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TECHNICAL ANALYSIS

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TECHNICAL ANALYSIS

PRICE RIVER COAL COMPANY  
CRANDALL CANYON MODIFICATION  
ACT/007/004, Carbon County, Utah

Introduction

The Price River Coal Company has submitted an underground mining and reclamation permit application for the Price River Mine Complex. The Crandall Canyon modification to this mine plan has been reviewed under a complete technical and environmental assessment process because major changes in design for the underground mining operation have been developed. Due to the nature and extent of these changes, the length of the review process, and the pending necessity for their implementation, the Crandall Canyon modification was singled out for separate review and will later be assimilated into the entire complex mine plan review.

The facilities under review are located north of Price off of Highway 6 in northwestern Carbon County, Utah; T. 12 S., R. 9 E., Sections 27, 28 and 29. Twenty-eight acres of land are involved. The Price River, Willow Creek and Spring Canyon Creek are the closest drainages to the property. Mining activities associated with the modification take place in the #3 and #5 mines which have their main entries in Hardscrabble Canyon and Sowbelly Gulch to the south. Coal will not be hauled or extracted through the Crandall Canyon facilities. The proposed facilities in Crandall Canyon include; two mine access shafts, support facilities such as a bathhouse, warehouse, leach field and parking, as well as access roads. These are required to provide needed improvement in the ventilation of the mine and to reduce the underground transportation time for men and materials during the projected minimum 30 year life of the mine.

Mining in the consolidated leased and fee simple reserves has occurred to some degree in all mineable seams by various business entities since the turn of the century. In 1971, a corporate entity, Braztah, began mining activities. After internal reorganization in 1979, the operating interest became Price River Coal Company, a holding of the American Electric Power Company.

The proposed permit area is in the Wattis Planning Unit in the northwest portion of the Price River Resource Area, Moab District. The Wattis Planning Unit Management Framework Plan (MFP) was completed in March 1973. The MFP was updated in September 1978 and took into consideration 22 criteria developed under the Surface Mining Control and Reclamation Act, including meeting BLM requirements. An approved mining and reclamation plan under the interim program was issued by the Utah Division of Oil, Gas and Mining with USGS concurrence on April 27, 1977.

The current Mining and Reclamation Plan was received at the Division of Oil, Gas and Mining offices on March 20, 1981. The Apparent Completeness Review was finished and returned to Price River Coal Company together with USGS and OSM comments on July 17, 1981. Final submittal of the Crandall Canyon Modification was determined complete on December 17, 1981. Concurrence with the Determination of Completeness by the OSM was given on January 15, 1982. At the time when the Price River Complex Mining and Reclamation Plan completeness determination is made, the Crandall Canyon Modification will be included in the newspaper publications and agency notifications required under UMC 786.11(a) and (b). In addition, the OSM will review the Crandall Canyon Modification Technical Analysis in conjunction with their review of Price River Complex Technical Analysis and concurrence will not be necessary for completion of the review at this time. Coordination of review was achieved with the following State agencies; the Department of State Health, Division of Water Rights, Division of Wildlife Resources, and the following Federal agencies; the OSM, the Forest Service, the BLM and the USGS. Most agencies concerns have not dealt specifically with the Crandall Canyon Modification but rather with the other portions of the mine complex.

#### Existing Environment and Operations

The permit area is located in a narrow canyon of the Wastach Plateau. Elevation ranges approximately between 6,400 feet and 8,400 feet. Mixed mountain brush, Douglas fir/aspen forest and a riparian/canyon bottom complex are the major vegetation types located in the canyon. Most of the impact will be associated with the latter vegetation type. No known threatened or endangered species have been observed in the canyon.

The stream in the bottom of the canyon is classified as ephemeral above the spring which is located approximately one mile below the surface facilities. The reader is referred to the Environmental Assessment performed by the Bureau of Land Management on the power transmission line which supplies the electric power for the surface facilities.

#### UMC 817.11 Signs and Markers

#### Applicant's Proposal

The existing sign used on the permit area can be easily seen and read and indicates the name of the mine, owner and permit identification information. It is located at the public access point. Perimeter marker signs have been suggested by inspectors and a time period for implementation has been given. Topsoil stockpile signs are in current use. There are no perennial streams or a stream with a biological community on the permit area, therefore, no buffer zone markers will be necessary. No surface blasting will be conducted by the applicant and no signs will be posted.

Stipulation - 2-19-82-1TT

The applicant must submit a statement to the Division to the effect that all signs; identification, perimeter and otherwise, have been installed and conform specifically to the 817.11 regulations.

Compliance

The applicant will comply with this section when this stipulation is met.

UMC 817.13-.15 Casing and Sealing of Exposed Underground Openings

Applicant's Proposal

The two shafts proposed for the Crandall Canyon facilities will be lined with approximately one foot of concrete during construction. Interformational waters will be effectively sealed off or controlled throughout operational use. After operations, about one third of the material removed from the shafts will be available to be returned down hole (the remainder will have been emplaced into fills). All paved surfaces except for the access roadway will have been broken up and removed and consequently placed into the shafts. A reinforced concrete cap will be placed over the shafts and will be covered by at least two feet of surficial material.

Stipulation - 2-19-82-2TT

The applicant should submit a statement to the Division that all exploration holes and monitoring wells will be or have been abandoned in accordance with UMC 817.13-.15. (Although never specifically mentioned, the applicant is assumed to be aware of the minimum State and USGS requirements.)

Compliance

The applicant will comply with this section when this stipulation is met.

817.21-.25 Topsoil

Applicant's Proposal

Topsoil removal and storage procedures will be performed during all phases of site construction. Prior to construction activities for designated areas within the proposed area of disturbance, the topsoil or upper six (6) inches of unconsolidated growth medium will be removed and stored in designated locations (see Exhibits No. 4, 5 and 6). Existing organic materials will not be included in topsoil storage piles. Topsoil will only be collected from areas where collection is technologically feasible; considering degree of slope and percentage of large boulders as limiting factors. Specifically, topsoil removal will not occur in the rocky Castle Valley soil formations.

This includes slopes above the colluvial/alluvial valley soil complexes (Horrocks & Corollo, 7-79). Access road development, as shown in Exhibits 8A through 8F, will primarily disturb the Castle Valley formation with the exception of areas between State Route 6 and the first stream crossing. This stretch is "made land" (based on recommendations by the Bureau of Land Management and DOGM), being previously affected by highway construction. Some suitable growth material may be obtainable.

In areas where suitable unconsolidated growth media exists in excess of six inches, a greater amount may be collected to provide resoiling material in areas for which topsoil is unavailable.

Topsoil will be stored in designated areas to the point of stable capacity. Measures to achieve rapid growth will be attempted as soon as possible after each stockpile is complete. Methodology will include mechanical scarification, mulching, crimping and seeding with species of both an annual and perennial habit. Soil amendments will be added to stimulate growth as per soil test recommendations. Topsoil stockpiles will remain intact for a minimum of thirty (30) years. Surrounding mature species will not be discouraged from colonization. The following species will be included in the planting plan (based on recommendations by the Bureau of Land Management and DOGM):

<u>Common Name</u>	<u>Species</u>	<u>Habit</u>	<u>Lbs. Per Acre</u>
Barley	Hordeum vulgare	Annual	26
Intermediate Wheatgrass	Agropyron intermedium	Perennial	4
Russian wildrye	Elymous junceous	Perennial	4
Great Basin wildrye	Elymous cinereus	Perennial	4
Woods rose	Rosa woodsii ultramontana	Perennial	1/2
Bitterbrush	Purshia tridentata	Perennial	1/2
Curlleaf Mtn. Mahogany	Cecocarpus ledifolus ledifolus	Perennial	1/2
Birchleaf Mtn. Mahogany	Cecocarpus montanus montanus	Perennial	1/2

Upon final reclamation, all disturbed areas will be graded to approximate original contour, tying into the natural slopes. Stored resoiling material will be spread on all graded areas to a minimum depth of six (6) inches.

Fertilizer or other soil amendments will be applied to the seeded areas based on soil analyses to be performed at the time of resoiling.

The soils in the area are entisols, inceptisols and mollisols. These soils are found at an elevation of from 7,000-9,000 feet and have an annual precipitation in the range of 16-30 inches and a mean annual air temperature of about 38° F.

Stipulation - 2-19-82-3EH

817.22 Topsoil Removal

Applicant must indicate the depth and volume of soil to be removed from each area of construction. These figures are needed to insure enough soil material is available to provide the six inch depth of resoiling proposed by the applicant.

Stipulation - 2-19-82-4EH

UMC 817.22 Topsoil Removal

Applicant must indicate the equipment and methods to be employed in removal from insitu and transporting of topsoil to storage locations.

Stipulation - 2-19-82-5EH

817.23 Topsoil Storage

Applicant must address the methods of erosion control used to insure topsoil stockpile protection prior to plant establishment.

Stipulation - 2-19-82-6EH

817.24 Topsoil Redistribution

Applicant must provide the equipment and methods employed to insure that the requirements set forth under UMC 817.24 are achieved.

Compliance

Compliance will be achieved when the previous stipulations have been met.

817.41-.42 Water Quality Standards and Effluent Limitations

Applicant's Proposal

Price River Coal Company has proposed to utilize a sedimentation pond, #016, for topsoil storage runoff, an oil separator for facilities area runoff and a septic system with a leach field for waste water treatment. The sediment control facilities are described specifically under Sections UMC 817.45, 817.47 and 817.52 of this review.

Stipulation

None.

Compliance

Applicant has complied with this section.

UMC 817.43 Stream Channel Diversions

Applicant's Proposal

Applicant has adequately sized the permanent stream channel diversion for the ephemeral Crandall stream channel utilizing the Rational Method to determine the peak flow rate for the 100-year event in the Crandall Creek watershed. The Chezy-Manning formula was used to determine the minimum height and width required for the diversion channel to handle the peak flow rate.

The slopes of the channel will be riprapped as required and contained between the natural canyon wall stone facade and a concrete retaining wall in specific sections. The gradient of the floor of the stream channel will not be changed. Price River Coal Company intends to maintain and enhance the permanent stream channel diversion to reflect its natural condition.

Stipulation

None.

Compliance

Applicant has demonstrated compliance with UMC 817.44.

UMC 817.44 Stream Channel Diversions

Not applicable.

UMC 817.45 Sediment Control Measures

Applicant's Proposal

Applicant has not proposed sediment control devices for the support facilities area around the shaft. The basic assumption is that runoff will meet Federal and State effluent limitations for all parameters except oil and grease. Two oil separators will be installed along the facilities pad to ensure compliance for oil and grease in runoff from the shop-maintenance and paved areas. The oil skimmers are equipped to handle up to 30 gpm. Oil collected in the skimming device will be directed to a sump which will be pumped to a waste oil tank.

