATION ROAD DETAILS.
 - TOTAL CUT AND FILL VOLUME BALANCE (ARE EQUAL) FOR THE PROPOSED EXPLORATION ROAD CONSTRUCTION.

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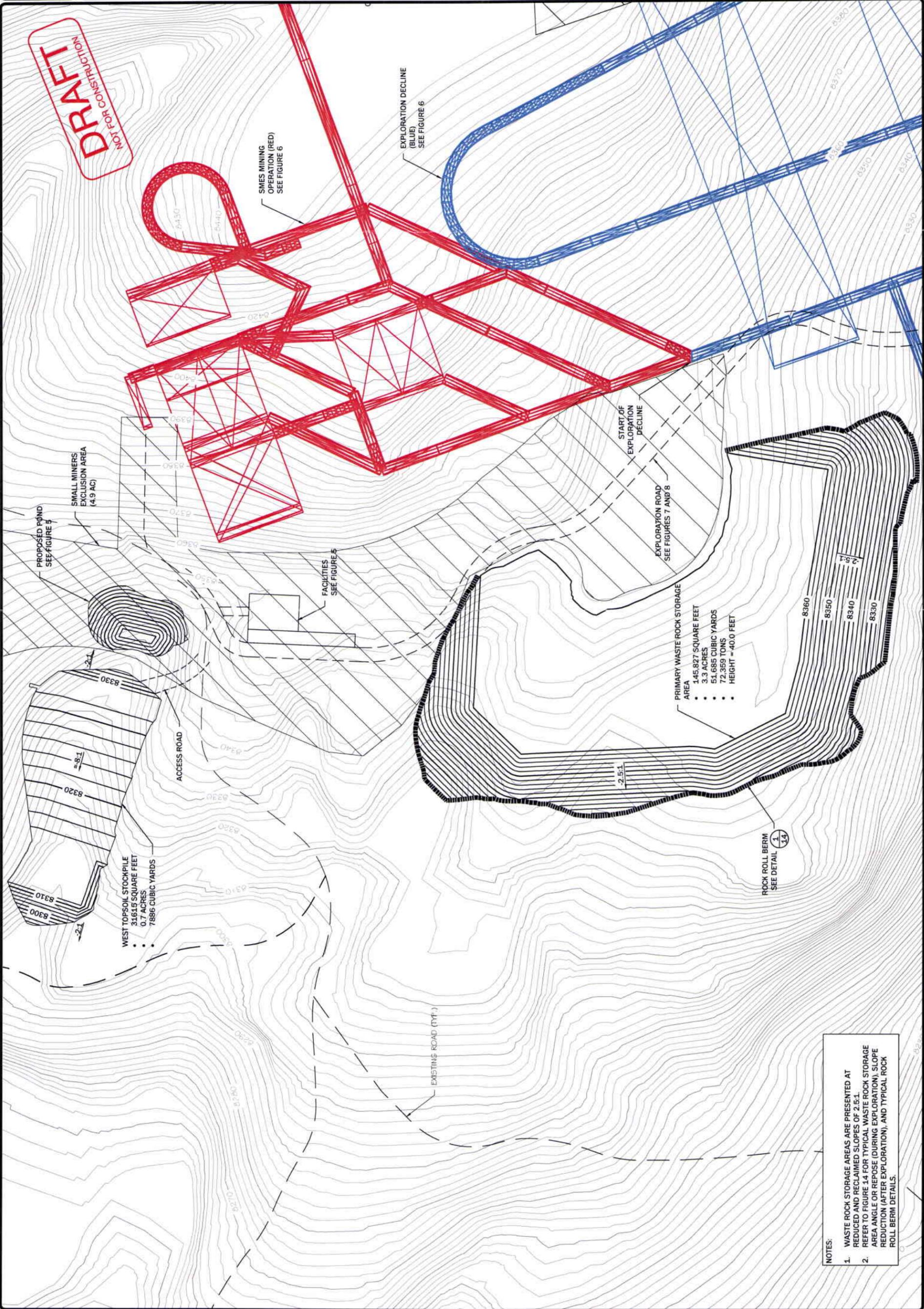


GREVICE MINING GROUP LLC
 EXPLORATION PERMIT

**PRIMARY WASTE
 ROCK STORAGE
 AREA**

PIONEER
 TECHNICAL SERVICES, INC.
 201 E BROADWAY, SUITE C
 HELENA, MT 59601
 (406) 457-8252

PAGE 16
 FIGURE 11

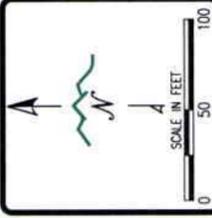


NOTES:
 1. WASTE ROCK STORAGE AREAS ARE PRESENTED AT REDUCED AND RECLAIMED SLOPES OF 2.5:1. REFER TO FIGURE 14 FOR TYPICAL WASTE ROCK STORAGE AREA ANGLE OR REPOSE (DURING EXPLORATION), SLOPE REDUCTION (AFTER EXPLORATION), AND TYPICAL ROCK ROLL BERM DETAILS.
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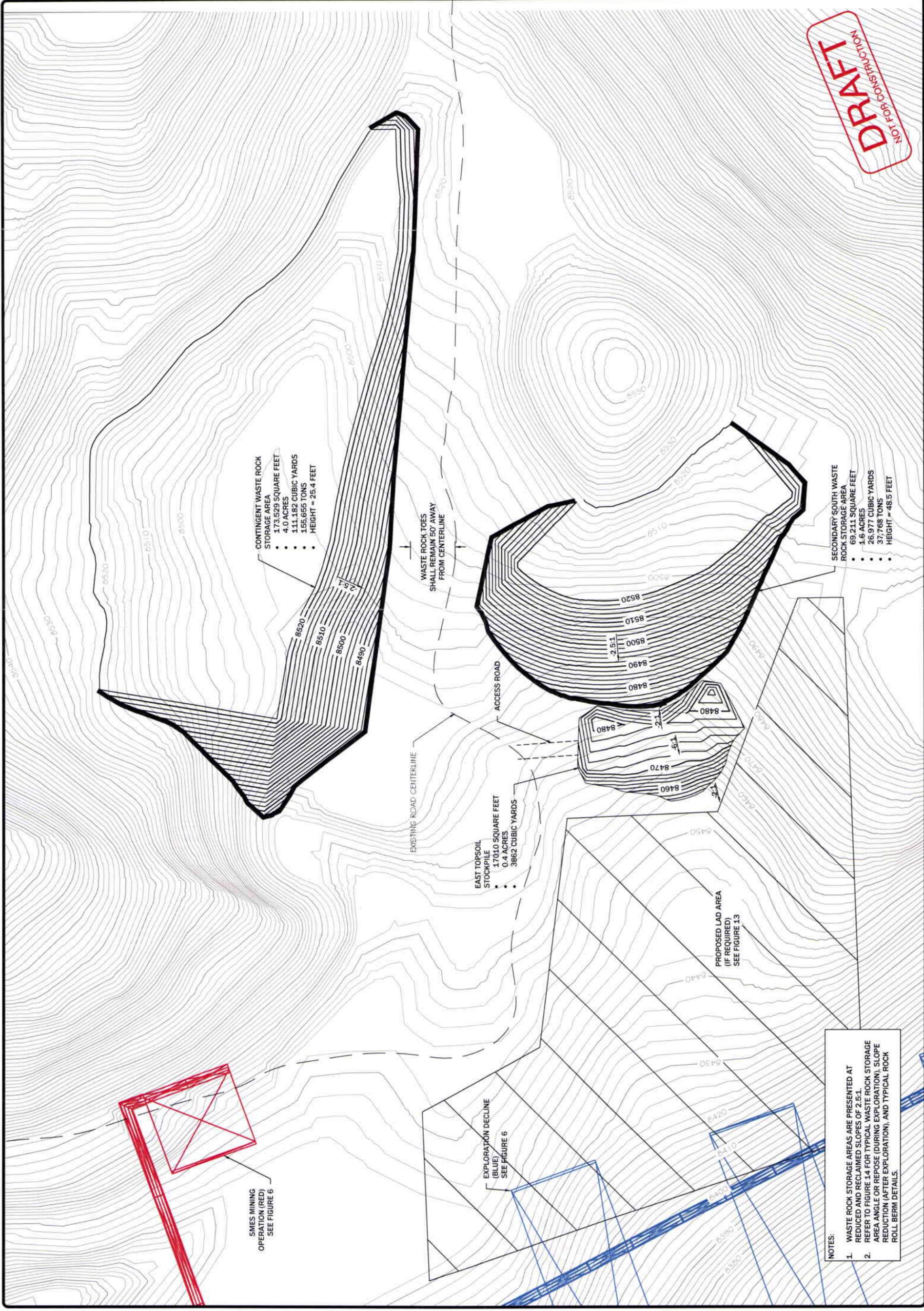


