STATE OF COLORADO

DIVISION OF RECLAMATION, MINING AND SAFETY
Department of Natural Resources

1313 Sherman St., Room 215
Denver, Colorado 80203
Phone: (303) 866-3567
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COLORADO DIVISION OF RECLAMATION MINING & SAFETY

November 14, 2012

Mr. Rory Williams
Star Mine Operations LLC
1675 Larimer Street, Suite 820
Denver, CO 80202

Re: Revenue Mine, File No. M-2012-032, 112d-1 Application, Second Adequacy Review Letter.

Dear Mr. Williams,

The Division continues to review the above-named permit application for technical adequacy, and has included the following comments and questions that must be addressed. As you recall, the Division's Minerals program has already provided comments and questions to the applicant. Additional comments from the Division are contained in the enclosed memo, regarding Geotechnical Stability, for your responses.

The Division's decision date is still set for December 14, 2012. I must ask you to please provide all responses to me at least one week prior to that date, to allow time for our review and reply. If it appears that additional time will be needed to prepare and submit your response materials, an extension of the Division's decision date may be requested.

Please provide two complete sets of all response materials. Responses should be directed to me at the Durango address below.

Please be reminded that all application-related correspondence and adequacy materials must be promptly filed for public review with the Ouray County Clerk and Recorder, and the filing receipts obtained from them must be promptly submitted to me. Materials to be filed with the county must include: review letters and memoranda from the Division, as well as all responses from you and your consultant.

If you have any questions, I may be reached at the Division's Durango Field Office: 691 CR 233, Room A-2, Durango, CO 81301.

Sincerely,

Bob Oswald
Environmental Protection Specialist

Enclosures: DRMS review memo: geotechnical stability

EC: Russ Means, DRMS Grand Junction
Greg Lewicki and Associates, PLLC
John Trujillo, Star Mine Operations LLC, Ouray

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COLORADO DIVISION OF RECLAMATION MINING & SAFETY

DATE: October 18, 2012
TO: Bob Oswald, DRMS
FROM: TC Wait, DRMS
SUBJECT: Revenue Mine (M-2012-032)
Geologic Hazards and Stability Analysis

Per your request, I have completed a preliminary review of the submitted stability analysis as part of the Revenue Mine permit. The permit will re-activate a historic underground mine and under ground mill near Sneffles Creek west of the town of Ouray. The comments below should be considered as part of the adequacy response to DRMS.

Global Geologic Hazards for the Area:

Geologic hazards for this site include Floodplain, Erosion, Debris Flow, Unstable Slopes (including rockfall), and Avalanche. This assessment is stemming largely from the HB 1041 hazards maps done in the 1970s for the Ironton and Telluride Geologic Quadrangles.

The proposed tailings piles do encroach onto the physiographic flood plain for Sneffles Creek. The 100-year flood plain is shown in the Exhibit C maps near the ponds, but the flood plain boundary is not extended through the entire site. The concerns for the flood plain are 1) erosion of the tailings pile, which could destabilize the piles, and 2) elevated water possibly coming in contact with waste rock that may be contaminated.

There are a number of debris flow fans in this valley area, and Ouray County is known for its destructive debris flow potential. One of the mapped fans includes the lower parts of the Atlas drainage south of the existing pond. Another is slightly down-valley and crosses the road, shedding from the slopes on the north side of the county road, and there is potential for the entire Sneffles Creek to have a debris flow run. Debris flows are very unpredictable, and can rapidly jump from one drainage channel to another on these fans. Although the proposed locations for the facilities relating to the mine are not on the fans, if the fan by the Atlas drainage drains toward the east or the fan by the county road drains to the west, they could impact mine structures.