Natural drainage from the surrounding watershed will be routed directly to the stream channel by use of strategically located culverts. A stilling basin is proposed at the entrance of each culvert. The natural drainage diversion around the facilities area has been designed to pass the 25-year, 24-hour event. Calculations provided show that a surface ditch with a cross sectional area of 2.25 ft<sup>2</sup> will be adequate.

Drainage from the access road will be routed to a roadway ditch. Sizing calculations are adequate for predicted peak runoff.

Stipulation - 2-19-82-7SK

If an NPDES permit is not required, then the operator shall carry out storm discharge monitoring from the two oil separators. Data shall be gathered at least once per 90 day period (assuming an occurrence of runoff). An analysis of the first flush should be carried out with at least one more discharge sample obtained 10 minutes later. Those parameters included in the impact monitoring program shall be applied to this analysis.

Compliance

The applicant has not discussed monitoring storm water runoff as it discharges from the oil separators. Sampling the flow will determine the feasibility of utilizing this treatment technology. As stated in UMC 817.42(a)(3)(i), Price River Coal Company must demonstrate that a conventional treatment system is not warranted. If the monitoring stipulation is fulfilled, Price River Coal Company will be in compliance with the requirements of this performance standard.

UMC 817.46 Hydrologic Balance

Applicant's Proposal

Runoff from the topsoil stockpile at the west end of the facilities pad will be routed through a sediment pond designated as 016. Sizing calculations

provided show adequate treatment of runoff will be achieved. The topsoil resource will be protected in that 714 ft<sup>3</sup> collected in the sediment pond each year will be returned to the stockpile on an annual basis. The applicant has not provided detailed design specifications for the construction of pond 016.

Stipulation - 2-19-82-8SK

Applicant must submit detailed design specifications addressing UMC 817.46(j-u), as applicable, to assure the stable construction and operation of pond 016.

Compliance

The applicant will achieve compliance by submitting detailed design specifications for sediment pond 016 60 days prior to construction (or from this approval).

UMC 817.47 Discharge Structures

Applicant's Proposal

Applicant has provided calculations for the peak flow rate occurring from the 25-year event for the emergency spillway on pond 016.

The calculations for the storm drain system are provided for the 25-year, 24-hour event. Maximum runoff discharge and culvert sizing are provided.

Stipulation - 2-19-82-9SK

A plan must be submitted to the Division and approved at least 60 days prior to construction; the applicant must provide:

Detailed design specifications for the constructed spillway on pond 016. Include the design for point of discharge.

Stipulation - 2-19-82-10SK

The applicant must provide:

Designs indicating stormwater routing for upper and lower pad through oil separators.

Compliance

Applicant has not included design specifications for the spillway on pond 016. Although the size of the CMP riser is indicated, the discharge point is not discussed in terms of energy dissipation.

Stormwater routing must be indicated for the upper and lower pad areas to provide assurance that flows will run through the oil separators before discharge into Crandall Creek. When these stipulations have been met the operator will be in compliance.

UMC 817.48 Acid-forming and Toxic-forming Materials

Applicant's Proposal

Applicant has provided a toxicity analysis for the excavated materials due to shaft development. The materials are to be placed and compacted for facilities pad development. The pad will then be paved for the life of the shaft thus there is little chance that erosion or breakdown of these materials will result.

Stipulation

None.

Compliance

Applicant complies with this section.

UMC 817.49 Permanent and Temporary Impoundments

Not applicable.

UMC 817.50 Underground Mine Entry and Access Discharges

Applicant's Proposal

Any aquifers encountered during shaft development will either be grouted off or collected in shaft water rings and pumped to storage tanks for later use in the mine. Excessive inflow during and after shaft development will be discharged in accordance with State of Utah effluent limitations (addendum January 1982).

Stipulation

None.

Compliance

Applicant complies with this section.

UMC 817.52 Surface and Ground Water Monitoring

Applicant's Proposal

The applicant has two surface water monitoring stations located above and below the disturbed area in Crandall Canyon. These stations (B-25, B-26) were added to the two ground water monitoring stations in existence in April, 1981.

Ground water stations (B-22 and B-43) are located at and below surface facilities. The sample locations established will adequately depict the impacts due to the shaft excavation and operation and associated surface facilities occurring in Crandall Canyon.

Price River Coal Company has followed the State of Utah's guidelines for establishing surface and ground water baseline data in the mine plan area. Crandall Creek is an ephemeral drainage. Thus far, very limited surface water baseline data have been collected due to the erratic occurrence of flow. However, the amount of baseline data are sufficient for the reviewer to determine seasonal variation. The frequency of impact monitoring is as follows: ground water samples are collected biannually; and, surface samples are collected bimonthly.

In an addendum submitted in January 1982, Price River Coal Company requested to be allowed to discharge (70 gpm) overflow from storage tanks holding the discharge from shaft excavation. Unless a NPDES permit is issued for this flow, there will be no specific monitoring to characterize the quality of this flow.

The Manti-LaSal National Forest supervisor has expressed concern on the impact of changes in the ground water regime on surface resource management and present land-use due to the shaft excavation and use (letter dated May 5, 1981).

Stipulation

None.

Compliance

The applicant has shown compliance with this section.

UMC 817.53 Transfer of Wells

Not applicable.

UMC 817.54 Water Rights and Replacement

Applicant's Proposal

The applicant has not addressed the interruption, contamination or diminution of water supply for owners of real property who obtain their supply either from surface or ground water sources affected by the mining activity.

Stipulation - 2-19-82-11SK

Applicant must describe adjacent water uses which may be impacted by the shaft excavation and determine a means for supplying water if interruption, contamination or diminution occurs.

Compliance

Applicant must evaluate the impact of the shaft excavation and future use of the facilities on surrounding water users before being considered "in compliance" with this regulation.

UMC 817.55 Discharge of Water into an Underground Mine

Not applicable.

UMC 817.56 Postmining Rehabilitation of Sedimentation Ponds, Diversions, Impoundments and Treatment Facilities

Applicant's Proposal

The applicant proposes to maintain the present existing gradient of the stream channel floor. The upstream end will be widened to funnel the flow from upper slopes of the canyon. The slopes will either be rip-rapped or contained with a metal retaining wall.

Stipulation - 2-19-82-12SK

Price River Coal Company must submit an adequate discussion on measures to renovate the permanent Crandall Creek stream channel diversion at the time of final reclamation.

Compliance

The applicant has not discussed renovation of the permanent diversion at the time of final reclamation and therefore compliance with this section has not been achieved. When the stipulation is met, however, compliance will be achieved.

UMC 817.57 Stream Buffer Zones

Crandall Creek is classified as an ephemeral stream therefore this section does not apply.

UMC 817.59 Coal Recovery

Section 817.59, Coal Recovery, for the Price River Crandall Canyon facilities will be addressed in the Technical Analysis of the entire Price River Coal Company facility. As a mine access surface facility, no coal removal is directly involved in Crandall Canyon.

Stipulations

None.

Compliance

Compliance has been achieved.

UMC 817.61-.68 Use of Explosives

Applicant's Proposal

Explosives will be used below ground level to fracture resistant strata during shaft construction. No wells, dwellings or public buildings exist within 1/2 mile of the blasting sites. The blast site is nearly two (2) miles from any public roads.

Stipulation

None.

Compliance

Applicant will comply with Section 817.61-.68.

UMC 817.71-.74 Disposal of Underground Development Waste, Excess Spoil,  
Nonacid and Nontoxic-forming Coal Processing

Applicant's Proposal

All underground development waste encountered during the construction of the two shafts will be spread in even layers and compacted as fill beneath the batnhouse/office building, the parking lot, the access road at the intake shaft area and the exhaust shaft/sewage plant site. The fill area is considered a Valley Fill and will comply with the requirements of 817.71 and 817.72.

The development waste will be compacted in two foot lifts. The materials and plans for compaction have been reviewed by registered engineers and certified as acceptable for the use intended if properly compacted to 95 percent relative density (Exhibit 7A and 373.A, page 4).

The materials to be excavated and used in the fill construction have been chemically analyzed and determined to be nonacid/nontoxic-forming (Exhibit 7 [test hole analyzed] and Exhibit 7B [laboratory results]).

All water will be diverted away from and around the fill area by diversion ditches which will remain for the life of the facility. Exhibit 5 shows the diversion ditches and the drainage off of and under the fill area. The fill area will be paved.

The outslope of the fill is 1v:2h. This is the only portion of the fill that will not be bounded by a retaining wall or a natural slope (Exhibits 5A-5B and ACR response, page 12).

Exhibits 5A-5B show cross sections of the fill area.

Stipulation

None.

Compliance

Applicant will comply with 817.71-.74.

UMC 817.81-.88 Coal Processing Waste Banks

Applicant's Proposal

No coal processing waste will be associated with the Crandall Canyon Modification proposal.

Stipulation

None.

Compliance

The applicant complies with Sections 817.81-.88.

UMC 817.89 Disposal of Noncoal Waste

Applicant's Proposal

Applicant has stated that a contract will be let with a local trash hauling company who will most likely haul trash to the nearest approved landfill.

Waste oil will be stored in minimum 3,000 gallon capacity tanks and scavenged by contracted, licensed waste oil haulers. Solvents will be mixed with waste oil. Oil tanks will be installed within concrete berm areas capable of retaining the entire capacity of the tank without discharge. All oil spills will be captured. Exhibit 5 shows the location of waste oil storage.

Stipulation - 2-19-82-13MR

Applicant must obtain a letter from appropriate landfill authorities showing approval to dispose of trash at the landfill.

Stipulation - 2-19-82-14MR

Is the area where the oil and etc., stored in tanks covered by the application's SSCP plan?

Compliance

Applicant will comply if the above stipulations are met.

UMC 817.91-.93 Coal Processing Waste: Dams and Embankments

There is no coal processing waste generated at the Crandall Canyon facility.

UMC 817.95 Air Resources Protection

Applicant's Proposal

Price River Coal Company has committed to watering roads during construction activities to suppress dust. Upon final completion of the facilities in Crandall Canyon, the main access road and the majority of the disturbed area will be paved. Cut areas, banks, etc., that are not paved will be revegetated. Pursuant to the fact that coal or mining wastes will not be removed from the shafts at Crandall Canyon, no other measures should be necessary to control fugitive dust.

Stipulation

None.

Compliance

Pursuant to the MRP, this section is in compliance.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values

Applicant's Proposal

The permit area for the Crandall Canyon facilities are located in the Wasatch Plateau and is represented by the upper Sonoran/Transition and Canadian life zones. These life zones provide habitat for approximately 368 species of fish and wildlife of which the main species include mule deer, elk, mountain lion, black bear, blue grouse, cottontail rabbits, golden eagles and mourning doves.