CREVICE MINING GROUP, LLC
 CREVICE MOUNTAIN
 EXPLORATION PERMIT

**SECONDARY AND
 WASTE ROCK
 STORAGE AREA**



NOT FOR CONSTRUCTION
 DRAFT



**CONTINGENT WASTE ROCK
 STORAGE AREA**
 • 173,529 SQUARE FEET
 • 4.0 ACRES
 • 111,182 CUBIC YARDS
 • 155,655 TONS
 • HEIGHT = 25.4 FEET

**SECONDARY SOUTH WASTE
 ROCK STORAGE AREA**
 • 69,211 SQUARE FEET
 • 1.6 ACRES
 • 26,977 CUBIC YARDS
 • 37,768 TONS
 • HEIGHT = 48.5 FEET

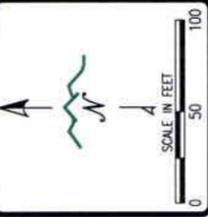
**EAST TOPSOIL
 STOCKPILE**
 • 17,010 SQUARE FEET
 • 0.4 ACRES
 • 3862 CUBIC YARDS

NOTES:
 1. WASTE ROCK STORAGE AREAS ARE PRESENTED AT REDUCED AND RECLAIMED SLOPES OF 2.5:1. REFER TO FIGURE 14 FOR TYPICAL WASTE ROCK STORAGE AREA ANGLE OR REPOSE (DURING EXPLORATION), SLOPE REDUCTION (AFTER EXPLORATION), AND TYPICAL ROCK ROLL BERM DETAILS.
 2.

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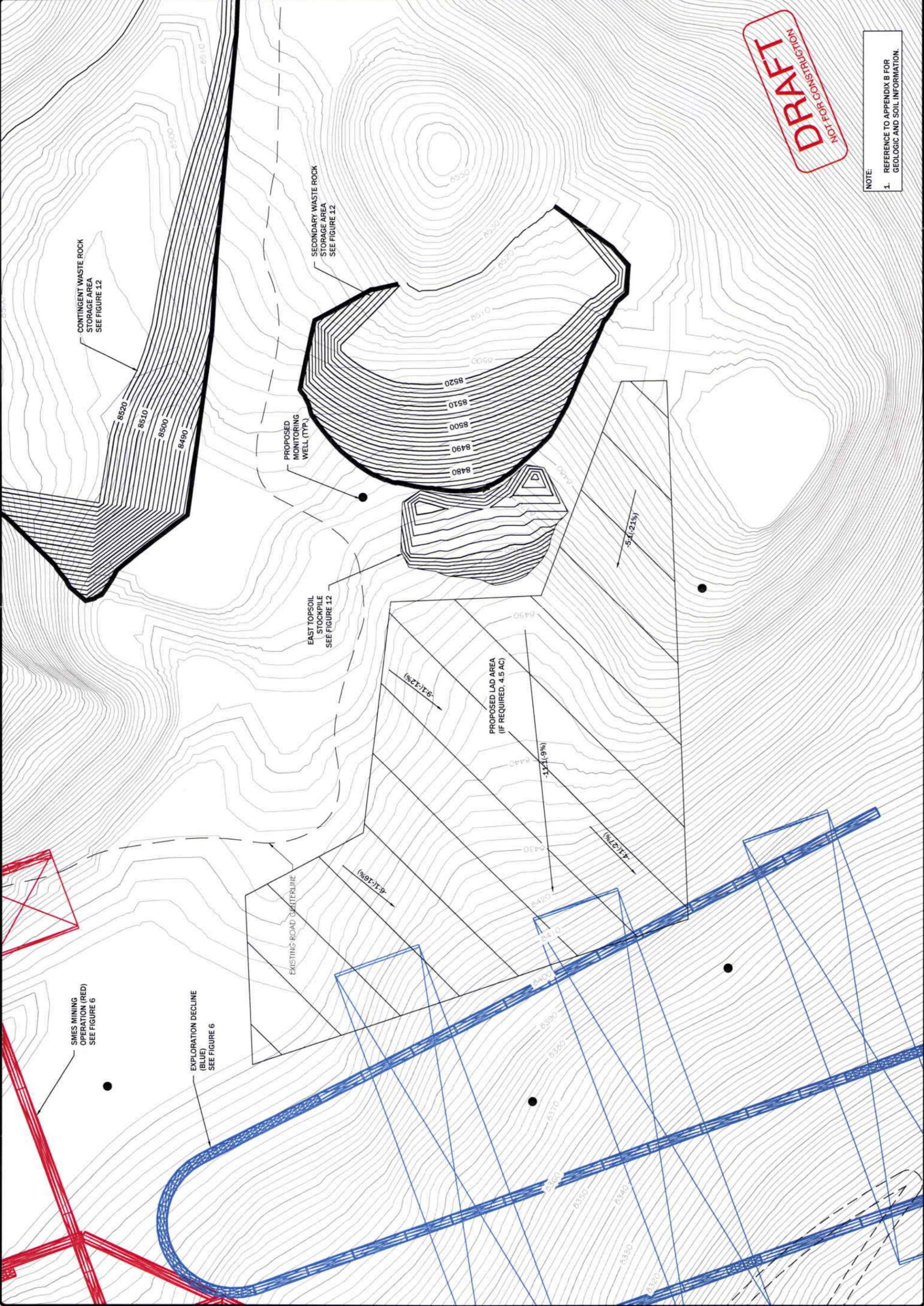


CREVICE MINING GROUP, LLC
 CREVICE MOUNTAIN
 EXPLORATION PERMIT

**PROPOSED
 LAD AREA**

PIONEER
 TECHNICAL SERVICES, INC.
 201 E. BROADWAY, SUITE C
 HELENA, MT 59601
 (406) 457-8252

PAGE 18
 FIGURE 13



NOTE:
 1. REFERENCE TO APPENDIX B FOR
 GEOLOGIC AND SOIL INFORMATION.

