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October 27, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor

THRU: Daron Haddock, Permit Supervisor

FROM: Sharon Falvey, Senior Reclamation Hydrologist SKF

RE: South Refuse Ditch , Received Sept 4, 1997, Western States Minerals, J.B. King Mine, ACT/015/002-97B, File #2, Emery County, Utah

SYNOPSIS

The information reviewed was presented to resolve issues related to NOV#N98-45-4-1. Included in the document are proposed steps to reconstruct the ditch, husbandry practices and precipitation data to show the 10-year, 6-hour precipitation event was exceeded.

ANALYSIS

This submittal presents data from the precipitation event recorded at the site on September 1, 1998 which produced 1.2 inches over a two hour period. This event was followed by a precipitation event, on September 10, 1998, precipitating 1.5 inches over 15 hours and a maximum 1.2 inches over a 10 hour period. According to the NOAA Atlas Volume VI - Utah the 10-year, 6-hour event for the disturbed area is between 1.2 and 1.3 inches over the 6-hour event and was interpolated to approximate 1.28 inches. The 10-year, 24-hour event is approximately 1.7 inches and the 100-year, 6-hour event is approximately 1.8 inches for reference.

Because the 1.2 inch precipitation event occurred in a two hour period the peak runoff that results from that event should be compared to the design flow capacity provided by the ditch. No design was found in the plan. However, the following was found:

1. The existing plan, under UMC 784.22 *Diversions* (blue page version), indicates that the natural drainage north of the refuse pile is protected by plus four inch riprap and is diked on the south side to prevent refuse contaminated run-off from entering the natural drainage. The dike is proposed to control all runoff from the refuse area and discharge to the sedimentation pond.

2. The existing plan under UMC 784.13 *Reclamation Summary* indicated the fourth phase of reclamation included building a sedimentation control berm and ditch along the northern perimeter of the refuse area. However, no designs could be found.

The review by the consultant Hansen Allen and Luce suggested the design storm has a recurrence interval of 25 years but did not provide the method analyses and calculations to support the estimate presented.

Observations during a site visit suggest a rubber rabbit brush in the ditch may have resulted in backwater that contributed to the ditch failure. Removal of vegetation as ditch maintenance should be considered especially if previous inspections have recognized a need to remove vegetation from the channel.

The data collected on site indicate the precipitation depth for the 10-year, 6-hour event occurred in a short duration (2 hours). Division policy has been that perimeter ditches be designed to convey the 10 year - 24 hour event so that the 10-year, 24- hour event is contained at the pond as required by R645-301-742.221. However, the Division approved a lesser design to be contained in the pond according to R645-301-742.221.33 (the predicted 10-year, 24-hour runoff volume exceeds the pond volume by 1.66 acre feet). Still, the plan suggests the ditch is built to convey all flows but, no design for the ditch was provided.

The proposed steps to repair and improve the site are acceptable and include minimizing the flow that currently reaches the ditch.

FINDINGS:

Prior to determining that the precipitation event exceeded design requirements exceeded the following should be considered:

1. A ditch design needs to be provided.

2. Removal of vegetation as a ditch maintenance procedure should be considered, especially if previous inspections have recognized a need to remove vegetation from the channel.

3. The peak flow from the 2 hr event should be compared to the approved ditch design to determine if the design was exceeded.

RECOMMENDATION:

It is recommended that the inspector consider the information presented in this analyses prior to further actions regarding the NOV. The plan should be modified to incorporate designs for the north perimeter ditch and proposed changes should be implemented in the field immediately. Following implementation the permittee should demonstrate the design is adequate to convey the flows equal to the 10-year, 24-hour event or a precipitation event design that is equal to the capacity the pond is currently sized to contain.

cc: Susan White
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