



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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August 22, 1989

TO: Susan C. Linner, Permit Supervisor

FROM: Mike DeWeese, Reclamation Hydrologist *YMD*

RE: Sowbelly Canyon Reclamation Plan, Castle Gate Coal Company,
Castle Gate Complex, ACT/041/004, Folder #2, Carbon County,
Utah *10071*

SUMMARY:

The Sowbelly reclamation plan submitted as part of the permit renewal mining and reclamation plan (MRP) has been reviewed for completeness and technical adequacy. The submittal is not considered complete, therefore a thorough technical analysis is not appropriate at this time. The following comments are listed by the original mid-permit term review comments.

ANALYSIS:

UMC 783.25 Cross Sections, Maps, and Plans - MMD

Exhibit 3.2.3 contains the following deficiencies:

1. The disturbed area is incorrectly labeled as the permit area. The substation pad and access road below pond 005 must be included with the rest of the disturbed area and delineated as such on an appropriate map.

OPERATOR'S RESPONSE:

The pad area and access road are outlined by a discontinuous boundary labeled "permit perimeter". As noted in the Division's original comments, "permit" area and "disturbed" areas are two distinct classifications and must be labeled appropriately on this map. Disturbed areas must be outlined around the entire perimeter by a continuous boundary.

The operator's response is not adequate.

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2. The map scale is not large enough to accurately determine diversion locations, drainage areas reporting to specific runoff control structures, runoff controls, and disturbed area slopes. A map of scale 1 inch = 40 feet or greater must be submitted which accurately depicts and labels these features.

OPERATOR'S RESPONSE:

As agreed in the operator's meeting with the Division on January 6, 1989, a disturbed area map scale of 1 in. = 200 ft. is adequate for areas no smaller than the sowbelly canyon disturbance. The operator has included cross sections of the disturbed area sufficient to determine the reclaimed surface topography.

The operator's response is adequate.

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 inch = 100 feet 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.

OPERATOR'S RESPONSE:

As agreed in the operator's meeting with the Division on January 6, 1989, a map scale of 1:24000 is acceptable for the permit area boundary and the larger watershed areas. However this scale is not adequate to accurately determine watershed parameters on the smaller watersheds. Specifically Sowbelly watershed areas SB 1, SB 5, SB 6, and SB 7 should be shown on a map of sufficient scale to present the same magnitude of detail as shown on the larger watersheds.

The operator's response is not adequate.

UMC 784.13 Reclamation Plan: General Requirements - MMD

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

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.

OPERATOR'S RESPONSE:

The submitted reclamation timetable does not address the sequence of construction or include channel reclamation.

The operator's response is not adequate.

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.

OPERATOR'S RESPONSE:

The operator appears to have removed the text regarding the aforementioned references. Page 1 of section 3.2 describes acreages and initial construction dates for reclamation. No description of permanent facilities could be found in the revised text.

The operator's is not adequate.

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.

OPERATOR'S RESPONSE:

The operator states on page 9, section 3.2 that alternate sediment controls will be provided by straw bale dikes placed at 150 foot intervals in the diversion channels and straw mulch applied along the channels. The Division has agreed that site constraints warrant the removal of sediment ponds prior to vegetative establishment. However as supplemental sediment control in place of the sediment ponds the operator must commit to utilizing straw mulch at a rate of 2000 lbs. per acre over all disturbed areas with slopes of 50% or less. This mulch must be crimped into the soil parallel to the contour of the reclaimed surface.

The operator's response is not adequate.

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.

OPERATOR'S RESPONSE:

Section 7.5-1 presents a sampling schedule and constituents to be analyzed for the operational surface water quality monitoring plan. The operator states on page 247 that sampling will be conducted for two years after reclamation. No other information could be located regarding the post-operational monitoring plan. The operator must submit the same information for the post-operational sampling plan as provided in the operational sampling program. In addition, the sampling methodology and relative date on which the post-operational program is to commence must be submitted.

The operator's response is not adequate.

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UMC 784.22 Diversions - MMD

Diversion design worksheets submitted in the plan are not legible. Designs must be submitted for each proposed or existing diversion which will remain during reclamation or permanently. Designs must include calculations and values 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.

OPERATOR'S RESPONSE:

After cursory review, the submitted design worksheets appear to be legible.

The operator's response is adequate.

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.

OPERATOR'S RESPONSE:

The operator has removed the channel cross section from the top of exhibit 3.2-3. This exhibit depicts the permit boundary around the perimeter of the disturbance area. This is an incorrect reference and must be revised to accurately show the disturbed area boundary labeled as such. Furthermore the reclaimed channel extending from transect G to the channel reach across from pond 005 must be included in the disturbed area.