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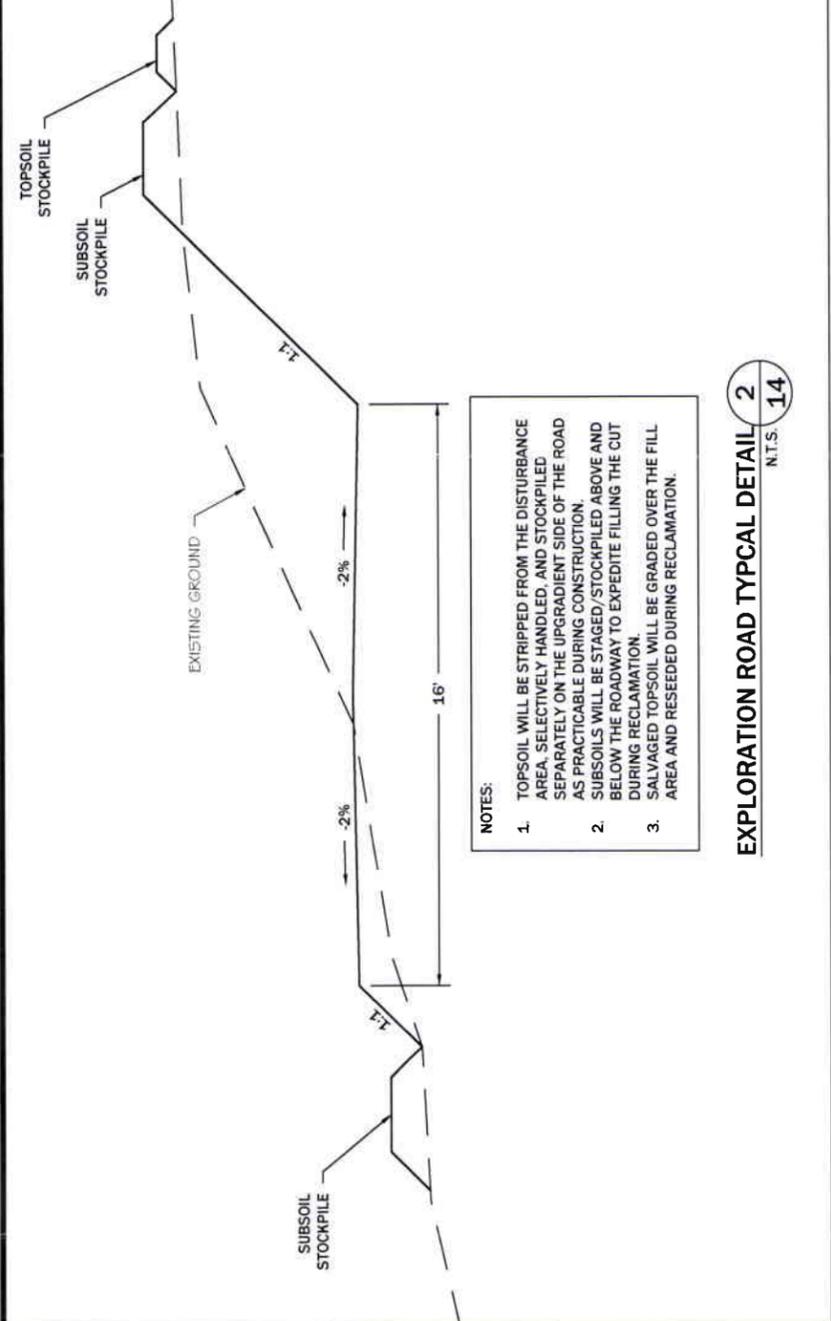
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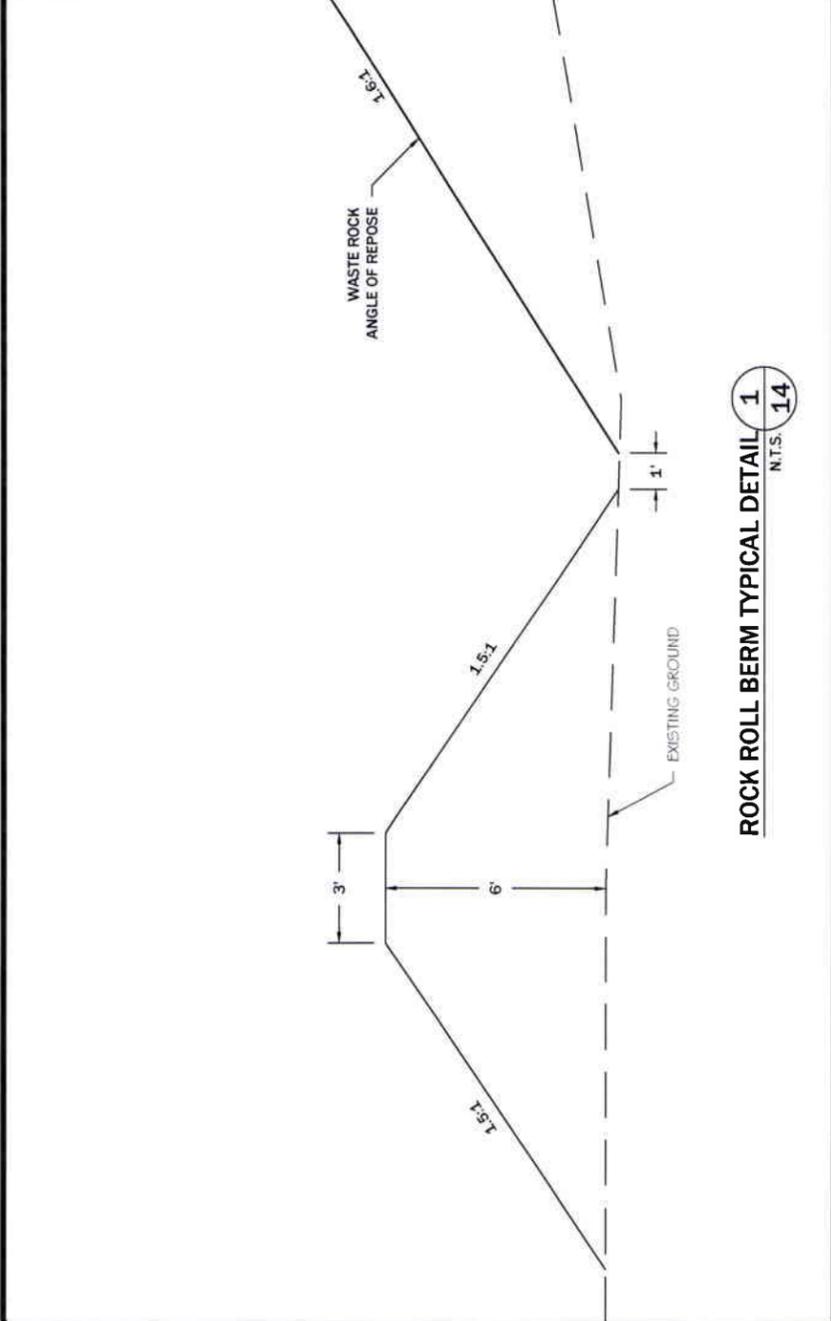
CREVICE MINING GROUP, LLC
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TYPICAL
 DETAILS

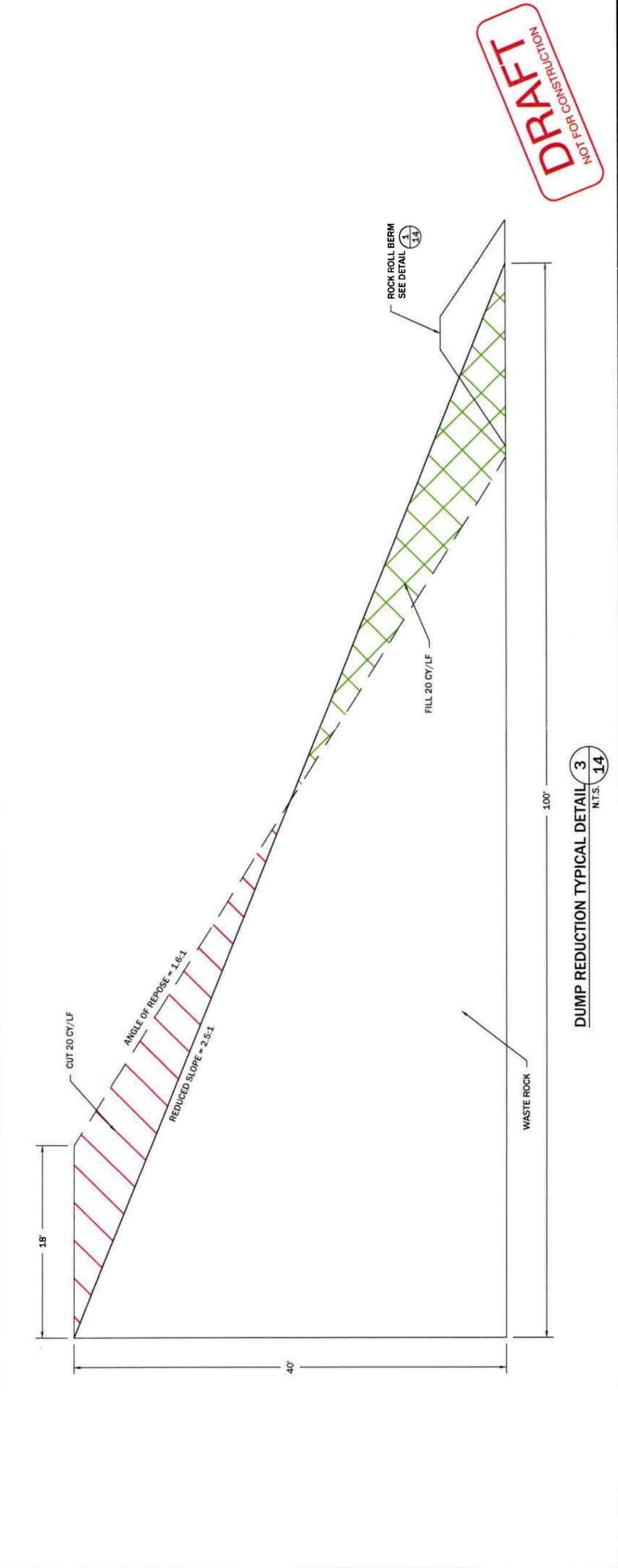


- NOTES:
1. TOPSOIL WILL BE STRIPPED FROM THE DISTURBANCE AREA, SELECTIVELY HANDLED, AND STOCKPILED SEPARATELY ON THE UPGRADE SIDE OF THE ROAD AS PRACTICABLE DURING CONSTRUCTION.
 2. SUBSOILS WILL BE STAGED/STOCKPILED ABOVE AND BELOW THE ROADWAY TO EXPEDITE FILLING THE CUT DURING RECLAMATION.
 3. SALVAGED TOPSOIL WILL BE GRADED OVER THE FILL AREA AND RESEEDED DURING RECLAMATION.

EXPLORATION ROAD TYPICAL DETAIL **2**
 N.T.S. **14**



ROCK ROLL BERM TYPICAL DETAIL **1**
 N.T.S. **14**



DUMP REDUCTION TYPICAL DETAIL **3**
 N.T.S. **14**

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6 PUBLIC ROADS

The site will be accessed through a combination of existing U. S. Forest Service and county roads. In the interest of public safety and to serve project needs, Crevice will complete minor repairs and improvements to the existing road network. Sections of the road where small trees and overgrowth limit line-of-sight visibility will be cleared; corners where visibility is limited will be widened and/or straightened. Crevice will improve the road surface by placing and compacting waste rock generated from exploration operations (if approved after significant analytical testing) on the roadways to create a more durable, weather-resistant surface. No new roads will be constructed for site access, but a section of roadway over private property on patented mining claims is planned for improvement. An exploration road will be constructed within the exploration site limits (See Section 7) and will serve as access for surface drilling. This exploration road will not be a public road.

