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# State of Utah

DEPARTMENT OF NATURAL RESOURCES  
DIVISION OF OIL, GAS AND MINING

Norman H. Bangertter  
Governor  
Dee C. Hansen  
Executive Director  
Dianne R. Nielson, Ph.D.  
Division Director

355 West North Temple  
3 Triad Center, Suite 350  
Salt Lake City, Utah 84180-1203  
801-538-5340

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TO: Susan Linner, Permit Supervisor  
FROM: Mike DeWeese, Reclamation Hydrologist *MD*  
RE: Sowbelly Canyon Reclamation Plan, Castle Gate Coal Company, Price River Complex, ACT/007/004, Folder #2, Carbon County, Utah

### SYNOPSIS

Castle Gate Coal Company's request for small area exemption status for the Sowbelly Canyon facilities, received October 18, 1988, has been reviewed regarding compliance with UMC 817.42. This request was incorporated into the general review of the Sowbelly Canyon final reclamation plan submitted in the MRP. The current submitted reclamation plan is not complete and contains technical inadequacies which prohibit a thorough technical analysis at this time. The following deficiencies must be addressed by the operator.

### ANALYSIS:

#### UMC 783.25 Cross Sections, Maps, and Plans - MMD

Exhibit 3.2.3 contains the following deficiencies:

1. The permit boundary is depicted as extending around the perimeter boundary is depicted as extending around the substation pad and access road below pond 005. The actual permit area encompasses the entire Sowbelly Canyon watershed. The substation load and access road must be included with the rest of the disturbed area and delineated as such on an appropriate map.
2. Post-reclamation surface contours are not shown for the reclaimed area. Final surface contours must be depicted at an interval of no less than 5 feet for the disturbed area and extending 100 feet beyond the disturbance boundaries.

3. The map scale is not large enough to accurately determine diversion locations, watershed boundaries, runoff controls, and land slopes. A map of scale 1 inch = 100 feet or greater must be submitted which accurately depicts and labels all drainage control structures, stream channels, diversions, and disturbed watershed boundaries.

Exhibit 7-3 is the only map which delineates watershed boundaries for Sowbelly Canyon. The map scale is not adequate to accurately determine physiographic parameters necessary to calculate design peak flows. Without these calculations the Division cannot approve any structural designs for the facility. A revised map of scale 1:6000 or greater must be submitted delineating watershed boundaries for undisturbed and disturbed areas and which clearly shows surface contour lines at an interval of 50 feet or less.

UMC 784.14 Reclamation Plan: Protection of Hydrologic Balance  
- MMD

The operator must include in the reclamation plan all best management practices to be utilized during the reclamation process including alternate sediment control measures such as straw bales and sediment fences. The location of any permanent measure to be implemented must be included on an appropriate map.

The operator needs to submit a post-mining water quality monitoring plan to be followed after the operational monitoring plan has ceased. This plan should commit to sampling every year until termination of bonding and conducting analyses for constituents listed in the Division's Water Quality Monitoring Guidelines. A single stage sampler similar to the US U-59 sampler should be utilized for sample collection because of the drainage system's ephemeral nature in Sowbelly Canyon.

UMC 784.13 Reclamation Plan: General Requirements - MMD

UMC 784.16 Ponds, Impoundments, Banks, Dams, and  
Embankments - MMD

The MRP does not contain a detailed reclamation plan as required by regulations. The operator must submit a reclamation plan containing a detailed narrative of the operations to be conducted during the reclamation process. This should include backfilling and grading, removal and/or construction of sedimentation ponds, and revegetation.

The reclamation timetable, submitted in response to the Division's Mid-Term Permit Review dated February 19, 1988, must be sequentially organized relative to the start of reclamation construction. Channel reclamation should be included in addition to the activities contained in the submitted table.

