

Norman H. Bangerter
GovernorDee C. Hansen
Executive DirectorDianne R. Nielson, Ph.D.
Division Director355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

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TO: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Thomas Munson, Senior Reclamation Hydrologist *TM*

RE: Deficiencies for the Gordon Creek #2, #7 & #8 Mining and Reclamation Plan, Mountain Coal Company, ACT/007/016, Folder #2, Carbon County, Utah

Synopsis

The operator submitted on February 1, 1993 a reclamation plan for the Gordon Creek #2, #7 and #8 property. This memo will outline the deficiencies identified during the completeness review to date.

Analysis

- 732.210.** *Sedimentation ponds whether temporary or permanent, will be designed in compliance with the requirements of R645-301-356.300, R645-301-356.400, R645-301-513.200, R645-301-742.200 through R645-301-742.240, and R645-301-763. Any sedimentation pond or earthen structure which will remain on the proposed permit area as a permanent water impoundment will also be constructed and maintained to comply with the requirements of R645-301-743, R645-301-533.100 through R645-301-533.600, R645-301-512.240, R645-301-514.310 through R645-301-514.321 and R645-301-515.200.*
- 356.300.** *Siltation structures will be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated. In no case will the structure be removed sooner than two years after the last augmented seeding.*

The requirements for providing for an adequate pond maintenance plan are spelled out above. The operator has failed to provide for any long term maintenance for the permanent sediment pond, the stock watering pond, or the Sweet's Pond per the requirements of **R645-301-880-320** and Phase II bond release. This maintenance requirement is also asked for under R645-301-732-210. The operator has to state specifically how he will comply with the requirement for permanent maintenance including sediment removal.

The sediment clean out levels for the sediment pond are shown on the stage capacity curve but have not been transposed to Plate 7-14. In addition to showing these elevations on Plate 7-14, the operator must identify how the clean out elevations will be marked in the pond (i.e., sediment markers).

The Stock Water Basin must also be included in the maintenance plan to meet all regulatory requirements.

Sweet's Canyon Pond and Permanent Sediment Pond

733.200 Permanent and Temporary Impoundments

The operator must provide stability comparable to a 1.3 minimum static safety factor in lieu of engineering tests to establish compliance with the minimum static safety factor of 1.3 specified in R645-301-533.100.

Diversions

732.300. *Diversions. All diversions will be constructed and maintained to comply with the requirements of R645-301-742.100 and R645-301-742.300.*

742.312. *The diversion and its appurtenant structures will be designed, located, constructed, maintained and used to:*

742.312.1. *Be stable;*

742.313. *Temporary diversions will be removed when no longer needed to achieve the purpose for which they were authorized. The land disturbed by the removal process will be restored in accordance with R645-301 and R645-302. Before diversions are removed, downstream water-treatment facilities previously protected by the*

diversion will be modified or removed, as necessary, to prevent overtopping or failure of the facilities. This requirement will not relieve the operator from maintaining water-treatment facilities as otherwise required. A permanent diversion or a stream channel reclaimed after the removal of a temporary diversion will be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel including the natural riparian vegetation to promote the recovery and the enhancement of the aquatic habitat.

The operator has failed to adequately address the following stability issues:

- 1) Stability issues associated with the location of the main channel which runs through the #2 mine site. This review will also involve the outcome of the "A.O.C. considerations."
- 2) Stability issues associated with diverting seeps across reclaimed fills with no consideration of infiltration into the fills (Page 3-3, PAP). An underdrain or french drain might be the appropriate solution versus proof of fill stability under saturated conditions.
- 3) Restoration of the Right Fork of Bryner Canyon to restore premining characteristics of the original stream channel where it meets the old pad fill. Ponding in what is considered a natural depression appears to be caused by the presence of the pad and failure to reestablish original grade for the channel.
- 4) The stability of all channels and the riprap protection proposed for these channels is questioned. It is very apparent that the operator has decreased the size of riprap protection by almost a factor of three for the lower pad area (D50 of 18 inches to a D50 of 6 inches). The peak flow values have been recalculated and were dropped from 195.1 cfs for the lower mine site to 28.21 cfs. Although this is a product of regulatory changes, the operator has chosen to use liberal peak flow methodology [100-year/24-hour storm (type II storm, TR-55 model) changed to the 100-year/6-hour storm (type B storm distribution, SCS program used by Earthfax, Inc.)] The type of storm used and the means of distributing that storm over 6 hours versus 24 hours has a large bearing on the peak flows generated. The Division feels that the operator has chosen the least conservative

method for estimating peak flows and must be made aware of the liability associated with using these less conservative numbers to generate designs. Any failure of riprap or channel caused by greater than the design storm will have to be documented by **1) having a raingage on the reclaimed site; and 2) using a known channel cross-section with staff gage (floating cork in a perforated PVC pipe) to calculate flows.**