Road work and maintenance schedules and procedures have been discussed in detail with Park County and the Forest Service. A site-specific road improvement plan will be presented to Park County and the Forest Service for approval. If required, bonding for road reduction after exploration will be levied by the Forest Service. Agreements for post-exploration road configuration will be communicated to DEQ and presented for the record as required under exploration regulations. Coordination will continue during exploration to ensure the Forest Service and Park County agree to the scale and scope of roadway improvements made during development.

Road maintenance and snow removal will be conducted in a manner to preserve and protect roads, to ensure safe and efficient travel, and to prevent excessive erosion damage to roads, streams, and adjacent lands. Where applicable, Crevice will construct turnouts to accommodate public safety.

The following specific practices will be employed:

- Maintain drains at switchbacks and otherwise assure that water will drain off the roadbed, minimizing the distance running water will flow down the road.
- Berms will be avoided unless necessary at specific locations for safety or resource protection or as required by the Mine Safety and Health Administration (MSHA). Berms remaining from construction activities will be bladed back onto the road surface.
- Cut and fill slopes, if necessary, will be limited to a maximum slope of 1.5 (horizontal) to 1 (vertical) when practical. Cut and fill slopes will be re-vegetated, as practical, at the earliest opportunity.
- Stream crossings will be maintained to minimize sediment loading of streams. Culverts will be kept open. No stream fords will be used.
- Snow will be removed from the entire road width, including turnouts.

- All material removed from the roads during snow removal, except snow and ice, will be kept away from the stream channels and bladed back onto the road bed when weather permits.
- Snow berms will be avoided, as possible, and drainage gaps left at appropriate spacing where snow berming cannot be avoided to facilitate surface drainage and avoid erosion.
- A minimal cover of snow will be maintained on roads to protect roadbeds and minimize erosion.

7 EXPLORATION ROADS

Crevice will construct a primary exploration road to access the project area. The exploration road (See **Figure 7** through **Figure 10**) will traverse patented mining claims and will be fully bonded for reclamation per DEQ regulations. The road will be constructed such that excavated (cut) materials (including topsoil) are staged upslope from the roadway to aid in regrading during reclamation. All best management practices for roadway construction and maintenance listed above for public roadways will be implemented. Drainage culverts will be installed where required.

8 SERVICES

8.1 Power

A portable diesel generator will be installed to supply power. The mining contractor will supply the generator, which will be large enough to accommodate all mining activities plus 75 hp for a diamond-drill unit. The generator unit and an air compressor unit will be enclosed in industry standard enclosures to minimize noise. Crevice will utilize low sulfur diesel. Crevice will secure the appropriate air quality permits associated with emissions from the diesel generators. Crevice intends to develop and utilize three-phase grid power as soon as practicable.

8.2 Water

Potable water requirements are estimated to be in the range of fifty (50) gallons per day. Potable water will be supplied by a commercial bottled water supplier.

Very little groundwater is expected to be encountered during exploration operations. **Table 2** presents historic data confirming that no water was encountered during mining and/or exploration operations within the project area. In 1944 George Seager wrote an article on the Crevasse Mountain Mining District in which he recorded that the First Chance was driven in 365 feet, from which a raise was driven to the surface. The adit was then driven another 350 feet for a total of 795 feet. As of the writing, no water was encountered in the First Chance or Highland Chief adits. Present observations indicated that there is still no water associated with the First

Chance or Highland Chief. The Vindicator adit, which is lower than the First Chance and on the Gardiner side of the drainage, was driven in 415 feet and no water was encountered. Crevice personnel have observed no water in the historic working described. Crevice management has toured DEQ personnel through the entirety of the project area and surrounding areas to demonstrate no evidence of water encountered in the historical workings.

During exploration associated with the Crevice Tunnel Project, significant water was encountered at the Palmer fault intersection. Crevice contends that the proposed operation is over 2 miles from the area where groundwater was encountered and at a higher elevation. Little to no groundwater is expected to be encountered during the proposed exploration operation. Section 11.3, Water Quality, presents a discussion of baseline data, acid potential, and monitoring planning.

TABLE 2: Groundwater Observations

| Key Point of Interest | Elevation (feet) | Groundwater Observation |
|---|-------------------------|--|
| Proposed Crevice Portal / Exploration Decline | 8375 | Little to no water expected based on historic data |
| First Chance Adit | 8159 | No water encountered or presently observed (795 total feet driven) |
| Base of Crevice Exploration Decline | 8150 | Little to no water expected based on historic data |
| Vindicator Adit | 7999 | No water encountered or presently observed (415 total feet driven) |
| Highland Chief Adit | 7837 | No water encountered or presently observed |
| Crevice Tunnel Project | 7500 | Water encountered along Palmer fault, which is 650 feet below base of planned decline and over two miles away from planned Crevice exploration area. |

The portal location is 104 degrees and approximately 1,400 feet northwest of the First Chance Portal. The approximate elevation of the planned Crevice portal is 8375 feet and the portal of the First Chance Adit is approximately 8159 feet. The First Chance adit was driven in a nearly intersecting direction to that of the planned exploration adit. Crevice contends that since no water is coming from existing adits on the mountain, a decline driven down dip will not produce water that will be discharged naturally into the environment. The logical assumption is that if the decline development hits water, development will stop and water will not flow out of the decline.

Mine water requirements for drilling and other uses are expected to be approximately 5 gpm. The water supply will originate from existing surface water rights held within the project limits by Crevice and any water encountered in the exploration drift (expected to be 0-5 gpm). Water will be stored in constructed sumps or, if necessary, stored in tanks located on the portal pad. In both cases, the water will be recycled by a closed-circuit system of surface holding/settling tanks and underground sumps.

8.3 Sewage

Two portable toilets will be located on the site, one at the portal and one at the contractors' service building. Toilets will be pumped regularly by a commercial septic pumping service. The change room ("dry") will be located on the site associated with Crevice's SMES. When the exploration work proves favorable, sewage facilities for the dry will be constructed in accordance with Park County and DEQ regulations and will be licensed under the appropriate authority.

8.4 Garbage and Solid Waste

Domestic garbage from the site will be bagged and stored in latchable, bear-proof steel containers. Garbage will be hauled to a county pick-up point in Gardiner once or twice weekly or as necessary. Solid waste, e.g., lumber and steel scrap, will be segregated for recycling, where practical, or disposed of in accordance with applicable regulations.

8.5 Housing

Project personnel will be housed in Southern Park County as dictated by the local housing market.

8.6 Fuel and Lubricants

Diesel fuel and lubricants for surface and underground mobile equipment will be supplied by a local fuel supplier. Above-ground tanks, suited to contain 20,000 gallons, will be located at the portal. The tank(s) will be set within a bermed and lined sump capable of holding 30,000 gallons. All lubricants will be stored in the contractors' service building or in lined underground storage areas. Used oil will be held in barrels in a lined containment area for pick-up by a licensed used-oil recycler.

8.7 Emergency Services

Emergency services, including fire-fighting, medical, and mine rescue, will be the responsibility of both Crevice Mining Group and its respective contractors. Mine rescue will be provided by Central Mine Rescue located in Osburn, ID. Emergency services will be provided by local providers in Gardiner, Mammoth, and Livingston, MT.

9 SURFACE DISTURBANCE

The site proposed for the primary waste rock storage area and topsoil stockpile is located 600 feet southwest of the portal and is generally gently sloping terrain. This area holds less timber than the surrounding landscape and will require limited clearing and grubbing. The secondary waste rock storage area is located 1,500 feet southeast of the portal and will be accessed via the existing road from the portal that bypassed the historic Snowshoe site, loops to the north and back to the south and east to the waste rock storage area. This area also holds less timber than the surrounding landscape and will require limited clearing and grubbing. Total area of surface

disturbance associated with waste rock storage areas is approximately 5.0 acres (**Figure 11 and Figure 12**). Topsoil will be salvaged up to fifty percent (50%) rock content and up to fifty percent (50%) slopes, stockpiled, and immediately seeded. Disturbance acreage associated with topsoil stockpiles will be approximately 1.1 acres.

Crevice will construct a surface drainage sediment collection pond downslope of the facilities and portal. The pond will be within the SMES area and encompass approximately 0.1 acres of surface area and will have the capacity to contain 200,500 gallons. Collection ditches will be constructed to route runoff from disturbed areas to the pond and diversions will be constructed upslope of disturbed areas to divert runoff waters. Given the nature of the porous soils in the area, excess sediment from runoff is not expected, but Crevice will commit to controlling sediment and will install appropriate Best Management Practices (BMPs) (straw wattles, filter fence, check dams, etc.) in key areas showing potential to produce erosion and sediment runoff. The pond will also serve to store water for dust control and explorations activities (drilling). Crevice will partially fill the pond by way of an existing surface water right on Crevice property or drill a well if necessary. Surface water rights are expected to be adequate to handle water make-up requirements.

