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File

July 6, 1988

TO: File

FROM: Rick P. Summers, Reclamation Hydrologist

RE: Design of Reclamation Channel For Little Snyder Canyon, Blazon #1 Mine, Received July 1, 1988, North American Equities, ACT/007/021, Carbon County, Utah

Summary:

The above referenced submittal consists of a channel design, inlet structure for an existing culvert, an overflow swale, and a culvert outlet modification for the reclamation of Little Synder Canyon at the Blazon site. The submittal was made as a response to a stipulation on the permit issued in 1986.

Analysis:

The channel design was based upon a 100 yr. - 24 hr. design precipitation event. The original Technical Analysis for the permit stated that the 50 yr. - 24 hr. event would be acceptable for the design based upon the proposed post-mining land use for the site and the rules of UMC 817.133. However, upon more careful evaluation of the hydrograph for the area, it was found that the 100 yr. - 24 hr. peak flow event was less than the originally proposed 50 yr. - 24 hr. peak. This is largely due to utilization of a more specific precipitation depth from the NOAA atlas (Miller, et. al.) rather than using the data from the gage at the Clear Creek Summit. The applicant chose to use the 100 yr. - 24 hr. event for the design work to meet the more stringent requirements of our rules (UMC 817.44).

Review of the peak flow values presented indicate the applicant's values are correct. The technical analysis is as follows:

Parameter	Applicant's Value	DOGM Value
Area (acres)	121 ac.	130.1 ac.
Hydraulic Length	4730 ft.	5062.2 ft.
Watershed slope	34.8%	31.2%
Curve number	64	64
Ppt. 100/24	3.42 in.	3.42 in.
Time of Conc.	0.49 hrs.	0.54 hrs.
Storm Distr.	Type II	Type II

The results are:

Peak Flow	Applicant's Value	DOGM Value
100 yr. - 24 hr.	46.4 cfs	48.12 cfs
50 yr. - 24 hr.	30.61 cfs	29.3 cfs

The application presents the results of two seive analyses of material existing in the recently excavated channel. The analysis indicated the need for the placement of a filter blanket for the channel design. The application correctly calculated and proposed a double filter blanket to insure channel and riprap stability.

The channel has been designed to pass the peak flow event at a depth of 1.03 feet and 0.47 ft. of freeboard. The application presented a slope value for the final configuration of the channel of 16.4 percent. However, Division evaluation of the slope value resulted in a value of 20.4 percent. The design should be reevaluated using the correct value for the slope.

An existing culvert (24 " CMP), labeled culvert D, currently conveys the drainage across the pad and discharges into the Mud Creek Channel just downstream from Culvert B. The exact depth of this culvert is not known at this time. However, excavations conducted last fall indicate the pipe depth to be approximately 5.0 feet. The proposal demonstrates that this culvert is adequate to pass the 50 yr. - 24 hr. design event if the 5 foot headwall can be maintained. The reader is referred to the Technical Analysis and Decision Document of the original permit for justification for the use of a 50 yr. - 24 hr. event. Since the depth of the existing culvert is unknown at this time, the proposal will be approvable with the following stipulation:

<u>Stipulation UMC 817.133- RPS</u>

> The inlet to culvert D must be constructed to maintain a minimum of 5.0 feet of clearance above the top of the excavated culvert. If this distance cannot be maintained, the operator must install an adequately sized culvert to pass the excess flow. The Division must be notified of the culvert size (including design) to be installed prior to installation.

In addition, the applicant has proposed a 20 foot top width and a 1 foot deep overflow swale that can adequately pass the excess flow from the 100 yr. - 24 hr. precipitation event (17.1 cfs) at an acceptable velocity of 2.9 fps. As a conservative measure, 2 inch compacted road base will be installed to further insure the swale will not erode. The installation of the swale will result in interference with the drainage in the diversion labeled ditch B. A correctly sized culvert will need to be placed at the inlet to the swale to direct the disturbed area drainage to the sediment pond.

Stipulation UMC 817.46 - RPS

> The operator must submit plans for the installation of a culvert to direct the drainage in Ditch B to the sedimentation pond in the vicinity of the proposed swale inlet. The plans must be submitted prior to commencement of construction of the Little Synder channel.

The proposal states that the discharge from culvert (D) will be directed toward Mud Creek via a 90° elbow. The currently approved plan requires the installation of a riprap lining with a D_{50} of 33.6 inches (Exhibit 23, Blazon MR&P, October, 1986). Riprap stability charts indicate that this riprap is stable for velocities to 21 fps. This will adequately dissapate the energy from culvert D. However, if this size riprap is not installed in the immediate area of discharge or the channel designs for the Mud Creek restoration are revised, the applicant will need to submit design details for an adequate energy dissapator. Additionally, concern is raised relative to the forces on the 90° elbow and the potential need for a thrust block or similar reinforcement (See comments by R. Harden, staff engineer, memo dated July 7, 1988). Stipulation UMC 817.47-RPS is warranted.

Stipulation UMC 817.47-RPS

> The applicant must insure that a riprap layer with a D_{50} of 33.6 inches is installed in the vicinity of the outlet to culvert D. If the layer is not installed in this vicinity or the plans for the reconstruction of the Mud Creek Channel are revised to include decreasing the size of the currently approved riprap, the applicant must submit designs for an adequate energy dissapation structure. The plans must be submitted and approved prior to initiation of construction of the Mud Creek Channel.

Recommendations

The proposal is not approvable at this time due to an error in the calculation of the design slope for the project. The error has been discussed with the operator's consultant and agreement has been made to redesign the channel using the correct slope value. Since the redesign will require a resubmittal of the package, the applicant should incorporte the information required by the stipulations in this memo in the next submitted proposal.

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