There are a number of avalanche chutes in the area, including the one shown on the Exhibit C maps. The slopes on the north side of the county road appear to run frequently, based on air photos. The runout zone for the avalanche chute directly above the permit area will include the tailings piles. Should this chute run, there may be increased snowmelt on the tailings. The mine structures are below a slope that is less worrisome due to the presence of mature trees, and a lower total slope elevation. It is wise to avoid having personnel at the mine during the winter months. In addition, it may be prudent to add avalanche-resistant design to critical structures

that may have offices or workers. Avalanche-resistant designs will also be helpful for other hazards like debris flow and rockfall. There is no information regarding the proposed Avalanche Protection Berm shown in Exhibit C. For more information on the avalanche hazards for this site, contact Ethan Greene of the Colorado Avalanche Information Center (303-499-9650).

Hazards with less potential impact to the mine operations would be slope creep, landslides, and talus or rockfall.

Waste Piles

There will be two waste rock piles as part of the permit: The Atlas pile (to the west) and the Revenue Combined pile (to the east). The permit states the average height of the Revenue pile to be 55 ft. There will be diversion ditches built on the uphill sides of the piles to "permanently" convey runoff water around the piles.

The permit states that a stability analysis was not preformed on the waste piles because of the apparent stability of the existing waste material. The proposed slopes for the waste piles will be at a 3:1 slope grade, and as stated above, water will be diverted away from the piles.

Shaft Locations

The permit indicates that three new shafts are proposed and that three existing shafts will also be used for the mine. These shaft locations are shown in Exhibit C-5. The shafts will be up to 6 feet in diameter. The permit mentions that any topsoil stripped from the location of the shafts will be used to create a berm around the shaft to reduce water runoff inflow into the shafts. In addition, the shafts should be evaluated for and protected from avalanches, debris flows, and rockfall. The location for the 960 Incline Vent, in particular, is located within the known avalanche chute. The existing shafts should also be evaluated and make sure there is some sort of diversion berm.

Geotechnical Stability Exhibit

The permit included a stability analysis for the waste piles and for the regraded disturbed areas (not a global stability analysis) for the Revenue Mine . Specific details for waste rock embankment placement are given to ensure a structural integrity. Based on the analysis, the embankment and regarded (REGRADED) areas do not appear to be at risk for failure under design conditions. However, long-term design and maintenance for the site should be considered. If a flood or debris flow event on Sneffles Creek occurs, erosion of the waste rock piles could occur and decrease the stability of the waste rock. Additionally, should the drainage diversion ditches around the waste rock piles become compromised, water may encroach into the waste rock and destabilize the piles.

Also important to note is that the stability analysis is not looking at global conditions. As stated above, the entire site is in an area that has been mapped as a high risk for slope movement (landslide, slope creep, talus/rockfall). While the locations of the proposed structures are not in areas of exceptionally elevated risk, the entire site is prone for potential stability problems related to the underlying geologic conditions, regardless of the mining contributions.

Summary, Recommendations and Comments:

1) Generally, the permit application is well thought out from a geologic hazards stance. The proposed locations of the mine-related structures are likely in the best possible locations; however that does not mean they are risk free. Reducing exposure by only mining in the summer is a good strategy, but won't help with flooding or debris flow events.

2) The stability evaluation is adequate for ideal conditions for the mine-related portions of the site. It does not address global conditions, and assumes proper site drainage and maintenance. The internal analysis done by DRMS indicates the geologic materials are generally well-drained granular materials that are likely stable under normal conditions. Adverse grading or excavation, unusually wet ground conditions, or seismic activity may affect the overall stability of the site.

3) There should be a maintenance plan developed to monitor and maintain the diversion ditches around the waste piles and the toe of the waste pile embankments to ensure proper function. The Operator should also consider impacts from extra snowmelt water that may encroach on the waste piles if avalanche runout occurs.

4) The shaft locations, particularly the location for the 960 Incline Vent, should be evaluated and protected for possible geologic hazards.

5) There is no information regarding the design of the Avalanche Protection Berm shown in Exhibit C. This information would be helpful in determining what facilities the structure should be protecting, and if it is of adequate design to do so. With design forethought, this berm may also double as a debris flow berm.