High priority habitat for cougar, black bear and cottontail rabbit exists in the permit area. A pair of golden eagles have a nest in Robinson Gulch and another nest of this pair possibly exists in Crandall Canyon. No known threatened or endangered species have been found in Crandall Canyon.

The power transmission line between Hardscrabble Canyon and the Crandall Canyon facilities has been designed and constructed according to the criteria set forth in the REA Bulletin 61-10, Power Line Contacts by Eagles and Other Large Birds.

Several species of raptors inhabit the permit area. The applicant has in the past, and will continue to, notify the Division of Oil, Gas and Mining and the Division of Wildlife Resources of the locations of any nests or roost trees of raptors.

Stipulation

None.

Compliance

Pursuant to the MRP, this section is in compliance.

UMC 817.99 Slides

Applicant's Proposal

The Slope Stability Analysis Report submitted for cut/fill slopes on the access road suggests there is a possibility of slumping on the steeper slopes should the slopes become saturated. It also concludes that it was unlikely a massive slope failure would occur in this area.

Stipulation - 2-19-82-15MR

Should a slide occur within the permit area, the applicant would be required to notify the Division and comply with any remedial measures required by the Division.

Compliance

This applicant will comply with this section when the above stipulation is met.

UMC 817.100 Contemporaneous Reclamation

Applicant's Proposal

Price River Coal Company has committed to revegetate all areas of disturbance (i.e., road cuts, out slopes, etc.) to prevent erosion as soon as it is feasible after disturbance to establish a vegetative cover.

Stipulation

None.

Compliance

Pursuant to the MRP, this section is in compliance.

UMC 817.101-.106 Backfilling and Grading

Applicant's Proposal

Upon final reclamation, approximately 34 percent of the materials removed during shaft construction will be returned to the shafts. The remaining material will be graded and used to backfill any toe of slope cuts. The reclamation contour will approximate the original contour and be 3-10 feet higher in elevation. Stable drainage ways will be established across the regraded areas. All backfilling and grading reclamation will be done in accordance with the reclamation timetable (3.75C, page 35-38).

Final reclamation cross sections are shown on Exhibits 9, 9A, 9B and 9C. Exhibit 9 shows the natural drainage pattern.

The fill material has been tested for toxicity and is classified as nonacid/nontoxic-forming (Exhibit 7B).

Stipulation

None.

Compliance

Applicant will comply with this section.

UMC 817.111-.117 Revegetation

Applicant's Proposal

Price River Coal Company has selected to use the "reference area" method for establishing the success criteria and standards for revegetation success.

Three community types will be affected by the activities in Crandall Canyon, and reference areas have been established for each type and approved by the Division (see memos dated August 20, 1981, and August 27, 1981).

The "riparian bottom" community encompasses a narrow band along the bottom of the canyon. Living cover was estimated at 47.2 percent, woody plant density at 550 plants/acre (146 trees/acre and 404 shrubs/acre) and production at 2,500-3,000 pounds dry weight/acre. The reference area for this type is located approximately .5 miles below the surface facilities.

The "conifer" community occurs on north-facing slopes in the canyon. Less than two acres of this type will be affected. Total living cover for this type was estimated at 74.4 percent, tree density at 400 trees/acre, shrub density at 5,350 plants/acre and productivity at 200-300 pounds dry weight/acre.

The "mixed brush" community encompasses most of the south-facing slopes at lower elevations. Total cover for this type was estimated at 40.9 percent, shrub density at 2,500 plants/acre and productivity at 650-700 pounds dry weight/acre.

The goal of the applicant's revegetation effort is to return the area to premining conditions and productivity.

The seed mixes to be used for reclamation are adapted to the area and are compatible with the postmining land-use.

Stipulation

None.

Compliance

The applicant is in compliance with this section.

UMC 817.121-.126 Subsidence Control

Applicant's Proposal

The applicant has agreed with the Division of Oil, Gas and Mining that the effects of subsidence associated with mining in the multiple seam area beneath

Crandall Canyon will be better addressed during a review of the entire complex. An analysis at this time associated with a review of surface facility installations would be inappropriate.

Stipulation

None.

Compliance

The applicant will comply with these sections when a review is conducted of the Complex plan.

UMC 817.131 Cessation of Operations: Temporary

Applicant's Proposal

The applicant has not addressed this section.

Stipulation - 2-19-82-16MR

The applicant must address Section 817.131 and comply with this regulation should temporary abandonment of the Crandall Canyon facility be initiated.

Compliance

Applicant will comply with this section when the stipulation is met.

UMC 817.132 Cessation of Operations: Permanent

Applicant's Proposal

The Crandall Canyon facility will remain active for a minimum of thirty (30) years. All surface facilities and structures will be removed in accordance with the reclamation activities listed on 3.75C, page 35-39. All areas will be backfilled, graded and revegetated in compliance with regulations. The mine access road will remain (discussed under Section 817.150-.176, Roads).

Stipulation

None.

Compliance

Applicant will comply with 817.132.

UMC 817.133 Postmining Land-Use

Applicant's Proposal

The premining land in Crandall Canyon is primarily undeveloped and unmanaged. Much of the land is owned by Price River Coal Company and leased to local ranchers for light cattle grazing. No management activities or hay production have taken place. Historical and cultural studies (3.74G) revealed some past use in the canyon; residential, recreational and sheep herding. These uses existed fifty (50) years ago and the area has returned to an undeveloped state through natural succession.

Postmining reclamation activities will reestablish the land to conditions capable of supporting the land-use activities before mining began.

Stipulation

None.

Compliance

Applicant will comply with Section 817.133.

UMC 817.150-.176 Roads

Applicant's Proposal

The access road to Crandall Canyon is an existing jeep trail and will be upgraded to meet the requirements of a Class II road. Exhibits 8B-8F show plans and profiles of the access road. The overall road grade is approximately 5.5 percent. The maximum pitch grade is 9.0 percent. Typical roadway cross sections showing proposed cut/fill slopes have been submitted as Figure No. 1 found in the Slope Stability Analysis Report, October 1981. The analysis concluded that slopes would be stable under ordinary conditions (a factor of safety of 1.5 and 1.6 was obtained). The report added that if the slopes become saturated, slumping of the steeper slopes will likely occur. It is not anticipated any massive slope stability failures will occur in this area. Recommendations for construction of the facility to help prevent slope failure are submitted in the Slope Stability Analysis Report. A typical access road cross section shows the road surface sloped two percent from the centerline to drainage ditches (Exhibit 5B). The drainage culverts in Crandall Canyon were designed to handle a 10-year, 24-hour precipitation event. Culverts are located at the "fingers" in the canyon and/or every 500 feet (shown on Exhibits 8B-8F). Typical culvert design is shown on Attachment 7, ACR response. Culvert sizing calculations for various drainages were included in a Hydrological Report, July 20, 1981. The road crosses the stream channel in three locations. Bridges are designed to safely pass a 100-year, 24-hour precipitation event (MRP-373.B, page 7). The access road will be 24 feet wide and hard surfaced.

To facilitate safe access between the proposed Crandall Canyon road and Utah State Route 6 at the mouth of Crandall Canyon, a new intersection will be constructed to Utah Department of Transportation specifications. Exhibit 8A shows plans, profiles and a typical cross section of the intersection.

A Class III road will be constructed to provide access for construction equipment and infrequent routine inspection to the leachfield. Plans, typical cross section and profile of the road is shown on Plates 1 and 2 in the Crandall Canyon Waste Water Treatment Plan (WWT). The road is discussed in the WWT Plan. The overall road grade is eight percent. The maximum pitch grade is approximately 10 percent. Road cuts are 1v:1.5h, 1v:1h; fills are 1v:2h, 1v:4h. Drainage design calculations are shown in WWT Plan. Thirty-six inch culverts have been used for the major drainage areas that cross the roads. The road will be 24 feet wide, crowned at the center and surfaced with gravel.

Reclamation. The access road will remain a hard surfaced permanent road from the state highway to the edge of the lower pad area. The road beyond that point will be returned to a Class III condition, tying into the pre-existing road system up the canyon. The permanent road is needed for access to evaluate reclamation, continuation of the subsidence monitoring program and to provide a corridor to upper canyon grazing areas which will be leased after reclamation is successful.

#### Stipulation - 2-19-82-17MR

Applicant must submit a letter from UDOT stating their approval of plans for the new intersection at Utah State Route 6 and the Crandall Canyon access road.

#### Compliance

When the above stipulation is met, the applicant will comply with 817.150-.176.

#### UMC 817.180 Other Transportation Facilities

The applicant is in compliance as this section is not applicable to the Crandall Canyon facilities.

#### UMC 817.181 Support Facilities and Utility Installations

#### Applicant's Proposal

Price River Coal Company plans to construct the following support facilities in Crandall Canyon; hoist building, fan house, bathhouse, office, warehouse and a power transmission line between Hardscrabble Canyon and Crandall Canyon.

These facilities will be constructed so as to minimize damage to fish, wildlife and related environmental values. All runoff from this area will pass through approved sediment control devices so as to minimize the contribution of suspended solids to stream flow or runoff outside the permit area.

Stipulation

None.

Compliance

The applicant is in compliance with this section.



United States Department of the Interior  
OFFICE OF SURFACE MINING  
Reclamation and Enforcement  
BROOKS TOWERS  
1020 15TH STREET  
DENVER, COLORADO 80202

November 22, 1982

Mr. Thomas N. Tetting, Engineering Geologist  
State of Utah  
Natural Resources and Energy  
Utah Division of Oil, Gas and Mining  
4241 State Office Building  
Salt Lake City, Utah 84114

Re: Price River Apparent Completeness Review (ACR), as prepared by Fred C.  
Hart Associates, dated 10/15/81.

Dear Mr. Tetting:

Mr. Young has reviewed sections 784.13, 783.25, 784.14 and 784.16 of the above mentioned ACR, and has found Hart's work to be satisfactory. The ACR sections that were spot checked appear to be well prepared and sound from a technical aspect. He did not make any changes other than some minor misspelling.

Enclosed is the latest version of the ACR, and as mutually agreed upon, we will be looking forward to your telephone call later this month regarding the joint meeting between Utah, OSM and the Coal Company, regarding this ACR, the company's responses to it, and a schedule from the coal company responding to ACR comments. Also at that meeting we need to reach an agreement as to how the Technical Analysis will be handled regarding this mine complex. Please call Bennett H. Young, OSM Project Leader at (303) 837-5656 if you have any questions.