Temporary facilities to be located within the SMES area near the portal (**Figure 5**) will include the following:

- Office Trailer (30 ft X 60 ft)
- Shop (40 ft X 56 ft)
- Two Generators (4 ft X 12 ft Each)
- Two Compressors (4 ft X 7.5 ft Each)
- Two Propane Tanks (4 ft X 16 ft Each)
- Water Storage Tank(s) with capacity of 8,000 to 10,000 gallons
- Electric Switch Gear Box (8 ft X 40 ft)
- Parking Lot (15 ft X 120 ft)
- Lined Petroleum Products Containment Facility which will contain the following tanks
 - Two Red Diesel Tanks (8 ft X 32 ft Each)
 - One Highway Diesel Tank (4 ft X 11 ft)
 - Waste Oil Storage Tank (4 ft X 6 ft)
 - Engine Oil Storage Tank (4 ft X 6 ft).

The lined petroleum products containment facility will have capacity for all fuel/petroleum volume (plus 50% surplus capacity).

10 DEVELOPMENT ROCK HANDLING

To provide access for exploration drilling operations, approximately 96,000 tons of waste rock will be produced during development of the portal and exploration decline. The waste rock dumps will be reclaimed when capacity is reached. Backfill of stopes will be implemented when practicable to limit waste rock volume at the surface. After exploration is initiated, waste rock taken from outside the limits of the mineralized zone will be utilized as road material to improve

the access road network leading to the exploration area. TVX-Mineral Hill utilized the practice of placing waste rock on roadways to improve road surfaces, limiting the overall need for waste rock storage area and associated disturbance. Waste rock typical of the Crevice Mountain exploration area, after blasting, is well graded, fragmented, and suitable for use as road mix.

To attain DEQ, Forest Service, and Park County approval for road mix, Crevice will commit to completing significant analytical testing for acid generation to prove that the material is inert and will not cause any impact to the environment. After approval, Crevice will place and grade the waste rock material over roadways as approved by the Forest Service and Park County and work the material into the roadway with a grader and vibratory compaction. Waste rock will be identical to rock encountered during TVX-Mineral Hill operations shown in the following photos. Note that the waste rock stockpiles shown in the photos are during active operations. Also note that waste rock stockpiles are nutrient poor and generally lack the physical and chemical characteristics for revegetation success. Crevice will salvage and stockpile all available topsoil as described herein and indicated on the figures to ensure that revegetation success and proper reclamation methods are implemented and achieved.



Photo 1: Waste Rock Stockpile Typical for Crevice Mountain Material

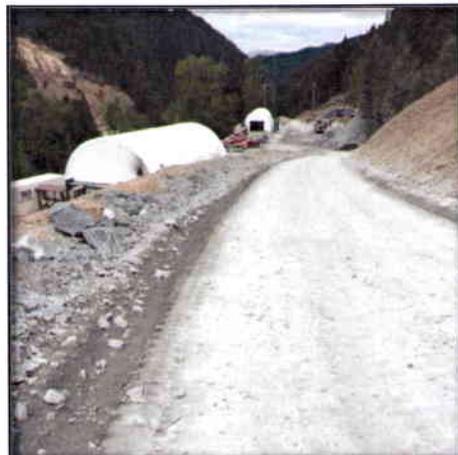


Photo 2: Waste Rock Utilized to Improve Road Surfaces

The planned waste rock storage areas are presented in **Figure 11** and **Figure 12**. The contingent waste rock storage area is not expected to be required, but will be fully bonded at the request of DEQ if required. Prior to placing waste rock, the planned disturbance area will be grubbed of existing timber and topsoil will be stripped and stockpiled on site. Topsoil stockpiles will be shaped to control runoff, seeded, and protected from run-on and runoff by ditches, berms and BMPs such as straw wattles. The waste rock will be placed and graded in approximate 20-foot lifts and reduced to a 2.5H:1V slope to limit rilling and erosion. For each respective lift, the reduced slope will be reclaimed prior to placing additional waste rock. Slope reclamation will be completed by placing and grading a 12- to 16-inch lift of topsoil (as available) over the reduced slope; shaping the slope with additional erosion control features (dozer basins, excavator pits, and grader tracking) to contain runoff; and seeding, fertilizing, and hydromulching the slopes.

Since this is an exploration project, Crevice does not intend to haul the allowable 10,000-ton bulk ore sample off site. As stated, if exploration proves an economic ore reserve, Crevice will mine the ore under the SMES and ship the ore to a mill to be determined at a later date.

10.1 Exploration and Definition Drilling

Crevice will complete approximately 64,000 feet (128 drillholes at 500 feet each) of detailed underground diamond drilling by way of drilling from the surface along the exploration road alignment and underground along the decline alignment. In the first year, 36,000 feet of exploration drilling is planned. Assumptions for the drilling program include the following:

- \$ 35 per foot for diamond drilling;
- \$ 20 per foot for RC drilling;
- \$ 20 per sample (sampling every meter for RC drilling and every foot for diamond drilling);
- 100 feet per shift of drilling for diamond drilling;
- One shift per hole for position change;
- 100-foot centers for exploration down dip;
- 50-foot centers for definition drilling;
- Initial exploration will focus on the first 225 feet down dip. Future exploration may expand on this area after initial exploration better defines data gaps. .

Year One exploration drilling will include approximately 14,000 feet of primary exploration drilling on 100-foot centers and 22,200 feet of secondary definition drilling on 50-foot centers. The planned drilling approach includes the following variables:

- Strike length of mineralized zone = 3800 feet
- Exploration drill holes will include 178 holes drilled on 100-foot centers at an average depth of 78 feet per hole for a total of 13,728 feet.
- Definition drill holes will include 74 sections drilled on 50-foot centers at four holes per section for a total of 296 definition holes and 300 feet total per section for a total of 22,200 feet.

Year Two exploration and definition drilling is budgeted for an additional 28,000 feet of drilling which will be defined based on the results of Year One drilling and exploration.

11 WATER MANAGEMENT

11.1 Underground Water

The Crevice Mountain area is a recharge area characterized by ephemeral, seasonal surface, and near-surface flows and very little groundwater flow in bedrock. Several lines of evidence strongly suggest that very little water is likely to be encountered by underground development (Montana Department of Environmental Quality, 1996):

- Historic records indicating previous mining operations in the district were plagued by chronic water shortages. Miles of old surface ditches in the area provide evidence of the lengths to which miners went to transport water from any available source.
- Past and present landowners in the area have encountered considerable difficulty locating and maintaining permanent water sources for domestic use.
- During periodic inspections completed by TVX-Mineral Hill of a nearby exploration drive over the course of a year, water in-flow was seasonal (spring rain and snowmelt periods) and appeared to be coming almost exclusively from two existing historic raises (i.e., from the surface).
- Previous surface exploration core drilling in the surrounding area has encountered significant groundwater flow in only one of fifty holes, and that hole is outside of the exploration development area proposed in this plan.

The exact locations of all the core drilling holes from previous explorations are unknown, but are assumed to be in the general location of the current project based on descriptions provided in the 1996 report.

A water resource baseline investigation was completed in 1993 for the Crevice Mine Project and presented in *Water Resources Baseline Investigation for the Crevice Mine Project, Park County* (Huntingdon Chen-Northern, 1994). Eleven exploration boreholes were placed in bedrock material and used for measuring static groundwater levels. Short-term aquifer tests in two of the boreholes within the project area were used to evaluate the hydraulic characteristics of the bedrock. The collected values suggested bedrock material of low permeability. Little or no water was encountered during the exploration borehole drilling, confirming the low permeability of the bedrock in this area. The report also noted that because of the fractured nature of the bedrock and low permeability, groundwater elevations measured in the boreholes were variable and a majority of the boreholes had groundwater levels in excess of 100 feet below ground surface.

The Montana Ground Water Information Center (GWIC), an on-line well mapper maintained by the Montana Bureau of Mines and Geology, was searched for the locations of water wells and boreholes in the Crevice project area (<http://data.mbmgs.mtech.edu/mapper/mapper/>.) Two domestic wells were identified within the immediate project vicinity; **Appendix B-1 includes** well logs. Elevations relative to the base of the planned exploration decline are presented below:

1. The Laubach Well located to the northeast:
 - a. Approximate well elevation at ground surface = 8721 feet
 - b. Total Depth = 165 feet deep (Base elevation of 8556 feet as compared to the base elevation of 8150 feet for the proposed exploration decline)
 - c. Static Water Level = 83 feet
 - d. Discharge Rate = 1 gallon per minute

2. The Johnson Well to the northwest (at an elevation more than 1,300 vertical feet lower than the project area)
 - a. Approximate surface elevation = 7029 feet
 - b. Total Depth = 195 feet (Base elevation of 6834 feet elevation as compared to the base elevation of 8150 feet for the proposed exploration decline; or 1316 vertical feet lower than the proposed base of the exploration decline)
 - c. Static Water Level = 65 feet
 - d. Discharge Rate = 20 gallons per minute

Groundwater flow in the underground development is anticipated to be in the range of 0-5 gpm (Montana Department of Environmental Quality, 1996). Since development water demand is expected in the range of 4-5 gpm, it is likely that the underground water balance will be neutral or negative, resulting in no flow out of the existing portal. To provide makeup water at startup for the operation, Crevice will utilize existing surface water rights and all groundwater encountered.

