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Oil, Gas & Mining

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Cleon B. Feight, Division Director

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

February 19, 1982

#0367276

REGISTERED - RETURN RECEIPT REQUESTED

Mr. Robert Wiley
Environmental Engineer
Price River Coal Company
P.O. Box 629
Helper, Utan 84526

RE: Technical Analysis Completion for
Crandall Canyon Modification
ACT/007/004
Carbon County, Utah

Dear Mr. Wiley:

The Division has completed its technical review of the Crandall Canyon Modification to the Price River coal Company mine plan. A conditional approval is hereby given based upon acceptance and implementation of seventeen separate stipulations herewith attached:

Stipulation - 2-19-82-1TT (UMC 817.11)

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.

Stipulation - 2-19-82-2TT (UMC 817.13-.15)

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

Stipulation - 2-19-82-3EH (UMC 817.22)

The applicant must indicate tne 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.

Board/Charles R. Henderson, Chairman • John L. Bell • E. Steele McIntyre • Edward T. Beck
Robert R. Norman • Margaret R. Bird • Herm Olsen

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Stipulation - 2-19-82-4EH (UMC 817.22)

The 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 (UMC 817.23)

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

Stipulation - 2-19-82-6EH (UMC 817.24)

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

Stipulation - 2-19-82-7SK (UMC 817.45)

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.

Stipulation - 2-19-82-8SK (UMC 817.46)

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

Stipulation - 2-19-82-9SK (UMC 817.47)

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 (UMC 817.47)

The applicant must provide:

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

Stipulation - 2-19-82-11SK (UMC 817.54)

The 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.

Stipulation -2-19-82-12SK (UMC 817.56)

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.

Stipulation - 2-19-82-13MR (UMC 817.89)

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

Stipulation - 2-19-82-14MR (UMC 817.89)

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

Stipulation - 2-19-82-15MR (UMC 817.99)

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.

Stipulation - 2-19-82-16MR (UMC 817.131)

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

Stipulation - 2-19-82-17MR (UMC 817.150-.176)

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

These stipulations must be accepted in writing before approval is issued. All stipulations must be implemented and proof furnished to the Division within 60 days of the date of Division approval unless otherwise noted within a stipulation.

A complete compilation of all material requested for the modification should be kept on file at the Carbon County Recorder's office.

If any questions develop or you desire to have further discussion over any of the stipulations, please contact Lynn Kunzler or myself.

Sincerely,

THOMAS N. TETTING
ENGINEERING GEOLOGIST

TNT/te

cc: Richard E. Dawes, OSM, Denver
Jackson Moffett, U.S.G.S.

Enc: T.A.

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 coments 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 tributory 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 useage 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 acording 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 exsiting 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 arrvie 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
		508 ft^3/ac of Vegetated Area	908 ft^3/ac of Disturbed Area	2,723 ft^3/ac of Vegetated Area	3,630 ft^3/ac of Disturbed area	0.035 ac-ft/ac
Disturbed	11.9	--	10,805	--	43,197	18,143
Vegetated	2.3	1,168	--	6,263	--	
TOTAL	14.2	11,973 ft^3		49,460 ft^3		18,143 ft^3

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 form 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.