Sincerely,

Allen D. Klein  
Administrator  
Western Technical Center

Enclosure

RECEIVED  
DEC 9 3 1982

DIVISION OF  
OIL, GAS & MINING

FRED C. HART ASSOCIATES, INC. • CONSULTANTS

MARKET CENTER • 1320 17TH STREET, DENVER, COLORADO 80202

(303) 629-1818

November 15, 1982

Mr. Bennett Young  
Office of Surface Mining  
Western Technical Center  
Brooks Tower, Second Floor  
1020 Fifteenth Street  
Denver, Colorado 80202

Dear Ben,

As we discussed, I have attached a revised version of our Apparent Completeness Review (ACR) for the Price River Complex. The revisions are based upon information gained by our staff during the site visit on October 14, 1982.

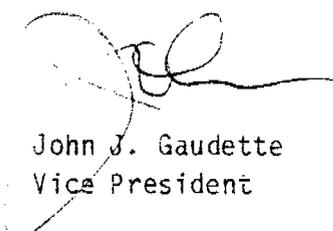
Because the revisions were relatively minor, no amendment to the task order is necessary. However, this situation has demonstrated the value of site visits before ACR or other review work begins.

Appendix A (Cultural Resources) has not been revised, and therefore is not included in this revised version of our ACR.

I hope that this revised ACR is satisfactory. Please give us a call if you have any questions. We look forward to beginning the next phase of this task order.

Sincerely,

FRED C. HART ASSOCIATES, INC.



John J. Gaudette  
Vice President

JJG/et

Enclosure

PRICE RIVER COAL COMPLEX  
DETERMINATION OF APPARENT COMPLETENESS  
FOR THE APPLICATION RESUBMITTAL

Listed by Utah Regulations

**771.23 Permit Applications - General**

Nowhere in the application is it clearly stated for which mines this application applies, and which mines are excluded. The applicant must supply a map showing the area covered by this permit term.

The applicant must provide a map showing where underground coal mining activities occurred both prior to and after August 3, 1977. Mining prior to, and after May 3, 1978; as well as prior to the approval of the regulatory program, and after the estimated date of issuance of a permit by the Division must also be shown.

**782.13 Identification of Interests**

Complete

**782.14 Compliance Information**

Complete

**782.15 Right of Entry and Operation**

Complete

**782.16 Relationship to Areas Unsuitable for Mining**

Complete

**782.17 Permit Term**

See comments under 771.23.

**782.18 Personal Liability and Property**

Complete

**782.20 Public Office for Filing**

Complete

**782.21 Newspaper Advertisement**

Complete

**783.13 Hydrology/Geology Information**

See comments under 783.14, 783.15, and 783.16.

**783.14 Geology Description**

The applicant must provide analyses for pyrite content of the coal as well as the stratum immediately above and below the coal. The information provided in Tables 6-1, 6-2, and 6-3 does not include pyrite.

Table 6-1 must include analyses of all nine target coal seams rather than the six presented.

#### 783.15 Groundwater Information

Inadequacies in the description of the hydrogeologic system present at the Price River Mine Complex were a major topic of concern in the April, 1981, ACR. To date, these inadequacies have not been rectified. It is still unclear exactly how the mining sequence and surface disturbances proposed for the Price River Mine Complex relate to the groundwater system present in the area. The applicant needs to provide a more detailed description of the hydrogeology of the area, as requested initially in the original ACR. For example, piezometric contour maps have not been provided for the subsurface water bearing zone(s) eluded to in the text of the mine plan. The three geologic cross sections presented in Chapter VI of the application denote the presence of subsurface water, yet it is unclear, without a piezometric surface map, what the flow direction(s) and hydraulic gradient(s) are for the waterbearing zones identified. The applicant should also provide, at a minimum, in addition to the piezometric surface map:

- o A specific description of the recharge and discharge areas for the waterbearing zones identified. Of related concern is the potential for hydraulic communication between the bedrock groundwater and the alluvial groundwater located along the principal drainages in the study area. It is conceivable that the alluvium could be a principal point of discharge for the deeper bedrock zones. If this potential for discharge to the alluvium is found to be present, it could have further importance in terms of assessing impacts to potential alluvial valley floors located along the principal drainages.
  
- o A detailed description, including appropriate references, of the methodologies employed to determine hydraulic conductivities of the bedrock zones. At present, all that is known is that the applicant conducted "packer" tests, without any further detail on how the

tests were employed. A statement regarding the accuracy of the measurements ( $10^{-5}$  to  $10^{-7}$  cm/sec) should also be provided.

- o A quantification of transmissivity values for the waterbearing zones present. Aquifer yield is a function of both saturated thickness and hydraulic conductivity. At present, an attempt has been made to estimate only hydraulic conductivity.
- o The elevations of the tops of the waterbearing zones present.

The applicant states on page I-3 of the introduction to the permit application that ". . . water accumulations in abandoned mine workings are substantial." This indicates that regulatory requests for additional groundwater information are justified, and that a more accurate projection of possible mine groundwater inflows by the applicant is necessary. This is important from an operational standpoint (e.g., how much mine water may be intercepted) as well as from an abandonment standpoint (e.g., will water enter the mine workings and subsequently degrade in quality). Also, if mine inflow were to occur following abandonment, the timing of groundwater discharges would be affected downgradient of the mine, and hence, a change in the water balance would be realized. In light of the fact that "substantial" accumulations of water have accumulated in abandoned mines in the area, the applicant must provide a more quantitative evaluation of potential groundwater impacts resulting from their mining sequence.

The applicant should identify the locations of the mine workings which have experienced the "substantial" mine inflow described above.

The applicant should provide a detailed identification, including a map, of known groundwater users in the area. If groundwater users are not identified, the applicant should clearly show the radius about the permit area utilized in the inventory.

The applicant provided a Water Quality Summary by Vaughn Hansen Associates as Appendix 7-A. Attachment 1 of that summary, which apparently discusses hydrologic evaluations of the Blackhawk Formation, was not included in the permit application. Please provide this document.

The hydrogeologic characteristics of the coal seams has not been discussed by the applicant. It is stated that the coal contains a relatively high moisture content. It is conceivable that the coal seams in the area serve as waterbearing zones, worthy of further characterization.

The applicant, on page 371, refers to a summary of hydrologic test results as being contained in Exhibit 6-12. No Exhibit 6-12 was found in the permit application. On page 372, it is stated that further monitoring is on-going. What is the nature of these further efforts? What is the timing and schedule for completion?

### **Groundwater Monitoring**

The applicant has presented the results of past groundwater monitoring activities at the site which have taken place, under various programs, since 1977. It is apparent that the program has evolved during the time period 1977 to September 1981 (the latest date for which data was submitted) with the addition of some monitoring stations and the deletion of others. It is unclear which stations will be utilized for long term, future monitoring at the site. The applicant should explicitly identify which of the stations will be utilized for future activities.

The analytical parameter list has also gone through a number of modifications during the 1977 to 1981 period. The applicant should provide a statement confirming which set of parameters will be utilized for future monitoring activities, since the data provided to-date show that several lists have been utilized in the past.

Table 7-1 on page 370 of the permit application identifies groundwater monitoring stations, which the text of the application says are located on Figure 7-1. Four wells from Table 7-1, B-40, B-41, B-42, and B-43 are not located on Figure 7-1. Please identify the locations of these stations.

The water quality summary provided by Vaughn Hansen Associates (Appendix 7-A) does not identify depth to water (and hence, piezometric level) in the monitor wells at the time of sample collection. Is this information available? Such information is crucial to the applicant's contention on page 372 of the application that water levels have not been affected in the Blackhawk Formation by previous mining activities.

Also, the groundwater summary presented in Appendix 7-A identifies "flow (cfs)" as a measurement parameter for the wells. How was this parameter determined? Is it the extraction rate used for sample collection?

#### **783.16 Surface Water Information**

The applicant should provide a description of the design and construction of the surface water monitoring stations, including the type of flow gauges in use.

The applicant should identify the watershed areas for all the principal drainages which are located in the mine plan area. For example, the drainage areas for the Price River (above the downstream limit of the mine complex), Willow Creek, Hardscrabble Canyon, Sowbelly Gulch, Spring Canyon, Bear Canyon, Crandall Canyon, Sulfur Canyon Creek and Ford Creek should be provided.

At a minimum, long term mean annual yield for Willow Creek, Spring Canyon Creek and the Price River (the three perennial streams in the study area) should be provided. If such information is available for the non-perennial tributary drainages also, it should be provided.

The applicant needs to provide a discussion of NPDES discharges to the surface water resources in the area. What is the result of past NPDES monitoring activities conducted to-date?

### **783.17 Alternative Water Supply Information**

As discussed in 783.14, the applicant needs to substantiate, via a detailed inventory, the locations of water users in the study area who may be potentially impacted by mining operations. The description should identify the distance from the permit area which was included in the inventory.

### **783.18 Climatological Information**

Complete

### **783.19 Vegetation Information**

The applicant's vegetation map should be revised to portray the locations of the proposed reference areas more distinctly. As presently shown, they are difficult to find. Additionally, the reference areas should be labeled on the map to correspond with the areas described in Section 3.3.

Tables 3.4, 3.5, and 3.6 are missing. They must be provided in order to present required baseline data for the mine plan area.

On the vegetation map, AVF's are illustrated with a line pattern. What does the dot pattern represent?

### **783.20**

Although all species of fish and wildlife in the permit area that are of high interest or economic value have been discussed in the text of Section 10.1, a summary table listing each species by name would be helpful.

### 783.21 Soil Resources Information

In order to fully comply with this portion of the regulations, the applicant must provide the results of soil tests done for all materials to be used in restoring topsoil to each disturbed portion of the mine plan area. This information should supplement the soil test results for the Crandall Canyon area that are presented in Chapter VIII, Appendix B.

### 783.22 Land Use Information

The applicant has not provided a map which illustrates existing land uses within the proposed permit area.

The applicant has not provided a narrative describing the land's capability and productivity. This material must be provided and must address parts 783.22(a)(2)(i) and (ii) of the regulations.

The applicant must describe previous mining activities on site with respect to the criteria outlined in parts 783.22(b)(1) through (5) of this section of the regulations. Present references to the items required under this section are brief, general background statements which don't adequately address all five criteria in this section.

The applicant must describe any land use classifications of the permit area which exist under local law.

### 783.24 Maps - General

Nowhere in the application is it concisely stated for which mines and associated surface disturbances this application applies. It appears that the current permit area includes mines 3 and 5 and existing surface disturbances, as well as the Castle Gate preparation plant and associated refuse pile. If this is so, Exhibit 3-20, showing mining in the Panther mine area, should be revised to show the correct dates when mining will occur.

The applicant must provide a map showing all sub-areas where it is anticipated that additional permits will be sought.

A map showing the location and use of all buildings in the permit area as well as those within 1,000 feet of the permit area must be included.

The locations and boundaries of each of the proposed reference areas should be displayed more prominently on the vegetation map. As drawn, they are difficult to find.