Section 3.2-5(2) of the MRP states that the access road and substations will remain until final reclamation is undertaken. Section 3.2-5(1) estimates final reclamation will occur in the year 2008 for an area of only three acres with the access road remaining permanently. This discrepancy should be addressed and clarified as to what facilities are to remain permanently, the acreage of the area to be reclaimed, and when final reclamation is to occur.

#### UMC 784.22 Diversions - MMD

Diversion design worksheets submitted in the plan are not legible. Designs must be submitted for each diversion to be constructed which include calculations for peak flows, channel depth, channel width, flow depth, flow width, side slope, minimum and maximum bed slope, and channel roughness. Permanent diversions must be designed to safely convey the runoff from a 100 year 24 hour event.

Exhibit 3.2-3 shows the channel parallel to the road above channel section RC-2 as unreclaimed. This reach is in the disturbed area and must be included in the final channel reclamation design for the 100 year 24 hour storm. The location of the access road and stream channel cross section at the top of this exhibit is not identified on the map. It is not clear what the orientation of this cross section is. The channel configuration depicted on the map conflicts with the configuration portrayed in the cross section.

#### UMC 817 Permanent Program Performance Standards

A cursory review of the design calculations for the existing sedimentation ponds and diversions revealed the following inadequacies:

1. No justification could be found for the determination of curve numbers used in design calculations. Table 7.4 of the MRP presents SCS curve number values. Soil and ground cover input values used for this methodology must be provided with references to the appropriate corresponding maps and survey information describing soil and vegetation types.

2. The operator uses a value of 0.35 acre feet per acre of disturbance in the pond volume calculations on pages 7-9, section 3.2 of the MRP. Example calculations in chapter seven determined a conflicting value of 0.035 acre feet per acre of disturbance. Neither value is justified by the example calculations presented in chapter seven. These calculations were performed using input values for Crandall Canyon assuming that this was representative of the entire permit area. This is not a valid assumption. Calculations for sediment yields must be conducted using site specific values for Sowbelly Canyon.
3. Submitted maps of ponds 003, 004, and 005 are not adequate. Cross sections of pond embankments included on these maps do not show spillway structural dimensions or configurations. Longitudinal cross sections and plan views of spillway structures should be submitted for any proposed or existing sedimentation ponds to remain during reclamation depicting dimensions such as barrel length, height, and slopes. Calculations must be submitted demonstrating that these spillways are adequate to convey the design storm as required by UMC 817.46.
4. Section 3.2-5(1) states that stream channels will be riprapped where necessary yet no calculations were found regarding channel stability. Calculations must be submitted demonstrating channel velocities and identifying reaches requiring riprap. The operator must submit riprap design calculations for each channel to be reclaimed including values for riprap and filter blanket gradations.
5. No exhibits were found which were adequate to determine channel slopes. Maps or longitudinal profiles of all diversions and stream channels must be submitted which are sufficient to verify channel slopes.

UMC 817.42 Hydrologic Balance: Water Quality Standards and  
Effluent Limitations - MMD

The operator's letter to the Division received October 19, 1988, requests that the Division grant a small area exemption for the entire 16 acre disturbed area in Sowbelly Canyon. This request was based on the operator's assumption that without an exemption, the three existing ponds could not be removed until adequate vegetative cover had been established. Subsequent removal would then require re-entering the reclaimed area, subjecting the area to further disturbance. However, other options are available for sediment control during the revegetation process which will satisfy the requirements of subsection (a) without requiring a small area exemption.

The Division recommends that the two upstream sedimentation ponds be removed during regrading operations prior to reseeded. One pond structure located at the downstream perimeter of the disturbed area can be constructed to provide interim sediment control. The operator would then have the option of removing this and after vegetative and effluent limitations have been met or leaving the pond as part of the post-mining land use if justified.

Subsection (a) (3) of this regulation states that exemptions may be granted for "small areas only". Therefore, the Division cannot grant an exemption for the entire disturbed area in Sowbelly Canyon as per the operator's request.