Please note a conflict exists on page 7-34 regarding the use of "plus-18 inch rock" where as the plan calls for much smaller rock. Please correct or clarify. Certainly distributing 18 inch rock randomly isn't considered prudent when specific gradations of riprap are spelled out in the plan.

Filter Blanket Under Riprap

The plan states that a "properly graded coarse grained soil" will be used. The operator has not provided any characteristics of the base material to evaluate the need for a filter layer. The proper test must be carried out for determination and selection of an appropriate filter layer.

Riprap Selection

A rock durability test must be carried out in the field for evaluating suitable riprap material. Such characteristics must be observed:

- 1) " Rings" when hit with a hammer.
- 2) Knife scratch with difficulty.
- 3) Breaks with difficulty.
- 4) No earthy odor.

A slake durability test is in order when sandstones, clay-rich siltstones or limestone is selected.

The type of riprap selected must be angular and be placed by end dumping versus rolling down the hill. **The operator must include these commitments in his plan.**

Sediment Control Measures

742. *Sediment Control Measures.*

- 742.100. General Requirements.**
- 742.110. *Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to:***
- 742.111. *Prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area;***
- 742.112. *Meet the effluent limitations under R645-301-751; and***
- 742.113. *Minimize erosion to the extent possible.***
- 742.120. *Sediment control measures include practices carried out within and adjacent to the disturbed area. The sedimentation storage capacity of practices in and downstream from the disturbed areas will reflect the degree to which successful mining and reclamation techniques are applied to reduce erosion and control sediment. Sediment control measures consist of the utilization of proper mining and reclamation methods and sediment control practices, singly or in combination. Sediment control methods include, but are not limited to:***
- 742.121. *Retaining sediment within disturbed areas;***
- 742.122. *Diverting runoff away from disturbed areas;***
- 742.123. *Diverting runoff using protected channels or pipes through disturbed areas so as not to cause additional erosion;***
- 742.124. *Using straw dikes, riprap, check dams, mulches, vegetative sediment filters, dugout ponds and other measures that reduce overland flow velocities, reduce runoff volumes or trap sediment;***

The operator has not provided enough detail to delineate exactly how the treatment of erosion will take place during reclamation or following reclamation. Mulching rates, hydromulch application rates and tackifier amounts and types, erosion control matting specifications, and surface roughness are provided in some detail (page 3-53, PAP). The operator will provide the following details to verify compliance with R645-301-742.

- 1.) A detailed maintenance plan addressing how rills and gullies will be assessed and when maintenance will be required.
- 2.) The maintenance treatments proposed to be used in addressing problem erosion areas during the bonding period will be spelled out in the PAP.
- 3.) The operator must also present a plan which delineates how the operator will monitor soil surface stability and how water quality data will be collected to demonstrate compliance with the applicable rules.

Roads

762. *Roads. A road not to be retained for use under an approved postmining land use will be reclaimed immediately after it is no longer needed for coal mining and reclamation operations, including:*
- 762.100. *Restoring the natural drainage patterns;*
- 762.200. *Reshaping all cut and fill slopes to be compatible with the postmining land use and to complement the drainage pattern of the surrounding terrain.*

The operator has failed to provide the necessary information for this portion of the reclamation plan involving the removal of the access road below the #2 mine site. This information must be included in the plan.

Recommendations

The operator must look closely at the level of design stability and decide if he feels comfortable with the liability of using the least conservative design parameters for sizing riprap and channels. The operator must also address what the Division considers major channel stability and A.O.C. questions in a reasonable and realistic fashion. The operator must not take lightly the question of Erosion Control during the reclamation process following regrading and reclamation because it is a liability which is considered on going and must be planned for.