#### **783.25 Cross Sections, Maps, and Plans**

All portals currently owned by Price River Coal Company (PRCC) for any portion of the operation must be identified. If portals are not used or sealed, their status should be identified.

Projections on the cross sections in the exhibits are too vast for practical use. For example, MC-53 is projected 5,100 feet from the north and MC-132 is projected 5,200 feet from the south onto cross-section A-A<sup>1</sup>, thus resulting in a shift of nearly 2 miles.

The applicant must provide an illustration of the locations of monitoring stations designed to gather data on fish and wildlife.

Sufficient slope measurements must be provided as required by 783.25.

#### **783.27 Prime Farmlands**

Complete

#### **784.11 Operating Plan**

The location and areal extent of the topsoil storage area in Gravel Canyon must be shown on a map along with the surface water control structures.

#### 784.12 Operating Plan: Existing Structures

Information for each of the existing structures utilized by PRCC must be provided as required by this part. In particular, the stability of any cuts and fills in the surface facilities areas must be identified; as well as areas where mine development waste, and shaft construction waste is, or has been, disposed of.

In the narrative description of the Willow Creek facilities (p. 164, Section 3.6 of the permit application), the applicant discusses the failure potential for embankments, including piping and tension cracks. Some elaboration of this discussion is necessary: 1) which dike has failed, and was it repaired, and 2) have remedial measures been effective?

#### 784.13 Reclamation Plan: General Requirements

The applicant must provide information on measures to be taken if temporary closure becomes necessary as required by 817.131.

The applicant should define the boundaries of the proposed permit area (see 771.23).

The amount of proposed bond must include the cost for grading of the refuse pile and reclamation of the pile, for the worst case situation, if the site is abandoned prior to complete pile construction. In addition, the closure costs for each of the portals must be estimated in more detail along with building removal costs. References are available which provide reasonable data to make a more detailed estimate.

The specific dates anticipated for reclamation of the disturbed areas must be noted for all disturbances in the permit area, for each major step of the reclamation process.

Plans and cross-sections must be submitted showing the existing and final surface configuration of all areas disturbed by mining. Cross-sections of

the sites are the only way to ensure that the disturbed areas are being returned to the most stable configuration reasonably possible.

Specific plans should be provided showing how each portal and shaft will be closed to insure that the design is adequate for each particular setting. Consideration of potential hydraulic heads on portal seals subsequent to closure must be taken into account, especially given the fact that the old workings are flooded.

The applicant has indicated that the sedimentation ponds are numbered according to their NPDES permits. A list is given on p. 48, Sec. 2.7 in the permit application that includes three NPDES permits. The narratives given in Chapter 3 and information located on exhibits 3.2-1, 3.3-1, 3.4-1 and 3.6-1 indicates that there are at least eight existing sediment ponds, a minimum of three proposed ponds and numerous, undescribed structures called sedimentation basins. The applicant must: 1) Explain why there are not more NPDES permits; 2) Supply a more complete list of NPDES permits if possible 3) Provide a narrative of the requirements (monitoring and efficient limitations) attached to the NPDES permits for each discharge point and 4) Provide a thorough discussion of any violations of NPDES effluent limitation requirements that may have occurred at any existing pond (or basin) and the remedial measures that have been implemented or proposed to correct the violations.

#### **784.14 Reclamation Plan: Protection of Hydrologic Balance**

The applicant must clearly indicate where all the sediment and sludge cleaned from every sediment pond or basin in the permit area is being disposed of.

Throughout Chapter 3 of the permit application, the applicant mentions that small area exemptions from sedimentation ponds are being requested. In order to evaluate these requests, the applicant must locate these areas on Exhibits 3.2-1, 3.3-1, 3.4-1 and 3.6-1. Additionally, acreages of the small area exemption requests should be provided in every case and the

applicant should explain the alternative sediment controls that will be used in those areas.

The applicant has designed sedimentation ponds based on a sediment value derived initially from the USLE on pages 401-409, Chapter 7 of the permit application. Several questions arose during the review of this methodology:

(1)

On p. 401, the applicant states that precipitation varies from 10 to 20 inches across the permit area. This fact is later used to support the contention that the sediment derivation for Crandall Canyon is a worst case analysis since that area receives the highest amount of rainfall. The applicant should discuss why Crandall Canyon was used as a worst case solely on the basis of precipitation since the R factor for the entire mine is 40 anyway and is not particularly affected by precipitation amount at the mine site according to Figure 1 of the permit application. In other words, could there be other areas of the mine that are yielding larger sediment contributions to ponds based on parameters other than precipitation that are factored into the Universal Soil Loss Equation?

(2)

According to the USLE calculations on p. 405 presented as an example for arriving at the typical sediment contribution, .016 acre feet per acre per year could be expected as a "worst case". According to 817.46(1), annual sediment volumes calculated via the USLE or an equivalent methodology must be tripled to arrive at the required pond sediment storage volume. In this case, that requirement would dictate a sediment storage volume of .048 acre feet (.016 acre ft./acre/years x 3 years). This would contradict the applicant's argument presented on p. 409 of the permit application that the calculated sediment contribution is less than .035 acre feet/acre. Therefore, the applicant should re-evaluate the use of .035 acre feet/acre as a conservative estimate and supply supporting data for the chosen methodology.

The applicant has sized all the sedimentation ponds based on the storm runoff and the sediment contribution. These quantities are presented in tables in Chapter 3 of the permit application under the respective surface facilities areas. These tables appear to be incorrect. For example, on p. 117 of the permit application, Table 3.2-4(B) presents the volumes used to size the ponds for mine site 5. It appears that the runoff from disturbed areas during a 25-year storm was added to the runoff from disturbed areas during a 10-year storm to get the total runoff volume for a 25-year event. This type of error was consistent throughout all the calculations for pond sizes presented in the permit application. The applicant must correct all of these and provide a new evaluation of pond sizes.

The applicant must provide a clear explanation of structures scattered throughout the surface facilities that are referred to as sedimentation basins and for which no design data was supplied. What distinguishes a sedimentation basin from a sedimentation pond? According to UMC 700.5, a sedimentation pond is also on excavated depression, as well as a barrier or dam. The applicant should provide a good definition of sedimentation basins as utilized at this mine site and provide plans, cross-sections and calculations for each existing and proposed structure.

#### 784.15 Reclamation Plan: Post Mining Land Use

The applicant must indicate what type of support activities will be required to achieve the proposed post mining land use.

The applicant should evaluate the compatibility of the proposed land use with any existing or proposed surface water plans, and with any applicable State and local land use plans.

Comments submitted to the applicant by owners of the affected lands should be summarized by the applicant.

## 784.16 Reclamation Plan: Ponds and Banks

An inspection plan must be provided to meet the requirements of 816.71(j).

A detailed geotechnical analysis must be provided which shows the stability of the refuse pile setting pond embankment structure. This analysis must incorporate consideration of the following factors: 1) an analysis of the effects of the water flowing through the embankment, the anticipated phreatic surface must be identified; 2) the stability of the foundation material and the potential for seepage through the foundation.

Maintenance requirements for the embankment structure at the refuse pile settling pond must be identified.

The applicant has assumed that discharge structures are not required for some ponds that can retain the sediment and runoff from a 25-year storm event. According to UMC 817.46(d), every sedimentation pond (which includes excavated depressions per UMC 700.5) must be provided with a "non-clogging dewatering device or a conduit spillway approved by the Division". The applicant must upgrade existing sedimentation ponds to conform with this part of Subchapter K, and provide discharge structures for all proposed sedimentation ponds. The submitted information should include: plans, cross-sections, calculations and methodology used to design the discharge structure (refer to UMC 817.46(g)(i)).

The applicant has provided locations for the majority of sedimentation ponds on Exhibit 3.2-1 (Sowbelly Gulch), 3.3-1 (Hardscrabble Canyon), 3.4-1 (Castle Gate and Utah Fuels #1) and 3.6-1 (Willow Creek). There have not been any usable plans or cross-sections, however, save for a few insufficient cross-sections provided in Exhibit 3.2-2. An analysis of sediment pond adequacy requires that the following items be submitted for each existing and proposed sediment pond:

- o Outlines of the drainage areas to each pond shown on the above exhibits.

- o A plan view map for each pond or cross-sections through the entire structure to be used for calculating available storage; a cross-section of each embankment used to construct a sedimentation pond that is to-scale, showing the top-width, height, side slopes and spillway locations; typical cross-sections or plan views of the principal and/or emergency spillways from which dimensions can be obtained; calculations showing that the emergency spillway is capable of adequately passing the run-off (keyed into peak flows in Table 7.5) from a 25 year-24 hour storm event alone or in conjunction with the principal spillway; placement of erosion controls.

On Exhibit 3.4-1, the applicant shows proposed sedimentation ponds 27A and 27B. The explanation for these ponds is presented on p. 146 of the permit application. The applicant should present a drainage area map that clearly shows how runoff formerly routed to ponds 011 and 012 will flow into these proposed ponds.

On p. 116 of the permit application, the applicant explains that three sedimentation ponds in the Sowbelly Gulch area are connected via an 18-inch corrugated metal pipe. What purpose does this serve? The volume analysis for these ponds should be re-evaluated to show that each pond is capable of storing the runoff and sediment from its designated drainage area.

#### 784.16

The applicant should specify what the final design of the refuse disposal site will be and which of the design suggestions that Golder Assoc. has made have been utilized in the construction of the refuse pile. The following specific information is required.

- o An estimate of the quality of the water draining from the refuse material during spring runoff must be made to assess potential hydrologic impacts.

- o Details must be provided on the analyses utilized to determine safety factors including an evaluation of the material properties of the refuse related to stability.
- o The applicant should ensure that that the refuse material will be compacted to 95% of the maximum dry density.
- o An inspection program must be developed showing compliance with 817.82.
- o A materials handling plan should be provided showing the volume of material to be removed, stockpiled and replaced to achieve the required 4 feet of cover and required topsoil during various stages of construction. Otherwise, tests must be performed to substantiate that a lesser amount of cover will support vegetation.
- o The applicant is required by 817.81 to comply with 817.71, 72, and 73. As such, the applicant is required to construct a sub-drainage system. A plan must be submitted showing compliance with this requirement.
- o All plans for the design of the refuse pile must be certified by a registered professional engineer.
- o The applicant must specify if any of the thickener underflow will be disposed of at the refuse pile site.

#### 784.17 Protection of Public Parks and Historic Places

See comments in Attachment A

#### 784.18 Public Roads

Complete

#### **784.19 Underground Development Waste**

See comments under 784.16

#### **784.20 Subsidence Control Plan**

The applicant must provide justification that the Castle Gate Sandstone is capable of subsiding without cracking and as such will not cause surface cracking in areas where structures and renewable resources exist. An analysis should be provided relating subsidence in mined out areas to the percent of coal extracted in those areas. A relationship between coal extraction, seam depths, seam thicknesses and subsidence can be made which could be utilized to predict anticipated subsidence in longwall areas and areas where first mining will occur.