Groundwater encountered in the course of underground development will be managed as follows:

- Store all mine water in underground sumps; size, number, and location of sumps will depend on groundwater flow rate and current mine cycle;
- Recycle as much mine water as possible;
- Construct surface contingency capacity for excess water, if encountered; water storage tanks at the portal, and an approximately 200,500-gallon sediment collection pond downslope from the portal;
- Grout underground inflows as required;
- Drill probe holes in advance of and in conjunction with exploration decline development to determine if groundwater is present.
- Install hole packers and valves or grout diamond-drill holes which generate excess water;

- Provide make-up water, if necessary, from existing surface sources via an existing water right held by Crevice, including the sediment collection pond; and
- Truck water from private sources if necessary.

Excessive ground-water flows are not expected. Probe holes will be drilled in conjunction with decline development and exploration. In the event excess flows are encountered that exceed the limits of the proposed Land Application Discharge/Disposal (LAD) site, the probe holes will be sealed and abandoned as required under the exploration permit requirements and exploration will cease. If manageable flows are encountered and if approved by DEQ, the excess water will be pumped from underground sumps to the proposed Land Application Discharge/Disposal (LAD) site.

11.2 Surface Water

Surface (runoff) water will be managed as follows:

- Construct diversion ditches and berms above and collector ditches below the disturbed area.
- Construct a sediment collection pond below the disturbed area to which collection ditches will gravity feed; pond capacity will be conservatively designed for the 25-year, 24-hour event (approximately 200,500 gallons).
- Provide an oil skimmer in the event mine water must be temporally decanted into the sediment collection pond.
- Monitor water quality regularly underground and as necessary in the surface sediment collection pond.
- If high groundwater flows are encountered due to periodic surface water inflows, the excess water will be pumped from underground sumps to the proposed LAD site.

11.3 Water Quality

11.3.1 Baseline Water Quality Sampling

Water quality sampling was conducted between 1992 and 1995 in the Upper Crevice area at sample sites including streams, springs, a pond (Frog Pond), a portal (Exploration), adits, and groundwater wells and boreholes by TVX-Mineral Hill and Huntingdon Chen-Northern, Inc. (HCN). A grab sample for surface water (spring runoff) was collected in 2015 near the proposed portal area. **Appendix B-2** includes the sample results, which show no elevated metals of concern.

In general, concentrations of the metals in the sampled surface water were low or below detection levels and meet DEQ-7 water quality standards (DEQ, 2012). Arsenic levels exceeded the DEQ-7 standard of 0.01 mg/L in samples collected at the Frog Pond (0.024 L to 0.072 mg/L). Frog Pond is downgradient of the pond at PCT-300, a Palmer Creek tributary (0.028 to 0.046 mg/L), and upgradient of the pond at PCT-100 (0.152 mg/L) and at BCT-300 (0.352 mg/L), a tributary to Bear Creek. Concentrations of iron and manganese exceeded secondary drinking

water standards at several sample sites. The sample collected at BCT-300 also exceeded standards for chromium and nickel, but was collected during early summer runoff and high turbidity. All of the sampling sites are likely affected by drainage from historic mine workings including adits, tailings, and waste rock (HCN, 1994).

Water samples collected from the Exploration portal and drift (CRA-2) had arsenic concentrations ranging from 0.18 to 1.22 mg/L and elevated levels of iron over the two-year sampling period. Water quality from the other two adit seeps, the exploration borehole, and the two domestic wells was generally good, with a couple of slight arsenic and iron exceedances.

Results of the sampling show water in the Crevice area to be generally good quality, calcium-bicarbonate type, with the following characteristics (DEQ, 1996):

- hardness < 125 mg/L;
- total dissolved solids < 155 mg/L;
- specific conductance < 210 μ mhos/cm;
- pH 6-8; and
- nitrate + nitrite < 0.30 mg/L (one sample from the Exploration portal was 0.86 mg/L).

The HCN baseline investigation concluded that surface water quality within the project area is generally of high quality, with some elevated levels of arsenic, iron, and manganese. Water from seeps, springs, and adit discharges was generally good with some arsenic exceedances, but relatively low flow rates of 10 gpm, and pH was neutral to slightly alkaline. Groundwater varied both in depth and quality, but in general had few water quality standard exceedances.

11.3.2 Acid Mine Drainage

Despite over 100 years of mining in the district, including historic mines at Mineral Hill and Crevice Mountain, years of operational water quality monitoring have yielded no evidence of acid mine drainage (AMD). Although sulfide-bearing mineralogies have long been exposed to water and air in historic workings, analytical results of water quality sampling at the 1300-level portal (Mineral Hill Area), driven in about 1910, and at the First Chance Portal (Crevice Area), driven in 1890, show pH values neutral or slightly alkaline, with low sulfide concentrations (Montana Department of State Lands, 1994). These two historic mines serve as the best possible predictors of acid-producing potential of mineralized rock in the area.

The HCN report on a 12-month baseline water quality study (HCN, 1994) concluded: “Analytical results show that water from adits generally is good quality calcium-bicarbonate type with a neutral to slightly alkaline pH (6.0 to 7.7 s.u.). There is no evidence of acid mine drainage from any adits observed in the study area. Concentrations of sulfate (4 to 10 mg/l) are low and the water is soft (14 to 39 mg/l hardness as CaCO₃).”

TVX-Mineral Hill performed acid/base accounting (ABA) analysis on drill-core samples from the Conrad zone, which represents the rock types to be encountered underground during the Crevice Project. Static ABA assumes that all sulfur in the samples will be converted to sulfuric acid. Results for Crevice samples indicated the potential for acid generation in 19 of 21 samples

(HCN, 1994). Current literature suggests that ABA testing is limited by the assumption that all acidity originates exclusively from pyrite, ignoring other sulfide minerals. As discussed in *A Critical Review of Static Geochemical Test Methods Applied to Mining Wastes, Including Their Applicability to Field Conditions*, presented at the 2012 International Mine Water Association Conference (Rousseau, 2012), "...other minerals can have a bearing on the result but are often ignored as the assumption that pyrite, if present, is considered to be conservative (analysis) from an environmental point of view. From an economic point of view, however, if other minerals make up a significant proportion of a sample, it may be erroneously classified as potentially acid forming." Appendix B-3 includes an abstract of Rousseau's report.

On-site evidence at Mineral Hill Mine and at Crevice contradicts results of the ABA analyses and supports erroneous classification. Mineralogy is similar in both deposits: sulfide content of ore averages 6-10% and 5% respectively, and only a small percentage (approximately 5%) of total sulfides in each deposit is comprised of reactive species such as pyrite (Montana Department of State Lands, 1994). Reported observations of waste rock dumps at Crevice and Mineral Hill show no iron deposition or other evidence of AMD, and historic dumps and old workings support substantial volunteer regrowth of native plants. The measured pH values of Crevice ABA samples run neutral or slightly alkaline, with only 2 of 21 samples below 7, at 6.5 and 6.9, respectively. In addition, water quality samples collected from historic portals at Crevice (Exploration in 1890) and Mineral Hill (1300 level in 1910) had pH values near or above neutral.

Since there are no field indications of acid mine drainage at either Mineral Hill or Crevice, despite mining activities in the area for over 100 years, it is not anticipated that acid drainage will result from the proposed Crevice Project exploration activities. Water quality sampling during the Project will be performed as necessary to confirm water quality standards are met for any dewatering activities and best management practices (BMPs) will be implemented to prevent any impacts to surface water. If core samples from the proposed exploration indicate a significant change in lithology, Crevice will provide petrographic descriptions and conduct the applicable geochemical analyses as necessary. Crevice will notify DEQ of any changes.

11.3.3 Water Quality Monitoring

Crevice will develop a monitoring well network at the proposed Land Application Discharge (LAD) area to establish baseline water quality (if groundwater is encountered) and to ensure the system, if required, is functioning as designed and meeting water quality requirements. All water encountered that is local to the project area, including water encountered when developing the exploration decline and local surface water and groundwater (if encountered), will be sampled and compared against available baseline water quality. The monitoring program and frequency will be coordinated with DEQ based on water volume and water quality conditions encountered during exploration and will include coordination to determine the specific analytical parameters required by DEQ.