The operator's is not adequate.

UMC 817 Permanent Program Performance Standards - MMD

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.

OPERATOR'S RESPONSE:

Section 7.2-2(5) page 63 presents an average curve number of 46.5 for the entire permit area. The operator agreed in the meeting with the Division on January 6, 1989, that these calculations and supporting vegetative and soils information would be provided for each canyon in the permit area. The assumption that one curve number value is applicable to the entire permit area is not valid. Furthermore, supporting soils maps and surveys presenting soils characteristics and distributions in the undisturbed watershed areas have not been submitted.

The operator's response is not adequate.

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.

OPERATOR'S RESPONSE:

Table 3.2-7 presents erosion calculations for the Sowbelly disturbed area.

The operator's response is considered adequate.

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 scale 1 inch = 10 feet or greater must be submitted for any proposed or existing sedimentation ponds to remain during reclamation. These drawings must show 1 or 2 foot contours of the pond structure and extend at least to the spillway outlet. Elevations of the following features should be included:

- i. Top of the embankment.
- ii. Crest of the emergency spillway.
- iii. Principle spillway inlet.
- iv. Riser to barrel connection.
- v. Principle spillway outlet invert.
- vi. Maximum water level.
- vii. Maximum sediment level.
- viii. 60 % sediment cleanout level.
- ix. Bottom of the pond.

Calculations must be submitted demonstrating that these spillways are adequate to convey the design storm as required by UMC 817.46.

OPERATOR'S RESPONSE:

Section 3.2 contains hydraulic calculations of the pond spillway structures. The operator has revised the drawings of ponds 003, 004, and 005 to show 2 foot contours of the incised portions of the pond structures. During the operator's meeting with the Division on January 6, 1989, it was agreed that these drawings would depict contours a minimum of 50 feet beyond the primary spillway outlet. The submitted pond drawings depict contours barely beyond the embankment crest in some instances. In addition the exhibit does not present sufficient detail of the pond spillway to determine the adequacy of this structure.

The operator's response is not adequate.

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.

OPERATOR'S RESPONSE:

Design worksheets for the reclaimed stream channel are located on pages 44-47 of section 3.2. Velocities on these worksheets are in conflict with velocities presented in table 7-11 (chapter 7 page 73). This table also presents riprap sizes referred to as a given diameter "minus" which implies that this is the maximum diameter of the riprap material. However a footnote at the bottom of the page states that "50% of the rock will be design size" indicating that these are actually d_{50} values. These discrepancies must be corrected. The riprap material size distributions must be submitted with the correct riprap diameters. No calculations regarding riprap in diversion channels D-1 through D-6 were found. No calculations of filter blanket material requirements or a demonstration that this is unnecessary was found. These calculations must be submitted for all diversion channels.

The operator's response is not adequate.

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.

OPERATOR'S RESPONSE:

The operator has submitted cross sections of the reclaimed surface area.

The operator's response is considered adequate.

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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 reseeding. 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 pond 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.

OPERATOR'S RESPONSE:

During an on-site meeting on February 10, 1989, the operator requested that the Division grant a variance to the requirement that all surface drainage must report to a sedimentation pond until adequate vegetation was established during reclamation. The Division agreed that site constraints warranted this action and an in-channel sediment treatment structure would be adequate. The operator's latest submittal will remove only pond 004, leaving ponds 003 and 005 as permanent structures. The Division believes that these ponds serve no practical purpose as permanent structures under the operator's post-mining land use of grazing and wildlife. The operator's assumption that these ponds will serve as a continuous water supply to wildlife and livestock is unfounded. Unless the operator can present calculations demonstrating that these structures will indeed retain water during the majority of the dry season the ponds must be removed upon final reclamation.

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No designs for a sediment treatment structure to be utilized in place of sedimentation ponds was found. The operator must commit to leaving at least one sedimentation pond during reclamation or an equivalent structure to be constructed in the stream channel as discussed on-site.

The operator's response is not adequate.

RECOMMENDATIONS:

The operator has not adequately responded to the majority of the Division's concerns in the mid-permit term review. Without an accurate watershed map and soils information the basic parameters necessary to conduct a technical analysis of the Sowbelly facilities cannot be determined. Therefore the Division recommends that no further review be conducted until the operator has adequately responded to the aforementioned completeness issues.

BT6010/15-24