It appears that the subsidence control points utilized in subsidence monitoring are located over previous mining and within the angle of draw of adjacent mining. The applicant must provide data showing that all measurements were made from points unaffected by mining.

The table provided on subsidence data collected to date is mostly unreadable. A readable table must be provided.

#### **784.21 Fish and Wildlife Plan**

Specific information must be provided concerning how the applicant intends to protect or enhance threatened or endangered species of plants or animals in the permit areas, protected species of wildlife in the area, and habitats of unusually high value which may occur in the permit area.

#### **784.22 Diversions**

The applicant should locate the typical channel cross-sections for the Schoolhouse Canyon Refuse Pile diversion (Figure 5-3 of the Golder Report)

on a plan view of the diversion, so that an evaluation of velocities in various segments of the channel is possible.

On p. 5-4 of the Golder Report, a statement is made implying that some portions of the diversion might be constructed in unconsolidated material. This would be an unfavorable situation where the diversion makes a 90-degree swing to the northwest. Therefore, erosion controls must be placed at that juncture or the applicant should demonstrate that the bend in the diversion will be excavated in rock.

In Chapter 7, on Table 7.5, the applicant has presented peak flow calculations that could be used to size the existing and proposed ditches and culverts at the surface facilities areas. The applicant should confirm that these flows were indeed used for that purpose, then supply calculations showing that each diversion and culvert to be utilized during this permit term is capable of adequately passing its assigned peak flow. This could be handled via a table showing the Manning's Equation parameters utilized for each ditch design, its applicable Q-value and resulting velocity. A similar table could be used for each culvert, showing its required Q (again, from Table 7-5) and the designed pipe diameter. A typical cross-section for the ditches could be acceptable, providing that special cases were also provided with cross-sections. These calculations and cross-sections should be keyed into the appropriate plan view map (Exhibit 3.2-1, 3.3-1, 3.4-1 and 3.6-1).

Unless surface water monitoring data proves that these are ephemeral streams, longitudinal profiles should be provided for the larger stream channel diversions, such as Sowbelly Gulch showing pre-construction conditions (if available) existing conditions and proposed restoration.

#### **784.23 Operations Plan: Maps and Plans**

The applicant has made a statement that berms are constructed around the surface facilities at the mine (p. 413 Chapter II) as an integral part of controlling runoff from disturbed areas. These berm locations should be

shown on Exhibits 3.2-1, 3.3-1, 3.4-1 and 3.6-1 so that a realistic evaluation of surface water control can be made. It is not possible to look at the exhibits and determine where runoff is flowing unless these berm locations are clearly shown on the exhibits.

The small sumps mentioned on p. 114 of the permit application should be shown on Exhibit 3.2-1.

The culverts proposed for the access road in the Sowbelly Gulch area mentioned on p. 114 should be located on Exhibit 3.2-1. Associated plans and calculations should also be submitted.

The applicant should provide stationing on the plan view lines of sedimentation pond cross-sections shown on the surface facilities maps so that some correspondence can be made between those plan views and the cross-sections on Exhibit 3.2-2.

The area of land for which the performance bond will be posted must be identified.

Areas where underground development waste has been disposed of must be identified.

#### **784.24 Transportation Facilities**

Detailed descriptions of all roads to be used by the applicant have not been provided. This matter was mentioned in the previous ACR; but, because all the roads--except for the Crandall Canyon access road--to be used by the applicant are very old mining roads and County roads throughout the permit area, it would be impractical for the applicant to provide design data on all of them. Unless others in the regulatory authority have reason for this data, the applicant's submittals should suffice.

Detailed descriptions and drawings have not been provided for conveyors and rail systems as requires by this section.

**784.25 Return of Coal Processing Waste**

N/A

**784.26 Air Pollution Control Plan**

Complete

**785.13 Experimental Practices**

N/A

**785.17 Prime Farmlands**

Complete

**785.19 Alluvial Valley Floors**

The applicant has requested a determination by the State of Utah DOGM regarding the presence of Alluvial Valley Floors. Until consultation with the Utah DOGM has been completed, no questions regarding AVF's (which would require response from the applicant) are appropriate at this time.

**785.21 Coal Plant Not in Mining Plan Area**

N/A

**785.22 In-Situ Processing**

N/A

**785.11 Public Notice of Filing**

Complete

**786.25 Permit Term**

Complete

**800.11 Filing Bond**

Complete

**800.12 Liability Insurance**

Complete

**805.11 Determination of Bond**

See comments under 784.13.

A breakdown of how bonding cost was computed should be compiled to a single breakdown table itemizing areas of reclamation with manpower and machinery as well as materials required.

**805.13 Period of Liability**

Complete

**806.11 Form of Bond**

Complete

**806.14 Terms of Liability Insurance**

Complete

**817.11 Signs and Markers**

The applicant has provided signs and marker information for the Crandall Canyon site only. This information must be provided for all of the permit area and applicable mines.

The remainder of applicable 817 series regulations have been referenced in the previous 783 and 784 series discussions.

APPARENT COMPLETENESS REVIEW

Price River Coal Company  
Price River Complex  
ACT/007/004, Carbon County, Utah

771.23 Permit Applications: General

Nowhere in the application is it clearly stated for which mines this application applies, and which mines are excluded.

The applicant must provide a map showing where underground coal mining activities occurred both prior to and after August 3, 1977. Mining prior to and after May 3, 1978; as well as prior to the approval of the regulatory program, and after the estimated date of issuance of a permit by the Division must also be shown.

UMC 782.13 Identification of Interests

Complete.

UMC 782.14 Compliance Information

Complete.

UMC 782.15 Right of Entry and Operation

complete.

UMC 782.16 Relationship to Areas Unsuitable for Mining

Complete.

UMC 782.17 Permit Term

See comments under UMC 771.23.

UMC 782.18 Personal Liability and Property

Complete.

UMC 782.20 Public Office for Filing

Complete.

UMC 782.21 Newspaper Advertisement

Complete.

### UMC 783.13 Hydrology/Geology Information

See comments under UMC 783.14, 783.15 and 783.16.

### UMC 783.14 Geology Description

The applicant must provide analyses for pyrite content of the coal as well as the stratum immediately above and below the coal. The information provided in Tables 6-1, 6-2 and 6-3 does not include pyrite.

Table 6-1 must include analyses of all nine target coal seams rather than the six presented.

### UMC 783.15 Ground Water Information

Inadequacies in the description of the hydrogeologic system present at the Price River Mine Complex were a major topic of concern in the April 1981 ACR. To date, these inadequacies have not been rectified. It is still unclear exactly how the mining sequence and surface disturbances proposed for the Price River Mine Complex relate to the ground water system present in the area. The applicant needs to provide a more detailed description of the hydrogeology of the area, as requested initially in the original ACR. For example, piezometric contour maps have not been provided for the subsurface waterbearing zone(s) eluded to in the text of the mine plan. The three geologic cross-sections presented in Chapter VI of the application denote the presence of subsurface water, yet it is unclear, without a piezometric surface map, what the flow direction(s) and hydraulic gradient(s) are for the waterbearing zones identified. The applicant should also provide, at a minimum, in addition to the piezometric surface map:

1. A specific description of the recharge and discharge areas for the waterbearing zones identified. Of related concern is the potential for hydraulic communication between the bedrock ground water and the alluvial ground water located along the principal drainages in the study area. It is conceivable that the alluvium could be a principal point of discharge for the deeper bedrock zones. If this potential for discharge to the alluvium is found to be present, it could have further importance in terms of assessing impacts to potential alluvial valley floors located along the principal drainages.
2. A detailed description, including appropriate references, of the methodologies employed to determine hydraulic conductivities of the bedrock zones. At present, all that is known is that the applicant conducted "packer" tests, without any further detail on how the tests were employed. A statement regarding the accuracy of the measurements ( $10^{-5}$  to  $10^{-7}$  cm/sec) should also be provided.

3. A quantification of transmissivity values for the waterbearing zones present. Aquifer yield is a function of both saturated thickness and hydraulic conductivity. At present, an attempt has been made to estimate only hydraulic conductivity.
4. The elevations of the tops of the waterbearing zones present.

The applicant states on page 1-3 of the introduction to the permit application that ". . . water accumulations in abandoned mine workings are substantial." This indicates that regulatory requests for additional ground water information are justified, and that a more accurate projection of possible mine ground water inflows by the applicant is necessary. This is important from an operational standpoint (e.g., how much mine water may be intercepted) as well as from an abandonment standpoint (e.g., will water enter the mine workings and subsequently degrade in quality). Also, if mine inflow were to occur following abandonment, the timing of ground water discharges would be affected downgradient of the mine, and hence, a change in the water balance would be realized. In light of the fact that "substantial" accumulations of water have accumulated in abandoned mines in the area, the applicant must provide a more quantitative evaluation of potential ground water impacts resulting from their mining sequence.

The applicant should identify the locations of the mine workings which have experienced the "substantial" mine inflow described above.

The applicant should provide a detailed identification, including a map, of known ground water users in the area. If ground water users are not identified, the applicant should clearly show the radius about the permit area utilized in the inventory.

The applicant provided a Water Quality Summary by Vaughn Hansen Associates as Appendix 7-A. Attachment 1 of that summary, which apparently discusses hydrologic evaluations of the Blackhawk Formation, was not included in the permit application. Please provide this document.

The hydrogeologic characteristics of the coal seams has not been discussed by the applicant. It is stated that the coal contains a relatively high moisture content. It is conceivable that the coal seams in the area serve as waterbearing zones, worthy of further characterization.

The applicant, on page 371, refers to a summary of hydrologic test results as being contained in Exhibit 6-12. No Exhibit 6-12 was found in the permit application. On page 372, it is stated that further monitoring is on-going. What is the nature of these further efforts? What is the timing and schedule for completion?

Ground Water Monitoring. The applicant has presented the results of past ground water monitoring activities at the site which have taken place, under various programs, since 1977. It is apparent that the program has evolved during the time period 1977 to September 1981 (the latest date for which data were submitted) with the addition of some monitoring stations and the deletion of others. It is unclear which stations will be utilized for long-term, future monitoring at the site. The applicant should explicitly identify which of the stations will be utilized for future activities.

The analytical parameter list has also gone through a number of modifications during the 1977 to 1981 period. The applicant should provide a statement confirming which set of parameters will be utilized for future monitoring activities, since the data provided to date show that several lists have been utilized in the past.