12 LAND APPLICATION DISCHARGE (LAD) AREA

Crevice does not anticipate the need for a Land Application Discharge (LAD) Area. Crevice is more concerned about obtaining sufficient make-up water by way of existing surface water rights and/or groundwater wells (application for beneficial use in process) for exploration and dust control requirements. However, Crevice intends to have a plan in place in the event excess groundwater is encountered. Crevice will complete a full-scale characterization effort for the proposed LAD area. A monitoring well network will be established and include both upgradient and downgradient wells for establishing baseline data. No water is expected to be encountered for the monitoring wells, but the wells will be installed to confirm this assumption and to serve the purpose of monitoring the site in the event the LAD is required. The proposed LAD area (if required) is shown on **Figure 13**.

If water volumes are very small, water quality will be analyzed and the LAD, when approved by DEQ, will be operated at agronomic rates during the growing season only (no groundwater discharge authorization required, but seasonal discharge only, and not during rainy periods).

While not expected, if excessive water volume is encountered, the LAD would be designed to accommodate discharge to subsurface but would be managed such that there is no potential for surface runoff of irrigated water. Irrigation would be limited to within the growing season and, depending on volume and water quality, Crevice would meet the following DEQ requirements:

- Irrigated water would meet all groundwater quality standards before irrigation (except possibly nutrients [nitrate] that would be consumed by vegetation during the growing season). However, treatment may be required for arsenic or other constituents that may be present in the water above standards); or
- DEQ would require hydrologic tests, soil attenuation tests, monitoring, and a mixing zone determination to document that all constituents of concern would be adsorbed to soils and/or diluted by mixing with ambient groundwater beneath the LAD area to the degree that there would be no exceedance of any standard at the downgradient edge of the mixing zone. Groundwater monitoring requirements would be site-specific and dependent upon topography, etc., of the LAD area, but as a general rule DEQ would require at least one upgradient well and three downgradient wells.

If water disposal cannot be limited to summer months, a subsurface disposal system (drainfield) may be considered. In this case, no allowance for nutrient uptake during summer months would be made, and water quality standards for nutrients would be met year-round. An Underground Injection Control (UIC) permit from EPA may also be required. All other conditions for LAD mentioned above would still be required (compliance with standards either at the point of discharge or at the end of a mixing zone). EPA generally requires compliance with groundwater standards at the point of discharge under a UIC permit.

The planned LAD area is adjacent to and included within the waste rock storage area. The proposed LAD area is presented in **Figure 13**. Natural Resource Conservation Service(NRCS) soils data for the proposed LAD area indicate favorable Hydrologic Group B soil conditions for

water absorption which are conducive to a well-functioning LAD system. **Appendix C** includes a custom NRCS soils report of the proposed LAD area. The proposed area falls within Map Unit 34-1B.

13 SITE RECLAMATION

The facilities and infrastructure layout at the exploration portal are designed to minimize impacts. Hence, complete site restoration can be readily achieved.

When exploration is complete and if exploration results are favorable for long-term mining, infrastructure related to exploration will be reclaimed and the portal and decline will be utilized for future mining purposes. The portal area will be managed as follows:

- Remove all temporary structures;
- Re-establish, as nearly as possible, pre-Project topography;
- Properly abandon drillholes per ARM 17.24.106;
- Replace topsoil and revegetate disturbed areas; and
- Regrade and re-establish pre-exploration drainage conditions.

If exploration results are not favorable, Crevice will complete all of the actions above in addition to sealing the portal (per ARM 17.24.107 (6) requirements), decline, and raise(s) to prevent access and inflow/outflow of water.

13.1 Bonding Requirements and Calculations

Crevice will fully bond for all disturbance associated with exploration, including waste rock storage areas, exploration roads and ancillary areas, storm water BMPS, required dust control, weed control, and contingency for all secondary disturbance such as debris and additional erosion control measures.

DEQ will calculate the actual bond requirement based on the information provided herein. **Table 3** presents estimated bond requirements calculated using recent construction/reclamation costs on comparable reclamation projects; An itemized description of the bond calculations is presented below:

- **Mobilization, Bonding, and Insurance:** For contracted work and construction bids, costs associated with mobilization are generally calculated at ten percent (10%) of the total construction costs. This bond item covers bonding and insurance costs for prospective contractors. It is considered a conservative estimate given the proximity of the site to contracting entities.

- Waste Rock Storage Areas: When the primary waste rock storage area reaches capacity, Crevice plans to reclaim the area while the secondary waste rock storage area is under development (See **Figure 11** and **Figure 12**). However, Crevice will bond the full 5 acres of disturbance associated with waste rock storage areas. Included in the bond calculation are costs for regrading and reducing the waste rock slopes, excavating, loading, placing, and spreading cover soil, fertilizing and seeding, hydromulching, and constructing run-on and runoff control drainage. Also included are costs for reclaiming the disturbance associated with topsoil stockpiles areas.
- Exploration Roads and Ancillary Items: Crevice will construct the exploration road in a manner where spoils and topsoil are stockpiled upgradient from the roadway to provide efficient operations during road grading and reclamation. Drill pads scheduled for surface drilling which are constructed along the exploration road alignment will be reclaimed concurrently as exploration operations advance. DEQ will determine the bond based on the information provided herein.
- Dust Control: Crevice will bond for required dust control associated with reclaiming roadways, waste rock storage areas, and ancillary areas related to the exploration work. It is estimated that reclamation for the total disturbance acreage will take a competent contractor approximately one month. For the purpose of dust control and the limited acres, sixty loads from a 4,000 gallon water truck are considered sufficient for dust control measures, should bonded work be required.
- Stormwater BMPs: This item includes all potential erosion control measures that may be required to ensure the site is stable. The items include typical engineering tools that are commonly implemented on construction projects, including filter fence, straw wattles, erosion control mat, stone check dams, riprap, and geotextiles placed prior to placing riprap.
- Weed Control: Although the disturbance area is limited to approximately 7 acres, Crevice will bond for weed control on 10 acres for a period of three years. The bond estimate equates to \$100.00 per acre for three years and is considered sufficient for commercially available weed control contractors.
- Landfill Debris Disposal: Crevice commits to keeping the site clean and will control debris and litter as outlined in Section 14.2, Solid Waste. However, Crevice will bond for landfill debris disposal if required to properly reclaim the site.
- Ten Percent Contingency: Not including the voluntary bond for the SMES, the total estimated bonded value of \$163,791.60 equates to nearly \$22,000 per acre of disturbance associated with the exploration plan (7.0 acres), Crevice proposes an additional ten percent bond in the amount of \$13,649.30 to account for unforeseen reclamation costs. The total bond value will be \$163,791.60.

Crevice will not post bond for the contingent waste rock storage and contingent LAD area (Figure 12 and Figure 13) unless the areas are actually used.

Table 3: Crevice Mining Group LLC Exploration Bond Calculation

| BOND ITEM | DISTURBANCE/RECLAMATION QUANTITY | UNITS | DESCRIPTION | UNIT PRICE, \$ | TOTAL PRICE, \$ |
|-----------------|----------------------------------|-------|---|----------------|---------------------|
| 1 | 1 | LS | MOBILIZATION, BONDING, AND INSURANCE Lump sum for Mobilization, Bonding, and Insurance Calculated at 10% of Bonded Items | LS | \$13,649.30 |
| 2 | | | WASTE ROCK STORAGE AREAS | | |
| 2a | 5 | Acres | Regrade and Reduce Slopes | \$1,200.00 | \$6,000.00 |
| 2b | 2,200 | CY | Excavate, Load, Haul and Place Coversoil | \$3.50 | \$7,700.00 |
| 2c | 5 | ACRES | Fertilize and Seed | \$1,100.00 | \$5,500.00 |
| 2d | 5 | ACRES | Hydromulch | \$1,400.00 | \$7,000.00 |
| 2e | 0.6 | ACRES | Reclaim Topsoil Stockpile Areas (Fertilize, Seed, and Hydromulch) | \$2,500.00 | \$1,500.00 |
| 2f | 2000 | LF | Construct Run-on and Runoff Control Ditches/Drainage | \$6.00 | \$12,000.00 |
| 3 | | | REMOVE AND RECLAIM EXPLORATION ROADS & ANCILLARY ITEMS | | |
| 3a | 2,871 | LF | Reclaim Exploration Road | \$8.00 | \$22,968.00 |
| 3b | 10 | EA | Reclaim Exploration Drillpads | \$500.00 | \$5,000.00 |
| 3c | 10 | EA | Drillhole Abandonment | \$800.00 | \$8,000.00 |
| 3d | 6 | EA | Remove 18" HDPE Culverts | \$300.00 | \$1,800.00 |
| 4 | | | PROVIDE WATER FOR DUST CONTROL | | |
| 4a | 1 | LS | Water Loading Area | \$800.00 | \$800.00 |
| 4b | 60 | Loads | Provide 4000 Gallon Water Trucks | \$100.00 | \$6,000.00 |
| 5 | | | STORM WATER BMPs | | |
| 5a | 500 | LF | Filter Fence | \$5.75 | \$2,875.00 |
| 5b | 1,200 | LF | Straw Wattles | \$7.50 | \$9,000.00 |
| 5c | 1,000 | SY | Erosion Control Mat | \$4.50 | \$4,500.00 |
| 5d | 6 | EA | Stone Check Dams | \$200.00 | \$1,200.00 |
| 5e | 50 | SY | Install Type 1 Riprap | \$50.00 | \$2,500.00 |
| 5f | 50 | SY | Install Type 2 Riprap | \$75.00 | \$3,750.00 |
| 5g | 100 | SY | Bank Stabilization Geotextile | \$4.00 | \$400.00 |
| 6 | 3 | YEARS | WEED CONTROL (TEN ACRES "MINIMUM" PER YEAR) | \$1,000.00 | \$3,000.00 |
| 7 | 50 | CY | LANDFILL DEBRIS DISPOSAL | \$250.00 | \$12,500.00 |
| 8 | 5 | AC | RECLAIM SMALL MINER'S EXCLUSION STATEMENT AREA (VOLUNTARY BOND) | \$2,500.00 | \$12,500.00 |
| 9 | 1 | LS | 10% CONTINGENCY | LS | \$13,649.30 |
| SUBTOTAL | | | | | \$163,791.60 |