Table 7-1 on page 370 of the permit application identifies ground water monitoring stations, which the text of the application says are located on Figure 7-1. Four wells from Table 7-1, B-40, B-41, B-42 and B-43 are not located on Figure 7-1. Please identify the locations of these stations.

The water quality summary provided by Vaughn Hansen Associates (Appendix 7-A) does not identify depth to water (and hence, piezometric level) in the monitor wells at the time of sample collection. Is this information available? Such information is crucial to the applicant's contention on page 372 of the application that water levels have not been affected in the Blackhawk Formation by previous mining activities.

Also, the ground water summary presented in Appendix 7-A identified "flow (cfs)" as a measurement parameter for the wells. How was this parameter determined? Is it the extraction rate used for sample collection?

#### UMC 783.16 Surface Water Information

The applicant should provide a description of the design and construction of the surface water monitoring stations, including the type of flow gauges in use.

The applicant should identify the watershed areas for all the principal drainages which are located in the mine plan area. For example, the drainage areas for the Price River (above the downstream limit of the mine complex), Willow Creek, Hardscrabble Canyon, Sowbelly Gulch, Spring Canyon, Bear Canyon, Crandall Canyon, Sulfur Canyon Creek and Fork Creek should be provided.

At a minimum, long-term mean annual yield for Willow Creek, Spring Canyon Creek and the Price River (the three perennial streams in the study area) should be provided. If such information is available for the nonperennial tributary drainages also, it should be provided.

The applicant needs to provide a discussion of NPDES discharges to the surface water resources in the area. What is the result of past NPDES monitoring activities conducted to date?

UMC 783.18 Climatological Information

Complete.

UMC 783.19 Vegetation Information

Complete.

UMC 783.20 Fish and Wildlife Information

Complete.

UMC 783.21 Soils Resources Information

Complete

UMC 783.22 Land-Use Information

The applicant has not provided a map which illustrates existing land-uses within the proposed permit area.

The applicant must describe previous mining activities on-site with respect to the criteria outlined in parts 783.22(b)(1) through (5) of this section of the regulations. Present references to the items required under this section are brief, general background statements which don't adequately address all five criteria in this section.

The applicant must describe any land-use classifications of the permit area which exist under local law.

UMC 783.24 Maps: General

Nowhere in the application is it concisely stated for which mines and associated surface disturbances this application applies. It appears that the current permit area includes mines 3 and 5 and existing surface disturbances, as well as the Castle Gate preparation plant and associated refuse pile. If this is so, Exhibit 3-20, showing mining in the Panther Mine area, should be revised to show the correct dates when mining will occur.

The applicant must provide a map showing all sub-areas where it is anticipated that additional permits will be sought.

A map showing the location and use of all buildings in the permit area as well as those within 1,000 feet of the permit area must be included.

#### UMC 783.25 Cross-sections, Maps and Plans

The applicant should specify that the mines identified on Exhibit 3-1 constitute all of the active and inactive mine openings within the mine plan area and adjacent areas. It should be indicated just what kind of closing (type) or usage has been employed by the operation.

Projections on cross-sections A-A' in the exhibit are too vast for practical use. For example, MC-53 is projected 5,100 feet from the north and MC-132 is projected 5,200 feet from the south, thus resulting in a shift of nearly two miles. Several holes appear to be more relevant to the nature of cross-sectional depiction (e.g., MC-170, MC-73, MC-77, MC-100, MC-61). What is the justification for the particular pattern of observation points referenced?

Cross-sectional slope measurements are lacking for areas critical to the mine plan, e.g., Schoolhouse Canyon-Castlegate Prep Plant area, Hardscrabble and Sowbelly canyons and Willow Creek. These should be developed in a representative fashion for areas that may be considered as reasonable examples of the disturbed area (e.g., the distance along the line between the Price River and the drainage ditch above Schoolhouse Canyon; portal areas in the canyons through refuse piles; across access roads; etc.).

#### UMC 783.27 Prime Farmlands

Complete.

#### UMC 784.11 Operating Plan

The location and areal extent of the topsoil storage area in Gravel Canyon must be shown on a map along with the surface water control structures. Reference the date of submittal if these have already been provided.

#### UMC 784.12 Operating Plan: Existing Structures

Information for each of the existing structures utilized by PRCC must be provided as required by this part. In particular, the stability of any cuts and fills in the surface facilities areas must be identified; as well as areas where mine development waste, and shaft construction waste is, or has been, disposed of.

In the narrative description of the Willow Creek facilities (page 164, Section 3.6 of the permit application), the applicant discusses the failure potential for embankments, including piping and tension cracks. Some elaboration of this discussion is necessary: (1) which dike has failed, and was it repaired; and (2) have remedial measures been effective?

## UMC 784.13 Reclamation Plan: General Requirements

The applicant must provide information on measures to be taken if temporary closure becomes necessary as required by UMC 817.131.

The applicant should define the boundaries of the proposed permit area (see UMC 771.23).

The amount of proposed bond must include the cost for grading of the refuse pile and reclamation of the pile, for the worst case situation, if the site is abandoned prior to complete pile construction. In addition, the closure costs for the portals must be estimated in more detail along with building removal costs. References are available which provide reasonable data to make a more detailed estimate.

The specific dates anticipated for reclamation of the disturbed areas must be noted for all disturbances in the permit area, for each major step of the reclamation process.

Plans and cross-sections must be submitted showing the existing and final surface configuration of all areas disturbed by mining. Cross-sections of the sites are the only way to ensure that the disturbed areas are being returned to the most stable configuration reasonably possible.

Specific plans should be provided showing how each portal and shaft will be closed to ensure that the design is adequate for each particular setting. Consideration of potential hydraulic heads on portal seals subsequent to closure must be taken into account.

The applicant has indicated that the sedimentation ponds are numbered according to their NPDES permits. A list is given on page 48, Section 2.7 in the permit application that includes three NPDES permits. The narratives given in Chapter 3 and information located on Exhibits 3.2-1, 3.3-1, 3.4-1 and 3.6-1 indicates that there are at least eight existing sediment ponds, a minimum of three proposed ponds and numerous, undescribed structures called sedimentation basins. The applicant must: (1) explain why there are not more NPDES permits; (2) supply a more complete list of NPDES permits if possible; (3) provide a narrative of the requirements (monitoring and effluent limitations) attached to the NPDES permits for each discharge point; and (4) provide a thorough discussion of any violations of NPDES effluent limitation requirements that may have occurred at any existing pond (or basin) and the remedial measures that have been implemented or proposed to correct the violations.

The applicant's figures for disturbed areas that will be reclaimed do not match those that indicate the total amount of disturbance. This area should be clarified so a valid estimation of soil material required for reclamation can be made.

## Recommendation

Due to the severe lack of soil material for reclamation, the applicant should consider some type of study to determine the feasibility of using soil material present at the areas that are prelaw disturbance

### UMC 784.14 Reclamation Plan: Protection of Hydrologic Balance

The applicant must clearly indicate where all the sediment and sludge cleaned from every sediment pond or basin in the permit area is being disposed of.

On page 125 of the permit application, the narrative on Hardscrabble Canyon explains that coal wastes and fines have been dumped into the stream channel, but that remedial measures will not be continued at present due to the limited life of the facility. The applicant should provide data on the significance of this contamination, i.e., the changes in surface water quality that have occurred since the material was dumped in the stream.

Throughout Chapter 3 of the permit application, the applicant mentions that small area exemptions from sedimentation ponds are being requested. In order to evaluate these requests, the applicant must locate these areas on Exhibits 3.2-1, 3.3-1, 3.4-1 and 3.6-1. Additionally, acreages of the small area exemption requests should be provided in every case and the applicant should explain the alternative sediment controls that will be used in those areas.

The applicant has designed sedimentation ponds based on a sediment value derived initially from the Universal Soil Loss Equation (USLE) on pages 401-409, Chapter 7 of the permit application. Several questions arose during the review of this methodology:

1. On page 401, the applicant states that precipitation varies from 10 to 20 inches across the permit area. This fact is later used to support the contention that the sediment derivation for Crandall Canyon is a worst case analysis since that area receives the highest amount of rainfall. The applicant should discuss why Crandall Canyon was used as a worst case solely on the basis of precipitation since the R factor for the entire mine is 40 anyway and is not particularly affected by precipitation amount at the minesite according to Figure 1 of the permit application. In other words, could there be other areas of the mine that are yielding large sediment contributions to ponds based on parameters other than precipitation that are factored into the USLE?

2. According to the USLE calculations on page 405 presented as an example for arriving at the typical sediment contribution, .016 acre-feet per acre per year could be expected as a "worst case." According to UMC 817.46(1), annual sediment volumes calculated via the USLE or an equivalent methodology must be tripled to arrive at the required pond sediment storage volume. In this case, that requirement would dictate a sediment storage volume of .048 acre feet (.016 acre feet/acre/year X 3 years). This would contradict the applicant's argument presented on page 409 of the permit application that the calculated sediment contribution is less than .035 acre-feet/acre. Therefore, the applicant should re-evaluate the use of .035 acre-feet/acre as a conservative estimate and supply supporting data for the chosen methodology.

The applicant has sized all the sediment ponds based on the storm runoff and the sediment contribution. These quantities are presented in tables in Chapter 3 of the permit application under the respective surface facilities areas. These tables are confusing. Better column headings are necessary (see example on following page). Estimates of sediment produced from vegetated areas is lacking in all pond calculations. If they drain to sediment ponds, erosion from these areas must be included in sediment capacity estimates.

The applicant must provide a clear explanation of structures scattered throughout the surface facilities that are referred to as sedimentation basins and for which no design data were supplied. What distinguishes a sedimentation basin from a sedimentation pond? According to UMC 700.5, a sedimentation pond is also an excavated depression, as well as a barrier or dam. The applicant should provide a good definition of sedimentation basins as utilized at this minesite and provide plans, cross-sections and calculations for each existing and proposed structure.

#### UMC 784.15 Reclamation Plan: Postmining Land-Use

The applicant must indicate what type of support activities will be required to achieve the proposed postmining land-use.

The applicant should evaluate the compatibility of the proposed land-use with any existing or proposed surface water plans, and with any applicable State and local land-use plans.

Comments submitted to the applicant by owners of the affected lands should be summarized by the applicant.

#### UMC 784.16 Reclamation Plan: Ponds and Banks

Potential effects of subsidence from underground mining on the embankment structure for the refuse pile settling pond must be evaluated.

Example Table 3.2-4(B)

Sub-basin	Area (acres)	10-year Storm Runoff Volume		25-year Storm Runoff Volume		Sediment Volume 0.035 ac-ft/ac
		508 ft <sup>3</sup> /ac of Vegetated Area	908 ft <sup>3</sup> /ac of Disturbed Area	2,723 ft <sup>3</sup> /ac of Vegetated Area	3,630 ft <sup>3</sup> /ac of Disturbed area	
Disturbed	11.9	--	10,805	--	43,197	18,143
Vegetated	2.3	1,168	--	6,263	--	
TOTAL	14.2		11,973 ft <sup>3</sup>		49,460 ft <sup>3</sup>	18,143 ft <sup>3</sup>

An inspection plan must be provided to meet the requirements of the design of the embankment structure for the refuse pile settling pond, and must be certified by a registered professional engineer.

A detailed geotechnical analysis must be provided which shows the stability of the refuse pile settling pond embankment structure. This analysis must incorporate consideration of the following factors: (1) an analysis of the effects of the water flowing through the embankment, the anticipated phreatic surface must be identified; (2) the stability of the foundation material and the potential for seepage through the foundation.

Maintenance requirements for the embankment structure at the refuse pile settling pond must be identified.

The applicant has assumed that discharge structures are not required for some ponds that can retain the sediment and runoff from a 25-year storm event. According to UMC 817.46(d), every sedimentation pond (which includes excavated depressions per UMC 700.5) must be provided with a "nonclogging dewatering device or a conduit spillway approved by the Division." The applicant must upgrade existing sedimentation ponds to conform with this part of Subchapter K, and provide discharge structures for all proposed sedimentation ponds. The submitted information should include: plans; cross-sections; calculations; and, methodology used to design the discharge structure (refer to UMC 817.46[g][i]).

The applicant has provided locations for the majority of sedimentation ponds on Exhibit 3.2-1 (Sowbelly Gulch), 3.3-1 (Hardscrabble Canyon), 3.4-1 (Castle Gate and Utah Fuels #1) and 3.6-1 (Willow Creek). There have not been any usable plans or cross-sections, however, save for a few insufficient cross-sections provided in Exhibit 3.2-2. An analysis of sediment pond adequacy requires that the following items be submitted for each existing and proposed sediment pond:

1. Outlines of the drainage areas to each pond shown on the above exhibits.
2. A plan view map for each pond or cross-sections through the entire structure to be used for calculating available storage; a cross-section of each embankment used to construct a sedimentation pond that is to-scale, showing the top width, height, side slopes and spillway locations; typical cross-sections or plan views of the principal and/or emergency spillways from which dimensions can be obtained; calculations showing that the emergency spillway is capable of adequately passing the runoff (keyed into peak flows in Table 7.5) from a 25-year, 24-hour storm event alone or in conjunction with the principal spillway; placement of erosion controls.

On Exhibit 3.4-1, the applicant shows proposed sedimentation ponds 27A and 27B. The explanation for these ponds is presented on page 146 of the permit application. The applicant should present a drainage area map that clearly shows how runoff formerly routed to ponds 011 and 012 will flow into these proposed ponds.

On page 116 of the permit application, the applicant explains that three sedimentation ponds in the Sowbelly Gulch area are connected via an 18-inch corrugated metal pipe. What purpose does this serve? The volume analysis for these ponds should be re-evaluated to show that each pond, or one at a lower elevation, is capable of providing runoff and sediment storage for the designated drainage areas.

The applicant should specify what the design of the refuse disposal site will be and which of the design suggestions that Golder Associates has made will be utilized in the design of the refuse pile. Assuming that the design of the refuse pile will follow all aspects of the design criteria suggested by Golder, the following information is still required.

1. An estimate of the quality of the water draining from the refuse material must be made to assess potential hydrologic impacts.
2. Details must be provided on the analysis utilized to determine the safety factors.
3. If portions of the alluvium/colluvium are removed to cover the refuse pile (page 4-5), will there be enough left to act as a drain (page 6-12) and will it remain sufficiently uncompacted after equipment has traversed it to allow water to percolate through it?
4. The applicant should provide for drainage of the pile during the initial stages of construction and then, subsequent to further testing, if drainage is not needed, delete the drain construction rather than the opposite as suggested on page 6-12. This way, costly reconstruction of the pile might be avoided.
5. The amount of time required to drain the refuse pile in order to ensure stability during construction should be incorporated into the construction requirements of the pile.
6. The applicant should ensure that the refuse material will be compacted to 95 percent of the maximum dry density.
7. An inspection program must be developed showing compliance with UMC 817.82.

8. A materials handling plan should be provided showing the volume of material to be removed, stockpiled and replaced to achieve the required four feet of cover and required topsoil during various stages of construction.
9. A survey of springs and seeps in the disposal site must be made.
10. The effect of subsidence on the stability of the pile must be evaluated (see related comments under UMC 784.20).
11. The applicant is required by UMC 817.81 to comply with UMC 817.71-.73. As such, the applicant is required to construct a sub-drainage system. A plan must be submitted showing compliance with this requirement.
12. All plans for the design of the refuse pile must be certified by a registered professional engineer.
13. A plan to ensure the mixing of fine and course refuse must be provided. Also, the applicant must specify if any of the thickener underflow be disposed of at the refuse pile site.
14. The application should include a plan specifying the maintenance schedule for sediment removal from sediment ponds.

UMC 784.17 Protection of Public Parks and Historic Places

See comments in Attachment A.

UMC 784.18 Public Roads

Complete.

UMC 784.19 Underground Development Waste

See comments under UMC 784.16.

UMC 784.20 Subsidence Control Plan

The applicant must provide justification that the Castle Gate Sandstone is capable of subsiding without cracking and as such will not cause surface cracking. An analysis should be provided relating subsidence in mined out areas to the percent of coal extracted in those areas. A relationship between coal extraction, seam depths, seam thicknesses and subsidence can be made which could be utilized to predict anticipated subsidence in longwall areas and areas where first mining will occur.

It appears that the subsidence control points utilized in subsidence monitoring are located over previous mining and within the angle of draw of adjacent mining. The applicant must provide data showing that all measurements were made from points unaffected by mining.

The table provided on subsidence data collected to date are mostly unreadable. A readable table must be provided.

#### UMC 784.22 Diversions

The applicant should locate the typical channel cross-sections for the Schoolhouse Canyon Refuse Pile diversion (Figure 5-3 of the Golder Report) on a plan view of the diversion, so that an evaluation of velocities in various segments of the channel is possible.

On page 5-4 of the Golder Report, a statement is made implying that some portions of the diversion might be constructed in unconsolidated material. This would be an unfavorable situation where the diversion makes a 90 degree swing to the northwest. Therefore, erosion controls must be placed at that juncture or the applicant should demonstrate that the bend in the diversion will be excavated in rock.

In Chapter 7, on Table 7.5, the applicant has presented peak flow calculations that could be used to size the existing and proposed ditches and culverts at the surface facilities areas. The applicant should confirm that these flows were indeed used for that purpose, then supply calculations showing that each diversion and culvert to be utilized during this permit term is capable of adequately passing its assigned peak flow. This could be handled via a table showing the Manning's Equation parameters utilized for each ditch design, its applicable Q-value and resulting velocity. A similar table could be used for each culvert, showing its required Q (again, from Table 7-5) and the designed pipe diameter. A typical cross-section for the ditches could be acceptable, providing that special cases were also provided with cross-sections. These calculations and cross-sections should be keyed into the appropriate plan view map (Exhibit 3.2-1, 3.3-1, 3.4-1 and 3.6-1).

Unless surface water monitoring data proves that these are ephemeral streams, longitudinal profiles should be provided for the larger stream channel diversions, such as Sowbelly Gulch showing pre-construction conditions (if available), existing conditions and proposed restoration.

#### UMC 784.23 Operations Plan: Maps and Plans

It does not appear that pond 011 has been shown on Exhibit 3.4-1 which depicts surface facilities for the Castle Gate area.

The applicant has made a statement that berms are constructed around the surface facilities at the mine (page 413, Chapter II) as an integral part of controlling runoff from disturbed areas. These berm locations should be shown on Exhibits 3.2-1, 3.3-1, 3.4-1 and 3.6-1 so that a realistic evaluation of surface water control can be made. It is not possible to look at the exhibits and determine where runoff is flowing unless these berm locations are clearly shown on the exhibits.

The small sumps mentioned on page 114 of the permit application should be shown on Exhibit 3.2-1.

The culverts proposed for the access road in the Sowbelly Gulch area mentioned on page 114 should be located on Exhibit 3.2-1. Associated plans and calculations should also be submitted.

The applicant should provide stationing on the plan view lines of sedimentation pond cross-sections shown on the surface facilities maps so that some correspondence can be made between those plan views and the cross-sections on Exhibit 3.2-2.

The area of land for which the performance bond will be posted must be identified.

Areas where underground development waste has been disposed of must be identified.

#### UMC 784.24 Transportation Facilities

Detailed descriptions and drawings have not been provided for conveyors and rail systems as required by this section.

#### UMC 784.25 Return of Coal Processing Waste

Not applicable.

#### UMC 784.26 Air Pollution Control Plan

Complete.

#### UMC 785.13 Experimental Practices

Not applicable.

#### UMC 785.17 Prime Farmlands

Complete.

#### UMC 785.19 Alluvial Valley Floors

Have been included in new response.

UMC 785.21 Coal Plant Not in Mining Plan Area

Not applicable.

UMC 785.22 In-Situ Processing

Not applicable.

UMC 785.11 Public Notice of Filing

Complete.

UMC 786.25 Permit Term

Complete.

UMC 800.11 Filing Bond

Complete.

UMC 800.12 Liability Insurance

Complete.

UMC 805.11 Determination of Bond

See comments under UMC 784.13.

A breakdown of how bonding cost was computed should be compiled to a single breakdown table itemizing areas of reclamation with manpower and machinery as well as materials required, rather than referencing scattered portions of the submittal.

UMC 805.13 Period of Liability

Complete.

UMC 806.11 Form of Bond

Complete.

UMC 806.14 Terms of Liability Insurance

Complete.

UMC 817.11 Signs and Markers

The applicant has provided signs and marker information for the Crandall Canyon site only. This information must be provided for all of the permit area and applicable mines.

UMC 817.43 Hydrologic Balance

The applicant must address the outlet structure for the Schoolhouse Canyon diversion. A stilling basin at the outlet of the diversion is depicted on Exhibit 3.4-1, but not mentioned in the MRP. The applicant should submit information regarding erosion at the outlet of the diversion since its construction. The applicant should submit evidence that this diversion will not increase the potential for landslides at the outlet. Alteration of the Barn Canyon channel and associated flow routing structures within the PRCC preparation plant area should be addressed in regards to the additional runoff contributed to this drainage by the diversion. Design adequacy for these structures must be demonstrated.

UMC 817.97 Protection of Fish, Wildlife and Related Environmental Values

Specific information must be provided concerning how the applicant intends to protect or enhance threatened or endangered species of plants or animals which may occur in the permit area.