AC = Acres
 EA = Each
 LF = Linear Feet
 LS = Lump Sum
 SY = Square Yards

14 MITIGATING MEASURES

14.1 Air Quality

The potential for fugitive emissions during the Project exists on the county access road and at the waste dumps, facilities, surface drilling, and surface haulage. Crevice will apply water and/or chemical stabilization to the road and any other disturbed area as necessary to minimize wind erosion emissions. Crevice will coordinate closely with DEQ, the Forest Service, and Park County to ensure dust control measures are satisfactory.

Crevice will secure the appropriate air quality permits, where required, associated with emissions from the diesel generators and all applicable requirements. The exploration area does not fall within a Class I airshed. Generators utilized will meet the air quality requirements mandated by the DEQ air quality permit (if required). IP56 silent enclosures will be utilized for the diesel generators. Crevice will use low-sulfur diesel. Crevice intends to develop and utilize three-phase grid power as soon as practicable.

14.2 Solid Waste

Solid waste disposal will be in compliance with all applicable federal, state, and local regulations. All garbage, refuse, and waste will be contained in appropriate containers and removed from the site not less than weekly.

14.3 Scenic/Aesthetic Values

The proposed exploration portal site and associated waste rock storage area was selected, in part, to minimize visual impacts. The site is shielded from view by topographic features and trees and is visible from neither Yellowstone National Park nor from most other vantage points.

New surface disturbance will be limited to a small area. Sheltering trees will be retained, and total tree removal will be limited to the extent possible.

Infrastructure developed for lighting needed to work at night, where required, will be directed downward and shielded where practicable.

14.4 Fish and Wildlife

The nearest perennial stream to the Crevice site, Malin Creek (approximately 3500 feet from the portal), is a first-order tributary of the Yellowstone River which falls approximately 3/4 –mile short of physically draining into the river and almost certainly does not support a fish population. Storm water runoff from disturbed areas at the project site will be diverted into constructed ditches (as previously described) to eliminate sediment loss from the site to the Malin Creek drainage.

All appropriate measures will be taken to avoid negative impacts to or conflict with wildlife.

Traffic speed limits will be strictly enforced and drivers trained to watch for and avoid wildlife on roads. No firearms will be permitted on company property. No pets will be permitted on the project site. All garbage, food, or other potential bear attractants will be secured from bears at all times. Garbage will be stored in bear-proof, latched containers and removed from the site at least weekly.

Sightings or sign of wildlife will be reported to supervisory personnel and recorded on standard wildlife observation forms.

14.5 Cultural Resources

Historic and prehistoric cultural resources, if encountered, will be preserved in place, if possible, and otherwise preserved and recorded in accordance with state and federal standards.

14.6 Hazardous Substances

Use and storage of hazardous substances are not anticipated and will be avoided. However, any such materials necessary to the successful completion of the project will be handled in accordance with all applicable local, state, and federal standards and BMPs. Material Safety Data Sheets will be on hand for all materials on site.

14.7 Sediment Control

As previously discussed, off-site sediment losses will be controlled by a system of diversion and collection berms and ditches in conjunction with a sediment collection pond. Temporarily stockpiled topsoil will be seeded immediately to prevent soil erosion. Additional erosion control measures (BMPs) will be installed in critical erosion prone areas identified in the field, including areas associated with the exploration roads. Crevice will comply with DEQ regulations for Stormwater Pollution Prevention Plans (SWPPP), inspection, and administration.

14.8 Water Management

It is anticipated that little, if any, groundwater will be encountered in underground operations. As previously discussed, mine water will be contained in a closed-circuit system and recycled. Surface tanks may initially be utilized to hold and settle mine water prior to recycling. If excessive water volume is encountered, the water will be pumped to the LAD site to be permitted at a later date if necessary (see also Section 12). Fugitive oils (sheen or film) will be skimmed from tanks and sumps prior to recycling.

If water is encountered in the diamond drillholes, the holes will be plugged with hole packers and valved or grouted. Water quality will be monitored regularly.

14.9 Fire Prevention and Control

All applicable local, state, and federal fire prevention and burning standards and BMPs will be adhered to. No open fires will be permitted on the Project.

Chainsaws will be equipped with approved spark arrestors. Fire extinguishers will be kept on site and in good working order at all times, and hand tools, pumps, and heavy equipment will be available for fire control.

14.10 Fuel Storage

Above-ground fuel tanks will be set in a lined petroleum products facility. There will be no underground or buried fuel tanks. Regular inspections will be made to ensure that tanks and filling hoses and nozzles are in good condition and not leaking.

Oil/fuel absorbing materials will be kept on-hand at the exploration office in the event of minor spills or leaks. All applicable local, state, and federal regulations and BMPs with regard to storage, handling, and use of fuels will be followed.

14.11 Noxious Weed Control

To prevent introduction of noxious weed seed, all mobile equipment and vehicles will be thoroughly washed at an off-site location and inspected by a qualified supervisor prior to mobilizing onto the project. Equipment or vehicles which leave the project must be washed again and inspected before redeployment on the Project. No hay or straw will be permitted on the project unless management has designated a specific need and then only if it is certified weed-free. Crevice will contract weed control services during exploration to control the spread of noxious weeds. In addition, Crevice will fully bond the exploration disturbance areas (and surrounding roadways) for three years/seasons of weed control.

14.12 Transportation

To eliminate the need for road building, existing roads will be used for the duration of the project. Traffic between Jardine and Crevice will be kept to minimum practical levels by coordinating supply trips and by transporting workers in multi-passenger vehicles. In addition, consumable items such as fuel, water, drill bits, etc. will be stockpiled to the extent possible prior to the opening of the general hunting season in the fall. This practice will minimize the amount of traffic on the existing roads and will minimize potential conflicts between mine operations and hunters.

14.13 Noise

The mine generator and compressor at the portal will be housed in a sound-attenuating temporary structure. Some near-surface blasting will occur during portal construction, but only during the daylight hours. Exploration drilling from the surface will be limited to daylight hours.

14.14 Socioeconomics

Contractors will be encouraged to hire workers from the local labor pool and to purchase goods and services locally as much as possible.

15 PROJECT SCHEDULE

The exploration project has a proposed 18-month schedule planned to start in 2016 and be completed in 2017. If exploration produces results favorable to production mining, Crevice will mine the project under its existing SMES, with surface disturbance limited to 4.98 acres. The exploration project will be completed in two phases:

Phase 1 (2016)

1. Developing facilities associated with the Small Miner's Exclusion Statement;
2. Starting the exploration decline;
3. Developing the primary waste rock storage area;
4. Developing an exploration road;
5. Initiating exploration drilling from the surface along the exploration road alignment; and
6. Initiating underground exploration drilling along the exploration decline.

Phase 2 (2017)

1. Completing the exploration decline;
2. Developing the south waste rock storage area;
3. Completing secondary surface drilling adjacent to the exploration road and south waste rock storage area; and
4. Completing the remainder of the underground drilling program.

Waste rock storage area reclamation and areas disturbed by surface drilling will be reclaimed concurrently as exploration work progresses. The final site restoration will be completed upon review of the project feasibility study associated with exploration results. If exploration and modeling results are favorable, Crevice plans to work under the existing Small Miners Exclusion Statement. If exploration results prove to be very favorable, Crevice will consider an application for an operating permit.

16 REFERENCES

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